

Progressive Resistance Training in Patients with Hip Dysplasia scheduled for Periacetabular Osteotomy

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Disclosures

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- Outside present study:
 - No conflicts of interest

Background

- Progressive resistance training (PRT) may be effective in:
 - Improving hip strength
 - Improving physical function
 - Reducing hip pain
 - Shown in patients with groin and hip OA-related pain
- No studies on patients with hip dysplasia

Holmich 1999, Kristensen 2012, Bennell 2011, Golightly 2012, Gill 2013, Hermann 2016, Steinhilber 2016

Purpose

- To examine if PRT is feasible in patients with hip dysplasia in terms of compliance, drop-outs, adverse events and pain responses to the training program
- A secondary purpose was to report data on changes in patient reported outcomes, functional tests and hip muscle strength

Design

- **Feasibility study**

- **Inclusion criteria**

- Diagnosed hip dysplasia and scheduled for periacetabular osteotomy
- Age \geq 18 years
- Lived within 50 km of Aarhus
- Able to transport herself to the training location

- **Exclusion criteria**

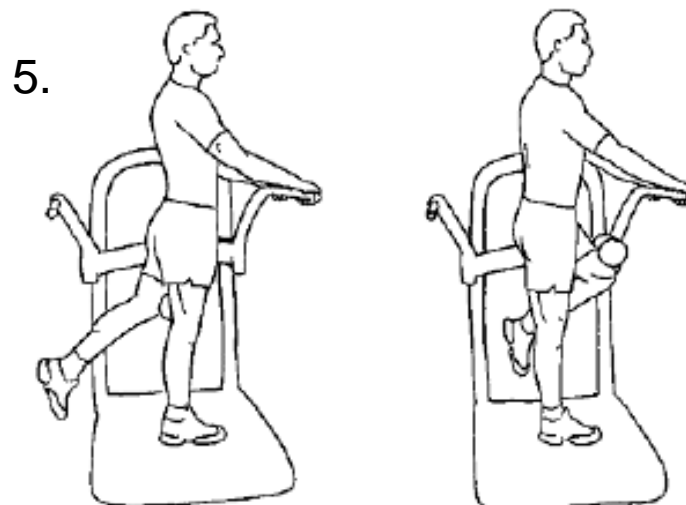
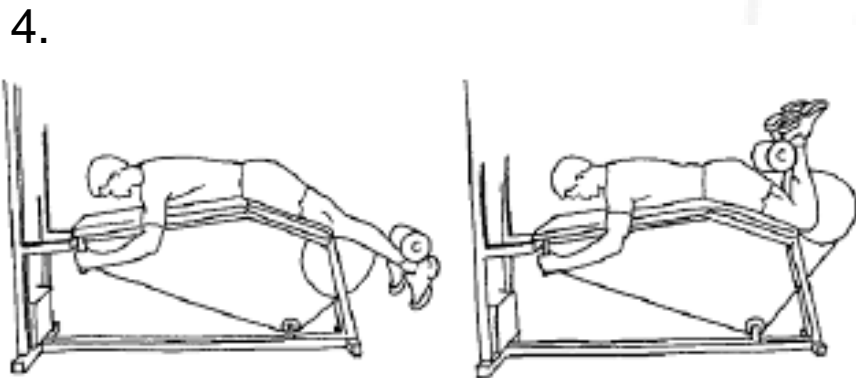
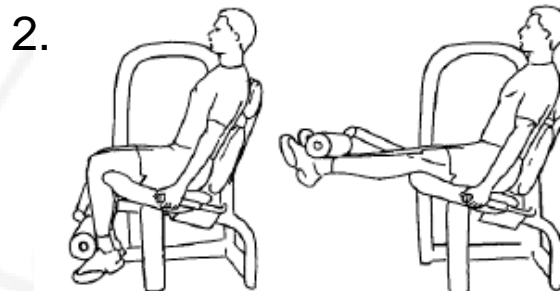
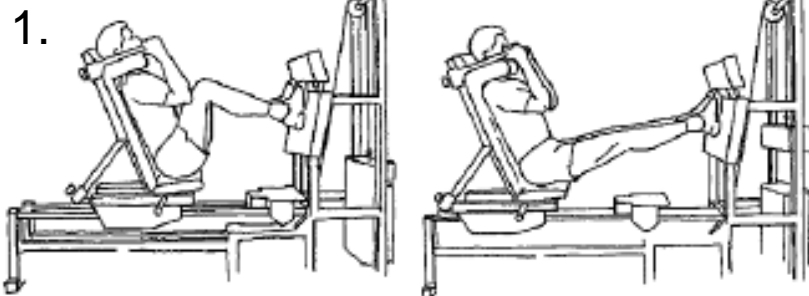
- Co-morbidities and history of previous surgical interventions affecting the function of their hip

