Risk factors for revision within 1 year following osteosynthesis of a displaced femoral neck fracture

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Background: Optimal treatment of displaces femoral neck fractures (d-FNF) has been debated and primary arthroplasty proposed due to high failure rates after osteosynthesis.
Purpose / Aim of Study: To evaluate risk of revision within 1 year after osteosynthesis of d-FNFs.
Materials and Methods: All surgeries for a FNF with parallel implants and available x-rays were collected from the Danish Fracture Database. Data included age, gender, ASA score and surgical delay (SD). X-rays were analysed for initial displacement, quality of reduction, Cortical Thickness Index (CTI), protrusion of implants in the joint (POI) and angulation of implants to the femoral shaft. Nondisplaced fractures with posterior tilt (PT) <20° were excluded. Data on revision (to arthroplasty or femoral head removal) and vitality was collected from the Civil Registrational System. Data was analysed by adjusted cox- regression analysis.
Findings / Results: 654 cases were included. Mean age was 69 years and 59% were female. 54% were Garden 2 with PT >20° or Garden 3 and 46% were Garden 4. 28% had surgery within 12h, 78% within 24h and 89% within 36h. 38% were sufficiently reduced, while the fracture was still displaced or with >10° PT in 62%. POI was present in 18 cases. 124 (19%) cases were revised and 117 (18%) died within 1 year. Female gender (HR 1.71), SD between 12-24h vs <12h (HR 1.66), Garden 4 type fracture (HR 3.00), insufficient reduction (HR 1.70) and POI (HR 2.32) were associated with significantly increased risk of revision. No association between revision risk and age, CTI or the angulation of implants was found.
Conclusions: These findings indicate that risk of revision is linked mainly to displacement and reduction of the fracture, with no apparent effect of age or the quality of the bone estimated by CTI. We suggest considering primary arthroplasty in all highly displaced fractures.