

# Metatarsal Trauma

Dan Preece DPM, R3

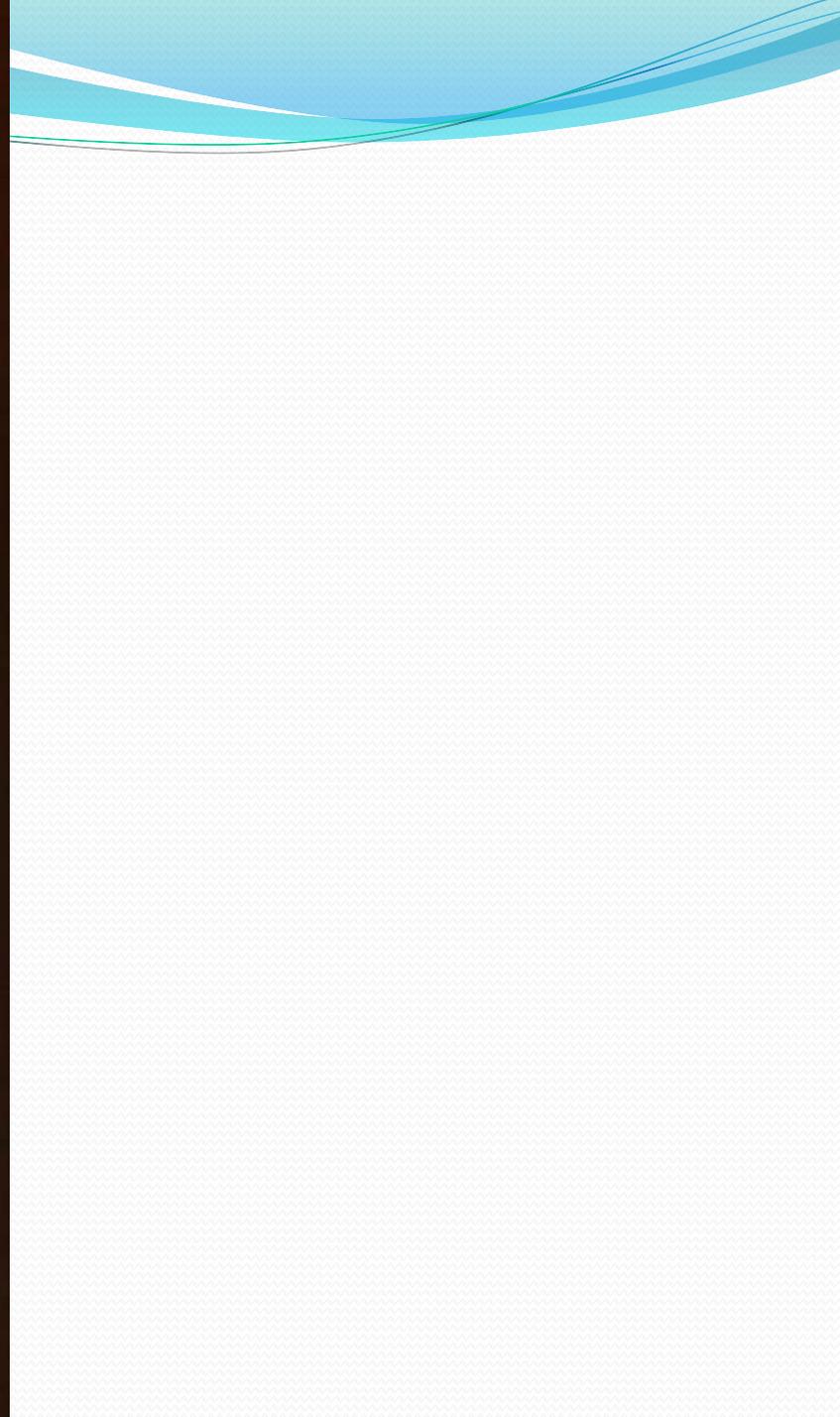
What are the possible outcomes, if you don't land this jump?

