MAJOR TARSAL AND ANKLE ARTHRODESIS

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Multiple rearfoot arthrodesing procedures are often useful as a salvage treatment for extensive arthritis and deformity affecting the hindfoot and ankle. Although these procedures produce a single osseous segment extending from the knee joint to the intertarsal or midtarsal level (and occasionally to the metatarsus), the resultant rigid beam is typically far more desirable and functional than a painful foot and ankle. The alternative procedure, a below-knee amputation, further limits activity and ambulation, and requires the use of a prothesis.

Fundamental to the success of extensive hindfoot and ankle fusion is a patient with a very clear understanding of the goals, limitations, potential risks and complications, and the rehabilitation related to the surgical process. Obviously, a normal extremity will not result from these surgical techniques. Moreover, considerable postoperative rehabilitation and shoe modification are critical to the overall successful management of these surgical candidates.

CASE PRESENTATION

L.B., a 34 year old female secretary, presented with severe hindfoot pain involving primarily the left lower extremity. Her symptoms were longstanding, and progressively worsening over a 3 month period. The remainder of the medical history and interview were unremarkable, with the exception of chronic lumbar region discomfort. The physical exam revealed bilateral rigid convex pes valgus (Figure 1) with ankle equinus, and possible lumbosacral radiculitis. The tuberosity of the calcaneus was primarily non-weight bearing and the feet revealed plantar hyperkeratosis at the midtarsal level, consistent with convex pes valgus. (Figure 2) The gait was markedly apropulsive bilaterally, and guarding of the left foot was evident (or observed). The Hubscher maneuver further supported the diagnosis of a rigid deformity. (Figure 3)

Radiographic inspection confirmed a congenital vertical talus with advanced degenerative arthrosis affecting primarily the talus and navicular. (Figures 4, 5) Subsequent neurological consultation confirmed partially herniated L5 and S1 disks, and the patient responded well to conservative therapy. Despite diminished low back symptoms, she was ultimately taken to surgery to attempt triple arthrodesis on the left foot. Consent was also obtained for pantalar fusion, in the event that this procedure was deemed more optimal pending operative findings.

Intraoperative findings revealed severe articular degeneration of the dome of the talus, and there was no visible evidence of articular cartilage or intact subchondral cortical bone available to articulate with the distal tibial bearing surface, upon repositioning the talus. (Figure 6) It was also necessary to lengthen the heel cord and remove the deformed navicular in order to relocate the talus in the ankle mortise and increase the calcaneal inclination ankle. (Figure 7) An intraoperative decision was made to perform pantalar and medial column arthrodesis, as well as intercuneiform arthrodesis, in an effort to reconstruct the greater and lesser tarsal components and, avoid inevitable ankle arthritis.

The ankle fusion was performed by means of a trans-fibular approach, and the distal portion of the fibula (Figure 8) was used as an onlay graft across the tibio-talar fusion site. The fibula also

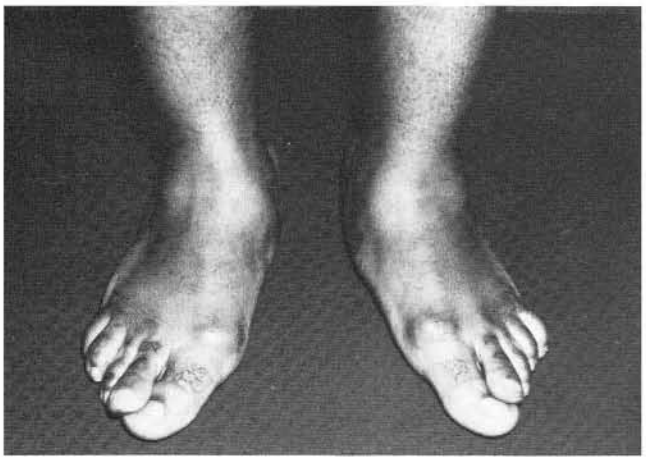

Figure 1. Clinical weight bearing of bilateral convex pes valgus deformity. Note the collapsed medial arch and abducted forefoot.

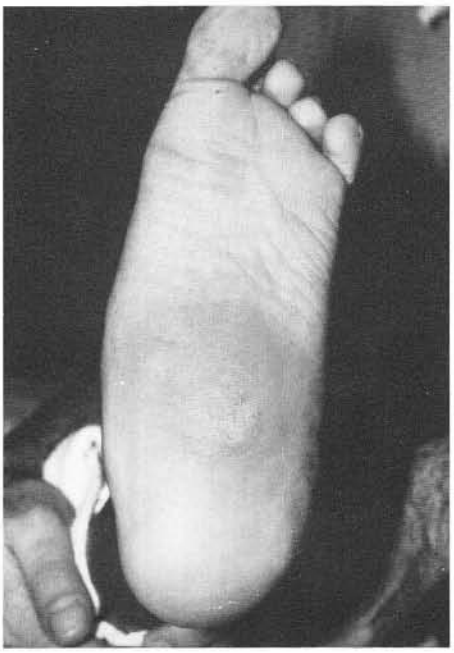

Figure 2. Plantar hyperkeratosis overlying the midtarsal joint, secondary to equinus deformity and breakdown of the midfoot.

Figure 3. The Hubshire maneuver failed to recreate a medial arch, supporting the diagnosis of a rigid deformity.

Figure 5. Lateral radiographs reveal a congenital vertical talus deformity.

Figure 4. Dp radiograph reveals a congenital vertical talus deformity. The navicular is articulating with the neck of the talus, and advanced degenerative arthritis is evident.

Figure 6. Medial rearfoot dissection reveals severe degeneration of the talar dome articular surface.

