Proximal Hamstring Tendon Avulsion Repair in Aging Patients

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INTRODUCTION:

Aging is an intricate process involving the accumulation of numerous molecular changes that result in pathological modifications to normal physiological functions. It has been established that degenerative changes are commonly found in the tendons of people over 35 years of age.

From a biological perspective, increased tendon age results in decreased collagen synthesis and an increased production of enzymes that break down collagen. This can lead to a decreased tendon tensile strength with greater risk of injury. There are several risk factors associated with proximal hamstring avulsion injuries in aging athletes including a history of hamstring injuries, leg muscle imbalances, and poor leg flexibility or muscle conditioning. Other risk factors include participation in high-intensity sports or activities, a high body mass index, and underlying comorbidities including diabetes or osteoporosis. The objective of this study was to assess proximal hamstring avulsion repair in patients with aging tendons.

METHODS: A retrospective review of patients over the age of 40 with proximal hamstring tendon avulsion injuries who underwent surgical repair was conducted. We identified 76 patients who were treated between 2010 and 2022, of which 36 were over the age of 40 years. Demographic data and surgical details were reported. Postoperative patient-reported outcome measures (PROMs) included the Perth Hamstring Assessment Tool (PHAT), the Lower Extremity Functional Score (LEFS), the Marx Activity Rating Scale (MARS), the Single Assessment Numeric Evaluation (SANE), the Short Form 12 (SF-12) physical (PCS) and mental (MCS) components, and patient satisfaction (0-10 scale). All patients had their injuries confirmed by magnetic resonance imaging (MRI). Patient follow-up assessment included the mechanism of injury, activity levels before and after injury, recovery periods, residual pain, and functional deficits. Specific attention was given to pain and deficit in relation to the level of activity.

RESULTS:

Twenty-two patients, 13 females and 9 males consisting of 13 with left side avulsions and 9 with right side avulsions, were included in this study. The mean age at the time of surgery was 55.7 ± 8.5 years, the average BMI was 27.7 ± 6.7, 19 patients sustained a three-tendon avulsion, 1 patient sustained a two-tendon avulsion, 2 patients sustained a one-tendon avulsion, and the average retraction amount was 5.0 ± 3.0 cm. Seventeen patients were treated acutely, 5 patients were treated chronically, 21 patients were treated with anchor repairs, and 1 patient was treated with a site-to-site repair. The mean follow-up time was 69.5 ± 21.6 months. Mean follow-up PROMs included a PHAT score of 85.1 ± 15.8, a LEFS score of 72.6 ± 11.4, a MARS score of 7.5 ± 5.9, a SANE score of 90.2 ± 10.1 %, and a SF-12 PCS of 50.2 ± 7.4 and MCS of 56.9 ± 4.3. The average patient satisfaction was 9.5 ± 0.9. Following surgery, all tendons appeared intact and re-inserted at the ischial tuberosity via ultrasound and physical examination. Upon physical examination, 1 patient experienced pain upon palpation at the ischial tuberosity, the average concentric strength was 4.7 ± 0.5, and the average eccentric strength was 4.7 ± 0.5. The typical injury mechanism was described as improper body position resulting in forced, severe hip flexion while the knee was maintained in extension. Tennis players and water-skiers that suffered injuries also experienced leg abduction.

DISCUSSION AND CONCLUSION:

Aging patients with proximal hamstring avulsion injuries were surgically repaired and demonstrated positive results upon postoperative PROM assessments and physical evaluations. Patients performed well despite a high average age at the time of surgery. Further studies should be conducted to determine the effect of age on hamstring tendon function following surgical repair.