Trans-osseous versus Anchor Repair of Acute Patellar Tendon Ruptures

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INTRODUCTION

• Patellar tendon ruptures are relatively uncommon injuries that require prompt diagnosis and surgical repair to restore the extensor mechanism of the knee. 1,7,10
• Traditional method of tendon repair requires sutures passed through trans-osseous tunnels, and tying of the sutures on the superior pole of the patella or tibial tubercle. Outcomes are generally reported to be positive. 2,10
• Suture anchors have gained popularity with recent cadaveric studies demonstrating significantly less gap formation during cyclic loading and higher ultimate failure loads. 13,14
• Prior retrospective studies have shown good clinical results of suture anchor repair, but with a small number of patients. 15

AIM

• We present the largest series of patellar tendon repairs and compare the clinical outcomes and complications of trans-osseous (TO) and anchor (A) repair types.
• We hypothesize that suture anchor repair will have lower re-rupture rates and complications, than trans-osseous tunnel repair types.
• In addition, we aim to better characterize the patient demographics, comorbidities, and mechanism of injury in a large cohort of patients.

METHODS

• All patients who underwent a primary repair of traumatic patellar tendon rupture within 45 days of injury, between 2007 and 2016, were retrospectively reviewed. Surgeries were performed at a multi-surgeon (114 surgeons), multi-center (13 centers) community-based integrated health care system.
• Exclusion criteria included chronic injuries, those requiring allograft, tears in patients who have undergone total knee arthroplasty, concurrent or prior fracture of the patella or other fracture about the knee, quadriceps tendon rupture, associated tumor, or open injuries.
• Patient demographic information, repair type, complications, time from surgery to release from medical care, and rate of re-rupture and re-operation were recorded.
• Baseline characteristics were compared by repair type. Chi-square test of used for comparisons between continuous age, BMI, tourniquet time, and re-operation were recorded.

RESULTS

• 361 patients (374 knees) met our inclusion criteria.
• The average age was 39.8 years (9 to 86 years).
• There were 341 males (94.5%).
• 13 had bilateral repairs during our study period.
• There were 321 TO and 54 A repairs. There was a significant difference in re-rupture between TO (14.2%) and A (0%) (P=0.034). Using logistic regression, we found that TO had 3.244 times the odds of re-operation as those with A (95% CI: 0.757,13.895. p-value:0.1129) but did not reach significance.
• The infection rate was 7.5% for A and 1.6% for TO (P=0.160). There was no difference in time to release from medical care, 18.4 weeks vs. 17.1 weeks (P=0.92).
• A limitation of this study lies in the larger number of trans-osseous repairs analyzed compared to a smaller cohort of anchor repairs. This limits our power to draw conclusions. The difference in rupture rate, however, with zero ruptures in our anchor group reached statistical significance.
• Conclusions. The difference in rupture rate, however, reached statistical significance.

CONCLUSIONS

• Compared to transosseous sutures, primary repair of patellar tendon ruptures with suture anchors demonstrated statistically significant decrease in re-rupture rate, but there was no difference in re-operation rate, infection, or release from medical care.
• Regarding the demographics of this injury, we found an age range similar to prior studies with an average age near 40. We also found a disproportionately large number of African Americans patients (43.4%). Obesity was common among the cohort with an average BMI of 31. The majority of ruptures occurred during basketball play (47%)
• Interventions directed at this high risk demographic could potentially reduce the incidence of the injury. Primary care physicians, athletic coaches, and trainers could educate regarding the risk of tendon rupture in the susceptible population. Basketball and other activities involving rapid acceleration may be substituted with lower impact exercise and weight loss.
• A limitation of this study lies in the larger number of trans-osseous repairs analyzed compared to a smaller cohort of anchor repairs. This limits our power to draw conclusions. The difference in rupture rate, however, with zero ruptures in our anchor group reached statistical significance.
• Given our promising retrospective data, randomized controlled trials may be undertaken to more rigorously analyze the difference in treatment. Suture anchors may be a preferred alternative to the gold-standard of trans-osseous sutures with the benefit of reduced re-rupture rates.
• Cost benefit analysis should also be undertaken to assess if there is justification to employ the more expensive suture anchor repair technique.