Abstracts

Oktober 2019

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DOS Bestyrelse
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ISSN 0902-8633

Videnskabeligt program

	Onsdag d. 23. oktober	Torsdag d. 24. oktober	Fredag d. 25. oktober
07:30-08:00		Generalforsamling	
08.00-08.30			
08:30-09:00			
09:00-09:30	1. Knee I 2. Hand and Wrist 3. Trauma I UDDU Workshop SAKS 20 års Jubilæumssymposium		14. Hip II 15. Infection, Amputation and Tumor VU Symposium UDDU Symposium
09:30-10:30		7. Foot and Ankle 8. YODA Best Papers 9. Hip I	
10:30-11:00	Kaffe i udstillingen	Kaffe i udstillingen	Kaffe i udstillingen
11:00-11:30	4. Pediatrics 5. Best Posters 6. Sports Orthopedics UDDU Symposium	DOS Honorary Lecture Uddelinger fra DOS Fonden Uddelinger af håndkirurgiske legater	Guildal Forelæsning Uddelinger fra Guildal Fonden
11.30-12.00			
12:00-12:30	Frokost i udstillingen Frokostsymposium		
12:30-13:00		Frokost i udstillingen Frokostsymposium	Frokost i udstillingen Frokostsymposium
13:00-13:30	Møde i fagområderne		
13:30-14.00		10. Knee II 11. Shoulder and Elbow / Sports Orthopedics 12. Trauma II KU Symposium UDDU Workshop DOT Workshop	16. Knee III 17. Spine 18. Experimental VU Symposium
14.00-14.30			
14:30-15:00	Kaffe i udstillingen		
15:00-15:30	Møde i fagområderne (fortsat)	Kaffe i udstillingen	Kaffe i Ving Foyer
15:30-16:00		Velkomst til nye speciallæger	
16:00-16:30		Professorforelæsninger	
16:30-17:00		13. DOS Best Papers	
17:00-17:30			
17:30-18:00			

Indhold

Videnskabeligt Program

Onsdag d. 23. oktober 2019

		Lokale:
09:00 – 10.30	**Session 1** *(Knee I)*	*Centersal*
09:00 – 10:30	**Session 2** *(Hand and Wrist)*	*Vingsal 1*
09:00 – 10:30	**Session 3** *(Trauma I)*	*Vingsal 2*
09:00 – 10.30	**SAKS 20 års jubilæumssymposium** ***"Progress in sports surgery"***	*Vingsal 3*
09:00 – 10:30	**UDDU Workshop** ***"Kompetencevurdering i hverdagen"***	*Lokale 15/16*
10:30 – 12:00	**Forum for ledende overlæger**	*Lokale 0*
10:30 - 11:00	***Kaffe i udstillingen***	
11:00 – 12:00	**Forum for uddannelsesansvarlige overlæger**	*Lokale 17/18*
11:00 - 12:00	**Session 4** *(Pediatrics)*	*Centersal*
11:00 - 12:00	**Session 5** *(Best Posters)*	*Vingsal 1*
11:00 – 12:00	**Session 6** *(Sports Orthopedics)*	*Vingsal 3*
11:00 - 12:00	**Uddannelsessymposium** ***Meet the expert: "Ankel frakturer"***	*Vingsal 2*
12:00 - 13:00	***Frokost i udstillingen***	
12:15 – 13:00	**Frokostsymposium** ***Arthrex Danmark*** *Prof. Dr. Stefan Hinterwimmer* ***Augmentation in ACL Repair and ACL Reconstruction***	*Vingsal 1*

		Lokale:
12:15 – 13:00	**Frokostsymposium** ***Zimmer Biomet*** *v/Prof. Anders Troelsen og prof. Henrik Malchau* ***Historik, evidens & kliniske perspektiver for Vitamin-E Polyetylene indenfor hoftekirurgien***	*Vingsal 3*
13:00 - 14:30	**Møde i fagområderne**	
	Dansk Selskab for Hofte- og Knæalloplastik	*Vingsal 1*
	Dansk Selskab for Håndkirurgi	*Centersal*
	Dansk Ortopædisk Traumeselskab samt	*Vingsal 2*
	Dansk Fod- og Ankelkirurgisk Selskab	*Lokale 8/9*
	Dansk Selskab for Artroskopi og Sportstraumatologi	*Vingsal 3*
	Dansk Selskab for Skulder- og Albuekirurgi	*Lokale 4*
	Dansk onkologi/knogle og bløddelstumorer	*Lokale 17/18*
	Dansk Børneortopædisk Selskab	*Lokale 3*
14:30 – 15:00	***Kaffe i udstillingen***	
15:00 – 17.30	**Møde i fagområderne (fortsat)**	
15:00 – 17:00	*Ryginteressegruppen*	*Engsal*
16:00 – 17:30	*Dansk Selskab for Infektionsinteresserede Ortopædkirurger*	*Lokale 0*
17:30 – 19:30	*YODA generalforsamling*	*lokale 4*
18:00 – 20:30	*Danske Ortopæders Organisation*	*lokale 15/16*

Videnskabeligt Program

Torsdag d. 24. oktober 2019

		Lokale:
07:30 – 09:30	**Generalforsamling i DOS**	*Vingsal 1/2/3*
09:30– 10:30	**Session 7** *(Foot and Ankle)*	*Vingsal 1*
09.30 – 10.30	**Session 8** *(YODA Best Papers)*	*Vingsal 2*
09:30 -10:30	**Session 9** *(Hip I)*	*Vingsal 3*
10:30 – 11:00	***Kaffe i udstillingen***	
11:00 – 12:30	**Honorary Lecture:** *Ian Harris, MBBS, MMed (Clin.Epi) PhD* *Orthopedic Surgery* *University of New South Wales, Australia* ***"Surgery as Placebo"***	*Centersal*
	Uddelinger fra DOS Fonden og Uddelinger af håndkirurgiske legater	*Centersal*
12:30 – 13:30	***Frokost i udstillingen***	
12.45- 13:30	**Frokost Symposium** ***Bone Support*** *v/Dr. Jamie Ferguson, Dr. Hans Gottlieb, and Dr. Paul Hercock* ***"Optimizing bone healing in fractures and bone infections".***	*Vingsal 1*
12:45 – 13:30	**Frokost Symposium** ***Viking Medical/Waldemar Link*** *v/Dr. Cecilia Rogmark* ***Strategy in hip fracture management in the elderly focusing on the experience in Sweden***	*Vingsal 2*

		Lokale:
13:30 – 1500	**Session10** *(Knee II)*	*Centersal*
13:30 – 15:00	**Session 11** *(Shoulder and Elbow, Sports Traumatologi)*	*Vingsal 1*
13:30 – 15:00	**Session 12** *(Trauma II)*	*Vingsal 2*
13:30 – 15:00	**KU Symposium** ***"Rammerne for offentligt ansattes ytringsfrihed"***	*Vingsal 3*
13:30 – 15:00	**UDDU Workshop** ***"Kompetencevurdering i hverdagen"***	*Lokale 15/16*
13:30 – 15:00	**DOT Workshop** ***"Basale principper i ekstern fiksation"***	*Lokale 17/18*
15:00 – 15:30	***Kaffe i udstillingen***	
15:30 – 16:00	**Velkommen til nye speciallæger**	*Centersal*
16:00 – 16:15	**Professorforelæsning** *Alma Becic Pedersen* ***"Patient safety in surgery – The role of clinical quality databases"***	*Centersal*
16:15 -16:30	**Professorforelæsning** *Ole Rahbek, MD, PhD* ***"Dickens and Dunning-Kruger in Orthopedics"***	*Centersal*
16:30 – 18:00	**Session 13** *(DOS Best Paper)*	*Centersal*
18.30 – 19.00	***DOS fest***	*Restauranten*
19:00 – 01:00	**Fest og uddeling af priser** DOS Best Paper and second Best Paper Bedste Poster Bedste PhD 2019 Best published paper 2019 YODA Best Paper "Den gyldne YODA"	

Videnskabeligt Program

Fredag d. 25. oktober 2019

		Lokale:
09:00 – 10:30	**Session 14** *(Hip II)*	*Centersal*
09:00 – 10:30	**Session 15** *(Infection, amputation and tumor)*	*Vingsal 1*
09:00 – 10:30	**VU Symposium** ***"Klassikere i ortopædkirurgien"***	*Vingsal 2*
09:00 – 10:30	**Uddannelsessymposium** ***"Den nye målbeskrivelse"***	*Vingsal 3*
10:30 – 11:00	***Kaffe i udstillingen***	
11:00 – 12:30	**Guildal Lecture** *Mathew Varghese, MS* *Head, Department of Orthopedics* *St. Stephen´s Hospital, Deli, India* ***"Enabling persons with disabilities, my journey from Knowledge to Understanding"***	*Centersal*
	Uddelinger fra Guildal Fonden	*Centersal*
12:30– 13:30	***Frokost i udstillingen***	
12:45 – 13:30	**Frokostsymosium** ***Stryker Medical*** *v/Dr. Sören Toksvig-Larsen,* *Hässleholm Sjukhus, Sverige* ***"The evolution of the "high demand" patient´s expectations of TKA"***	*Vingsal 1*

		Lokale:
13:30 – 15:00	**Session 16** *(Knee III)*	*Centersal*
13:30 – 15:00	**Session 17** *(Spine)*	*Vingsal 2*
13:30 – 15:00	**Session 18** *(Experimental)*	*Vingsal 3*
13:30 – 15:00	**VU Symposium** ***"Battle"***	*Vingsal 1*
15:00 – 15:30	***Kaffe i Ving Foyer***	

Videnskabelige sessioner

Session 1: Knee I

Onsdag d. 23. oktober
09:00-10:30
Lokale: Centersal

Chairmen: Daan Koppens og Lasse Enkebølle Rasmussen

1. 5-Year Results of a Randomized Clinical Trial Comparing Patellofemoral and Total Knee Arthroplasty
Anders Odgaard, Jesper Fabrin, Frank Madsen, Per Wagner Kristensen, Andreas Kappel

2. Early follow-up of hybrid Total Knee Arthroplasty (TKA) using Persona® prostheses – a prospective study using Model-based Radiostereometric Analysis
Müjgan Yilmaz, Christina Holm, Gunnar Flivik, Thomas Lind, Anders Odgaard, Michael Mørk Petersen

3. Tibial Component Overhang of both Total and medial Unicondylar Knee replacement can increase local pain in soft tissues.
Jacob Fyhring Mortensen, Julius Hald, Lasse Enkebølle Rasmussen, Anders Odgaard

4. ODINE IMPREGNATED INCISION DRAPE DOES NOT PREVENT INFECTION IN KNEE ARTHROPLASTY SURGERY – 12 MONTHS FOLLOW-UP IN A COHORT OF 1187 PATIENTS
Anne Brun Hesselvig, Magnus Arpi, Frank Madsen, Thomas Bjarnsholt, Anders Odgaard

5. Intraoperative Contamination During Primary Knee Arthroplasty Does Not Affect Patient Reported Outcomes for Patients Who Do Not Develop an Infection in the First Year After Surgery: A Prospective Cohort Study of 714 Patients
Jakob Bjørnholdt Olsen, Tobias Justesen, Anne Mørup-Petersen, Anne Brun Hesselvig, Anders Odgaard

6. Outcome after combined treatment of knee arthrofibrosis
Peter Faunø, Lone Frandsen, Bitten Munk Hansen, Martin Carøe Lind

7. Knee fracture increases the risk of total knee arthroplasty after initial fracture treatment and throughout life.
Veronique Vestergaard, Alma Becic Pedersen, Kristoffer Borbjerg Hare, Henrik Morville Schrøder, Anders Troelsen

8. The incidence of primary knee replacement and radiographic severity of osteoarthritis prior to surgery varies between Danish regions – reports from the SPARK study
Anne Mørup-Petersen, Kristian B.G. Mongelard, Mogens Laursen, Frank Madsen, Michael R. Krogsgaard, Lone Rømer, Matilde Winther-Jensen, Anders Odgaard

9. Heuristic ranking delivers more detail than ordinal grading of knee osteoarthritis radiographs
Kristian Mongelard, Anne Mørup-Petersen, Lone Rømer, Karl Bang Christensen, Anders Odgaard

10. Knee Osteoarthritis: A comparison of Preoperative Radiographic Grading based on OARSI score and Its Correlation with Histopathological findings
Ahmed Salam N. Kurmasha, Daan Koppens, Jess Pilgaard, Torben Bæk Hansen

Session 2: Hand and Wrist

Onsdag d. 23. oktober
09:00-10:30
Lokale: Vingsal 1

Chairmen: Torben Bæk-Hansen og Maiken Stilling

11. Ligament Reconstruction Interposition Arthroplasty combined with Suspension Arthroplasty for CMC-1 Osteoarthritis results in Better Mobility and Less Pain at 6 months
Rasmus Wejnold Jørgensen , Kiran Anderson, Claus Hjorth Jensen

12. Higher preoperative pain catastrophizing increases the risk of low patient reported satisfaction after carpal tunnel release
Sebastian Breddam Mosegaard, Maiken Stilling, Torben Bæk Hansen

13. TFCC foveal re-attachment by modified ulnar tunnel technique - significant clinical improvement at one-year follow-up
Sabine Simonsen, Søren Ohrt-Nissen, Robert Gvozdenovic

14. Total Joint Arthroplasty of the Trapeziometacarpal Joint in WALANT.
Lotte Priess Larsen, Torben Bæk Hansen

15. Lower recurrence rate of Dupuytrens Contracture following collagenase clostridium histolyticum treatment compared with percutaneous needle fasciotomy.
Stig Jørring, Claus Hjorth Jensen

16. Clinical Dorsal Wrist Ganglion: Clinical implications after imaging and pathological assessment
Jamila Eriksen, Niels Henrik Søe, Dimitar Ivanov Radev, Xiong Xie, Eva Balslev, Merete Juhl Kønig, Lisbeth Vesterløkke, Helle Raagaard Larsen, Nana Vermehren, Guðlaug Rósa Sigurðardóttir, Britt Ebstrup,

17. Scapholunate ligament reconstruction. One-year follow-up using the SLAM procedure in 43 patients.
Lars Soelberg Vadstrup

18. Measurements on sagittal CT scans of the scaphoid bone. What are the normal values?
Cæcilie West, Robert Gvozdenovic, Dimitar Radev

19. Primary treatment of trigger finger: Higher recurrence upon corticosteroid-injection
Frederik Flensted Andersen, Rasmus Wejnold Jørgensen, Claus Hjorth Jensen, Jens-Christian Vedel, Henrik Daugaard

20. Can pre-operative measurement of humpback deformity and the size of bony cysts predict the union rate and time to healing of Scaphoid Nonunions?
Benjamin Presman, Morten Bo Larsen , Dimitar Ivanov Radev, Stig Jørring, Claus Hjorth Jensen, Robert Gvozdenovic

Session 3: Trauma I

Onsdag d. 23. oktober
09:00-10:30
Lokale: Vingsal 2

Chairmen: Ilija Ban og Bjarke Viberg

21. Elevation of synovial cytokines after intra-articular ankle fracture
That Minh Pham, Lonnie Froberg, Lars-Henrik Frich , Søren Overgaard, Hagen Schmal

22. Operative versus nonoperative treatment of humeral shaft fractures: a systematic review and meta-analysis.
Ingunn Lode, Vegard Nordviste, Julie Ladeby Erichsen, Hagen Schmal, Bjarke Viberg

23. Low dislocation rate after hemiarthroplasty for femoral neck fractures using anterolateral compared to posterior surgical approach - short-term follow-up of 182 consecutive patients
Casper Gronbek, Stig Brorson, Rasmus Nielsen, Peter Soendergaard, Jens Peter Alva-Joergensen, Peter Max Halschou-Jensen

24. Incidence and Epidemiology of Foot Fractures
Christian Grundtvig Refstrup Rasmussen, Søren Benfeldt Jørgensen, Peter Larsen, Rasmus Elsøe

25. Treating displaced isolated lateral malleolar fractures non-operatively - Patient reported outcome and need of secondary osteosynthesis in a prospective cohort study
Mads Terndrup, Ilija Ban, Søren Kring, Morten Thomsen, Anders Troelsen, Peter Tengberg

26. Ankle joint surgery following osteosynthesis of malleolar fractures
Jonas Adjal, Anne Marie Nyholm

27. Is X-ray follow-up of surgically treated fractures of the adult distal forearm necessary?
Henrik Sjølander, Per Hviid Gundtoft, Sune Jauffred, Michael Brix

28. Conservative treatment vs surgical treatment of humeral shaft fractures – A retrospective study
Dennis Karimi, Cecilie Mølgaard, Søren Kring, Peter Toft Tengberg

29. Results of tibia fractures treated with an all fine-wire circular external fixator. A retrospective case study
Liv Vesterby, Ilija Ban, Morten Grove Thomsen, Peter Toft Tengberg

30. Operation time, perioperative radiolucency and complications following Supra- or Infrapatellar approach for tibia intramedullary nailing; a retrospective study
Line Wickstrøm, Julie Erichsen, Rasmus Bendtson, Anders Jordy, Bjarke Viberg

Session 4: Pediatrics

Onsdag d. 23. oktober
11:00-12:00
Lokale: Centersal

Chairmen: Martin Gottliebsen og Ole Rahbek

31. SEVERELY INJURED CHILDREN ADMITTED TO THE UNIVERSITY LEVEL TRAUMA CENTRE AT ODENSE UNIVERSITY HOSPITAL 2002-2018
Christian Færgemann

32. Experience with anatomical re-alignment for severe Slipped Capital Femoral Epiphysis with surgical dislocation of the hip joint. Use of intraoperative monitoring of femoral head perfusion.
Martin Gottliebsen, Ole Rahbek, Mathias Bunger, Bjarne Moller-Madsen

33. Accelerated Ponseti method is an effective treatment for Congenital Clubfoot
Vilhelm Engell, Mathias Bünger, Ole Rahbek, Søren Qwist

34. Reliability and feasibility of MRI in pediatric acetabular dysplasia
Ole Rahbek, Martin Gottliebsen, Bjarne Møller-Madsen, Michel Bach Hellfritzsch

35. The association between pain and physical activities for children with cerebral palsy
Cecilie Schmidt Østergaard, Nanna Sofie Astrup Pedersen, Anne Thomasen, Inger Mechlenburg, Kirsten Nordbye-Nielsen

36. In Vivo Anatomical Variations of the Lateral Femoral Cutaneous Nerve in a Pediatric Population.
Line Kjeldgard Pedersen, Ole Rahbek, Bjarne Møller-Madsen

37. Bone lengthening with intramedullary magnetic nails. Intra- and post-operative complications
Uggi Balle, Christian Færgemann

Session 5: Best Posters

Onsdag d. 23. oktober
11:00-12:00
Lokale: Vingsal 1

Chairmen: Peter Toft Tengberg og Maiken Stilling

38. Fair to moderate interrater reliability when classifying CMC-1 osteoarthritis using the Eaton Littler classification
Rasmus Wejnold Jørgensen, Frederik Flensted, Kiran Annette Anderson, Claus Hjorth Jensen

39. Conservative Management of Type 2 Dens Fractures: A SPINE Database pilot study
Oliver Zielinski, Rune Bech, Benny Dahl, Martin Gehrchen

40. The Danish Version of the Oswestry Disability Index Applied to Adult Spinal Deformity Patients Satisfies a Unidimensional Rasch Model
Dennis Winge Hallager, Jonathan D Commins, Stig Brorson, Benny T Dahl, Martin Gehrchen

41. Spike in knee fractures in children ages 0-5 in Denmark
Veronique Vestergaard, Alma Becic Pedersen, Peter Toft Tengberg,
Anders Troelsen, Henrik Morville Schrøder

42. Withdrawn

43. Comorbidities associated with chronic postsurgical pain following total knee replacement
Peter Skrejborg, Kristian Kjær Petersen, Søren Kold, Andreas Kappel, Christian Pedersen, Svend Erik Østgaard, Ole Simonsen, Lars Arendt-Nielsen

44. Evaluation of extended scope physiotherapists in an orthopedic outpatient shoulder clinic
Merete Nørgaard Madsen, Maria Lange Kirkegaard, Thomas Martin Klebe, Charlotte Lorenzen Linnebjerg, Stine Junge Due, Søren Martin Riis Villumsen, Jeanette Trøstrup, Hans Okkels Birk, Lone Ramer Mikkelsen

45. Impact of surgery and patient related factors on mortality and morbidity in patients with hip periprosthetic fracture.
Roshan Latifi, Jonatan Damsgaard, Niels Krarup, Marianne Toft Vestermark

46. Evaluation of a new sagittal classification system in Adolescent Idiopathic Scoliosis
Sidsel Fruergaard, Casper Dragsted, Mohit J. Jain, Lorenzo Deveza, David Liu, John Heydemann, Søren Ohrt-Nissen, Martin Gehrchen, Benny Dahl

47. Leg length discrepancy and limb lengthening in children in relation to circumferential periosteal release assessed using EOS.
Line Kjeldgaard Pedersen, Jens Svendsson, Ahmed Abood, Søren Harving

Session 6: Sports Orthopedics I

Onsdag d. 23. oktober
11:00-12:00
Lokale: Vingsal 3

Chairmen: Martin Lind og Kristoffer Barfod

48. Outcome after knee dislocation. A comparison of multiligament injuries using the Schenck classification. Results from the Danish Knee ligament Reconstructions Registry
Torsten Grønbech Nielsen, Lene Lindberg Miller, Martin Lind

49. Practicing procedural skills in knee arthroscopy is more effective than basic psychomotor training: A randomized trial
Mads Emil Jacobsen, Amandus Gustafsson, Per Gorm Jørgensen, Lars Konge,

50. Surgical versus nonsurgical treatment of anterior cruciate ligament rupture with at least 10 years of follow-up: a systematic review and meta-analysis
Daniel Barklin Morgan, Teodor Lien-Iversen, Carsten Jensen, May Arna Risberg, Lars Engebretsen, Bjarke Viberg

51. Five Year Follow-up of Patients Treated with Arthroscopic Partial Meniscectomy
Mathias Gregersen, Rasmus Wejnold Jørgensen , Claus Hjorth Jensen , Anders Odgaard

52. Bone ingrowth into open architecture PEEK interference screw after ACL reconstruction
Martin Lind, Torsten Nielsen, Ole Gade Sørensen, Bjarne Mygind-Klavsen, Peter Faunø, Stacy Leake-Gardner

53. Combined Bone Marrow Aspirate and Platelet-rich Plasma for Cartilage Repair – Two-Year Clinical Results

Kris Tvilum Chadwick Hede, Bjørn Borsøe Christensen, Jonas Jensen, Casper Bindzus Foldager, Martin Lind

54. Risk Factors to First Time and Recurrent Patella Dislocation with Focus on Familial Association. - A Systematic Review and Best Knowledge Synthesis of Present Literature

Oddrún Danielsen, Turið Akraberg Poulsen, Niclas Højgaard Eysturoy, Elinborg Mortensen, Per Hölmich, Kristoffer Weisskirchner Barfod

Session 7: Foot and Ankle

Torsdag d. 24. oktober
09:30-10:30
Lokale: Vingsal 1

Chairmen: Ellen Hamborg-Petersen og Jens Kurt Johansen

55. A new passive movement model for the treatment of non-healing diabetic foot ulcers. A randomized clinical trial of wound healing
Tue Smith Jørgensen, Maria Leinum, Hans Gottlieb, Stig Brorson, Ylva Hellsten, Birgitte Høier

56. Calcaneal positioning in equinus immobilization of the ankle joint. A comparsion of common orthoses used in the treatment of acute Achilles tendon ruptures
Rasmus Mikkelsen, Sanja Somodi, Per Hölmich, Kristoffer Barfod

57. How can we implement Early Functional Rehabilitation for Achilles tendon ruptures if the original studies didnt describe what they did? A systematic review
Marianne Christensen, Jennifer A Zellers, Inge Lunding Kjær, Karin Grävare Silbernagel, Michael Skovdal Rathleff

58. Defining components of Early Functional Rehabilitation for acute Achilles tendon rupture: A systematic review
Marianne Christensen, Jennifer A Zellers, Inge Lunding Kjær, Michael Skovdal Rathleff, Karin Grävare Silbernagel

59. The Achilles tendon Total Rupture Score – a manual of how to use it
Hansen Maria Swennergren , Helander Katarina Nilsson , Karlsson Jon

60. Charcot Foot Reconstruction – How Does Hardware Failure And Non-union Affect The Clinical Outcome?
Ingvild Kummen, Ngwe Phyo , Venu Kavarthapu

Session 8: YODA Best Papers

Torsdag d. 24. oktober
09:30-10:30
Lokale: Vingsal 2

Chairmen: Jakob Klit og Søren Ohrt-Nissen

61. Implant Positioning in Undisplaced Femoral Neck Fractures: association to reoperation and development of a scoring system
Maja Ida Boye Koldaas, Josefine Nadia Pedersen, Frederik Damsgaard Højsager, Henrik Palm, Bjarke Viberg

62. Systemic Intermittent Hypoxic Therapy Inhibits Allogenic Bone Graft Resorption by Inhibition of Osteoclastogenesis in a Mouse Model
Ari Demirel, Natasja Leth Bergholt, Michael Pedersen, Ming Ding, Bent Winding Deleuran, Casper Bindzus Foldager

63. Withdrawn

64. Is percutaneous needle fasciotomy a safe treatment for Dupuytren contracture? – An observational study on 3,365 treated fingers in 2,280 patients
Laura Houstrup Therkelsen, Simon Toftgaard Skov, Malene Laursen, Jeppe Lange

65. Local concentrations of gentamicin obtained by microdialysis after a controlled application of a GentaColl sponge in a porcine model
Maja Thomassen, Pelle Hanberg, Maiken Stilling, Klaus Petersen, Kjled Søballe, Lasse Krag, Carsten Højskov, Mats Bue

Session 9: Hip I

Torsdag d. 24. oktober
09:30-10:30
Lokale: Vingsal 3

Chairmen: Claus Varnum og Alma Pedersen

66. Do patients with hip dysplasia have a strength deficit 1 year after periacetabular osteotomy?
Julie Sandell Jacobsen, Stig Storgaard Jakobsen, Kjeld Søballe, Per Hölmich, Kristian Thorborg

67. Prevalence of hip dysplasia in adult patients
Anna Bohman, Sören Overgaard, Carl-Johan Tiderius, Cecilia Rogmark

68. Patient Reported Outcome of Periacetabular Osteotomy in Treatment of Acetabular Retroversion
Bjarke Viberg, Kate Andersen, Ole Ovesen, Morten F. Bøgehøj, Søren Overgaard

69. Does pain and hip function improve two years after reverse peri-acetabular osteotomy?
Christina Nielsen Bræmer, Sarah Ankjær Langberg, Stig Storgaard Jakobsen, Søren Reinhold Jakobsen, Hugo Aleixo, Kjeld Søballe, Inger Mechlenburg

70. 14-year hip survivorship after periacetabular osteotomy: a follow-up study on 1385 hips
Josefine Beck Larsen, Stig Storgaard Jakobsen, Theis Muncholm Thillemann, Inger Mechlenburg, Kjeld Søballe

71. No-fault compensation after primary total hip replacement in Danish hospitals 2005-2016 - A retrospective cohort study
Nissa Khan, Henrik Morville Schrøder, Michael Mørk Petersen, Kim Lyngby Mikkelsen

Session 10: Knee II

Torsdag d. 24. oktober
13:30-15:00
Lokale: Centersal

Chairmen: Søren Rytter og Frank Madsen

72. PAIN SCORE, DOES IT MATTER HOW IT IS ASSESSED
Peter Skrejborg, Kristian Kjær Petersen, Mogens Laursen, Lars Arendt-Nielsen

73. NO BENEFIT FROM FEMORAL NERVE BLOCK COMPARED TO LOCAL INFILTRATION ANALGESIA IN OPEN-WEDGE HIGH TIBIAL OSTEOTOMY; A RANDOMIZED, CONTROLLED TRIAL
Anders Christian Laursen, Ashir Ejaz, Andreas Kappel, Poul Torben Nielsen, Mogens Laursen

74. Withdrawn

75. The effect of bone quality on tibial component migration in medial cemented unicompartmental knee arthroplasty. A prospective cohort study using dual x-ray absorptiometry and radiostereometric analysis
Daan Koppens, Søren Rytter, Stig Munk, Jesper Dalsgaard, Ole Gade Sørensen, Torben Bæk Hansen, Maiken Stilling

76. Improvements in gait patterns after knee arthroplasty and differences between unicompartmental and total knee arthroplasty – findings from an RCT comparing medial Oxford and TKA.
Julius Tetens Hald, Jacob Fyhring Mortensen, Odgaard Anders

77. Implant migration of a cemented, fixed-bearing medial unicompartmental knee arthroplasty with mid-term follow-up.
Daan Koppens, Maiken Stilling, Torben Bæk Hansen

78. TKA vs. UKA: is there something to gain from implementing medial UKA?
Mette Mikkelsen, Kirill Gromov, Anders Troelsen

79. Outpatient total joint arthroplasty in ambulatory surgery center vs standard patient ward – a randomized controlled trial
Christian Emil Husted, Henrik Husted, Helle Krogshøj Hansen, Billy B Kristensen, Kirill Gromov

80. Why still in hospital after fast-track unilateral unicompartmental knee arthroplasty?
Christian Bredgaard Jensen, Anders Troelsen, Christian Skovgaard Nielsen, Niels Kristian Stahl Otte, Henrik Husted, Kirill Gromov

81. Comparison of two strategies in knee arthroplasty: TKA only vs. UKA if possible.
Mette Mikkelsen, Hannah Wilson, Kirill Gromov, Andrew Price, Anders Troelsen

Session 11: Shoulder and Elbow / Sports Orthopedics II

Torsdag d. 24. oktober
13:30-15:00
Lokale: Vingsal 1

Chairmen: Michael Rindom Krogsgaard og Jeppe Vejgaard Rasmussen

82. The short-term survival of total stemless shoulder arthroplasty for osteoarthritis is comparable to that of total stemmed shoulder arthroplasty: a Nordic Arthroplasty Register Association study
Rasmussen Jeppe, Jenni Harjula, Erica Arverud, Randi Hole, Steen Lund Jensen, Stig Brorson, Anne Marie Fenstad, Björn Salomonsson, Ville Äärimaa

83. Increased use of total shoulder arthroplasty and improved patient-reported outcome for osteoarthritic patient in Denmark from 2006 to 2015: a nationwide cohort study from the Danish shoulder arthroplasty Registry.
Jeppe Rasmussen, Alexander Amundsen, Anne Kathrine Sørensen, Tobias Klausen, John Jakobsen, Steen Lund Jensen, Bo Sanderhoff Olsen

84. How objective knee laxity correlates with patient-reported outcome after ACL reconstruction
Malthe Fiil Larsen

85. Low agreement on fracture morphology in patients considered for shoulder arthroplasty
Alexander Amundsen, Jeppe Vejlgaard Rasmussen, Bo Sanderhoff Olsen, John Kloth Petersen, Stig Brorson

86. Surgical versus non-surgical management of displaced fractures of the proximal humerus in elderly
Stig Brorson, Ilija Ban, Janne Ovesen

87. Lost jobs and sick leave are common in patients with subacromial impingement syndrome in secondary care: a consecutive cohort study.
Mikkel Bek Clausen, Mathias Fabricius Nielsen, Mikas Merrild, Per Hölmich, Kristian Thorborg

88. Dynamic radiostereometric analysis for pre- and postoperative evaluation of range of motion in the femeroacetabular impingement hip joint
Lars Hansen, Sepp de Raedt, Bjarne Mygind-Klavsen, Peter Bo Jørgensen, Kjeld Søballe, Maiken Stilling

89. Complications after nonsurgical management of proximal humeral fractures: a systematic review of terms and definitions
Stig Brorson, Nikola Alispahic, Christian Bahrs, Alexander Joeris, Amir Steinitz, Laurent Audigé

90. Supraspinatus and deltoid muscle fiber diversity in rotator cuff tear conditions
Morten K Ravn, Trine I Østergaard, Henrik Daa Schrøder, Jens R Nyengaard, Kate L Lambertsen, Lars H Frich

91. Reliability testing of the Baseline® Hydraulic Wrist Dynamometer for supination strength after distal biceps tendon injury
Muhammed Bakhtiyar, Christian Dippmann

92. Computer tomography acquired hip angles and patient reported outcomes in patients with femoroacetabular impingement syndrome
Signe Kierkegaard, Lone Rømer, Bent Lund, Ulrik Dalgas , Kjeld Søballe, Inger Mechlenburg

Session 12: Trauma II

Torsdag d. 24. oktober
13:30-15:00
Lokale: Vingsal 2

Chairmen: Søren Kold og Jeppe Barckman

93. Immediate mobilization after osteosynthesis of proximal tibial fractures.
Eske Brand, Peter Toquer, Thomas Bloch, Kristoffer Hare

94. Fractures after stroke - a Danish registerbased study of 106.001 patients
Jonas Kristensen, Inger Mechlenburg, Birn Ida

95. Posterolateral Approach to the ankle – Major complications following open reduction and internal fixation of posterior malleolar fragments – a prospective cohort study
Mads Terndrup, Ilija Ban, Søren Kring, Morten Thomsen, Anders Troelsen, Peter Tengberg

96. Patient-related disparities in quality of acute hip fracture care - a 10-year nationwide population-based cohort study
Pia Kjær Kristensen, Anne Mette Falstie-Jensen, Søren Paaske Johnsen

97. Hospital and regional variation in the incidence of post-surgery infection among hip fracture patients.
Damgren Vesterager Jeppe, Kjær Kristensen Pia , Petersen Irene , Becic Pedersen Alma

98. Effect of Teriparatide treatment on bone healing in insufficiency fractures of the pelvis: A systematic review
Pernille Bovbjerg, Ditte Høgh, Lonnie Froberg, Hagen Schmal, Moustapha Kassem

99. Initial fracture displacement is the main risk factor for insufficient reposition in internal fixation of a displaced femoral neck fracture
Anne Marie Nyholm, Henrik Palm, Anders Troelsen, Kirill Gromov

100. Time consumption in the ED and cost-effectiveness analysis of the biomarker S100B versus CCT
Hjalte Oltmann, Lonnie Froberg

101. Poor adherence to standardized treatment protocols in hip fracture treatment
Christina Frandsen, Maiken Stillling , Glassou Eva Natalia , Hansen Torben Baek

102. Complications after initial external fixation of unstable ankle fractures before final surgery
Nicholas Bonde, Peter Tengberg, Anders Troelsen, Mads Terndrup

Session 13: DOS Best Papers

Torsdag d. 24. oktober
16:30-18:00
Lokale: Centersal

Chairmen: Peter Toft Tengberg og Bo Sanderhoff-Olsen

103. Improved healing of diabetic foot ulcers after high-dose vitamin D: a randomized double-blinded clinical trial
Peter Max Halschou-Jensen, Jannie Sauer, Jesper Fabrin, Pierre Bouchelouche, Stig Brorson, Søren Ohrt-Nissen

104. Vitamin E diffused THA liners show no less head penetration after 5 years postoperatively compared to HXLPE in a randomized controlled trial
Kristian Kjærgaard, Ming Ding, Carsten Jensen, Charles Bragdon, Henrik Malchau, Christina Møller Andreasen, Ole Ovesen, Christian Hofbauer, Søren Overgaard

105. Hospital differences in mortality rates after hip fracture surgery in Denmark
Pia Kjær Kristensen, Juan Merlo, Nermin Ghith, George Leckie, Søren Paaske Johnsen

106. Intermittent Systemic Hypoxic Therapy as Adjuvant Treatment in Rotator Cuff Reinsertion in Rats
Larsen Mikkel, Elmengaard Brian, Bergholt Natasja, Pedersen Michael, Foldager Casper

107. Two-year results of trapeziometacarpal joint arthroplasty with the Moovis cup
Lene Dremstrup, Maiken Stilling, Kjærgaard Janni Thillemann, Lone Kirkeby, Lotte Priess Larsen, Torben Bæk Hansen

108. Degenerative changes on adjacent segments levels (ASD) with and without interbody fusion – 10 year MRI follow up on a RCT.
Kristian Høy, Lin Ding, Thomas Borbjerg Andersen, Niels Egund

109. True frequency and risk factors for hip dislocation within two years after primary total hip arthroplasty (THA) – a Danish nationwide population-based study
Lars Lykke Hermansen, Bjarke Viberg, Lars Hansen, Søren Overgaard

Session 14: Hip II

Fredag d. 25. oktober
09:00-10:30
Lokale: Centersal

Chairmen: Anders Troelsen og Thomas Jakobsen

110. 1-year Evaluation of the uncemented Echo Bi-Metric THA stem versus the uncemented Bi-Metric Porous Primary THA stem in a randomized controlled trial using RSA
Karen Dyreborg, Gunnar Flivik, Mikkel Rathsach Andersen, Nikolaj Winther, Søren Solgaard, Michael Mørk Petersen

111. Incidence and risk factors for venous thromboembolism despite ongoing thromboprophylaxis after fast-track hip and knee arthroplasty – a prospective multicenter cohort study of 34,397 procedures
Pelle Baggesgaard Petersen, Christoffer Calov Jørgensen, Henrik Kehlet

112. Improvements in fast-track primary hip and knee arthroplasty – a prospective multicentre cohort study of 36,935 procedures from 2010-2017
Pelle Baggesgaard Petersen, Henrik Kehlet, Christoffer Calov Jørgensen

113. Correlation between THA templating and recovery of function & quality of life in individuals with an Exeter-stem
Louise Ujunma Kiesbye Holm, Mogens Laursen

114. Gender, age, and diagnosis specific time trends of primary total hip arthroplasty in patients between 20-49 years - A study from the Nordic Arthroplasty Register Association (NARA) database
Claus Varnum, Geir Hallan, Anne Marie Fenstad, Ola Rolfson, Maziar Mohaddes, Keijo Mäkelä, Antti Eskelinen, Søren Overgaard

115. Comparison of Patient Self-Reported and Surgeon Assessed Harris Hip Scorein Femoral Neck Patients with Total Hip Arthroplasty
Niels Frederik Breum Jakobsen, Steffan Tabori-Jensen, Maiken Stilling, Torben Bæk Hansen

116. Patient Acceptable Symptom State for the Oxford Hip Score and Forgotten Joint Score Following Total Hip Arthroplasty
Galea Vincent, Ingelsrud Lina, Florissi Isabella, Shin David, Bragdon Charles, Malchau Henrik, Gromov Kirill, Troelsen Anders

117. Effectiveness of supervised resistance training for patients with hip osteoarthritis on patient-reported function, hip-related pain, health-related quality of life and performance-based function; a systematic review and meta-analysis
Hansen Sebrina, Mikkelsen Lone Ramer, Overgaard Søren , Mechlenburg Inger

118. Outcomes of open Gluteus medius repair with one-year follow-up - our initial experience.
Marie Bagger Bohn, Bent Lund , Jeppe Lange

119. Improvements in postoperative outcome after fast-track hip and knee arthroplasty in the elderly – a prospective multicenter cohort study of 1427 procedures in patients ≥ 85 years
Pelle Baggesgaard Petersen, Christoffer Calov Jørgensen, Henrik Kehlet

Session 15: Infection and Amputation/Tumor

Fredag d. 25. oktober
09:00-10:30
Lokale: Vingsal 1

Chairmen: Christen Ravn og Michael Mørk Petersen

120. Angiogenic potential is retained in ischemic muscle in patients with critical limb ischemia undergoing amputation
Tue Smith jørgensen, ylva hellsten, Hans gottlieb , Christopher D. Askew, stig brorson, Birgitte Høier

121. The association between socioeconomic position and tumour size, grade, stage, and mortality in Danish sarcoma patients – a national, observational study from 2000 to 2013.
Mathias Rædkjær, Katja Maretty-Kongstad, Thomas Baad-Hansen, Akmal Safwat , Michael Mørk Petersen, Johnny Keller, Peter Vedsted

122. FDG-PET/CT has poor diagnostic accuracy in diagnosing shoulder periprosthetic joint infection
Thomas Falstie-Jensen, Jeppe Lange, Henrik Daugaard, Anne Katrine Belling Sørensen, Bo Zerahn, Janne Ovesen, Mikkel Vendelbo, Lars Christian Gormsen

123. Plasma YKL-40 and IL-6 are prognostic for survival after surgery for metastatic bone disease of the extremities
Michala Skovlund Sørensen, Thomas Colding-Rasmussen, Peter Frederik Horstmann, Klaus Hindsø, Christian Dehlendorff, Julia Johansen, Michael Mørk Petersen, Michala

124. No improvement of failure rate after resection of primary bone tumors and reconstruction with second-generation mega-prostheses
Christina Holm, Michala Sørensen, Müjgan Yilmaz, Michael Mørk Petersen

125. Non-traumatic Lower Extremity Amputation (LEA) in a historic cohort –can we improve quality of life?
Ines Willerslev Jørgensen, Dorte Dall-Hansen, Hanne Popp, Carsten Jensen

126. Osteomyelitis in patients with diabetes mellitus, one-stage revision protocol
Karl Viktor Strange Guldagger, Hans Gottlieb, Magnus Petur Bjarnason Obinah

127. The use of plastic surgery in single-stage treatment of chronic osteomyelitis
Anne Kathrine Lorentzen, Janne Horn, Hans Gottlieb, Magnús Petúr Bjarnason Obinah

Session 16: Knee III

Fredag d. 25. oktober
13:30-15:00
Lokale: Centersal

Chairmen: Anders Odgaard og Kirill Gromov

128. Patient Reported Outcome and Body Mass Index in 3,327 total knee arthroplasty patients
Anders Overgaard

129. Effect of growing population and obesity primary total knee arthroplasty rates in Sweden
Anders Overgaard

130. The osteoarthritic knee is worse in retrospective: recall bias in Oxford Knee Score and patient-reported range of motion 1 year after knee replacement
Anne Mørup-Petersen, Sofia Mitropolskaya, Anders Odgaard

131. Does Pre-Operative Pattern of Knee Osteoarthritis Affect Patient-Reported Outcomes in Total Knee Arthroplasty?
Veronique Vestergaard, Yhan Emid Colon Iban, Vincent P Galea, Christopher Melnic, Hany Bedair, James I 3rd Huddleston, Charles R Bragdon, Henrik Malchau, Anders Troelsen

132. Patient-reported results are the same across Danish high-volume knee arthroplasty centers despite persistent differences in revision rates
Anne Mørup-Petersen, Mogens Laursen, Frank Madsen, Michael R. Krogsgaard, Matilde Winther-Jensen, Anders Odgaard

133. Translation and classical test theory validation of the Danish version of the Oxford Knee Score
Anne Mørup-Petersen, Michael Krogsgaard, Rasmus Nielsen, Aksel Paulsen, Anders Odgaard

134. Translation and cross-cultural adaptation of the Oxford Knee Score – Activity and Participation Questionnaire (OKS-APQ) into Danish
Lina Holm Ingelsrud, Kirill Gromov, Anders Troelsen

135. Which Oxford Knee Score level represents a satisfactory symptom state after undergoing a total knee replacement?
Lina Holm Ingelsrud, Kirill Gromov, Berend Terluin, Andrew Price, David Beard, Anders Troelsen

136. Reproducibility and Responsiveness of a Danish version of the IKDC Subjective Knee Form for adults with knee disorders
Annemette Krintel Petersen, Julie Sandell Jacobsen, Marianne Godt Hansen, Randi Gram Rasmussen, Birgitte Blaabjerg, Martin Carøe Lind, Lisa Gregersen Oestergaard

137. Prober training and education may eliminate the learning curve when chancing implant in a high volume total knee arthroplasty unit
Lasse E. Rasmussen, Thomas Lind-Hansen, Bjørn Gotlieb Jensen

Session 17: Spine

Fredag d. 25. oktober
13:30-15:00
Lokale: Vingsal 2

Chairmen: Kristian Høy og Rikke Rousing

138. Are magnetically controlled growing-rod lengthening procedures in early-onset scoliosis patients pain-free?
Simon Toftgaard Skov, Haisheng Li, Jan Duedal Rölfing, Marianne Vigh-Larsen, Cody Bünger

139. Conservative Treatment of Main Thoracic Adolescent Idiopathic Scoliosis: Full-time or Night-time bracing?
Søren Ohrt-Nissen, Markus Lastikka, Thomas Borbjerg Andersen, Ilkka Helenius, Martin Gehrchen

140. Scheuermann Kyphosis – A 39-year follow-up from diagnosis in non-operated patients
Lærke Ragborg, Casper Dragsted, Benny Dahl, Martin Gehrchen

141. Readmission following complex spine surgery in a prospective cohort of 679 patients – 2-years follow up using the Spine AdVerse Event Severity (SAVES) system
Tanvir Johanning Bari, Sven Karstensen, Mathias Dahl Sørensen, Martin Gehrchen, John Street, Benny Dahl

142. Which mri findings are associated with long-term disability in low back pain patients?
Peter Udby, Søren Ohrt-Nissen, Tom Bendix, Michael Rud Lassen, Stig Brorson, Carreon Leah , Mikkel Østerheden Andersen

143. Mechanical complications following 3-Column Osteotomy surgery – A Competing Risk Survival Analysis in 193 consecutive Adult Spinal Deformity patients
Tanvir Johanning Bari, Dennis Winge Hallager, Lars Valentin Hansen, Benny Dahl, Martin Gehrchen

144. Distraction-to-stall versus estimated distraction in Magnetically Controlled Growing Rods

Casper Dragsted, Sidsel Fruergaard, Mohit Jain, Deveza Deveza, John Heydemann, Søren Ohrt-Nissen, Thomas Andersen, Martin Gehrchen, Benny Dahl, Texas Children's Hospital Spine Study Group

145. EOS, O-arm and standard spine radiographs; what is the cumulative radiation exposure during current scoliosis management?

Ari Demirel, Peter Heide Pedersen, Søren Peter Eiskjær

146. Revision Surgery and Mortality following complex spine surgery in a prospective cohort of 679 patients – 2-years follow-up using the Spine AdVerse Event Severity (SAVES) system

Tanvir Johanning Bari, Sven Karstensen, Mathias Dahl Sørensen, Martin Gehrchen, John Street, Benny Dahl

147. Selection of the lowest instrumented vertebra in main thoracic adolescent idiopathic scoliosis – Is it safe to fuse shorter than the last touched vertebra?

