Ankle arthrodesis is a well-established procedure for treatment of end-stage ankle arthritis. More than 30 techniques for ankle and ankle-hindfoot arthrodesis have been described in the literature with varying rates of fusion, complications, and patient satisfaction.(1-3) This case series reports our initial results with an anterior approach utilizing an anteriorly placed locking compression plate for both ankle and ankle-hindfoot arthrodesis.

**Methodology**

A retrospective chart review was performed and 7 patients were identified who had an ankle or ankle-hindfoot arthrodesis with an anteriorly placed locking compression plate: 6 patients underwent isolated ankle arthrodesis and 1 underwent ankle-hindfoot arthrodesis. Mean follow-up was 13.7 months (range 7-43 months). All 7 patients were female. Average patient age at time of surgery was 53 years old (range 23-67 years). Etiologies included post-traumatic arthritis (3 cases), revision of previous nonunion (2 cases), rheumatoid arthritis (1 case), and residual clubfoot deformity (1 case).

**Procedure**

Isolated ankle arthrodesis or ankle-hindfoot arthrodesis was performed through an anterior incision. For the patient who underwent ankle-hindfoot arthrodesis, a secondary lateral incision was utilized. An anteriorly placed locking compression plate and screws were used for internal fixation in all cases. Additional screws outside of the plate were used at the discretion of the surgeon.

![Figure 1. Post-operative lateral radiograph following ankle-hindfoot arthrodesis for residual subluxation deformity. Note skin staples on radiograph identifying lateral incision which was utilized to access subcalcaneal joint.](image1)

![Figure 2. Intra-operative photograph demonstrating placement of incision on anterior ankle.](image2)

![Figure 3. Intra-operative photograph shows anterior locking compression plate being fixated to tibia.](image3)

**Results**

All cases went on to successful union. Average time to fusion was 14.2 weeks (range 8-25 weeks). 2 cases of irritable fixation necessitated hardware removal. 1 patient suffered a delayed union, which resolved with conservative therapy and went on to eventual fusion. 1 patient suffered a stress reaction on the tibia proximal to the compression plate. This resolved uneventfully with a period of offloading. This patient was also fused with the ankle in 5 degrees of plantarflexion. This required use of a heel lift after the transition to full weightbearing.

![Figure 4a. Post-injury lateral radiograph showing tri-malleolar ankle fracture which progressed to post-traumatic arthritis. 4b. Post-operative lateral x-ray after isolated ankle fusion. 4c. A-P radiograph following ankle fusion.](image4)

![Figure 5a. Pre-operative lateral radiograph following ankle fusion. 5b. Post-operative lateral x-ray following ankle fusion. 5c. Post-operative lateral x-ray following ankle fusion.](image5)

**Discussion**

Reported advantages or using an anterior approach and anteriorly placed plate include ease of joint preparation and deformity correction (1,3,4), preservation of large osseous contact area (5), biomechanical ability to act as tension band, buttress plate, or neutralization plate (6,7), stability of fixation (1,8), low incidence of wound complications (9), and ability to use same approach for revision of failed total ankle arthroplasty (TAA) or later conversion of fusion to TAA (3,10).

Since Albert first described ankle arthrodesis in the late 1800's (11), many different fixation options have been described with varying success rates. The current case series reports on a small group of patients with successful fusion via an anterior approach utilizing a locking compression plate for both ankle and ankle-hindfoot arthrodesis. The anterior approach to ankle and ankle-hindfoot arthrodesis with an anteriorly placed locking compression plate provides satisfactory results with 100% fusion in the current series.

![Figure 6. Intra-operative lateral x-ray showing ankle fusion with anterior locking plate and screws.](image6)

**References**