Intervention

- 8-weeks of PRT with a total of 20 training sessions (5 sessions per 2 weeks)
- 5-10 min warm-up on a stationary bicycle
- 5 exercises: leg press, hamstring curl, walking lunges, knee extension, hip flexion

Week	1-2	3-4	5-6	7-8
Set	3	3	4	4
Repetitions	12	12	10	8
Intensity RM	15	12	10	8
Rest (in sec)	80	80	100	100

Exercises



Feasibility was assessed based on:

- VAS scores ≥ 50 (high-risk category)
- Drop-outs
- Adverse events
- Compliance to training ($\geq 80\%$)

Thomee A comprehensive treatment approach for patellofemoral pain syndrome in young women. *Physical therapy*. 1997;77(12):1690-703.

Test procedures

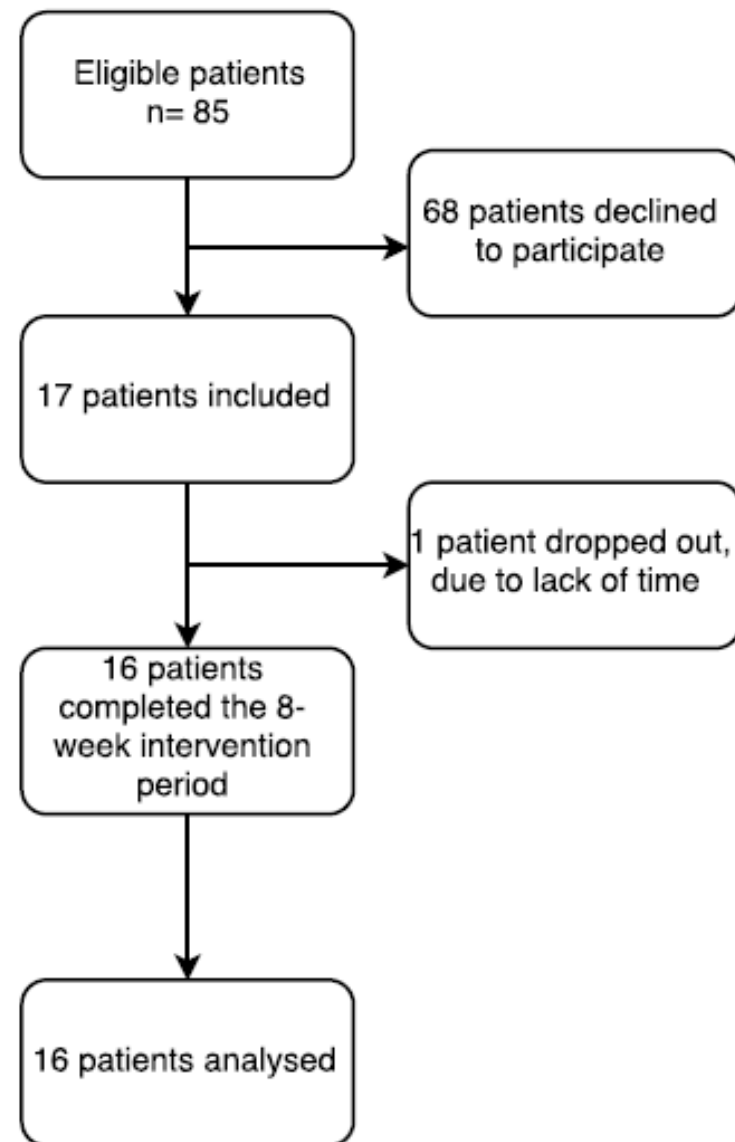
Pre- and post intervention:

