A Comparative Analysis of Outcomes Using PROMIS after Surgical Versus Nonsurgical Treatment of Achilles Rupture

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INTRODUCTION: Achilles tendon rupture is a common injury in the adult population. The role of surgical and nonsurgical management remains controversial with the development of functional rehabilitation programs. The purpose of this study is to evaluate and compare the patient-reported outcomes using Patient-Reported Outcomes Measurement Information System (PROMIS) after surgical and nonsurgical treatment of acute Achilles rupture. PROMIS is a valid, reliable, and effective tool to evaluate patient outcomes after treatment for Achilles ruptures. Our hypothesis is that there is no significant difference in PROMIS scores between patients undergoing surgical compared to nonsurgical treatment of Achilles rupture.

METHODS:

Under an IRB-approved protocol, Achilles rupture was identified using ICD 9 and ICD10 codes of 727.67 and S86.0. Patients who underwent Achilles tendon primary repair were identified using CPT code 27650 (Repair, primary open or percutaneous, ruptured Achilles tendon). Revision Achilles repair and chronic Achilles ruptures were excluded. All patients treated nonsurgical underwent a strict functional rehabilitation protocol. We included patients treated between 1/1/2015 and 11/30/2022. PROMIS physical function (PF), pain interference (PI), and depression scores were routinely collected prospectively during the initial office visit and follow-up appointments. A distribution-based method used to determine the minimal clinically important difference (MCID), which was 1/2 standard deviation of each PROMIS domain. A medical records review was performed to collect patient demographic data. Statistical analysis was used to compare preoperative and postoperative scores and significance was indicated when $P<0.05$.

RESULTS:

A total of 216 patients with Achilles tendon rupture were included (115 nonsurgical versus 101 surgical). Patients treated nonsurgically (age: 45.1 ± 15) were significantly older than those treated surgically (age: 35.6 ± 12.3; $p<0.001$). Sex distribution among the nonsurgical and surgical groups were similar (18.3% vs. 17.8% Female, $p=0.933$). The surgical group had a lower BMI compared to nonsurgical group (27.8 ± 4.3 vs. 29.5 ± 5.3; $p=0.004$). There is no statistical difference in the Achilles tendon rerupture rate between both treatment groups (surgical: 2% vs. 4.3%; $p=0.344$). Both treatment groups are effective in improving PROMIS PF, PI, and depression scores ($p<0.001$). The mean PROMIS PF change (pre- to post-treatment) is significantly greater in the surgical, compared to the nonsurgical group (13.2 ± 13.9 vs. 9.5 ± 12.5; $p=0.042$). There was no difference pre- vs. post-treatment in mean PROMIS PI change (operative: -12.5 ± 11.5 vs. -10.8 ± 11.1; $p=0.134$) and PROMIS depression (operative: -3.9 ± 7.7 vs. -5.2 ± 9.3; $p=0.201$). MCID thresholds for the nonsurgical vs. surgical group were calculated as 5.7 vs. 6.3 in PROMIS PF, 4.3 vs. 4.2 in PROMIS PI, and a 4.15 vs. 4.9 in PROMIS depression, respectively. There is no difference in the number of patients that achieve MCID for PF, PI, and depression among both treatment groups at the 6-months follow-up period.

DISCUSSION AND CONCLUSION:

In patients with Achilles tendon rupture, surgical management may lead to statistically significant improvements in patient-reported physical function. However, nonsurgical management was associated with similar overall rates of rerupture, PROMIS PI and depression outcomes, and chances of meeting MCID as those who underwent surgical intervention. Both surgical and nonsurgical management of Achilles tendon rupture are successful treatment options and lead to significant improvement in physical function, pain interference, and depression PROMIS scores. However, there may still be some benefit to performance and function with operative intervention.