

Case Reports

Traumatic Hallux Fracture

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Keywords: traumatic hallux fracture, great toe fracture

<https://doi.org/10.52965/001c.122540>

Orthopedic Reviews

Vol. 16, 2024

The authors present a case of a traumatic hallux (big toe) fracture in a 77-year-old male who was walking near a construction site when a brick fell and hit his big toe on his right foot. This case report highlights the usage of different treatment types in a toe fracture and different techniques used to diagnose the fracture. Treatment options are evaluated based on the location and severity of the fracture.

INTRODUCTION

Toe fractures are one of the most common lower extremity fractures. Toe injuries are often caused by a crushing force to the foot, but joint hyperextension and stress fractures are also seen as minor causes of these types of injuries.¹ There are a variety of toe fractures such as sesamoid fractures, traumatic bunion, or injuries to the hallux. This paper will mainly be analyzing hallux injuries as the hallux enables daily functionality by providing a weight bearing and stabilizing role in the body. Toe fractures are a fairly common type of fracture given the small size of the toe in relation to other parts of the body. One study found that fracture clinics have reported that toe injuries alone account for 10% of injuries seen in the clinic.² Toe fractures were found to have an incidence ranging from 14 to 39.6 patients per 10,000 persons per year. The prevalence of fractures in adults and children is comparable at 3 percent of all fractures in children to 3.6 percent of all fractures in adults.³ If a toe fracture is severe enough, an amputation may be required to provide adequate relief to the patient. Risk factors for toe fractures can include foot heavy sports such as football as athletes are 14 times more likely to injure their toes during a football game. Injuries that specifically happen on the football field are referred to as “turf toe” which refer to the sprain of the first metatarsophalangeal (MTP) joint complex.⁴ Studies also show that the type of field that football is being played on also affects the likelihood of getting a toe fracture. The study described how a third-generation artificial surface showed a significantly higher injury rate when compared to natural grass.⁴ Heavy on foot activity and accidents can be factors that cause toe injuries as one study showed that among participants, 60% of serious foot fractures were caused by falling and 20% by walking injuries like stubbing one’s toe on a curb. Having a history of physician reported diabetes, foot disease, cataracts, and or prior fracture can also increase one’s risk of having a severe toe fracture.⁵ The most prevalent cases of toe fracture and amputations occur mainly in men 45 and older. Symptoms that typically present with these toe or foot injuries are pain and trouble with ambu-

lation. Patients also have point tenderness at the injured site and oftentimes even gentle load bearing causes pain.⁶ Radiographic evaluation or ultrasonography may be needed to accurately determine the location of the fracture and its effect on weight-bearing activities.⁷ The majority of foot fractures are generally caused by falls. Additionally, a significant percent of fractures corresponds with a history of physician diagnosed cataracts or diabetes. These non-trauma related factors make patients prone to fractures due to their bone density and accidentally stubbing their toes due to lack of vision respectively. Patients might also present with a predisposed history of fractures and difficulty walking.⁵

CASE PRESENTATION

A 77-year-old man was taking a walk with his wife near a construction site when a brick fell directly onto his foot. He was wearing open toe sandals, leaving his big toe exposed. The brick was heavy enough where he needed help to get it off his foot. Afterward he was unable to bear weight and also felt pre-syncope seeing the blood. EMS was called. In the Emergency department, his vital signs were temperature 97.8⁰ F, respiratory rate 18 breaths per minute, blood pressure 156/72 mmHg, oxygenating at 95% on room air. Examination of his foot revealed a large stellate laceration and a smaller puncture wound at the top of the toe [Figure 1]. The nail of the great toe was spared. Dorsalis pedis pulse was intact. Range of motion about the ankle was intact. The patient had difficulty weight bearing secondary to pain. Radiographs of the foot demonstrated a comminuted intra-articular fracture of the first distal phalanx. The presence of soft tissue gas was also detected [Figure 2]. The wound was thoroughly irrigated, and no evidence of foreign body was noted within. He was given tetanus prophylaxis and a dose of intravenous cefazolin intravenously. A digital block using 2% lidocaine without epinephrine was performed, after which the skin of the toe was approximated as was best possible. He was discharged home with a walking boot and orthopedic follow up.