- Copenhagen Hip and Groin Outcome Score (HAGOS)
- Functional tests:
 - Standing distance jump
 - Countermovement jump
- Muscle strength
 - Isometric
 - Isokinetic



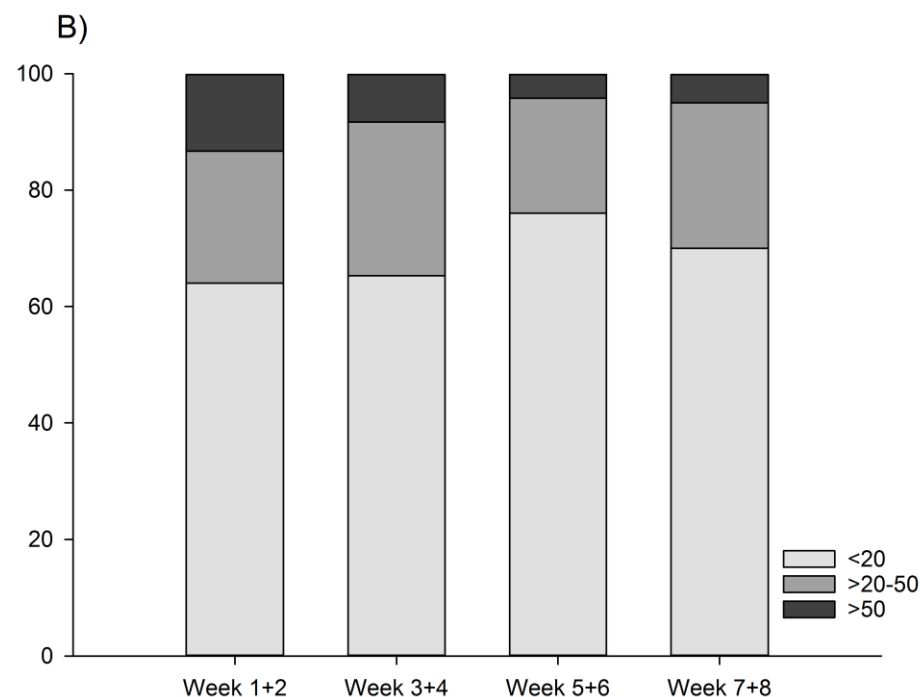
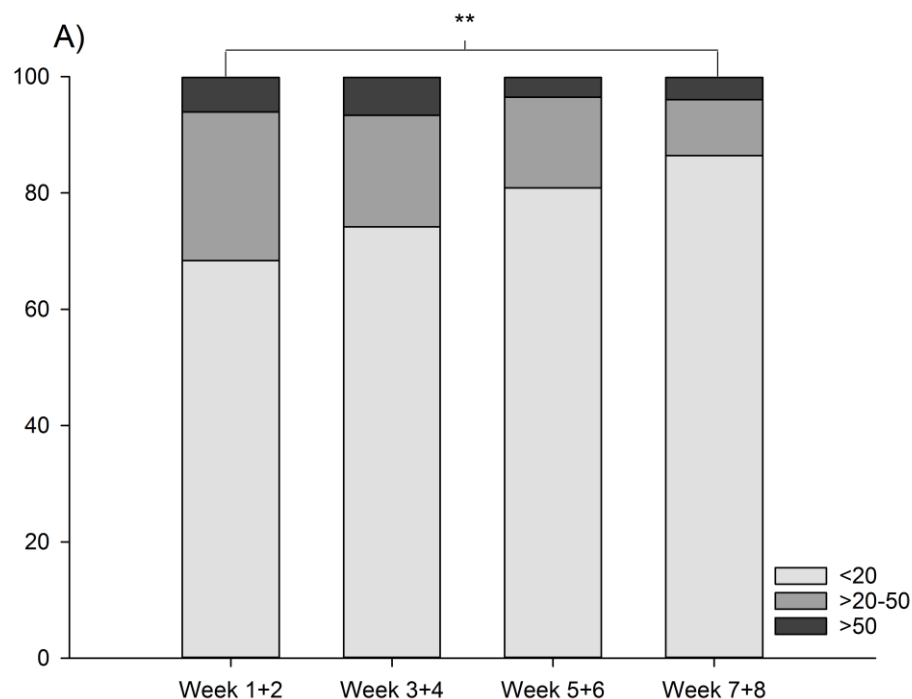
Feasibility outcomes

