Acute Rupture Open Repair Techniques

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KEYWORDS

• Achilles tendon • Acute rupture • Open repair • Limited open • Surgical technique

KEY POINTS

- Achilles tendon ruptures may be treated operatively or nonoperatively; however, the current literature remains controversial.
- Open surgical intervention has historically resulted in lower rerupture rates but higher complication rates.
- Limited open surgical repairs provide adequate end-to-end tendon repair, with improved cosmesis and lower risk for skin complications.

INTRODUCTION

The Achilles tendon is the strongest tendon in the human body and is the main contributor to plantarflexion of the ankle.[1] Consisting of the medial gastrocnemius, lateral gastrocnemius, and soleus, the Achilles tendon is surrounded by a paratenon and attaches to the calcaneal tuberosity. The region, 2 to 6 cm proximal to the calcaneal insertion, has the smallest cross-sectional area and is the most common site of rupture.[2] Approximately 9% of ruptures occur proximally at the musculotendinous junction, 72% occur in the middle portion of the tendon, and 19% occur distally at the tendinous insertion.[3] Ruptures may be partial or complete and are misdiagnosed in 20% to 25% of patients.[4] These injuries are more common in men than in women during the third to fifth decade with an incidence of about 18 per 100,000 persons.[5–7] The injury often involves a noncontact mechanism, such as forceful dorsiflexion of a plantarflexed ankle or vigorous push-off with an extended knee, but may also involve a direct injury, such as laceration or direct blow.[4,6] Most patients experience a sudden snap or shooting pain and are able to be diagnosed by history and physical examination. Imaging studies are not routinely required but may be useful if the diagnosis is questionable. Associated patient factors that may predispose to Achilles rupture

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include, but are not limited to, fluoroquinolone use, local corticosteroid administration, underlying systemic inflammatory conditions, endocrine dysfunction, and infection.[4]

Historically, operative treatment has been associated with lower rerupture rates and better functional outcomes compared with conservative treatment.[8–10] A Cochrane database meta-analysis in 2010 revealed a rerupture rate of 12.6% with conservative treatment compared with 3.5% with surgical treatment after analyzing 14 different studies.[11] Proponents of surgical intervention also cite the benefits of direct tendon apposition, earlier motion, and earlier weight bearing. However, more recent literature comparing operative and nonoperative intervention is less clear.[12,13] Advocates of nonoperative treatment report lower overall complication rates compared with surgery, excluding rerupture, along with similar patient outcomes if treated with appropriate protocols.[14]

Operative techniques for acute Achilles tendon ruptures can be generalized into 3 categories: open repair, limited open repair, and percutaneous repair. Open Achilles tendon repairs, specifically, have been described by the American Academy of Orthopaedic Surgeons (AAOS) as “a procedure using an extended incision for exposure, allowing visualization of the rupture and tendon to allow direct placement of sutures for repair.”[15] Although studies have supported better cosmetic results with limited open or percutaneous repairs, there are concerns for increased rerupture rates and sural nerve injuries compared with open repair.[16] Studies have also shown a remaining tendon gap when using percutaneous techniques that takes longer to disappear on MRI compared with open techniques.[17]

INDICATIONS/CONTRAINDICATIONS

- Indications
  - Acute ruptures (<3 weeks)
  - Young patients
  - Active lifestyle
- Contraindications
  - Chronic ruptures (>3 weeks)
  - Elderly with limited functional demands
  - Tobacco addiction
  - Alcohol addiction
  - Chronic cortisone treatment
  - Vascular disease
  - Severe comorbidities (renal disease)
  - Risk for wound complications
  - Diabetes
  - Neuropathy
  - Local/systemic dermatologic disorders
  - Obesity
  - Sedentary lifestyle

AUTHORS’ PREFERRED METHOD FOR ACUTE PRIMARY RUPTURES

The authors work with our referring urgent care centers, emergency departments, and primary care physicians to immediately immobilize acute Achilles tendon ruptures into equinus with a well-padded splint. We recommend that all acute Achilles tendon ruptures be referred to our office within 24 hours if possible.

Acute ruptures with minimal (<2 cm) gap are offered nonoperative treatment or surgical treatment. Surgical treatment is offered only to patients who are nonsmokers and

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