Søren Ohrt-Nissen, Keith DK Luk, Dino Samartzis, Jason PY Cheung

Session 18: Experimental

Fredag d. 25. oktober
13:30-15:00
Lokale: Vingsal 3

Chairmen: Casper Foldager og Mats Bue

148. Combination treatment of Spondylodiscitis with Moxifloxacin and Rifampicin may result in Reduced Vertebral Bone Concentrations of Moxifloxacin
Josefine Slater, Mathias A.F Bendtsen, Mats Bue, Pelle Hanberg, Nis P. Jørgensen, Andrea R. Jørgensen, Maiken Stilling, Kjeld Søballe

149. Pharmacokinetics of double-dose cefuroxime in porcine intervertebral disc and vertebral cancellous bone – a randomized microdialysis study
Pelle Hanberg, Andrea René Jørgensen, Maiken Stilling, Maja Thomassen, Kjeld Søballe, Mats Bue

150. Adipocytes may have an important function for remodeling of the human myotendinous junction
Jens Rithamer Jakobsen, Niels Rithamer Jakobsen, Abigail Mackey, Michael Kjær, Michael Rindom Krogsgaard

151. Protective Paracrine Effect on Chondrocytes when Co-cultured with Mesenchymal Stem Cells in a Hyaluronic Acid Hydrogel in vitro
Mogensen Simon Linbrecht, Rasmussen Martin Krøyer, Foldager Casper Bindzus

152. Continuous wireless force measurement in gradual and acute bone lengthening
Markus Frost, Tariq Rahman , William Mackenzie, Harald Steen, Søren Kold

153. Local vancomycin concentrations after intra-articular injection into the knee joint – an experimental porcine study
Mats Bue, Maja B Thomassen, Ole H Larsen, Andrea R Jørgensen, Maiken Stilling, Kjeld Søballe, Pelle Hanberg

154. Withdrawn

155. Cognitive load in virtual reality simulation of hip fracture surgery: an investigation of different methods to estimate cognitive load.
Jeppe Kempf Nørskov, Jan Duedal Rölfing, Charlotte Paltved, Lars Konge, Andersen Steven Arild Wuyts

156. Blood flow restricted low-load resistance strength training in patients with a variety of orthopedic lower limb injuries: a feasibility study
Stian Langgård Jørgensen, Marie Bagger Bohn

Posters

157. Predictive value of ultrasound guided intraarticular injection with local anesthesia and glucocoricosteroid before hip arthroscopy for femoro-acetabular impingement syndrome (FAIS)
Christian Dippmann, Line Dahl, Finn Johansen, Michael Rindom Krogsgaard

158. Early polywear in dual mobility articulation in trapeziometacarpal total joint replacement. A presentation of three cases.
Anne Lysgaard Schulz, Lene Dremstrup, Lone Kirkeby, Torben Bæk Hansen

159. Caput radii fractures - are follow-up necessary?
Paul-Atle le fevre Roy, Anna Mi Skov

160. Outcomes following discectomy for lumbar disc herniation in patients with substantial back pain
Simon Thorbjørn Sørensen, Rachid Bech-Azeddine, Søren Fruensgaard, Mikkel Østerheden Andersen, Leah Carreon

161. Causes and risk factors for reoperation after operative treatment of Tibial Plateau Fractures
Martin Lundorff, Jeppe Lange, Juozas Petruskevicius

162. Surgical Core Decompression for Aseptic Necrosis of the Femoral Head – a Retrospective Cohort
Ann-Mari Lawaetz, Martin Lamm, Stig Storgaard Jacobsen, Kjeld Søballe, Casper Bindzus Foldager

163. Facilitators and barriers among physiotherapists and orthopedic surgeons to pre-operative home-based exercise therapy with one exercise-only in patients with end-stage knee osteoarthritis
Rasmus Skov Husted, Thomas Bandholm, Michael Rathleff, Anders Troelsen, Jeanette Kirk

164. The association between quality of Tension band wiring and complications
Kia Cirkeline Møller Hansen, Jensen Stefan, Viberg Bjarke

165. Is progressive resistance training feasible in patients with symptomatic external snapping hip?
Troels Kjeldsen, Inger Mechlenburg, Susan Merrild Drejer, Lisa Reimer, Lars Grøndahl Hvid, Ulrik Dalgas

166. Pectoralis Minor Syndrome
Anders Kjørup, Klaus Bak

167. Hypermobility among patients with greater trochanteric pain syndrome
Lisa Cecilie Urup Reimer, Julie Sandell Jacobsen, Inger Mechlenburg

169. Reattachment of proximal avulsions of the hamstrings tendons is a good treatment in middle aged patients.
Torsten Warming, Peter Lavard, Martin Rathcke, Christian Dippmann, Lars Konradsen, Anke Simone Rechter, Michael Rindom Krogsgaard

170. Validation of the PHAT-score for evaluation of proximal hamstring avulsions
Balint Vajta, Jeppe Lange, Bent Lund

Abstracts

5-Year Results of a Randomized Clinical Trial Comparing Patellofemoral and Total Knee Arthroplasty

1.

Anders Odgaard, Jesper Fabrin, Frank Madsen, Per Wagner Kristensen, Andreas Kappel

Dept. of Orthopaedics, Copenhagen University Hospital Herlev-Gentofte; Dept. of Orthopaedics, Køge University Hospital; Dept. of Orthopaedics, Aarhus University Hospital; Dept. of Orthopaedics, Vejle Hospital; Dept. of Orthopaedics, Aalborg University Hospital

Background: Implant registers show dismissive results of patellofemoral arthroplasty (PFA). Two-year results from this RCT have shown superior outcomes for PFA compared to total knee arthroplasty (TKA) (Clin Orthop 2018; 476:87-100).
Purpose / Aim of Study: This update of the PFA vs. TKA RCT presents 5- year results for patient-reported (PRO), clinical and survival outcomes. A subgroup analysis aiming to identify predictors of outcomes will also be presented.
Materials and Methods: Double-blinded RCT comparing PFA and TKA of 100 patients with isolated PF-OA operated 2007-14 (age 64, range 39-85; females 77%). A number of PROMs were used (incl. SF36, Oxford Knee Score and KOOS) and measured at baseline and at 3, 6, 9 and 12 months and yearly henceforth. Physical findings were recorded at baseline, 2 weeks, 4 months, and 1, 2 and 5 years. Longitudinal data were analysed both at individual time points and using time-weighted measures (area under the curve – AUC). Intention-to-treat analysis was used. Age and baseline diagnosis (posttraumatic, dysplastic or idiopathic PF-OA) were analysed to determine their effects on the primary patient-reported outcome (SF36 pain).
Findings / Results: At 5 years, the AUC for PROMs SF36 physical functioning, SF36 bodily pain, KOOS symptoms and OKS were significatly better for PFA than for TKA (p=0.013, 0.006, 0.002, 0.002, respectively). The remaining PRO dimensions of SF36 and KOOS were all better for PFA but with insignificant p-values. The knee range of movement for PFA patients had returned to the preoperative range at 12 months, while the ROM for TKA had not returned at 5 years (mean=-12deg (SEM=3.9deg), p<0.001). Neither age nor PF-OA pathegenesis had an effect on the patient/reported outcomes. After 5 years, there has been 4 and 2 revisions of PFA and TKA, respectively.
Conclusions: Time-weighted patient-reported outcomes (using intention-to-treat analysis) are better for PFA than TKA patients a five years. PFA patients also have a better range of movement, and the TKA patients have not regained the preoperative ROM at 5 years. Exploratory analyses suggest that neither age nor PF-OA pathogenesis has an effect on patient- reported outcomes, and they should consequently not be considered for indication purposes.

2. Early follow-up of hybrid Total Knee Arthroplasty (TKA) using Persona® prostheses – a prospective study using Model-based Radiostereometric Analysis

2.

Müjgan Yilmaz, Christina Holm, Gunnar Flivik, Thomas Lind, Anders Odgaard, Michael Mørk Petersen

Ortopedic department, Rigshospitalet; Ortopedic department, Skåne University Hospital; Ortopedic department, Gentofte Hospital;

Background: Total knee arthroplasty (TKA) is generally a very successful treatment for patients with knee osteoarthritis. However, there are a group of patients, so called non-responders that for various reasons (mainly persistent pain) are not satisfied with the implant. The Persona® (ZimmerBiomet) TKA has been designed with the aim of minimizing the group of dissatisfied patients by achieving better biomechanical restoration, with more sizes and an asymmetrical tibial component that allows better coverage of the tibial plateau with less risk of placing the component in in-ward rotation.
Purpose / Aim of Study: 1. Early implant migration 2. Functional outcome
Materials and Methods: Thirty-one patients, (mean age 65 y, F/M= 18/13) scheduled for primary TKA due to osteoarthritis were included. Two patients were excluded, one due to PCL rupture and therefore a ultra-curve insert were used and one due to competing disease, leaving 29 to follow-up, no revision surgeries were registered during follow-up. Surgery were performed at Gentofte Hospital. All received a hybrid Persona® TKA with cemented tibia, uncemented TM femur and a cemented patella Persona® all poly patella components. Implants were evaluated with model-based- RSA after average 7 days, 3, 6, and 12 months. Functional and clinical outcome were evaluated with Knee Society Score (KSS) and Oxford Knee Score (OKS) preoperatively and 1-year after surgery.
Findings / Results: Average Maximal Total Point Motion (MTPM) for the cemented tibial components were at 3 months 0.86 mm (0.28-5.66, n=27), 6 months 0.95 mm (0.18-5.74, n=23) and 1-year 1.56 mm (0.29-5.84, n=24). Average MTPM for the uncemented femur components were at 3 months 0.71 mm (0.28-2.12, n=24), 6 months 0.86 mm (0.22- 2.09, n=21) and 1 year 0.9 mm (0.26-1.97, n=23). KSS-clinical showed an increase from 38 (0-79) preoperatively to 84 (57-93) at 1-year follow-up, KSS-function 54 (10-60) to 92 (60-100) and OKS showed an increase from 25 (13-38) to 43 (32-48).
Conclusions: Early RSA follow-up results are promising, with 1-year average MTPM values on the same levels as seen in previous studies evaluating other well-functioning uncemented and cemented implants. Further follow-up is needed to evaluate if continuous migration is taking place.

Tibial Component Overhang of both Total and medial Unicondylar Knee replacement can increase local pain in soft tissues

3.

Jacob Fyhring Mortensen, Julius Hald, Lasse Enkebølle Rasmussen, Anders Odgaard

Orthopedic hip- and knee replacement, Gentofte Hospital; Orthopedic hip- and knee replacement, Vejle Hospital

Background: Tibial overhang (TO) of the tibial component (TC) is observed in both total knee replacement (TKR) and medial unicompartmental knee replacement (mUKR). It has generally been claimed that an overhang below 3mm doesn't have a clinical significance. Use of x-ray to determine TO depends on the x-ray angle used, possibly underestimating TO because of the parallax effect.
Purpose / Aim of Study: Ultrasound (US) can measure the direct distance from TC to bone, and measure local TO at any wished angle. The main objectives are to see if TO of either TKR or mUKR correlate with higher local pain, and if TO correlates to worse Forgotten joint scores (FJS).
Materials and Methods: 64 post-operative (mean 97days) control patients of UKA/TKA were included prospectively. An orthopedic resident performed all measurements. The patients had their pain and TO measured at 10 sites around the prosthesis medially and laterally using a validated self-assembly algometer and ultrasound. The pressure acceleration applied was approximately 0,5kg/cm2 per second, and patients were instructed to verbally indicate when they felt a pain sensation, and the pressure (kg/cm2) was measured. Pain measurements were compared between sites with and without TO, creating an outcome of deltapain between these sites, used for further analysis. FJS was obtained at 6 months.
Findings / Results: TKR had a higher mean deltapain of 6,2 vs mUKR at 3,2, and a lower FJS at 6 months at 44,3 vs 64,9 for UKR. 56% of all had a site of TO >2mm. Of these TO-sites, 72,3% of them were located postero- medially for both TKR and UKR. A Relative Risk of 3,56 (CI 1,2-10-9, p = 0,021) was found for patients with a positive deltapain and with an overhang over 2mm. When comparing AP x-rays to US medially, we found LOA to be -5,8-0,7.
Conclusions: TO over 2mm can increase pain locally, but does not correlate to a worse FJS a 6 months. Ultrasound is a decent but interdependent tool to diagnose a majority of underdiagnosed TO posteromedially, which could be optimized with specialized staff and techniques.

ODINE IMPREGNATED INCISION DRAPE DOES NOT PREVENT INFECTION IN KNEE ARTHROPLASTY SURGERY – 12 MONTHS FOLLOW-UP IN A COHORT OF 1187 PATIENTS

4.

Anne Brun Hesselvig, Magnus Arpi, Frank Madsen, Thomas Bjarnsholt, Anders Odgaard

Afdeling for Led- og Knoglekirurgi, Herlev og Gentofte Hospital; Klinisk Mikrobiologisk Afdeling, Herlev og Gentofte Hospital; Ortopædkirurgisk Afdeling, Aarhus Universitetshospital; Costerton Biofilm Center, Institut for immunologi og mikrobiologi; Afdeling for Led- og Knoglekirurgi, Herlev og Gentofte Hospital

Background: Periprosthetic joint infection (PJI) is a devastating incident for the patient. Despite prophylactic measures as pre-operative decontamination, antisepsis and prophylactic antibiotics the infection rate has been constant at 1-2%.
Purpose / Aim of Study: The primary aim of this study was to examine whether the use of iodine impregnated incision drape (IIID) decreased the risk of periprosthetic joint infections (PJIs). The secondary aim was to investigate whether intraoperative contamination could predict postoperative infection.
Materials and Methods: We performed a transregional, prospective, randomized two arm study (IIID vs control group) of 1187 patients undergoing primary knee arthroplasty surgery. A database with patient demographics and surgical observations was established with the purpose of following the patients for ten years. Patients, who developed an infection within the first year of surgery were analyzed for correlation with the intraoperative bacterial findings and the use of IIID.
Findings / Results: 970 patients were available for preliminary analysis. 35/970 (3.6%) patients were re-operated during the follow-up period. 14/35 (40%) patients had positive tissue biopsies taken at revision surgery within one year of initial surgery. 15/35 (42%) were deemed infected and received antibiotic treatment. 9/15 patients deemed infected were male. Of the 15 infected patients 2 were contaminated at the primary surgery. Chi square test showed no correlation between contamination and infection (OR 0.87, 95% CI 0.13-6.0, p=0.89). 6 of the 15 infected patients were operated with IIID at the primary surgery. No correlation was found between the use of IIID at primary surgery and subsequent infection (OR 0.67, 95% CI 0.17-2.58, p=0.56.)
Conclusions: We found no effect of the use of IIID and subsequent development of PJI. Nor did we find a correlation between the intraoperative contamination and development of PJI within the first year of follow-up.

Intraoperative Contamination During Primary Knee Arthroplasty Does Not Affect Patient Reported Outcomes for Patients Who Do Not Develop an Infection in the First Year After Surgery: A Prospective Cohort Study of 714 Patients

5.

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Background: It is well recognized that some knee arthroplasty (KA) patients present with prolonged post-operative inflammation and some develop persistent pain. It can reasonably be speculated that some of these problems develop because of slow infection with low virulence bacteria caused by intraoperative contamination.
Purpose / Aim of Study: This prospective study was performed to investigate whether intraoperative contamination results in a prolonged inflammatory response, increased discomfort, prolonged rehabilitation and subsequently lower patient-reported outcomes (PRO) in the first post-operative year compared to the outcomes of patients without intraoperative contamination.
Materials and Methods: We combined data from two major prospective studies on patients undergoing primary knee arthroplasty (KA) at two Danish hospitals between September 2016 and January 2018. A total of 714 patients were included in the current study. Pre- and post-operative (1.5, 3, 6, and 12 months) PROs and intraoperative microbiological cultures were obtained on all patients. Based on the microbiological cultures, the patients were divided in two groups, contaminated and non-contaminated. Differences in PROs between contaminated and non-contaminated patients were analyzed at post-operative time points.
Findings / Results: 84 of 714 (11.8%) patients were intraoperatively contaminated without developing clinical infection. The preoperative OKS was 23.2 (SD 6.54) for all patients and 23.7 and 23.1 for contaminated and non-contaminated patients, respectively (p=0.45), improving to 39.5 and 38.9 at one year (p=0.78). The one-year AUC for Oxford Knee Score was 2.80 (SD 1.65) and 2.89 (SD 1.70) for contaminated and non-contaminated patients, respectively, (p=0.69). The absolute improvement at each post-operative time point for Forgotten Joint Score and EQ-5D-5L also did not differ between contaminated and non- contaminated patients (p>0.1).
Conclusions: Based on PROs from 714 patients, intraoperative contamination does not affect the knee-specific or general health related quality of life measured by PROs in primary KA patients within the first year after surgery.

Outcome after combined treatment of knee arthrofibrosis

6.

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Background: A difficult patient group, With no evidence based treatment options

Purpose / Aim of Study: Clinical outcome following surgical treatment and intensive physiotherapy were evaluated in patients with arthrofibrosis as a complication to varying knee-ligament reconstructions.

Materials and Methods: From 2010 to 2017, 36 patients underwent treatment for arthrofibrosis. Treatment consisted of arthroscopic arthrolysis and Brissement forcé under general anastesia followed by intensive physiotherapy under optimized pain relieve for two weeks. Twenty-one patients were available for one-year follow-up. Objective examination, VAS pain score, SF-36, KOOS and Tegner scores as well as muscle strength measurements scores were used to evaluate the clinical outcome at follow-up.

Findings / Results: : Pain score at rest and during exercise was in average reduced from VAS score 2.8 to 1.9 and 5.1 to 4.3 respectively. The knee extension deficit was in average reduced from 13.9 to 1.9 degrees and the flexion was increased from 99 to 126 degrees. Tegner activity level increased from 1.5 to 2.8. The KOOS score increased from 36,8 to 55.0. The average SF-36 level increased from 37.2 to 51.6. Average muscle strength was elevated from 143 to 153 in index leg. The muscle strength in other leg decreased from 258 to 241.

Conclusions: Surgical arthrolysis combined with intensive physiotherapy improved range of motion,subjective outcome and muscle strength significantly.

Knee fracture increases the risk of total knee arthroplasty after initial fracture treatment and throughout life

7.

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Background: Knee fractures can lead to posttraumatic osteoarthritis (OA) and total knee arthroplasty (TKA). Knowing TKA risk and risk factors will establish treatment burden and direct patient counseling after knee fracture.
Purpose / Aim of Study: 1) What is the short-term and long- term risk of TKA after knee fracture? 2) What are the risk factors of TKA in knee fracture patients?
Materials and Methods: A nationwide 20.25-year case- comparison-study included all patients ages ¡Ý15 with knee fracture ICD-10 code/s (knee fracture cases) at knee fracture registration (index-date) from Danish National Patient Registry. Each knee fracture case was matched (sex+age) to 5 persons without knee fracture at index-date (population- controls). Cohorts were followed from index-date to TKA/amputation/knee fusion/emigration/death/end of follow- up date. Hazard Ratios (HRs) with 95% confidence intervals (95%CIs) were estimated for TKA risk and risk factors.
Findings / Results: 48,791 knee fracture cases (median age 58.1; 57.8% females) were matched to 263,593 population- controls. HR for TKA in knee fracture cases vs population-controls was 3.74 (95%CI: 3.44-4.07) 0-3 years after knee fracture and 1.59(95% CI:1.46-1.71) >3 years. 3.7% knee fracture cases had TKA vs 1.4% population-controls. 20.25-year risk factors for TKA in knee fracture cases were: primary knee OA vs no primary knee OA HR 9.57(95%CI:5.39-16.98), external fixation vs open reduction internal fixation and reduction HR 1.92 (95%CI:1.01-3.66), proximal tibia vs patella fracture HR 1.75(95% CI:1.30-2.36), distal femur vs patella fracture HR 1.68(95%CI:1.08-2.64) and increasing age HR 1.02(95% CI:1.02-1.02). HR for TKA in surgically- vs conservatively-treated knee fracture was 2.05(95%CI:1.83-2.30) 0-5 years after knee fracture and 1.19(95% CI:1.01-1.41) >5 years.
Conclusions: Knee fracture patients have higher TKA risk initially after knee fracture and throughout life. Primary knee OA, surgically-treated knee fracture, external fixation, proximal tibia fracture, distal femur fracture and increasing age are TKA risk factors. These findings highlight knee fracture treatment burden especially with increased longevity and activity in elderly patients and inform patients on their patient- and fracture-specific TKA risk.

The incidence of primary knee replacement and radiographic severity of osteoarthritis prior to surgery varies between Danish regions – reports from the SPARK study

8.

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Background: Persistent regional differences in revision rates after primary knee arthroplasty (KA) have given rise to speculations of whether surgical quality or patient selection differs between Danish regions. Previously, the SPARK-study has shown how preoperative patient-reported outcome measures (PROMs) were the same across three regions. Now, objective measures are presented as well.
Purpose / Aim of Study: The present study presents regional incidence of KA and compares radiological severity of knee osteoarthritis (OA) in KA patients across hospitals in three Danish regions.
Materials and Methods: As part of a prospective cohort study, two radiologists made blinded Ahlbäck (0-5) and Kellgren-Lawrence (K-L: 0-4) classifications on standing AP- radiographs of 1,051 patients scheduled for KA. Disagreements were settled in separate consensus rounds. Moreover, thirteen experienced knee arthroplasty surgeons made 17,214 head-to-head comparisons of radiographs resulting in a complete ranking of pictures by OA severity based on clinical experience free of classifications. From the National Patient Register, 2017-incidence of KA was extracted by the ICD10-code KNGB.
Findings / Results: Surgeons' ranking and K-L score differed significantly between centers (overall P <0.001/=0.013). In one hospital known to have low revision rates (Aarhus), KA patients with K-L grade 0-2 were less common (12.7%) than in Aalborg/Farsoe (20.7%) and Gentofte (20.1%), overall P=0.028. Particularly K-L/Ahlbäck scores of 0-1 were more rare in Aarhus (2.1/24.9%) than elsewhere (7.6/38.0% and 5.9/34%, respectively), overall P=0.030/0.015. The incidence of KA in the whole Capital Region exceeded that of the Central Region of Denmark by 28 % (534 vs. 416 per 100.000 persons aged 60-79 years, P<0.001).
Conclusions: Variation in incidence of knee replacement and in radiological severity of OA prior to surgery suggests some regional differences in thresholds for primary knee replacement. This contradicts the uniformity of baseline PROMs recorded in the same population, and it may have an influence on regional revision rates.

Heuristic ranking delivers more detail than ordinal grading of knee osteoarthritis radiographs

9.

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Background: Ordinal scales (Kellgren-Lawrence (KL), Ahlbäck etc.) are used to express the severity of radiographic knee osteoarthritis (OA). With clinical experience, formal gradings are used selectively and more weight is placed on intuition and rules of thumb (heuristics). Advanced analytical methods allow ranking of observations based on two-by-two comparisons rather than assessing individual cases.
Purpose / Aim of Study: To quantify the details observed by clinicians when assessing knee OA radiographs, and to investigate morphological features that are part of the clinicians' tacit knowledge and hence forms their heuristics.
Materials and Methods: 1087 knee OA radiographs were assessed in three ways. First, 13 knee arthroplasty surgeons performed 17,214 two-by-two comparisons: for each comparison, the surgeon selected the radiograph expected to cause more symptoms. Second, two radiologists individually graded the radiographs by the KL and Ahlbäck systems, and consensus was reached in cases of disagreement. Third, 20 morphological features, e.g. medial joint space narrowing or presence of metal, was judged in comparisons similar to the first step. A statistical model was formed, that calculated an OA strength and morphological feature strengths for each radiograph.
Findings / Results: The frequencies of KL grades were 0:0.6%, I:5.7%, II:13.3%, III:74.2%, IV:6.1%. The analytical OA strength ranged from 3.6E-7 to 3.8E2. The OA strength allowed a much more detailed distinction between radiographs than the classic grading systems. Seven classes could be defined, that with 95% certainty distinguished neighbouring classes. In contrast, there was a very large overlap between the classic gradings. Only 52% and 51% of KL and Ahlbäck gradings corresponded to the surgeons' assessments. The analysis of morphological features revealed that both classic systems lacked important information.
Conclusions: It was demonstrated, that clinicians observe morphological features other than those, that are part of the classic grading systems, and that the features are considered when judging radiological OA strength. Surgeons make a clearer distinction between radiographs than the classic systems. Neither the KL nor the Ahlbäck system agrees well with surgeons' assessments.

Knee Osteoarthritis: A comparison of Preoperative Radiographic Grading based on OARSI score and Its Correlation with Histopathological findings

10.

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Background: Medial unicompartmental knee arthroplasty (UKA) has been used to treat patients with medial osteoarthritis (OA) of the knee in many years with excellent clinical outcome. Histopathological grading is accurate, though impractical in a clinical situation. The OARSI score for OA is applied both to assess the grade of radiological OA from grade 0 to 3 in addition to assess the stage of OA based on the extent of joint involvement from 0 to 4.
Purpose / Aim of Study: To evaluate the correlation between the radiographical assessment and histopathological degree of OA of the tibial condyle based on OARSI score in patients undergoing medial UKA.
Materials and Methods: 57 patients with medial OA undergoing a UKA were selected, all patients provided written informed consent. Weight-bearing radiographs were obtained before surgery. At surgery, the tibial plateau was resected and placed in 4% neutral buffered formalin. Femoral and tibial osteophytes and joint space narrowing (JSN) in the medial compartment will be scored using the radiographic OARSI criteria. A summary score will be determined. Regression analyses is applied to evaluate the correlation. Histopathological grading is done according to OARSI grading. The histopathological OARSI score is obtained as grade X stage. In the abstract, the grade is presented, at the time of conference grade X stage will be presented.
Findings / Results: The mean radiographic summary score was 5.3 (range 2 – 9) and the mean grade for histopathology was 3.8 (range 2 – 4). Regression analysis showed no association between radiographic and histopathologic grading of OA, R2 = 0.1
Conclusions: We found no correlation between radiographical OA and histopathological grade of OA of the medial compartment of the knee. This might be due to selection bias as only patients with severe OA who were eligible for UKA were included. Histopathological grade X stage will be presented at the time of conference as it could provide further details and higher correlation value.

Ligament Reconstruction Interposition Arthroplasty combined with Suspension Arthroplasty for CMC-1 Osteoarthritis results in Better Mobility and Less Pain at 6 months

11.

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Background: Recovery time after surgery for thumb CMC-1 J osteoarthritis usually approximates three to six months regardless of operative technique.
Purpose / Aim of Study: The purpose of this study was to examine if adding a suspension arthroplasty (Mini Tight Rope, Arthrex) to Ligament Reconstruction Tendon Interposition of the CMC-1 joint would add stability to the thumb and thereby give a faster recovery and less pain at 6 months postoperatively.
Materials and Methods: 12 consecutive patients underwent thumb CMC-1 J LRTI arthroplasty a.m. Burton Pellegrini. In addition, they underwent a suspension arthroplasty using two strands of #2 FiberWire suture which are fixed with two oblong stainless-steel buttons for cortical fixation between first and second metacarpal bone (Mini Tight Rope, Arthrex). Patients were then given a soft cast and mobilization was begun at 3-5 days after surgery. The patients are followed using Quick- DASH questionnaire, VAS pain, satisfaction, range of motion and pinch strength preoperatively and at 3, 6, 12 and 24 months postoperatively. Each patient was matched with three controls from our own database of 250 patients receiving only LRTI arthroplasty matched on gender, age and preoperative Q-DASH.
Findings / Results: Preoperative Q-DASH for cases has a median of 44 (range 13-70) and for controls a median of 45 (range 13-75). 6-month postoperative Q-DASH for cases has a median of 6.8 (range 0-27) and controls a median of 20,5 (range 0-70). Preliminary results show a significant difference in Q-DASH for cases and controls at 6 months postoperatively. Regarding question 9 of the Q-DASH (1=no pain and 5=extreme pain) cases has a preoperative median of 4 (range 2-4) and for controls a median of 3 (range 3-5). 6-month postoperative results show a median of 1 (range 1-3) for cases and a median of 2 (range 1-5) for controls. This is not statistically significant.
Conclusions: Treating thumb CMC-1 osteoarthritis with a combination of LRTI and suture suspension arthroplasty between first and second metacarpal bone show significantly lower Q-DASH at 6-months follow up compared to LRTI alone. However, the pain level at 6-months follow up is not significantly different for case and controls.

Higher preoperative pain catastrophizing increases the risk of low patient reported satisfaction after carpal tunnel release

12.

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Background: Carpal tunnel syndrome is a common upper limb nerve compression disease where operative treatment is used when conservative treatment fails. However, several factors may influence the results of the operation including preoperative pain catastrophizing.
Purpose / Aim of Study: Based on demographic characteristics, PROMs and with special reference to pain catastrophizing the purpose of this study was to identify risk factors for low patient- reported satisfaction following surgical treatment of idiopathic CTS with CTR. The main hypothesis of this study was that: Higher preoperative pain catastrophizing increases the risk of low postoperative patient reported satisfaction.
Materials and Methods: A total of 417 hands from 417 patients (64.5% females) with a mean age of 58.0 years was included in this 1-year prospective follow-up study. Data on DASH score, EQ-5D, distal motor latency and pain catastrophizing was collected preoperatively and data on DASH score, EQ-5D and patient satisfaction was collected 12 months postoperatively. Wilcoxon matched-pairs signed-rank test was used to test for improvement in DASH and EQ-5D. Risk factors for low postoperative patient reported satisfaction was examined using stepwise multiple logistic regression analysis.
Findings / Results: We found a general improvement in patients DASH score (12.29 [95% CI: 10.65 – 13.90], p<0.001) and EQ-5D (0.14 [95% CI: 0.13 – 0.16], p<0.001) from preoperative to 12 months postoperative. In the fully adjusted multiple regression analysis there was only statistically significant effect of preoperative pain catastrophizing. A 1-unit increase on the preoperative pain catastrophizing scale lead to an increased risk of OR=1.05 (p=0.022) for low 12-month postoperative patient satisfaction. There was no statistically significant predictive effect of preoperative EQ-5D (p=0.869), DASH (p=0.076), distal motor latency (p=0.067), age (p=0.505), or gender (p=0.222) on 12-month postoperative patient satisfaction.
Conclusions: Patients improved both DASH and EQ-5D scores from preoperative to 12 months postoperative. Higher preoperative score on the Pain Catastrophizing Scale seems to have a negative effect on postoperative patient reported satisfaction 12 months after carpal tunnel release.

TFCC foveal re-attachment by modified ulnar tunnel technique - significant clinical improvement at one-year follow-up

13.

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Background: Traumatic disruption of the Triangular fibrocartilage complex (TFCC) is a common cause of ulnar sided wrist pain and is often associated with decreased grip strength and impaired function .TFCC injuries are present in up to 80% of displaced distal radius fractures, but can also occur after a minor wrist trauma. TFCC injuries that do not respond to conservative treatment should be offered diagnostic arthroscopic surgery and re- attachment if indicated.
Purpose / Aim of Study: The aim of this study was to evaluate the clinical and patient-reported outcome one year after TFCC re- attachment by modified ulnar tunnel technique.
Materials and Methods: Between April 2013 and June 2018, 32 patients underwent surgery with the modified Iwasaki ulnar tunnel technique for foveal re-attachment of TFCC injury. All patients had ulnar- sided wrist pain and mild instability of the distal radioulnar joint (DRUJ). Diagnosis was finally established intraoperatively by the hook-test. All patients were immobilized for 2 weeks in a sugar tong splint and then with a removable orthosis with limited rotation for further 4 weeks. Full weight-bearing activities were allowed at 3 months. Prospective evaluation included assessment of pain (VAS score), grip strength, range of motion and q-DASH score.
Findings / Results: The study included 32 patients with 31 available for one-year follow-up. 21 patients had preoperative MRI of which 13 (62 %) showed no signs of TFCC injury. Median preoperative activity VAS score was 60 [50-70], which decreased to 14 [6-20] (p=0.001). Median q-DASH score was 41 [36-43], which improved to 11 [4-25] (p ¡Ü 0.001). Grip strength also improved significantly (p ¡Ü 0.001), while improvement in rotation of the forearm was observed without significance. All patients achieved full stability, except one who needed re-fixation due to early discontinuation of the splint. One patient underwent synovectomy without improvement of symptoms. One patient was referred to SL ligament reconstruction.
Conclusions: Modified ulnar tunnel method improves stability and symptoms in patients with TFCC injury. Preoperative MRI is not sensitive for TFCC injury and should primarily be considered for differential diagnostic purposes.

Total Joint Arthroplasty of the Trapeziometacarpal Joint in WALANT.

14.

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Background: In recent years the concept of WALANT (Wide Awake Local Anaesthetic No Tourniquet) surgery has gained in popularity and is increasingly reported internationally as useful in hand surgery. WALANT provides benefits for both the patient and the surgeon, but concerns are present regarding the use in more complex surgical procedures. Numerous case reports of WALANT in hand surgery are available but studies describing total joint arthroplasty (TJA) of the trapeziometacarpal joint are yet to be published.
Purpose / Aim of Study: With this study we wanted to do a descriptive study of possible adverse effects and patient acceptance of WALANT in TJA of the trapeziometacarpal joint and to compare the duration of the operation in WALANT with TJA performed in a bloodless field under general or regional anaesthesia.
Materials and Methods: In a matched cohort study we compared duration of the operation in 27 patients at mean age 58 (range 48-69) receiving TJA in WALANT with 27 patients at mean age 59 (range 43-72) receiving TJA in general or regional anaesthesia with the use of tourniquet. All patients were operated by the same surgeon in the same institution and with the same operative team. In the WALANT group we also registered conversion to general anaesthesia, intraoperative supplemental local anaesthesia, use of tourniquet, adverse effects to the anaesthesia and willingness to repeat (WTR).
Findings / Results: There were no conversions to general anaesthesia, 2 patients required additional local anaesthesia intraopertively, 1 patient required the use of tourniquet for 2 minutes, 1 case of adrenalin rush was registered. WTR in the WALANT group was 100%. There was no significant difference in operating time in the two groups.
Conclusions: The use of WALANT in thumb TJA surgery is well tolerated by patients and provides a safe and reliable method of anaesthesia. WALANT provides similar working conditions as experienced with the use of tourniquet during general/regional anaesthesia and is not associated with prolonged operating time.

Lower recurrence rate of Dupuytrens Contracture following collagenase clostridium histolyticum treatment compared with percutaneous needle fasciotomy.

15.

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Background: Few studies report on recurrence rates following treatment with collagenase histolyticum injections (CI) of Dupuytrens contracture in comparison to other treatment modalities.
Purpose / Aim of Study: To evaluate CI against another minimally invasive treatment modality a RCT comparing CI and percutaneous needle fasciotomy (PNF) of the MCP joints in Dupuytrens Contracture (DC) was undertaken.
Materials and Methods: 77 patients suffering from DC with isolated extension deficit > 30 degrees in the MP joint were randomized in a RCT. The patients were allocated to either CI injection in accordance with manufacturers guidelines or PNF. Only one finger was treated in each patient, and only one injection was given to the patients in the CI group. A correction of 20 degrees in extension deficit at 1 month was considered an acceptable result. Patients were followed 1-3 years. Recurrence of > 30 degrees or new treatment of the finger were considered failure.
Findings / Results: 5 patients withdrew from the study prior to treatment leaving 34 patients in the CI group and 36 in the PNF group. At 1 month 32 patients in the CI group (94%) and 35 patients in the PNF group (97 %) were considered having an acceptable result and were consequently planned for subsequent follow up at 1, 2, 3 and 5 years. Analysis of durability in accordance with Kaplan Meyers Statistics showed a significantly lower recurrence rate of DD in favour of CI treatment 1 to 3 years after treatment. Log Rank P 0.005.
Conclusions: Considering recurrence CI yields superior results compared to PNF at follow up at 1-3 years in the treatment of isolated DC in the metacarpophalangeal joints.

Clinical Dorsal Wrist Ganglion: Clinical implications after imaging and pathological assessment

16.

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Background: The clinical dorsal wrist ganglion accounts for 60- 70% of the hand and wrist ganglia. Little is known of the ætiology or pathogenesis of this unsightly and often painful soft tissue mass and recurrence after lege artis surgical incision is seen in up to 30% of cases.

Purpose / Aim of Study: The purpose of the study is to gather as much knowledge about the dorsal wrist ganglion as possible through patient history, imaging and pathological examination to see whether this can improve diagnosis and treatment and hinder recurrence.

Materials and Methods: 42 patients with clinical dorsal ganglion have over two years been included into the study at two Danish handsurgery departments. The affected wrists, which have not formerly been treated, have been examined by X-ray, MRI imaging and ultrasound imaging. After excision of the dorsal wrist ganglion by the same surgeon, the tissue has been stained with CD68, vimentin and D2-40 and examined microscopically. Patients are followed at 3 months, 6 months, 1 year and 2 years and in case of recurrence. The study is ongoing.

Findings / Results: We discovered that approximately 50% of the clinical dorsal ganglia were ganglion cysts and 50% synovial cysts. Preliminary results show greater recurrence rates in patients with synovial cysts. X- ray, MRI and ultrasound imaging cannot precisely give the exact origin nor predict the type of tissue the mass is composed of. Neither is there a clear connection to gender, former trauma or occupation.

Conclusions: This study shows that although the clinical dorsal ganglion has the same appearance, location and similar characteristics on X-ray, MRI and ultrasound imaging, the tissue excised is clearly one of two distinct tissue types, namely ganglion and synovial cysts. The aforementioned imaging techniques are therefore not clinically diagnostic and may not be justified in the diagnosis and treatment of dorsal wrist ganglia. The discovery of differences in recurrence rate in the two tissue types is also new information, which can lead to improved patient information and begin to question the choice of treatment method whether it be open or arthroscopic excision.

Scapholunate ligament reconstruction. One-year follow-up using the SLAM procedure in 43 patients. 17.

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Background: The objective of this study is to evaluate scapholunate ligament reconstruction using a modified ScaphoLunate Axis Method (SLAM) in patients with a dynamic or reducible static scapholunate ligament tear. Many different methods have been suggested in the past, some with promising results and some with less promising results. The minimal invasive SLAM procedure is reliable in treating SL ruptures and the results are promising.
Purpose / Aim of Study: To evaluate scapholunate ligament reconstruction using a modified ScaphoLunate Axis Method (SLAM) in patients with a dynamic or reducible static scapholunate ligament tear.
Materials and Methods: Between June 2014 and June 2019, 43 consecutive patients have been operated using the ScaphoLunate Axis Method (Arthrex) for reconstruction of a scapholunate ligament tear. The SL lesion was identified by wrist arthroscopy, and the scaphoid reducibility was identified prior to minimal open ligament reconstruction in a single session. Follow-up was 12 months. Evaluation pre-operatively and at 3, 6 and 12 month after surgery included assessment of range of motion (ROM), grip strength and Disabilities of the Arm, Shoulder and Hand (quick-DASH) Score.
Findings / Results: There were three complications during surgery the operative procedures or the recovery / hand therapy. All but one patient improved in the patient reported outcome measure at 12 months as q-DASH values improved significantly ($p<0.05$). Mean q-DASH value pre-operatively was 39 (range 9-80), and 21 (range 0-72) post-operatively. ROM and grip strength was unchanged at 12 month compared to pre-operative measures. Mean grip strength was 39 Kilogram- Forces (KgF) pre-operatively, and 43 KgF post- operatively (86 % strength of the contralateral side).
Conclusions: Short-term results of the SLAM procedure for patients with a dynamic or reducible static scapholunate ligament tear provided satisfactory results with a few observed complications. The presented technique using a tendon autograft (PL or part of the FCR) placed along the axis of rotation of the SL joint, fixated in both the scaphoid and the lunate, minimize loss of the obtained SL reduction and reconstructs the scapho-lunate ligament complex.

Measurements on sagittal CT scans of the scaphoid bone. What are the normal values?

18.

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Background: Scaphoid waist fractures are often undisplaced but can be complicated by a humpback deformity with or without union. It is believed that not only nonunion, but also malunion can cause impaired outcome. However, there are no consensus on reliable measurements of scaphoid malunion to predict functional and subjective outcome. The lateral intrascaphoid angle (LISA) has previously shown to be a good predictor of outcome but is suspected to have poor inter- and intra-rater reliability. Height-length ratio (HLR) seems to have a high intra- and interrater reliability but a poor predictor of outcome and the dorsal cortical angle (DCA) seems to be less prone to observer bias than LISA but a poorer predictor of outcome. To our knowledge, the normal values of HLR, LISA and DCA, have never been investigated on a larger population of normal scaphoids.

Purpose / Aim of Study: To determine the normal values of the most commonly used measurements (HLR, LISA, DCA) on a sagittal CT scans of the scaphoid.

Materials and Methods: We included CT scans of normal wrists and scans with pathology not related to the scaphoid. Exclusion criteria were age younger than 18, any type of scaphoid pathology, signs of carpal instability, osteoarthritis and wrist-near fractures among others. All CT scans were reformatted along the long axis of the scaphoid and images of 0,5-2mm thickness were obtained. 3 observers (1 musculoskeletal radiologist, 1 hand surgeon and 1 orthopedic resident) applied the measurements. Descriptive values were calculated using measurement from all three observers. Interrater reliability was estimated using intraclass correlation coefficient.

Findings / Results: We investigated CT scans from 62 patients (53 % men), mean age 39 years. The mean HL-ratio was 0,58 (range 0,49-0,70), mean LISA 27 degrees (4- 58) and mean DCA was 128 degrees (106-151). Interrater reliability was good (0,83) for HL-ratio, moderate (0,74) for DCA and poor (0,03) for LISA.

Conclusions: This study provides an impression of the normal values of the scaphoid and may aid in decision making when defining malunion. We suggest that LISA cannot be utilized as a measure of deformity. Further studies on the correlation between HL-ratio, DCA and clinical outcome are needed.

Primary treatment of trigger finger: Higher recurrence upon corticosteroid-injection

19.

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Background: Treatment options for trigger digits are typically either surgery or corticosteroid injections. Though previous studies have shown big differences in success- and recurrence rates when comparing the treatments, follow-ups have been short and cohorts small

Purpose / Aim of Study: The purpose of the study was to compare corticosteroid injection with surgical treatment of first time and reoccurring trigger finger

Materials and Methods: In a retrospective chart review, records of 815 patients referred with trigger finger during the period 2014-2015 were identified. Inclusion criteria was primary treatment of the finger with corticosteroid injection or surgery as first line treatment. 210 cases were excluded, due to previous treatment of the same finger or wrong diagnosis, as patients were initially identified by the ICD- 10 code for trigger finger. Primary treatment type, recurrence, secondary treatment type and comorbidities were recorded. Minimum follow-ups were 2 years.

Findings / Results: Of 605 primary trigger digits, 539 were treated with corticosteroid-injection and 66 with surgery as first line treatment. 330 recurrences in the corticosteroid group as compared to 8 in the surgery group were observed, Chi square, ($p<0,001$). Increased risk of recurrence was seen after treatment of the third finger regardless the treatment as compared to the other digits. Among others, carpal tunnel syndrome was associated with an increased risk of recurrence among those treated with injection. As second-line treatment, 207 patients had corticosteroid-injection, 106 were operated and 25 had other treatment. After second line treatment 106 trigger fingers recurred again in the injection group as compared to 8 in the surgery group, Chi square, ($p<0,001$). Time to recurrence was significantly shorter in the corticosteroid group, survival analysis ($p<0,001$) with a Hazard ratio of 6,839 (CI95%: 3,39-13,79, $p<0,05$).

Conclusions: Significantly higher recurrence rate of trigger finger was observed when comparing corticosteroid-injection to surgical treatment both primary and secondary. Recurrence happened faster upon surgery, but at any timepoint, the risk of recurrence are higher among those treated with corticosteroid-injection as primary treatment.

Can pre-operative measurement of humpback deformity and the size of bony cysts predict the union rate and time to healing of Scaphoid Nonunions? 20.

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Background: Non-union is reported to occur in approximately 10% of all scaphoid fractures. It is known, that the occurrence of nonunion is affected by factors such as fracture location, displacement and the time from injury to treatment. However, the impact of humpback deformity and bony cysts on union rate and time to healing after surgery has not been studied.
Purpose / Aim of Study: The purpose of this study was to examine, if the degree of humpback deformity or the size of cysts along the fracture line besides different treatment methods are associated with the union rate and healing time following surgery of scaphoid nonunion.
Materials and Methods: 63 patients with scaphoid delayed or nonunion and preoperative CT scans were retrospectively analyzed. Four orthopedic surgeons and one intra- scaphoid angle, the height/length ratio, the size of the cysts and displacement of the fracture were radiologist independently analyzed the CT scans. The dorsal cortical angle, measured. Healing was assessed by CT scan or by conventional x-ray and clinical examination.
Findings / Results: Open surgery was the treatment of choice in 49 patients, 8 patients were treated arthroscopically and 6 patients with delayed union were operated with percutaneous method. Overall union rate was 86% (54/63) and was achieved after 84 days (mean). The failure rate and time to healing was not associated with the degree of the humpback deformity, size of the cysts or displacement of the fracture. Patients treated arthroscopically achieved significantly faster healing (42 days) as compared to patients treated by open techniques (92 days) (p¡Ü0.05). Time from injury to surgery was significantly correlated with time to union but not associated with the union rate (p¡Ü0.05, p¡Ü0.4, respectively).
Conclusions: The degree of humpback deformity and the size of cysts along the fracture line have no predictive value for the surgical result. Time to healing following surgery is influenced by the surgical technique and the time from injury to the surgical treatment of scaphoid nonunion.

Elevation of synovial cytokines after intra-articular ankle fracture

21.

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Background: Elevation of synovial cytokines following intra-articular ankle fracture may play an important role in cartilage degeneration leading to osteoarthritis development. Therefore in addiction to fracture reduction, it would be ideal to prevent inflammatory response. However little is known about the composition of the synovial environment and how it correlates to clinical outcomes. may play an important role in cartilage degeneration leading to osteoarthritis development. Therefore in addiction to fracture reduction, it would be ideal to prevent inflammatory response. However little is known about the composition of the synovial environment and how it correlates to clinical outcomes.

Purpose / Aim of Study: 1) Are there differentially regulated c cytokines in ankles with and without a f fracture? 2) Do the identified cytokines correlate with short-term clinical o outcomes?

Materials and Methods: In a prospective cohort study between October 2017 and June 2019 synovial fluid (SF) from bilateral ankle joints and serum were collected from 47 patients with ankle fractures undergoing open reduction and internal fixation in Odense University Hospital. For this preliminary report (n=39/47), the patients (n=39) were followed for 3 months and evaluated using the Foot Function Index (FFI) and the AOFAS. The serum and SF were analyzed for bFGF bFGF, IL-1b, IL-6 and IL-8. Furthermore, the fractures were classified according to AO.