- 85 eligible patients, 17 included
- 1 dropped out
- Median age 28 years (22-40)
- 12/16 were women
- 12/16 had bilateral hip dysplasia
- 2/16 had previously PAO
- Average compliance 90.3%



Feasibility outcomes - pain

Pain responses to intervention



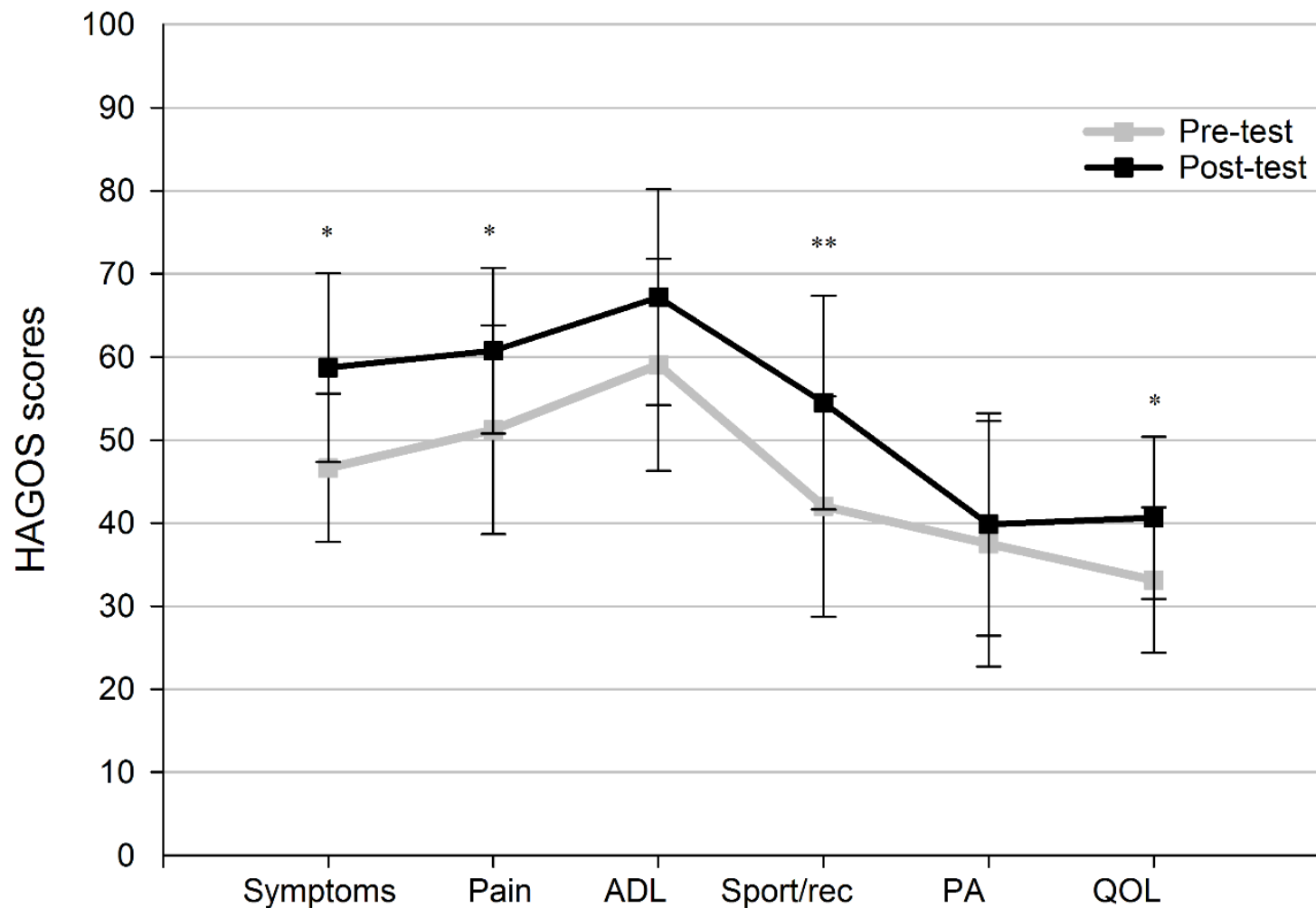
Pain immediately after training

Pain 1 day after training

Feasibility outcomes - adverse events

	Patients (n=16)	
Adverse Events	No. of patients	Patient fraction (%)
No. of patients cancelled sessions due to pain (no. of sessions cancelled per person)	4 (5, 2, 3, 1)	25%
Self-reported knee joint symptoms	3	18.8%
Injured index finger	1	6.3%

Secondary outcomes - HAGOS



Secondary outcomes - functional tests

Outcome	Pre-test	Post-test	Change	P-value
SDJ (cm)				
Affected side	93.7 [77.7, 109.8]	102 [88.3, 115.7]	8.3 [1.2, 15.3]	0.025
Non-affected side	91.4 [73.6, 109.1]	100.7 [84.1, 117.3]	9.3 [4.0, 14.6]	0.002
CMJ (cm)				
Affected side	10.2 [7.7, 12.8]	12.0 [9.8, 14.2]	1.8 [0.7, 2.9]	0.005
Non-affected	11.3 [9.0, 13.6]	12.2 [10.2, 14.3]	0.9 [-0.2, 2.0]	0.092



