FOOT AND ANKLE

Safety and outcome of surgical debridement of insertional Achilles tendinopathy using a transverse (Cincinnati) incision

This is a prospective analysis on 30 physically active individuals with a mean age of 48.9 years (35 to 64) with chronic insertional tendinopathy of the tendo Achillis. Using a transverse incision, the tendon was debrided and an osteotomy of the posterosuperior corner of the calcaneus was performed in all patients. At a minimum post-operative follow-up of three years, the Victorian Institute of Sports Assessment scale – Achilles tendon scores were significantly improved compared to the baseline status. In two patients a superficial infection of the wound developed which resolved on antibiotics. There were no other wound complications, no nerve related complications, and no secondary avulsions of the tendo Achillis. In all, 26 patients had returned to their pre-injury level of activity and the remaining four modified their sporting activity. At the last appointment, the mean pain threshold and the mean post-operative tenderness were also significantly improved from the baseline (p < 0.001). In patients with insertional tendo Achillis a transverse incision allows a wide exposure and adequate debridement of the tendo Achillis insertion, less soft-tissue injury from aggressive retraction and a safe osteotomy of the posterosuperior corner of the calcaneum.

In insertional Achilles tendinopathy, symptoms occur at the bone-tendon junction. The distal portion is affected in 24% of patients, but the actual incidence of insertional Achilles tendinopathy is unknown. Conservative measures are helpful in most patients, and include rest, ice, non-steroidal anti-inflammatory drugs, careful selection of footwear and activity modification. Eccentric exercises of the gastro-soleus complex are effective in only 32% of patients, with 67% of promising clinical results in patients undergoing a new model of painful eccentric calf-muscle training. Alternatively, extracorporeal shock wave therapy is more effective than other measures, but it may not be widely available. Conservative management fails in 10% of patients and surgery is then indicated. Different surgical options have been described, including bursectomy, excision of the diseased tendon, resection of any calcific deposit, and removal of the prominent posterolateral corner of the calcaneum. The traditional longitudinal extensile incisions, such as isolated medial or lateral, concurrent medial and lateral, posterior central splitting and hockey-stick transverse incisions, are prone to complications of wound healing and breakdown and iatrogenic nerve injury. Soft-tissue endoscopic procedures have been suggested as an alternative, and retrocalcaneal endoscopic decompression may have fewer skin-related complications, whereas an additional tenodesis with a knotless absorbable screw may reduce the risk of infection and fistulas reported with the use of less absorbable and braided sutures. We described the use of a transverse skin incision close to the insertion of the tendo Achillis to obtain a wide exposure of the area and the distal tendo Achillis. Using this approach, debridement of the peritendinous and tendon tissues, and, when necessary, superficial and deep Achilles bursectomy, can be performed. In addition, this transverse skin incision allows wide access to the posterosuperior corner of the calcaneum for an osteotomy. The purpose of the present investigation is to describe the primary outcomes (Victorian Institute of Sports Assessment scale – Achilles tendon score (VISA-A) and safety of this procedure.

Patients and Methods

This is a prospective study involving analysis of clinical and functional data on 30 consecutive physically active patients, comprising nine women and 21 men with a mean age of 48.9 years (35 to 64), with chronic insertional Achilles tendinopathy operated on at our institution between 2002 and 2007. They had experienced symptoms of pain, swelling, burning
and stiffness over the posterior aspect of the tuberosity for a mean of 20 months (14 to 45) prior to surgery, and had a bony prominence of the posterosuperior corner of the calcaneal tuberosity on plain lateral radiographs. Those who had received less than six months of conservative management, those who had undergone previous surgery on the affected tendon and those with metabolic, inflammatory and autoimmune disease were excluded, as were smokers, patients who had radiological evidence of calcific insertional tendinopathy, and those who had taken systemic corticosteroids or fluoroquinolones for at least three years before symptoms had begun. All patients had received some conservative management, including complete or modified rest from their sport, several (three to five) one week cycles of non-steroidal anti-inflammatory drugs, physiotherapy with eccentric exercises, cryotherapy, deep frictional massage, ultrasound therapy, pulsed electro-magnetic fields, laser therapy and orthotics. All patients had been given at least one peritendinous or intrabursal ultrasound-guided injection of corticosteroids or aprotinin, with partial, temporary or no benefit. A total of 18 patients were secondary referrals from family practitioners or physiotherapists, and 12 were tertiary referrals from other orthopaedic surgeons or sports physicians. The scientific and ethical contents of this study were in compliance with guidelines by our institutional review board and all patients gave their written consent.