Figure 1. Clinical photographs of the patient's foot after debridement and approximation with 4-0 Prolene® sutures.



Figure 2. Radiograph demonstrating comminuted intraarticular fracture of the hallux with distal gas.

DISCUSSION

Toe fractures require different types of treatment depending on which toe is involved, whether there is displacement or angulation and the degree of each of these, whether there is intraarticular involvement, and in the case of children, whether a growth plate is involved.

Fractures of the great toe are usually managed with a walking boot or short leg cast with a toe plate for two to three weeks followed by a rigid solid shoe for an additional three to four weeks. Patients are instructed to weight bear as tolerated. Repeat x-rays after a week are advised if there is an intraarticular fracture as in the case of our patient [Figure 3]. Intraarticular fractures involving more than 25% of the joint require orthopedic referral, as was done in this case.⁸

The goal of fracture treatment is to stabilize fixation of bones to ensure mobility while also maintaining recovery. The proper recovery of foot features is incredibly important to the patient's well-being as improper recovery can be debilitating to day to day living. Particularly in older individ-

uals, the inability to ambulate and the resulting immobility can lead to isolation and depression.

Buddy taping is another form of treatment used to treat toe fractures, albeit of the lesser toes. Buddy taping is taping the injured toe to the uninjured toe next to it to allow the injured toe to straighten out and form correctly relative to the rest of the foot. Another method is the use of a rigid sole shoe. Rigid sole shoes help with fracture recovery by limiting the movement in the toes allowing the fracture to heal properly.⁷

CONCLUSION

This case represents a moderately severe toe fracture. This case report demonstrates the importance of taking prompt action to treat toe fractures, and appreciating how important proper foot care, including wearing protective shoes, is.

Submitted: July 18, 2024 EST, Accepted: July 31, 2024 EST

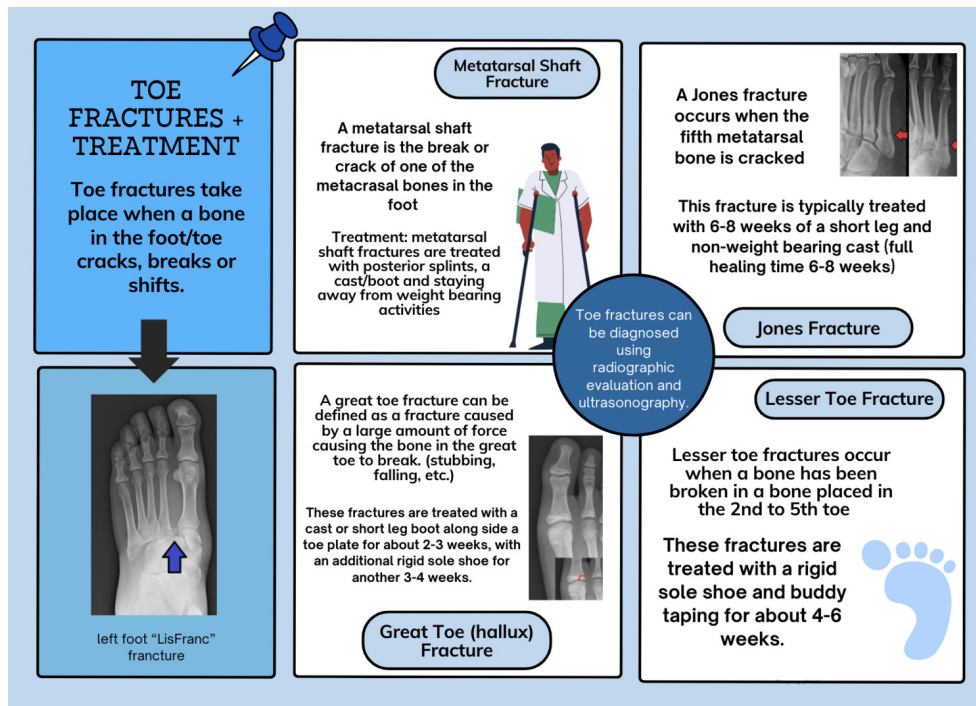


Figure 3. Infographic depicting treatment of toe fractures. Designed by Shilpa Subramaniam using [canva.com](https://www.canva.com)

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