Secondary outcomes - muscle strength

MVC (Nm)	pre-test	Post-test	Change	P-value
Isometric hip flexion				
Affected side	121.4 [95.4, 147.4]	125.8 [104.9, 146.7]	4.4 [-9.6, 18.4]	0.516
Non-affected side	124.7 [102.0, 147.4]	135.7 [110.9, 160.5]	11.0 [1.1, 21.0]	0.032
Isokinetic hip flexion				
Concentric				
Affected side†	115.7 [95.1, 136.2]	131.5 [109.1, 153.9]	15.8 [5.9, 25.8]	0.004
Non-affected side	121.5 [97.2, 145.7]	129.3 [108.9, 149.8]	7.9 [-6.0, 21.7]	0.245
VAS (mm) pain during MVC				
Affected side	25.2 [9.7, 40.5]	9.0 [0.9, 17.0]	-16.1 [-31.8, -0.4]	0.045
Non-affected side	8.7 [0.0, 18.6]	7.6 [0.0, 15.7]	-1.1 [-12.5, 10.4]	0.842



Conclusion

- Progressive resistance training in patients with hip dysplasia scheduled for PAO is feasible
- PRT may improve pain, patient reported outcomes, function and flexion muscle strength
- In future RCT, we plan to add hip abduction and extension exercises to increase hip muscle strength

Thank you

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