Findings / Results: Typical inflammatory parameters such as IL-1â, IL-6, and IL-8 were found in normal joints with concentrations just above detection level but were highly upregulated in ankles with a fracture. Basic fibroblast growth factor (bFGF), a chondrogenic metabolite, was constitutively expressed, but statistically significant upregulated in ankle joints with a fracture. FFI and AOFAS strongly correlated with age; however, there was no association with either of the initially measured cytokines. The time periods between occurrence of fracture and collection of effusion did not show a statistically significant correlation.

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Conclusions: Elevation of synovial cytokines following intra-articular ankle fracture is characterized by the expression of inflammatory proteins within the first 12 days, however, an association with the short-term follow-up after 3 months could not be found. Further clinical follow-up may be needed to demonstrate a relationship between elevations of synovial cytokines to osteoarthritis development.

Operative versus nonoperative treatment of humeral shaft fractures: a systematic review and meta-analysis.

22.

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Background: Nonoperative treatment is commonly considered as the gold standard in Denmark for humeral shaft fractures but advantages in certain aspects have been described using operative stabilization.
Purpose / Aim of Study: To conduct a systematic review and meta-analysis to compare operative and nonoperative treatment in adult patients with humeral shaft fractures.
Materials and Methods: A search string was developed using a PICO- model in cooperation with a scientific librarian and was applied to Medline, Embase, Cochrane, and Cinahl on 1st of October 2018 searching for randomized controlled trials (RCT) and cohort studies. Two reviewers screened 8,071 eligible studies using Covidence followed by systematic data extraction. The primary outcome was defined as post-treatment complications concerning nonunion, nerve damage, major reintervention, and infections. The secondary outcomes were functional scores and patient reported outcome measures (PROM). The quality of included studies was assessed using Cochrane tools.
Findings / Results: Twelve studies were included; 1 RCT, 1 prospective cohort and 10 retrospective cohorts with totally 1406 patients, of which 835 were treated operatively and 571 nonoperatively. Mean age ranged from 35 to 64, and 54% of the patients were male. The cohort studies had in general moderate bias while the RCT had low bias. There were statistically significant fewer nonunions in the operative group (8%) compared with the nonoperative group (17%) yielding a Risk Ratio (RR) of 0.5 (0.4-0.7) and a number needed to treat of 12. There were more deep infections (3%) in the operative group than in the nonoperative group (1%) yielding a RR of 2.8 (1.0-7.5) but otherwise no statistical differences concerning malunion or nerve damage. Only one study included PROM data with no differences between treatments.
Conclusions: There were fewer nonunions in the operative group but more deep infections. Due to the lack of studies reporting PROMs, the potential positive effect of operative therapy in early aftercare could not be evaluated. Therefore, PROMs should be mandatory in future comparative studies.

Low dislocation rate after hemiarthroplasty for femoral neck fractures using anterolateral compared to posterior surgical approach - short-term follow-up of 182 consecutive patients

23.

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Background: The incidence of hip fractures increases with age and predominantly occurs in a group of patients often suffering from various comorbidities. Hemiarthroplasty is the most used surgical procedure following displaced femoral neck fractures. In Denmark, approximately 90% of hemiarthroplasties are inserted using a posterior approach (PA), and about 8-10 % using an anterolateral approach (AL).
Purpose / Aim of Study: To compare the short-term dislocation rate, revision surgery, fall-related hospital contacts and death between AL and PA in a consecutive cohort treated with hemiarthroplasty.
Materials and Methods: Chart data was retrospectively collected for a consecutive series of hip fracture patients undergoing hemiarthroplasty between June 1st, 2017 and May 31st, 2018 at Herlev University Hospital, Copenhagen, Denmark. We registered gender, age and ASA-score at the time of surgery. Data on dislocation, revision surgery, death and fall- related hospital contacts were recorded. The two populations were compared using an unpaired t-test while gender distribution was compared using the chi-square test. 182 patients with hemiarthroplasties were identified, 139 were operated using PA and 43 using AL. The follow-up period was one year for all patients. The choice of surgical approach was based on the individual surgeon's preference.
Findings / Results: In the PA group 37 dislocations appeared in 10.1% (14 of 139 patients) compared to zero patients in the AL group (p=0.03). The two groups differed in age with the AL group having a mean age of 82.6 and the PA group of 85.1 (p=0.04). We found a statistically significant difference in fall-related hospital visits with fewer contacts in the AL group compared to the PA group (p=0.47), but no significant difference in the amount of injuries requiring hospitalization (p=0.23). There was no statistically significant difference between the two groups in ASA-score (p=0.8), gender (p=0.64), revision surgery (p=0.56) or mortality (p=0.84).
Conclusions: Postoperative dislocation is a common complication after hemiarthroplasty for displaced femoral neck fractures. In our series, using AL reduced this risk without influencing short-term risk for revision surgery, death or fall-related hospitalizations.

Incidence and Epidemiology of Foot Fractures

24.

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Background: Fractures of the foot are some of the most common fractures. Resent literature concerning the epidemiologi of foot fractures are scares and there is a lack of coherent data, including distribution of fractures, trauma mechanism and classification.
Purpose / Aim of Study: The aim of the study was to provide up- to-date concerning the incidence of foot fractures in a large and complete population including all age groups spanning 6 years, and report the distribution of fractures, trauma mechanism and patient baseline demographics.
Materials and Methods: Population based epidemiological study including all foot fractures in a 6 year period from 2005 to 2010 in North Region of Denmark. All patient charts and radiology were manually assessed. The average population of North Region of Denmark was 578.000 persons.
Findings / Results: 4,938 patients presenting with 5,912 foot fractures were assessed. The mean age was 36.1 years at time of fracture (female 41.3 years, male 31.3 years). The overall incidence was 142.3/100,000/year (female 130.2/100,000/year, male 185.1/100,000/year). The most common fracture types were fracture of the 5th metatarsal and 1st digit with an incidence of 49.5/100,000/year and 37.6/100,000/year, respectively. Both genders had the highest incidence in the age group 10-19 years (female 201.4/100,000/year, male 296.9/100,000/year). The most common trauma mechanism was low- energy trauma representing 99.2% of all fractures. The predominant mode of injury was distortion, (18.4%) followed by sport, (16.6%).
Conclusions: The incidence of foot fractures was 142.3/100,000/year. The most common fracture types were fracture of the 5th metatarsal and 1st digit with an incidence of 49.5/100,000/year and 37.6/100,000/year, respectively. The predominant mode of injury was distortion (16.6%).

Treating displaced isolated lateral malleolar fractures non-operatively - Patient reported outcome and need of secondary osteosynthesis in a prospective cohort study

25.

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Background: Operative treatment of isolated lateral malleolar fractures is often considered if fracture displacement is >2mm. However, acute open reduction and internal fixation (ORIF) of this common injury is not without risk
Purpose / Aim of Study: To examine patient reported outcome (PROM) and the need of secondary ORIF in a prospective cohort of adult patients with displaced (>2mm) isolated lateral malleolar fractures
Materials and Methods: The protocol was registered on clinicaltrials.gov (NCT03107767). Adult patients with isolated lateral malleolar fractures were reassessed with weight bearing radiographs 7-10 days after injury. Follow-up was set at 6, 12 and 52 weeks including weightbearing radiographs. At all follow-ups patients reported: pain on weightbearing; satisfaction and Ollerud Molander ankle scores (OMAS). At 52 weeks, patients additionally completed Short Form (SF- 36) Health scores
Findings / Results: 102 of 166 included patients (61%) had fracture displacement (FxDisp) ≥ 2mm, with mean FxDisp of 2,8 mm (CI [2,7- 3,0], Range (2-6mm)). 93% had transsyndesmotic AO44B1 type fractures and 7% suprasyndesmotic AO44C1/2 types, without posterior malleolar involvement. Five patients (4,9%) required secondary ORIF, of which four progressed to union without complication. One patient with FxDisp of 2,1mm suffered non-union with very poor outcome after secondary ORIF. One additional patient required subtalar arthrodesis 1y after injury. Six patients reported substantial persisting pain at 9- 12 months, but progressed to a satisfactory result without surgery. 90 patients completed PROM at 6 weeks, 88% completed PROM at 12 weeks and 66% completed PROM at 52 weeks. Mean 12 week OMAS score was 70 and mean 52 week OMAS score was 89 (Good). SF36 PhysicalFunction score at 52 weeks was 90. The five patients requiring surgery were not included in the total PROM score analysis. 12 patients withdrew consent at 6 week follow-up
Conclusions: Non-operative treatment should be considered safe for displaced isolated lateral malleolar fractures, despite a secondary ORIF rate of 4,9% and delayed-union rate of 5,9%. Functional patient reported outcome was satisfactory in 90% of patients and primary surgical treatment for this common injury is not without risk

Ankle joint surgery following osteosynthesis of malleolar fractures

26

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Background: Background Symptomatic post-traumatic osteoarthrosis of the ankle (PTOA) can be treated with ankle joint fusion (AJF) or arthroplasty (AP). The prevalence of PTOA is currently unknown.
Purpose / Aim of Study: Objectives To estimate the prevalence of secondary surgery (AJF, AP) following surgery for a malleolar fracture.
Materials and Methods: Design and Methods 4195 lower leg fractures (ICD10: DS82.1- 8)) treated with the surgery code KNGJ in a Danish hospital be-tween 01.01.2000- 31.12.2009 were collected from the Civil registra-tional system. Data included age, gender and any diagnosis of osteoarthrosis (OA) prior to fracture. The fractures were sub-grouped according to fracture diagnosis. Surgeries for proximal tibia or shaft fractures (1636) were excluded. Data on later AJF, AP and amputations at any time until 04.12.2017 was like-wise collected.
Findings / Results: Results 2559 patients with a follow up of 7-17 years were included. 959 (37,5%) were female and 1600 (62,5%) male with a mean age of 43. Six sub-groups were analyzed: Bi-or tri malleolar or multiple fractures of the leg or knee (BTM): 1565. Bimalleolar fractures (B): 62. Isolated fibular shaft fractures (F): 246. Isolated frac-tures of the lateral malleolus (L): 297. Isolated fractures of the medial malleolus (M): 72. Unspecified frac-tures in the malleolar region (U): 317. 105 (4.1%) patients underwent secondary surgery: 44 (1.7%) were amputated, 11 (0.4%) had an AP and 50 (2%) had an AJF. 47 (77%) of the AP's and AJF's were performed within five years from osteosynthesis. 79 of the 105 surgeries (75%) were performed on patients with a bi- or trimalleolar fracture. Only 11 (1.8%) of 615 uni malleolar fractures underwent AP's or AJF's. 4 cases had been diagnosed with OA prior to osteosynthesis. The prevalence of ankle joint surgery secondary to malleolar fracture in patients without OA prior to malleo-lar fracture was 2.33%. The prevalence of AP's and AJF's for patients with no former OA in the B/BMT sub-groups was 2.9%.
Conclusions: Conclusions The prevalence of AP's and AJF's was 2.4%. Most of these operations occurred within the first 5 years. Fur-thermore, the sever-ity of the ankle fracture seems to further increase the risk of these secondary surgeries.

Is X-ray follow-up of surgically treated fractures of the adult distal forearm necessary?

27

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Background: The standard postoperative regimen for surgically treated fractures of the distal forearm consists of clinical- and x-ray follow-up 2-weeks postoperatively. It is unclear whether the x-ray at time of follow-up has any consequences for the treatment of these patients.
Purpose / Aim of Study: To study whether x-ray at 2 weeks follow-up has any therapeutic consequence for the patients, especially whether these x-ray controls results in any re- operations.
Materials and Methods: This retrospective cohort study was performed at Zealand University Hospital, Køge during 2011 and Odense University Hospital during 2019. We reviewed the medical record and pre-operative, post-operative and follow-up x-rays of patients with a fracture of the distal forearm treated with a volar locking compression plate. Standard aftercare at both departments is 2 weeks in a cast, which is replaced by a removable orthosis for an additional 3 weeks. The cast is replaced at a 2 weeks follow-up visit in the outpatient clinic where x-ray is performed. It was recorded whether the x-ray follow-up resulted in any change of treatment in terms of re-operation, extension of immobilization, additional diagnostic imaging or additional clinical follow-up.
Findings / Results: A total of 525 medical records were screened of which 502 were included in the study. The 2 weeks clinical and x-ray follow-up resulted in a change of the postoperative plan for 11 (2.2%) patients: 3 patients (0.6%) were re-operated (of which one was a patient who did not follow the postoperative regime), for 3 (0.6%) patients the immobilization in a cast was extended. Additional diagnostics imaging was performed for 12 (2.4%) patients, but beside the 6 (1.2%) patients who were re-operated or were immobilized for an extended period of time; this additional diagnostic imaging did not result in a change of the postoperative plan.
Conclusions: The x-ray control at 2 weeks follow-up only resulted in a change of the postoperative plan in 1.2% of the cases. As many other surgically treated fractures are treated without follow-up x-ray it seems fair to conclude that routinely performed 2 weeks follow-up x-ray of surgically treated distal forearm fractures are unnecessary.

Conservative treatment vs surgical treatment of humeral shaft fractures – A retrospective study

28

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Background: Humeral shaft fractures are traditionally treated conservatively with a functional prefabricated brace. Historical studies of this method have shown excellent results with high union rates. More recent studies have shown a different story with reported nonunion rates as high as 39%. In our experience, most patients with humeral fractures achieve union with conservative treatment. Some of these patients might have benefitted from surgical treatment as this could have shortened their time to union considerably

Purpose / Aim of Study: To examine the rate of union and time to union of conservative treatment vs surgical treatment of humeral shaft fractures

Materials and Methods: In this retrospective single-center study, all adult patients (≥18 years) treated for a humeral shaft fracture at our facility from 2016 through 2018 were enrolled. Baseline data and radiographs were collected. All radiographs were reviewed for union, fracture location and fracture pattern by AO- classification. Union was defined as callus bridge in at least one radiograph between the two main fragments and no pain. Nonunion was defined as transfer to secondary surgery or the lack of union past one year. Nerve injury was recorded prior to and after treatment

Findings / Results: A total of 117 humeral shaft fractures were treated. Twenty-one patients (18%) were excluded due to loss to follow-up. Of the 96 patients included: 59 were female, mean age was 60 years (SD±18.3) and 73 were treated conservatively. A total of 17 patients went on to nonunion from the conservative treatment, giving an overall union rate of 77% for the conservative treatment. Of the 17 nonunions, 16 were treated with secondary osteosynthesis, one was treated with lifelong bracing. All patients who underwent primary surgery achieved union. Time to union in the conservatively treated group was 81 days (95%CI=62.2-93.4, SD±44.3) without the nonunions vs. 76 days (95%CI=56.1-95.8, SD±45.9) in the surgically treated group (p=0.6). Iatrogenic nerve injury occurred in one patient after surgical treatment and no patients had deep infection

Conclusions: Difference in time to union was not statistically significant between the two treatment modalities, but 23% of the conservatively treated group went on to nonunion

Results of tibia fractures treated with an all fine-wire circular external fixator. A retrospective case study

29

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Background: Circular external fixation (CEF) is widely used for both reconstruction and trauma. Many different types of frame constructions are used in trauma making comparison difficult. A standardised stepwise technique for treatment of tibial fractures with an all fine wire CEF have recently been published.
Purpose / Aim of Study: To evaluate the clinical and radiological outcome of a consecutive series of patients with acute tibial fractures treated with an all fine wire CEF applied with a standardised stepwise method.
Materials and Methods: The stepwise CEF method was introduced in August 2017. Basic demographic data, fracture union (evaluated by the RUST score) and complications (all secondary operations, malalignment and infections) were evaluated based on a retrospective inquiry of both patient files and radiographs.
Findings / Results: 25 patients were identified. Median age was 56.9 years [IQR 44.5-69.3], 15 of 25 were males, 1 of 25 had diabetes mellitus and the median ASA-score was 2 [IQR 1-3]. The fractures were divided according to the AO classification (AO 41 A-C (n=4), AO 42 A-C (n=6) and AO 43 A-C (n=15). In 12 of 25 the fracture was classified as open. The standardised step-wise method was applied in all but 1 case. Median operating time was 87 minutes [IQR 72-108]. Median time from frame application to removal was 16.9 weeks [IQR 15.9-19.2]. At time of frame removal the median RUST score was 8 [IQR 7-9]. Union was achieved in all but 1 patient. This single nonunion patient was co-morbid with severe atherosclerosis and amputation was discussed initially. After removal of the CEF he developed deep infection and was above knee amputated. 2 patients had secondary surgery due to complications (pin tract infection not responding to antibiotics (n=1) and malalignment of fracture (n=1)). 1 patient had secondary fracture displacement but did not want to undergo secondary surgery. 15 patients had minor pin tract infection all treated successfully with antibiotics.
Conclusions: The stepwise CEF method is effective and reproducible resulting in relative short operation times, anatomic alignment, high union rate and few major complications. Pin tract infection is still seen in most cases but can be treated successfully with oral antibiotics.

Operation time, perioperative radiolucency and complications following Supra- or Infrapatellar approach for tibia intramedullary nailing; a retrospective study

30.

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Background: Traditional surgical approach to tibia shaft fractures is through an infrapatellar approach. This method can displace the fracture and tends to make the radiographic imaging during the operation difficult. To avoid the disadvantages of the infrapatellar approach, a suprapatellar technique has been used in recent years.
Purpose / Aim of Study: To compare the operation time, perioperative dose area product (DAP - absorbed x-ray dose multiplied by the area irradiated) and complication frequency in the supra- versus the infrapatellar approach in adult patients with tibia shaft fractures surgical treated with intramedullary nailing.
Materials and Methods: From January 1st 2015 to February 28th 2019 a retrospective cohort was retrieved using the local hospital database. Patients with a tibia shaft fracture, operated with a tibia nail using either a supra- or infrapatellar approach, were included. Data on age, sex, ASA score, fracture classification, operation time, DAP, surgical approach and complications leading to a second operation, were collected by reviewing the patients' health care files and x-ray images.
Findings / Results: 100 patients were included, 31 with suprapatellar approach and 69 with infrapatellar. The mean age was 49 (SD; 9) with no statistical differences in age, sex, ASA score or fracture classification between groups. There were 16% (5/31) complications in the suprapatellar approach due to screw removal. No other complications were reported. There were 36% (25/69) complications in the infrapatellar approach, 26% (18/69) due to screw removal, 6% (4/69) due to deep infection, 3% (2/69) experienced a malunion, and 1% (1/69) had a nonunion. This leaded to a statistical difference in complications between the two groups ($p<0.042$). Perioperative DAP was mean 3.12 gycm2 (SD; 5.5) for the suprapatellar and mean 3.38 gycm2 (SD; 8.9) for the infrapatellar approach ($p=0.3$), operation time was 97 minutes (SD; 0.3) for the suprapatellar and 111 minutes (SD; 0.4) for the infrapatellar approach ($p=0.3$).
Conclusions: This study indicates the suprapatellar approach for intramedullary nailing of tibia shaft fractures to be superior to the infrapatellar approach.

SEVERELY INJURED CHILDREN ADMITTED TO THE UNIVERSITY LEVEL TRAUMA CENTRE AT ODENSE UNIVERSITY HOSPITAL 2002-2018

31.

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Background: Generally, children in Denmark live a safe life. The incidence of severe injuries in children is low. However, each year a number of Danish children are severely injured and some die from their injuries. The epidemiology of severe injuries in Danish children is largely unknown and is important information in prevention and for hospital resource planning.
Purpose / Aim of Study: To describe the epidemiology of severely injured children admitted to a Danish trauma centre.
Materials and Methods: A descriptive study including all severely injured (ISS>15) children aged 0-15 years admitted to the university level trauma centre at Odense University Hospital 2002-2018. Data was extracted from the multiple trauma register and medical records. Data analyses were made stratified by age groups (0 2018. Data was extracted from the multiple trauma register and medical records. Data analyses were made stratified by age groups (0-4, 5-10, and 11-15 years).
Findings / Results: Overall152 children were included as 62 % were primarily admitted and 38 % were transferred from another hospital. The median number of cases each year was 8. Overall 58 % were boys. The median age was 11 (0-15) years. Accidents accounted for 99 % and in two cases (1 %) the injuries were inflicted by violence. Overall half of the injuries were traffic related and accounted for 22 %, 55 %, and 60 % in the age groups 0-4, 5-10, and 11-15 years respectively. Among the traffic injured children 50 % were injured in a car crash and 38 % as a pedestrian in the youngest age group. In the eldest age group 46 % were injured riding a bicycle and 22 % in a car crash. Injuries in domestic areas accounted for 51 %, 24 %, and 11 % in the different age groups with falls from heights as the dominating trauma mechanism. The overall median ISS was 25 (16-75) with no differences between age groups. Overall 39 (25 %) children died. The mortality in the age groups was 24 %, 15 %, and 30 %. Overall 89 % had injuries in the head/face, 57 % had limb injuries, 36 % had injuries in the thorax, 25 % had abdominal injuries, and 11 % had spinal injuries.
Conclusions: The study describes the epidemiology of severely injured children by including several aspects regarding injury pattern and severity, which may be useful in a population for risk identification, prevention of accidents among specific subgroups, and for hospital resource planning.

Experience with anatomical re-alignment for severe Slipped Capital Femoral Epiphysis with surgical dislocation of the hip joint. Use of intraoperative monitoring of femoral head perfusion.

32.

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Background: Slipped Capital Femoral Epiphysis (SCFE) is a condition that affects the hips in older children and adolescents. Current treatment is primarily based on in situ fixation using a single cannulated screw. Anatomical re-alignment using surgical dislocation of the affected hip joint is gaining increasing acceptance. The procedure is technically demanding and carries a risk for inducing avascular necrosis (AVN) of the femoral head. Based on experience from an international high volume centre we have established a setup where we use a intracranial pressure (ICP) monitoring probe to monitor perfusion of the femoral head during surgery.
Purpose / Aim of Study: To present our experience with treating severe SCFE using surgical dislocation technique guided by monitoring of femoral head perfusion.
Materials and Methods: From March 2016 to March 2019 a total of 16 children underwent surgical dislocation for severe SCFE at Aarhus University Hospital. The group consisted of 11 girls and 5 boys with median age 13 year (range 10 - 16 year). Median slip angle before surgery was 63,5 deg (range 44 - 77). 5 children had unstable SCFE at the time of admission. Intraoperative monitoring of perfusion in the femoral head was performed using a Codman ICP probe.
Findings / Results: All children had perfused femoral heads postoperatively on SPECT (Bonescan). AVN was not detected during follow-up (range 6w - 2y). Median correction of deformity was 51.5 deg (range 30 - 65). Prophylactic fixation of the contralateral hip was performed in 8 cases.
Conclusions: We present 16 consecutive cases of open reduction for severe SCFE using a new surgical procedure. AVN was not observed in any cases. Avoiding this devastating complication is the most important step to improve the outcome by performing anatomical realignment in severe SCFE.

Accelerated Ponseti method is an effective treatment for Congenital Clubfoot

33.

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Background: The Ponseti method is the gold standard in the treatment of Congenital Clubfoot due to its efficacy and good long term results. The standard Ponseti method entails weekly manipulation and plaster casting in order to correct all components of the clubfoot.In order to reduce the duration of the initial correction plaster casting intervals have been reduced with comparebly good results in several accelerated series.
Purpose / Aim of Study: We report our results and experience with accelerated Ponseti method in a consecutive prospective series of clubfeet.
Materials and Methods: In this consecutive prospective series we included all children with congenital idiopathic clubfoot treated in the department in 2016. They were treated using an accelerated Ponseti method with manipulation and casting twice a week. Controls were all children with congenital idiopathic clubfoot treated in the department in 2015 using the standard Ponseti method. All patients in both groups had follow-up at two years. A p-value of < 0.05 was considered statistically significant.
Findings / Results: During follow-up we had relapse in two feet (7%) in PM and four feet (14%) in APM (p=0,41). All were treated with (re)casting + second TAL. APM reduced the correction time by 40 % from 32 to 19 days (p=0,0002).
Conclusions: Eventhough not statistically significant there were increased relapse in APM compared to PM. One of the feet in the APM was non-compliant with the FAB. A longer follow-up will further assess the relapse rate. We found that APM reduced the correction time by 40 %.

Reliability and feasibility of MRI in pediatric acetabular dysplasia

34.

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Background: MRI may have a role in the assessment of acetabular dysplasia. MRI provides information on Cartilaginous Acetabular Index (CAI) as well as the Osseous Acetabular Index (OAI). OAI decreases until the age of 10-12 years. CAI remains stable from 2 years of age and may therefore be a predictor for acetabular roof development.
Purpose / Aim of Study: To compare findings from standard pelvic radiographs (XR) and coronal MRI images in acetabular residual DDH. Primary aim was to establish the reliability of OAI and CAI. Secondary aim was to estimate feasibility of MRI examination and compare findings of MRI with XR in a retrospective cohort with age between 4-12 years of age.
Materials and Methods: Booking lists were searched for patients with coronal MRIs. OAI, CAI and descriptions were obtained from MRI and XR radiological reports. Blinded measurements where repeated. Bias and limits of agreement (LOA) were calculated for intra- and interrater agreement (Bland Altman). Agreements and correlation (Pearson) between MRI and PR were established. Bias was compared (F-test, T-test).
Findings / Results: 15 (1 male) patients (30 hips) with coronal MRIs and prior XRs were obtained. Mean age was 5 (range 4-12) years. MRIs were performed without sedation. Most XRs were with tilted pelvis (13 of 15). Mean interval between XR and MRI was 134 (range 14-300) days. CAI had the best intra- and interrater agreement (Bias -0, LOA -4.1,4.1; Bias 0.2, LOA -4.5,5.2) compared to OAI (XR and MRI). OAI (MRI) correlated slightly better with OAI (XR) than CAI (r=0.73 vs r=0.68). Agreement for OAI (XR) and OAI (MRI) was established (Bias 1.2, LOA -6.0,8.4). In 2 of 15 of MRIs ischiofemoral impingement was suspected. Other MRI findings were joint effusion (2 hips), ganglion (1 hip), labrum abnormality (4 hips) and bilateral bone marrow edema at the ischio-pubic synchondrosis (1 patient).
Conclusions: CAI is a more reliable measurement compared to OAI (MRI or XR). Additional valuable information from MRI was gained in 8 of 15 patients. MRI is feasible from the age of 4 years without sedation. MRI should be considered as a routine examination in pediatric acetabular dysplasia.

The association between pain and physical activities for children with cerebral palsy

35.

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Background: Experienced pain and affected gross motor functioning in children diagnosed with cerebral palsy (CP), might influence children's participation in physical leisure activities. These factors may also influence children's development of social skills, the feeling of being part of community and limit the child's experienced quality of life.
Purpose / Aim of Study: The aim was to investigate the prevalence of pain among children with CP. Furthermore, to investigate the association between reporting pain and participation in physical leisure activities and the association between gross motor functioning and participation in in physical leisure activities.
Materials and Methods: This is a cross sectional study based on data from the National Danish Clinical Quality Database on children diagnosed with CP or symptoms similar to CP. The study population consisted of 960 children aged between 2-11 years across all Gross Motor Function Classification System levels (GMFCS levels), registered in the database by physiotherapists at regular visits in 2016 or 2017. We had information about participation in physical leisure activities for 845 children and information on pain for 817 children. The associations were estimated as odds ratios (OR) by logistic regression, adjusted for age.
Findings / Results: 36% of the children had pain. Children who reported pain, had a statistically significant lower participation in physical leisure activities, compared to children who did not report pain ($p=0.03$). Children with the lowest GMFCS level I, had a higher participation in physical leisure activities than children with a higher GMFCS level V ($p<0.01$).
Conclusions: Our study shows that a large part of children with CP report to have pain. Moreover, the study indicates that pain is associated with the level of participation in physical leisure activities in children with CP. Furthermore, children's gross motor functioning is significantly associated with participation in physical leisure activities.

In Vivo Anatomical Variations of the Lateral Femoral Cutaneous Nerve in a Pediatric Population. 36.

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Background: The lateral femoral cutaneous nerve (LFCN) has several anatomical variations. Iatrogenic damage in relation to surgery might cause painful meralgia paresthetica. A metaanalysis of adult cadaveric dissection and ultrasound imaging studies of LFCN report that 87% of nerves exits medial to the anterior superior iliac spine (ASIS) and under the inguinal ligament (IL) with a mean distance of 19 mm to the ASIS. A single nerve was the far most common branching pattern. No anatomic studies of the LFCN in a pediatric population has been reported.

Purpose / Aim of Study: To report in vivo anatomical variations of the LFCN in a pediatric population.

Materials and Methods: Thirty-one children (15 boys, 16 girls) aged 4-14 years undergoing pelvic osteotomy (three bilateral) were included in a prospective study. Standardized peroperative photography of the LFCN was performed. The outcome parameters were pelvic exit, distance from exit to ASIS, branching patterns, LFCN width and appearance.

Findings / Results: Of the 34 LFCN's in this study, 31 nerves (91%) exited the pelvis medial to the ASIS and under the Sartorius muscle, one nerve (3%) exited the pelvis medial to the ASIS but through the IL, one nerve (3%) exited through the ASIS and one nerve (3%) exited lateral to the ASIS. The mean distance from the pelvic exit to the ASIS was 17 mm. Nine nerves (26%) showed no branching, one nerve had a bifurcation within the pelvis (3%), 12 nerves (35%) showed bifurcation in the IL area, seven nerves (20%) showed trifurcation, two nerves (6%) showed quadrification and three nerves (9%) had a branching pattern of more than four. Nine nerves (26%) had a curved appearance and 25 nerves (74%) had a straight appearance.

Conclusions: Present study indicates that in a pediatric population, the LFCN exits the pelvis medial to the ASIS more frequently than in adults with a mean distance to the ASIS similar to adults even though not corrected for body size. Furthermore, the LFCN exhibits markedly higher number of branches in children compared to adults. The pediatric surgeon need to be aware hereof to avoid iatrogenic injury to the LFCN.

Bone lengthening with intramedullary magnetic nails. Intra- and post-operative complications

37.

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Background: Bone lengthening with an intramedullary magnetic nail has become first choice of treatment in both adults and old children with lower limb length discrepancy (LLD). Studies have described the procedure as a safe method. Since 2015 the method has been the standard treatment at Odense University Hospital.
Purpose / Aim of Study: To describe the outcome with focus on intra- and postoperative complications to intramedullary bone lengthening with Precise® magnetic nails.
Materials and Methods: A descriptive study of all patients with LLD who underwent limb lengthening surgery with Precise® magnetic intramedullary nail at OUH 2015-2018. Data on all patients were extracted from medical records.
Findings / Results: Overall 12 patients were included. The median age was 26 (14-49) years. The median LLD was 35 (18-90) mm. A femoral anterograde technique was used in 9 cases, a femoral retrograde technique in two cases in order to correct a simultaneously distal angular deformity, and a tibial anterograde technique was used in one case. No patients had intraoperative complications. All patients had continuous regional analgesic treatment postoperatively and discharged after 3-9 days. All patients were mobilized with restricted weight bearing (¡Ü 20 kg). So far no postoperative infection or bleeding has been observed. Eight patients had the LLD fully corrected (¡À5 mm). Two patients were corrected according to the preoperative ambition leaving a rest-LLD of 10 mm and 30 mm. Two patients did not receive the planned full correction because of complications. One patient with hypothyroidism required secondary auto-transplant and intramedullary nailing of tibia due to lack of bone formation. The LLD was partly corrected. One patient with cerebral palsy had the lengthening prematurely terminated after 20 mm of lengthening (35mm intended) because of contracture of the knee. One person had a fracture through the callus 205 days postoperatively due to too early return to sports. After a year all three patients were fully mobilized with no sequelae.
Conclusions: Based on a limited number of cases intramedullary bone lengthening with Precise® magnetic nail seems to be a safe procedure. However, continuously monitoring of complications is important.

Fair to moderate interrater reliability when classifying CMC-1 osteoarthritis using the Eaton Littler classification

38.

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Background: Patients with osteoarthritis of the thumb carpometacarpal (CMC) joint perceive pain and lack of function. The problem mostly affects postmenopausal women. Radiographic findings range from mild osteoarthritis to severe degenerative changes. Previous attempts at correlating preoperative radiographic findings of osteoarthritis in the carpometacarpal joint of the thumb with the subjective complaints of the patients have proven difficult. The most common radiographic classification system of the CMC-1 joint is the Eaton and Littler classification system.

Purpose / Aim of Study: The purpose of the study is determining interrater reliability and intrarater reproducibility in the classification of CMC-1 osteoarthritis.

Materials and Methods: 58 preoperative radiographs were analyzed. The standard AP projection was used as well as a thumb view. 5 orthopedic surgeons with a particular interest in hand surgery independently scrutinized the radiographs classifying each in degrees from one to four at two occasions with a minimum of one week in-between. Fleiss and Cohens Kappa values using SPSS v. 24 were calculated and interpreted according to Landis and Koch.

Findings / Results: On the average 11 % were classified as category 1, 30 % as category 2, 43 % as category 3, and 16 % as category 4. The interrater reliability of the classification showed an overall Kappa value of 0.34 at the first round of classification and 0.43 at the second round. Overall intrarater reproducibility of the classification was 0.55.

Conclusions: Interrater reliability was fair to moderate based on the first and second classification, respectively. Intrarater reproducibility showed moderate agreement. Based on the current findings, that are in line with the current literature, we question the use of the Eaton Littler classification system in the classification of osteoarthritis of the thumb carpometacarpal joint.

Conservative Management of Type 2 Dens Fractures: A SPINE Database pilot study

39.

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Background: Management of Type 2 fractures of the dens remains a point of contention, with both surgical and conservative measures having shown high rates of complications and mortality. Differences in management practices are widespread, and as these fractures become more prevalent due to an aging population, the need for consensus heightens.

Purpose / Aim of Study: Rigshospitalet's Spine Unit's management of odontoid fractures is currently dominated by a conservative approach. Our aim was to evaluate the current management practices of Type 2 dens fractures, in our treated patient group.

Materials and Methods: All patients with CT verified Type 2 dens fractures (Anderson and D'Alonzo) referred to the Spine Unit at Rigshospitalet within a two-year period, were prospectively evaluated. Data concerning epidemiological and etiological factors were gathered via the patient's Electronic Health Record. After a one-year follow-up period, treatment success was assessed, with success defined as no surgical revision, and no renewed contact to a Healthcare Provider due to complications arising from treatment.

Findings / Results: Sixty patients with a Type 2 dens fracture were registered, of which 58 were treated conservatively with a stiff neck collar. 89.7% of conservatively managed patients had no further contact with a Healthcare Provider due to their injury, after end of treatment. Two patients underwent surgical correction at a later date, while 4 patients had ongoing contact, all due to pain issues. Total one- year mortality was 23.3%, and 38.3% of patients suffered complications due to their injury, primarily pseudarthrosis. Complications to treatment were observed to be associated with a higher degree of displacement, at initial evaluation.

Conclusions: We have estimated that a large majority of Type 2 dens fractures referred to our Spine Unit have been successfully managed conservatively, with only 3.4% converting to surgical management. Although our mortality and complications rates seem substantial, these findings are in line with previous reports. We conclude that conservative management of Type 2 dens fractures remains a viable strategy, especially in high-risk patient groups, though further research is needed to establish best practices in this area.

The Danish Version of the Oswestry Disability Index Applied to Adult Spinal Deformity Patients Satisfies a Unidimensional Rasch Model

40.

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Background: The ODI is commonly used to measure patient- perceived disability in adult spinal deformity (ASD) disorders. Notwithstanding, the psychometric properties of ODI have never been assessed using Rasch item response theory (IRT) in patients with ASD. Rasch IRT is the gold standard for psychometric validation of PROMs. The goal of this study was to assess the Danish ODI with respect to dimensionality, local response dependency (LD), and differential item functioning (DIF) in a cohort of patients with ASD.
Purpose / Aim of Study: To test whether the ODI is an appropriate patient-reported outcome measure (PROM) for patients with ASD.
Materials and Methods: ODI data collected from 322 consecutive adult patients referred for spinal deformity evaluation at Rigshospitalet (mean age 54 years, range 18-85, 229 women) were assessed using a Rasch partial credit model. The data is part of a previous publication (PMID: 26656058). Overall and individual item fit were assessed, LD, and DIF for exogenous variables of gender; age (more/less than 40 years); etiology (degenerative, adolescent idiopathic scoliosis, other); and history of spinal surgery.
Findings / Results: A 10-item partial credit model was confirmed (overall fit: Chi^2 = 42.66 [df 40]; P=0.36), as was individual fit for all 10 items with no LD or DIF. Item 4 (walking) showed under-discrimination with a fit residual of +5.4 (normative = ± 2.5). After collapsing distance categories, the fit residual was 2.1. Items 8, 9, and 10 also revealed problematic response categories, which warrant further collapsing. ODI showed adequate targeting with a slight ceiling effect.
Conclusions: The Danish version of the ODI satisfied unidimensional Rasch model expectations after minor modifications. Thus, ODI shows solid psychometric performance characteristics in patients with ASD. Future studies should investigate whether the modifications will be confirmed in a new cohort.

Spike in knee fractures in children ages 0-5 in Denmark

41.

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Background: Approximately 3,500 knee fractures are registered in Denmark annually. Knee fractures can lead to impaired function and pain as well as societal costs and spent hospital resources. During 1996-2017 in Denmark, children ages 0-5 accounted for the largest incidence rate (IR) spike claiming >7% of conservatively treated knee fractures. These patients have not previously been described in literature.
Purpose / Aim of Study: To calculate IRs and describe characteristics of knee fractures in children ages 0-5 during 1996-2017 in Denmark.
Materials and Methods: This nationwide cohort study included all patients ages 0-5 with knee fracture ICD-10 codes ±knee surgery code/s from Danish National Patient Registry (DNPR). IRs for knee fractures were computed per 100,000 inhabitants with 95% confidence intervals (CIs). The study population was described by sex, age, Charlson Comorbidity Index (CCI), treatment-, fracture- and surgery-type.
Findings / Results: 3,655 children sustained 3,686 knee fractures. Sex was evenly distributed, mean age was 3, >93.7% of patients had CCI=0 and 5.2% CCI=1. There were 79 surgeries in total. In conservatively-treated patients, mean age was 3, 77.2% had proximal tibia fracture, 19.1% distal femur fracture and 3.7% patella fracture. In surgically- treated patients, mean age was 4, 49.3% had distal femur fracture, 46.7% proximal tibia fracture and 4% patella fracture. The most frequent surgeries were closed reduction of distal femur fracture (n=22), closed reduction of proximal tibia fracture (n=15) and K-wires for distal femur fracture (n=14). IR for conservatively-treated knee fractures was 30(95% CI 25-35) in 1996 increasing to 74(95% CI 65-84) in 2017 corresponding to an increase of 150% while IR for surgically-treated knee fractures remained stable.
Conclusions: The IR for conservatively-treated knee fractures in children ages 0-5 increased 150% in 22 years. This could perhaps be explained by a cultural shift towards more radiographs being performed on children so as not to oversee a potential fracture, aided by novel lower-radiation x-ray machines. Another explanation could be increased registrations to DNPR. Further research is needed to explain the spike in conservatively-treated knee fractures in children ages 0-5.

Comorbidities associated with chronic postsurgical pain following total knee replacement

43.

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Background: Chronic postsurgical knee-pain (CPSP) is a burden for approx. 20% of the patients following total knee replacement (TKR). Presurgical pain intensities have consistently been found associated with CPSP and it is suggested that e.g. comorbidities are likewise important for development of CPSP.
Purpose / Aim of Study: This study aimed to identify presurgical risk factors for development of CPSP 5 years after TKR based on medical records containing information regarding comorbidities.
Materials and Methods: Patients undergoing primary TKR surgery were contacted 5 years after TKR. Presurgical Knee Society Score and comorbidities were evaluated. Postsurgical knee-pain at 5-years follow-up was assessed on a numeric rating scale (NRS, 0-10). Logistic regression models were utilized to identify patients with moderate-to- severe (NRS≥3) and mild-to-no (NRS<3) CPSP at 5-year follow-up. An odds ratio (OR) for significant factors were calculated.
Findings / Results: A total of 604 patients were contacted, 493 patients responded, 352 patients provided a complete questionnaire. A total of 107 patients reported NRS≥3 at follow-up. Significant presurgical factors associated with CPSP were fibromyalgia (OR 20.66, p=0.024), chronic pain in other body parts than the knee (OR 6.70, p=0.033), previous diagnosis of cancer (OR 3.06, p=0.001), knee instability (OR 2.16, p=0.021), age (OR 2.15, p=0.007), and presurgical knee- pain (OR 1.61, p=0.044). Regression analysis identified 36 out of 107 (33.6%) patients with CPSP based on presurgical factors, and 231 patients (94.3%) without CPSP were classified correct.
Conclusions: The current study found that a variety of presurgical clinical factors can correctly classify 33.6% of patients at risk for developing CPSP 5 years following TKR.

Evaluation of extended scope physiotherapists in an orthopedic outpatient shoulder clinic

44.

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Background: Extended scope physiotherapists (ESP) are increasingly used to diagnose patients with musculoskeletal disorders. At our orthopedic clinic, ESPs share this task with orthopedic surgeons (OSs). Previous studies have reported satisfactory diagnostic agreement between ESPs and OSs but methodological quality is generally low and studies addressing shoulder disorders are sparse.
Purpose / Aim of Study: To evaluate agreement on diagnosis and treatment plan between ESPs and OSs examining patients with shoulder disorders.
Materials and Methods: An inter-agreement study was conducted in an orthopedic outpatient shoulder clinic. Four OSs and three ESPs participated. All ESPs had completed a specialist education at the hospital. 69 patients were examined twice on the same day independently by both ESP and OS in random order. Each professional registered primary and secondary diagnoses (nine predefined categories) and treatment plan (five predefined categories). Diagnostic agreement was calculated using three estimates: A) agreement on the primary diagnosis, B) agreement on the combination of diagnoses, but with a different ranking of primary/secondary diagnoses, and C) partial diagnostic agreement, which was considered present if the primary diagnosis registered by one of the professionals was also registered as either primary or secondary diagnosis by the other. Full agreement on overall treatment plan was defined as full concordance between categories chosen, while partial agreement was defined as ESP and OS agreeing on one or more recommendations on treatment.
Findings / Results: ESP and OS agreed on the primary diagnosis in 62 % (95 % CI: [50; 73]) of the cases. In 79 % (95% CI: [70; 89]) the professionals registered the same combination of diagnoses. Partial diagnostic agreement was 96 % (95% CI: [91; 100]). Full agreement on treatment plan was 43 % (95 % CI: [31; 54]) and partial agreement 96 % (95 % CI: [91; 100]). Agreement on each treatment category varied between 68 % and 100 %.
Conclusions: The majority of patients received the same or almost the same diagnosis and treatment plan from the ESP and the OS. We find that our results support that ESPs and OSs can share the task of examining patients with shoulder disorders in an orthopedic clinic.

Impact of surgery and patient related factors on mortality and morbidity in patients with hip periprosthetic fracture.

45.

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Background: Studies of large registry databases on periprosthetic fractures (PPF) are technically difficult because of ambiguity of reporting and completeness. Previous literature has mostly studied surgery related (SR) factors on mortality, but studies dealing with patient related (PR) factors and morbidity are scarce.

Purpose / Aim of Study: Our primary outcome was to study the impact and predictive value of SR and PR factors on mortality and morbidity in patients with hip PPF.

Materials and Methods: In this retrospective cohort study all hip PPF, admitted to a single trauma unit between 2014 and 2019 were included. Information about the operation, demographic data and comorbidities were registered. Furthermore, the patients were followed up 3 months, 6 months and 1 year after operation. Logistic regression analysis was used to identify factors associated with mortality and morbidity after operation.

Findings / Results: 50 consecutive unselected PPF were identified. The median age at operation, time to fracture, operation delay and hospitalization period were 81 years, 9.3 years, 2 days and 6 days respectively. Vancouver B2 was the most common fracture (n = 19). Mortality rate(MR) 1 month(1m), 3 months(3m) and 1 year(1y) after surgery were 10%, 18% and 25% respectively. Dementia is an independent risk factor for 3m (OR: 1.98, CI: 0.41-3.50, P: 0.013) and 1y mortality (OR: 2.41, CI: 0.86-3.96, P: 0.002). Living in a nursing home (NH) is another independent risk factor for 3m (OR: 2.66, CI: 0.99-4.33, P: 0.002) and 1y mortality (OR: 2.41, CI: 0.86-3.96, P: 0.002). 16% of the patients, who were living in NH and were ambulatory, were bounded to wheelchair at 3m follow up. Patients living in NH had the most pronounced drop in walking ability 3m postoperatively (OR: 1.97, CI: 0.31-3.63, P: 0.020). The patients with several cardiac diseases are at high risk of 1m mortality (OR: 7.57, SE: 8.39, CI: 95, P: 0.067).

Conclusions: PPF patients have a high risk of mortality. PR factors such as comorbidities and living in NH seem to have a significant impact on mortality and morbidity. Further studies with larger group of patients are needed but it might be recommendable that patients with PPF should get specialized geriatric care before and after surgery.

Evaluation of a new sagittal classification system in Adolescent Idiopathic Scoliosis

46.

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Background: The overall objective of Adolescent Idiopathic Scoliosis (AIS) corrective surgery is to achieve a balanced spine both in the coronal and sagittal plane. The implications of sagittal malalignment are well documented in the adult population but less is known about the consequences in AIS. Recently, a new spinal sagittal classification has been proposed by Abelin-Genevois to provide guidelines for the surgical strategy.
Purpose / Aim of Study: The purpose of the present study was to validate this classification.
Materials and Methods: We retrospectively included 105 consecutive AIS patients who underwent posterior spinal fusion. Preoperative long standing EOS radiographs were available on all patients. Patients were classified according to the four suggested sagittal patterns; type 1, 2a, 2b or 3. Several predetermined sagittal parameters were compared between the four groups.
Findings / Results: The mean preoperative Cobb angle was 64±12° and 73 % of the patients were female. Of 105 patients, 51 were type 1, 14 were type 2a, one was type 2b and 39 were type 3. The distribution of the four sagittal patterns was significantly different compared with the original publication ($p<0.05$). However, the two study populations were comparable in terms of Lenke- and Roussouly types ($p=0.49$ and 0.47, respectively). In our study population, the main three sagittal groups differed significantly in terms of thoracic kyphosis, length of thoracic and lumbar curves, lumbar lordosis, thoracic slope, C7 slope, pelvic incidence, and sacral slope ($p<0.05$). We found no difference between the groups in terms of cervical lordosis or upper and lower cervical angle.
Conclusions: The distribution of the four sagittal patterns varies between AIS populations. Type 2b was rare, which limits the clinical applicability. Contrary to the original publication, we found that the spinopelvic parameters, lumbar lordosis, pelvic incidence and sacral slope were significantly different between the three Abelin-Genevois types. Hence, the corrective surgical strategy may need to incorporate these spinopelvic parameters to achieve a balanced spine requiring a minimum of energy expenditure.

