

# GERIATRIC ANKLE FRACTURE MANAGEMENT

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## INTRODUCTION

Traumatic injuries in the elderly are becoming increasingly common as a result of longer lives and increased activity. The management of geriatric trauma requires special attention to different details during the preoperative, intraoperative, and postoperative periods. The most common traumatic injuries encountered are ankle, calcaneal, and midfoot fractures. Due to compromised health issues, multiple illnesses, poor bone quality, and prolonged immobilization, potential morbidity is drastically increased. This update will detail the necessary parameters to follow prior, during, and after the surgical treatment of a traumatic event in the elderly to avoid or significantly decrease those morbidities, along with describing different surgical techniques that have been employed with a good amount of success.

## OVERVIEW

In the geriatric population, there are many issues that arise when considering surgical alternatives for traumatic injuries. Modern preventative medicine has encouraged more activity and exercise in the elderly, which has contributed to a longer life span. This longer life span has also increased the number of traumatic events documented to date in the elderly. This is commonly seen in the retirement community, where the population is older and generally more active. Unfortunately, the increased activity level in the elderly can also increase the odds of direct traumatic injury including trips, ground level falls, and other types of accidents.

## TRAUMATIC INJURIES

A multitude of orthopedic injuries require aggressive rehabilitation goals. Surgery for hip fractures involves almost immediate surgery and an effort to get the patient out of bed the next day and begin ambulation and physical therapy. This in turn decreases the possibilities of postoperative deep vein thrombosis (DVT), pneumonia, and deconditioning. Ankle fractures can be especially

problematic with smaller bones, as compared with the hip, and typically treated in a nonweight bearing manner in the younger patient population. However, nonweight bearing in an elderly patient for 6 to 8 weeks can increase the risk of DVT, pulmonary complications, urinary tract infections, and unrecoverable deconditioning. There are of course other specific concerns that the surgeon has to deal with when managing trauma in the geriatric patient including osteoporotic bones, increased comminution, atrophic skin, multiple medications, anti-coagulation, obesity, and other complicating orthopedic issues such as back, hip, and knee pathology. Often the patient may have other joint problems and they may already be using a walker prior to the lower extremity fracture.

## CASE STUDIES

### Patient 1

The patient is 74-year-old woman with a history of long term steroid use with poor skin and trimalleolar fracture. She underwent typical open reduction internal fixation with lateral plate fixation, but developed significant wound complications. She ultimately required extensive wound care, intravenous antibiotics, hardware removal and wound vac therapy. The time for skin healing was 5 months (Figures 1 and 2).

### Patient 2

An 88-year-old woman had a history of severe dementia, but was otherwise healthy. She suffered a ground level fall and unstable bimalleolar fracture. The patient was ambulatory prior to her injury. The family wanted minimal treatment, but wanted her to walk. She underwent open reduction internal fixation with a lateral locking plate. Her medial fracture was fixated with percutaneous screw fixation and washers for her osteoporotic bone. As an adjunctive procedure, a syndesmotic fixation device was also placed to buttress her fibula to the tibia. The patient was ambulatory immediately in a walking cast (Figures 3 and 4).



Figure 1. Postoperative wound complication.



Figure 2. Note the exposed hardware.



Figure 3 and 4. Patient 2, treated with locking plate laterally and screws with washers medially. Note use of Arthrex TightRope device as adjunctive stabilizing fixation.



Figure 5 and 6. Patient 3, treated with locking plate laterally. Note usage of Arthrex TightRope device as stabilizing fixation for deltoid ligament rupture.

**Patient 3**

This patient is a 101-year-old man with no medical problems. The patient slipped and fell getting out of the car, which resulted in an unstable bimalleolar fracture. The patient was independently ambulatory prior to his injury, and was anxious to resume walking. He underwent similar open reduction internal fixation with a lateral locking plate. Because he had a deltoid rupture, a syndesmotic fixation device was also placed to buttress his fibula to the tibia, stabilizing his deltoid ligament. The patient was ambulatory partial weight only in a walking cast (Figures 5 and 6).

**Patient 4**

The patient is an 86-year-old woman with history of severe osteoarthritis. The patient was involved in a motor vehicle accident that resulted in an unstable trimalleolar fracture. The patient's skin was atrophic. She underwent percutaneous plate fixation with syndesmotic repair. After the initial 2 weeks for her skin to heal, the patient was fitted for a patellar tendon bearing brace and allowed to ambulate with walker assistance (Figures 7 and 8).

**Patient 5**

The patient is a 78-year-old woman with rheumatoid arthritis, hypertension, asthma, bronchitis, chronic back pain, fibromyalgia, and a history of severe osteoarthritis.



Figure 7 and 8. Patient 4, treated with percutaneous locking plate laterally. The plate was used to bridge butterfly fragments.

The patient became dizzy and suffered a ground level fall. The patient has severe chronic lower leg edema and weighs ~200 pounds. Because of her poor skin, a minimally invasive approach was performed. A locked intramedullary nail was utilized for the fibula and cannulated screws for the medial malleolus. The distal fibula was quite comminuted. After the initial 2 weeks for her skin to stabilize, the patient was also fitted for a patellar tendon bearing brace and allowed to walk with walker assistance (Figures 9 and 10).

## SURGICAL PEARLS

The following is a list of pearls for trauma surgery in the geriatric patient that can improve outcomes and speed recovery: early surgery when possible; minimal incisions to decrease dehiscence and other wound healing factors; percutaneous screws and plates; IM rods; locking plates; early weight bearing as soon as skin is stable and then into a patellar tendon bearing brace; admittance to a skilled nursing facility may be necessary for the appropriate postoperative care; home physical therapy; and medical management concomitant with the patient's primary care physician such as anti-coagulation management.



Figure 9 and 10. Patient 5, was treated with percutaneous locked intramedullary nail (Biomet S.S.T. Small Bone Locking Nail).

Return to activity and early rehabilitation are the goal of treatment but this needs to be supervised by both physician and physical therapist until the desired level of activity is reached. In addition, a home program is necessary for the patient to continue overall strengthening on a consistent daily basis to prevent reinjury. The sooner the patient can return to normal daily activities, the better the overall situation for the patient from all respects: better mental status, decreased postoperative morbidities, and improved strength.

## SUMMARY

It is important to manage the geriatric patient with precautionary measures and comprehensive care. The aging process places demands on all organ systems and exposes the patient to more risks, complications and other mitigating deleterious factors. Working in combination with the patient's primary care physician before, during and after the trauma surgery is also important and necessary to prevent postoperative morbidities. When all factors have been considered, the geriatric patient can have an acceptable result in maintain their mobility.