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Case report
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Arthrodesis using a distraction technique for isolated talonavicular joint arthritis

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Abstract

Isolated talonavicular (TN) joint arthritis is uncommon because the TN joint is typically affected together with other midfoot articulations. As a multiaxial component of the medial column, the TN joint plays a key role in stability during gait. TN arthrodesis is indicated in conditions such as post-traumatic arthritis, rheumatoid arthritis, posterior tibial tendon insufficiency, and structural foot deformities, with generally favorable clinical outcomes. We report a 52-year-old woman with rheumatoid arthritis who presented with severe dorsal right foot pain, most pronounced during the mid-stance phase of gait. Clinical and radiographic evaluation demonstrated isolated TN arthritis without subtalar or talocalcaneal involvement. Arthrodesis was performed using a distraction technique with a monolateral external fixator to maintain a neutral midfoot position and help prevent collapse of the medial arch. The patient experienced progressive pain relief and functional improvement during follow-up, with substantial reduction in pain and restoration of independent ambulation. This case suggests that external fixation with distraction may represent a useful alternative technique for isolated TN arthrodesis and warrants evaluation in larger series.

Keywords: talonavicular joint, arthrodesis, distraction

Introduction

The talonavicular (TN) joint is a multiaxial joint exposed to multidirectional forces and forms a key part of the medial column complex, contributing to stability throughout the gait cycle [1, 2]. Isolated TN arthritis without subtalar or talocalcaneal joint involvement is rare. TN arthrodesis has been described for post-traumatic arthritis, rheumatoid arthritis, posterior tibial tendon insufficiency, adult-acquired flatfoot, and juvenile pes calcaneovalgus, with generally favorable outcomes reported [3]. We present the clinical outcome of TN arthrodesis performed using a distraction technique with an external fixator in a patient with isolated TN arthritis as a potential alternative option for similar cases.

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Informed Consent
The authors stated that the written consent was obtained from the patient presented with images in the study.

Conflict of Interest
No conflict of interest was declared by the authors.

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Case presentation

A 52-year-old woman presented with pain over the dorsum of the right foot, particularly during the mid-stance phase of gait. Her symptoms had progressed over several months and resulted in marked difficulty with ambulation.

The patient had a known diagnosis of rheumatoid arthritis; however, she was not receiving regular follow-up or treatment. She reported no history of smoking or alcohol use. There was no known family history of chronic disease, although she noted that her mother had experienced symptoms suggestive of rheumatoid arthritis.

On examination, the patient was unable to walk plantigrade and required support for mobilization because of pain. Local tenderness was present over the TN joint. Distal neurovascular and motor examinations were normal. Preoperative radiographs (Figure 1) and computed tomography images (Figure 2) demonstrated advanced degenerative changes consistent with isolated arthrosis of the right TN joint. Based on the Larsen classification system using magnetic resonance imaging, the patient had grade 4 articular destruction [4]. No arthritic changes were identified in the subtalar or talocalcaneal joints.

Surgical technique

The patient was placed supine, and a tourniquet was applied to the operative limb. After standard sterile preparation and draping, antibiotic prophylaxis was administered. Under fluoroscopic guidance, the medial TN joint line was identified and marked. A curved, oblique incision of approximately 3 cm was made, and the skin, subcutaneous tissue, and joint capsule were incised to expose the joint. Degenerative cartilage and arthrotic changes were debrided using a burr.

A monolateral external fixator was then applied, with one Schanz screw inserted into the proximal first metatarsal and another into the calcaneus. After achieving distraction, allograft material was placed into the residual joint space. Finally, one cannulated screw was inserted across the TN joint to complete fixation. Postoperative radiographs demonstrated TN arthrodesis with the monolateral external fixator and cannulated screw (Figure 3), and fluoroscopic imaging confirmed proximal first metatarsal Schanz screw placement (Figure 4).

Rehabilitation and follow-up

Postoperative assessments were performed at 15, 30, 45, and 60 days. The external fixator was removed at the end of the first postoperative month, and active ankle range-of-motion exercises were initiated. The patient was mobilized with a walker without weight-bearing. At 6 weeks postoperatively, partial weight-bearing was permitted after clinical evaluation demonstrated a painless joint. After completion of the second postoperative month, full weight-bearing with support was allowed.

Across follow-up visits, the patient showed progressive reduction in pain and tenderness, with complete resolution of pain during weight-bearing by the final visit. The preoperative Visual Analog Scale score was 9 and decreased to 2 at the final follow-up. At presentation, the patient was wheelchair-dependent; by the end of treatment, she attended follow-up visits without a walker, and independent ambulation was achieved by 10 weeks postoperatively.

Figure 1. Preoperative radiographs showing degenerative arthritis of the talonavicular joint.

Figure 2. Preoperative computed tomography images demonstrating degenerative changes of the talonavicular joint.

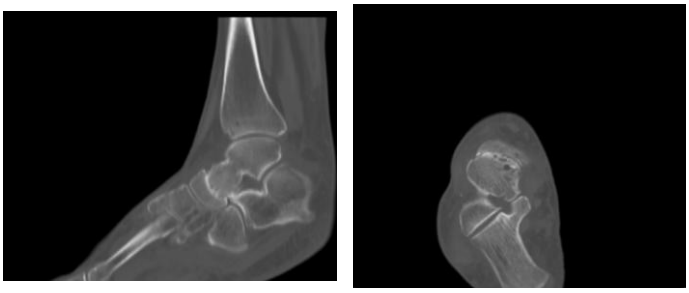

Figure 3. Postoperative radiographs showing talonavicular arthrodesis with a monolateral external fixator and a cannulated screw.

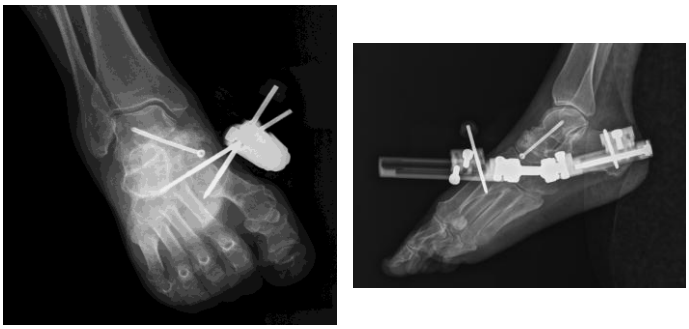

Figure 4. Schanz screw placement in the proximal first metatarsal.

Discussion

Isolated TN arthritis is uncommon in routine clinical practice. Although plate-and-screw constructs are frequently used for TN arthrodesis, current evidence has not demonstrated clear superiority of any single fixation method [5]. In this patient, we used a cannulated screw combined with a monolateral external fixator to distract the midfoot and maintain a neutral position. The rationale was to minimize the risk of medial arch collapse and potential graft subsidence by maintaining distraction during early healing.

This approach is more commonly described in the context of navicular fracture fixation; however, maintaining a neutral foot position may also be advantageous in isolated TN arthrosis by supporting alignment and preserving the medial longitudinal arch. Consistent with the broader literature, including comparative observations reported by Lu et al. [6], definitive superiority of one technique over another has not been established. Larger case series are needed to clarify the relative benefits and limitations of distraction-assisted TN arthrodesis compared with other fixation strategies.

The main limitations of this report are the single-patient design and the lack of long-term follow-up due to socioeconomic constraints. Further evaluation in larger cohorts with longer follow-up is required.

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