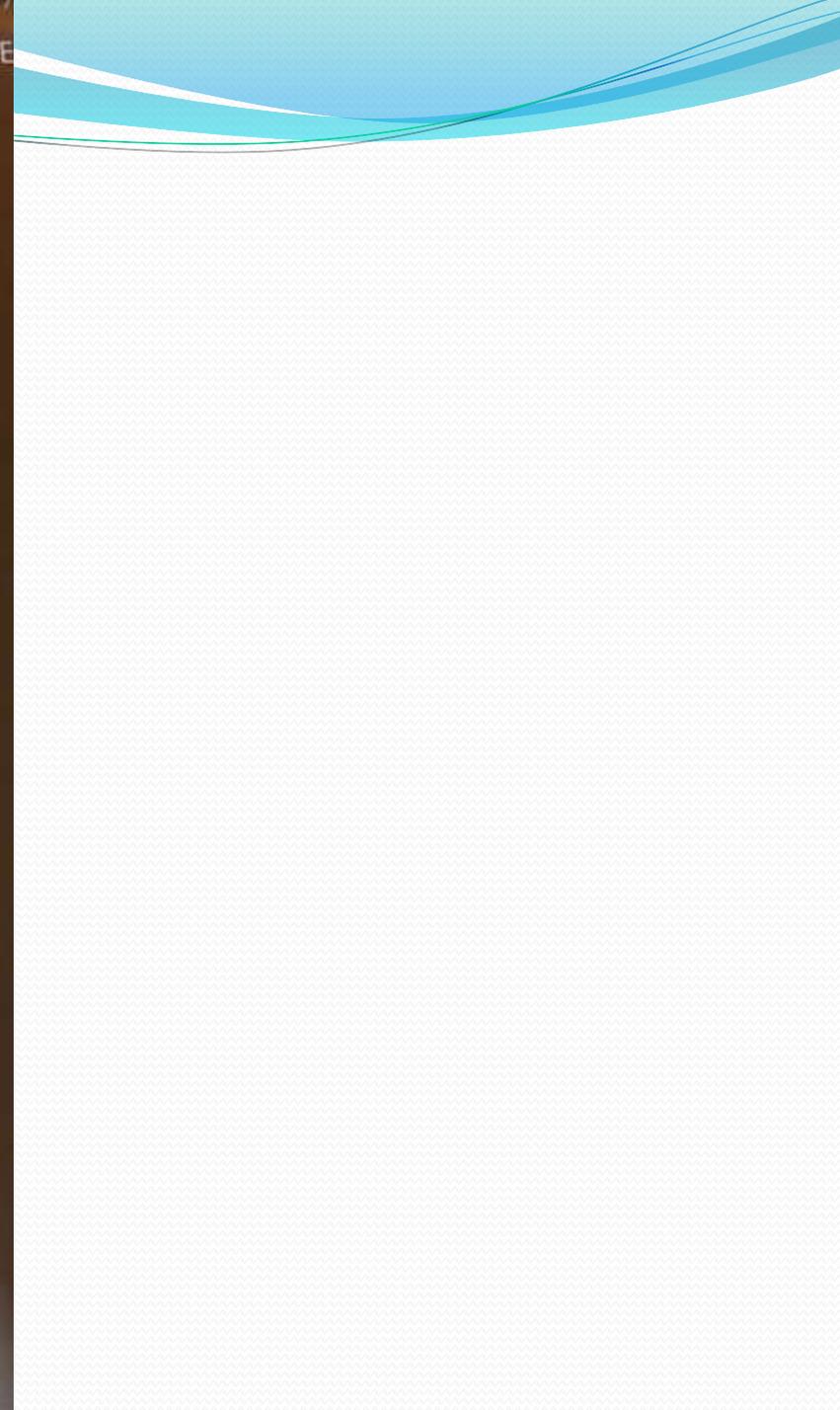




Open fx, skin  
laceration > 1.5  
cm.







3end





**Classify this injury...**

# Classify this injury...

## Gustillo & Anderson: Open Fractures Classification

**Type I:** Clean wound, < 1cm long, Little soft tissue damage, No crushing component  
Simple transverse/short oblique fx, Minimal comminution.

**Type II: Laceration, > 1cm long, No extensive soft tissue damage, Moderate contamination, Simple transverse/short oblique fx. Minimal comminution,**

**Type III:** > 5cm long, extensive soft tissue damage, Muscle, Skin  
Neurovascular structures, Severe crush component, Severely comminuted fracture  
Marked contamination, Examples include: Farm injuries, Gunshot wounds  
Traumatic amputations. Open fractures > 8 hours old.

