Recovery of Maximal Lower Limb Strength in 40 - 65 year old patients following Total Hip Replacement

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INTRO: Muscle weakness in elderly is prevalent and closely linked to functional decline, falls and possible injuries (1) but also lower limb explosive power has been associated with functional difficulties even more than strength itself (2). Immobilization due to pain or major surgery can further accelerate such decline (3). We prospectively investigated muscle strength and impact of surgery in a group of pt. before and after elective total hip replacement (THR).

METHODS: N=26, (age 55.9 ± 4.8; height 174 ± 8; BMI 27.1 ± 4.5, sex F:M 9:18) with unilateral OA participated. Post-lat. approach was used. Preop. no training and postop. fully weight-bearing was allowed and pt. were instructed to follow a home-based rehab. Both the affected (AF) and the non-affected (UN) leg were assessed pre, 8 and 26W post using a custom-made dynamometer. In vivo peak torque and rate of torque development were measured during unilateral isometric knee ext. and flex. and during hip ext., flex., abd. and add. All tests performed with visual feedback of the exerted force (5). Paired students t-test used for groups and ANOVA for repeated measures over time (α=0.05).

RESULTS: The preliminary results were calculated as % of the UN side. Side-to-side deficits for the AF side ranging from 47.6 to 1.1% and the principal deficit were observed for hip flex. (47.6%). Hip flex. being sig. more impacted then the other muscle groups. Pre. all but hip ext. showed a sig. torque deficit for the AF side. At 8W all deficits became sig. and at 26W the hip add. and hip flex. deficit remained sig. whereas hip abd. and hip ext. only tended to be reduced (p=0.15 & 0.17). Knee flex. and knee ext. were normalized. A sig. reduction over time for all muscle groups expect hip ext. was observed.

DISCUSSION: The study showed that hip muscle torque was sig. reduced in OA pt. After 26W isometric torque did not normalize for hip add. and hip flex. Despite some improvement over time hip flex. remained sig. weaker after 26W (32.4%). Shih et al., 1994 showed that isometric torques for hip flex., -ext. and abd. of AF hips had not caught up to the UN hips in the 1 year follow-up period (5), and an ongoing study by Rasch et al., 2008 (abstract) reported a 15, 10, 16 % deficit for hip ext., -flex. and abd. respectively after 26W (6). Both studies recommend more qualified rehab. in order to achieve a more rapid recovery.

CONCLUSIONS: In the OA limb a persisting loss in maximum muscle torque was observed for hip add. and –flex. and a trend observed for abd. and hip ext. after 26W of conventional home-based rehab.

(1) Portegijs et al., J Am Geriatr Soc., 54(3), 551-3, 2006
(2) Skelton et al., Age Ageing, 31(2), 119-25, 2002
(3) Suetta et al., J. Appl. Physiol., 102(3), 942-8, 2006
(6) Rasch et al., EFFORT 2008, abstract