

Effect of early progressive resistance training compared to home based exercise after fast track total hip replacement -A randomized controlled trial

L. Ramer Mikkelsen¹, I Mechlenburg², K. Søballe², S. Mikkelsen¹, T. Bandholm³,
M. Krintel Petersen⁴,

1: Elective Surgery Centre, Silkeborg Regional Hospital, 2: Department of orthopaedic surgery, Aarhus University Hospital, 3: Physical Medicine & Rehabilitation Research – Copenhagen (PMR-C), Department of Physiotherapy, Department of Orthopedic Surgery, Clinical Research Centre, Copenhagen University Hospital, Hvidovre, 4: Department of Physiotherapy and Occupational Therapy, Aarhus University Hospital / Institute of public health, Aarhus University

Introduction & Aim

After Total Hip Replacement (THR) deficits in muscle strength and physical function persist (1). There is lack of evidence concerning which rehabilitation strategy is most effective and the amount of rehabilitation needed after fast track THR (2).

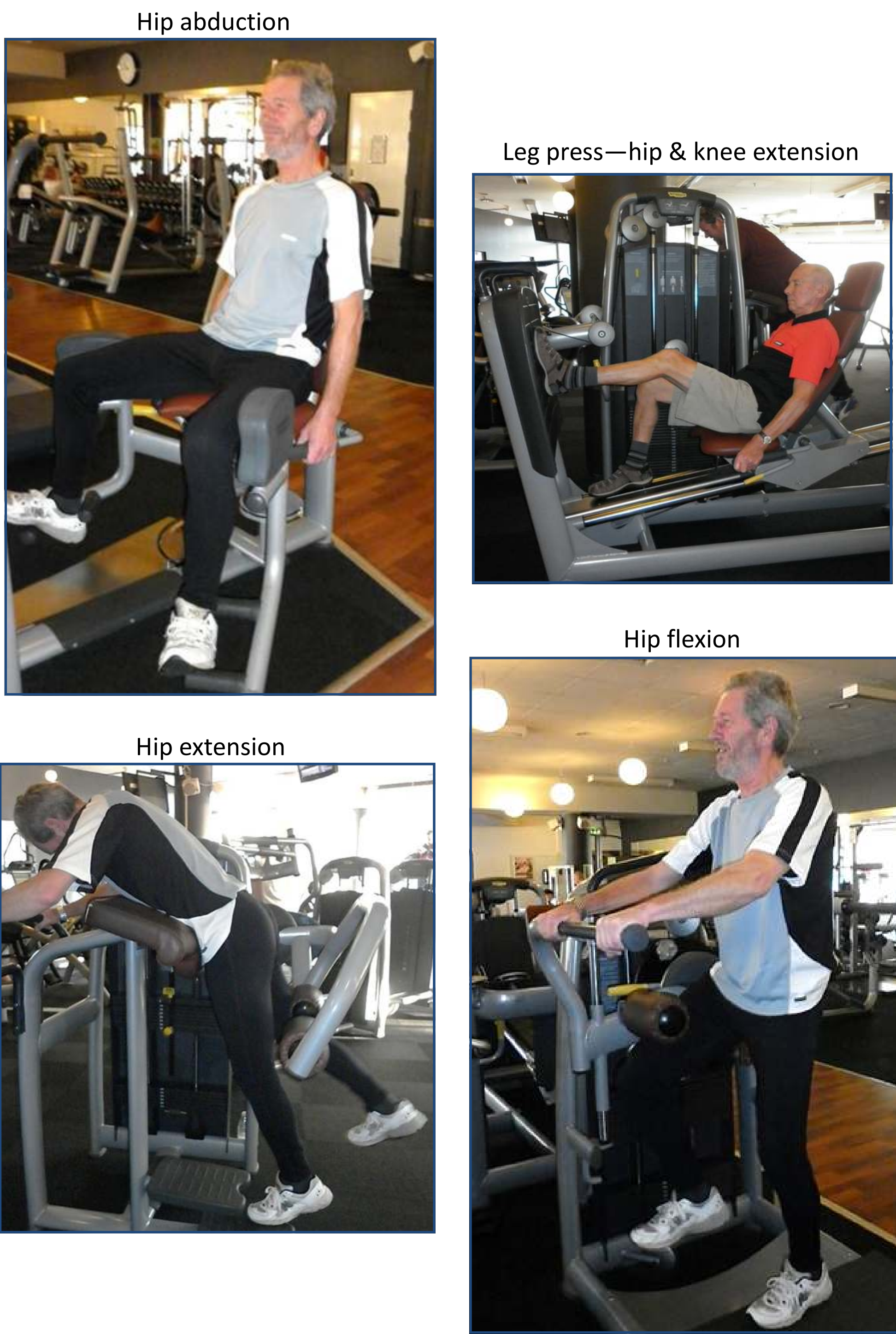
Aim of study

To investigate the effect of supervised progressive resistance training in the early rehabilitation phase after fast track THR in improving muscle strength and functional performance.

Material

A consecutive sample of 73 THR patients with pre-operative patient reported disability (HOOS ADL score <67) was consecutively included from Silkeborg Regional Hospital. Sixty-two patients completed the trial (31 in each group). Participants mean age was 64.9 years (SD 8) in the intervention group versus 66.8 years (SD 10) in the control group with 53% (IG) versus 57% (CG) being male.

The resistance training exercises



Interventions

Participants were randomly assigned to a control group (CG) or intervention group (IG) with different rehabilitation interventions:

CG: Home based exercise 7 days/week

IG: Home based exercise 5 days/week + progressive resistance training of hip and thigh muscles 2 days/week. The IG trained with relative loads of 8-10 repetition max starting within the first postoperative week and continued until 10 weeks after THR .