The diagnosis of insertional tendinopathy with no calcific component was confirmed in all patients by a lateral radiograph of the calcaneum and ankle (Fig. 1). On ultrasound scans, all patients had an increased antero-posterior (AP) diameter of the distal 3 cm of the tendon, with occasional loss of the normal intratendinous texture. An independent Consultant Radiologist with a special interest in musculoskeletal diseases measured the maximum AP diameter of the tendon, and compared this with the contralateral tendon (9.5 mm (SD 2.8) versus 6.1 mm (SD 1.9), p = 0.05).

All surgical procedures were performed by a single experienced surgeon (NM) under general anaesthesia. Pre-operative anatomical markings include the tendo Achillis and the calcaneal tuberosity. A 7 cm to 10 cm semi-circular transverse skin incision is made over the area of tendinopathy, which appears typically erythematous and swollen, with a prominent tuberosity of the calcaneum (Fig. 2). After haemostasis, the subcutaneous bursa of the tendo Achillis is completely excised, the tendinopathic insertional area is identified and the tissue is debrided from the healthy tissue. The medial and lateral margins of the tendo Achillis are identified and the space in front of it is exposed revealing the bursa which is excised, allowing full access to the posterosuperior corner of the calcaneum. It is therefore not necessary to detach the tendon from its insertion onto the calcaneum to gain access to this area. An osteotomy of the posterosuperior corner of the calcaneum is performed, making sure that no sharp edges of bone are left to impinge on the insertion of the tendo Achillis on dorsiflexion of the ankle. After thorough irrigation with normal saline, the transverse skin incision is sutured with subcuticular absorbable sutures and steri strips. A below-knee weight-bearing synthetic cast is applied with the foot plantigrade.
Results

No patient was lost to follow-up. The mean follow-up was 39 months (37 to 73). The mean time interval between referral and operation was 7.4 months (4.2 to 11.0). All patients gradually improved in symptoms initially related to their sporting activities and subsequently affecting daily activities. The mean VISA-A score improved from 62 (49 to 75; 95% confidence interval (CI) 59.8 to 64.2) preoperatively to 88 (77 to 96; 95% CI 85.8 to 90.2) at final follow-up (p < 0.001).

All patients were able to fully weight-bear on the operated limb by the end of the first post-operative week. Two patients developed a superficial wound infection, both of which healed uneventfully after two weeks of antibiotics. Iatrogenic rupture or detachment of the tendon Achilles, wound breakdown, scar adhesion, complex regional pain syndrome and sural nerve injury did not occur. No patients complained of hypersensitivity or loss of sensation at or around the wound. At final review, all patients were satisfied with the appearance of their scar. On inspection and palpation, the operated tendon appeared thicker than the other side in all instances.

Twenty-six patients returned to their pre-injury level of activity at a mean of 32 weeks (24 to 38) after surgery. The remaining four patients did not return to their normal levels of sporting activity, despite prolonged supervised postoperative physiotherapy, with cryotherapy, massage, ultrasound, pulsed magnetic and laser therapy. However, these four patients did not experience problems in their daily activities, and kept fit by swimming, cycling, rowing and exercising using a stair climber.

At the last follow-up, 26 patients (86.7%) reported a 1 (completely recovered) or 2 (much improved) score, whereas the remaining four patients reported a score of 3 (little improved) compared with their baseline status.