### **Type IIIA:**

Adequate soft tissue coverage of the fracture with limited periosteal stripping.

### **Type IIIB:**

Extensive soft tissue injury with periosteal stripping, considerable bone exposure.

### **Type IIIC:**

Associated with arterial injury. Reported amputation rate of 25-90%.

# Treatment Plan?

## Principles of treatment:

All open fractures should be treated as an emergency (pager went off at midnight...).

Evaluate patient for other life threatening injuries.

Appropriate antibiotic therapy.

Tetanus prophylaxis.

Adequate debridement and irrigation.

Stabilization of fracture.

Early cancellous bone grafting.

Appropriate wound coverage.

Rehabilitation.

## **Antibiotic therapy:**

Antibiotic therapy is considered therapeutic rather than prophylactic. Cultures should be taken from deep tissues after thorough irrigation and debridement. Antibiotic therapy is administered after cultures are taken and should be given within the first three hours of injury.

Type I: cephalosporin.

Type II: cephalosporin or cephalosporin + an aminoglycoside. If any question about the cleanliness of the wound, an aminoglycoside is added to the cephalosporin.

Type III: cephalosporin + aminoglycoside.

Farm injuries: penicillin.

## **Irrigation:**

Type I: 1-2 L of solution.

Type II & III: 2-4 L of solution.

All type III wounds should be checked again in 24-48 hours.

## **Wound coverage:**

Primary closure: Indicated in type I and the majority of type II open fractures.

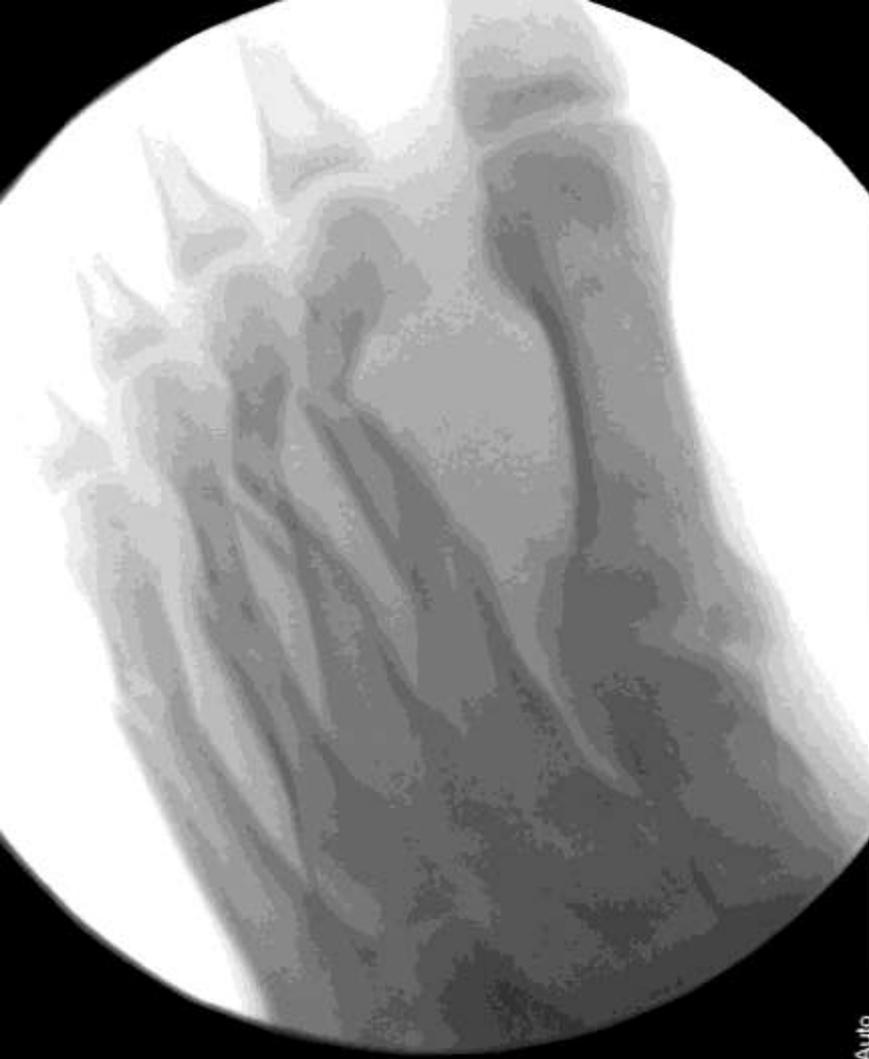
Delayed primary closure: Defined as closure of the wound within 3-10 days. Indicated for type III open fractures.