Leg length discrepancy and limb lengthening in children in relation to circumferential periosteal release assessed using EOS. 47.

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Background: Leg length discrepancy (LLD) in children may be treated using circumferential periosteal release (CPR); however, it is controversial how minor LLD in children are best managed. Currently, limb lengthening with intramedullary lengthening nails or ring fixators are used widespread for major LLD. When the child is approaching skeletal maturity total epihysiodesis of the longer leg may be used, however previous reports has shown CPR to stimulate longitudinal bone growth in the shorter leg.
Purpose / Aim of Study: The primary purpose was to evaluate whether CPR can improve leg length discrepancy in children. The secondary purpose was to evaluate reproducibility of 2D EOS imaging of leg length parameters.
Materials and Methods: Sixteen children (12 boys and 4 girls) aged 7-12 years were retrospectively evaluated after treatment of LLD with CPR between 2016 and 2018 in the department of children's orthopedics at Aalborg University Hospital. The causes of LLD were Legg-Calve-Perthes disease (n=9), Cerebral Palsy (n=4) and idiopathic (n=3). Limb length can be assessed using biplanar X-ray (EOSTM). In present study all preoperative and postoperative EOS scans were assessed by manual assessment. The primary outcome of the study is the change of LLD before and after CPR. The secondary outcome is the inter-rater reliability of the manual leg length assessments on EOS scans presented by Intra-Class Correlations (ICC).
Findings / Results: For the manual assessments a ratio between the non-operated and the operated femur and functional lengths were calculated. The preoperative femoral ratio were 0.026 (SD=0.019) and the postoperative femur length ratio were 0.014 (SD=0.022), with a difference of 0.012 (p=0.001). The preoperative functional length ratio were 0.02 (SD=0.008) and the postoperative functional length ratio were 0.012 (SD=0.013), with a difference of 0.007 (p=0.004). A test-retest showed excellent inter-rater reliability with Intra Class Correlations of 0.99-1.00.
Conclusions: Circumferential periosteal release may improve minor LLD. The improvement amounts to 1.2% on the femur and 0.7% of the functional lower limb length. However statistically significant, it can be discussed whether present improvement are clinically relevant.

Outcome after knee dislocation. A comparison of multiligament injuries using the Schenck classification. Results from the Danish Knee ligament Reconstructions Registry

48.

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Background: In the Danish Knee Ligament Reconstruction Registry (DKRR) knee dislocation surgeries have been monitored since 2005. This study is the first registry study dividing knee dislocations into sub groups using Schenck classification and using patient reported outcome scores at 1 year follow-up as primary outcome.
Purpose / Aim of Study: The purpose of this study is to compare subjective clinical outcomes in patients who have undergone multiligament reconstruction after knee disclocation using the Schenck classification.
Materials and Methods: Data on multiligament surgeries in the DKRR between 2005 and 2017 were analyzed. Clinical subjective outcome and knee function was evaluated by Knee injury and Osteoarthritis Outcome Scores (KOOS) and Tegner activity scale.
Findings / Results: A total of 1,201 multiligament surgeries were registered in the DKRR between 2005 and 2017 (isolated cruciate ligament reconstructions were excluded). Mean age was 33.2 (range 9-71). Of the 1,201 patients 70% were males. Sport injuries and traffic accidents accounted for 54% and 19% of the knee dislocation injuries, respectively. Schenck KD-I and KD-III (KD-IIII-L + KD-IIII-M) comprising 930 patients (77%) and 169 patients (14%), respectively. The rest was in group KD-2 and KD-4 (88 and 14). KOOS Pain, ADL, Sport, QOL and Tegner significant improved from baseline to 1 year follow-up for all groups. KD-1 group demonstrated better scores improvements than KD-III with more severe ligament lesions. Between groups significant improved were seen in ADL, Sport and Tegner in favour of group KD-1. KOOS scores at 1 year follow-up in the KD-1 group by subscale were 82 (ADL) and 47 (Sport). Scores for KD-3 were 77 (ADL) and 34 (Sports). Tegner scores were 4.1 and 3.5, respectively.
Conclusions: Surgical reconstructions after knee dislocation result in clinical relevant subjective outcome improvements. KD-1 lesions demonstrated better outcome improvements than KD-3 lesions.

Practicing procedural skills in knee arthroscopy is more effective than basic psychomotor training: A randomized trial

49.

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Background: Simulator-assisted arthroscopy education traditionally consists of initial training of basic psychomotor skills before advancing to more complex procedural tasks.
Purpose / Aim of Study: The purpose was to explore and compare the effects of basic psychomotor skills training and procedural skills training on novice surgeons' subsequent knee arthroscopy performance.
Materials and Methods: 22 novice orthopedic surgeons and 11 experienced arthroscopic surgeons voluntarily participated in the study. Novices received a booklet and a standardized introductory lesson on knee arthroscopy before being randomized into a basic skills training group and a procedural skills training group. Each group performed two sessions on a knee arthroscopy simulator; the basic skills training group did one session consisting of basic psychomotor skills modules and one session of procedural modules (diagnostic knee arthroscopy and meniscal resection) whereas the procedural skills training group did two sessions of procedural modules. Performance of the novices was compared to performance of the experienced surgeons to explore evidence of validity for the basic psychomotoric training skills modules and the procedural modules. The effect of prior basic psychomotoric skills training and procedural skills training was explored by comparing pre- and post-training performances of the randomized groups using a mixed-effects regression.
Findings / Results: Validity evidence was found for the whole-procedure modules but not for basic psychomotoric skills modules. We found no statistical effect of basic psychomotor skills training compared to no training ($p=0.27$). We found a statistically significant effect of prior procedural skills training ($p<0.001$) and a significantly larger effect of procedural skills training compared to basic psychomotoric skills training ($p=0.016$).
Conclusions: Procedural skills training was significantly more effective than basic psychomotor skills training with regards to improved performance in diagnostic knee arthroscopy and meniscal resection on a knee arthroscopy simulator. Furthermore, the basic psychomotoric skills modules lacked validity evidence, and we suggest future competency-based training curricula to focus on training full procedures.

Surgical versus nonsurgical treatment of anterior cruciate ligament rupture with at least 10 years of follow-up: a systematic review and meta-analysis

50.

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Background: The evidence on surgical versus nonsurgical treatment of anterior cruciate ligament (ACL) rupture, with at least 10 years follow-up, is scarce. Existing systematic reviews include studies with open surgery, thereby limiting the generalizability to modern clinical practice.
Purpose / Aim of Study: To compare the long-term effects of surgical versus nonsurgical treatment of ACL-rupture on radiographic knee osteoarthritis (OA), secondary intervention, knee laxity, and patient-reported outcome measures (PROMs).
Materials and Methods: Studies comparing minimally invasive surgical treatment (arthroscopy/mini-arthrotomy) with nonsurgical treatment of ACL rupture at 10+ years, in adults, were included. Embase, Medline, CINAHL, and Cochrane Library databases were used for the literature search. Covidence was used for the study selection. Study selection and data collection was performed by two independent reviewers. Risk of bias was assessed using the Downs and Black Checklist. Meta-analysis was performed by comparing the risk of knee OA, secondary meniscal surgery and secondary intervention; graft rupture/secondary reconstruction for surgical group and reconstruction for non-surgical.
Findings / Results: The results from five studies were analysed. The meta-analysis revealed higher risk of radiographic knee OA: RR 1.42 [95% CI: 1.09 to 1.85], and lower risk of secondary meniscal surgery: RR 0.34 [95% CI: 0.20 to 0.58] in those patients who received surgical treatment. In four studies, knee laxity was reduced in the patients, who had surgical treatment. The risk of secondary intervention was independent of treatment: RR 0.90 [95% CI: 0.49 to 1.66] and so was PROM scores (i.e., International Knee Documentation Committee, Tegner, Knee Injury and Osteoarthritis Outcome, and Lysholm scores).
Conclusions: The risk of radiographic knee OA was higher while the risk of secondary meniscal injury was lower, and the risk of secondary intervention was equal in patients who had surgical treatment of their ACL rupture 10+ years ago. However, due to the methodological challenges encountered in this systematic review, the findings must be interpreted with caution.

Five Year Follow-up of Patients Treated with Arthroscopic Partial Meniscectomy

51.

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Background: The number of arthroscopic partial meniscectomies (APM) has declined since 2010, however, it is still one of the most common orthopaedic surgeries in Denmark. Results have been debated as well as predictors of the outcome.
Purpose / Aim of Study: The purpose of this study was to evaluate Patient Reported Outcome Measures (PROM) five years following APM.
Materials and Methods: Oxford Knee Score 0-100 (OKS) and questions on patient satisfaction and further postoperative treatment were prospectively collected from patients treated with APM in 2013 and 2014. Patients treated with chondrectomy, murectomy or micro fracture were excluded. 113 eligible patients completed the questions (73,9%). Improvements in OKS and differences in gender was analyzed by t-tests. Correlation analysis between age and the improvement in OKS was performed with Pearson's correlation coefficient. Significance level was set at $p < 0.05$.
Findings / Results: At 5 year after surgery (mean 61.2 months) OKS had improved 27.9 ± 18.5 points on average, $p<0.001$. Preoperative scores were 55.1 (SD 17.3), at 3 months scores were 74.6 (SD 19.4), and at 5 years 83.0 (SD 19.1) Patients with no further treatment had a mean score of 87.1 (SD 16.9) and patients with any further treatment had a mean of 70.2 (SD 20.1), $p < 0.001$. There was no significant difference in the improvement in OKS between these groups ($p = 0.085$). Four patients had an arthroplasty at follow-up (three TKR and one UKR), a rate of 4.4% (age ≥ 40 years). 85.1% of patients were satisfied with the result at 5 years follow-up. Patients who were satisfied had a mean OKS of 88.3, unsatisfied patients had a mean of 55.7, $p < 0.001$. Gender and age did not correlate with OKS outcome.
Conclusions: Oxford Knee Score improved at 5-year follow-up after APM with a high satisfaction rate. Preoperative age and gender did not correlate with PROM outcome.

Bone ingrowth into open architecture PEEK interference screw after ACL reconstruction

52.

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Background: Open or fenestrated interference screw design that allow bone ingrowth is a concept for improved bone healing to softtissue graft and bone filling in bone tunnels after anterior cruciate ligament reconstruction (ACLR) No clinical studies with this concept has been performed.
Purpose / Aim of Study: The aim of the current study was to assess CT scanning evaluated bone ingrowth into an open architecture interference screws in the tibial tunnel of patients undergoing ACL with soft tissue grafts.
Materials and Methods: Twelve patients requiring ACLR were included. They underwent arthroscopic ACLR with semitendinosus-/gracilis tendon graft and an open architecture polyetheretherketone (PEEK) interference screw. The patients were scanned with a multi-slice CT scanner two weeks, 6 and 12 months postoperatively. On CT reconstruction slices bone ingrowth into the screws was measured.
Findings / Results: At 6 months no implants demonstrated more than 10 % bone ingrowth. At 12 months 42 % (5/12) implants had more than 10 % bone ingrowth ($p = 0.009$). There was no tunnel widening or cyst formation seen in relation to any of the implants. Subjective IKDC score improved significantly from 50.6 baseline to 80.1 at 24 month follow-up. Preoperative side-to-side knee laxity improved from 3.7 (2.1) to 1.4 (1.2) mm ($p = 0.004$) at 12 months. There were no serious adverse events in relation to the new open architecture thread PEEK interference screw during or after hamstring ACL reconstruction. Knee stability, functional, subjective and objective outcomes were similar to large volume ACL outcome studies.
Conclusions: The present study demonstrated bone ingrowth into the open architecture thread PEEK interference screw after soft tissue ACL reconstruction with 42 % of implants having more than 10 % increase in bone ingrowth at 12 months and average bone filling into screws was 7.7 %. Clinical outcome were similar to large volume ACL outcome studies.

Combined Bone Marrow Aspirate and Platelet-rich Plasma for Cartilage Repair – Two-Year Clinical Results

53.

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Background: Cartilage injuries remain a challenge. Development of two-step cell-based treatments have led to large increases in costs but no significant improvements in patient outcome. Autologous bone marrow aspirate concentrate (BMAC) has been proposed as cell source in a one-step cell- based treatment. Platelet-rich plasma (PRP) is a popular source of endogenous growth factors.
Purpose / Aim of Study: To evaluate the clinical and biological outcome of combined BMAC and PRP on a collagen scaffold for treating cartilage lesions in the knee.
Materials and Methods: Ten patients (mean age: 29.4 years, range 18-36) suffering from large full-thickness cartilage in the patella (n=7), trochlea (n=2) or the femoral condyle (n=1) were treated with BMAC and PRP from January 2015 to December 2016. In a one-step procedure autologous BMAC and PRP was seeded onto a collagen scaffold and sutured into the debrided defect. Patients were evaluated by clinical outcome scores (IKDC, KOOS and pain score using the numeric rating scale (NRS)) pre- operatively, after three months, one and two years. Second-look arthroscopies were performed (n = 7), with biopsies of the repair tissue for histology. All patients had MRI pre-operatively, after one year and 2- 3.5 years evaluated using "magnetic resonance observation of cartilage repair tissue" (MOCART) score (0(worst) - 100(best)).
Findings / Results: After one year significant improvements were found in IKDC ($p = 0.003$), KOOS symptoms ($p = 0.01$), KOOS ADL ($p = 0.04$), KOOS QOL ($p = 0.04$) and pain at activity ($p = 0.006$). At the latest follow-up significant improvements were seen in IKDC ($p = 0.009$), KOOS symptoms ($p = 0.04$), KOOS QOL ($p = 0.04$), pain at rest ($p = 0.02$) and pain at activity ($p = 0.007$). MRI MOCART score for cartilage repair improved significantly from baseline to one- year follow-up ($p = 0.01$). Histomorphometry of repair tissue demonstrated a mixture of fibrous tissue (58%) and fibrocartilage (40%).
Conclusions: Treatment of cartilage injuries using combined BMAC and PRP improved subjective clinical outcome scores and pain scores at one and two years postoperatively. MRI and histology indicated repair tissue inferior to the native hyaline cartilage.

Risk Factors to First Time and Recurrent Patella Dislocation with Focus on Familial Association. - A Systematic Review and Best Knowledge Synthesis of Present Literature

54.

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Background: The etiology of patellar dislocation (PD) is complex and to a large extent unknown. A range of biomechanical as well as epidemiological risk factors have been identified, familial association being one of them.
Purpose / Aim of Study: The aim of the study was to do a systematic review and best knowledge synthesis of present literature concerning risk factors for developing first time and recurrent PD with a special focus on familial association.
Materials and Methods: The study was performed as a systematic review following the PRISMA guidelines. PubMed and EMBASE were systematically searched. Studies investigating participants with risk factors for first time as well as recurrent PD were included. The records were screened and data extracted independently by two researchers supervised by a third independent assessor. The study is registered in PROSPERO: ID number 127931.
Findings / Results: 5,209 records were screened to find 62 eligible studies. Familial association was described as a risk factor to PD in six studies. Four studies found accumulation of PD across generations in specific families. One study found a family history of PD in 9% of 74 participants and another that participants with a family history of PD had 3.7 higher odds of PD in the contralateral asymptomatic knee. Also, a range of genetic syndromes were found to be associated with PD. Anatomical factors such as trochlear dysplasia, increased TT- TG distance, patella alta and patellar tilt were described as risk factors to PD. Epidemiologically, young age and skeletal immaturity was found to be risk factors to PD.
Conclusions: There may be familial association to PD, but further investigation is necessary to determine the strength and the etiology of the association. There is evidence that trochlear dysplasia, increased TT-TG distance, patella alta, patellar tilt, young age and skeletal immaturity are risk factors to PD

A new passive movement model for the treatment of non-healing diabetic foot ulcers. A randomized clinical trial of wound healing

55.

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Background: Diabetic foot ulcers are a frequent and serious complication in diabetes. Exercise can promote wound healing but as, many of the patients have poor exercise tolerance, passive movement may be an alternative.
Purpose / Aim of Study: To evaluate the effect of 8 weeks of passive movement training of both legs on wound healing in patients with non- healing diabetic foot ulcers.
Materials and Methods: Twenty-one patients were included in a randomized, controlled, clinical trial with two-leg passive movement. Wound healing, patient compliance, femoral blood flow, blood samples, functional tests and muscle proteins related to vascular function and angiogenesis were assessed.
Findings / Results: 16 participants completed the trial. Two participants from the intervention group and two from the control group were excluded due to adverse events not related to the intervention. There was a clinically, but not statistically, significant improvement of 40% in wound healing (p=0.062) with the passive movement intervention. There was a significant negative correlation (p=0.037) between the duration of the wound at baseline and wound area reduction after the eight-week intervention period. The intervention did not alter blood flow, and there was no change in measured angiogenic or vascular proteins.
Conclusions: The intervention was well tolerated and had a clinically significant effect on wound healing. The modality has potential as an effective first line treatment in diabetic patients with reduced physical abilities to accelerate healing of non-healing ulcers.

Calcaneal positioning in equinus immobilization of the ankle joint. A comparsion of common orthoses used in the treatment of acute Achilles tendon ruptures

56.

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Background: Orthoses are an important part of both conservative and operative treatment of acute Achilles tendon rupture. It is believed to be of critical importance to position the foot in equinus in order to protect the torn tendon from strain and allow the tendon to heal in correct length.
Purpose / Aim of Study: The aim of the study was to test four different orthoses, commercially available and commonly used in treatment of acute Achilles ruptures.
Materials and Methods: Lateral radiographs were taken of the right ankle and foot in 5 healthy study participants. Each participant had 11 true lateral radiographs taken: One of the ankle joint in neutral position. One of a circular equinus cast (CEC). Three of an adjustable equinus boot (VACOped) with the foot in 30°, 15° and 0° of plantar flexion, respectively. Three of a DJO AirSelect Standard boot with 3, 2 and 1 Aircast Achilles wedge (AAW), respectively. And finally, three of a DJO AirSelect Standard boot with 3, 2 and 1 BREG wedges, respectively. The radiographs were analyzed by a radiologist for the following two radiographic measurements: The tibiocalcanar angle (TCA) and the Achilles Relief Distance (ARD).
Findings / Results: The lateral radiographs showed a mean (SD) TCA of 86 (7,8) in CEC, 76 (7,3) with 3 AAW, 90 (6,9) with 3 BREG wedges and 84 (6,6) in the VACOped in 30 of plantarflexion. There was significant greater TCA using VACOped ($p<0.01$) and 3 BREG ($p<0.01$) compared to 3 AAW. The mean ARD (SD) was 10mm (6,6) in CEC, 19mm (5,5) with 3 AAW, 7mm (4,5) with 3 BREG and 12mm (4,6) using VACOped in 30. ARD was significantly lower in CEC ($p<0.05$), 3 BREG ($p<0.01$) and VacoPed 30 ($p<0.05$) compared to 3 AAW. No difference was shown comparing 1 vs 3 AAW´s in ARD ($p=0,18$) with a mean of 22,6 mm and 19,0 mm respectively.
Conclusions: The study found that CEC, 3 BREG and VACOped 30 produced significantly better equinus compared to 3 AAW. We believe the difference to be of clinical relevance in the treatment of acute Achilles tendon ruptures.

How can we implement Early Functional Rehabilitation for Achilles tendon ruptures if the original studies didn't describe what they did? A systematic review

57.

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Background: Achilles tendon rupture is associated with long-term deficits in lower leg muscle strength and function which impairs the ability to participate in sport, physical activity and physically demanding work. Irrespective of surgical or non-surgical treatment, Early Functional Rehabilitation (EFR) is recommended after initial treatment. Resistance exercise is a key component of EFR, but no synthesis of the specific exercises exists.
Purpose / Aim of Study: To describe the resistance exercises used in EFR in the treatment for acute Achilles tendon rupture and to investigate the completeness of the exercise descriptions.
Materials and Methods: A systematic review was performed in MEDLINE, Embase, PEDro, CINAHL and Cochrane. Inclusion criteria were RCTs, cohort studies and case series (¡Ý10 participants) using resistance exercise in the immobilization period within eight weeks after Achilles tendon rupture. Completeness of the exercise description in the publications was assessed with the CERT and the Toigo & Boutellier exercise reporting checklists.
Findings / Results: 38 studies were included, containing 51 different programs with resistance exercises. Twenty consisted of isometric exercise, 6 used heel-rises, 13 used strengthening with external resistance and 12 were unspecified. None of the studies reported all items of the reporting checklists. Repetitions and sets were described in 6 of the 51 interventions. The completion of CERT were median (IQR) 8(6;10) of the 19 items possible. Completion of Toigo and Boutellier were 2(1;3) of the 13 items possible.
Conclusions: Resistance exercise as part of EFR captures a variety of approaches targeted at training the ankle plantar flexors, however, this review highlights the inadequate description of these interventions. When even the most common exercise descriptors are lacking it presents a substantial obstacle in implementing evidence- based exercise in clinical practice.

Defining components of Early Functional Rehabilitation for acute Achilles tendon rupture: A systematic review 58.

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Background: Early functional rehabilitation is a key feature in treatment of Achilles tendon rupture, but there is a lack of consistency in what defines early functional rehabilitation across studies.
Purpose / Aim of Study: To define early functional rehabilitation when used to treat Achilles tendon rupture, and to identify outcome measures evaluating the effect of treatment.
Materials and Methods: 174 studies (published 1979-2018) were included. Studies rated a median (IQR) of 17(15-20) on the Downs & Black. Early functional rehabilitation incorporated weight bearing (95%), range of motion (73%) and isometric/strengthening exercise (50%). Weight bearing was initiated within the first week, whereas exercise (i.e. ankle range of motion, strengthening, whole body conditioning) was initiated in the second week. Initiation of exercises varied based on whether treatment was nonsurgical (3.0(2.0-4.0)weeks), simple (2.0(0.0-2.3) weeks), or augmented surgical repair (0.5(0.0-2.8) weeks)($p = 0.017$). Functional outcomes were reported in 130 studies, including ankle range of motion (n=84) and strength (n=76). Other outcome domains included patient reported outcomes (n=89), survey-based functional outcomes (n=50), and tendon properties (n=53).
Findings / Results: 174 studies (published 1979-2018) were included. Studies rated a median (IQR) of 17(15-20) on the Downs & Black. Early functional rehabilitation incorporated weight bearing (95%), range of motion (73%) and isometric/strengthening exercise (50%). Weight bearing was initiated within the first week, whereas exercise (i.e. ankle range of motion, strengthening, whole body conditioning) was initiated in the second week. Functional outcomes were reported in 130 studies, including ankle range of motion (n=84) and strength (n=76).
Conclusions: Early functional rehabilitation includes weight bearing and a variety of exercise-based interventions initiated within the first 2 weeks following acute Achilles tendon rupture. Because early functional rehabilitation has lacked a standardised definition, interventions and outcome measures are highly variable and pooling data across studies should be done with attention to what was included in the intervention and how treatment was assessed.

The Achilles tendon Total Rupture Score – a manual of how to use it

59.

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Background: The Achilles tendon Total Rupture Score (ATRS) is a commonly used patient reported outcome in patients with an acute Achilles tendon rupture. The score contains ten items of which the last three concerns tasks that some patients cannot and some do not perform. No manual for the use of ATRS has been developed. The purpose was to investigate how ATRS responds at 4, 12 and 24 months after rupture and develop a manual for the use of ATRS.
Purpose / Aim of Study: This study has a mixed method. The first part was performed as a retrospective registry study analysing prospectively gathered data from the Danish Achilles tendon Database. The data was gathered 4, 12 and 24 months after rupture. The original score based on 10 items was compared with a score based on the first 7 items adjusted to the same scale as the original score. Density- and scatterplots were made and differences between the scores were tested by t-test or Mann–WhitneyU test. The second part has an explorative design where a manual to ATRS was developed. To validate some of the changes in the manual, patient involvement is used in a focus group interview.
Materials and Methods: 2790 completed ATRS scores were included. The 7-item score statistically significantly overestimated the value of the 10 items score at all time points ($p<0.001$) but only at 4 months a clinically relevant difference was found (9.7points).
Findings / Results: The original ATRS needs to specified and updated.
Conclusions: When ATRS is used for evaluation within the first 4 months after injury, the results are skewed due to a problem with the last three items. Based on this finding, a manual for the use of ATRS was developed including an updated version of ATRS.

Charcot Foot Reconstruction – How Does Hardware Failure And Non-union Affect The Clinical Outcome? 60.

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Background: Surgical reconstruction of the most severe Charcot foot or ankle deformities using internal fixation has become a more and more commonly used option. However, there has been a concern that this carries a higher risk of major hardware failure.
Purpose / Aim of Study: The aim of our study was to look at the demographics of hardware failure and non-union in Charcot midfoot and hindfoot reconstructions, the radiological and clinical outcomes in those with and without hardware failure.
Materials and Methods: We retrospectively reviewed our 78 patients with the mean age of 56.5 years ±11.59 years that have undergone reconstruction of Charcot deformity affecting the midfoot, hindfoot or both, between October 2007 and December 2017. Minimal follow up was 1 year. We looked at the patients demographics, radiological bone union and ability to ambulate.
Findings / Results: 19/78 (24.4%) patients had major hardware failure. 14/25 (56.0%) of the patients who underwent combination hindfoot and midfoot surgery had hardware failure, in comparison to 5/53 (9.4%) in cases with surgery in either hindfoot or midfoot ($p < .001$). 7/19 (36,8%) patients developed full fusion radiologically, compared to 49/59 (83.1%) of the non-hardware failure patients ($p < .001$). In the hardware failure group 9/19 (47.4%) were able to weight bear in shoes, in comparison to 43/59 (72.9%) in the non-hardware failure patients ($p=.040$). 10/19 (52.6%) patients from the hardware failure group needed a cast or orthosis to ambulate compared to 11/59 (18.6%) in the non-hardware failure group ($p= .004$). 8/19 (42.2%) in hardware failure cases required revision surgery, compared to 19/59 (32.2%) in the non-hardware failure cases ($p= .089$) The patients with BMI over 30 were 3.5 times more likely to have hardware failure (95% CI [1.08, 12.22], $p = .038$). Limb salvage was achieved in all patients.
Conclusions: The hardware breakage is common following Charcot hindfoot and midfoot deformity corrections, highest among combined reconstructions. However, the clinical and radiological outcomes are still satisfactory following such complex procedures. Dedicated durable hardware designed for Charcot foot reconstructions will potentially reduce this complication and improve the patient outcomes further.

Implant Positioning in Undisplaced Femoral Neck Fractures: association to reoperation and development of a scoring system

61.

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Background: Undisplaced femoral neck fractures (FNF) are usually treated with internal fixation (IF), but reoperation frequency is 9-19% after 2 years. A predictor for reoperation may be implant positioning, but it has not been well investigated for undisplaced FNF.
Purpose / Aim of Study: The aim of this study was to assess if implant positioning is associated with risk of reoperation following IF of undisplaced FNF with a posterior tilt < 20° in patients > 65 years.
Materials and Methods: Patients treated in the Region of Southern Denmark during 2009-2013 were retrieved from the Danish Multidisciplinary Hip Fracture Register. The patients' health records and x-rays were reviewed for; age, sex, implant, Charlson Comorbidity Index, mortality, reoperation, fracture classification and implant positioning. X-ray measurements included; posterior tilt, distance to the femoral calcar and the articular margin of the femoral head, placement within the femoral head and implant angulation. Implant placement was scored according to a pre-existing system for scoring of internal fixation (SIFA). Primary outcome was reoperation (simple IF removal not included) within 2 years.
Findings / Results: 406 patients were included; 75% was female and median (range) age was 82 (65-99) years. 1-year mortality was 25 %. There were 45 (11 %) reoperations. Distance to inferior (OR 2(1.1-4)) and superior calcar (OR 2(1.1-5)), tip-apex distance (OR 2(1.1-4)), placement within the femoral head (Ap-view: OR 3(2-9), lateral-view: OR 3(1.3-5)) and inter-implant angle (OR 3(1.4-8)) were individually associated to risk of reoperation. Distance to posterior calcar and SIFA was not associated to reoperation. Using SIFA as base, a modified SIFA (mSIFA) with 7 items/points was developed by including predefined additional x-ray measures. The mSIFA score of 0-2 and 3-4 points had an increased risk of reoperation (OR 28(9-83) and OR 5(2-12)) compared to a score of 5-7. Among the 206 patients with a score of 5-7, the reoperation frequency was 3 %.
Conclusions: This study identified implant placement as a predictor for increased risk of reoperation in undisplaced FNF and has developed a mSIFA for future clinical use.

Systemic Intermittent Hypoxic Therapy Inhibits Allogenic Bone Graft Resorption by Inhibition of Osteoclastogenesis in a Mouse Model

62.

A
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Background: Hypoxia is a universal stimulus able to drive proliferation, differentiation, apoptosis and homeostasis of most cell types. The adaptative response to short-term hypoxia (systemic intermittent hypoxic therapy, SIHT) in animals has been linked to resistance to tissue injury.
Purpose / Aim of Study: The aim of the study was to evaluate the effect of SIHT on allogenic bone graft survival and to investigate the proinflammatory response attendant to bone homeostasis.
Materials and Methods: Forty eight C57BL/6 mice (6 to 10 weeks old) received implantation of 10 mg of morselized allogenic bone graft posterior to the lumbar spine. The mice were divided into three groups: (A) control group, (B) SIHT one week preoperative or (C) SIHT one week postoperative, and followed for 1 and 4 weeks postoperative (n=8). SIHT consisted of 30 min of 10% oxygen twice a day in a hypoxic chamber with normoxic recovery between exposures. Microcomputed tomography (microCT) was performed to investigate bone graft volume. Analysis of serum proteins were performed using an Olink mouse exploratory multiplex array. Wilcoxon rank sum test, one-way ANOVA, and Kruskal-Wallis rank test were used for statistical analyses.
Findings / Results: Complete graft resorption was observed in 33- 36% of the animals control groups, none of the animals in the pre-operative SIHT group, and one animal in the postoperative SIHT group. Increased bone graft volume was seen on microCT in the preoperative SIHT group after 1 week compared with controls (P=0.03), while a nonsignificant difference was observed after 4 weeks (P=0.12). SIHT resulted in a significant increase in serum levels of the major osteoclast inhibitor osteoprotegerin (OPG) as well as well as other important osteogenic regulators Tgfbr3, Fstl3, Wisp1, and Vegfd ($p<0.01$). The inflammatory cytokines and RANKL stimulators IL-6 (p=0.03), IL-17A, IL-17F and IL-23R (all $p<0.0001$) were all increased after 1 and 4 weeks while P-RANKL expression remained constant.
Conclusions: We conclude that the adaptive response to SIHT preoperative activates numerous osteogenic and immunomodulatory pathways leading to inhibition of allogenic bone graft resorption through inhibition of osteoclastic activity.

Are patient reported outcomes and early pain affected by discharge on the day of surgery following Total Hip and Knee Arthroplasty?

63.

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Background: Outpatient total knee - and total hip arthroplasty (TKA and TKA) has been shown to be feasible and safe in selected patients. However, little data is available on patient reported outcomes as well as early pain in patients discharged on day of surgery (DOS).
Purpose / Aim of Study: The aim of this study was to investigate patient reported outcomes at 1 year as well as early pain following outpatient TKA and THA patients discharged on DOS (DDOS) and compare them to TKA and THA patients scheduled for outpatient surgery but not discharged on DOS (nDDOS).
Materials and Methods: We collected prospective data on 261 consecutive patients scheduled for outpatient TKA (n=126) and THA (n=135) at one high-volume arthroplasty department. 35% (TKA/THA = 47/45) of patients fulfilled discharge criteria on DOS and were discharged to their own home. Pain scores at rest and activity (VAS 0-10) and use of morphine (yes/no) were registered on day 1-7. Oxford Knee Score (OKS) and Oxford Hip Score (OHS) were collected preoperatively and at 3 months and 1 year follow up (f/u).
Findings / Results: DDOS and nDDOS patients did not differ in respect to age, gender, procedure type (TKA vs THA) or preoperative OKS or OHS. OKS at 3 months / 1year f/u was 32.0 / 38.7 and 31.2 / 37.7 for DDOS and nDDOS patients respectively (p=0.59 / p=0.48). OHS at 3 months / 1year f/u was 39.4 / 43.0 and 37.2 / 42.9 for DDOS and nDDOS patients respectively (p=0.11 / p=0.95). Increase in OKS at 1 year f/u was 16.4 and 15.5 points for DDOS and nDDOS patients, respectively (p=0.56). Increase in OHS at 1 year f/u was 19.4 and 20.0 points for DDOS and nDDOS patients, respectively (p=0.73). Pain at rest and activity and use of morphine did not differ between the two groups on day 1-7.
Conclusions: In this prospective cohort study of patients scheduled for outpatient TKA and THA we found very similar patient reported outcomes between patients discharged on DOS and those who had at least one overnight stay. These findings support continuous utilization of outpatient TKA and THA in selected patients.

Is percutaneous needle fasciotomy a safe treatment for Dupuytren contracture? – An observational study on 3,365 treated fingers in 2,280 patients

64.

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Background: Dupuytren contracture is a progressive disease that causes flexion contracture of one or more fingers which often lead to disabled hand function. Percutaneous needle fasciotomy (PNF) is a minimal invasive surgical treatment using a fine syringe needle to perforate the Dupuytren cord until the finger can be extended. PNF has gained momentum worldwide in recent years, and the procedure is applied in many countries including Denmark. However, evidence regarding complications associated with PNF is sparse, and many hand surgeons fear the risk of iatrogenic nerve and tendon injuries during the procedure.
Purpose / Aim of Study: The aim of this study was to evaluate the safety of PNF for Dupuytren contracture in the largest cohort reported in the literature.
Materials and Methods: This is a single-center, register-based, observational study on all PNF-treated patients between 2007-2015 at Silkeborg Regional Hospital, Denmark. The study population was identified in the Danish National Patient Registry. Diagnosis codes and procedure codes were used to identify possible severe postoperative complications such as: tendon rupture, nerve damage, infection, amputation and reflex dystrophy for all index treatments. The Danish Drug Statistics Registry was used to identify non- hospital-treated infections. All index treatments and postoperative complications identified were verified by manual review of medical records.
Findings / Results: 2,280 patients received PNF treatment with a total of 3,365 fingers treated. Median follow-up was 7.1 years [interquartile range: 4.9-9.5]. 0.18% (n=4) sustained flexor tendon rupture with three having further treatment. 0.04% (n=1) had digital nerve damage, with no further treatment. 0.04% (n=1) had an infection treated in hospital, while 1.4% (n=32) received antibiotics in the primary sector for an infection, or based on suspicion of an infection, after PNF. None of the infections required surgical intervention. No amputation of the index digit or ipsilateral upper limb reflex dystrophy cases were registered in relation to the procedure.
Conclusions: PNF for Dupuytren contracture is a safe procedure with a low rate of severe postoperative complications, when an appropriate technique is applied.

Local concentrations of gentamicin obtained by microdialysis after a controlled application of a GentaColl sponge in a porcine model

65.

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Background: Local treatment with gentamicin may be an important tool in the prevention and treatment of surgical site infections in high- risk procedures and patients.
Purpose / Aim of Study: The aim of this study was to evaluate the pharmacokinetic profile of gentamicin in bone and surrounding tissue, released from a controlled application of a GentaColl sponge in a porcine model.
Materials and Methods: In 8 female pigs, a GentaColl sponge of 10x10 cm (1.3 mg gentamicin/cm2) was placed in a cancellous bone cavity in the proximal tibia. Microdialysis was used for sampling of gentamicin concentrations over 48 hours from the cavity with the implanted GentaColl sponge, cancellous bone parallel to the cavity over and under the epiphyseal plate, cortical bone, the intramedullary canal, subcutaneous tissue, and the joint cavity of the knee. Venous blood samples were obtained as reference.
Findings / Results: The main finding was a mean peak drug concentration (95-CI) of gentamicin in the cancellous bone cavity containing the implanted GentaColl sponge of 11,315 (9,049-13,581) µg/ml, persisting above 1000 µg/ml until approximately 40 hours after application. Moreover, the concentrations were low (< 1 µg/ml) in the surrounding tissues as well as in plasma.
Conclusions: The mean peak gentamicin concentration from the cancellous bone cavity after a controlled application of a GentaColl sponge was high and may be adequate for the prevention of biofilm formation. However, high MIC strains and uncontrolled application of the GentaColl sponge may jeopardize this conclusion.

Do patients with hip dysplasia have a strength deficit 1 year after periacetabular osteotomy?

66.

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Background: Hip dysplasia is a pathological development of the hip joint with reduced acetabular weight-bearing area. The clinical presentation of hip dysplasia is groin pain, low patient-reported function and impaired hip muscle strength. Patient-reported pain and function improve after periacetabular osteotomy (PAO). However, little is known about hip muscle strength after PAO.
Purpose / Aim of Study: We aimed to investigate changes in isometric hip muscle strength from before to 1 year after PAO in patients with hip dysplasia and to compare the muscle strength values of the patients to the values of a reference group with no hip problems.
Materials and Methods: Muscle strength was assessed before and after PAO in 100 patients with a mean age of 30 years (SD 9); while the muscle strength of 50 references with a mean age of 31 (SD 9) was assessed at one time point. Isometric hip muscle strength was assessed in flexion, extension, abduction and adduction with a hand-held dynamometer using a standardised procedure. Changes in muscle strength from before to 1 year after PAO and differences between patients and references were analysed with a univariate repeated measurement model.
Findings / Results: From before to 1 year after PAO, patients improved their isometric hip muscle strength in flexion and abduction, 0.13 Nm/kg (CI 0.06 - 0.20) and 0.10 Nm/kg (CI 0.02 - 0.18). Hip muscle strength in adduction did not change and muscle strength in hip extension failed to reach statistical significance (0.09 Nm/kg (CI -0.05 - 0.23), p=0.188). However, despite improvements in hip flexion and abduction, the hip muscle strength values of the patients were 13-34% lower than the hip muscle strength values of the healthy references at both time points ($p<0.01$).
Conclusions: One year after PAO, patients improved their maximal isometric hip muscle strength in flexion and abduction. However, patients' pre- and postoperative hip muscle strength values were low compared to the hip muscle strength values of the healthy references. Consequently, future studies should focus on the measured strength deficits and investigate if strength training can improve hip muscle strength in patients with hip dysplasia.

Prevalence of hip dysplasia in adult patients

67.

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Background: Hip dysplasia (HD) is commonly defined as a center-edge angle (CE) ≤20 degrees on pelvic radiographs. A 5% prevalence is suggested by a Danish population study. Patients with HD may develop symptoms which can be treated non-surgically, by joint preserving surgery, or total hip replacement. Thus, early diagnosis is important for the patients' treatment.
Purpose / Aim of Study: To describe a) prevalence of HD in our catchment area; b) concordance between original assessment and dedicated measurement of dysplasia angles c) association of pain and HD.
Materials and Methods: Retrospective study of individuals 20-70 years; 1501 hip/pelvis radiographs taken 2007 in Malmö. 808 of these permitted both hips to be measured. CE was measured according to Wiberg and acetabular index angle (AIA) according to Tönnis. Radiological dysplasia was defined as CE ≤20 degrees. One researcher performed all measurements, read x-ray referrals and assessments. Patients had either planned or acute x-ray. T- test and chi2-test.
Findings / Results: In the 245 acute cases, 10 had uni- or bilateral dysplasia (4.1%). In 563 planned cases, the result was 29 (5.2%). The AIA angles were significantly higher in HD cases, right side 18 versus 7 degrees (SD 6 and 5), left 17 vs 6 (SD 5 and 4). According to the referral, 22 of the 39 HD cases had pain. Men had dysplasia in 5.5% of the acute cases, and in 5.7% of the planned cases, women 3.0 and 4.8%. The radiologists' assessments mentioned dysplasia (or similar) in 4 of the 39 cases.
Conclusions: The hip dysplasia prevalence was 5% in a adult population with no gender difference. A majority of the patients with radiological dysplasia did actually have pain, but the radiology assessment described acetabular dysplasia just in a few cases. If patients are not detected in routine health care, individuals with symptoms may miss out on treatment.

Patient Reported Outcome of Periacetabular Osteotomy in Treatment of Acetabular Retroversion

68.

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Background: Periacetabular osteotomy (PAO) is a treatment option in symptomatic acetabular retroversion (AR) where non-surgical treatment has failed. Very few studies have been published on patient reported outcome measure (PROM). The present study reports on the largest series of patients until today.
Purpose / Aim of Study: Assess PROMs and complications after PAO surgery in adult patients with AR.
Materials and Methods: From June 2007 to May 2018, 214 patients with AR were retrieved from a prospective local database. Patients were followed at baseline, 1, 2, and 5 years after surgery and answered Oxford Hip Score (OHS), EuroQol-5 dimensions index (EQ-5D), University of California at Los Angeles Activity score (UCLA), pain Verbal Rating Scale (pVRS), and Harris Hip Score (HHS). Complications are entered into the database but were also retrieved from the Danish National Patient Registry. Two follow-up periods were defined as 2 years (1-2.2 years postoperatively) and 5 years (2.3-6 years). STROBE guidelines were followed.
Findings / Results: The 214 patients had a mean (SD) age of 23.7 (24) years, 165 (77%) were female, and the mean (SD) BMI was 24.7 (16.9). From baseline to 2 and 5 years after surgery, there was statistical significant improvement in all PROMs. Preoperatively and median (InterQuartileRange) delta value improvements: pVRS was 8 (7-9) preoperatively and was reduced with 7 (5-8) points after 2 years and 7 (5-8) after 5 years. EQ5D was preoperatively 0.72 (0.56-0.72) and increased with 0.21 (0.05-0.32) points after 2 years and 0.12 (0-0.28) after 5 years. UCLA was preoperatively 5 (4-7) and increased with 2 (0-4) points after 2 years and 1 (0-4) after 5 years (non-significant after 5 years). OHS was preoperatively 30 (24-35) and increased with 10 (4.5-17) points after 2 years and 7 (4-15) after 5 years. HHS was preoperatively 69 (63-74) and increased with 27 (22-34) points after 2 years and 26 (24-30) after 5 years. Apart from screw removal of fixation material in 20.1% of the patients 2 hips (0.9%) were converted to total hip arthroplasty.
Conclusions: PAO for AR surgery leads to favorable outcomes in all PROMs suggesting PAO as an effective treatment of acetabular retroversion with a low frequency of severe complications.

Does pain and hip function improve two years after reverse periacetabular osteotomy?

69.

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Background: Outcome in patients with acetabular retroversion (AR) treated with reverse periacetabular osteotomy (reverse PAO) is sparsely reported.
Purpose / Aim of Study: The aim of this study was to investigate changes in pain and hip function among patients with AR two years after reverse PAO and to examine whether 'changes in pain' is associated with 'changes in hip function'. In addition, to evaluate patient satisfaction and changes in quality of life (QoL).
Materials and Methods: This was a follow-up study with patient reported outcome data from Aarhus University Hospital Denmark. Pain at rest and during activity was measured with Visual Analogue Scale (VAS), hip function with Hip disability and Osteoarthritis Outcome Score (HOOS) and QoL with Short-Form 36 (SF-36) both preoperatively and two years after reverse PAO in 74 patients. Changes were analyzed using paired t-test. Multiple linear regressions were applied.
Findings / Results: Significant ($P < 0.05$) and clinically relevant mean improvements in pain and hip function were found. Proportion of responders achieving a minimal detectable important change varied from 51-73%. Positive significant association between 'changes in pain' and 'changes in hip function' were found ($P < 0.05$). Significant mean improvement in QoL were found ($P < 0.05$). The study had a loss to follow-up of 23%.
Conclusions: Two years after reverse PAO, patients diagnosed with AR showed significant and clinically relevant mean improvements in pain and hip function and decreased pain was significantly associated with improved hip function. The majority of patients were satisfied with the results of reverse PAO and QoL were improved towards mean values for the Danish population.

14-year hip survivorship after periacetabular osteotomy: a follow-up study on 1385 hips

70.

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Background: Only few studies have evaluated long- and mid- term outcomes after periacetabular osteotomy (PAO).
Purpose / Aim of Study: The aim of this study was to investigate: (1) the long-term hip survival rate after PAO; (2) the risk of complications after PAO and (3) the hip function at different follow-up points.
Materials and Methods: We retrospectively reviewed 1385 hips (1126 patients) undergoing PAO between January 2004 and December 2017. Through inquiry to the Danish National Patient Registry we identified conversions to total hip arthroplasty (THA) and complications after PAO. We evaluated the Hip disability and Osteoarthritis Outcome Score (HOOS) obtained preoperatively, and at 6 months, 2, 5, and 10 years follow-up.
Findings / Results: The overall Kaplan Meier hip survival rate was 80.2% (CI: 68.0-88.1) at 14 years. There was a significant difference between age groups. 0.43% had deep vein thrombosis after PAO. The most common complication was PAO screw removal (12.5%). 11.1% had additional hip arthroscopy. At 2-year follow-up, HOOS pain improved by a mean of 25.7 points (CI 23.6-27.9) and a HOOS pain score ≤50 was observed in 14%.
Conclusions: The three outcomes used in this study allows for a more distinct description of PAO surgery outcome, which can possibly help surgeons in the selection of patients and enable them to inform the patients about the expected PAO outcome.

No-fault compensation after primary total hip replacement in Danish hospitals 2005-2016 - A retrospective cohort study

71.

