

Operative versus Nonoperative Treatment of Proximal Hamstring Avulsions

Elsa Pihl, Sofia Laszlo, Anne Mari Rosenlund¹, Målfrid Holen Kristoferssen², Jörg Schilcher³, Carl Johan Hedbeck⁴, Mikael Skorpil⁵, Chiara Micoli⁶, Martin Eklund⁶, Olof Sköldenberg⁴, Frede Frihagen⁷, Kenneth B Jonsson⁸

¹ Institute of Clinical Medicine, University of Oslo, N-0407 Oslo, Norway. Division of orthopedic surgery, Oslo University Hospital, Oslo, Norway, ² Department of Orthopedic Surgery, Haukeland University Hospital, Bergen, Norw, ³ Department of Orthopedic Surgery and Department of Clinical and Experimental Medicine, Faculty of Health Sciences, Linköping University, Linköping, Sweden. Wallenberg Centre for Molecular Medicine, Linköping University, Linköping, Sweden, ⁴ Karolinska Institutet, Department of Clinical Sciences at Danderyds Hospital. Danderyds Hospital, Department of Orthopedics, Stockholm, Sweden, ⁵ Karolinska Institutet, Department of Molecular Medicine and Surgery, Stockholm, Sweden, ⁶ Karolinska Institutet, Department of Medical Epidemiology and Biostatistics of Medical Epidemiology, ⁷ Institute of Clinical Medicine, University of Oslo, N-0407 Oslo, Norway. Department of Orthopaedic Surgery, Østfold Hospital Trust, N-1712 Grålum, Norway, ⁸ Uppsala University, Department of Surgical Sciences, Uppsala University Hospital, Uppsala, Sweden

Background

Operative treatment is widely used for acute proximal hamstring avulsions, but its effectiveness compared to nonoperative treatment has not been demonstrated in randomized trials.

Methods

In this noninferiority trial, ten centers in Sweden and Norway enrolled patients aged 30–70 years old with a proximal hamstring avulsion in a randomized and a parallel observational cohort. Treatments were operative reinsertion of the tendons or nonoperative management. The primary endpoint was the Perth Hamstring Assessment Tool (PHAT) at two years of follow-up. Secondary outcomes included the Lower Extremity Functional scale.

Results

We enrolled 119 patients in the randomized trial and 97 in the observational cohort. In the per protocol analysis of the randomized trial, the mean (\pm SD) PHAT scores were 79.9 (19.5) and 78.5 (19.4) in the operative and nonoperative groups, respectively. The prespecified non-inferiority limit of 10 points was not crossed (mean difference, -1.2; 95% [CI], -8.6 to 6.2; $p=0.009$ for noninferiority). Analyses of secondary outcomes, including a mean difference in the LEFS score of -1.6 (CI, -5.2 to 2.0), aligned with the primary outcome. The observed numbers of adverse events in the randomized trial were 9 in the operative vs. 3 in the nonoperative group (odds ratio: 0.30 [CI, 0.1to 1.2]). In the analysis of the observational cohort, the mean PHAT score difference was -2.6 (CI, -9.9 to 4.6).

Conclusion

In 30–70-year-old patients with proximal hamstring avulsions, nonoperative treatment was noninferior to operative treatment.