At the last follow-up, the mean pain threshold of 3.9 kg (2.7 to 4.8) was significantly (p < 0.001) improved from the baseline mean of 1.1 kg (0.3 to 1.5). The mean postoperative tenderness was significantly improved at 7.5 (5.5 to 8.9) compared with the baseline level of 2.7 (1.4 to 3.9, p < 0.001).

Discussion

In the treatment of insertional Achilles tendinopathy, conservative management is the traditional first line approach; however, scanty data and variable success rates do not provide convincing evidence for its use.

Our main finding was a statistically significant improvement in the VISA-A score in a cohort of 30 active patients with insertional Achilles tendinopathy treated surgically via a transverse incision.

There is currently no consensus on the optimal surgical management of this condition; many techniques have been described, but the evaluation of operations has been predominantly retrospective and inconclusive. Unfortunately, given the lack of standardised methods to assess the...
severity of the condition, it is difficult to compare the various studies. Various surgical approaches to the Achilles insertion have been described, including a medial J-shaped incision, a lateral incision, and a combination of two incisions, medial and lateral. A posterior midline central tendon splitting approach has also been described to improve access to the tendon, but, though popular, the published experience with this approach is relatively limited. A medial or lateral approach may result in limited exposure, inadequate debridement and soft-tissue injury from aggressive retraction. The transverse incision used in our patients allows the surgeon to assess the whole of the tendon Achilles insertion, to identify easily how much tendon is abnormal and needs to be debrided, and to safely perform the osteotomy of the posterosuperior corner of the calcaneum, which has been recommended in order to remove the impingement that may contribute to the symptoms (Fig. 3). The transverse incision allows wide exposure of the area of interest, so we have now extended its use to patients with calcific insertional tendinopathy, in whom the insertion of the tendon Achilles may have to be at least partially detached to excise the calcific deposit(s), and then perform the osteotomy of the posterosuperior corner of the calcaneum.

At a mean follow-up of three years, our patients had less pain and a significantly improved mean VISA-A score of 88 compared with before the index procedure. As observed in previous studies, all our patients had thickening of the tendon Achilles after surgery. Its significance, though uncertain, is likely to be a physiological response to surgical trauma. Most patients had returned to their pre-injury level of activity after surgery. Only four patients (13.3%) did not return to their normal levels of sporting activity, but they did not experience problems in their daily activities, and modified their sporting activities. We stress that the recovery period following the operative management of insertional tendinopathy is not insignificant, and patients, physiotherapists and coaches should be educated that attempts at early return to sport may compromise the results of technically well-performed surgery.

With regard to the safety of this procedure, there were no complications such as iatrogenic rupture or detachment of the tendon Achilles, wound breakdown, scar adhesion or complex regional pain syndrome. The surgery did not require detachment and reinsertion of the tendon. Given the anatomy of the hindfoot, the sural nerve is prone to injury with troublesome symptoms. To minimise the risk of this injury, surgical incisions should be parallel to nerves. Although this semi-circumferential transverse incision is almost perpendicular to the course of the sural nerve, at the level of the insertion of the tendon Achilles the nerve has split into multiple small branches, and is therefore not at risk. No patient reported numbness around or distal to the incision. In the hindfoot, once transverse scars have healed, the cosmetic appearance is excellent (Fig. 4). They are less likely to develop tethering, hypertrophy and contracture than longitudinal scars.

An overall complication rate of 11% has been reported in a large series of patients undergoing surgery for chronic Achilles tendinopathy, with a 4.7% complication rate for the subgroup of patients with insertional tendinopathy. This included skin necrosis in one patient, superficial wound infection in another, hematoma in two more, and fibrotic reaction or scar formation in one. Other authors have reported avulsion of the tendon Achilles, which mostly occurs following a fall during the early post-operative period. Major wound complications are rare, but
potentially devastating; however, the most common complications reported are hypersensitivity, hypertrophy and numbness of the scar. Delayed wound healing, superficial plications reported are hypersensitivity, hypertrophy and numbness of the scar. Delayed wound healing, superficial plications reported are hypersensitivity, hypertrophy and numbness of the scar.

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References