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Background: In Denmark, 107.837 primary total hip arthroplasties (THA) were performed during 2005-2016. As patient safety awareness increases, a source of insight is data on health care-related injuries from patient compensation administration. Studies show a rise in claims due to higher expectations of treatment and outcomes, greater awareness of medical errors, and hence, lower levels of confidence and trust in the health care system. The majority of filed orthopaedics claims are from elective surgery, and many successful claims might have a preventable cause.
Purpose / Aim of Study: We examined the Danish Patient Compensation Association (DPCA) database to outline the frequency and financial burden of compensation claims after primary THA in Denmark.
Materials and Methods: This was a retrospective study of closed compensation claims following THA reported to DPCA between 1st of January 2005 and 31st of December 2016. The primary cause for claim was included.
Findings / Results: There were 29.370 orthopaedic patient claims in the DPCA from which 9.4% was due to primary THA (2759 cases i.e. 2.6% of all THAs performed in this period). The approval rate was 54%. Despite an increase in the number of THAs being carried out, the number of claims filed was stagnant, except for a spike of MoM prosthesis-cases. The total pay-out was DKK 192,494,484, and 87% of this was due to nerve damage (DKK 58,137,721), infection (DKK 38,611,026), MoM prosthesis (DKK 31,343,184), insufficient or incorrect treatment (DKK 25,788,714), and fracture (DKK 13,707,826). Nerve injury (17%), insufficient or incorrect treatment (16%) and MoM- prosthesis (15%) were the three most common causes for hip claims. However, those most likely to result in pay-out were nerve damage (84%), tendon injury (75%) and equipment failure during treatment (73%).
Conclusions: 2.6% of all primary THAs resulted in a compensation claim reported to DPCA and 54% of these were approved. The majority of pay-outs were due to nerve damage, infection, MoM prostheses, insufficient or incorrect treatment, and fracture. Although DPCA manages claims for patients, the data can also provide beneficial feedback to arthroplasty surgeons with the aim of improving patient care.

PAIN SCORE, DOES IT MATTER HOW IT IS ASSESSED

72.

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Background: Assessing pain by use of VAS or NRS scales have been used widely in clinical and research settings in which a quick index of pain intensity is required and to which a numerical value can be assigned. The literature suggests that health professionals have a tendency to underestimate pain when performing clinical assessment of pain.
Purpose / Aim of Study: The aim of the analyze was to investigate the difference in health professional and patient assessed pain score.
Materials and Methods: Secondary analyze of data from a drug- study were the participants Pain at rest were assessed on a VAS scale by a nurse at inclusion and by the patients themselves in connection with different questionnaires prior to knee or hip replacement surgery. Paired samples T-Test was used to calculate any difference.
Findings / Results: 341 patients scheduled for Total Knee or Hip Replacement were presurgical assessed. There was found a significant difference in mean VAS on 1.67 (2.24), $p<0.001$. Mean VAS assessed by nurses were 1.78 (2.14) and by patients 3.44 (2.24), with a moderate correlation between the 2 variables ($r=0.432$, $p<0.001$).
Conclusions: The current study found that there was a discrepancy between health professional and patient assessed pain measured by VASs at patients scheduled for knee hip replacement surgery with clear underestimating of the pain by the health professionals.

NO BENEFIT FROM FEMORAL NERVE BLOCK COMPARED TO LOCAL INFILTRATION ANALGESIA IN OPEN-WEDGE HIGH TIBIAL OSTEOTOMY; A RANDOMIZED, CONTROLLED TRIAL

73.

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Background: Open-wedge high tibia osteotomy (OW-HTO) is a painful procedure requiring intensive post-operative pain management. There are no high quality evidence to inform clinical practice about the most effective pain management approach. Current practice for pain management may include local infiltration analgesia (LIA), femoral nerve block (FNB), oral or intravenous opioid treatment, or typically a combination.
Purpose / Aim of Study: The aim of this randomized, controlled trial was to compare the effects of LIA versus FNB on morphine consumption during the first 48 hours, in patients undergoing OW-HTO. The hypothesis was that FNB would be associated with lower opioid consumption than LIA.
Materials and Methods: 64 patients undergoing OW-HTO were randomized to receive bolus FNB (Group F) or LIA (Group L). Primary outcome was measured by adjuvant opioid consumption, secondary measures included pain intensity rating on a numerical scale, adverse effects, and time to discharge.
Findings / Results: All patients received adjuvant opioid treatment, but only few in large amounts. We found no difference in opioid consumption between the groups. 7 patients reported severe pain (NRS > 7) during the active treatment. We observed no differences on length of stay, and the number of adverse effects was low, 2 in each groups.
Conclusions: There were no clinical or significant difference between LIA and FNB on morphine consumption. Neither treatment was associated with significant side effects. As standard treatment, we recommend local infiltration analgesia, due to lower technical requirements and cost, and avoidance of motor function impairment and peripheral nerve injury.

The effect of bone quality on tibial component migration in medial cemented unicompartmental knee arthroplasty. A prospective cohort study using dual x-ray absorptiometry and radiostereometric analysis

75.

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Background: Peri-prosthetic bone mineral density (BMD) may influence implant fixation and subsequent loosening. Unicompartmental knee arthroplasty (UKA) aims to restore normal knee kinematics and thereby preserve peri-prosthetic BMD.
Purpose / Aim of Study: We studied the influence of systemic and peri- prosthetic BMD in 4 Regions of Interest (ROI) of the proximal tibia on migration of the tibial component of cemented medial UKA.
Materials and Methods: Patients were allocated to a mobile-bearing UKA or a fixed-bearing UKA. Preoperatively patients were dichotomized in a normal BMD group (n = 37) and a low BMD group (n = 28) according to WHO criteria. Dual X-ray absorptiometry (DXA) scans were obtained before surgery, 7 days after surgery, and at 4, 12, and 24 months. Stereo-radiographs were obtained post-operatively, and at 4, 12, and 24 months.
Findings / Results: Patients with normal systemic BMD had a 11-15% higher BMD in all ROIs compared to patients with low systemic BMD throughout follow-up. Over time, a decrease in peri-prosthetic BMD was seen for both groups. Patient's operated knees and contralateral knees showed a similar reduction in BMD in all ROIs between pre-operative and 24 months. Between 12 and 24 months, the normal BMD group migrated (MTPM) 0.03 mm (95% CI -0.01; 0.08) and the low BMD group migrated 0.02 mm (CI -0.03; 0.07). Migration over time was not influenced by peri-prosthetic BMD.
Conclusions: Migration of cemented medial tibial UKA was low until 24 months and was affected by neither preoperative systemic BMD nor by postoperative change in peri-prosthetic BMD. This suggests good long-term fixation despite an index difference in proximal tibial BMD.

Improvements in gait patterns after knee arthroplasty and differences between unicompartmental and total knee arthroplasty – findings from an RCT comparing medial Oxford and TKA.

76.

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Background: Recent technological advances with inertial sensors, have made gait analysis possible. Previous studies have shown that it is possible to use this technology for assessing pre- and postoperative knee-status for knee arthroplasty patients and that gait-analysis could become a routine method of evaluating knee-performance in Orthopedic departments.
Purpose / Aim of Study: The purpose of this study is to investigate the gait patterns in a population of knee arthroplasty patients participating in a double-blinded RCT study comparing medial Oxford and total knee arthroplasty (mUKA vs. TKA).
Materials and Methods: 14 patients were included prospectively. They had all been diagnosed with isolated antero-medial OA. 7 were randomized to UKA and 7 to TKA. The participants were measured with inertial sensors on a treadmill pre-operatively to arthroplasty and 4 months postoperatively. Participants were examined at level and uphill walking at their self- determined comfortable speed and maximal speed. Average gait cycles were produced, and 36 gait-parameters were calculated using our own algorithms in R. We used non- parametric tests to identify differences between measurements. A p-value of < 0.1 was considered significant because of the explorative nature of the study.
Findings / Results: We found the greatest differences in gait between the pre- and postoperative group, at level walking, comfortable speed. 16 of 36 parameters were significantly different after arthroplasty. Improvements were seen in spatiotemporal, angular, angular velocity, angular acceleration and variability parameter categories. When comparing UKA with TKA we found the greatest differences at uphill walking, maximal speed. In this setting, 10 of 36 parameters were significantly different. UKAs had greater improvements in these same categories.
Conclusions: We found a clear postoperative improvement in gait four months after arthroplasty. Uphill walking seemed to highlight differences between the gait of UKAs and TKAs. Our findings suggest that UKAs improve their gait-pattern more than TKAs.

Implant migration of a cemented, fixed-bearing medial unicompartmental knee arthroplasty with mid-term follow-up. 77.

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Background: The fixed-bearing Sigma medial unicompartmental knee arthroplasty (UKA) has shown a low 7-year revision rate (5.5-6%) in the national registries of England and Australia. A previous radiostereometric analysis (RSA) study with early follow-up showed low implant migration and good clinical outcome (Koppens, Stilling et al. 2018). However, 30% of tibial components showed continuous migration, indicating a risk of loosening.
Purpose / Aim of Study: To evaluate mid-term migration of the tibial component of the Sigma UKA on the same cohort.
Materials and Methods: Between December 2012 and December 2013, 45 cemented, uncoated, fixed-bearing medial Sigma UKA were implanted in 45 patients (21 male; mean age 63 years; SD 9.7). Stereoradiographs were obtained postoperatively, at 4, 12, 24, and 60 months after surgery. Model-based RSA was used to analyse migration (MTPM) of the tibial components. A sub-analysis was performed, classifying components as stable (difference MTPM 12-24 months < 0.02 mm) (n=26) or continuously migrating (difference MTPM 12-24 months > 0.02 mm) (n=11). Clinical outcome was obtained with Oxford Knee Score (OKS) preoperatively, and at 4, 12, 24, and 60 months.
Findings / Results: The cohort showed some initial migration of 0.10 mm (95% CI 0.05; 0.17) between 12 and 24 months and stabilized afterwards. No migration was seen between 24 and 60 months. Sub-analysis showed 0.05 mm (95% CI 0.00; 0.11) migration in the stable group and 0.52 mm (95%CI 0.33; 0.76) migration in the continuously migrating group until 24 months. Stabilization occurred between 24 and 60 months, the stable group migrated 0.04 mm (95% CI -0.03; 0.13) and continuously migrating group migrated 0.04 mm (95% CI -0.21; 0.37). OKS improved with 14.3 (95% CI 11.6; 16.9) at 4 months after surgery, and this improvement remained throughout follow-up. Similar OKS was seen between the stable and continuously migrating group. There were 3 revisions, one due to aseptic loosening of the tibial component.
Conclusions: At mid-term, the Sigma UKA tibial components were well-fixed and stable as measured by RSA, indicating low risk of long-term aseptic loosening.

TKA vs. UKA: is there something to gain from implementing medial UKA?

78.

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Background: When implementing new procedures, surgeons need to be confident it does not result in a performance drop. In April 2016 medial unicompartmental knee arthroplasties (MUKAs) were implemented at our center. During this we monitored patient reported outcome measurements (PROMs).
Purpose / Aim of Study: The aim of this study was to compare patient reported outcomes following MUKA and compare them to TKAs with anteromedial osteoarthritis (AMOA) performed prior to implementation of MUKA.
Materials and Methods: The last 158 TKAs with AMOA on their pre-operative radiographs performed prior to introductions of MUKA were identified and compared to the first 172 MUKA procedures.. Oxford knee scores (OKS) and Forgotten joint scores (FJS) were collected preoperatively and at 3, 12 and 24 months follow-up (f/u). Patient demographics included gender, age, BMI, ASA and Kellgren-Lawrence grades.
Findings / Results: The time series analyses showed significant differences for all three PROMs in the favor of MUKA with p-value < 0.0001. Values presented are mean adjusted improvements from baseline values with CI 95 %. For FJS the MUKAs improved by 30.70 (26.72 - 34.67) at 3 months, 43.93 (39.28 - 48.59) at 1 year and 45.80 (39.84 - 51.76) at 2 years. TKAs improved by 30.91 (23.25 - 38.56) at 3 months, 37.74 (32.22 - 43.26) at 1 year and 39.89 (34.16 - 45.63) at 2 year (p-values: 1.40e-14– 4.13e-59). For OKS the MUKAs improved by 10.14 (8.86 - 11.42) at 3 months, 15.16 (13.73 - 16.59) at 1 year and 15.51 (13.74 - 17.27) at 2 years. TKAs improved by 9.07 (6.83 - 11.31) at 3 months, 14.32 (13.00 - 15.64) at 1 year and 15.01 (13.55 - 16.47) at 2 years (p-values: 9.57e-15 - 9.56e-73). 52 % of MUKAs and 42 % of TKAs reached an excellent outcome (OKS > 41) at 1 year.
Conclusions: Both procedures show an overall improvement. MUKAs showed significantly larger and more rapid improvements than TKAs. The TKAs approached the MUKAs scores at 2 years for OKS, but do not reach the same results for FJS. In conclusion the gain by using MUKA, when measured in knee specific PROMs, is achieved immediately after implementation and becomes clinically important when seen in the context of nationwide healthcare.

Outpatient total joint arthroplasty in ambulatory surgery center vs standard patient ward – a randomized controlled trial

79.

Christian Emil Husted, Henrik Husted, Helle Krogshøj Hansen, Billy B Kristensen, Kirill Gromov

Department of Orthopedic Surgery, Copenhagen , University Hospital Hvidovre, Copenhagen; Ambulatory Surgery Department, Copenhagen , University Hospital Hvidovre, Copenhagen

Background: Outpatient total joint arthroplasty in ambulatory surgery center vs standard patient ward – a randomized controlled trial Christian Emil Husted, Henrik Husted, Helle Krogshøj Hansen, Billy B Kristensen, Kirill Gromov Ortopædkirurgisk afdeling, Hvidovre Hospital Discharge on the day of surgery (DOS) among selected patients operated with total hip arthroplasty (THA) or total knee arthroplasty (TKA) has been shown to be feasible and safe. However, different factors play a part in determining whether patients are discharged on the DOS or not and location may be one of them.

Purpose / Aim of Study: The purpose of this study was to investigate the importance of the setting in which the short stay following THA or TKA takes place: was there a significant difference between the proportion of patients being discharged on the DOS when staying at an ambulatory surgery center (ASC) compared to patients staying at a regular ward after surgery.

Materials and Methods: In total 154 patients (64 THA, 90 TKA) were screened for eligibility to undergo fast-track surgery in an outpatient setting. Of those, 50 patients (30 TKA, 20 THA) were all operated in the ASC by one experienced surgeon and immediately postoperatively randomized to either staying in the ASC or being transferred to the regular ward.

Findings / Results: Ninety-six % (n=24) of the patients who stayed at the ASC vs 80% (n=20) of the patients at the ward were discharged on the DOS following fulfillment of discharge criteria. All THA patients were discharged, but significant more TKA patients were discharged from the ASC (p=0.044) resulting in an overall nearly significant difference between the two groups of patients regarding discharge on the DOS (power all=0.082). There was no difference between patients staying at the ASC or the ward regarding gender (pTKA=0.431/pTHA=0.964), age (pTKA=0.136/pTHA=0.72), ASA-score (pTKA=0.232/pTHA=0.436), BMI (pTKA=0.51/pTHA=0.685), surgery time (pTKA=0.459/pTHA=0.138), or blood loss (pTKA=0.287/pTHA=0.999).

Conclusions: Despite fixed discharge criteria, the setting may play a role for achieving early discharge, which may be facilitated be the presence of a dedicated anesthetist reducing pain and dizziness.

Why still in hospital after fast-track unilateral unicompartmental knee arthroplasty?

80.

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Background: Discharge on the day of surgery (DOS) is reported to be safe and effective after unicompartmental knee arthroplasty (UKA). Previous studies have determined risk factors for prolonged length of stay, but little is known about specific factors resulting in continued hospitalization within the first postoperative days after UKA.
Purpose / Aim of Study: To investigate what clinical and logistical factors prevent patients from being discharged on the day of surgery and the first postoperative day following primary UKA in a fast track setting.
Materials and Methods: We prospectively collected data on 100 unselected UKA patients operated from December, 2017 to May, 2019. All patients were operated in a standardized fast-track setup with functional discharge criteria continuously evaluated from DOS and until discharge. A form screening all discharge criteria was filled out before 8pm on DOS and postoperative day 1 and 2 if the patients were still in the hospital.
Findings / Results: Median length of stay for the entire cohort was 1 day. 22% and 78% of all patients were discharged on DOS and the first postoperative day respectively (27% and 80% respectively, when only considering patients operated as #1 and #2). Lack of mobilization only and pain only delayed discharge in respectively 78% and 24% of patients, respectively. The main reasons for lack of mobilization were motor blockade (37%) and logistical factors (26%). Urinary retention, nausea or vomiting, circulatory insufficiency, and wound issues delayed discharge in fewer cases (2-11%). For patients operated as #1 and #2 we found that; If mobilization only was managed successfully, the discharge rate on DOS would increase to 55%. If pain only was managed successfully, the discharge rate on DOS would increase to 40%.
Conclusions: 22% of unselected UKA patients operated in a standardized fast-track setup are discharged on DOS. Pain and lack of mobilization were the major reasons for continued hospitalization within the initial postoperative 24-48 hours. Strategies aimed at decreasing length of stay after UKA should strive to improve analgesia and the setup regarding postoperative mobilization.

Comparison of two strategies in knee arthroplasty: TKA only vs. UKA if possible. 81.

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Background: The choice between total- and unicompartmental knee replacement (TKA/UKA) is a continued area of discussion. Internationally unicompartmental knee replacements are still lacking behind the total replacements even though it has fewer complications and readmissions, lower mortality and better functional outcomes. Liddle et al. showed a small but significant difference in favor of the unicompartmental arthroplasty in patient reported outcome measurements (PROMs) in 2014. We aimed to investigate this further, however using only the total knee replacements that would have been suitable for a medial unicompartmental replacement.
Purpose / Aim of Study: Thus the aim of this study was to investigate any difference in Oxford Knee Scores at 1 year between TKAs with anteromedial osteoarthritis (AMOA) and medial UKA (MUKA).
Materials and Methods: We did a dual center cohort study where all TKAs were recruited from a center that didn't offer MUKA at the time, and all MUKAs were included from a center that does MUKA if it is possible. The TKAs' preoperative radiographs were evaluated to identify patients with AMOA. A total of 500 patients were included (301 MUKA) from 2013-2016. We investigated the change score for OKS from pre-operative to 1 year post- operative and the proportion of patients achieving the patient accepted symptom state (PASS) of > 31.56 OKS at 1 year follow-up. Patient demographics included gender and age in both analyses and additionally pre-operative OKS in the PASS analysis.
Findings / Results: The change score at 1 year showed a mean adjusted difference of 4.38 OKS (CI 95 % 2.84-5.92) in favor of the MUKAs (p-value of 4.07e-08). The proportion of MUKAs achieving PASS was 88.70 % compared to 81.91 % for TKAs with an OR of 2.59 and a p-value of 0.00104.
Conclusions: In conclusion we found a significant difference in change score between the two procedures similarly to previously published series. We found an OR of 2.59 in favor of MUKA for achieving PASS. Even with the limitations of this study, we are confident in the conclusion that there is a difference in change in OKS at 1 year between MUKA and TKA and that MUKA has a higher chance of achieving PASS.

The short-term survival of total stemless shoulder arthroplasty for osteoarthritis is comparable to that of total stemmed shoulder arthroplasty: a Nordic Arthroplasty Register Association study

82.

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Background: Despite potential benefits, there are also concerns related to stemless shoulder arthroplasty systems. The metaphyseal fixation relies on adequate bone quality, and the risk of component loosening, especially in elderly patients, could in theory be higher than with stemmed humeral components.
Purpose / Aim of Study: The purpose of this study was to compare the short-term survival rate of total stemless, metaphyseal fixated, shoulder arthroplasty with that of total stemmed shoulder arthroplasty in the treatment of osteoarthritis.
Materials and Methods: Data were collected by the national arthroplasty registries in Denmark, Finland, Norway, and Sweden and merged into one dataset under the umbrella of the Nordic Arthroplasty Register Association. For the present study, we included all patients with osteoarthritis treated with either stemless (n = 761) or stemmed (n = 4398) shoulder arthroplasty from 2011 to 2016.
Findings / Results: A total of 21 (2.8%) stemless and 116 (2.6%) stemmed shoulder arthroplasties were revised. The 6-year unadjusted cumulative survival rates were 0.953 for stemless shoulder arthroplasty and 0.958 for stemmed shoulder arthroplasty, P = .77. The most common indication for revision of both arthroplasty types was infection. Five (0.7%) stemless and 16 (0.4%) stemmed shoulder arthroplasties were revised because of loosening of either the glenoid or the humeral component. In the multivariate cox regression model, which included age, category, gender, year of surgery, previous surgery, and arthroplasty type, the hazard ratio (HR) for revision of the stemless shoulder arthroplasty was 1.00 (95% confidence interval [CI], 0.63-1.61), P = .99, with the stemmed shoulder arthroplasty as reference. Male gender (HR = 1.50 [95% CI, 1.06-2.13], P = .02) and previous surgery (HR = 2.70 [95% CI, 1.82-4.01], P < .001) were associated with increased risk of revision.
Conclusions: The short-term survival of total stemless shoulder arthroplasty appears comparable with total stemmed shoulder arthroplasty, but longer observation time is needed to confirm whether they continue to perform equally.

Increased use of total shoulder arthroplasty and improved patient-reported outcome for osteoarthritic patient in Denmark from 2006 to 2015: a nationwide cohort study from the Danish shoulder arthroplasty Registry.

83.

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Background: Osteoarthritis has become the most common indication for shoulder arthroplasty in Denmark. The outcome have been monitored by the Danish Shoulder Arthroplasty Registry (DSR) since 2004, and data on patient- reported outcome and revision rates have been published in annual reports and in international orthopedic journals
Purpose / Aim of Study: The aims were to investigate the use of different arthroplasty types for osteoarthritis in Denmark from 2006- 2015, to report the patient-reported outcome, and to study if changes in the use of arthroplasty types have changed the overall patient-reported outcome from 2006-2015.
Materials and Methods: We included 2,867 shoulder arthroplasties performed for osteoarthritis between 2006 and 2015 and reported to the DSR. The Western Ontario Osteoarthritis of the Shoulder (WOOS) index at one year was used as outcome. The raw score was converted to a percentage of a maximum score. General linear models were used to analyze differences in WOOS.
Findings / Results: The proportion of anatomical total shoulder arthroplasty and reverse shoulder arthroplasty increased from 3% and 7% in 2006 to 53% and 27% in 2015. The mean WOOS score was 70 (SD26) after resurfacing hemiarthroplasties (n=1.258), 68 (SD26) after stemmed hemiarthroplasty (n=500), 82 (SD23) after anatomical total shoulder arthroplasties (n=815) and 74 (SD23) after reverse shoulder arthroplasties (n=213). The overall WOOS increased with 18 (95%CI 12:22, P<0.001) in the univariate model and 10 (95%CI 5:15, P<0.001) in the multiple model. We found improved WOOS scores for anatomical total shoulder arthroplasty (14, 95%CI: 5-23, P=0.003) from 2006- 2015.
Conclusions: The patient reported outcome of shoulder arthroplasty for osteoarthritis improved from 2006 to 2015. This may be related to different factors: improved outcome of anatomical total shoulder arthroplasty; the increased use of total shoulder arthroplasty towards the end of the study period; and better treatment selection including the use of reverse shoulder arthroplasty in patients with poor rotator cuff function. The reason for the increased use of total shoulder arthroplasty is unknown but may be related to surgeons' awareness of clinical results through annual reports from the DSR.

How objective knee laxity correlates with patient-reported outcome after ACL reconstruction

84.

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Background: The orthopedic literature has found variable results concerning knee laxity and subjective outcomes after ACL reconstruction.
Purpose / Aim of Study: Therefore, the purpose of this study is to describe the relationship between objective sagittal knee laxity and subjective assessment of function and symptoms using high-volume registry data. The hypothesis of this study is that greater laxity correlates with an inferior patient reported outcome and with a higher risk of revision surgery
Materials and Methods: 13035 patients who underwent primary ACL reconstruction from the Danish Knee Ligament Reconstruction Registry were divided into three groups based on their side-to-side difference on instrumented sagittal laxity 1-year after surgery. Group A (n=10613) with ≤ 2mm, group B (n=2122) with 3-5 mm, and group C (n=300) with >5 mm. The outcome measures were Knee injury and Osteoarthritis Outcome Score (KOOS) and Tegner activity scores as well as revision rate.
Findings / Results: The study found that revision surgery was highly correlated to laxity. The group with most laxity (group C: 26%) were more than four times as likely to get revision surgery compared to the group with least laxity (group A: 6%) Furthermore, there were a significant correlation between sagittal laxity and the KOOS QoL sub score in all groups. KOOS-4 score and Tegner activity were both significant different when comparing the group with least (group A) and most laxity (group C).
Conclusions: Increased post-operative sagittal laxity correlates with worse knee related quality of life and with a greatly increased risk of revision surgery.

Low agreement on fracture morphology in patients considered for shoulder arthroplasty

85.

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Background: The majority of proximal humeral fractures can be treated non-surgically. However, an arthroplasty is often considered in the case of head-split fractures or fracture dislocations. Previous studies have reported a poor to moderate inter- and intra-observer agreement on Neer classification of proximal humeral fractures. However, these studies have not focused on the most complex fracture patterns.
Purpose / Aim of Study: To study the level of agreement between and within shoulder surgeons assessing proximal humeral fracture morphology in patients considered for arthroplasty.
Materials and Methods: Preoperative anterior-posterior and scapular- lateral radiographs of 51 consecutive patients with proximal humeral fractures treated with hemiarthroplasty at two university hospitals were retrospectively obtained. One case of glenoid fracture was excluded. First, 4 shoulder surgeons served as observers and independently reviewed all cases. Each case was first classified according to Neer. Second, the surgeon determined if a fracture dislocation or a head-split fracture was present. This process was repeated in a changed picture sequence 3 weeks later. Inter-observer and intra-observer agreement were calculated using Cohen's kappa and 95 % confidence intervals. Kappa values were interpreted according to Landis and Koch.
Findings / Results: The overall mean kappa-values for inter-observer agreement on Neer classification were 0.11 and 0.34 in the two rounds. Higher mean kappa-values for inter-observer agreement were found for dislocation (0.59 and 0.72) and head-split (0.56 and 0.65). Mean kappa-values for intra-observer agreement on Neer classification ranged from -0.06 to 0.84 and from -0.38 to 1 for dislocation, while intra-observer agreement on head-split ranged from 0.41 to 0.89.
Conclusions: We found slight to fair agreement on Neer classification between four experienced shoulder surgeons. The level of agreement on dislocation and head-split was moderate to substantial. The agreement within surgeons varied from poor to almost perfect. The classification of these fractures and the diagnosis of headsplit fractures and fracture dislocations remain difficult even for experienced surgeons.

Surgical versus non-surgical management of displaced fractures of the proximal humerus in elderly

86.

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Background: Proximal humeral fractures are the third most common non-vertebral fractures in elderly. Minimally displaced fractures account for about half of the fractures and can be treated non-surgically. However, the optimal treatment of displaced 2-, 3-, and 4-part fractures is disputed.
Purpose / Aim of Study: To determine the clinical outcome after surgical versus non-surgical management of displaced fractures of the proximal humerus in elderly (>60 years).
Materials and Methods: Our search strategy from 2015 was applied. Metaanalyses and randomized trials were assessed for eligibility. Two reviewers independently assessed all systematic reviews with metaanalyses using the AMSTAR tool. Additional randomized clinical trials were assessed using the Cochrane Risk of Bias tool.
Findings / Results: Eight new metaanalyses were identified and assessed. The two highest scoring metaanalyses were included in the guideline. They covered eight randomized trials with a total of 567 patients. No additional randomized trials were identified. There was high quality evidence of no statistically or clinically relevant difference in patient-reported function at one- or two-year follow-up between surgical and non-surgical management. There was moderate quality evidence of a significantly higher risk of additional surgery in the surgery group. No randomized trial comparing outcome after non- surgical management and primary reverse prosthesis were identified. Two network mataanalyses of moderate to low quality recommend the use of reverse prostheses. However, the heterogeneity of populations, indications and interventions does not justify the application of network metaanalyses. Recommendations on the use of reverse prosthesis in acute fractures therefore awaits the reporting from well conducted randomized trials.
Conclusions: We recommend a non-surgical approach to displaced 2-, 3-, and 4-part fractures of the proximal humerus in elderly. Other fracture patterns like fracture-dislocations or articular fractures and fracture in younger patients may benefit from surgical management.

Lost jobs and sick leave are common in patients with subacromial impingement syndrome in secondary care: a consecutive cohort study.

87.

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Background: Loss of workdays is the main societal cost related to shoulder disorders, with nine lost workdays per six months in average. It is, however, unknown if loss of workdays is equally common for patients with subacromial impingement syndrome (SIS).
Purpose / Aim of Study: The aim is to investigate the amount of workdays lost due to SIS in secondary care.
Materials and Methods: From 157 consecutive patients diagnosed with SIS, 129 (82%) completed a structured six-month follow- up interview. Job status (fulltime/part- time/no job), average weekly working hours and days on sick leave due to SIS were recorded. Only patients in job (n= 58) and patients who lost their job due to SIS (n=8) were considered at-risk of losing workdays, leaving 66 patients to be further analyzed. Lost worktime due to SIS was calculated separately for sick leave, lost job, and working part-time, and normalized to full-time workdays. Mean lost workdays per 6 months was estimated using Poisson regression analyses.
Findings / Results: In total, 1781 workdays were lost due to sick leave (851 days), lost job (647 days) and part-time work (283 days), for the entire cohort (n=129). Mean lost workdays per six months was 14 (95%CI: 9-21) days for the entire cohort, and 27.0 (95%CI: 18-40) days for patients at-risk (n=66).
Conclusions: In secondary care, the amount of workdays lost due to SIS in patients at-risk of losing workdays was 27 workdays (>5 work- weeks). This is 3 times higher than the 9 days previously reported, indicating that productivity loss in this population is a major concern.

Dynamic radiostereometric analysis for pre- and postoperative evaluation of range of motion in the femeroacetabular impingement hip joint

88.

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Background: Dynamic RSA (dRSA) enables precise non- invasive 3D motion-tracking of bones. Hereby, the biomechanical effects of arthroscopic cheilectomy and –rim trimming (ACH) can be evaluated in patients with femoroacetabular impingement (FAI).
Purpose / Aim of Study: The aim of this study was to investigate the pre- and postoperative range of motion (ROM) and CT bone volume removed after ACH.
Materials and Methods: 13 patients (6 women) were included. The patient's hips were CT-scanned and CT- bone models of the proximal femur and pelvis were created. Preoperative dRSA recordings were acquired at 5 frames/sec during flexion to 90°, adduction to stop, and internal rotation to stop (FADIR). ACH was performed, CT and dRSA were repeated 3 months and 1 year postoperatively. dRSA images were analyzed using customized automated software called AutoRSA. Hip joint kinematics before, and 3 months and 1 year after ACH were compared pairwise. The bone volume (BV) removal was quantified and compared to postoperative ROM. The center edge angle, alpha angle, acetabular index and femoral anteversion were measured pre- and postoperatively.
Findings / Results: Mean internal hip rotation was 11.4° before ACH surgery, and 8.1° at 3 months and 9.4° at 1 year after surgery, ($p>0.84$). Hip adduction was 10.4° preoperatively, and 10.5° and 11.6° after ACH surgery ($p>0.87$). Mean hip flexion during dRSA tests were 80.3° preoperatively, and 78.5° and 79.3° after ACH surgery ($p>0.94$). The subluxation of the femoral head in the acetabulum, along the x-axis decreased after surgery ($p=0.01$). No difference along y- and z-axis translations were observed ($p>0.05$). The BV was 406-1783 mm3 and was not correlated to ROM. Radiological measures were unchanged.
Conclusions: ACH surgery in FAI patients reduced the subluxation of the femoral head but had no impact of ROM during passive FADIR test at 1 year followup. This indicates that the positive clinical effects of ACH are not brought by increased ROM but rather a reduction in labral stress and cartilage pressure during end-range motion.

Complications after nonsurgical management of proximal humeral fractures: a systematic review of terms and definitions

89.

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Background: A majority of proximal humeral fractures can be managed without surgery. Recent randomized clinical trials and meta-analyses even question the benefit of surgical treatment for displaced 3-, and 4- part fractures. However, evidence-based treatment recommendations, balancing benefits and harms, presuppose a common reporting of complications and adverse events, which at the moment is largely missing.
Purpose / Aim of Study: To systematically review the use of terms and definitions of complications after nonsurgical management of proximal humeral fractures.
Materials and Methods: We searched PubMed, EMBASE, Cochrane Library, Scopus and WorldCat (2010-2017) and included articles and book chapters containing complication terms or definitions. Two reviewers independently extracted and grouped terms and definitions according to a predefined scheme. Terms and definitions concerning nonsurgical management were tabulated, grouped and analyzed qualitatively.
Findings / Results: The initial search identified 1,376 references from which 470 articles were selected for full-text retrieval. A total of 69 terms for complications after nonsurgical management were identified. The most commonly reported event terms regarded osteonecrosis, malunion, secondary displacement and rotator cuff problems. Seven individual terms were accompanied by some kind of definition. Most terms and definitions were based on radiographical assessments.
Conclusions: We found no consensus in the use of terms and definitions of complications after nonsurgical management of proximal humeral fractures. Multiple terms, some synonymous, some partly synonymous, some distinct, were used. Few complication terms were explicitly defined. Development and validation of an internationally consensus-based core event set for complications after proximal humeral fractures managed nonsurgically is needed.

Supraspinatus and deltoid muscle fiber diversity in rotator cuff tear conditions

90.

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Background: Rotator cuff (RC) tears are associated with RC muscle atrophy and changes in composition that are crucial to the prognosis of RC repair.
Purpose / Aim of Study: The aim of this study was to characterize muscle fiber composition in the supraspinatus (SS) muscle under tear conditions
Materials and Methods: Muscle biopsies were obtained from 21 patients undergoing surgery for RC tendon tear. Biopsies were obtained from the musculotendinous junction of the SS muscle and control biopsies were harvested from the deltoid muscle (DT). Biopsies were immunohistochemically processed for detection of type 1 (slow type) and type 2 (fast type) fibers and analyzed using design-unbiased, stereological principles. We counted the total numbers of type 1 and 2 muscle fibers/mm2 and fiber diameter was used to estimate muscle fiber atrophy and hypertrophy
Findings / Results: We found significantly more type 2 cells/mm² in the SS compared to the DT ($p<0.01$). In addition, we found a significantly higher fraction of type 1 fibers than type 2 fibers in the DT ($p<0.01$), whereas both fiber types were equally present in the SS. The diameters of SS cells were generally smaller than those of DT cells. Atrophy of especially SS type 2 fibers was also demonstrated. Fiber atrophy was more pronounced in men than women
Conclusions: The changes in the composition of SS muscle cell types suggest a shift from type 1 to type 2 muscle fibers and atrophy of both type 1 and 2 fibers. This composition indicates loss of endurance and rapid fatigue of the SS muscle under RC tear conditions

Reliability testing of the Baseline® Hydraulic Wrist Dynamometer for supination strength after distal biceps tendon injury

91.

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Background: Rupture of the distal biceps' tendon (DBT) is a rare injury with a reported incidence of 1.2 ruptures per 100.000 patients per year. Untreated a rupture of the DBT results in a reduction of flexion and supination strength up to 50%. Data from patient related outcome measures (PROMS) show significant increase after operation. Precise measures of the effect of operation on strength are rarely reported, probably because strength testing requires access to a biomechanical testing machine.
Purpose / Aim of Study: This aim of this study was to analyse, if a handy strength measurement tool: the Baseline® Hydraulic Wrist Dynamometer is useful for testing peak torque of supination. The reliability of repeated measurements with the device was investigated. Both arms were measured to study, if the opposite side can be used as reference.
Materials and Methods: A power analysis showed that 6 subjects would be needed to achieve 80 % power and an alpha value of 5 %. The design of the study was a test-retest reliability with at least 48 hours between the two testing sessions. Six Subjects without any history of upper extremity pathology were enrolled and performed supination peak torque in two different positions (neutral and 90degrees supination) with both arms.
Findings / Results: The mean age of the subjects was 26.67 +/- 4.75 years. The measurements for neutral position (thumbs up) were discarded because the readings surpassed the maximal threshold of the dynamometer. The ICC, used to access reliability, for the right and dominant upper extremity was 0.949 corresponding to excellent reliability, and 0.791 for the left extremity corresponding to good reliability. No significant difference was detected between the dominant and non-dominant upper extremity (P-value 0.145)
Conclusions: The Baseline® Hydraulic Wrist Dynamometer is a reliable device to measure supination peak torque, although testing should be performed in 90degrees supination in order to avoid a ceiling effect. Furthermore, we could show that the dominant and non-dominant upper extremities demonstrate similar supination peak torque and therefor can be used as reference to compare supination strength following a rupture of the distal biceps' tendon.

Computer tomography acquired hip angles and patient reported outcomes in patients with femoroacetabular impingement syndrome

92.

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Background: Patients with femoroacetabular impingement syndrome (FAIS) experience pain, decreased function and quality of life. Patients present with cam and/or pincer morphology of their hip joint. In the literature, several studies have focus on diagnosis via imaging but recent literature suggests that FAIS should be diagnosed via imaging, clinical signs and symptoms. Associations between patient reported outcomes and specific hip angles might highlight which radiological parameters affect outcomes experienced by the patients.
Purpose / Aim of Study: The aims of the study were 1) to describe computer tomography (CT) acquired angles in patients with FAIS 2) to investigate the association between hip angles in patients with FAIS and the Copenhagen Hip and Groin Outcome Score (HAGOS).
Materials and Methods: Patients were eligible for inclusion if they were scheduled for primary hip arthroscopic surgery for FAIS. The study was approved by the Central Denmark Region Committee on Biomedical Research Ethics (1-10-72-239-14) and the Danish Data Protection Agency (1-16-02- 499-14). The CT images of the hip were acquired on a Philips Brilliance 64 (Philips Medical Systems, Best, the Netherlands) scanner with low-dose radiation. All patients completed the HAGOS. Associations between patient reported outcomes and hip angles was tested with linear regression.
Findings / Results: Sixty patients aged 36 ±9, 63% females were included in the study. The following mean ±standard deviation was found: alpha angle 51.7 ±9.6, femoral anteversion angle 27.5 ±10.5, lateral centre edge angle 33.1 ±5.6, acetabular index angle 2.8 ±6.0, anterior acetabular sector angle 59.2 ±6.6, posterior acetabular sector angle 94.9 ±6.8, acetabular anteversion 18.0 ±4.7. Hip angles were not associated with any of the HAGOS scores.
Conclusions: Patients presented with a high femoral anteversion angle and many patients had a low acetabular index angle. There was no overall association between HAGOS scores and hip angles which highlights that patients with FAIS should be diagnosed using other diagnostic criteria than only scans.

Immediate mobilization after osteosynthesis of proximal tibial fractures.

93.

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Background: Little to no evidence exist regarding the postoperative regime after osteosynthesis of proximal tibial fractures (PTF). Even so, current literature suggests no weightbearing (NWB) for approx. 6-21 weeks following osteosynthesis of a tibia plateau fracture until sign of healing. However, few studies suggest that early weightbearing as tolerated (WBT) may be allowed without the risk of secondary fracture displacement.
Purpose / Aim of Study: To investigate if immediate WBT after osteosynthesis of a proximal tibial fracture causes secondary fracture displacement. Furthermore, to describe functional outcome, adverse events and return to work and normal activity in these patients.
Materials and Methods: The study is an ongoing prospective cohort study including all patients surgically treated for a proximal tibia fracture at Slagelse Hospital from March 2018 to March 2020. Patients are followed up in the outpatient clinic at 2, 6 and 12 weeks and 1 year. Fracture displacement is classified as displacement more than 2 mm on radiography validated by the authors.
Findings / Results: So far 50 patients was treated for a proximal tibia fracture. 8 patients were excluded. 34 of 42 were allowed immediate WBT (most noticable 11 type AO 41B3, 8 type 41C3), 8 were instructed in NWB (all type 41C3). Patients were followed from 2 weeks to 1 year. Secondary fracture displacement was seen in 2 of 34 in WBT group (one type 41C3 and one 41B3) and 1 of 8 in the NBW group. Maximum displacement was 3mm. Functional test was the 30 second chair- stand-test. At 2, 6, 12 weeks and 1 year the WBT group performed (median) 8 (0;19, n=32), 13,5 (0;24, n=29), 15 (0;28, n=30) and 17 (0;30, n=8) respectively compared to the NWT group which performed 0 (0, n=8), 3,5 (0;13, n=8), 9,5 (0;24, n=8) and 10 (5;15, n=3). There were 6 adverse events in the WBT group and 3 in the NWB group. At 2 weeks, 9 of 31 in the WBT group and 0 of 8 in the NWB had returned to normal function. At 12 weeks 14 of 30 in the WBT group and 5 of 8 in the NWB group had returned to normal function.
Conclusions: We found immediate WBT to be a viable postoperative regime after a surgically treated proximal tibial fracture with secondary fracture displacement in 2 of 34 of patients allowed immediate WBT.

Fractures after stroke - a Danish registerbased study of 106.001 patients

94.

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Background: Stroke can have severe consequences such as depression, pain, impaired functional capacity, decreased quality of life and death. Furthermore, stroke has been associated with an increased risk of falls and fractures in the elderly population. Up to 75% of all patients with stroke fall within six months after their stroke and studies suggest that 1- 15% experience a fall-related fracture. There are no recent national studies in Denmark on the incidence of fractures after the first episode of stroke in the elderly Danish population.
Purpose / Aim of Study: To estimate the incidence of fall-related fractures in patients aged 65 and older with first episode of stroke, and to estimate the incidence of specific fracture types for this group of patients. Another objective was to investigate stroke severity and marital status, as risk factors for fractures.
Materials and Methods: A large retrospective data-set of 116,519 patients with first episode of stroke was extracted from the Danish Stroke Registry between January 2003 and December 2017. The occurrence of fall-related fractures was then identified in the Danish National Patient Registry for this group of patients. A univariate analysis was conducted and a multivariate analysis was conducted to determine the relationship between stroke severity and fractures, and marital status and fractures, adjusting for multiple confounders. In the multivariate analysis, Cox regression with time varying covariates was used, taking time dependent variables into account.
Findings / Results: The incidence rate of fall-related fractures post- stroke was 41.07 per 1000 person-years between 2003-2017 in Denmark. A total of 15,872 (14.86%) sustained a fracture and the mean time at risk until outcome was 3.67 years post-stroke. Factors associated with an increased risk of fractures were a mild, moderate, severe and unknown stroke severity, living alone, age, female sex and high alcohol intake.
Conclusions: The incidence rate of fall-related fractures in Denmark was 41.07 per 1000 person-years. Femur fracture was the most common fracture type. Moreover, mild, moderate and severe stroke severity and living alone at the time of stroke were found to be risk factors for fracture.

Posterolateral Approach to the ankle – Major complications following open reduction and internal fixation of posterior malleolar fragments – a prospective cohort study

95.

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Background: The posterolateral approach to the distal tibia is reported to be safe, allowing anatomical reduction of posterior malleolar (PM) fractures
Purpose / Aim of Study: To examine the rate of major complications following posterior fragment fixation through the posterolateral approach, in a prospective cohort
Materials and Methods: The study was registered on clinicaltrials.gov (NCT03107767). Adult patients with trimalleolar fractures, were included prospectively. The PM fractures were treated with fixation of the PM through a posterolateral approach, from June 2016 to June 2018, as dictated by a standardized algorithm in a single level III trauma center serving 540.000 people. Radiological and clinical follow- up was performed in a dedicated ankle fracture out-patient clinic as part of the "PRO-Malleolus Algorithm study". Follow-up was set at 6, 12 and 52 weeks each including weightbearing radiographs
Findings / Results: 90 patients with mean age of 53y ([range 18y-86y]) were included. 96% were evaluated with a pre-operative computed tomography scan. 67 patients (74,4%) had AO/OTA fracture type 44B3, and twelve (24,4%) 44C-type fractures. One patient had an isolated PM fracture. 80% of patients were allowed full weight bearing in a circular cast from day one. 18 patients (20%) suffered major complications. There were six cases of failure (FAIL) requiring reoperation, either due to loss of reduction and/or suboptimal surgical reduction, two cases of deep infections (D.INF) requiring intravenous antibiotics and/or surgical debridement. Four patients suffered persisting pain (PP+REOP), requiring reoperation, including arthroscopy, arthrodesis or other reconstructive surgery (NB* not including implant removal procedures > 9 months post- ORIF). Six patients with severe persisting pain required long term follow up at a foot/ankle or pain center (PP- REOP). Additionally, ten patients had minor complications, six of which were superficial wound problems
Conclusions: Although ORIF through a posterolateral approach is an important tool in managing these injuries, the major complication rate remains 20% in our prospective study. This is considerably higher than other retrospective series, claiming that major complication and reoperation rates are minimal

Patient-related disparities in quality of acute hip fracture care - a 10-year nationwide population-based cohort study

96.

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Background: Health care systems have implemented continuous monitoring to improve quality of care. However, it is unknown whether the results are improving equally for all patients.
Purpose / Aim of Study: We aimed to identify patient characteristics associated with the chance of receiving the best quality of care and temporal trends in patient-related disparities in the quality of acute hip fracture care.
Materials and Methods: A Danish population-based cohort study among patients treated with hip fracture from 2007 through 2016 (N=56,376). A logistic model was used to identify patient-related characteristics that predicted the chance of receiving all recommended process performance measures in accordance with national clinical guideline for hip fracture care. Based on this model we identified the worst off patients (i.e., the 10% of the population with the lowest chance) and best off patients (i.e., the 10% of the patients with the highest chance). The patient-related characteristics included age, gender, fracture severity, comorbidity, immigration status, frailty, family income, level of education, labour market attachment, cohabitant status, and geographical residence. We examined the proportion of best off and worst off patients that received all recommended care according to calendar year and calculating absolute difference in percentage points.
Findings / Results: Throughout the 10-year period best off patients were more likely to be females, between 75 and 84 years, and living alone, whereas worst off patients were more likely to be males, aged 85 years or above, living together with a partner, to have high comorbidity, and a subtrochanteric fracture. The proportion of best off and worst off patients, which received high quality of care, increased throughout the period. However, the largest increase was seen among best off patients, thus the absolute difference increased from 12 percentage points in 2007 to 25 percentage points in 2016.
Conclusions: Throughout the 10-year period, quality of care increased for both best off and worst off patients treated for acute hip fracture. However, inequality increased concurrently as a larger increase in receiving the best quality of care were seen among best off patients than worst off patients.

Hospital and regional variation in the incidence of post-surgery infection among hip fracture patients. 97.

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Background: Post-surgery infections after hip fracture is one of the most serious and challenging complications - adversely affecting mortality, quality of life, and hospital costs. Hospital variation in 30 days mortality after hip fracture has not entirely been explained by patient characteristics, treatment or hospital level factors. We therefore, hypotheses that there is variation in post-surgery infections after hip fracture, which potentially could explain variation in mortality.

