The Journal of Foot & Ankle Surgery xxx (2016) 1–5

Contents lists available at ScienceDirect

The Journal of Foot & Ankle Surgery

journal homepage: www.jfas.org

Case Reports and Series

Dual Window Approach With Two-Side Screw Fixation for Isolated Talonavicular Arthrodesis

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ARTICLE INFO

Level Of Clinical Evidence: 4

Keywords:
complication
fusion
navicular
surgical approach
talus

ABSTRACT

Isolated talonavicular arthrodesis is a commonly performed surgical intervention. Nonunion is a dreaded complication. The aim of the present study was to analyze the clinical and radiologic outcome of talonavicular arthrodesis using a dual approach with 2-side screw fixation. From February 2012 to September 2014, isolated talonavicular arthrodesis was performed on 17 joints of 16 patients (mean age 59.12 years). All procedures were performed by a single surgeon. The incidence of union, visual analog scale scores, and complications were analyzed. Radiographic union was achieved in all 17 cases (100%) at a mean period of 13.12 weeks. The visual analog scale scores had improved significantly ($p < .001$) at a mean follow-up of 48.53 weeks. One patient (6%) had minimal wound problems, and one (6%) showed prolonged swelling postoperatively. We have concluded that the dual window approach with 2-side screw fixation for isolated talonavicular arthrodesis results in excellent clinical and radiographic results and high fusion rates.

Isolated talonavicular arthrodesis (TNA) can be indicated to treat inflammatory (1–6), degenerative (1,4,7,8), and post-traumatic (1,4,8) disorders of the talonavicular joint and provide good clinical outcomes and pain relief. It has also been described as part of operative foot reconstruction for flexible flatfoot deformities (6). The best surgical approach and fixation method to perform isolated TNA is still a theme of discussion. Most investigators have reported a single medial (3,6,9–11) or dorsomedial (2,5,7,8,12) approach. Recently, a dorsal approach was proposed and tested on cadaveric feet (13).

A large variety of osteosynthetic implants have been described in published reports. The use of screws (1,2,6–11), staples (5,8,11), a combination of staples and screws (2,3,6), and angle-stable miniplates (12) have been reported. Nonunion of this talonavicular joint is a dreaded complication. However, nonunion has been frequently reported in published studies (1,2,4–6,8,9).

At our institution, we perform a small medial and dorsal incision to visualize and prepare the talonavicular joint. This approach allows safe and optimal insertion of the transfixing screws. In the present report, we describe the clinical and radiographic results of TNA with 2-side screw fixation using 2 incisions.

Patients and Methods

Aims

The aim of the present study was to analyze the clinical and radiologic outcomes of TNA using a dual approach with 2-side screw fixation. The clinical findings, visual analog scale (VAS) scores, osseous union rates, complications, and the need for physiotherapy were assessed.

Assessors

One of us (G.V.) performed all the interventions as described and assessed the clinical and radiographic evaluations. Two of us (M.v.d.B., J.S.) assessed the clinical and radiographic evaluations. Finally, 1 of us (M.v.d.B.) performed the statistical analyses.

Study Population

The inclusion criteria were midfoot pain at the talonavicular joint and radiographic signs of arthritis. The exclusion criterion was surgery to the talonavicular joint combined with other surgical interventions at the same procedure.

A total of 16 patients (17 feet) were treated for isolated talonavicular arthrosis from February 2012 to September 2014. The demographic characteristics are listed in Table 1. The mean patient age at surgery was 59.12 (range 44 to74) years. Of the 16 patients, 8 were men (50%) and 8 were women (50%). Of the 17 feet, 9 (53%)

Financial Disclosure: None reported.
Conflict of Interest: None reported.
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http://dx.doi.org/10.1053/j.jfas.2016.03.004

Table 1
Patient demographics (N = 17 feet in 16 patients)

Variable	Value
Gender	
Male	8 (50)
Female	8 (50)
Age (y)	
Range	44 to 74
Mean	59.12
Follow-up (wk)	
Range	25 to 85
Mean	48.53
Diagnosis	
Post-traumatic osteoarthritis	9 (53)
Primary osteoarthritis	7 (41)
avascular necrosis	1 (6)

Data presented as n (%), unless noted otherwise.

were treated because of post-traumatic osteoarthritis (1 bilateral case), 7 (41%) because of primary osteoarthritis, and 1 (6%) because of avascular necrosis (AVN) of the navicular bone. All the patients had been treated conservatively for ≥6 months before surgery was performed. The mean follow-up period was 48.53 (range 25 to 85) weeks.