Patient drove 5+ hours from Mesquite Nevada, with foot in dependant position. Result? Severe edema.

Compartment pressures were <25 mmHg.

Your plan????

- 
- Percutaneous pinning/ Ex-fix for fracture stabilization.
  - Will consider ORIF if fragments do not consolidate later on.
  - Must address edema prior to making large incision for ORIF.

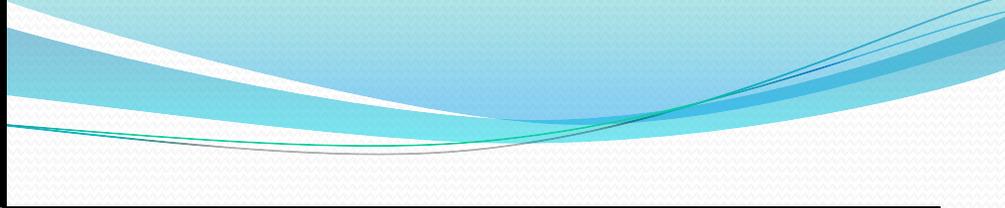
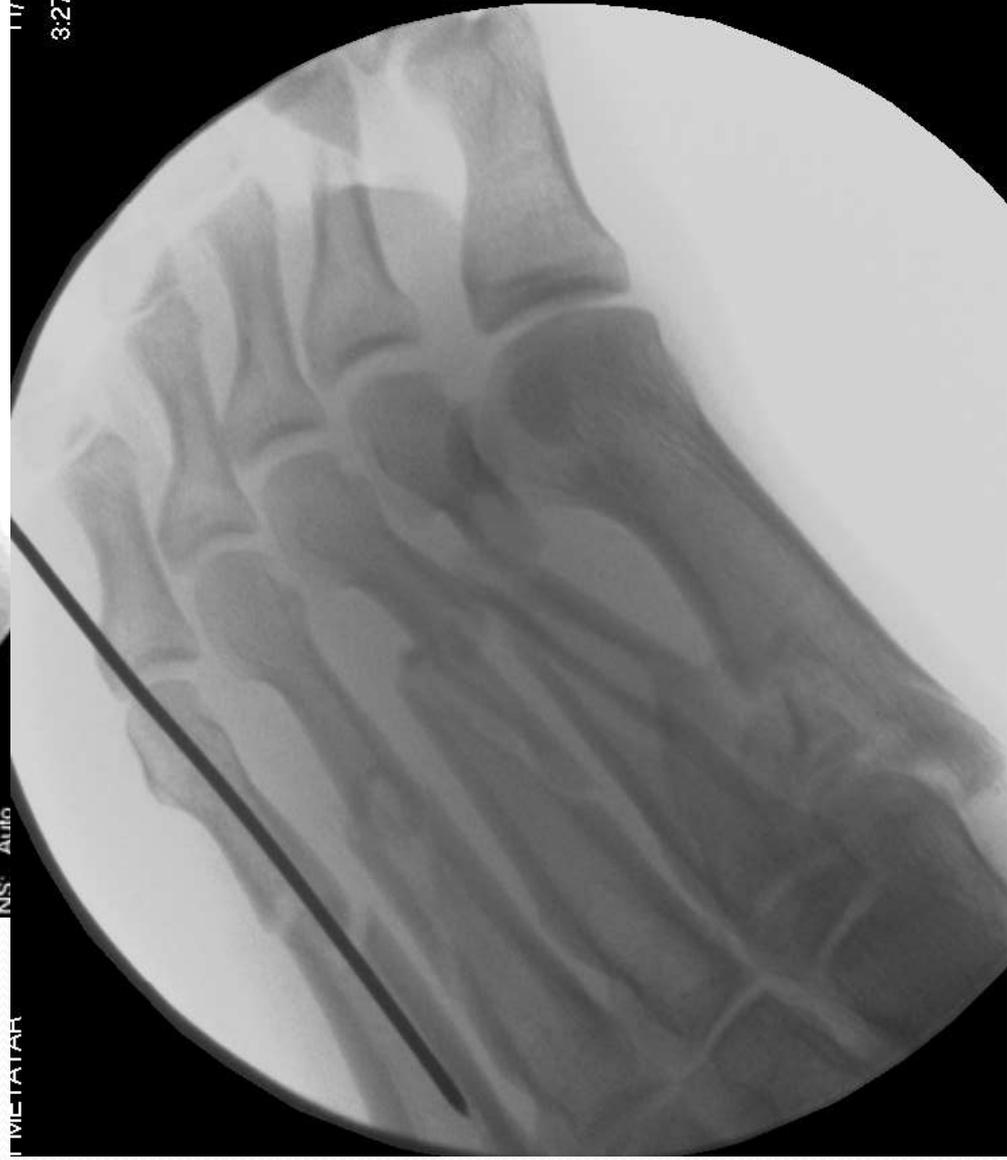