Purpose / Aim of Study: The aim of this study was to examine the variation in the incidence rates (IR) of post- surgery infections after hip fracture at hospital- and regional level in Denmark.

Materials and Methods: In this nationwide population-based cohort study we included all patients who underwent surgery for an incident hip fracture in the time period from 2012 to 2017 (n=31.304) using the Danish Multidisciplinary Hip Fracture Registry. Patients were followed 30 days from surgery date. Post-surgery infection was defined as any hospital- treated infection registered during hospital admission or outpatient clinic visit at a public or private hospital. Data on infections were collected from the Danish National Patient Register using International Classification of diseases codes. The IRs were calculated per 1000 person-days for hospitals (n=25) and regions (n=5).

Findings / Results: Overall the IR of post-surgery infection was 5.98 (95% confidence interval (CI), 5.82 – 6.16) per 1000 person-days. The IR for hospitals varied from 2.82 (95% CI, 1.86 - 4.28) per 1000 person-days to 16.44 (95% CI, 15.20 – 17.78) per 1000 person-days. The IR for regions varied from 4.88 (95% CI, 4.58 – 5.19) per 1000 person-days to 7.13 (95% CI, 6.68 – 7.59) per 1000 person-days. The incidence rate- ratio between the highest and lowest IR was 5.82 (95% CI, 3.81 – 9.36) for hospitals, whereas it was 1.46 (95% CI, 1.33 -1.60) for regions.

Conclusions: This study showed a substantial variation in the incidence of post-surgery infections following hip fracture between Danish hospitals and regions.

Effect of Teriparatide treatment on bone healing in insufficiency fractures of the pelvis: A systematic review

98.

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Background: The aging of our society is associated with an increasing number of fragility or insufficiency fractures of the pelvis. However, the current standard of care with bedrest and pain control is still a matter of debate. The instability in these fracture patterns seems often to require surgical stabilization, but patients' comorbidities significantly increase the risk of complications. Teriparatide (PTH) is a medical treatment option for osteoporosis and known to have a anabolic effect on bone.
Purpose / Aim of Study: Does treatment with PTH increase bone healing in insufficiency fractures of the pelvis compared to standard treatment?
Materials and Methods: To summarize the current status of PTH treatment for pelvic insufficiency fractures, we conducted a systematic review searching the databases PubMed, Embase and Cochrane. Patients who had sustained an insufficiency fracture of the pelvis was included. Intervention was medical treatment with PTH compared to standard treatment with bedrest af pain control. If a study included pathologic fractures or patients received PTH before the the time of the fracture it was excluded. Our primary outcome was fracture healing, secondary outcome measures comprised pain, mobility and patient reported outcome measures (PROM).
Findings / Results: After 299 articles were screened, 8 articles were included in the qualitative synthesis. However, only 3 studies were comparative including 1 randomized controlled trial. This was the only study scoring low using the Cochrane bias assessment tool. In total 131 patients were included, 59 patients received PTH and 74 patients did not. Besides one study age range from 73 to 84 years. All articles described a positive effect for PTH on fracture healing and pain. None reported on non-union, PROM or comparable mobility scoring. 2 studies were included in a meta-analysis: Fracture healing and reported pain were assessed after 8 weeks and were significantly improved in the group being treated with PTH ($p<0.01$).
Conclusions: The results of the systematic review indicate that there is a positive effect of PTH on healing and pain in patients with a insufficiency fracture of the pelvis, but further research is necessary.

Initial fracture displacement is the main risk factor for insufficient reposition in internal fixation of a displaced femoral neck fracture

99.

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Background: Insufficient reduction of a displaced femoral neck fracture (dFNF) has previously been demonstrated as a main risk factor for reoperation within 12 months.
Purpose / Aim of Study: To evaluate potential risk factors for insufficient reduction of dFNF.
Materials and Methods: 654 dFNF treated parallel implants with available pre- and postoperative x-rays were collected from the Danish Fracture Database. Data included age, gender, educational level of the surgeon (attending surgeon present vs no attending surgeon present) and whether the fracture was reduced open or closed. The X-rays were evaluated for initial fracture displacement and quality of reduction in accordance with the Garden classification and posterior tilt (PT), as well as bone quality measured as the Cortical Thickness Index (CTI). The fracture was considered sufficiently reduces if there was a maximum of 2 mm step-off in calcar, no varus and <10° PT. From the Dansk Anæstesi Database (DAD) data on height, weight and type of anesthesia (regional vs general) was collected. 244 cases were excluded from analysis due to missing data from DAD. Logistical regression was used to investigate risk factors for insufficient reduction.
Findings / Results: 410 cases with complete dataset were included. 243 (60%) were women and mean age was 68.3 years. 49 (12%) were Garden II with >20° PT, 173 (42%) were Garden III and 188 (46%) were Garden IV type fracture. In only 140 (34%) cases was the fracture sufficiently reduced. In a univariate analysis of the included variables, no single variable demonstrated any significant association with risk of insufficient reduction. In a multivariable analysis increased initial fracture displacement (Garden IV vs Garden II type fracture OR 2.3; CI 1.12-4.54) and decreasing BMI (<20 vs >25 OR 1.96; CI 1.04-3.73) were associated with increased odds for insufficient reduction. No association was seen for age, gender, type of anesthesia, educational level of the surgeon, CTI or method of reduction.
Conclusions: In the current setup the main risk factor for insufficient reduction seems to be the initial fracture displacement, with risk increasing with the severity of the displacement. This should be considered when choosing internal fixation as treatment of a dFNF.

Time consumption in the ED and cost-effectiveness analysis of the biomarker S100B versus CCT

100.

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Background: More than 90% of traumatic brain injuries (TBI) are classified as minor (mTBIs), defined by as GSC 14 or 15. Previously, cerebral CT- scans (CCT) have been considered the standard diagnostic, but the last decade CCT have become questionable since it is expensive and an increased risk of cancer has been proven. Serum 100 Beta Protein (S100B) is the most useful biomarker to select adult patients with low-risk mTBI for CT scans in the Emergency Department (ED).
Purpose / Aim of Study: 1.To compare the time spent in the ED for patients who are primarily evaluated with a CCT compared to those for whom their S100B level is used as a biomarker. 2.To investigate whether S100B as a tool for pre-CCT is cost-effective compared to CCT scan from a health care perspective.
Materials and Methods: Data from 94 patients presented to the ED at OUH between September 2018 and April 2019 were analyzed. Number of patients having a CCT (62), S100B (19), and S100B followed by a CCT (13) was registered. Patients were treated following national clinical guideline. The total time from primary examination by the ED doctor to final conclusion, based on S100B and/or CTC, was recorded. To summarize cost-effectiveness of S100B an Incremental Cost-Effectiveness Ratio (ICER) was calculated. A wilcoxon rank-sum test was used to calculate p-values.
Findings / Results: The patients who went directly to the CCT had a median total time spent in the ED of 109 minutes (CI: 96-123) compared to 124 minutes (CI: 107- 160, p=0.097) for patients who had S100B and 252 minutes (CI: 210-393, p=0.001) for those who first underwent an S100B and afterwards a CCT. The ICER of using S100B in the ED was in this study 11.1. For patients who only had S100B the ICER was -92.1 and for patients receiving both S100B and CCT the ICER was 2.4.
Conclusions: No statistically significant difference was found in time spent in the ED for patients having either a CCT or only a S100B. However, time spent was doubled when the patient needed a CCT following the S100B. The ICER of using the S100B analysis is -11.1 DKK saved for each additionel minute spent in the ED for patients who primarily had a S100B test. These findings suggest that S100B is a cost- effective analysis.

Poor adherence to standardized treatment protocols in hip fracture treatment

101.

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Background: Best treatment practices for hip fracture patients have been thoroughly investigated, and most institutions have integrated an evidence-based treatment protocol. However, it seems, that common practice often defies evidence due to patient characteristics or departmental constraints.
Purpose / Aim of Study: to investigate the degree of adherence to our protocol for hip fractures based on seven indicators, with a goal of 80% adherence.
Materials and Methods: Prospective data on all patients with a hip fracture admitted to our institution from January 1 2011 to December 31 2017, were collected in the Holstebro Hip Fracture Database (HHFD) (n=3050). The following seven treatment indicators, mirroring the different procedural steps and diverse care groups were investigated: 1) Pre-operative regional block 2) Surgical delay 3) Peri-operative antibiotics 4) Osteosynthesis 5) Thromboprophylaxis 6) Postoperative mobilization 7) Blood transfusions Data was obtained from the HHFD and patient records. Descriptive statistics as proportions with 95% confidence intervals were used. Degree of adherence was clarified by an all-or-none test.
Findings / Results: Preliminary results for 500 consecutive patients showed indicator 2, 3, 4 and 6 met our 80% goal. However, the all-or-none test showed a mean fulfillment for all seven indicators for only 15.7%(12.8-19.3%) of patients. Corrected for contraindications the all-or-none test showed a mean 29.9%(25.3-35%) adherence.
Conclusions: In our small and dedicated hip fracture unit, with great focus on best-treatment practice, the 80% goal were only met in less than one third of patients. This may not necessarily reflect suboptimal treatment, as the major problem may be, that patient characteristics does not always allow for standardized treatment in this heterogeneous patient group. Further research on more individualized treatment protocols may be needed.

Complications after initial external fixation of unstable ankle fractures before final surgery

102.

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Background: External fixation (ExFix) of unstable ankle fractures prior to final open reduction and internal fixation (ORIF) is the treatment of choice, when primary ORIF is deemed unsafe, often due to severe swelling or soft tissue damage. Complications after final ORIF will also be examined

Purpose / Aim of Study: To determine the average time (in hours), from ExFix to final ORIF in staged procedures, and the rate of loss of reduction before final ORIF, requiring either adjustment or renewal of the ExFix in the operating room (OR)

Materials and Methods: Surgical records of adult patients undergoing ankle fracture ORIF at single Level III trauma center serving 540.000 people, from 1st of June 2011 to 1st of January 2018, were reviewed. ExFix procedures were identified and radiographs and patient records were analyzed individually by two of the authors, with a minimum 1,5 year follow up. Time of injury was defined as the time of primary radiograph and the timestamp of ExFix and final ORIF was extracted from surgical logs

Findings / Results: 1102 patients were reviewed. 45 were treated with initial ExFix as primary ORIF was deemed unsafe. 38 patients subsequently underwent final ORIF and 7 patients kept the ExFix as final treatment. Initial ExFix was performed within an average of 27,2 hours CI (15.8 - 38.6), from time of injury. The mean time to surgery was 10 days CI (7,5 – 12,5), resulting in a total average delay until final ORIF of 11 days CI (8,6 – 13,6). 19 patients (42%) had open fractures and 26 (58%) closed injuries, requiring ExFix due to swelling or soft tissue damage. After initial ExFix, four patients (11%) suffered loss of reduction before final ORIF, requiring adjustment or renewal of the ExFix in the OR. After final ORIF, complications were seen in 16 cases (35,6%), seven of which (18,4%) were failures of the final ORIF requiring reoperation

Conclusions: Staged procedures prolonged immobilization and hospitalization. In our cohort one in ten patients suffered loss of reduction before final ORIF. Failure and severe complication rates after final ORIF remained high, in this high risk group of patients. Minimally invasive, definitive salvage procedures could be considered as an alternative to initial ExFix, when primary ORIF is deemed unsafe

Improved healing of diabetic foot ulcers after high-dose vitamin D: a randomized double-blinded clinical trial

103.

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Background: Chronic foot ulcers are a major cause of morbidity in diabetics with a life-time risk of chronic ulcers on the lower extremities of 25 %. Treatment is challenging and estimated 14 % have chronic leg ulcers for more than 10 years. Vitamin D deficiency is seen more commonly in diabetic patients with chronic foot ulcers, compared to non-diabetics as well as diabetics without foot ulcer.
Purpose / Aim of Study: To assess the efficacy of high-dose compared to low-dose Cholecalciferol vitamin D3 on healing of chronic diabetic foot ulcers.
Materials and Methods: We included diabetic patients with one or more ulcers of the foot for more than 6 weeks. Patients were randomly allocated to either a daily oral intake of high-dose (170 µg) or low-dose (20 µg) Cholecalciferol vitamin D3. Patients were seen in the outpatient clinic after 4, 12, 24, 36 and 48 weeks. At each visit, the ulcer was measured with a validated camera and the area (cm2) was calculated. Patients and assessors were blinded to treatment allocation. All patients were followed for 48 weeks or until wound healing or surgical treatment.
Findings / Results: 64 ulcers in 48 patients (24 in each group) were included in the analysis. 41 ulcers were followed until healing or 48-week follow-up and 20 ulcers were surgically treated during the study period. Three patients were lost to follow-up. The intention-to-treat analysis showed a significantly higher rate of ulcer healing in the high-dose group with 21/30 (70%) compared to 12/34 (35%) healed ulcers in the low-dose group ($p = 0.012$). Median ulcer reduction at final follow-up was 100% [IQR: 72 to 100] compared to 57% [IQR: -28 to 100.0]. Furthermore, we found a significant effect of high- dose Cholecalciferol vitamin D3 in the repeated measures analysis of variance using square-root- transformed ulcer area as dependent variable ($p = 0.014$).
Conclusions: High-dose Cholecalciferol vitamin D3 is efficient, compared to low-dose Cholecalciferol vitamin D3, in promoting wound healing in diabetic foot ulcers.

Vitamin E diffused THA liners show no less head penetration after 5 years postoperatively compared to HXLPE in a randomized controlled trial

104.

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Background: The most frequent indication for total hip arthroplasty (THA) revision surgery is aseptic loosening. Aseptic loosening is associated with increased wear of polyethylene liners, but wear may be reduced by using liners oxidatively stabilised with vitamin E.
Purpose / Aim of Study: Primary: To compare proximal femoral head penetration into the liner between a) vitamin E diffused highly cross-linked polyethylene (vE-PE) THA liners and conventional highly cross-linked polyethylene (XLPE) liners and b) 32 mm and 36 mm femoral heads. Secondary: To compare proximal cup migration between a) vE-PE and XLPE liners and b) 32 mm and 36 mm femoral heads. Exploratory: To compare patient-reported outcomes measures (PROMs) between 32 mm and 36 mm femoral heads.
Materials and Methods: Patients scheduled for a THA were randomised to receive vE-PE or XLPE liner with a CoCr femoral head size of 32 or 36 mm (4 intervention groups in a 2×2 factorial design). Head penetration and cup migration were measured using radiostereometric analysis (RSA) at baseline, 3, 12, 24, and 60 months postoperatively. PROMs (EQ-5D, SF-36, Harris Hip Score, and UCLA Activity Score) were assessed at baseline, 3, 12, 36, and 60 months. All outcome measures were analysed using linear mixed effects analysis.
Findings / Results: Of the 220 screened patients, 126 were included in this study, 117 received the allocated intervention, and 94 had their results analysed at five years. Head penetration was similar between liner materials and head sizes at five years, vE-PE versus XLPE was -0.084 mm (95% CI: [-0.173; 0.004], p = 0.06), and 32 mm versus 36 mm was -0.025 mm (95% CI: [-0.114; 0.065], p = 0.58), respectively. Cup migration was similar between liner and head sized at five years, vE-PE versus XLPE was 0.059 mm (95% CI: [-0.262; 0.380], p = 0.72), and 32 mm minus 36 mm was 0.042 mm (95% CI: [-0.283; 0.367], p = 0.80). No differences were found in any of the patient-reported outcome measures. None of the patients received revision surgery during the trial.
Conclusions: No difference in head penetration was found from baseline to five years between vE-PE and XLPE liners, or between 32 mm and 36 mm heads.

Hospital differences in mortality rates after hip fracture surgery in Denmark

105.

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Background: Thirty-day mortality after hip fracture is widely used when ranking hospital performance, but the reliability of such hospital ranking is seldom calculated.
Purpose / Aim of Study: We aimed to quantify the variation in 30- day mortality across hospitals and to determine the hospital general contextual effect for understanding patient differences in 30-day mortality risk.
Materials and Methods: Patients aged ¡Ÿ65 years with an incident hip fracture registered in the Danish Multidisciplinary Fracture Registry between 2007 and 2016 were identified (n= 60,004). We estimated unadjusted and patient-mix adjusted risk of 30-day mortality in 32 hospitals. We performed multilevel analysis of individual heterogeneity and discriminatory accuracy with patients nested within hospitals. We expressed the hospital general contextual effect by the Median Odds Ratio, the area under the receiver operating characteristics curve and the variance partition coefficient.
Findings / Results: The overall 30-day mortality rate was 10%. Patient characteristics including high sociodemographic risk score, underweight, comorbidity, a subtrochanteric fracture and living at a nursing home were strong predictors of 30-day mortality (area under the curve= 0.728). The adjusted differences between hospital averages in 30-day mortality varied from 5% to 9% across the 32 hospitals, which correspond to a median odds ratio of 1.18 (95% CI: 1.12-1.25). However, the hospital general context effect was low, as the variance partition coefficient was below 1% and adding the hospital level to a single-level model with adjustment for patient-mix increased the area under the receiver operating characteristics curve by only 0.004 units.
Conclusions: Only minor hospital differences were found in 30-day mortality after hip fracture. Mortality after hip fracture needs to be lowered in Denmark but possible interventions should be patient oriented and universal rather than focused on specific hospitals.

Intermittent Systemic Hypoxic Therapy as Adjuvant Treatment in Rotator Cuff Reinsertion in Rats

106.

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Background: Hypoxia affects the transcription of genes that control and regulate multiple cellular functions including initiation of angiogenesis and cell proliferation; a prerequisite tissue regeneration. Rotator Cuff injury is a common orthopaedic issue, often with an unfavourable outcome.
Purpose / Aim of Study: We hypothesize that treatment with systemic intermittent hypoxic therapy (SIHT) leads to an adaptive systemic response that will accelerate and improve bone-tendon regeneration. In an efficacy study we aim to evaluate the morphological outcome after use of SIHT as adjuvant treatment in surgical rotator cuff repair in rats.
Materials and Methods: Sixty-six 17-week old male Sprague Dawley rats were randomly divided into a two SIHT groups and a control group. The SIHT groups were exposed to systemic hypoxia (13.5% oxygen) for 1 hour in 12 hours intervals for 2 weeks in a closed oxygen- controlled chamber 14 days preoperative (SIHT14) or 7 days before and after surgery (SIHT7/7). The control group received ambient air. All rats received unilateral supraspinatus reinsertion after surgical release. The rats were euthanized after 2 and 4 weeks and evaluated with histology. Collagen fibre isotropy in the supraspinatus tendon was used as surrogate marker of tendon function and success of surgical repair The Student's t-test was used to investigate difference between groups.
Findings / Results: A significant improvement in collagen fiber isotropy was observed in the SIHT7/7 (61.6%, SD=8.472) and the SIHT14 (62.7%, SD=8.947) groups 14 days postoperatively compared with controls (51.5%, SD=7.264) ($p=0.0085$ and $p=0.0104$, respectively). Twenty-eight days postoperative there were no significant differences between groups.
Conclusions: Systemic intermittent hypoxia therapy seems accelerate tendon-bone regeneration, but did not affect the long- term morphological outcome. SIHT has potential be a be an integrated perioperative treatment, but more investigations are needed.

Two-year results of trapeziometacarpal joint arthroplasty with the Moovis cup

107.

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Background: Early aseptic loosening of total trapeziometacarpal (TMC) joint arthroplasty is a major problem and may be related to implant design. A new generation dual mobility cementless conical cup design has shown promising short-term results.
Purpose / Aim of Study: To evaluate the 2-year results of the Moovis cup/ Elektra stem for treatment of TMC osteoarthritis.
Materials and Methods: A consecutive cohort of the first 200 hands (97 right side) in 174 patients (37 men) operated with cementless Moovis cup/Electra stem at mean age 59 years (range 43-80) was followed for 2 years. There were 26 bilateral cases. We evaluated the preoperative Quick DASH (QDASH), grip strength and pain at rest and in activity measured on Numeric Rating Scale (NRS;0-10) for the first operated hand and report the 1 and 2-year improvement. Radiographs and complications were evaluated for all implants.
Findings / Results: Preoperative QDASH was mean 48 (median 48, IQR 33-61) and the improvement in QDASH score was mean 32 (SD 20) at both 1-year and 2 years($p<0.00$). Preoperative grip strength was mean 21kg (median 20, IQR 13-27) in the operated hand. The improvement in grip strength was mean 6kg (SD 10) at 1 year and mean 8kg (SD 10) after 2 years($p<0.00$). The preoperative pain score at rest (NRS) was mean 4 (SD 2.4), which improved to mean 0.8 (SD 1.7) at 1 year and mean 0.7 (SD 1.5) after 2 years ($p<0.00$). In activity, the preoperative pain score (NRS) was mean 8 (SD 1.7), which improved to 2.9 (SD 3.0) at 1-year and 2.6 (SD 3.1) at 2-years. Six hands (3%) with an intraoperative trapezium fracture were converted to a primary cemented cup($n=2$) or trapeziectomy (primary or within 6 weeks) ($n=4$). Fourteen implants (7%) had secondary surgery without cup/stem revision, including three implants (1.5%) reoperated due to polyethylene wear. Except for one cup, all implants were well fixed based on visual judgement of radiographs at 2-years followup.
Conclusions: In this large cohort of TMC joint arthroplasty with Moovis cup and 2-year followup, the patients had clinically relevant and statistical significant improvement of subjective and objective outcomes. Early implant failure and implant revision were rare. The reoperation rate was relatively high, but primarily due to minor issues.

Degenerative changes on adjacent segments levels (ASD) with and without interbody fusion – 10 year MRI follow up on a RCT. 108.

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Background: Due to the high number of spinal procedures, performed worldwide adjacent degenerative disease (ASD) has become a new challenge. Whether ASD is a matter of normal degenerative development in the disc over time or a result of increased stiffness and stress, is still debated. TLIF is the most widely used interbody method. Interbody fusion is thought to reduce the degenerative changes in the free disc due to better sagittal balance and restoration of lumbar lordosis.
Purpose / Aim of Study: Comparison of degenerative MR findings in a RCT, 10 years after surgery.
Materials and Methods: 100 pat. included in a prospective RCT between interbody fusion (TLIF) and Instrumented posterolateral fusion (PLF) was offered a MRI at long-term follow up. MRIs were classified according to Modic, Pfirrmanns, Schizas, Fardon and Milette in order to estimate degeneration of the discs above and below fusion. Grading was done by two independent observers without any contact to the patient. In patients who underwent secondary surgery, the MR prior to that was used.
Findings / Results: 79 pat. were available for MR. The groups were equal regarding sex, age, diagnosis and number of operated levels. The follow up length was 9.6 years. The Modic change found at the first upper disc was none in (85% TLIF/68% PLF), if present mostly grade 2 Modic change (12%TLIF/26%PLF) was found. There were no significant difference between the two groups p=0.274. Most patients did not show any sign of treatment needs regarding spinal stenosis according to Schizas A&B, 92% (TLIF)/92% (PLF) only 8 % (TLIF)/8% (PLF) had type C and D at first upper level. No difference between groups could be detected p = 0.930. Pfirrmann grading at the first proximal level was type 1: 0%(TLIF)/0%(PLF), type 2: 17%(TLIF)/16% (PLF), type 3: 54%(TLIF)/43% (PLF), type 4: 27%(TLIF)/35%(PLF), type 5: 2%(TLIF)/5% (PLF). No difference between groups p = 0.952. Degenerative disc protrusion posterior according to Fardon and Milette was none: 61%(TLIF)/63%(PLF), and bulge: 39% (TLIF)/32%(PLF),protusion:0%(TLIF)/5% (PLF), extrusion 0%(TLIF)/0%(PLF), p= =0.289.
Conclusions: In a RCT, the use of interbody fusion (TLIF), do not reduce degenerative changes (ASD) in MRI, in the upper or lower disc next to the fusion.

True frequency and risk factors for hip dislocation within two years after primary total hip arthroplasty (THA) – a Danish nationwide population-based study

109.

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Background: Hip dislocation is one of the leading indications for revision hip surgery and the term 'Revision due to dislocation' is often how this complication is measured. The true occurrence of hip dislocation can be difficult to establish as closed reductions may not be captured in available registers.
Purpose / Aim of Study: The purpose of this study was to identify the true frequency of hip dislocation after primary THA and secondary to find risk factors for dislocation.
Materials and Methods: From the Danish Hip Arthroplasty Registry, we extracted 31.762 primary THAs inserted from 2010-2014 due to osteoarthritis with two years follow-up. Dislocations were identified through extraction from the Danish National Patient Registry. Matching diagnosis and procedure codes were deemed correct while non-matching codes were reviewed through a comprehensive, nationwide review of patient files. Risk factors were analyzed by logistic regression adjusting for age, sex, comorbidity (ASA- score), body mass index (BMI), head size, fixation and surgical approach. Results are presented as odds ratios (OR) with 95% confidence intervals.
Findings / Results: We identified 1890 dislocations in 1094 THAs which corresponds to a dislocation frequency of 3.4% (3.2-3.7) This is a 50% increase compared to the registry-captured frequency of 2.3% (2.1-2.5). Age<65 had lower risk (OR=0.71 (0.60-0.84) and age>75 higher risk of dislocation (OR=1.32 (1.14- 1.53) compared to age=65-74. ASA-score of 1 were associated with reduced risk (OR=0.69 (0.56-0.87)) and ASA-score of 3 with increased risk (OR=1.67 (1.35-2.06)) compared to ASA-2 Male gender (OR=0.85 (0.75-0.97)), cemented fixation (OR=0.70 (0.57-0.86)) and lateral approach (OR=0.30 (0.17-0.52)) were all associated with lower risk. Head size of 32mm (OR=1.26 (1.09- 1.45)) and 40mm (OR=1.56 (1.13-2.14)) had higher risk of dislocation than 36mm heads, while dual mobility cups had reduced risk (OR=0.13 (0.05-0.35)).
Conclusions: We report the true frequency of dislocations within two years after primary THA in Denmark between 2010-14 to be 3.4%, and while most literature report the risk factors for 'Revision due do dislocation', we are able to present several risk factors for all patients with hip dislocation and not only the revised.

1-year Evaluation of the uncemented Echo Bi-Metric THA stem versus the uncemented Bi-Metric Porous Primary THA stem in a randomized controlled trial using RSA

110.

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Background: Generally, the primary total hip arthroplasty (THA) is a successful procedure with good clinical outcome. New implants are continuously developed, enhancing what is and has been, taking advantage of current knowledge and technology. One of these technologies is Radiosteriometric Analysis (RSA) which is used to predict implants at risk of later aseptic loosening. As the population grows older, an increasing number of people will be having THA done at some point in their life. In the period 1995-2011 a total of 17,791 THA revisions were performed in Denmark alone (5.8 mio. inhabitants).
Purpose / Aim of Study: The Bi-Metric THA stem had been developed into the Echo Bi-Metric THA stem and we wanted to know: how did they compare with regards to the migration patterns measured by RSA?
Materials and Methods: In the period February 2015 to September 2017 we enrolled and randomized 62 patients (mean age=64(49-74) years, F/M=28/34) who were planned for an uncemented THA at Herlev Gentofte Hospital (the Gentofte department) to receive either an Echo Bi-Metric® Full Proximal Profile THA stem or a Bi-Metric® Porous Primary THA stem from Zimmer Biomet. We performed radiosteriometric analysis (RSA) with model-based technique postoperatively, at 3, 6 and 12 months with measurement of rotation around and translation down all three axes (x, y, and z). Statistics: Mann-Whitney U test.
Findings / Results: Before 3 months follow-up two patients were reoperated (one due to periprosthetic fracture, one stem did not fit well and rotated in the femur). We found the early migration (mean) at 3, 6 and 12 months with regards to subsidence (i.e. y-translation) to be -1,13mm, -0,96mm and -1,03mm for the BiMetric and -1,51mm, -1,47mm and -1,44mm for the Echo BiMetric (p-value at 3, 6 and 13 months = 0.53; 0.33; 0.98). Measuring anteversion and retroversion (i.e. y-rotation) we found a mean rotation at 3, 6 and 12 months to be 2.11, 2.17 and 1.91 degrees for the BiMetric and 1.71, 2.15 and 2.01 degrees for the Echo BiMetric (p-value at 3, 6 and 13 months = 0.55; 0.63; 0.97).
Conclusions: Both stems showed stabilization at 3 months leading to the conclusion that we consider both of them to be performing well with regards to the early micromotion.

111.

Incidence and risk factors for venous thromboembolism despite ongoing thromboprophylaxis after fast-track hip and knee arthroplasty – a prospective multicenter cohort study of 34,397 procedures

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Background: Venous thromboembolism (VTE) is a serious complication to total hip and knee arthroplasty (THA/TKA). However, recent publications found low 90-days incidences of VTE with in-hospital only thromboprophylaxis after fast-track THA and TKA, but with a subgroup with VTE despite thromboprophylaxis
Purpose / Aim of Study: To provide a detailed investigation on the incidence and risk of VTE despite ongoing thromboprophylaxis after fast-track THA and TKA.
Materials and Methods: We used a prospective multicenter cohort from Jan 2010–Aug 2017. Prospective collection of preoperative comorbidity and demographics from the Lundbeck Foundation Centre for Fast-track Hip and Knee replacement database (www.FTHK.dk). Length of stay (LOS) and complete 90-days follow- up was obtained from the Danish National Patient Registry and review of medical records. Patients with preoperative use of potent anticoagulants were excluded.
Findings / Results: Of 34,397 procedures 32 (0.09%, 22.4% of all VTE) patients had VTE despite ongoing thromboprophylaxis. Median time to VTE was 2 days [IQR; 2-4]. 29 (2.1%) occurred in patients with LOS > 5 days and 3 during primary admission but with LOS ≤ 5 days. 78% of VTE's occurred without any identifiable pre-VTE complication. Risk-factor analysis found age 81-85 years OR 6.3 (95% CI; 1.8-22.4, p =0.005), BMI < 18.5 OR 11.1 (1.1-109.2, p=0.040), BMI 35-40 OR 5.1 (1.0-26.2, p=0.050) and BMI ≥ 40 OR 21.8 (4.6-103.6, p<0.001) as statistically significant.
Conclusions: VTE after fast-track THA/TKA occurred in 0.09% (22% of all VTE) despite ongoing thromboprophylaxis. Further investigation of this "high risk" population might help to improve the optimal choice for patient-specific thromboprophylaxis to further reduce incidence of postoperative VTE.

Improvements in fast-track primary hip and knee arthroplasty – a prospective multicentre cohort study of 36,935 procedures from 2010-2017

112.

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Background: Implementation of "enhanced recovery" or "fast- track" protocols has improved perioperative surgical care leading to a reduction in length of hospital stay (LOS) and postoperative complications within a variety of surgical procedures including total hip (THA) and knee arthroplasty (TKA). However, the effects of a continuous use and refinement of enhanced recovery protocols on postoperative morbidity and LOS have not been evaluated.
Purpose / Aim of Study: To investigate time-related changes in LOS, risk of LOS > 4 days, readmissions and mortality after fast- track THA and TKA within a prospective multicenter collaboration focusing on the continuous refinement of perioperative care.
Materials and Methods: Prospective multicentre cohort study in fast-track THA and TKA from Jan 2010 to Aug 2017 from 9 high-volume orthopaedic centres with established fast-track protocols (www.FTHK.dk). Prospective collection of comorbidities and complete 90-day follow-up from The Danish National Patient Registry and medical records. Primary outcomes were time-related changes in LOS, fraction of procedures with a LOS >4 days, 30-, and 90-days readmissions. Secondary outcomes were analyses of specific types of morbidity and 90-days mortality.
Findings / Results: Of 36,935 included procedures median age was 69 [IQR: 62-75] years and 58% women. LOS was median 3 [2–3] days in 2010 declining to 1 [1-2] days in 2017. The fraction with LOS > 4 days declined from 9.7% to 4.6% due to a decline in both "medical" complications (4.4% to 2.7%), "surgical" complications (1.5% to 0.6%), and no recorded morbidity (3.8% to 1.3%). 30- and 90-days readmission rates declined from 6.1% and 8.6% in 2010 to 5.3% and 7.7% in 2017, respectively. There was a slight increase in "surgical" complications leading to readmission ≤ 90 days from 2.9% to 3.8%, mainly due to more wound complications. All- cause 90-days mortality was unchanged at 0.3%.
Conclusions: Within a multicenter collaboration focusing on further refinements of similar well-established fast-track protocols for THA and TKA, there was a continued reduction of LOS and morbidity within a 7 year time- period

Correlation between THA templating and recovery of function & quality of life in individuals with an Exeter-stem

113.

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Background: Templating is considered a very important part of preoperative planning for a Total Hip Arthroplasty (THA). Besides discovering needs for very small or large components, which could affect department logistics, templating also provides the possibility of better treatment. Restoration of the anatomical femoral off-set (FOS), has proved important for the recovery of function, abductor strength and quality of life.
Purpose / Aim of Study: This study seeks to investigate whether patients show greater improvement (measured by OHS and EQ5D-3L) if the planned off-set is achieved, compared to patients, whose planned off-set isn't obtained.
Materials and Methods: The global femoral off-set was measured in pre- and post-surgery x-rays and compared to the patients' OHS and EQ5D-3L before surgery, 6 and 12 months post-surgery. The planned stem Off-Set was also compared to the used. The sample (141) was split into two sub-samples: Plan fulfilled (66) & Plan not-fulfilled (75). The margin for fulfilment of the plan was a post-surgery FOS within 10 mm of the templated plan. SPSS was used to investigate the descriptive statistics and run two-sample t-tests.
Findings / Results: The ÄOHS-mean 0-6 months & 0-12 months for the Plan fulfilled-group were respectively 43,0 & 45,1; while the ÄOHS-mean 0-6 months & 0-12 months for the Plan not-fulfilled-group were 34,7 & 41,0. The ÄEQ-5D-3L- mean 0-6 months & 0-12 months for the Plan fulfilled group were 0,27 & 0,34; while the ÄEQ-5D-3L-mean 0-6 months & 0-12 months for the Plan not- fulfilled-group were 0,21 & 0,23. In spite of this, the t-tests did not show statistical significance, except for the Plan not-fulfilled-group's mean in ÄEQ- 5D-3L 0-12 months. Therefore, no correlation could be proven; probably due to the small sample size.
Conclusions: The results of the descriptive statistics and two-sample t-tests showed a clear tendency towards the Plan fulfilled- group having a better recovery of function and quality of life after 6 and 12 months than the Plan not-fulfilled group. However, this must be investigated with a bigger sample size for a general conclusion to be made.

Gender, age, and diagnosis specific time trends of primary total hip arthroplasty in patients between 20-49 years - A study from the Nordic Arthroplasty Register Association (NARA) database

114.

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Background: The numbers of primary total hip arthroplasty (THA) have been increasing during recent years, but no detailed analysis on trends of the numbers of THA in patients younger than 50 years exists. This is important for evaluation of change in practice.
Purpose / Aim of Study: We aimed to investigate time trends in rates of gender, age, and diagnosis of primary THA in patients between 20-49 years in a population-based study from the Nordic Arthroplasty Registry Association (NARA).
Materials and Methods: From the NARA database we identified all primary THAs operated from January 1, 1995 to December 31, 2016 in patients aged 20-49 years (n=41,861). 5 time periods were defined: 1995-1999 (Period 1), 2000-2004 (Period 2), 2005-2009 (Period 3), 2010-2014 (Period 4), and 2015- 2016 (Period 5). These periods were used to describe time trends for gender, age and diagnoses. Proportions of total numbers within a given time period were calculated.
Findings / Results: 7,051 THAs (17%) were implanted in Period 1; 8,039 (19%) in Period 2; 10,343 (25%) in Period 3; 11,534 (27%) in Period 4; and 4,894 (12%) in Period 5, which was only 2 years. Gender: The proportion of males increased from 47% in Period 1, to 50% in Period 2, and 54-55% in Periods 3-5. Age: For the age groups 20-29 years and 30-39 years, the proportion of patients within each time period decreased throughout Periods 1-5 from 7% to 6% and 22% to 15%, respectively. However, patients aged 40-49 years increased from 71% in Period 1 to 79% in Period 5. The trends for age were similar for both men and women. Diagnosis: The proportion of OA was increasing throughout the Periods from 22% in Period 1 to 56% in Period 5. In contrast, the proportion of inflammatory disorders was decreasing from 17% in Period 1 to 3% in Period 5. Other diagnosis groups remained approximately constant throughout the different Periods.
Conclusions: We found an increasing numbers of patients aged between 20-49 years receiving a THA, especially for patients between 40 and 49 years. We do not believe that this increase is explained by increase in OA incidence but rather by change in practice. The study is important for the discussion on change in practice and the best treatment of the younger age groups in the future.

Comparison of Patient Self-Reported and Surgeon Assessed Harris Hip Scorein Femoral Neck Patients with Total Hip Arthroplasty

115.

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Background: Traditionally, outcomes following total hip arthroplasty(THA) in terms of Harris Hip Score (HHS) have been assessed by the surgeon. However, for an unbiased evaluation of effect after surgical interventions self-reported patient data are important. In patients treated for hip osteoarthritis with a THA, the HHS has excellent correlation between patient-self-reported data and surgeon-assessed data. It is unknown if these results are applicable to other patient groups receiving THA.
Purpose / Aim of Study: To investigate the correlation of patient-self-reported data compared with surgeon-assessed data in femoral neck fracture (FNF) patients treated with THA.
Materials and Methods: In a prospective cohort follow-up study we evaluated 124 FNF patients operated with dual mobility THA. At mean follow-up of 2.8 (range 1.0–7.7) years after surgery, participants were asked to complete a patient self-reported HHS (PR-HHS). On the same day surgeon completed the standard HHS too (surgeon-assessed HHS (SA-HHS). 8 participants missed completion of either the SA-HHS or the PR-HHS. The PR-HHS was rescaled to 100 for comparison of results (Mahomed et al, 2001). We tested differences between groups using a paired t-test. Correlation was assessed by Pearson's correlation coefficient. Categorical variables were tested using Kappa's coefficient.
Findings / Results: Patient age at the time of surgery was mean 74.8 (range 30–92) years.The rescaled mean PR-HHS value was 74.3 (SD 18.6) and significantly different from the mean SA-HHS value of 79.9 (SD 15.4), ($p<0.001$). The correlation between PR-HHS and SA-HHS was statistically significant and strong $rp = 0.74$ ($p>0.001$). The Kappa coefficient for HHS sub- variables indicated fair to moderate agreement: Pain (0.41), Support(0.67), Limp(0.37), Distance Walked(0.45), Stair Climbing(0.34), Shoes and Socks(0.55), and Sitting(0.28).
Conclusions: We found a strong correlation and a fair to moderate agreement between PR-HHS and SA-HHS at a minimum 1 year after THA in FNF patients, which is poorer than reported for patients treated with for hip osteoarthritis. Further studies are needed to explore the correlations between patient reported function and objective measures of e.g. walking distance in this patient group.

Patient Acceptable Symptom State for the Oxford Hip Score and Forgotten Joint Score Following Total Hip Arthroplasty

116.

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Background: Patient-reported outcome measures (PROMs) evaluate symptoms following total hip arthroplasty (THA). A previous study suggested that one PROM, the Forgotten Joint Score (FJS), may better differentiate outcomes of patients performing well following surgery, compared to the Oxford Hip Score (OHS). The patient acceptable symptom state (PASS) is the threshold on a PROM that reflects a satisfactory symptom state.
Purpose / Aim of Study: This study aimed to define PASS values for the OHS and FJS at 3 months, 1 year, and 2 years after primary THA.
Materials and Methods: Patients undergoing primary THA from an academic medical center's registry completed the OHS, FJS, and a satisfaction anchor question at 3 months (N=230, mean age 68, 61% female), 1 year (N=180, mean age 68, 62% female), or 2 years (N=187, mean age 67, 63% female) after surgery. Spearman's correlation coefficients (rho) were determined between the OHS and FJS and the anchor question. PASS thresholds were derived with Received Operating Characteristics analyses with the 80% specificity rule, and 95% confidence intervals were calculated using 1000 non- parametric bootstrap replications.
Findings / Results: OHS ($p<0.001$) and FJS ($p<0.001$) values as well as the proportion of patients reporting a satisfactory state ($p=0.002$) increased between 3 months and 1 year. No such differences were observed between the 1- and 2-year cohorts ($p>0.529$). Spearman's rho between the PROMs and the transition item were 0.47, 0.50, and 0.45 for the OHS, and 0.51, 0.53, and 0.56 for the FJS at 3-month, 1-year, and 2-year, respectively. At 3 months, 1 year, and 2 years, PASS thresholds (95% CI) were 33.5 (30.8-36.0), 39.5 (35.9-43.5), and 38.5 (34.5-42.0) for the OHS and 59.2 (54.3- 63.7), 67.7 (61.2-74.9), and 69.1 (61.9-75.4) for the FJS, respectively. From 3 months to 1 year, PASS thresholds for both the OHS and FJS increased significantly ($p<0.005$). Between 1 and 2 years, no significant change in PASS threshold was observed ($p>0.223$).
Conclusions: OHS and FJS PASS thresholds increased between 3-month and 1-year intervals, but not between 1- and 2-year intervals. These values will help interpret PROMs following THA, serving as clinically significant benchmarks and as patient-centered outcomes for research.

Effectiveness of supervised resistance training for patients with hip osteoarthritis on patient-reported function, hip-related pain, health-related quality of life and performance-based function; a systematic review and meta-analysis

117.

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Background: The effectiveness of supervised progressive resistance training among patients with hip osteoarthritis is only scarcely investigated.
Purpose / Aim of Study: To estimate the effectiveness of supervised resistance training compared to usual treatment (without resistance training), for people with hip osteoarthritis at end of treatment on patient-reported function, pain, health-related quality of life, performance-based function, and on patient- reported function at 6-12 months.
Materials and Methods: Systematic review and meta-analysis. A systematic search was performed 16th January 2019 in eight electronic databases (Medline, Embase, Cochrane, Pedro, AMED, Scopus, SPORTDiscus and Cinahl) and other resources. The methodology of the included studies and the overall quality of evidence was assessed by two authors independently using the Cochrane Risk of Bias tool and the Grading of Recommendations Assessment, Development and Evaluation.
Findings / Results: Three studies were included with a total of 189 participants. A significant difference in favour of the supervised progressive resistance groups was found in patient-reported function (SMD 0.55 [95% CI 0.26 to 0.84]), hip-related pain (weighted MD 8.16 [95% CI 3.19 to 13.12]) and health-related quality of life (weighted MD 6.80 [95% CI 1.96 to 11.63]) at end of treatment. The overall quality of evidence was downgraded to low due to lack of blinding in the included studies and imprecision in one study due to low number of participants.
Conclusions: Supervised progressive resistance training is effective in improving patient-reported function, hip- related pain and health-related quality of life for patients with hip osteoarthritis compared to usual treatment (without resistance training). The level of evidence is low and thus future studies may change the results.

Outcomes of open Gluteus medius repair with one-year follow-up - our initial experience. 118.

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Background: Awareness of Gluteus medius (GM) and/or minimus tendon tears as the cause of lateral hip pain has been growing over the past two decades. It is estimated that Gluteus medius tears may may be present in as many as 25% of late late middle-aged women and 10% of middle middle-aged men. Tears that impart significant significant functional impairment to patients and may be a source of debilitating debilitating and chronic lateral hip pain. Unfortunately Unfortunately, these tears are often misdiagnosed misdiagnosed and, thus, treated insufficiently insufficiently.
Purpose / Aim of Study: To report 1-Year outcomes of our initial 12 cases of open surgical repair of Gluteus medius tears.
Materials and Methods: Data were prospectively collected between between September 2017 and June 2019. Inclusion criteria for the study were were patients undergoing open GM repair repair who had completed a one-year follow follow-up. MRI was used to visualize the GM tears. Assessment of the patients was done pre-operatively (baseline) and at 1 year follow-up. At these these time points, pain at rest, during activity activity and worst pain was recorded, a 30 sec sit to stand test (STT) and patient reported outcome measures (Copenhagen hip and groin score (HAGOS) and Oxford Hip score (OHS)) were completed.
Findings / Results: The cohort included 12 patients (11 women women) with a mean age of 53 years (range 16-71). From baseline to one-year year follow-up, pain at rest, during activity activity and worst pain (expressed as NRS) decreased from 2.1 to 0.7 (p=0.15), 6.3 to 3.6 (p=0.04) and 8.8 to 6.4 (p=0.04), respectively. The 30 sec SST improved from 11.5 to 14.8 (p=0.06). All HAGOS sub scores and OHS improved significantly (HAGOS; pain pain: 33 to 65 (p=0.001), Symptom: 43 to 74 (p>0.001), ADL: 34 to 64 (p=0.009), Sport/Rec: 30 to 56 (p=0.04), PA: 15 to 37 (p=0.04), QOL: 22 to 46 (p=0.003), and OHS; 24 to 35 (p=0.001)) from baseline to one year follow follow-up.
Conclusions: This study indicates that surgical repair may may be an effective treatment of MR verified verified gluteus medius tears. At one-year year follow-up the patients experience less less pain, subjective outcome measures improve and the 30 sec sit to stand test implies a functional gain.

Improvements in postoperative outcome after fast-track hip and knee arthroplasty in the elderly – a prospective multicenter cohort study of 1427 procedures in patients ≥ 85 years

119.

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Background: Fast-track protocols in total hip and knee arthroplasty (THA/TKA) have improved postoperative recovery and reduced postoperative morbidity. Additionally, increasing life expectancy and improved surgical techniques have led to an increasing number of elderly patients undergoing THA and TKA. However, detailed studies on fast- track THA and TKA in the elderly are limited.
Purpose / Aim of Study: To describe length of stay (LOS) and postoperative morbidity in patients ≥ 85 years within a continuous multicenter fast-track collaboration.
Materials and Methods: We used a prospective observational cohort design with unselected consecutive data between 2010– 2017 on primary elective THA and TKA patients ≥ 85 years. Data were obtained from 9 centers reporting to the Lundbeck Foundation Centre for Fast-track Hip and Knee Replacement database (www.FTHK.dk) and the Danish National Patient Registry on LOS, readmissions, and mortality. Cause of morbidity were determined by review of health records.
Findings / Results: We included 1427 (3.9% of all THA/TKA) procedures with 62.3% THA. Median age was 87 (IQR: 85-88) years with 71% women. LOS decreased from median 4 (3-6) days in 2010 to 2 (2- 3) days in 2017. The proportion with LOS > 4 days decreased from 32 % to 18%, with a decrease in both combined "surgical", "medical", and no recorded morbidity leading to LOS > 4 days. No single specific organ dysfunction dominated the overall improvement. Readmission and mortality rates remained at about 11.7% and 0.9% at 30 days and 18.0% and 1.5% at 90 days, respectively. However, with a tendency towards a slight increase in "surgical" morbidity leading to readmissions ≤ 90 days.
Conclusions: This, detailed large multicenter fast-track THA/TKA study in patients ≥ 85 years found major improvements in LOS and patients with LOS > 4 days without increase in readmission or mortality rates. The unchanged readmission rate poses an area for further improvements.

