Achilles tendon ruptures

What is the optimal treatment?

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The optimal treatment of acute Achilles tendon ruptures has been a subject of debate for many years. The decision to forego nonoperative treatment and elect for surgical repair has been driven by earlier studies showing a lower risk of rerupture with surgery, but at the expense of a higher risk of soft tissue complications including infection and impaired wound healing [1].

Historically, nonoperative treatment consisted of cast immobilization, but with the emergence of functional bracing and early motion protocols, nonoperatively treated ruptures now show similar rerupture rates and functional outcomes as surgery, but with less risk of complication [2]. The exact definition of functional rehabilitation varies widely and may refer to early motion, protected weight bearing, or a combination of both. Typically, the patient is immobilized in a cast of splint for one to two weeks then transitioned to a controlled ankle motion (CAM) walker with initiation of gentle stretching and resistance exercises that progress over time. Some protocols may initiate protected motion by means of a rigid boot that is removed by the patient for daily range of motion exercises, while others use an adjustable, non-removable short-leg orthotic that allows progressive, restricted ankle motion [3].

Functional rehabilitation has demonstrated lower rerupture rates compared to those previously reported for cast immobilization. Most importantly however, some [4, 5], but not all [6], recent randomized control trials comparing functional rehabilitation to surgical repair show no difference in rerupture rate. Soroceanu et al. performed a meta-analysis of ten randomized control trials consisting of 418 pooled patients treated operatively and 408 patients treated nonoperatively. They reported no statistically significant difference in the risk of rerupture comparing operative and nonoperative treatment when the latter consisted of functional bracing and early motion (absolute risk difference 1,7 %, p = 0.45) [2]. If however, nonoperative treatment consisted of immobilization then surgery reduced the absolute risk of rerupture by 8,8 % (p = 0.010).

The only differences that have been shown are in time to return to work and plantarflexion strength. Soroceanu et al. found that operative treatment was associated with earlier return to work by up to 19 days [2]. However, specific criteria for return to work were not clearly defined and likely varied between pooled studies. In 144 patients, Willits et al found a small, yet statistically significant increase (14,15 %, 95 % confidence interval 1,12 % to 27,19 %) in plantarflexion strength after operative repair at one and two years [4]. Although the clinical significance of this difference is unknown, it is an important factor to consider when treating elite athletes.

Like earlier meta-analyses comparing surgery to immobilization, recent trials show that the risk of non rerupture complications is significantly lower with nonoperative treatment [1, 2]. This has led to newer surgical techniques that involve smaller incisions and less soft tissue devitalization. Ma and Griffith first reported on a percutaneous technique for suture repair of the Achilles tendon in 1977 using 3 medial and lateral stab incisions to pass and tie a suture between the proximal and distal tendon ends [7]. Percutaneous Achilles tendon repair is associated with decreased wound complications without increase in sural nerve injuries or rerupture rates [8].

Percutaneous Achilles tendon repair however, provides no access to visualize final tendon apposition or judge the quality of the repair. To ensure that tendon length is adequate, Kakiuchi devised a limited open technique that utilizes a small incision over the site of the Achilles tendon rupture while the suture repair is accomplished percutaneously by passing suture within the paratenon [9]. This technique has been improved upon with modern instrumentation that simplifies percutaneous suture passage through the tendon within the paratenon.

Conclusion

Nonoperative treatment of acute Achilles tendon ruptures should consist of functional rehabilitation, which in several studies has been shown to be superior to cast immobilization. Rerupture rates and functional outcomes with functional rehabilitation are similar to operative treatment while avoiding postoperative complications. While operative treatment is associated with increased complications including wound infections, newer less invasive techniques have decreased these risks without increasing rerupture rates and should be strongly considered if operative treatment is selected. Operative treatment has been shown to provide earlier return to work and slightly stronger plantarflexion strength, and should be considered in athletes.

Literature

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