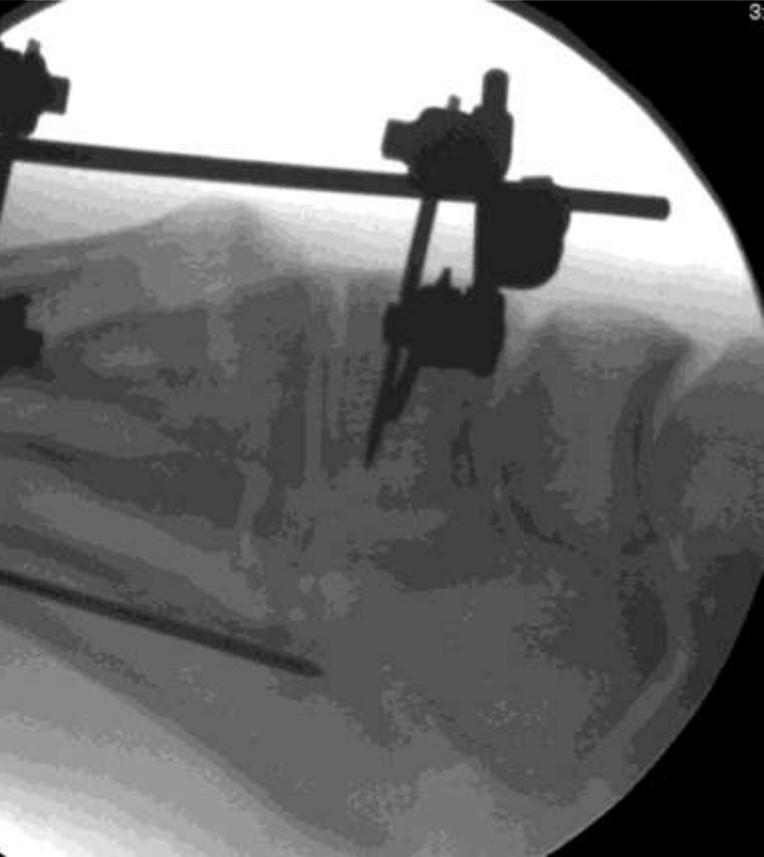
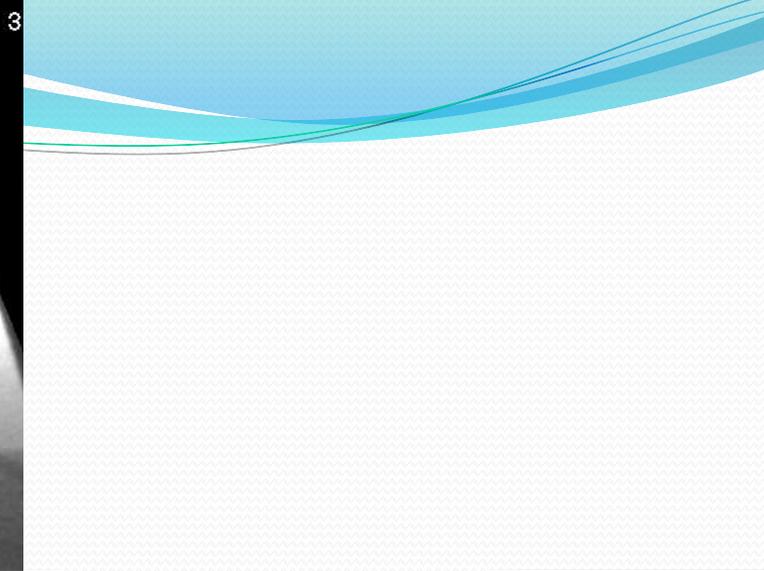
