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Safety of Achilles Detachment and Reattachment Using a Standard Midline Approach to Insertional Enthesophytes

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ABSTRACT

Detachment with reattachment of the Achilles tendon is a common surgery for debridement of retrocalcaneal exostosis, bursitis, and other insertional pathologic entities. The technique involves a midline skin incision on the posterior Achilles to the tendon. The distal Achilles attachment is removed in a U-shaped manner, leaving the medial and lateral flares, but exposing the posterior spur. This midline approach provides excellent exposure and allows for rapid and efficient surgical debridement. The tendon is reapproximated and repaired with a suture anchor to facilitate fixation to the posterior calcaneus. Some surgeons have expressed concerned that the rupture risk could be increased in the postoperative period using this technique. The present study was a retrospective medical record review of 98 patients (100 feet) who had undergone a midline approach with Achilles reattachment after insertional Achilles debridement during a 3-year period. The demographic and comorbidity data were collected and analyzed. The outcome measures were postoperative rupture and the need for revision surgery. The mean age was 51.9 years, and the patients included 59 females (60.2%) and 39 males (39.8%). The complications included 4 rupture or avulsion revisions (4.0%) and 2 recurrent pain and tendinitis revisions (2.0%). The most common repeat repair procedure included hardware removal and a flexor hallucis longus transfer or augmentation. Nine patients (9.0%) had wound complications, 7 (77.8%) of which necessitated incision and drainage. The midline approach with Achilles detachment and reattachment is a safe and effective method of surgical treatment of insertional Achilles pathologic entities. The low reoperation rate of 4.0% will allow foot and ankle surgeons to safely rely on this approach.

Posterior heel pain can be multifactorial and can be attributed to traumatic, metabolic, or altered biomechanical forces. Often a retrocalcaneal spur, or exostosis, will be the cause of symptoms and sequelae of prolonged Achilles tendinitis or tendinosis. The site will often be irritated by shoe gear and range of motion (1). This exostosis and its associated bursa are a source of recurrent pain and local inflammation. In 1938, Ghormley (2) wrote about the etiology and anatomy of these exostoses and related them to "tendonitis ossificans traumatica" and a form of periosteal ossification. Classifications have also been described by Morris et al (3) for Achilles tendon calcifications according to the anatomic location. Type I extends from the posterior calcaneus. Type II is within the tendon, approximately 0.5 to 3 cm proximal to the insertion. Type III lesions are located $\leq$12 cm proximal to the insertion.

Radiographically, one can usually appreciate intratendinous calcifications or an enlarged retrocalcaneal exostosis. Conservative measures include weightbearing restrictions, stretching, activity limitations, and nonsteroidal anti-inflammatory use. Conservative treatment should typically be used for a course of 3 to 6 months before surgical intervention is considered. In cases of advanced pathologic features or pain, this period can be shortened (4). Operative care has been described as a lateral, medial, or midline incision through skin and a U-shaped full-thickness Achilles detachment from its insertion centrally, resection of the exostosis and inflamed tendon, and reinsertion of the tendon with 1 or 2 suture anchors. Many different anchor types have been described for the use of tendon to bone healing (5–9). Reattachment at physiologic tension is quite important to prevent contracture and laxity. The Achilles tendon absorbs approximately 900-kg of force during aggressive exercise, and it is imperative to regain that strength postoperatively (10).

The postoperative care should typically include a period of nonweightbearing with progressive passive range of motion to maintain appropriate plantar flexion. Nunley et al (11) reported a 96% satisfaction rate for 27 patients with this type of approach during a 7-year follow-up period. No patients developed an Achilles rupture within

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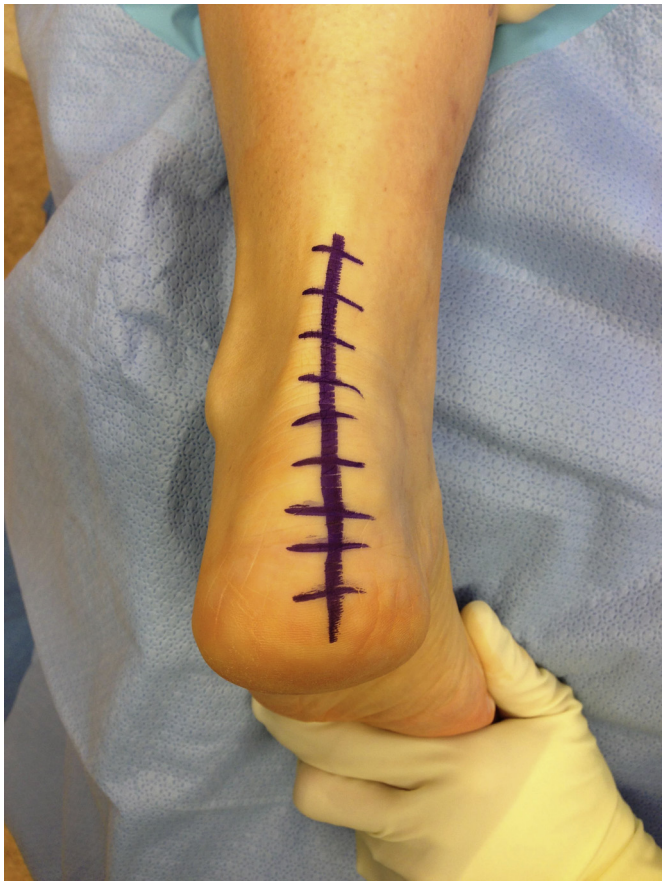

Fig. 1. Midline incision.