Angiogenic potential is retained in ischemic muscle in patients with critical limb ischemia undergoing amputation

120.

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Background: In peripheral arterial disease (PAD), alterations in microvascular density and structure are believed to contribute to chronic skeletal muscle ischemia. Impaired formation of vascular endothelial growth factor (VEGF), which is critical for capillary growth, may be a cause of the vascular rarefaction.
Purpose / Aim of Study: To determine the presence and release of VEGF protein in skeletal muscle and isolated muscle myocytes from critically ischemic limbs of patients with PAD.
Materials and Methods: Skeletal muscle biopsies were collected from proximal less ischemic muscle and from distal highly ischemic muscle of 15 patients with critical limb ischemia undergoing transfemoral amputation. Control samples were obtained from five age-matched healthy individuals. Muscle samples were analyzed for VEGF content and other angiogenic, mitochondrial and -vascular proteins. Skeletal muscle cells were also isolated and cultured to determine muscle specific VEGF content and release.
Findings / Results: Compared with age-matched individuals, the VEGF receptor 2 protein level was higher (p=0.042) in PAD patients. No differences were found for the other proteins. In the cell study, muscle cells from the proximal and distal limb regions showed similar amounts of VEGF protein and the capacity for VEGF protein release did not differ.
Conclusions: Our results indicate, that critically ischemic muscle has a similar angiogenic potential as healthy muscle. As VEGF availability and VEGF receptor density are not limited in CLI, therapeutic strategies to improve angiogenesis should focus on other targets.

The association between socioeconomic position and tumour size, grade, stage, and mortality in Danish sarcoma patients – a national, observational study from 2000 to 2013.

121.

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Background: Sarcoma is a rare, heterogenic type of cancer that originates from muscle, bones and connective tissue. Less than 1% of newly diagnosed cancer patients have sarcoma. Survival in sarcoma patients depends on a range of tumour related prognostic factors. An association between cancer survival and socioeconomic position is known for other cancers.
Purpose / Aim of Study: The aim of this study was to examine the relations between three socioeconomic factors and the risk of presenting with known prognostic factors (size, grade, stage) and the overall mortality of the different socioeconomic and prognostic factors in 1919 patients treated for sarcoma in Denmark 2000-2013.
Materials and Methods: Patients with sarcoma in extremities or trunk wall aged 30 years or more at diagnosis were identified in the Danish Sarcoma Registry, and linked on an individual level to Danish national registries. We obtained data on educational level, disposable income and cohabitation status. Odds ratios (ORs) were estimated for the association between the socioeconomic factors and grade, stage and tumour size. Survival analyses were performed using Cox proportional hazard models and Kaplan Meier survival curves.
Findings / Results: In adjusted analyses, educational level, income and cohabitation status were not associated with grade, stage or tumour size at the time of diagnosis. Patients with a short education, low income, who lived alone, with comorbidity or a large tumour had a significantly higher mortality.
Conclusions: In this nationwide, multicentre, population-based study we found that soft tissue sarcoma patients living alone had significantly greater risk of presenting with a large tumour at time of diagnosis. Patients with a short education, low income, who lived alone, had a statistically significant higher mortality. Thus, the social differences in mortality seems to be related to treatment aspects rather that the diagnostic process. More attention on socioeconomic factors in the treatment of sarcomas is needed in order to improve survival in patients with lower socioeconomic position.

FDG-PET/CT has poor diagnostic accuracy in diagnosing shoulder periprosthetic joint infection

122.

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Background: Chronic low-grade periprosthetic joint infection (PJI) of a shoulder replacement can be challenging to diagnose. 18F-FDG PET/CT is suggested as a modality to diagnose lower limb PJI, but no studies on shoulder replacements exist.
Purpose / Aim of Study: The aim of this study was to determine the diagnostic accuracy of 18F-FDG PET/CT in diagnosing chronic PJI of the shoulder.
Materials and Methods: Patients evaluated for a failed shoulder replacement during a 3-year period were prospectively included in the study. All patients underwent pre-operative 18F-FDG PET/CT and were evaluated for signs of infection by three independent reviewers using newly developed shoulder-specific criteria. Interrater-agreement was calculated between the reviewers. If the patient was revised, biopsy specimens were obtained and cultured with bacterial growth in the cultures serving as gold standard of infection.
Findings / Results: A total of 86 patients were included in the study. Nine patients were 18F-FDG PET/CT positive for infection; with only 3 true positive. Using the gold standard, infection was diagnosed after revision-surgery in 22 cases. All infections were chronic and caused by low-virulent microbes. The sensitivity of 18F-FDG PET/CT was 0.14 95%CI(0.03-0.36), specificity 0.91 95%CI(0.81-0.97), positive predictive value was 0.40 95%CI(0.15-0.71) and negative predictive value 0.71 95%CI(0.67-0.75). The interobserver agreement was 0.56 (Fleiss' kappa) indicating moderate agreement of the visual FDG-PET evaluation using the shoulder-specific criterion.
Conclusions: 18F-FDG PET/CT has poor diagnostic accuracy in diagnosing low-grade PJI of the shoulder. 18F-FDG PET/CT cannot be recommended as a part of the preoperative workup to diagnose low-grade infection of a shoulder replacement.

Plasma YKL-40 and IL-6 are prognostic for survival after surgery for metastatic bone disease of the extremities

123.

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Background: YKL-40 is up-regulated in diseases characterized by inflammation, injury, and remodeling. High YKL-40 concentrations in patients with different cancer types are associated with short overall survival (OS). Interleukine-6 (IL-6) plays a role in inflammation and high IL-6 is a prognostic for short OS in different cancer types. The prognostic value for YKL-40 and IL-6 in patients undergoing surgery for metastatic bone disease (MBD) is unknown.
Purpose / Aim of Study: The aims of study were to identify (1) if plasma YKL- 40 is associated with OS in patients undergoing surgery for MBD and (2) if this association was independent of plasma IL-6 levels.
Materials and Methods: A prospective study including patients undergoing surgery for MBD in the extremities at a tertiary referral center. In case of multiple surgeries during the inclusion period (May 2014-November 2018) only blood samples from index surgery were included also excluding revison surgeries. Blood samples were collected preoperatively. YKL-40 and IL-6 concentrations were determined by ELISA. Two-hundred-thirty-two patients (median age 66 years, IQR 58-74; female 51%) were included. Eighty-two percent of the patients had disseminated disease at time of surgery and 70% of the treated lesions were completely fractured. Cox regression analysis was performed to identify if YKL40 and IL-6 was independent prognostic factors for OS. Spearmann's test was used to adress correlation between YKL-40 and IL-6.
Findings / Results: Plasma IL-6 and YKL-40 were significantly correlated (rho: $p<0.001$). In univariate analysis, both high plasma IL-6 (> 50 percentile: HR=1.99, 95% CI: 1.47-2.68, $p<0.001$) and YKL-40 (age- adjusted >50 percentiles: HR=1.59, 95% CI: 1.10-2.32, $p=0.014$) were associated with short OS. In multivariable analysis, adjusted for known risk factors for survival, high IL-6 was prognostic for short OS (HR=2.21; 95% CI 1.41-3.19, $p<0.001$) but YKL-40 was not (HR=1.00, 95% CI: 0.64-1-56, $p=0.99$).
Conclusions: IL-6 and YKL-40 were associated with short OS in patients undergoing surgery for MBD. After adjusting for known clinical risk factors for poor OS only IL-6 remained significantly associated with OS. We therefore advocate for adjusting for IL-6 in prognostic studies of OS in MBD disease

No improvement of failure rate after resection of primary bone tumors and reconstruction with second-generation mega-prostheses

124.

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Background: Previous multicenter studies reports variable outcome and failure rates after mega-prosthetic reconstructions for tumors in the lower extremities.
Purpose / Aim of Study: Purpose of study was to evaluate if 1) use of second-generation mega-prosthesis for reconstruction after resection of primary malignancies result in lower incidence of implant failure and revision and also limb amputation compared to first generation prostheses, and 2) if the overall patient survival in a population based cohort of sarcoma patients has changed over time.
Materials and Methods: A retrospective study of 72 consecutive patients (F/M=30/42), mean age 44 (range 7-84) years with bone or soft tissue sarcomas (n=67) or aggressive benign bone tumors (n=5) having surgery between 2006 and 2016 with bone resection and reconstruction with mega-prostheses. Causes of failure were classified according to Henderson classification. Kaplan-Meier survival analysis was used for evaluation of overall patient survival. Fine and Gray competing risk analysis was used for assessing cumulative incidence of implant failure and limb amputation. Functional outcome was evaluated with the MSTS score
Findings / Results: Forty-seven patients were alive at follow-up.Twenty-eight patients (39%) underwent revision for all causes. Overall 10-year patient survival was 61% (95%CI 48-74%) with no difference over time (p=0.9).Ten-year incidence of implant revision and implant failure was 25% (CI: 14%-36%) and 18% (CI: 9%-28%) respectively. No difference between first and second-generation prostheses was found (p=0.9 and p=0.2 respectively).Ten-year incidence of limb amputation was 11% (95%CI: 3%-18%).No difference between first and second-generation prostheses (p=0.9).The overall predominant failure mode causing revision was non-mechanical (51%). Mean MSTS score was 20 (67%) (range 0-30)
Conclusions: Our results with second-generation mega- prostheses, justifies the use of limb salvage surgery regardless of patient diagnose and staging. We found no difference in implant failure or limb survival compared to our previously published findings (Holm et al. Int Orthop 2018;42:1175-81). For future evaluations of tumor prostheses we advocate using competing risk analyzes in order to achieve valid estimates.

Non-traumatic Lower Extremity Amputation (LEA) in a historic cohort –can we improve quality of life?

125.

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Background: The need to perform amputations has existed since ancient times, but the indication for surgery has changed drastically since World War II. E.g. amputations, due to trauma, have been reduced, while amputations, due to vascular disease and diabetes, have become more frequent. However, there is little knowledge on this group of patients and their in-hospital treatment and physical challenges.
Purpose / Aim of Study: To describe the group of non-traumatic patients undergoing above-knee- amputation (AKA), below-knee- amputation (BKA) and re-amputation (REA). Describe current in-hospital treatment, mortality and readmissions.
Materials and Methods: A retrospective cohort study, the medical records of 142 patients undergoing non-traumatic lower extremity amputation, at Kolding Hospital, Denmark, from March 2015 to December 2016, were included and data from their medical records were extracted using a standardized questionnaire.
Findings / Results: The mean age was 72 (12) years and 64% of the patients were men. Of the 142 patients, 90% had vascular disease and 50% had diabetes. 70% of the patients were ASA 3. 72% was admitted from the outpatient clinic or the vascular surgery department. 35% had medical audits during their hospitalization. 46% was mobilized to chair within 24hours and 83% during hospitalization. Infection was the most common complication (45%). AKA-patients had higher mortality at 30-days (18%) and 1-year (38%) while 8% and 15% for BKA-patients . 31% of AKA-patients were categorized ASA 4 compared with BKA (11%) and REA (21%). There was no difference in 30 days and 1-year readmission rate (13% and 35 %).
Conclusions: Lower extremity amputees deal with severe comorbidities and are in high risk of complications, readmissions and death. The current treatment focus on a multidisciplinary approach, however, does not include doctors of internal medicine. We discuss if the indication for amputation should be viewed as either a life-saving or palliative treatment. The patient's risks and non-surgical alternatives should be considered. We also point out the need for a scoring system for mobilization that focuses on essential activities.

Osteomyelitis in patients with diabetes mellitus, one-stage revision protocol

126.

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Background: Osteomyelitis(OM) are challenging to treat, especially in patients with diabetes mellitus(DM)
Purpose / Aim of Study: We report outcome after one-stage surgery with antibiotic loaded biocomposite(ALB) for management of OM in patients with DM
Materials and Methods: We report a consecutive series of 45 patients with OM and DM, treated at one institution, operated by a few surgeons, managed by a multidisciplinary team, using a one-stage revision protocol. The treatment protocol includes surgical debridement, tissue sampling, dead- space management using an ALB, direct closure when possible and 6 weeks of postoperative empirical antibiotic therapy, adjusted based on culturing. This series includes all patients with OM and DM operated at our institution according to this protocol, from March 2016 – September 2018
Findings / Results: A total of 45 patients were followed-up (FU) by chart review with a minimum FU of 6 months, mean FU was 13.7 months. Mean age was 68,8 years (45 to 92). A total of 34 (76%) patients were males and eleven (24%) females. Twelve patients (27%) were ASA class 2, 30 (67%) ASA class 3, 3 (7%) ASA class 4. Thirty-nine patients (87%) had cardiac issues ranging from essential hypertension to heart failure. Three patients had renal insufficiency and two were in dialysis. Four patients (8%) died within 3 months of surgery. The suspected cause of OM in our series, was soft tissue infection in 37 cases (82%) and surgical management of a closed fracture in 5 cases (11%), while the remaining three cases were suspected to be caused by hematogenous spread, insertion of a prosthesis or previous osteomyelitis in the local area. Following the primary procedure, during our follow-up period, 29 patients (64%) had not required further surgical revision, 9 patients (20%) had subsequent soft- tissue or bone revision and 10 patients (22%) had been amputated. Of the 10 amputations performed, 6 were due to exposed bone or infection in the overlying soft-tissue. Of note, the number of comorbidities was higher in the group of amputated patients compared to non-amputated, 9 patients (90%) were ASA class 3 and 1 was class 2 (10%)
Conclusions: An acceptable outcome was obtained considering the highly comorbid population with a high 3-month mortality of 8%

The use of plastic surgery in single-stage treatment of chronic osteomyelitis

127.

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Background: Treatment of chronic osteomyelitis (OM) comprises surgical excision of infected bone and soft tissue, dead space management, and subsequent soft tissue closure. When soft tissue revision results in defects too large for direct closure, assistance from plastic surgeons is needed.
Purpose / Aim of Study: To report outcomes for patients with OM treated by plastic and orthopedic surgeons in a single-stage operation with an antibiotic loaded biocomposite (ALB) and soft tissue closure with a local or free flap.
Materials and Methods: We report data on 11 patients with OM treated at our institution from 02/17 to 05/19. The treatment protocol included surgical debridement, dead-space management using ALB, and soft tissue closure with a local or free flap. The single- stage revision protocol was inspired by a recently published study.
Findings / Results: Mean age at surgery was 62 yrs (33-79), mean BMI was 28 (23-39). Three were females. Five patients suffered from cardiovascular disease, 2 were diabetics, and 7 had other comorbidities. Two were active smokers, and 3 had a history of smoking. Tibia was affected in 5 patients, while ulna, humerus, fibula and calcaneus were affected in the remaining patients. In 5 patients, OM followed surgical management of a closed fracture, 3 followed in open fractures, 1 arose after an overlying soft-tissue infection, 1 followed elective arthrodesis, and 1 was due to previous OM in the affected bone. Local flaps were used in 5 patients, including 1 reverse lateral arm flap, 1 soleus flap, 1 gastrocnemius flap, 1 latissimus dorsi flap, and 1 plantaris flap. Free flaps were used in 6 patients, 4 gracilis muscle flaps and 2 antero-lateral thigh flaps. Patients were followed up by chart review after a mean of 9 months (0-24). Two patients required a soft-tissue revision after 1 and 12 months, and two required bone revision and additional ALB after 7 and 10 months, respectively. No patients required amputation, and no mortalities were reported.
Conclusions: Single-stage treatment of OM using ALB performed by plastic- and orthopedic surgeons led to zero amputations in a highly morbid patient population, where amputation would otherwise have been unavoidable.

Patient Reported Outcome and Body Mass Index in 3,327 total knee arthroplasty patients

128.

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Background: As the number of primary knee arthroplasties, as well as the number of obese patients undergoing total knee arthroplasty (TKA), continues to increase, there has been more interest in the role of obesity as a risk factor for poor outcomes after TKA. In the literature, the influence of obesity on knee arthroplasty outcome diverges. We compared pain, function, quality of life, general health preoperatively and 1 year postoperatively, in patients operated on with TKA for knee OA.

Purpose / Aim of Study: Patient reported outcome (PRO) in total knee arthroplasty (TKA) patients with high body mass index (BMI) is controversial. We compared pain, function, quality of life, general health and satisfaction among different BMI categories preoperatively and 1 year after primary TKA

Materials and Methods: 4,318 patients were operated with a TKA for knee osteoarthritis in the Region of Skane 2013- 2015. 3,327 patients (77%) had complete PRO data and information on BMI and were included. Preoperatively the patients filled in the Knee injury and Osteoarthritis Outcome Score (KOOS) and EQ-VAS (general health). 1 year postoperatively the same questionnaires were filled in together with the question if they were satisfied with the surgery. Information on age, sex, BMI and ASA grade were obtained from the Swedish Knee Arthroplasty Register. Each patient was classified as Outcome Measures in Rheumatology - Osteoarthritis Research Society International (OMERACT-OARSI) responder or not based on a combination of absolute and relative changes in scores. Welch's t-test and Chi2-test were used in the statistical analysis.

Findings / Results: Both preoperatively and 1 year postoperatively the obese patients reported somewhat worse scores than normal- and over-weighted. The differences were small with 1 exception, the KOOS sport- and recreation function postoperatively where normal- and over-weighted patients reported fewer problems than obese patients with a BMI over 35 (40 and 39 points vs 31 points, $p<0.001$). Similar proportions of patients were satisfied and categorized as OMERACT-OARSI responders in the different BMI categories.

Conclusions: The degree of improvement in PRO's 1-year after TKA surgery does not seem to be affected by BMI.

Effect of growing population and obesity primary total knee arthroplasty rates in Sweden

129.

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Background: Obesity is the major risk factors for developing and progression of knee osteoarthritis that may lead to the need for arthroplasty surgery. As obesity among the population increases the number of operations is expected to follow similar patterns. The increasing strain on public healthcare costs from treating late- stage osteoarthritis patients, yields a need for studies on the association between obesity and the need for total joint arthroplasty.
Purpose / Aim of Study: This study aims to quantify the relative risk for total knee arthroplasty in the Swedish population for specific body mass index categories and age intervals to investigate whether the TKA use is attributable to changes in the prevalence of obesity and the growing elder-population.
Materials and Methods: The Swedish Nationwide Health Survey (SNHS) provided BMI data for a representative sample of the Swedish population and the Swedish Knee Arthroplasty Register (SKAR) to calculate Relative Risk (RR) of TKA surgery by age and BMI. Age groups of interest are middle-aged 45- 64 and elderly 65-84 years of age and patients were divided according to BMI categories (BMI 18.5-24.9 normal-weight; BMI 25.0-29.9 over- weight; BMI>30 obese). The RR for TKA surgery was applied to the demographic forecasts for the Swedish population as a forecasting model. We assumed unchanged indications and utilization patterns for TKA among obese and non-obese individuals.
Findings / Results: There was observed increases in population size of 5.1% from 2009 to 2015 (roughly 40.000 middle- aged and 250.000 elderly) and an increase in prevalence of obesity from 16 to 18% in the two age categories. Compared to normal-weight, the RR for TKA was 2.7 higher for over-weight and 7.3 higher for persons classified as obese, aged 45-64. The corresponding figures for individuals aged 65-84 were 2.1 higher and 4.0 higher respectively. Applying the RR to the demographical changes in prevalence of obesity and an increase in the elderly population accounted for an estimated increase of approximately 1300 TKAs.
Conclusions: The increase in the prevalence of obesity and the number of middle-aged and elderly in the population may to some extent explain the rapid increase in TKAs in Sweden over the last seven years.

The osteoarthritic knee is worse in retrospective: recall bias in Oxford Knee Score and patient-reported range of motion 1 year after knee replacement

130.

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Background: Patient-reported outcome measures (PROMs) concern patients' symptom states either currently or in the preceding e.g. four weeks, as in the case of Oxford Knee Score (OKS). Symptoms recorded retrospectively are generally perceived as less reliable, but, to our knowledge, no studies have reported recall bias in Danish knee arthroplasty patients
Purpose / Aim of Study: We sought to explore how well patients were able to remember their preoperative knee status one year after primary knee arthroplasty (pKA). Also, we aimed to find factors influencing recollection error.
Materials and Methods: 128 pKA patients, who had provided electronic preoperative PROM answers as part of a large prospective cohort study, were contacted by email two weeks after completion of their 1-year follow-up PROM set. An email titled, "Do you remember how your knee was before the operation?" contained OKS (0-48) along with Copenhagen Knee ROM Scale and a question regarding use of analgesics, all in past-time wording.
Findings / Results: 95 patients (74.2%) responded. Recalled OKS was 22.3 [CI: 20.9; 23.6] (SD 6.8, range 7-37), whereas true preoperative OKS was 24.4 [23.1; 25.7] (SD 6.5, range 8-41). The majority of patients (n=58, 61.1%) recalled a score worse than the actual score, and 9 (9.5%) reported the same overall score. The mean recall difference was -2.1 OKS points [-3.2; -1.1] (SD 4.9, range -16 to 10, P<0.001). This was more pronounced in females (insignificant in males) and in patients with high preoperative OKS level (P<0.03), but independent of age and OKS result at 1 year. Knee flexion was 1 score worse (median) at recall (corresponding to 10-20°, P<0.001). Knee extension and frequency of analgesics use did not differ significantly between the two tests.
Conclusions: One year after knee replacement, patients recalled their preoperative knee symptoms worse than originally reported. Though the reported difference in OKS is lower than the smallest possible detectable change (4 points), this should be kept in mind whenever recall OKS is used to replace real-time data.

Does Pre-Operative Pattern of Knee Osteoarthritis Affect Patient-Reported Outcomes in Total Knee Arthroplasty? 131.

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Background: Patient-reported outcome measures i.e. Knee Injury and Osteoarthritis Outcome Score (KOOS) validly measure surgical outcome. Knowing if knee osteoarthritis (OA) compartment patterns affect KOOS is essential for risk-stratification and TKA-outcome evaluation.
Purpose / Aim of Study: Analyze: 1)association between knee OA patterns and patient demographics as well as pre-operative KOOS 2)whether knee OA patterns are associated with post-operative KOOS
Materials and Methods: An international multicenter study included 391 TKA patients (median age:65.0; 65.0% females). Compartment OA in pre-operative anterior- posterior and lateral/sunrise radiographs with Kellgren-Lawrence grade III/IV and joint-space width<2.5mm were classified into 5 groups: 1)medial 2)medial+patellofemoral, 3)lateral 4)lateral+patellofemoral and 5)medial+lateral (bi- compartmental) or bi-compartmental+patellofemoral (tri- compartmental). KOOS Symptoms, Pain, Function in Daily Living (ADL), Sports and Recreation (Sports/Rec) and Quality of Life (QOL) were collected pre-, 1-, 3- and 5-years post-operatively.
Findings / Results: 282 patients had medial, 46 medial+patellofemoral, 34 lateral, 7 lateral+patellofemoral, and 22 bi/tri- compartmental OA. Patient demographics were similar in all groups; however, bi/tri- compartmental OA patients had fewer females. Medial OA patients had the lowest ADL scores pre-operatively. Medial+patellofemoral OA patients reported the least pain at 5-years. Lateral OA patients reported the lowest Sports/Rec scores at 3-5 years. Lateral+patellofemoral OA patients reported the lowest scores in all subscales except for KOOS Sports/Rec at 5-years and the most pain at 3-5 years. Bi/tri-compartmental OA patients reported the lowest Symptoms score pre-operatively, but reported the highest 1-year scores. At 5-years, these patients reported the highest score in all but the Pain subscale.
Conclusions: Presence of patellofemoral OA is not associated with pre-operative KOOS in patients with medial and lateral OA patterns, possibly diminishing the clinical importance of patellofemoral OA in the knee arthroplasty setting. Lateral OA and lateral+patellofemoral OA patients report lower post- operative KOOS signifying that these cases present with unique surgical challenges.

Patient-reported results are the same across Danish high-volume knee arthroplasty centers despite persistent differences in revision rates

132.

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Background: The SPARK study was initiated to explore whether the persistent differences in revisions rates after primary knee replacement across Danish regions were a sign of varying surgical quality. Our hypothesis was that patient-reported outcome measures (PROMs) could offer new aspects to the debate. So far, we have documented no variation in preoperative symptoms but some variations in patient selection between regions.
Purpose / Aim of Study: This study compares 1-year results after primary knee replacement in three centers traditionally known to differ in revision rates.
Materials and Methods: In a prospective cohort study of 1452 patients undergoing primary knee arthroplasty of any kind in Aarhus (n=321), Farsoe (202) or Gentofte (929), PROM sets were emailed pre- and postoperatively (6 weeks, 3, 6 and 12 months). Main outcome was Oxford Knee Score (OKS) at 1 year; secondary outcomes were patient satisfaction, EQ-5D, UCLA Activity Scale, Forgotten Joint Score, global knee rating (0- 100) and Copenhagen Knee ROM Scale.
Findings / Results: Within the first year, 32 patients were excluded due to revision: 22 in Gentofte (2.4%) 2 in Aarhus (0.6%) and 4 in Farsoe (2.0%). One-year answers were provided by 1307 patients (90% of all, or 93% of contacted patients). Overall OKS at 1 y. was 39.0 (SD 7.4) with no significant regional difference (P=0.092). Mean change in OKS was 15.4 (8.1). In Aarhus, it was lower but when adjusted age, sex and preoperative value, this was insignificant. Assigning imputed low OKS-values to revised (excluded) patients revealed no regional difference either. Patients were equally willing to repeat surgery (92%, P=0.124) and equally satisfied across regions (86%, P=0.642). A small, yet significant difference in knee extension was noted in Aarhus, where unicompartmental implants were used more frequently.
Conclusions: Despite well-known differences in revision rates, we found no differences in surgical quality between Danish high-volume knee replacement centers from a patients' perspective. Our study outlines that traditional registers, however well they contribute to the surveillance of joint replacement, cannot stand alone in the evaluation of surgery. Further studies should explore regional variations in thresholds for revision.

Translation and classical test theory validation of the Danish version of the Oxford Knee Score

133.

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Background: The Oxford Knee Score (OKS) a is a joint specific questionnaire, developed for the assessment of knee osteoarthritis patients. A Danish version was developed in 2007 but has not undergone formal validation.
Purpose / Aim of Study: To translate and validate the Danish version using the classical test theory validation techniques.
Materials and Methods: The original version was translated into Danish using a forward/backward protocol. Electronic patient-reported outcomes (PROMs) of 351 patients undergoing unicompartmental or total knee arthroplasty from Sept. 2016 to May 2018 were studied. Preoperative OKS was repeated after 2-7 days along with EQ-5D and a global knee anchor question. 1 year after surgery (± 2 mo.), PROMs were reassessed and patients were asked about satisfaction and willingness to repeat.
Findings / Results: Mean OKS difference from test to retest was 0.29, SD 3.85, P=0.16). A Bland-Altman plot revealed no systematic deviation and 95 % of patients were less than 7 points from their first answer. None of the preoperative measurements reached floor (0) or ceiling (48), while 7 postoperative measurements (2.0%) reached the ceiling. Internal consistency was appropriately high (Cronbachs alpha 0.83 preop., and 0.90 postop.). Construct validity measured by Spearman rank correlation between OKS and the anchor question was strong/moderate (rho=0.79/0.66, pre- and postop., respectively). Between OKS and EQ-5D dimensions mobility, activity and pain, correlations were fair/strong/strong preop. (r= -0.47/-0.72/-0.75) and moderate postop. (r=-0.70/-0.67/-0.71) while, as expected, correlations to self-care and anxiety/depression were fair/poor (rho=-0.51/-0.23 and -0.36/-0.20). OKS changed from 20.6 (SD 6.2) preoperatively to 38.0 (6.4) postoperatively, with an individual improvement of 17.4 (7.2). Postoperative OKS was moderately correlated to satisfaction (rho=-0.71) and willingness to repeat (rho=0.62), as was OKS improvement to global improvement (rho=0.63).
Conclusions: The Danish OKS was comparable to other versions regarding construct validity, reliability (test-retest and floor/ceiling effects) and responsiveness. We suggest further validation based on item response theory, e.g. Rasch analysis, for different knee pathologies.

Translation and cross-cultural adaptation of the Oxford Knee Score – Activity and Participation Questionnaire (OKS-APQ) into Danish

134.

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Background: The Oxford Knee Score – Activity and Participation Questionnaire (OKS- APQ) was developed in 2014 as a supplement to the OKS, intended to measure higher levels of activity and participation of patients undergoing total knee replacement (TKR).
Purpose / Aim of Study: The purpose of this study was to translate and cross-culturally adapt the 8-item OKS-APQ into Danish.
Materials and Methods: Translation to Danish was performed according to international translation guidelines. The translation procedure included two forward- and two backwards translations by independent translators, followed by a consensus meeting. To ensure high face- and content validity, the translated version was pre-tested on seven patients attending orthopedic consultations either on the waiting list for a TKR or for a 3-months or 1-year postoperative control after TKR. Psychometric evaluations included Rasch analysis, Differential Item Functioning (DIF) and internal consistency evaluations. Analyses were performed on randomly extracted 1-year postoperative data from one hospitals' arthroplasty database, from 400 patients (mean age 69.3, 61.5% female) undergoing primary TKR between August 2016 and February 2018.
Findings / Results: The Danish OKS-APQ was found to be relevant and comprehensive by patients in the pre-test, however some difficulty in interpreting the response options, resulting in reversing the response scale, was reported. Floor and ceiling effects were observed for 5% and 10%, respectively. A predefined hypothesis of convergent validity with the OKS was confirmed (Spearman correlation 0.76). Internal consistency was found high (Chronbachs alpha 0.95). Good fit to the Rasch model was observed when evaluating individual item fit statistics and no local dependence was found (Yen's Q3 0.05). There was evidence of DIF for gender in two items and for age (>= 60 vs. < 60 years) for one item, however the impact on the total score was considered small.
Conclusions: The Danish OKS-APQ show promising psychometric properties at 1 year after a TKR and can be used in conjunction with the 12-item OKS. Future psychometric analyses are needed to evaluate reliability and responsiveness of the OKS-APQ.

Which Oxford Knee Score level represents a satisfactory symptom state after undergoing a total knee replacement?

135.

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Background: Meaningful interpretation of postoperative Oxford Knee Score (OKS) is challenged due to a lack of knowledge about the patients' perspectives on the threshold for having a successful or unsuccessful treatment outcome.
Purpose / Aim of Study: To determine Patient Acceptable Symptoms State (PASS) and Treatment Failure (TF) values for the OKS in patients undergoing primary total knee replacement (TKR) in Denmark.
Materials and Methods: Data from patients undergoing primary TKR between February 2015 and January 2019 were extracted from one hospital's arthroplasty database. Patients completed the OKS at 3, 12 and 24 months postoperatively, accompanied by two anchor questions asking whether they considered their symptom level to be acceptable (yes/no), and if not, whether their symptom level was so unsatisfactory that they considered the treatment to have failed (yes/no). PASS and TF threshold values were calculated using the predictive modeling method, which is based on logistic regression, with the PASS and TF anchors as dependent variables and postoperative OKS as the independent variable. Non- parametric bootstrapping was used to derive 95% confidence intervals (CI).
Findings / Results: Complete data were obtained for 187 out of 209 (89%), 884 out of 915 (97%) and 575 out of 586 (98%) patients at 3, 12 and 24 months postoperatively, with a median age ranging from 68 to 70 years (59 to 64% female). The proportions of patients achieving a PASS were 72%, 77% and 79%, while 6%, 11% and 11% considered the treatment to have failed, at 3, 12 and 24 months postoperatively, respectively. OKS PASS values (95% CI) were 27.13 (25.82; 28.45), 30.18 (29.39; 30.99) and 30.45 (29.37; 31.39) at 3, 12 and 24 months postoperatively. Corresponding TF values were 26.67 (25.48; 27.83) at 12 months, and 27.28 (25.87; 28.63) at 24 months postoperatively. The absolute number of patients considering TF at 3 months was too low to calculate that TF value.
Conclusions: These PASS values, determined with novel methodology, can be used to guide the interpretation of the outcome of TKR, when measured with the OKS. PASS and TF thresholds were very close, suggesting that treatment outcome can be dichotomized into successful and not successful outcome using the PASS values.

Reproducibility and Responsiveness of a Danish version of the IKDC Subjective Knee Form for adults with knee disorders

136.

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Background: The International Knee Documentation Committee Subjective Knee Form (IKDC-SKF) is a widely used regions- specific patient-oriented outcome measure of symptoms, function, and sport activities in patients with knee disorders. Translation and assessment properties of a Danish version of the IKDC-SKF have not been established.
Purpose / Aim of Study: We aimed to translate the IKDC-SKF into Danish and test its reproducibility and responsiveness in patients with a variety of knee disorders.
Materials and Methods: The translation process followed international guidelines. Reproducibility and responsiveness were assessed in a clinical study on 86 adults with a median age of 25 (range 18-80) years. The most prevalent condition among the study population was anterior cruciate ligament lesion (n=50, 58%), either isolated or in combination with other lesions or osteoarthritis (N=14, 16 Reproducibility was assessed in 56 adults responding the IKDC-SKF questionnaire twice within 9 days. For analysis of responsiveness, 64 adults responded the IKDC-SKF again after 6 months after surgical treatment of ACL lesion, patella instability and cartilage lesion. Evaluating responsiveness, the change in scores was correlated to the Global Rating Scale. The scale consists of answers from "a very great deal worse "to "a very great deal better".
Findings / Results: The standardized response mean showed a large effect in patients reporting better condition. The minimal important change was 7.0 points. Evaluating reproducibility, the Intra class correlation coefficient (ICC) was 0.94, standard error of measurement (SEM) was 2.6 (2.2; 3.3) points, and smallest detectable change was 7.2 points. Evaluating responsiveness, the change in scores was correlated to the Global Rating Scale (Spearman`s rho= 0.32).
Conclusions: In conclusion, the Danish IKDC-SKF demonstrated excellent test retest reproducibility both at group and individual level. The IKDC-SKF showed adequate responsiveness and is suitable for assessing improvement or deterioration in adults with a variety of knee disorders.

Prober training and education may eliminate the learning curve when chancing implant in a high volume total knee arthroplasty unit

137.

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Background: When shifting total knee arthroplasty (TKA) brand, a 2-3-fold increase in early revisions occur as a result of a learning curve, most evident during the first 15 procedures (1). The Stryker Triathlon knee has previously shown a learning curve (1). Our unit consists of highly dedicated knee arthroplasty surgeons with more than 10 years of experience, with the Vanguard knee. We shifted from the Vanguard knee (Zimmer Biomet) to the Triathlon knee (Stryker) in May 2018.
Purpose / Aim of Study: To investigate whether the learning curve can be reduced when changing implant, this study describes outcome regarding early revisions, oxford knee score (OKS) and forgotten joint score (FJS) from the initial 3 months after changing primary implant and compared to the previous Vanguard knee.
Materials and Methods: Retrospective cohort study. Preoperative, 3 month and 1 year OKS and FJS was measured and compared between the two implants. Revisions for any cause for patients operated after the introduction of the implant was measured and compared to early revisions with the previous implant. All surgeons participated in an education program, provided by the manufacturer (Stryker), consisting of a 2-day course with theoretical education and cadaveric surgery, before May 2018. A company representative was present during the surgery for the first 10 procedures by each surgeon
Findings / Results: Triathlon knee: 138 procedures (5 Surgeons, May 2018 – Sept 2018). Vanguard knees: 128 procedures (same surgeons) from August 2017 – Oktober 2017. Early revisions (within 3 months) in the triathlon group = 0. The first revision was observed 7 months after introduction due to hematogenous infection from pneumococcus pneumonia. Re-admission within 30 days = 0 in both groups. 3 patients were revised within the first year in the Vanguard group. No difference was seen in FJS and OKS, when comparing the Triathlon to the Vanguard.
Conclusions: Introduction of a new implant can be done without a learning curve, with satisfactory outcome and without any increase in revisions if care is taken to properly educate surgeons prior to the introduction. (1) J Bone Joint Surg Am. 2013 Dec 4;95(23):2097- 103. doi: 10.2106/JBJS.L.01296.

Are magnetically controlled growing-rod lengthening procedures in early-onset scoliosis patients pain-free?

138.

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Background: Magnetically controlled growing-rods (MCGRs) have gained popularity because they offer non-surgical lengthening procedures in early-onset scoliosis (EOS) instead of semi-annual open surgery elongations with traditional growing rods. Many aspects of MCGR treatment have been investigated, but pain in conjunction with distraction is only sparsely described in the literature.
Purpose / Aim of Study: The aim was to investigate the pain associated with MCGR lengthening procedures.
Materials and Methods: Prospective cohort study assessing pain intensity of 25 EOS patients before, during and after MCGR lengthening procedures in an outpatient setup. They underwent at least two (range 2-16) lengthening procedures prior to this study. The pain intensity was estimated using patient-reported Faces Pain Scale (FPS-R), caregiver-reported pain numeric rating scale (NRS), and NRS and revised Face, Legs, Activity, Cry, Consolability scale (r-FLACC) by two medically trained observers. The inter- rater reliability and correlation between instruments were analyzed.
Findings / Results: 23 of 25 EOS patients (8-16 years old) with mixed etiology were able to self-report pain. The average pain intensity was mild, median 1 (range 0-6) on all four instruments on a 0-to-10 scale. Afterwards, 22 patients (88%) were completely pain-free and the remaining 3 patients had a pain score of 1. MCGR stalling (i.e. clunking) was encountered in 56% of the patients without impact on the pain intensity.
Conclusions: The average maximum pain intensities during the lengthening procedures were mild and pain ceased within few minutes. Inter-rater reliability was good to excellent for NRS and r-FLACC, and there were high correlations between all the four instruments, indicating high criterion validity.

Conservative Treatment of Main Thoracic Adolescent Idiopathic Scoliosis: Full-time or Night-time bracing?

139.

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Background: The full-time Boston brace is a well-established treatment in adolescent idiopathic scoliosis (AIS). The part-time Providence brace has become popular but some studies suggest that is not suitable for thoracic AIS.
Purpose / Aim of Study: To compare treatment efficacy between the Boston full-time brace and the Providence part-time brace in main thoracic AIS.
Materials and Methods: Patients were treated with either the Boston brace (n=37) or the Providence brace (n=40) at two different institutions. Inclusion criteria were Risser grade ≤2, major curve between 25-40° with the apex of the curve between T7 and T11 vertebrae. Two- year follow-up was available in all patients unless brace treatment had reached endpoint. The primary outcome measure was main curve progression to ≥45°.
Findings / Results: Median age was 12.6 years and median treatment length at follow-up was 25 months (IQR:18-32) with no difference between the groups ($p \geq 0.116$). Initial median main Cobb angle was 29° (IQR:27-33) and 36° (IQR:33-38) in the Boston and Providence group, respectively ($p<0.001$). At follow-up, 13 patients (35%) had progressed to ≥45° in the Boston group vs. 16 patients (40%) in the Providence group ($p = 0.838$). Twenty-three patients (62%) had progressed by more than five degrees in the Boston group vs. 22 patients (55%) in the Providence group ($p=0.685$). The secondary thoracolumbar/lumbar curve progressed by more than five degrees in 14 (38%) and 18 (45%) in the Boston and Providence groups, respectively ($p=0.548$).
Conclusions: Despite a larger initial curve size in the Providence group, progression of more than 5 degrees or to surgical indication area was similar in the Boston group. Our results indicate that night-time bracing is a viable alternative to full-time bracing also in main thoracic AIS.

Scheuermann Kyphosis – A 39-year follow-up from diagnosis in non-operated patients

140.

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Background: Previous studies have highlighted the impact on HRQOL in adolescent patients with SK; however, sparse information is available regarding the long-term effects of SK on HRQOL. Thoracolumbar (TL) SK has been associated with increased back pain compared to thoracic (Th) SK. Moreover, spino-pelvic parameters have been reported to impact on HRQOL.
Purpose / Aim of Study: To investigate the impact Scheuermann Kyphosis (SK) has on Health Related Quality Of Life (HRQOL) in adult patients and compare it to the general population along assessing whether location of the kyphosis affects pelvic parameters and HRQOL.
Materials and Methods: Of a cohort of 242 patients seen for a pediatric spinal deformity in the years 1972-1982 in the outpatient clinic, 55 had radiologically verified SK. Thirty-eight participated in the study and responded to HRQOL questionnaires, and 34 had radiographs taken. Patients were divided into two groups according to location of the SK apex: Thoracic (Th) above Th10 and Thoracolumbar (TL) from Th10 and below. Spino-pelvic parameters were measured for all radiographs. The HRQOL scores for all SK patients were compared with normative data from a Scandinavian population.
Findings / Results: Mean follow-up was 39±1.6 years and mean age at follow-up was 53±2.4 years. We found lower score in the TL group for SRS-22r function domain ($p=0.027$) compared with the Th group, but no significant difference in the remaining domains and SRS-22r subscore ($p>0.18$). Patients had significantly lower mean scores compared to normative values on SRS-22r domains pain ($p=0.049$) and self-image ($p=0.006$), but no statistically significant difference on SRS-22r subscore ($p=0.064$). There was no difference in pelvic parameters between the two SK groups.
Conclusions: We found a lower HRQOL in adult patients with SK 39 years after diagnosis regarding SRS-22r domains pain and self-image, and a tendency towards lower overall HRQOL compared with a background population. The location of the SK apex did not seem to have an overall impact on HRQOL. There was no difference in pelvic parameters in the two groups.

Readmission following complex spine surgery in a prospective cohort of 679 patients – 2-years follow up using the Spine AdVerse Event Severity (SAVES) system

141.

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Background: Adverse events (AEs) in spine surgery are attracting attention. Recent studies suggest that prospective registration more accurately reflects the true incidence. To our knowledge, no previous study has investigated prospectively registered AEs´ influence on hospital readmission following spine surgery.
Purpose / Aim of Study: To determine the frequency of unplanned readmissions after complex spine surgery, and to investigate if prospectively registered AEs can predict readmissions.
Materials and Methods: All patients undergoing surgery, at our tertiary referral center, were consecutively and prospectively included in 2013. Demographics and perioperative AEs were registered using the Spine AdVerse Events Severity system. Patients were followed for a minimum of 2 years. A competing risk survival model was used to estimate rates of readmissions with death as a competing risk. Multivariate logistic regression analysis and proportional odds survival models were used to assess predictors of i) 30-day readmission to any department and ii) readmission to a spine center at any time point. Results were reported as odds ratios (OR) with 95% confidence intervals (95%CI).
Findings / Results: We included 679 patients undergoing surgery for various spine pathologies (deformity, degenerative, tumor, trauma and infection). Within 2 years of index discharge, 443 (65%) were readmitted. Only 20% of readmissions were to a spine center. Cumulative incidence (95%CI) of readmission was estimated to 13% (10-16%) at 30 days, 26% (23-30%) at 90 days, 50% (46- 54%) at 1 year, and 59% (55-63%) at 2 years following discharge. Increased odds of 30-day readmission were correlated to intraoperative hypotension (P=0.02) and major intraoperative blood loss (P<0.01). Readmission to a spine center at any time point was associated to number of instrumented vertebra (P=0.047), major intraoperative AE (P=0.01) and intraoperative hypotension (P<0.01).
Conclusions: Readmission following complex spine surgery was more frequent than previously reported. Factors related to major intraoperative blood loss were associated to increased odds of readmission. This should be considered during planning of postoperative observation and care.

Which mri findings are associated with long-term disability in low back pain patients?

142.

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Background: MRI is used extensively as a diagnostic tool to evaluate and guide treatment of patients with low back pain. However, the long-term association between degenerative MRI findings and disability is unclear.
Purpose / Aim of Study: To assess whether long-term disability is associated with baseline disc degeneration, Modic Changes or facet joint degeneration in low back pain patients.
Materials and Methods: In 2004-2005, patients aged 18-60 with daily LBP were enrolled in an RCT study and lumbar MRI was performed. Patients completed Roland-Morris Disability Questionnaire (RMDQ) and LBP Rating Scale for activity limitations (RS), at baseline and 13-years after the MRI. Regression analysis with 13- yr RMDQ as depend variable and baseline disc degeneration, Modic Changes and facet joint degeneration as independent variables was performed. Demographics including smoking status, BMI and weekly physical activity at leisure was included in the analysis
Findings / Results: Of 204 cases with baseline MRI, 170 (83%) were available for follow-up; of these, 88 had disc degeneration (52%), 67 had Modic Changes (39%) and 139 had facet joint degeneration (82%). Only Modic Changes and weekly physical activity at leisure impacted the model significantly, respectively standard beta coefficient of -0.15 ($p=0.031$) for MC and -0.51 ($p<0.001$) for weekly physical activity at leisure.
Conclusions: Contrary to our hypothesis, none of the degenerative MRI changes at baseline was associated with a worse outcome at 13-year follow-up. Baseline Modic Changes was associated with statistically significant less long-term disability.

Mechanical complications following 3-Column Osteotomy surgery – A Competing Risk Survival Analysis in 193 consecutive Adult Spinal Deformity patients

143.

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Background: 3-Column Osteotomies (3CO) allow major surgical correction of Adult Spinal Deformity (ASD); although, the risk of mechanical complications remains considerable. Previous reports of revision risk have been based on smaller cohorts or multicenter databases and none have utilized Competing Risk (CR) survival analysis.
Purpose / Aim of Study: To report the incidence of revision surgery due to mechanical failure following 3CO surgery in patients with ASD.
Materials and Methods: All ASD patients undergoing 3CO surgery from 2010-2015 at a single, tertiary institution were included. Demographics, long standing radiographs as well as intra- and postoperative complications were registered for all. A CR-model was used to estimate the incidence of revision surgery due to mechanical failure and covariates were assessed for prediction of failure and reported as odds ratios (OR) with 95% confidence intervals (95%CI).
Findings / Results: A total of 193 patients were included with two- year follow-up available for 88% (mean [IQR]: 33 [24-49] months). Mechanical failure occurred in 120 cases (62%) at any time in follow-up, the most frequent being rod breakage affecting 86 patients (45%). Cumulative incidence of revision surgery due to mechanical failure was estimated to 34% at two-years and 56% at five-years. A multivariable proportional odds model with death as competing risk showed significant higher odds of revision with increasing age (OR: 1.03; 95%CI: 1.00-1.05) and preoperative Pelvic Tilt (PT) >20° (OR: 2.14; 95%CI: 1.09-4.22). Type of 3CO, history of previous surgery, number of instrumented vertebra, as well as postoperative SRS-Schwab modifiers and Global Alignment and Proportion score were not associated with significant effects on odds of revision.
Conclusions: In a consecutive single-center cohort of patients undergoing 3CO for ASD, we found an estimated incidence of revision surgery due to mechanical failure of 34% 2-years postoperatively. Age and preoperative PT >20° were associated with elevated risks of revision.