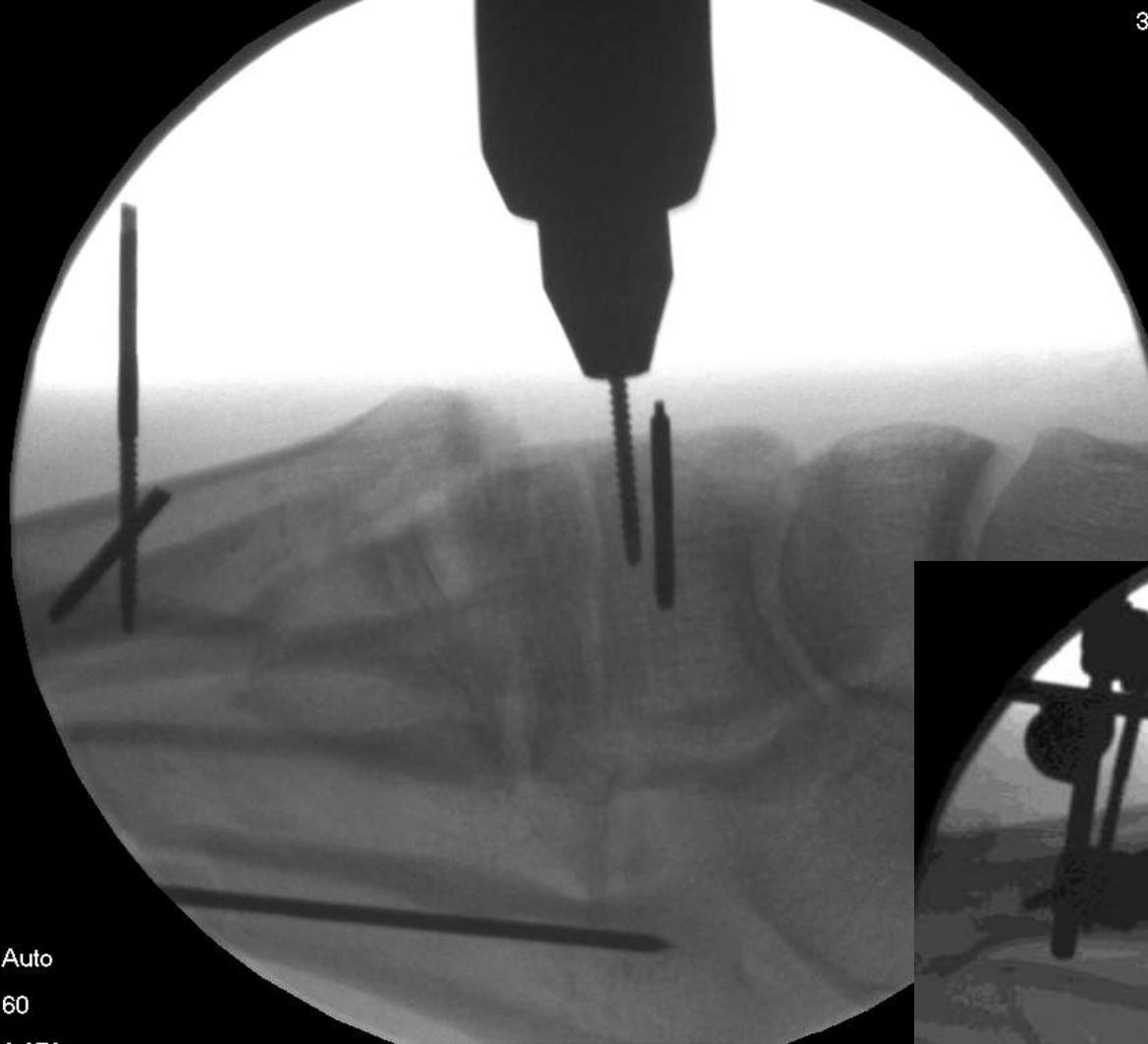
NS: Auto