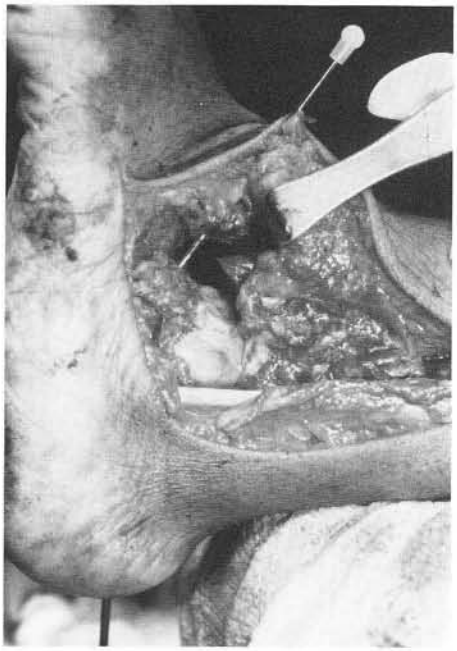

Figure 7. Temporary stabilization of the subtalar joint is performed after repositioning the talus on the calcaneus.

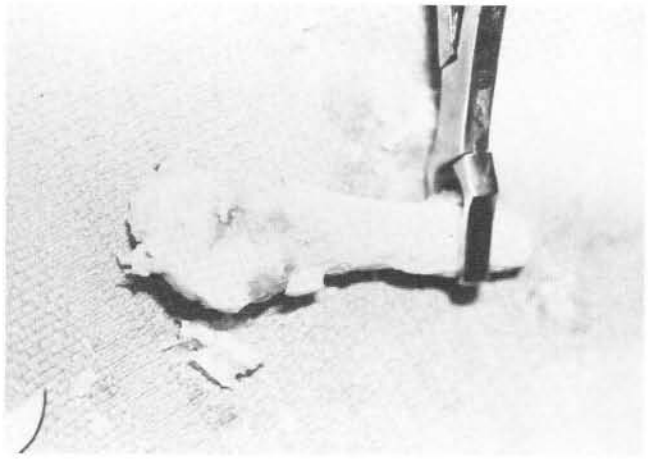

Figure 8. The resected distal fibula is fashioned into an onlay graft for fusion of the ankle joint.

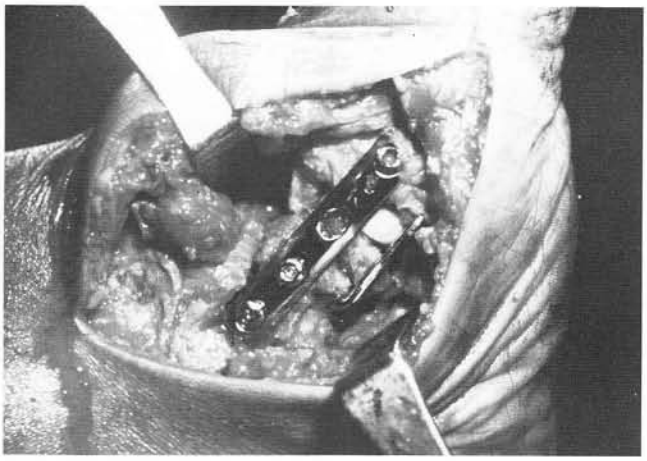

Figure 9. Stabilization of the medial column is performed with a five hole 1/3 tubular plate and staple fixation.

served as a donor for autogenous bone, and was used to graft the tarsus in conjunction with replacement of the navicular. The medial column was stabilized with a combination of a plate, screws, and staples. (Figure 9)

Postoperative radiographs revealed satisfactory osseous and hardware alignment (Figures 10, 11), and arthrodesis was clinically consolidated by 12 weeks postoperative. The patient continued to progress in an unremarkable fashion. At 6 months postoperative, the medial column hardware was removed due to gradually worsening symptoms related to hardware irritation of the first metatarsalcuneiform articulation. Following hardware removal (Figure 12), the patient progressed to the point where she was finally able to work full-time and ambulate to and from work.

The patient is now three-years postoperative, and desires surgical intervention for her painful right (opposite) foot. The current dilemma revolves around avoiding ankle fusion on the right side, at the risk of almost certain eventual ankle arthritis. This is, however, a reasonable approach in comparison to bilateral ankle arthrodesis which would be the last alternative in the event that arthritic pain warranted reconstructive fusion.

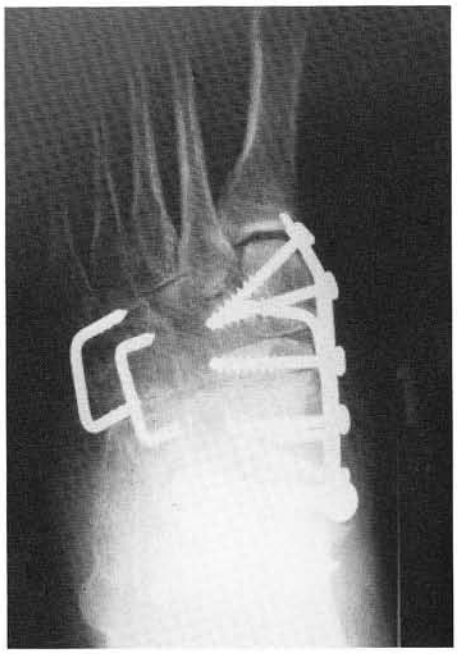

Figure 10. Postoperative DP radiograph reveals satisfactory osseous alignment and hardware placement.

Figure 11. Lateral radiograph showing satisfactory alignment.

Figure 12. The medial column hardware was removed at six months postoperative, and radiographic consolidation of the arthrodesis sites is evident.