Measurements

Before surgery and after the intervention, performance was evaluated by; leg extension power (primary outcome), isometric strength (hip abduction + flexion), sit-to-stand test (STS), stair climb test and 20 meter walking speed.



Results

Data is presented in table 1. Leg extension power improved significantly in both groups, with no between group difference. Maximal walking speed improved more in IG than CG, p=0.05. No significant differences were found in the other outcomes.

Table 1. Results from the physical tests before surgery and after the intervention period

	Intervention			Control			P-value
	Baseline	Follow up	Difference	Baseline	Follow up	Difference	
Power rig (W/kg)	1.45 [1.3;1.7]	1.73 [1.5;1.9]	0.28 [0.1;0.4]	1.53 [1.3;1.8]	1.78 [1.6;2.0]	0.26 [0.0;0.5]	0.91
20 meter walk test (sec)	13.93 [12.1;15.7]	10.95 [10.1;11.8]	2.98 [1.8;4.2]	13.67 [12.4;15.0]	12.09 [11.2;13.0]	1.58 [0.8;2.4]	0.05
Hip abduction strength (Nm/kg)	0.82 [0.7;0.9]	1.04 [0.9;1.2]	0.22 [0.14;0.29]	0.92 [0.8;1.1]	1.03 [0.9;1.1]	0.11 [0.0;0.2]	0.07
Hip flexion strength (Nm/kg)	1.07 [0.9;1.2]	1.26 [1.1;1.4]	0.19 [0.1;0.3]	1.26 [1.1;1.4]	1.31 [1.2;1.5]	0.05 [-0.1;0.2]	0.09
Sit-to-stand test (reps)	11.74 [10.3;13.1]	14.58 [13.2;16.0]	2.84 [1.8;3.9]	11.70 [10.0;13.4]	13.10 [11.5;14.7]	1.40 [0.3;2.5]	0.06
Stair climb test (sec)	12.66 [9.6;15.7]	9.38 [8.2;10.6]	3.28 [0.8;5.7]	13.25 [10.7;15.9]	10.61 [9.2;12.1]	2.64 [0.7;4.6]	0.68

Conclusion

Home based exercise 7 days/week was equally effective as 5 days/week of home based exercise plus 2 days/week of supervised progressive resistance training in improving leg extension power, stair climb performance and hip flexion muscle strength after THA. Progressive resistance training in addition to home based exercise resulted in larger improvements in walking speed than home based training alone. For sit-to-stand performance and hip abduction strength, trends were in favour of resistance training.

References

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