

# ANKLE FUSION WITH EARLY WEIGHTBEARING: A Case Study

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## INTRODUCTION

Ankle arthrodesis is a common procedure for fusion of the distal part of the tibia and the talus. The indications vary from arthritis (post-traumatic), inflammatory, degenerative, avascular necrosis of the talus to extreme deformities of the ankle (1). The course of the rehabilitation after an ankle arthrodesis varies from non-weightbearing for 3 months to weightbearing immediately postoperatively (Table 1). In this case presentation, the patient was allowed to bear weight early after ankle arthrodesis and the bone healing was evaluated to determine if early weightbearing could interfere with bone fusion and delay the healing process.

## CASE PRESENTATION

A 37-year-old female presented with a chief complaint of right ankle pain over the last 2 years. The patient had a history of right ankle fracture 3 years ago in Colombia. Open reduction and internal fixation (ORIF) corrected the fracture surgically. A year later, the patient started to develop pain from the screw in the right ankle, at which time the painful hardware was removed. After that, the pain still persisted in the right ankle and the patient underwent one month of physical therapy without pain relief.

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**Table 1**

### OVERVIEW OF DIFFERENT POSTOPERATIVE REHABILITATIONS AFTER ANKLE FUSION

Author (ref.)	Procedure	Postoperative Rehabilitation	Complete Bone Healing
Mann (2)	Screw fixation	6 weeks non-weightbearing to partial weightbearing	14 weeks
Paremain (3)	Screw fixation	2 weeks cast 2-5 weeks walking cast	6 weeks
Hammerschlag (4)	External ring fixation	Postoperative weightbearing	8-12 weeks
De Palma (5)	Arthroscopic arthrodesis	4 weeks cast 4 weeks walking cast 4 weeks brace	10 weeks
Rippstein (6)	Screw fixation	6 weeks up to 15 kg weightbearing	6 weeks
Klaue (7)	Screw fixation	2 weeks non-weightbearing to partial weightbearing	8-12 weeks
Gougoulias (8)	Arthroscopic arthrodesis	3 months immobilization	12 weeks
Nielsen (9)	Screw fixation	6 weeks non-weightbearing 6 weeks walking cast	12 weeks

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Next, a Controlled Ankle Motion (CAM) walker was used for a year but it did not help to reduce the pain intensity. The patient is still concerned about the toe walking and the painful motion of the right ankle joint. The past medical history is unremarkable, and the patient denies any history of smoking. Physical examination revealed fixed equinus position to the right ankle joint. No active dorsiflexion or plantarflexion to the right ankle joint but the right subtalar joint range of motion is within normal limits. There is painful passive dorsiflexion of the right ankle. Dermatological, vascular, and neurological examinations are within normal limits and unremarkable. The preoperative radiographs are shown in Figure 1.

### Postoperative Course

After a thorough discussion with the patient regarding an ankle arthrodesis using either external or internal fixation, the patient elected to undergo the procedure with internal fixation. The surgery was performed September 15, 2012. The patient was advised to remain non-weightbearing in a posterior splint in the time period immediately following the surgery. The patient was seen in the clinic two days following surgery for an initial dressing change as well as to check the incision for infection.

The patient's second postoperative visit occurred 12 days post-surgery. At this time, the first postoperative radiographs were taken (Figure 2). The patient was advised at this time to continue non-weightbearing on the surgical extremity, with crutches and was instructed to return in 2 weeks. At 4 weeks postoperative, the staples were removed and the posterior splint was discontinued. The patient reported no pain at this time. The second set of postoperative radiographs were taken at this time (Figure 3). After examining the radiographs and based on the patient's postoperative progression; the decision was made to allow the patient to begin weightbearing on her right ankle in a CAM walker.

The patient returned to our clinic 3 weeks later. At 7 weeks postoperative, the patient had been ambulating in a CAM walker since her last visit. The patient reported no pain or discomfort at this time. The patient returned to clinic at 10 weeks postoperative. She had been progressively increasing her ambulation and continued to deny any pain or discomfort to her right ankle. The third set of postoperative radiographs were taken at this time (Figure 4). These radiographs showed significant osseous union of the fusion site, and the decision was made at this time to transition the patient from her CAM walker to a sneaker. It was also decided at this time that the patient would begin physical therapy.