1 MILITARY

117

3:27





Auto  
60

Auto

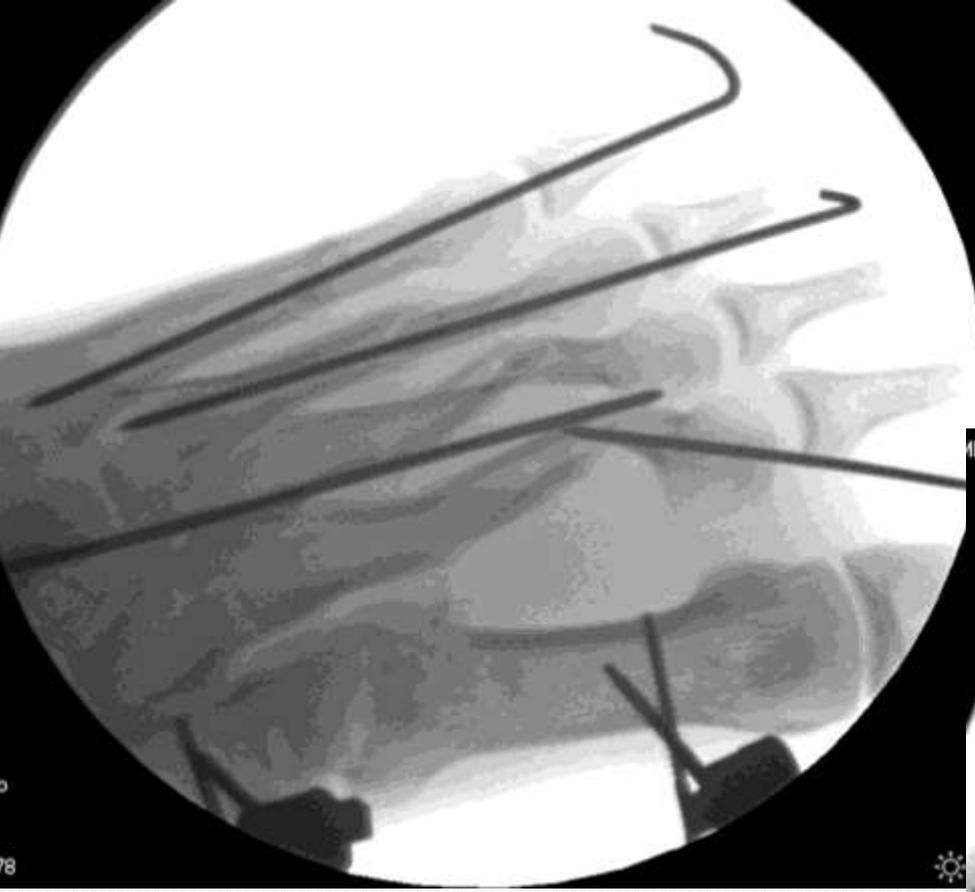


Two mini delta formations, one on 1<sup>st</sup> met, other on med cuneiform.

Connecting rod with universal joints allowing complete freedom of motion prior to stable fixation.



2<sup>nd</sup> and 3<sup>rd</sup> with 2 main fracture lines and other smaller comminuted fragments. Fragments of cortical bone crushed into medullary canal making k-wire placement difficult.



Small incision made to allow instrumentation placement to shift fragments as needed.

Struggling, struggling...



Mini-rail with carbon fiber rod to allow for better visualization placed.

Problem? Doesn't allow for mechanical distraction, only manual force.



Attempt at K-wire pinning.  
Cortical fragments  
blocking medullary canal  
again...

