

ABSTRACT

The Blair type ankle fusion has historically been utilized as a viable solution to significant osteonecrosis or structural bone loss of the talus. Additionally, much has been reported in recent years of traditional ankle fusion conversion to total ankle replacement (TAR). However, to the authors knowledge, there has never before been a cited an example of successful conversion of existing Blair ankle fusion to TAR. The purpose of this review and case report was to provide a detailed review and descriptor of a unique case of conversion of a long-standing Blair Ankle fusion to TAR.

LITERATURE REVIEW

The original Blair ankle fusion was described as a limb salvage procedure where significant portions of the talar body were discarded and an anterior cortical tibial strut graft was translated distally to the remaining talar head and neck. This has traditionally been used as a surgical treatment for significant necrosis or bone loss of the talus¹. Ross et al² described a surgical approach with use of an anterior compression plate to augment a modified Blair tibiotalar arthrodesis in a 29 year old female 10 years after initial talar injury with excellent functional and pain outcome scores. Shuang et al³ reported significant improvement in AOFAS hindfoot scores in 28 patients following modified Blair ankle fusion after a mean of nearly 20 months.

Additionally, literature has reported of traditional ankle fusion conversion to total ankle replacement (TAR). Greisberg et al⁴ followed 19 ankle fusion conversions to TAR in 18 patients for a mean of 39 months with 16 patients showing marked improvement in AOFAS hindfoot-ankle scores from 42 to 68 on average. However, all patients with previous fibular takedown had complicated outcomes. Hintermann et al⁵ prospectively saw 29 ankles in 27 patients improve with AOFAS hindfoot-ankle scores from 34 to 76 on average after 55 months following ankle fusion conversion to TAR.

Despite the literature supporting the ability to convert from ankle fusion to TAR, no literature exists citing examples of a dissolution of an existing Blair type ankle fusion or its modifications.

CASE REPORT

We present the case of a 62 year old Male with chronically progressive and painfully recalcitrant Right 'ankle pain' s/p talar fracture with subsequent Blair type ankle arthrodesis 10 years prior by a senior partner within the practice. The patient presented with degenerative joint disease of the Subtalar Joint (STJ) of the ipsilateral extremity as evidenced on physical exam and confirmed with diagnostic joint injection and with Ankle region Radiographs (**Figure 1**) and Computed Tomography.

The decision was made to pursue surgical reconstruction with STJ Arthrodesis and existing Ankle fusion conversion to TAR. Considering the progressive degenerative joint disease at the STJ and the patient's relatively active lifestyle it was agreed upon that the best course would be to prophylactically prevent/diminish the morbidity associated with continued rearfoot fusions by dissolution of the existing ankle fusion with conversion to a TAR.



FIGURE 1A, 1B & 1C: Preoperative AP/MO/LAT Ankle Radiographs. Patient underwent Blair ankle fusion 10 years prior to initiate presentation with significant STJ arthritis.



FIGURE 2A, 2B & 2C: Immediate Postoperative AP/MO/LAT Ankle Radiographs. Patient underwent dissolution of Blair ankle fusion with conversion to fourth-generation TAR.