Distraction-to-stall versus estimated distraction in Magnetically Controlled Growing Rods

144.

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Background: Consensus is lacking regarding distraction frequency, amount and technique in the treatment of early-onset scoliosis (EOS) with magnetically controlled growing rods (MCGR).
Purpose / Aim of Study: Compare distraction-to-stall with estimated distraction in the treatment with MCGR.
Materials and Methods: We performed a two-center retrospective study of all children treated with MCGR from November 2013 to January 2019, having minimum one-year follow-up and undergoing minimum three distractions. Exclusion criteria were single-rod constructs and conversion cases. At one center (21 patients) we used a distraction- to-stall principle, and at the second center (18 patients) we used an estimated distraction amount principle. In distraction- to-stall, each rod was lengthened until the internal magnetic driver stopped ("clunking") or the patient felt discomfort. In estimated distraction, a set distraction length was entered on the remote control before distraction. Both centers aimed for maximal distraction and curve correction at index surgery. Achieved lengthening was measured on radiographs and compared between the two centers using a linear mixed effects model adjusted for number of instrumented levels.
Findings / Results: Mean age at surgery was 9.5±2.0 years and 21 (55%) patients were females. Etiology of the deformity was congenital/structural (n=7), neuromuscular (n=9), syndromic (n=3) or idiopathic (n=20). Age, sex, etiology and pre- and postoperative spinal height (T1-T12 and T1-S1) did not differ between centers (p>0.46). Time between distractions were mean 17 days (95% CI 10-24) shorter in the distraction-to-stall compared with the estimated distraction group. Mechanical complications occurred in 10/39 patients, five at each center. In the linear mixed effects model, we found that achieved lengthening increased with number of instrumented levels; however, there was no significant difference between the two centers.
Conclusions: In two comparable and consecutive cohorts we found no difference in achieved lengthening between distraction-to-stall and estimated distraction lengthening principles.

EOS, O-arm and standard spine radiographs; what is the cumulative radiation exposure during current scoliosis management?

145.

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Background: During the course of treatment for adult idiopathic scoliosis (AIS), patients are subjected to repeated radiological exposure. Only a few studies have evaluated the total absorbed radiation dose during follow-up for scoliosis. To the best of our knowledge, this is the first study to evaluate total radiation dose exposure from all modalities for a cohort of AIS patients.
Purpose / Aim of Study: The aim of this study was to determine the radiation exposure of AIS patients and to compare follow-up algorithms among different international spine centers.
Materials and Methods: A retrospective review on radiation exposure of patients treated for AIS. Inclusions: patients followed for AIS at our institution from 2013-2016 without neuromuscular disease. The O-arm cone-beam CT scanner was used for 3D navigation in all surgically managed patients, low dose protocols were used (70kVp, 80mAs). A survey asking for information on radiological algorithms and imaging frequencies was sent to a number of international spine centers.
Findings / Results: 61 patients were included, 19 were treated conservatively (M/F: 6/13) and 42 surgically (M/F: 11/31). Median follow up time for the conservative group was 8 (range 0-51) months and 37 (range 13-163) months for the surgical group. Median number of X-rays/EOS were; 2 (range 0-20)/ 2 (range 0-17) for the conservative group and 15 (range 2-57)/11(range 0-26) for the surgery group. Patients undergoing surgery received a median cumulative radiation dose of 10.31mSv (range 3.79-20.43) vs. a median dose of 1.09mSv (range 0.22-7.17) for those treated conservatively. Approximately 25% (39.04/161.82mSv) of total intraoperative radiation dose for all patients was a result of O- arm 2D fluoroscopy. The results of the questionnaire showed great variety of radiological follow-up algorithms among 8 spine centers without adherence to any of the published consensus statements.
Conclusions: Surgically treated patients were exposed to more, radiation dose than those treated conservatively, owing mainly to intraoperative 3D scans and a larger numbers of radiological follow-up examinations. Further awareness to reduce radiation exposure is warranted in order to decrease potential risk of future radiation-induced malignancy.

Revision Surgery and Mortality following complex spine surgery in a prospective cohort of 679 patients – 2-years follow-up using the Spine AdVerse Event Severity (SAVES) system

146.

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Background: Revision surgery and mortality are serious complications to spine surgery. Previous studies of frequency have mainly been retrospective, and to our knowledge, next to none have employed competing risk survival analyses. In addition, assessment of predictors has focused on preoperative patient-characteristics. The effect of perioperative adverse events (AE) on long-term revision and mortality risk is not yet fully understood.
Purpose / Aim of Study: To determine the 2-year risk of revision surgery and mortality after complex spine surgery, and to assess if prospectively registered AEs could predict either outcome.
Materials and Methods: In 2013, we prospectively included all patients undergoing complex spine surgery at a single, tertiary institution. AEs were registered using the Spine Adverse Event Severity system. Patients were followed for a minimum of two years in regards to revision surgery and mortality. Incidences were estimated using competing risk survival analyses, and correlation between AEs and either outcome was assessed using proportional odds models.
Findings / Results: We included 679 adult and pediatric patients. Demographics, surgical data, AEs and any event of revision or mortality were registered for all. The overall, 2-year, cumulative incidence of all-cause revision was 19% (16-22%) and all-cause mortality was 15% (12-18%). Deformity surgery was the surgical category with highest incidence of revision surgery, and the highest incidence of mortality was seen in the tumor group. We found that a major intraoperative AE was associated to threefold increased odds of revision. Deep wound infection was associated to four-fold increased odds of mortality.
Conclusions: We report the cumulative incidences of revision surgery and mortality following complex spine surgery in a consecutive and prospective cohort of patients. The incidence of revision surgery was higher across most surgical categories compared to previous retrospective studies. In addition, prospectively registered AEs were correlated to increased odds of revision surgery and mortality. The results presented in this paper may serve at reference for future interventional studies and as a simple tool to perioperatively identify unforeseen, at-risk patients.

Selection of the lowest instrumented vertebra in main thoracic adolescent idiopathic scoliosis – Is it safe to fuse shorter than the last touched vertebra?

147.

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Background: Selection of the lowest instrumented vertebra (LIV) in main thoracic adolescent idiopathic scoliosis (AIS) remains controversial. Most guidelines for LIV selection are based on standing x-rays as does not take into account the flexibility of the curve.
Purpose / Aim of Study: To assess the radiographic and functional outcome using a standardized flexibility-based fusion strategy and to determine whether fusing shorter than the last touched vertebrae (LTV) was a safe approach in flexible main thoracic AIS curves.
Materials and Methods: This was a prospective study of consecutive patients with AIS surgically treated with alternate-level pedicle screw instrumentation. Only patients with selective fusion of the main thoracic curve were included in the study. Fusion level selection was based on the fulcrum bending radiograph method. Preoperative, postoperative and two-year follow-up radiographs were assessed. Patients were grouped based on the position of the LIV as proximal to the LTV (proxLTV), at the LTV (atLTV), and distal to the LTV (distLTV). Any adding-on was determined and the refined 22-item Scoliosis Research Society questionnaire was obtained.
Findings / Results: A total of 109 patients were included in the study and 43 were in the proxLTV, 45 were in the atLTV and 21 in the distLTV groups. Preoperatively, distLTV group had greater lumbar Cobb angle, lumbar apical translation and less flexibility in the thoracic curve. At two-year follow-up, the groups did not differ in thoracic curve correction but the distLTV had larger lumbar Cobb angle, more apical translation and worse coronal balance. Distal adding-on was most common in the proxLTV group (26%). Adding-on was only associated with younger patients at the time of surgery but not with any radiographic parameter. No differences in SRS-22r scores were observed between groups.
Conclusions: Proximal fusion carries the risk of adding-on but leaving unfused segments in the lower spine increases the potential for compensatory mechanisms to improve spinal and truncal balance. In mature patients with a flexible main thoracic curve, surgeons may consider fusion at or cranial to the LTV.

Combination treatment of Spondylodiscitis with Moxifloxacin and Rifampicin may result in Reduced Vertebral Bone Concentrations of Moxifloxacin

148.

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Background: Spondylodiscitis (SD) is a devasting disease and approximately 30% of cases occurs following spinal surgery. Moxifloxacin (M) is used in the treatment of pyogenic SD, and for implant- associated infections caused by Staphylococci, M may be combined with rifampicin (R). However, studies have shown that R may reduce the plasma concentrations of M, which stresses the need for pharmacokinetic studies investigating this potential interaction in relevant tissues.
Purpose / Aim of Study: To evaluate vertebral bone (VB), intervertebral disc (IVD) and subcutaneous tissue (SCT) pharmacokinetics of M with and without R using microdialysis in a porcine model.
Materials and Methods: 16 female pigs were randomized into two groups: Group A received M 400 mg orally once daily, and Group B received M 400 mg orally combined with R 450 mg twice daily. For both groups, treatment was administered until steady-state was achieved. Following, measurements were obtained from plasma, VB, IVD and SCT for 24 hours. Microdialysis was applied for sampling in solid tissues and concentrations were quantified using LCMSMS.
Findings / Results: The following data are preliminary, but the complete analysis will be finalized prior to the conference. Both the area under the concentration curve (AUC) and the maximal concentration (Cmax) was significantly lower for Group B compared to Group A in VB and SCT (evaluated by mann-whitney U test, $p<0.05$). Ranging from 1,13 to 1,51, tissue penetration (AUCtissue/AUCplasma) in Group A was complete in all compartments (full data set not yet obtained for group B). For both groups, tissue concentrations were stable throughout the sampling period, indicating that steady-state was achieved.
Conclusions: Group B exhibited lower AUC and Cmax values in VB and SCT, which indicates that the combination of M and R reduces the spine tissue concentrations compared to when M is administered as a monotherapy. The possible clinical implications of this will subsequently be discussed in the following work.

Pharmacokinetics of double-dose cefuroxime in porcine intervertebral disc and vertebral cancellous bone – a randomized microdialysis study

149.

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Background: Cefuroxime is a time-dependent antibiotic widely used as perioperative prophylaxis in spine surgery. A previous study has indicated that a single dose of cefuroxime provided insufficient spine tissue concentrations for spine procedures lasting more than 2-3 hours.
Purpose / Aim of Study: To evaluate if a twofold increase of standard dosage of 1.5g cefuroxime given as one double dose or two single doses with 4- hours intervals will lead to sufficient cefuroxime spine tissue concentrations throughout the dosing interval.
Materials and Methods: This is preliminary data for 8 out of 16 pigs. Data from all 16 pigs will be included for the conference. Eight pigs were randomized into two groups: Group A received one double dose of cefuroxime (3g) as a bolus, and Group B received two single doses of cefuroxime (2x1.5g) with 4-hours intervals. Measurements were obtained from plasma, subcutaneous tissue (SCT), vertebral cancellous bone and the intervertebral disc (IVD) for 8-hours thereafter. Microdialysis was applied for sampling in solid tissues. The cefuroxime concentrations were determined using UHPLC.
Findings / Results: The time with concentrations above the minimal inhibitory concentration (T>MIC) for the clinical breakpoint MIC for S aureus of 4 µg/ml, was superior in all compartments for Group B. For the MIC of 4 µg/ml, the mean T>MIC in all compartments ranged between 53-73% and 85-95% for Group A and B, respectively. Both groups exhibited comparable area under the concentration- curves (AUC) with the highest values found in plasma compared to the remaining compartments. The peak drug concentrations were lower for both vertebral cancellous bone and IVD compared to both SCT and plasma in both groups. When comparing the two groups, higher peak drug concentrations were found in all compartments for Group A. Tissue penetration was incomplete and delayed for all compartments.
Conclusions: Despite comparable pharmacokinetic results between the two groups, Group B exhibited superior T>MIC in all compartments for the clinical breakpoint MIC for S aureus of 4 µg/ml. Administration of cefuroxime as two single doses with 4- hours intervals provided sufficient cefuroxime spine tissue concentrations for a minimum of 85% of an 8-hour dosing interval.

Adipocytes may have an important function for remodeling of the human myotendinous junction

150.

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Background: The myotendinous junction (MTJ) is specialized in force transmission between muscle and tendon, and is an area where strain injuries frequently occur. Despite this, little is known about the human MTJ as most studies have been conducted on animals. The presence of adipocytes in skeletal muscle is normally observed in relation to injury and coupled to limited function in the muscle. However, in a pilot study we have observed that adipocytes are present also in healthy human MTJ. This has not been reported previously in neither human nor animal MTJ.
Purpose / Aim of Study: To analyze the presence of adipocytes at the human MTJ in healthy subjects as well as the effect of exercise on the presence of these cells. In addition, we want to investigate whether adipocytes are unique to the human MTJ or if they are also present in animal MTJ's.
Materials and Methods: From ten subjects, randomized to control or 4 weeks of heavy resistance training (HRT), we obtained samples from semitendinosus MTJ and stained immunohistochemically for adipocytes (PLIN1). The number of adipocytes adjacent to the MTJ was counted and the total length of MTJ with adjacent adipocytes was measured. In addition, samples from horse (N=15) and mice (N=9) MTJ were obtained and stained immunohistochemically.
Findings / Results: Adipocytes were present at the muscular side of the MTJ in all subjects. The median was 2.70 adipocytes pr. mm MTJ. There were large differences between subjects (Range: 6.94), but no difference observed between the two groups with either heavy resistance training or sedentary controls. Adipocytes were also present in MTJ from horse and mice .
Conclusions: Adipocytes are present in high concentration at the healthy human MTJ and was not affected by 4 weeks of HRT. The presence of adipocytes at the MTJ suggests that they have a function in this area, and we suggest that they are involved in the extensive remodeling process that occurs at the MTJ. The presence of adipocytes in human, horse and mice MTJ suggests that this phenomenon is not unique for the human MTJ.

Protective Paracrine Effect on Chondrocytes when Co-cultured with Mesenchymal Stem Cells in a Hyaluronic Acid Hydrogel in vitro

151.

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Background: Osteoarthritis (OA) is an inflammatory degenerative disease causing irreversible damage to the articular cartilage. Mesenchymal stem cells (MSCs) have been shown to affect host cells by paracrine stimulation in regenerative environments.
Purpose / Aim of Study: The aim of the present study was to investigate cell viability and paracrine effects of MSCs on human chondrocytes in an inflammatory co-culture assay. We hypothesized that MSCs immobilized in a hyaluronic acid (HA) hydrogel exerted protective paracrine effects on human chondrocytes when exposed to interleukin- 1beta (IL-1b).
Materials and Methods: Non-osteoarthritic human chondrocytes where co-cultured in biphasic wells with human MSCs immobilized in a divinyl sulfone crosslinked HA (500- 749 KDa) hydrogel (HyA) without physical contact between the two cell types. We investigated the chondrocyte response in an IL-1b induced inflammatory environment in four groups: 1) chondrocytes 2) chondrocytes and HyA 3) chondrocytes and MSCs 4) chondrocytes and HyA-immobilized MSCs. Follow-up times were day 3, 7 ,14, and 28. Relative gene expressions of aggrecan, SOX9, MMP-13 and ADAMTS-5 were measured. The unfolded protein response (UPR) was examined as a surrogate marker of cellular stress and the viability was studied using Hoechst staining.
Findings / Results: MSC viability was maintained in the hydrogel for up to 28 days. In chondrocytes co-cultured with MSCs or MSCs immobilized in HyA we found significant up- regulation of SOX9 at day 7, 14 and 28 and a significant down-regulation of ADAMTS-5 at day 14 and 28 compared with controls and HyA alone ($p < 0.05$). The UPR was down-regulated (1-3 fold) in co-cultures with MSCs but results were not significant.
Conclusions: We show that human MSCs can be immobilized in HyA and survive for up to 28 days and that MSCs with or without HyA exert protective paracrine effect on non- osteoarthritic human chondrocytes in an IL1-b induced.

Continuous wireless force measurement in gradual and acute bone lengthening

152.

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Background: Limb lengthening might result in reduced joint movement and risk of joint subluxation due to high resisting forces of lengthened soft tissues. At present, soft tissue forces are only assessed indirectly by clinical examination.
Purpose / Aim of Study: We aimed to develop and test instrumentation for continuous wireless force measurements in a rabbit limb lengthening model. We tested whether the equipment could detect differences in generated forces between gradual and acute limb lengthening.
Materials and Methods: In a paired controlled study, five New Zealand white rabbits underwent 12 mm gradual limb lengthening of the left leg and 12 mm acute limb lengthening of the right leg. GRADUAL LENGTHENING PROTOCOL: A midshaft osteotomy was performed on the left tibia. An external fixator with a built-in strain gauge for force measurement was attached to the bone by Orthofix pins. Lengthening was initiated from the third postoperative day with 0.25 mm two times per day for 24 days. The force was measured by the strain gauge at 15 sec. intervals and wirelessly transmitted to a computer. The bone formation was monitored 3 times a week by x-ray. At day 28 the rabbits were anaesthetized, and prior to euthanization, the right leg was acute lengthened. ACTUTE LENGTHENING PROTOCOL: Right leg was prepared as left and acute lengthening was performed in steps of 0.25 mm allowing for two measurements prior to next lengthening. The paired differences in force between acute and gradual lengthening were compared with a Wilcoxon signed- rank test.
Findings / Results: The median (interquartile range) maximum resting force was 5.5 (5.1-6.7) N/kg of rabbit during gradual bone lengthening and 25.2 (24.1-26.2) N/kg during acute lengthening. The median paired difference between acute and gradual lengthening was 18.4 (17.9-18.5) N/kg (p=0.04). Postoperative micro-CT demonstrated bone formation in the limbs with gradual bone lengthening.
Conclusions: The new device for wireless monitoring of force during limb lengthening was capable of detecting a difference between gradual and acute limb lengthening in a rabbit model. The generated force was substantially higher in acute compared with gradual lengthening despite bone formation occurring in the gradually lengthened tibias.

Local vancomycin concentrations after intra-articular injection into the knee joint – an experimental porcine study

153.

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Background: Intra-articular injection of vancomycin may be an important antimicrobial prophylactic supplement to systemic administration in the prevention of joint infection after reconstructive or prosthetic surgery.
Purpose / Aim of Study: To investigate the prophylactic effectiveness of an intra-articular injection of vancomycin into the knee joint.
Materials and Methods: In 8 female pigs, 500 mg diluted vancomycin was given by intra-articular injection into the knee joint. Microdialysis was used for dense sampling of vancomycin concentrations over 12 hours in the synovial fluid of the knee joint, and in the adjacent femoral and tibial cancellous bone and subcutaneous tissue. Venous blood samples were obtained as reference.
Findings / Results: The mean (SD) peak drug concentration of vancomycin in the synovial fluid of the knee joint was 5,277 (5,668) µg/ml. Only one pig failed to reach a peak drug concentration above 1,000 µg/ml. The concentration remained high throughout the sampling interval with a mean (SD) concentration of 337 (259) µg/ml after 690 min. For all extraarticular compartments, the pharmacokinetic parameters (area under the concentration time-curve, peak drug concentration, and time to peak drug concentration) were comparable. The highest extraarticular mean (SD) peak drug concentration of 4.4 (2.3) µg/ml was found in subcutaneous tissue.
Conclusions: An intra-articular injection of 500 mg diluted vancomycin was found to provide significant prophylactic mean concentrations for at least 12 hours in the synovial fluid of the knee joint. Correspondingly, the adjacent tissue and plasma concentrations were low, but remained stable, signifying low risk of systemic toxic side effects and a slow release or uptake from the synovium to the systemic circulation.

Cognitive load in virtual reality simulation of hip fracture surgery: an investigation of different methods to estimate cognitive load.

155.

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Background: One out of 10 hip fracture patients dies within the first months and approximately one out of four within the first year. High quality surgical training is therefore paramount for the young surgeon. Virtual reality (VR) simulation training has been introduced to address this issue, and previous studies have demonstrated that VR simulation training can ensure basic proficiency of the junior surgeon. Cognitive load (CL) theory has become an accepted theoretical framework for evaluation of medical education. Conflicting reports exist regarding the correlation of the different methods for CL estimation. We therefore set out to investigate these methods further.
Purpose / Aim of Study: The aim of this study was to investigate the relationship between performance in VR simulation tests in a hip fracture surgical training program and CL estimated by secondary-task reaction time test and the NASA-TLX and PAAS questionnaires. We further also investigated the relationship between the different CL measurement methods.
Materials and Methods: Participants were 42 first-year orthopedic residents employed at departments in the Central- or the North Denmark Region.The study was carried out at a central simulation center from November 2016 to March 2019. Performance was measured as passing/failing a procedure and the number of failed procedures within the latest three and five simulations. CL was measured by reaction time testing during simulation and using the NASA-TLX and PAAS questionnaires.
Findings / Results: We found that passing simulation tests were associated with a lower CL than failed for both the reaction time and questionnaire estimates of CL. The questionnaire responses were further affected by the number of failed procedures during last three and five procedures, resulting in a higher number of failures being associated with higher CL.
Conclusions: Questionnaires for estimation of CL seemed to be affected by participant frustration after failing a simulation – a meta-cognitive "carry over"-effect. This could be a general limitation of the subjective questionnaire approach to estimate CL. Reducing CL through instructional design and handling of participant frustration might improve the learning outcome of simulation training programs.

Blood flow restricted low-load resistance strength training in patients with a variety of orthopedic lower limb injuries: a feasibility study

156.

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Background: Resistance training with low loads (~30% 1repetition maximum) performed with concurrent partial blood flow restriction of the working limb (Blood flow restricted exercise: LL- BFRE) has achieved scientific merit over the past decades. Further, LL- BFRE has demonstrated to promote gains in skeletal muscle hypertrophy and strength as comparable to that seen with heavy resistance strength (HRST). In some patients, however, HRST can be contraindicated due to pain or post surgical restrictions. Despite these contraindication, the majority of patients would most likely benefit from increasing (or at least maintaining) their skeletal muscle mass and strength in order to maintain a sufficiently high functional capacity level and quality of life.

Purpose / Aim of Study: To examine the feasibility of blood flow restricted low- load exercise (LL- BFRE) in patients suffering from orthopedic lower limb (LL) injuries and measure outcomes on muscle strength, functional capacity, jump height, and patient-reported outcome measures (PROM).

Materials and Methods: 14 patients (52 +/-17 years) diagnosed with variuos orthopedic lower limb injuries were included. The patients performed LL-BFRE for 4-8 weeks. LL-BFRE comprised of unilateral leg press with concurrent partial blood restriction (40% occlusion pressure) at 30%1RM. Two protocols were tested containing 4 rounds with 30-sec rest pauses. Participants completed 3 functional performance tests, 2 strength-based tests, 1 hop- test, and KOOS.

Findings / Results: Three patients dropped out due to exercise-related adverse events (2) and personal reasons (1). Thigh Circumferences and Isometric Knee Extensor Strength (injured side) increased from 45.2 ± 3.1 cm to 46.0 ± 4.0 cm (p=0.05) and 3.1 ± 0.8 N/m to 4.3 ± 1.4 N/m (p=0.01). 30-seconds sit to stand improved from 16 ± 7 repetitions to 19 ± 10 repetitions (p=0.02). KOOS Pain, Symptoms and Sport & Rec improved from 62 ± 19 points to 74 ± 20 point (p=0.03), 58 ± 16 points to 67 ± 15 points (p=0.03), and 22 ± 18 points to 40 ± 24 points (p=0.03).

Conclusions: LL-BFRE was feasible in patients suffering from different LL-injuries. The intervention may improve isometric strength, functional performance, and various PROMs

Predictive value of ultrasound guided intraarticular injection with local anesthesia and glucocoricosteroid before hip arthroscopy for femoro-acetabular impingement syndrome (FAIS)

157.

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Background: Ultrasound guided intraarticular injection (UGII) with local anesthesia (LA) is frequently used to confirm joint related hip pain in patients with femoro- acetabular impingement syndrome (FAIS). In combination with glucocorticosteroid (GCS) it may result in long-lasting pain relief in individuals with inflammatory or degenerative joint pathologies.
Purpose / Aim of Study: The purpose of this study was to determine whether a long-lasting pain relief (> 1 day) in patients scheduled for hip arthroscopy after a positive UGII is indicative of degenerative or inflammatory changes in the hip joint.
Materials and Methods: Patients with clinical and/or radiological signs of FAIS received an UGII with LA and GCS. Immediate (within 15min) pain relief was documented at the consultation, while a long-lasting effect was registered by a follow-up mail 2 weeks later. Patients with pain relief were offered hip arthroscopy. Intraoperative findings were documented and compared to the preoperative responds after UGII.
Findings / Results: From July 2016 to October 2018 65 patients (28 males, 37 females) underwent hip arthroscopy. Fourty-seven patients confirmed both a positive short- (< 1 day) and long-term (>2 days) effect, while 18 patients reported an isolated, temporary pain relief (< 1 day). While all patients presented intraarticular pathologies, no difference regarding inflammatory (p=0.623) changes could be seen. However, patients with grad 3 and 4 cartilage lesions were overrepresented in the group of long- lasting pain relief (p=0.049).
Conclusions: Patients with a positive UGII all had changes in the hip joint. Long lasting pain relief may indicate severe cartilage injuries.

Early polywear in dual mobility articulation in trapeziometacarpal total joint replacement. A presentation of three cases.

158.

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Background: Total joint replacement is used for treating osteoarthritis of the trapeziometacarpal (TMC) joint. The prosthesis composes of a stem placed in the first metacarpal bone and a socket in the trapezium. It resembles the design of the total hip prothesis and may therefore have the same complications. To reduce the risk of head luxation the use of dual mobility articulation has been introduced, but in hip prosthesis dual mobility articulation has been shown to increase the wear of the polyethylene liner, and with that the risk of intraprosthetic dislocation.
Purpose / Aim of Study: To present three cases of early polywear in dual mobility TMC joint arthroplasty leading to complications and re-operation.
Materials and Methods: All three patients had a total joint replacement of the basal joint of the thumb with the Moovis (Stryker) dual mobility cementless prosthesis due to osteoarthritis of the TMC joint. The postoperative recovery period was uncomplicated, and the patients were followed with routine follow-up including radiographs at 3, 12, 24 and 60 months.
Findings / Results: After 24 months two patients presented with radiological signs of intraprosthetic luxation, and at the re-operation macroscopical signs of polywear was found leading to separation of the liner from the head. One patient presented with "clicking" of the joint and was re-operated on suspicion of collision or subluxation. At the operation macroscopical wear was found, with instability between the liner and the head. In the first case the polyethylene liner had been worn out and as a result of this the head of the prosthesis was no longer centralised in the socket. In the second case the head of the prosthesis had broken through the polyethylene liner. In the third case the polyethylene liner was worn out, so the head had extensive play in the movement in the polyethylene liner.
Conclusions: The three cases illustrate that polyethylene wear may also be a problem in small dual mobility articulations as in total joint replacement of the TMC joint. This highlights that when total joint replacement designs are transferred from one part of the body to another, the same complications may apply and should be considered.

Caput radii fractures - are follow-up necessary? 159.

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Background: Caput radii fractures are amongst the most common type of injuries found in adults and about 30% of elbow fractures. It usually happens when people fall from same height on a extended arm with valgus stress of the elbow. At Bisbebjerg we routinely follow up after 10-14 days including x-ray, but so far, no attempts have been made to qualify if this in fact alters the primary non operative plan.
Purpose / Aim of Study: The primary purpose of this study is to see if routine follow-ups of caput radii fractures lead to surgery.
Materials and Methods: This study is conducted as a retrospective study. A database is made from the outpatient clinic register with the last 2 years of patients who had follow-up 7-21 days after initial trauma and assigned the diagnosis of DR525 or DR525B, which is proximal radius or caput radii fractures, respectively. Fracture dislocations and fractures of both ulna and radius have a different regiment and was excluded. Fractures was reviewed and classified according to Masons and Hotchkiss classifications. The patient's history was searched up until present to see if the plans were altered from primary care, or if they later are assigned to secondary surgery due to ROM/pain issues.
Findings / Results: A total of 329 fractures was reviewed. 59 was excluded, mainly due to fracture dislocations, fractures of ulna and wrong coding, leaving 270 fractures. Of the 270 fractures 5 was assigned to primary surgery and 1 had secondary surgery with the removal of caput radii. The 5 fractures were all Mason types 2 or 3. They either involved a larger joint surface area or had large angulation or depression initially and none were assigned to surgery due to a secondary displacement. Of the 59 excluded fractures 13 had surgery.
Conclusions: Caput radii fractures are stable, and the initial care plan, operative or conservative, are rarely altered. Out of 270 fractures only 5 had ORIF, and of those none were due to a secondary displacement of the fracture. Only 1 had surgery later due to elbow ROM complications. Our results indicate that apart from patients with fracture dislocations, patients with concomitant ulna fractures and patients where there could be primary indication for surgery, there isn't a need for follow-up.

Outcomes following discectomy for lumbar disc herniation in patients with substantial back pain

160.

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Background: Patients with lumbar disc herniation (LDH) typically present with lower extremity radiculopathy. However, there are patients who have a concomitant substantial back pain and are considered candidates for fusion.
Purpose / Aim of Study: The purpose of this study is to determine if LDH patients with substantial back pain improve with discectomy alone.
Materials and Methods: The DaneSpine database was used to identify 2399 patients with LDH and baseline back pain Visual Analog Scale (VAS) ≥ 50 who underwent a lumbar discectomy at three facilities between June 2010 and December 2017. Standard demographic and surgical variables and patient reported outcomes including back and leg pain VAS (0-100), Oswestry Disability Index (ODI), and EuroQoL 5D (EQ-5D) at baseline and 12 months postoperatively were collected.
Findings / Results: A total of 1654 (69%) cases had 12 month data available, with a mean age of 48.7 years; 816 (49%) were male and mean BMI was 27 kg/m2. At 12 months postoperatively, there were statistically significant ($p<0.000$) improvements in back pain (72.6 to 36.9), leg pain (74.8 to 32.6), ODI (50.9 to 25.1) and EQ-5D (0.25 to 0.65) scores.
Conclusions: Patients with LDH and leg pain and a concomitant substantial back pain can be counseled to expect improvement in their back pain 12 months after surgery after a discectomy alone, as well as improvement in their leg pain.

Causes and risk factors for reoperation after operative treatment of Tibial Plateau Fractures

161.

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Background: Trauma to the knee may result in fractures involving the tibial plateau (TPF). In general, intraarticular fractures increase the risk of early onset osteoarthritis (OA), due to articular depression, malalignment and joint instability. Open reduction and internal fixation (ORIF) with condylar plates is the most commonly used operation method for this type of fracture. Previous studies report main reasons for reoperation as deep infection (3,1-8,4%), compartment syndrome (14,5%), knee stiffness requiring manipulation (6%) and removal of hardware (ROH) (12,2-18%). Overall reoperation rates are seen as high as 37%.
Purpose / Aim of Study: Defining rates, causes and possible risk factors for reoperation after primary ORIF of TPF.
Materials and Methods: We have retrospectively identified 155 patients who were operated for TPF at Aarhus University Hospital, Denmark (AUH) between 2012-16. Only ORIF with unilateral or/and bicondylar plating was included. Mean age was 55 (19-87) and mean follow-up-time was 4,1 years. The most common fracture type was AO41B3 (33,6%) and all procedures were performed by senior traumatologist Types of reoperation included ROH, irrigation and debridement, compartment release, brisement forcé, amputation and arthroplasty. Statistic analysis was performed using Kaplan-Meier survival measures including baseline demographics and surgical skills. CT-scans have been assessed using AO- classification.
Findings / Results: Overall reoperation rate was found at 23,5%. ROH accounts for 19,3% vs. 4,2% for the remaining reoperation types. The infection rate was 2,6%. We have not been able to identify any tested predictor variables (gender, age, BMI, diabetes, smoking status) as influential on outcome. Final results will be presented at the DOS convention.
Conclusions: Our results are similar compared with previously published reoperation rates and causes after plating of TPF. It is mandatory to identify preoperative risk factors and select patients meticulously for this method of operation to avoid complications.

Surgical Core Decompression for Aseptic Necrosis of the Femoral Head – a Retrospective Cohort

162.

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Background: Aseptic femoral head necrosis (FHN) is a painful condition causing a progressive partial collapse of the femoral head and is usually treated with total hip arthroplasty (THA). Core decompression (CD) is a joint preserving treatment that may represent an alternative to THA as first line treatment in selected patients.
Purpose / Aim of Study: In a consecutive retrospective cohort we aim to evaluate whether CD for early stage FHN is a viable first-line treatment to improve the clinical and radiology outcomes and by that avoid THA. The primary outcome is the converting rate to THA.
Materials and Methods: Patients were included by searching the regional database (BI-Portal) by surgical code "KNFK29" core decompression of the femoral bone treated at Aarhus University Hospital from 2004 to 2019. Patients were excluded if they did not have a CD of the femoral head or were treated outside AUH. The endpoint was a THA by reviewing patients journals and cross-checking the National Hip Registry. Radiology was used to evaluate the level of the FHN before and after CD.
Findings / Results: Ten patients (12 hips) were identified (mean age 38.9 years, range: 20-65 years). Prior to year 2009 6-8mm drills were used (group 1) and after that 3.2- 3.6 mm drills were used (group 2). In group 1 THA conversion rate was 66% (2 of 3) while in group 2 conversion rate was only 14% (1 of 7) Time to THA was 14.5 months, range: 6-36 months. At three- month postoperative follow-up the patients reported minor or no groin pain. X-ray confirmed the no absence of radiological evidence of FHN.
Conclusions: CD is an easily applied, low-cost, and non-bridge burning surgical technique. In the present cohort we find encouraging results using CD with drill diameters of 3.2-3.6 mm for the treatment of FHN in selected patient with improved radiological outcome, reduction in pain and low conversion rate to THA.

Facilitators and barriers among physiotherapists and orthopedic surgeons to pre-operative home-based exercise therapy with one exercise-only in patients with end-stage knee osteoarthritis

163.

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Background: Clinical guidelines recommend non-surgical treatment (e.g. exercise therapy) before surgery is considered in patients with end-stage knee OA. Orthopedic surgeons provide surgical care for patients eligible for surgery while patients not eligible for surgery can be referred to non- surgical treatment.
Purpose / Aim of Study: To investigate key stakeholder perspectives on enhanced coordination of non-surgical and surgical treatment in patients with end-stage knee OA.
Materials and Methods: This study is embedded within the randomized trial (the QUADX-1 trial) investigating a model of coordinated non-surgical and surgical treatment where orthopedic surgeons re-evaluate patients need for surgery following exercise therapy in the municipality (home-based exercise therapy with one exercise). Physiotherapists and orthopedic surgeons treating patients with end-stage knee OA in their clinical work were interviewed to explore their perceived facilitators and barriers related to coordinated non-surgical and surgical treatment. The interviews were analyzed using content analysis.
Findings / Results: From the content analysis three main themes emerged: 1) Physiotherapists' ambivalence in their professional role, 2) Orthopedic surgeons view on exercise and 3) Orthopedic surgeons' ambivalence in their professional role. Enhanced coordination of non-surgical and surgical treatment in patients with end-stage knee osteoarthritis created both facilitators and barriers among the physiotherapists and orthopedic surgeons creating ambivalence in the professional role in both professions.
Conclusions: As evidenced by the identified facilitators and barriers the intervention created ambivalence in the professional role of both the physiotherapists and orthopedic surgeons. The physiotherapists were skeptical towards too simplified exercise therapy, however, supportive of patient self- management. The orthopedic surgeons were skeptical towards the (long-term) effect of exercise therapy in patients with end-stage knee OA but acknowledge exercise therapy as a treatment option in daily clinical practice. This ambivalence in the professional role is important to consider when planning implementation of the intervention as it may appear simple but is regarded as complex.

The association between quality of Tension band wiring and complications

164.

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Background: Tension band wiring (TBW) is the most frequently used fixation for displaced olecranon fractures. TBW is in general terms known as a simple method that can be performed by most orthopaedic surgeons and has satisfying results.

Purpose / Aim of Study: The aim of this study was to determine if the quality of TBW for displaced olecranon fractures in adult patients was associated with an increase in complications.

Materials and Methods: Eligible patients were retrieved using elbow and olecranon fracture diagnosis codes from the hospital administration database. From 2013 to 2018 we found 155 patients and excluded 73 patients due to plate fixation and 21 due to other fracture diagnoses. Patient health care files were reviewed for demographics and complications defined as reoperations or loss of fixation within 6 weeks. Pre- operative x-rays were reviewed for classification and postoperative x-rays were evaluated quality of TBW based on 10 imperfections.

Findings / Results: A total of 61 patients were included, 21 males and 40 females. The median age was 64 (InterQuartileRange 26-74 and 78% were ASA≤2. There were 39 Mayo type 2A and 22 type 2B. 40 (66%) had postoperative complications. Of them were 31 (51%) minor: 7 (11%) had loss of fixation within 6 weeks (no hardware removal or reoperation) and 24 (39%) needed hardware removal after 6 months due to pain or loss of range of motion. 9 (15%) had major complications: 6 (10%) with hardware removal within 8 weeks, 1 (2%) needed reosteosynthesis, and 2 (3%) had deep infection. The quality of osteosynthesis had in the group with osteosynthesis problems (loss of fixation, reosteosynthesis, and hardware removal within 8 weeks) 0% with 0 imperfection, 50% had 1-2, 36% had 3-4, and 14% had 5 or more. The other surgeries had in comparison 9% with 0 imperfection, 53% had 1-2, 32% had 3-4, and 6% had 5 or more which lead to no association between the two groups (p=0.78).

Conclusions: In total 66% of the patients had complications and there were no association with the quality of osteosynthesis and osteosynthesis related complications. The outcome of traditional TBW is therefore questionable in the present cohort.

Is progressive resistance training feasible in patients with symptomatic external snapping hip? 165.

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Background: Little is known about the feasibility of progressive resistance training (PRT) applied to patients with symptomatic external snapping hip (SESH). In related hip disorders, PRT has proven to be feasible with high training adherence.
Purpose / Aim of Study: The primary purpose was to investigate whether PRT is feasible in patients with SESH and secondary, to explore potential effects of PRT on hip pain, hip-related function, awareness of the hip joint and muscle strength.
Materials and Methods: Nine patients with SESH were recruited for a 12-week supervised PRT intervention. Feasibility was measured by drop-out rate, adverse events, pain exacerbation (VAS) and adherence to the PRT. At baseline and at end of treatment patients completed the Copenhagen Hip and Groin Outcome Score (HAGOS), the Forgotten Joint Score (FJS), maximal voluntary contraction strength (MVC) for isometric, concentric and eccentric hip abduction and extension, one-repetition-maximum strength (1RM), and a loaded stair test (LST).
Findings / Results: Three patients (33%) dropped out during the PRT intervention. Few and minor adverse events were observed. Pain scores were acceptable (VAS < 50 mm) in 76% of all training sessions and a significant overall decrease in pain during PRT was found (-10.5 mm, 95% CI [-17.7 to -3.2]). Training adherence was 96.7 ± 4.2%. Per protocol analyses showed statistically significant and clinically relevant improvements ($p \leq 0.05$) in all HAGOS subscales (ranging from 27.5 to 41.7 points), FJS (+31.6 points), MVC strength for the most affected hip in concentric (+12.8%) hip abduction and isometric (+27.2%), concentric (+21.5%) and eccentric (+12.4%) hip extension, 1RM strength in leg press (+53.5%) and hip abduction for the most affected hip (+100.2%) and the least affected hip (+66.7%), and time to complete the LST (-25.4%).
Conclusions: PRT seems feasible in patients with SESH. Furthermore, the present study suggests that PRT may improve hip pain, function, awareness and muscle strength in these patients.

Pectoralis Minor Syndrome

166.

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Background: Thoracic outlet syndrome is a compression of the vessels and nerves to the upper limb. The most distale site of compression is the plexus brachialis under the pectoralis minor (PM) tendon. This can cause local pain and distal nerve affection of a second compression site in a "double crush" picture.
Purpose / Aim of Study: -
Materials and Methods: -
Findings / Results: 23 y/o girl with a history of 10 years handball, playing as goalkeeper presenting with carpal tunnel syndrome. She is twice decompressed on the clinical picture but has recurrence of symptoms. Neurophysiology is negative. On contact she presents with pain of the shoulder, scapula dyskinesia and fatigue of the hand on daily use. No nightly dysaesthesia. Continuous decreased sensibility of the median and radial nerve, together with decreased strength of high and low innervated muscles of same nerves. Positive Tinels of median nerve to infraclavicular level. Chest x-ray shows no cervical costa. MRI, EMG and nerve ultrasonography normal. On suspicion of pectoralis minor syndrome physiotherapy is initiated, worsening symptoms and following there is done ultrasonic guide botox injections in the thickest part of the PM. After 2 weeks relieve of symptoms but recurrence after 2 months. Another injection is made but again recurrence after 2 months. Surgery with a deltopectoral approach, a PM tenotomy from processus coracoideus with shortning of the tendon, is done. Physiotherapy with PM exercises shows gradual recovery. The patient is seen 6 months postoperative with full recovery of shoulder function without pain or fatigue. Distal normal sensibility.
Conclusions: Pectoralis minor syndrome (PMS) can present in a neurogenic disguise and can be difficult to classify. Rarely there will be a positive paraclinic picture. The patient history is often containing a trauma or sports with repetitive shoulder stress activity (handball, swimming and volleyball). Clinically there will be pain of the PM tendon and positive Tinels, "Upper Limb Tension Test" and "Elevated Arm Stress Test". A pectoralis minor muscle bloc can be used as a diagnostic tool. Neurophysiologically examination of the medial antebrachial cutaneous nerve shows good results. Surgery has a high success rate with no recurrence.

Hypermobility among patients with greater trochanteric pain syndrome

167.

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Background: Greater trochanteric pain syndrome (GTPS) is a common and disabling hip condition. Hypermobility has been suggested as a possible cause of GTPS.
Purpose / Aim of Study: The purpose of this study was to report the prevalence of hypermobility and to investigate its impact on hip-related function and awareness in patients with GTPS.
Materials and Methods: This cross-sectional study was based on a cohort of patients diagnosed with GTPS in the 2013-2015 period. Hypermobility was investigated with the Beighton Score and defined by a cut-off score ≥ 5. Data on patients' current hip function and awareness were collected with the questionnaires the Copenhagen Hip and Groin Outcome Score and the Forgotten Joint Score.
Findings / Results: A total of 612 patients with GTPS were identified based on the diagnosis system; out of those, 390 patients were assessed for eligibility, and 145 (37%) were included. The prevalence of hypermobility within this cohort was estimated to be 11% (95% confidence interval (CI): 3-26%) for males and 25% (95% CI: 17-34%) for females. No significant association was found between hypermobility and self- reported hip function and awareness.
Conclusions: The prevalence of hypermobility in patients with GTPS was high, but the prevalence of hypermobility did not influence hip function and awareness. The results were based on a very low response rate and should be interpreted with this in mind.

Reattachment of proximal avulsions of the hamstrings tendons is a good treatment in middle aged patients.

169.

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Background: It is documented in literature, that reinsertion of proximal avulsions of semitendinosus, semimembranosus and biceps femoris from the ischial tuberosity in younger patients, including athletes, result in good patient satisfaction and a high rate of return-to-sports. However, in a recent meta-analysis the complication rate was reported as 23 % There is very sparse evidence in literature in relation to treatment of middle-aged patients and patients who are past the acute phase. Middle-aged patients treated non-surgically have substantial strength deficits, but there is no difference in Lower Extremity Functional Score between series of surgically and non-surgically treated patients.
Purpose / Aim of Study: The aim of this study was to report the results of reinsertion or reconstruction of the proximal hamstrings in patients older than 35 years.
Materials and Methods: Consecutive patients operated since 2011 were included. Complications were recorded and patient satisfaction was registered at follow-up.
Findings / Results: Sixteen patients, mean age 52.4 year (range: (36-69) (8 women and 8 men) were operated. In 11 cases all three tendons (semitendinosus, semimembranosus and biceps femoris) had been avulsed and in 5 cases only two tendons. The mean interval between the injury and operation was 112 days (range 7-700). In 15 patients it was possible to reinsert the tendons directly onto the ischial tuberosity, and in one case it was necessary to reconstruct the tendons with allograft tendon material. There were no postoperative symptoms (temporary or permanent) from the sciatic nerve and no deep infections. At follow-up all patients were satisfied with the result.
Conclusions: Reattachment of proximal hamstrings avulsions show good results in middle- aged patients, and can be performed after the acute phase with positive result.

Validation of the PHAT-score for evaluation of proximal hamstring avulsions

170.

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Background: The surgical approach for treatment of proximal hamstring avulsions is increasing in prevalence in Denmark as the advancement in operative techniques yield better results. There is therefore a need for a tool in Danish, which assesses the patient's clinical condition pre- and postoperatively by utilizing patient reported outcomes.
Purpose / Aim of Study: The purpose of this study was to translate, test and validate the Perth Hamstring Assessment Tool (PHAT), an existing English self-reported questionnaire, for future utilization in a clinical setting.
Materials and Methods: Translation of the PHAT questionnaire was done following standardized translation protocol. Patients treated for hamstring injuries from 2010 to 2018 at RH Horsens were identified using the Danish electronic patient chart system.13 participants completed the questionnaire at baseline and at the 1-2 month follow-up via telephone. Data analysis was performed to test the internal consistency and reproducibility of the translated PHAT questionnaire.
Findings / Results: All 13 participants fully completed the questionnaire. Data analysis revealed a Cronbach's alpha of 0.87 at baseline and 0.85 at follow up, and a cumulative intra-class correlation coefficient of 0.677 from baseline to follow-up.
Conclusions: The study succeeded in the translation of the PHAT-score from English to Danish, supported by a high completion rate and high internal consistency. The limited number of included participants warranted for a more direct verbal contact to ensure the highest number of respondents. The approach may have had an effect on the statistical differences in reproducibility. A larger scale evaluation of the PHAT-score is required to further validate the Danish translation before the questionnaire can safely be utilized in a clinical setting for evaluation of patients with proximal hamstring avulsions. Due to the limited number of patients available at individual centers, the authors plan to initiate a multicenter study to achieve this task.

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