Acute Achilles Tendon Ruptures

Does Surgery Offer Superior Results (and Other Confusing Issues)?

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KEYWORDS

• Achilles tendon rupture • Operative repair of Achilles • Percutaneous tendon repair • Functional rehabilitation

KEY POINTS

- Nonoperative management of Achilles ruptures has gained popularity in recent years because studies have shown improved results with functional rehabilitation in terms of re-rupture rates.
- Operative treatment includes open and percutaneous techniques, both of which have shown excellent results, although recent studies have shown decreased complication rates with percutaneous repair.
- Prophylaxis against thromboembolic events is controversial, and to date there is no strong evidence to support its use in patients with Achilles rupture.

INTRODUCTION

Despite being the strongest and largest tendon in the body, the Achilles tendon is the most frequently ruptured.[1–3] Acute ruptures of the Achilles tendon most commonly occur during high-impact sports, such as ball or racket games.[4–10] The mechanism of rupture has been divided into 3 categories[11,12]:

1. Weight bearing with the forefoot pushing off and the knee in extension (most common)
2. Sudden unexpected dorsiflexion of the ankle
3. Violent dorsiflexion of a plantarflexed foot

Several studies have shown a male preponderance of 75% to 80% of ruptures, with mean ages between 37 and 42 years.[7,9,10,13–17] One recent study[18] reported that 46% of ruptures occurred in women, a fact attributed to the popularity of netball in that

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region, which is played competitively almost exclusively by women. This finding raises the question of whether simply being male is a risk factor, or whether it is more related to participation in certain activities.

The incidence of rupture has been increasing for the last several decades. In Sweden from 1950 to 1979, the incidence was 9 per 100,000, primarily in individuals between 40 and 50 years of age.[7] At that time more than half of the injuries occurred during sport, with the most common being badminton and soccer. A study by Leppilahti and colleagues[6] found an incidence in Finland of 18 per 100,000 in 1994, with a younger peak age group of 39 to 40 years. Houshian and colleagues[4] found an even higher rate over a similar time period in Denmark. More recently, Huttunen and colleagues[5] found the incidence to have increased dramatically from 2001 to 2012. For men, the incidence increased from 47.0 to 55.2 per 100,000 person-years; in women it increased from 12.0 to 14.7 per 100,000 person-years over the same time interval. Although the highest incidence occurred in men aged between 40 and 59 years, the largest increase was in men more than 60 years of age (29.6 per 100,000 person-years in 2001 to 62.9 per 100,000 person-years in 2012). The incidence declined by 28% in men between 18 and 39 years of age over that time. Most of these studies attribute the increase in incidence of acute ruptures to the growing number of older individuals participating in high-impact athletics; tendons in younger individuals have higher tensile rupture stress and lower stiffness than older tendons.[19]

DIAGNOSIS ISSUES

However, 20% to 25% of acute Achilles tendon ruptures are misdiagnosed initially.[1,3,20] Nevertheless a thorough physical examination and history taking should lead to an expedient diagnosis.

Many patients report pain in the back of the ankle, and often the feeling that they had been kicked or struck in the back of the ankle. Most do not have the ability to bear full weight on the affected limb; however, a small percentage of patients present with little pain and the ability to ambulate.

Clinical examination in the acute setting typically shows edema, bruising, and often a palpable gap within the tendon approximately 3 to 5 cm proximal to its insertion. Many patients may be able to actively plantarflex the ankle using secondary muscles (flexor hallucis longus, flexor digitorum longus, posterior tibialis, and peroneal muscles). The Simmonds or Thompson test is performed by squeezing the calf with the patient in the prone position and the knee flexed. This test assesses the integrity of the soleus musculotendinous unit. When intact, plantarflexion occurs at the ankle primarily because of posterior bowing of the calf tendons.[21] When the tendon is ruptured, a positive test shows no plantarflexion of the ankle. This test has shown sensitivity of 0.96 and specificity of 0.93.[3]

The American Academy of Orthopaedic Surgeons clinical practice guidelines on Achilles tendon ruptures suggest that a detailed history and physical examination be performed and should include 2 of the following tests to establish the diagnosis: positive Thompson test, decreased ankle plantarflexion strength, presence of a palpable gap, increased passive ankle dorsiflexion with gentle manipulation.[22] Garras and colleagues[8] described a combination of 3 physical examination findings that led to 100% sensitivity for diagnosis of a complete rupture: a positive Thompson test; decreased ankle resting tension with the patient in the prone position and the knee flexed to 90° (Matles test), compared with the contralateral side (normal is 20°–30° of plantarflexion); and a palpable defect in the Achilles tendon.