Figure 1. Preoperative radiographs.

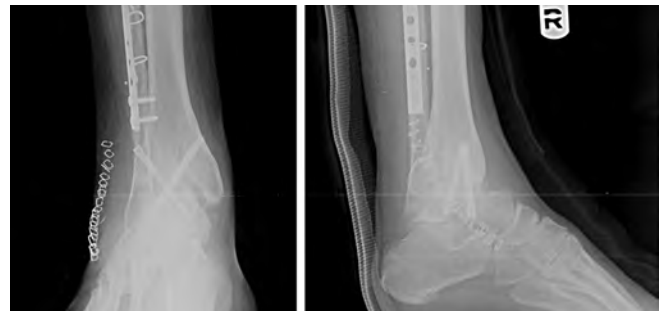


Figure 2. Postoperative radiographs, 12 days after the procedure.



Figure 3. Postoperative radiographs, 4 weeks after the surgery.

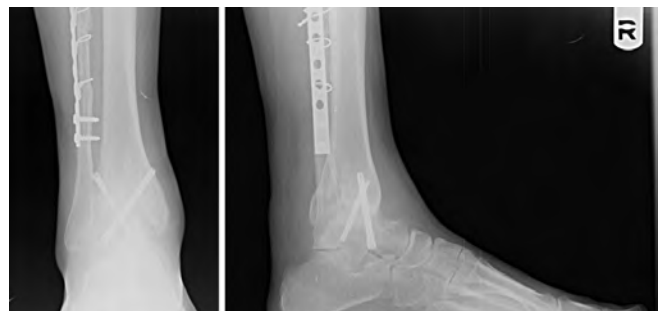


Figure 4. Postoperative radiographs, 10 weeks after the arthrodesis.



Figure 5. Final postoperative radiographs with complete bone healing at the fusion site, 15 weeks after the surgery.

The patient's last visit came at 15 weeks postoperative. At this time, the patient had been ambulating pain free to her right ankle, in sneakers for 5.5 weeks. The patient was extremely satisfied with the results of the surgery. The last set of postoperative radiographs were taken and showed complete union of the fusion site (Figure 5).

### Results

This case presentation revealed early weightbearing after ankle arthrodesis is safe and has the same outcome of bone healing as non-weightbearing postoperatively in uncomplicated patients. In this case presentation the patient was able to wear a CAM walker and bear weight to the right lower extremity 4 weeks after the procedure. Ten weeks later the patient began the transition from CAM walker to tennis shoes without experiencing any pain or discomfort, and 15 weeks postoperative, the patient was full weightbearing in tennis shoes without any reports of pain and the final postoperative radiographs showed complete bone healing.

## DISCUSSION

The findings of this case presentation support early weightbearing after ankle arthrodesis and conclude that the rate of the bone healing was similar to the patients with non-weightbearing. Cannon et al was the only study comparing early weightbearing versus non-weightbearing after ankle arthrodesis (10). This study consisted of two groups; the first group was treated conservatively and was instructed to be non-weightbearing until 8 weeks after the procedure. The second group was instructed to bear weight as tolerated from the time of the surgery. Most of the patients required crutches in the first 2 weeks and were able to bear full weight by 4 to 6 weeks. This study revealed no significant difference between both groups and the rate of bone healing was the same.

In addition, early weightbearing has advantages: the patients are more satisfied so they can bear weight earlier, reduced admission time in the hospital is required, and less support for the patients is needed if they are able to bear weight in the early stage (10). Although only one study was found comparing early versus late weightbearing after ankle arthrodesis, the findings in that study support our case presentation and prove that early weightbearing is safe in uncomplicated patients and there is no significant difference in bone healing between early and late weightbearing after ankle arthrodesis. Additional studies are required regarding early weightbearing after ankle arthrodesis since there are not enough articles comparing the rehabilitation possibilities after ankle arthrodesis.

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