A Novel Adjunctive Technique for Protecting Repair of Chronic Patellar Tendon Ruptures following Total Knee Arthroplasty

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INTRODUCTION

Patellar tendon ruptures are the most devastating injuries in orthopedics, especially following total knee arthroplasty (TKA), and may be acute (<6 weeks post injury) or chronic.

Chronic ruptures are the more disastrous and difficult to repair due to soft-tissue contracture, avascular scarring and proximal patellar migration. Despite having multiple surgical reconstructive techniques available, patellar tendon rupture repair results are reported to be unpredictable, involve subsequent loss of leg extension, loss of activities of daily living (ADL), loss of independence and result in poor patient satisfaction. We present a novel adjunctive technique for protecting the patellar tendon repair, independent of the repair technique selected.

METHODS

After knee exposure is achieved through a standard midline incision, the patellar tendon rupture is assessed for degree of soft-tissue contracture, avascular scarring, and proximal patellar migration. The adjunctive protective wire technique includes the use of a Dall-Miles “type” braided cable passed through the tibia approximately 1-2cm distal to the tibial tuberosity and laid on the sub-acute soft-tissue gutters of the knee. Utilizing an “In-N-Out, In-N-Out” weave through two separate stabs, the wire is passed through the quadriceps approximately 1-2cm above the patella, looped around the superior aspect of the patella, brought together for tightening and final crimping. While tensing the wire loop, the patella and patella tendon will advance and come together enough for tendon repair. In addition, prior to final crimping of the two ends of the wire, the leg is manually raised with a hand behind the knee, allowing for passive range pf motion (ROM) against gravity in which the tensed wire loop restricts flexion to between 30° and 45°, thus protecting the repair from undo tension from excessive, early ROM. The repair of the patella tendon is performed with an anchor suture with at least three fiber wires utilizing a suturing technique that the surgeon deems appropriate. Most often, its recommended to augment the repair. We prefer fascia lata or on global defect, allograft. Mesh is not recommended for these reconstructions. For the early post-operative period (3 to 4-weeks) it is necessary to maintain full extension. Then, in two-week increments thereafter, the patient can begin to advance ROM from 0° to 30°, 0° to 45°, and 0° to 60°. After achieving 60° ROM the patient is told to maintain this ROM limit for 3 additional months. After which they will stretch out enough to achieve to $\geq$ 90° within months 4 to 6.

DISCUSSION/CONCLUSION

We have described a surgical technique, and rehabilitation, for protecting patellar tendon rupture repairs. Short- to intermediate-term follow-up reveals that most patients (>70%) have achieved and maintained 0° to 90° ROM. The reported short-to-intermediate term failure rate in the literature ranges from 30% and has exceeded more than 50%. The failure rate with this described technique is less than 10% (we also include those patients with an extension lag >10° as a failure). This unique technique is reproducible, reliable, with less complications when compared to current literature, while contributing to improved patient independence, activities of daily living, and overall satisfaction.