

Curbside Delivery: A Fracture

Dustin L. Yothers, MSPAS, PA-C

Penn Medicine Lancaster General Health Urgent Care



CASE HISTORY

A 26-year-old male with no significant past medical history presents to Urgent Care with the chief complaint of falling off a curb last evening and rolling his right ankle. He reports 9/10 pain in his right ankle and right foot, and is not able to bear weight. He adds that the pain is radiating to his right lower leg. He denies hitting his head or passing out.

The patient reports no pain elsewhere in the body. He also denies numbness, tingling, cuts, or bleeding. He is not currently taking any daily medications and has no known drug allergies. The patient has no history of orthopedic surgeries.

Upon exam, his skin is intact with gross deformity and edema of the right ankle, with intact distal pulses. He exhibits limited range of motion of his right ankle but can move his right toes. X-rays of the right ankle and foot are pending.



Fig. 1. AP view, right ankle, initial plain film X-ray.

QUESTIONS

1. What rules would you use to determine whether the patient needs X-rays of the ankle?
2. How would you read the initial X-ray (see Fig. 1) of the right ankle?
3. How would you stabilize this patient's ankle?
4. What do you tell the patient will most likely happen next?
5. How soon should the patient return for a follow-up appointment?

ANSWERS

1. Follow Ottawa Ankle Rules, which are available on the MDCalc App. Anterior-posterior (AP), oblique, and lateral radiographs are the standard views obtained if imaging is necessary.
2. The X-ray (see Fig. 1) shows a bimalleolar fracture, including an oblique fracture through the distal fibula with fracture extending into the syndesmosis and a transverse fracture of the medial malleolus. Also seen are en bloc lateral displacement of the tibiotalar joint and foot, as well as associated soft tissue swelling around the ankle.
3. The patient should be splinted with the ankle joint at 90 degrees and remain non-weight bearing; typically, a short leg splint suffices.
4. Unstable fractures generally require operative fixation.
5. Open fractures and any injury with associated neurologic or vascular deficits require immediate orthopedic referral. Fracture dislocations require rapid reduction and referral. Unstable injuries should be referred within a few days.

DISCUSSION

Bimalleolar fractures represent a significant subset (approximately 60%) of ankle injuries, characterized by fractures of the medial and lateral malleoli of the distal tibia and fibula, respectively.¹ The vast majority of these fractures affect middle-aged individuals, often resulting from high-impact trauma or twisting injuries.

The mechanisms involved in these fractures often generate considerable force, leading to substantial disruption of the ankle's stability.

Surgical intervention, such as open reduction and internal fixation (ORIF), remains the gold standard for treating bimalleolar fractures, especially in cases with significant displacement or joint incongruity (see Fig. 2). The main goals of this approach are to restore anatomical alignment and promote functional recovery.²

The diversity in surgical techniques and fixation methods utilized across different health care settings influences postoperative outcomes. The radiological results for the treatment of bimalleolar fractures are time sensitive; surgery should be performed as soon as

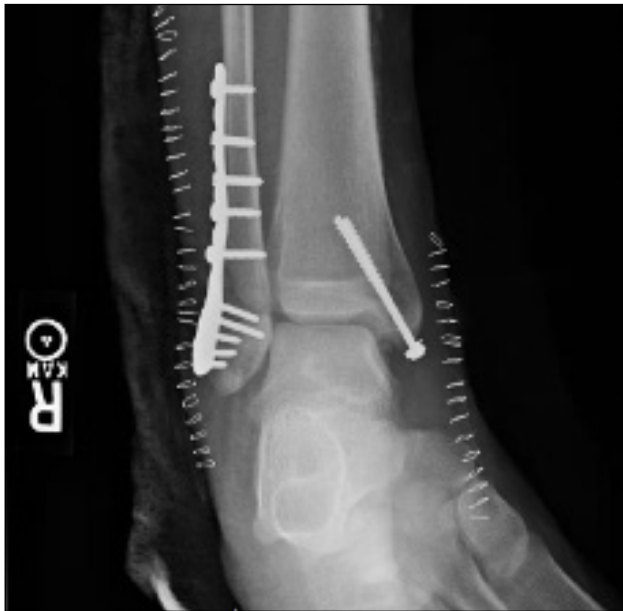


Fig. 2. AP view, right ankle, s/p ORIF.

possible, using adequate fixation materials (see Fig. 3), to achieve a better restoration of anatomy.³

Complications following bimalleolar fractures and subsequent surgical interventions are not uncommon and can include, but are not limited to, postoperative infections, malunion, nonunion, and hardware-related issues. These complications emphasize the importance of meticulous postoperative care and appropriate follow-up to mitigate adverse outcomes.

Smoking cessation leads to a 40% decreased risk of adverse outcomes.⁴ A study of patients who quit smoking for orthopedic surgery revealed a one-year abstinence rate of nearly 50%, suggesting this is an opportune time for the health care community to intervene on the patient's behalf.⁴

Functional outcomes following surgical management of bimalleolar fractures are generally favorable,



Fig. 3. Lateral view, right ankle, post-op staples.

with most patients achieving satisfactory ankle function and returning to their pre-injury activity levels. However, a subset of patients may experience residual pain, stiffness, or reduced range of motion, potentially impacting long-term quality of life.

Rehabilitation programs tailored to individual patient needs play a crucial role in optimizing functional recovery and reducing the risk of chronic disability. One study showed that early weight bearing at three weeks following ORIF of bimalleolar and bimalleolar-equivalent ankle fractures led to no increase in complications or nonunion rates.⁵

In conclusion, bimalleolar fractures pose significant challenges in orthopedic practice, necessitating a comprehensive understanding of their management and associated complications. While surgical intervention remains the cornerstone of treatment, ongoing research and advancements in surgical techniques are imperative to optimize outcomes and improve the long-term prognosis for patients sustaining bimalleolar fractures.

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Dustin L. Yothers, MSPAS, PA-C
 LG Health Urgent Care
 950 S. Octorara Trail, Parkesburg, PA 19365
 610-857-6639
 Dustin.Yothers@penmedicine.upenn.edu