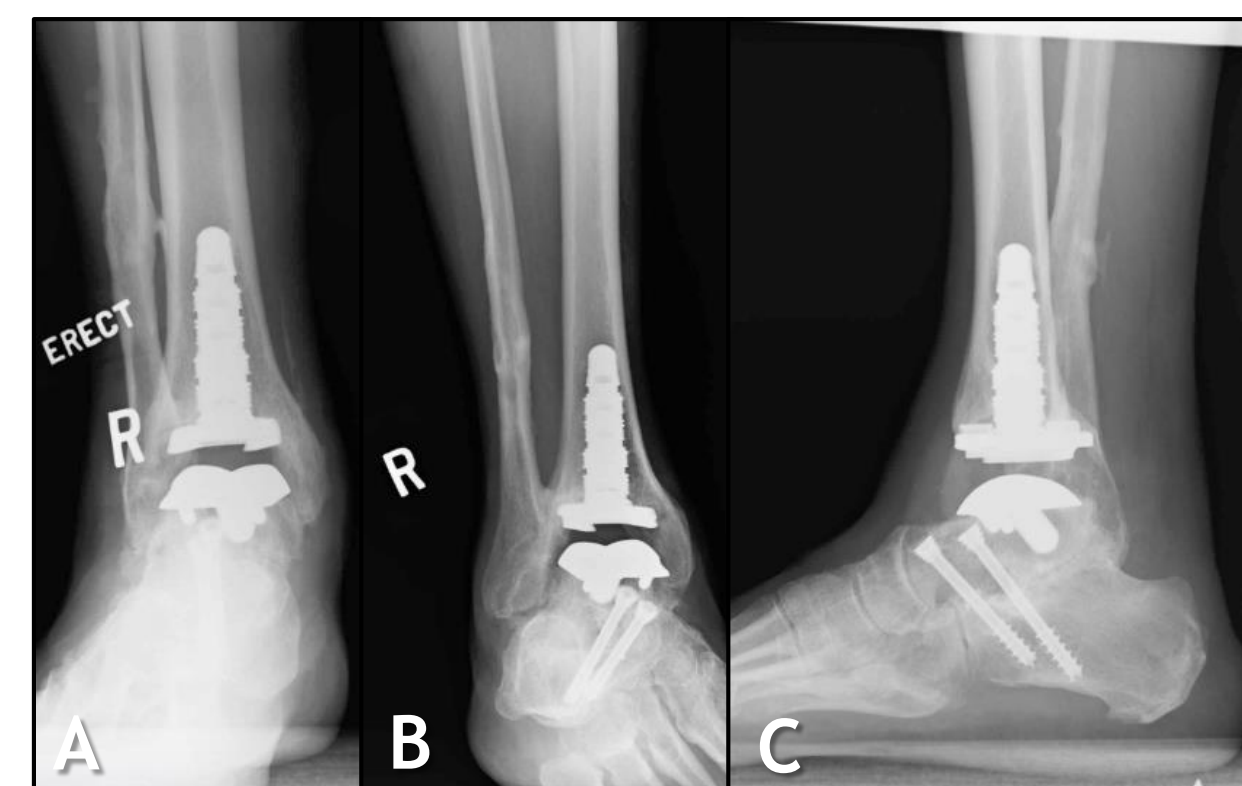


FIGURE 3A, 3B & 3C: Six Year Follow-up AP/MO/LAT Ankle Radiographs. Patient maintains significant improvements in alignment, motion and ambulatory efficiency.

Initial surgical intervention with STJ fusion and conversion of Blair ankle fusion to TAR with fourth-generation fixed-bearing prosthetic design and prophylactic medial malleolar fixation was undertaken (**Figure 2**). As part of our standard total joint protocol the patient was placed NWB in an AO style splint with incisional negative pressure vacuum for 5 days. He began protected WB in a CAM boot at 3 weeks postoperatively and initiated formalized physical therapy rehabilitation protocol at 4 weeks postoperatively.

Interestingly, the patient developed a tarsal tunnel entrapment within 6 months of mobilization of the previously fused ankle joint which necessitated a tarsal tunnel release 1 year after initial conversion and the previously placed prophylactic medial malleolar fixation was removed. At 14 months s/p conversion from previous Blair ankle fusion to TAR the patient ambulated pain free and without assistance in normal supportive shoe gear without bracing.

Six Year follow-up revealed a relatively active individual without activity restrictions and with significantly improved ambulatory efficiency including improved stride length, pace, gait symmetry and in a pain free state. Radiographic assessment revealed a well aligned ankle prosthesis with intact hardware without signs of position change or lucency/subsidence (**Figure 3**).

CONCLUSION

Recent years have illustrated the success of ankle fusion take-down with conversion to total ankle replacement. However, the Blair type ankle fusion and its modifications presents interesting consideration as its use may be precluded by significant talar pathology making the conversion to TAR problematic.

Ankle fusion, regardless of specific technique generally precipitates a predictable outcome but its limitations have been recognized including extended time to achieve fusion and the potential for nonunion and adjacent joint disease. While first generation TAR led to poor results, significant advancements in design and technique have revived optimism as an alternative to ankle fusion. The key for the future may not be related to the development of newer ankle components but rather in refining the criteria to determine who would best benefit from total ankle joint replacement versus ankle fusion versus conversion from fusion to TAR.

As seen in this interesting yet isolated case report, given the correct circumstances, the conversion from a Blair type ankle fusion to total ankle replacement may provide a durable and lasting result with significant longevity and function in an active patient population.

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