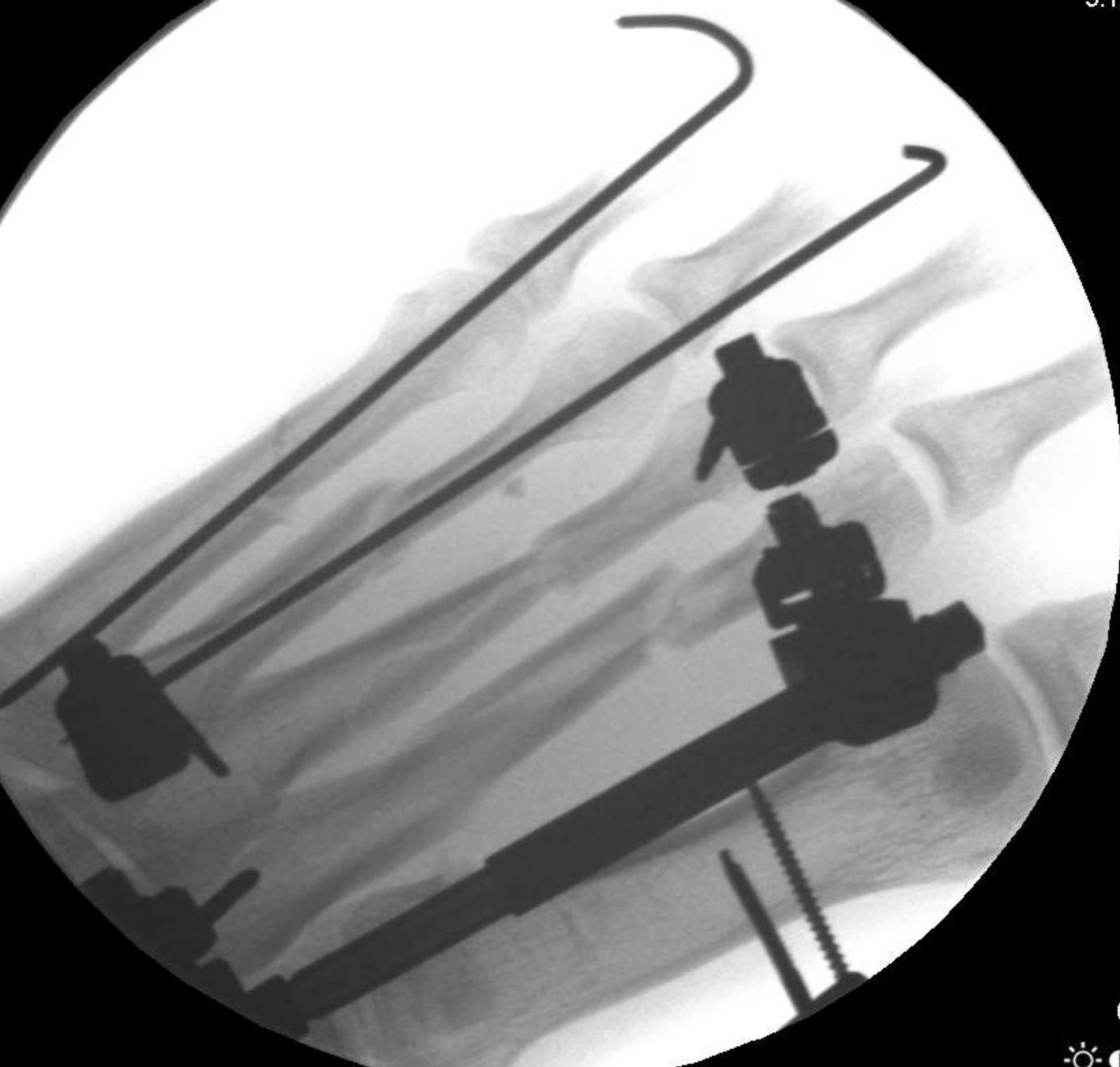


NS: Auto  
kV: 67  
mA: 0.090  
dt: 0:10  
DAP: 6.6469 cGy cm<sup>2</sup>

FLUOROSC/



Distraction  
needed, min-rail  
was placed with  
this capability.



The enemy of good  
is....?

It's 4 am, pts been on  
the table for 3 hours.

Call it good and Go  
home....





