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CORR Insights®: Novel Augmentation Technique for Patellar Tendon Repair Improves Strength and Decreases Gap Formation: A Cadaveric Study

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Where Are We Now?

Patellar tendon tears occur most commonly either at the lower pole of the patella or in mid-substance [10]. The injury can be disabling, and surgical repair is performed in patients who are fit for surgery

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This *CORR Insights®* comment refers to the

in the hope of restoring the lost extensor function [6]. It is not clear which of these two types of patellar tendon tears carries a better prognosis. Although several studies have described patellar tendon repairs with and without augmentation, we really do not know which approach is better. Biomechanical studies have compared the efficacy of various techniques, but a consensus regarding the preferred repair method could not be reached [2, 5, 7, 11].

Black and colleagues performed an elegant laboratory study using

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cadaveric samples to produce a lesion of the patellar tendon. The authors compared the simple suture technique to their novel figure-of-eight suture technique. The results are compelling, and confirm the potential advantages of the novel technique versus traditional end-to-end repair.

Early mobilization following repair and reconstruction procedures for the entire musculoskeletal system is well recognized [13]. Musculoskeletal injuries, including patellar tendon tears, require repairs that should be strong enough to withstand the stresses imposed by motion, loading, and, possibly, weight bearing. To this end, there are advocates for the use of bone anchors [8], which can be hard to use well, and which are expensive. The search is on for the ideal repair.

Where Do We Need To Go?

When the patellar tendon ruptures, the tendon is not neatly transected. Even in avulsions from the lower pole of the

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patella, the tendon is shredded, presenting a horse-tail or mop-head appearance. Torn tendons often show evidence of marked tendinopathic changes, with necrotic and malacic areas. These pathological changes, intrinsic to these lesions, would be difficult or impossible to reproduce in a laboratory study. Therefore, in order to better simulate the actual clinical picture, researchers should consider making several longitudinal tenotomies of the tendon before transecting it.

In the quest for the strongest materials, the use of nonabsorbable sutures remains popular, especially in North America. However, there is evidence [1] that absorbable materials are safer, as they do not act as a permanent foreign body, and are therefore less likely to contribute to infection. Since suitably strong absorbable materials are commercially available, surgeons should consider switching to biologically friendly materials, such as polyglactin, polydioxanone, and polyglyconate.

How Do We Get There?

Orthopaedic surgeons often think that stronger is better. Although the current study shows a statistically favorable increase in mechanical performance, we must determine if that percentage matters in a clinical practice setting.

Black and colleagues indicated an increase in mean load to failure of around 15%. However, the force generated by a quadriceps contraction is many times what even the modified technique would be able to withstand [3, 4, 9, 12]. Consequently, patients will still need to be immobilized. The technique advocated by Black and colleagues involves more surgical steps than the control technique, likely prolonging the operation. One has to consider whether prolonging the operation for an improved biomechanical performance, which may not produce any benefits in terms rehabilitation, is worthwhile.

Biomechanical studies of suture strength in cadaver or other models are a good start, but they are only a start. What matters is whether they heal, how they perform when used in our patients, and whether any observed differences are clinically important. To demonstrate this, only adequately powered randomized controlled trials with appropriately chosen outcome measures, and suitably long followup will do.

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