Outcomes

The VAS scores and clinical findings were analyzed at consultation preoperatively and at 2, 6, 12, and 18 weeks postoperatively. Radiographs were performed at a standard of 6 and 12 weeks postoperatively and at later dates until osseous union. Union was determined when the anteroposterior and lateral radiographs showed complete bridging of the joint without radiolucencies. The definitive VAS score was reported at the final follow-up consultation. Swelling and stiffness for <6 months was considered a normal postoperative finding. The complications and the need for physiotherapy were recorded.

Intervention

Surgery was performed with the patient in the supine position under general anesthesia and popliteal nerve block. Antibiotics were given at induction. A thigh tourniquet was applied. First, a small medial longitudinal incision (4 cm) was made between the tibialis posterior tendon and tibialis anterior tendon at the level of the talonavicular joint (Fig. 1). Hemostasis of the superficial small veins and branches from the greater saphenous vein was performed using bipolar cautery. The tibialis anterior and tibialis posterior tendons were retracted laterally and inferiorly, respectively (Fig. 2). Midtarsal abduction–adduction motion was performed to identify the talonavicular joint. The joint capsule was incised longitudinally, and the talonavicular joint was exposed and opened using a small laminar spreader (Fig. 3). It has been our experience that the medial approach is inadequate to fully visualize the curved talonavicular joint. Thus, we add a small dorsal incision (Fig. 4). This small incision (4 cm) runs just lateral to the extensor hallucis longus tendon. Superficial veins were coagulated using bipolar cautery. The extensor retinaculum, which is located more proximally, can be left untouched. Tendons were retracted using small Senn Miller retractors. The neurovascular bundle (including the arteria dorsalis pedis and deep peroneal nerves) was identified, carefully protected, and retracted medially (Fig. 5). The dorsal capsule of the talonavicular joint was incised longitudinally. Once the 2 approaches were performed, the talonavicular joint became mobile and offered excellent visualization of the joint. Next, extensive debridement of the joint was possible. The remaining cartilage of talar and navicular bone was removed using a sharp chisel

Fig. 2. Retraction of tibialis anterior tendon and tibialis posterior tendon.

Fig. 1. Small medial incision over the talonavicular joint.

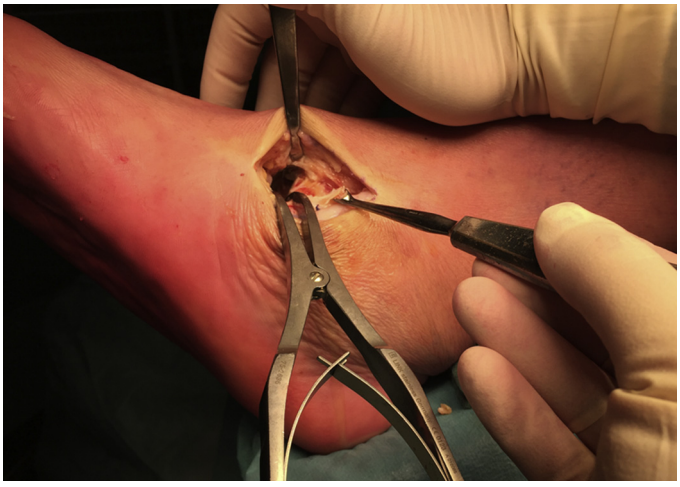

Fig. 3. The talonavicular joint was medially opened with a laminar spreader.