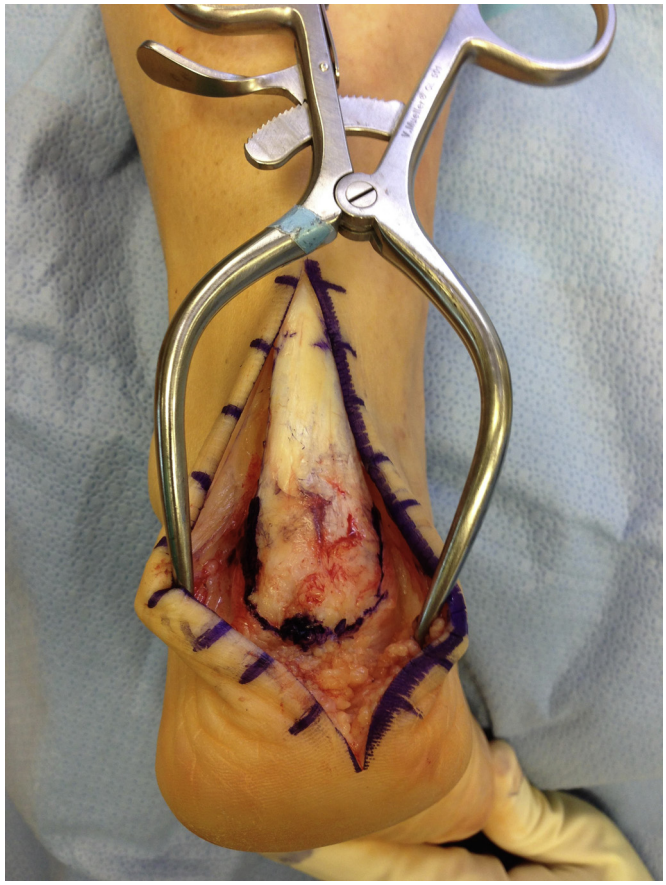

Fig. 2. U-shaped distal tendon incision.

the long-term follow-up period. The published data have reported other postoperative complications such as avulsions related to falls or tripping but at a low overall rate of 11% (12–14). The aim of the present investigation was to calculate the incidence of complications associated with detachment of the Achilles tendon using a midline incisional approach for the treatment of insertional tendinitis. To this end, we undertook a retrospective cohort study. We hypothesized that we would find the intervention was safe and associated with a low incidence of complications. The purpose of the present study was to report on the safety and low complication rate for the midline approach with reattachment of the Achilles tendon for insertional Achilles tendinitis.

Patients and Methods

The institutional review board approved the retrospective medical record review of the patients who had undergone a midline approach with Achilles detachment and repair of insertional pathologic features. Our study was not funded by any research grant or foundation. The medical records were reviewed for complications related to primary reattachment of the Achilles tendon for insertional tendinitis from February 2009 to May 2012 performed by 4 fellowship-trained foot and ankle surgeons at 1 institution. The patients were identified by appropriate Current Procedural Terminology codes for calcaneal exostectomy (code 28120) or Achilles tendon debridement (code 27650). The patients were included if they were ≥18 years old and had undergone the procedure as described. The patients were excluded if they had undergone primary repair with tendon augmentation or were <18 years old. The indications for surgical treatment included failed conservative measures (e.g., physical therapy, nonsteroidal anti-inflammatory drugs, immobilization) and clinical findings of insertional Achilles tendinopathy. In many cases of continued insertional pain despite conservative care, magnetic resonance imaging was used preoperatively and revealed intrasubstance signal abnormalities.

The study-independent variables included demographic data (e.g., age, height, weight, tobacco use, ethanol use, pertinent medical history). The study-dependent variables included the interval between the primary and revision procedures (if applicable), complications, and revision procedure performed. One of the authors (J.E.M.) reviewed all the patients' medical records and was not involved in any operative care. Through the medical record review, we focused on identifying any confounding variables, which might have played a role in the reoperation for each patient, if necessary. In the cases of reoperation, the reasons for continued pain versus repeat repair of rupture or avulsion were documented. The type and number of anchors used for reattachment were also recorded. Specific to the present study, we defined a safe surgical outcome as no repeat operation or revision procedure. The demographic and clinical characteristics were analyzed using Statistical Analysis Systems, version 9.3 (SAS Institute, Cary, NC), using frequencies and percentages for categorical variables and the mean ± standard deviation for continuous variables. The median and range for continuous variables are also presented.

The primary surgical technique was performed with the patient in the prone position and under a regional popliteal nerve block and general anesthesia. A well-padded, ipsilateral thigh tourniquet was set to 300 mm Hg. The operative limb was prepared and draped in the normal surgical fashion. The operative limb was then exsanguinated with an Esmarch bandage to the level of the tourniquet, and the tourniquet was inflated to 300 mm Hg. A midline incision was marked and made with a surgical blade. The approach for this technique was centered on the distal Achilles tendon (Fig. 1). The 6- to 8-cm incision was started approximately 6 cm proximal to the insertion of the tendon. It ended just distal to the insertion on the posterior calcaneus. Care was taken to ensure the incision was finished just distally to the insertion such that the surgeon could appreciate the extent of the insertion and resect the entire spur or spurs. The incision was then deepened to the level of the tendon, keeping the subcutaneous tissue and paratenon in 1 thick layer. A U-shaped, full-thickness incision of the Achilles tendon was made from medially to laterally, just below its insertion (Fig. 2). This maintained the medial and lateral tendinous attachments in an attempt to prevent rupture or avulsion (Fig. 3). Next, using a curved osteotome or microsagittal saw, the retrocalcaneal exostosis was resected, and any sharp edges were smoothed using a power rasp (Fig. 4). If an inflamed retrocalcaneal bursa was present, it was also excised. Intraoperative fluoroscopy was used to ascertain successful bone resection. If necessary, the hypertrophic Achilles tendon insertion was also debulked and repaired. At this