

Lab Exercise:  
Distal Femoral Osteotomy  
Using 3D Printed Guides  
for Medial Patellar Luxation Management

Stabilization Using Locking  
Plate and Screws



# Characterization of Deformity:

- Distal Femoral Varus:  $20^{\circ}$
- External Torsion:  $10^{\circ}$
- Shallow/absent trochlear groove



# Step 1: Osteotomy Guide Application

Find appropriate location of guide on distal femur:

1. Slide guide from proximal to distal
2. “Roll” guide lateral until guide pods engage the topography of the bone



## **Note:**

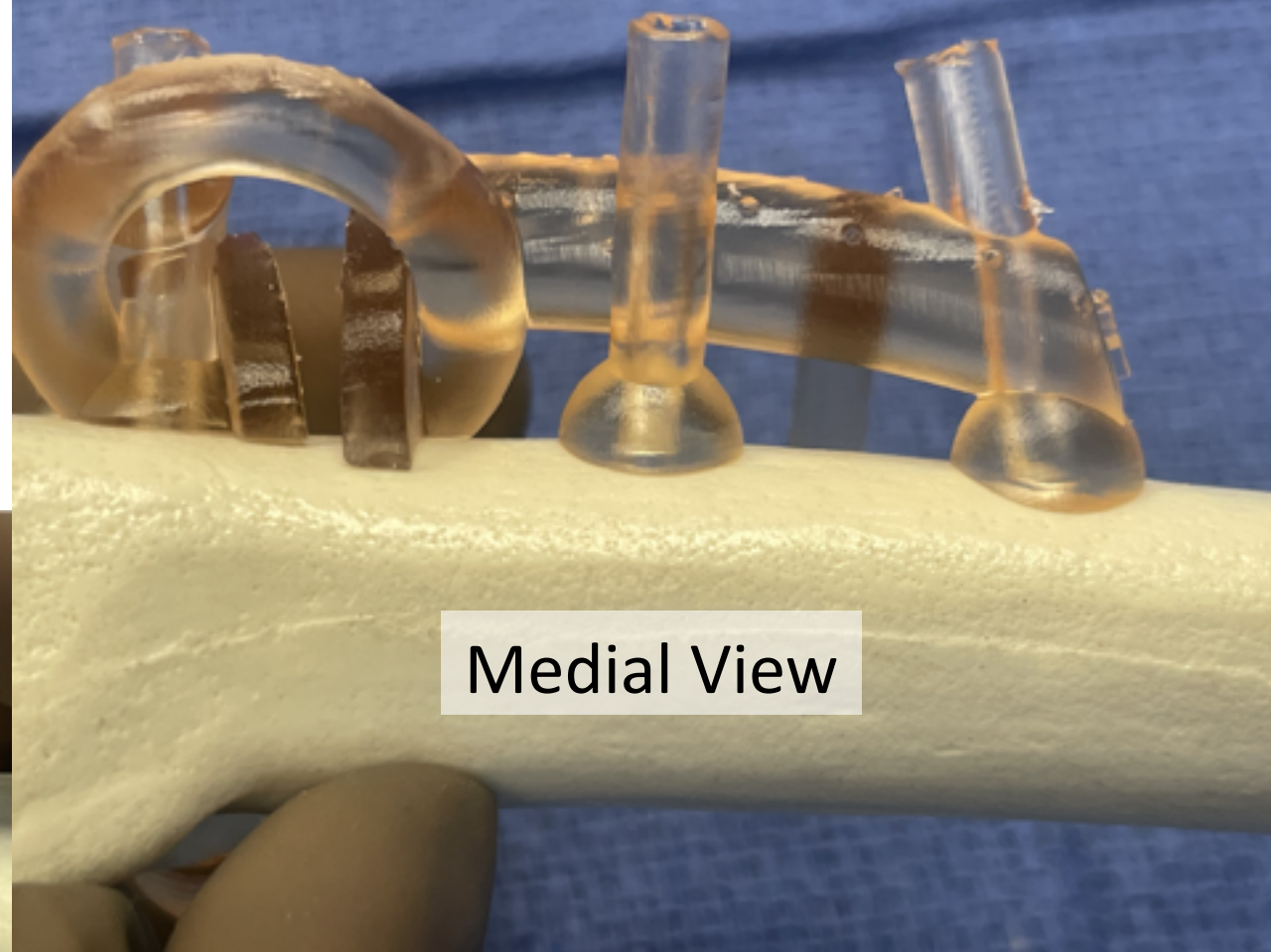
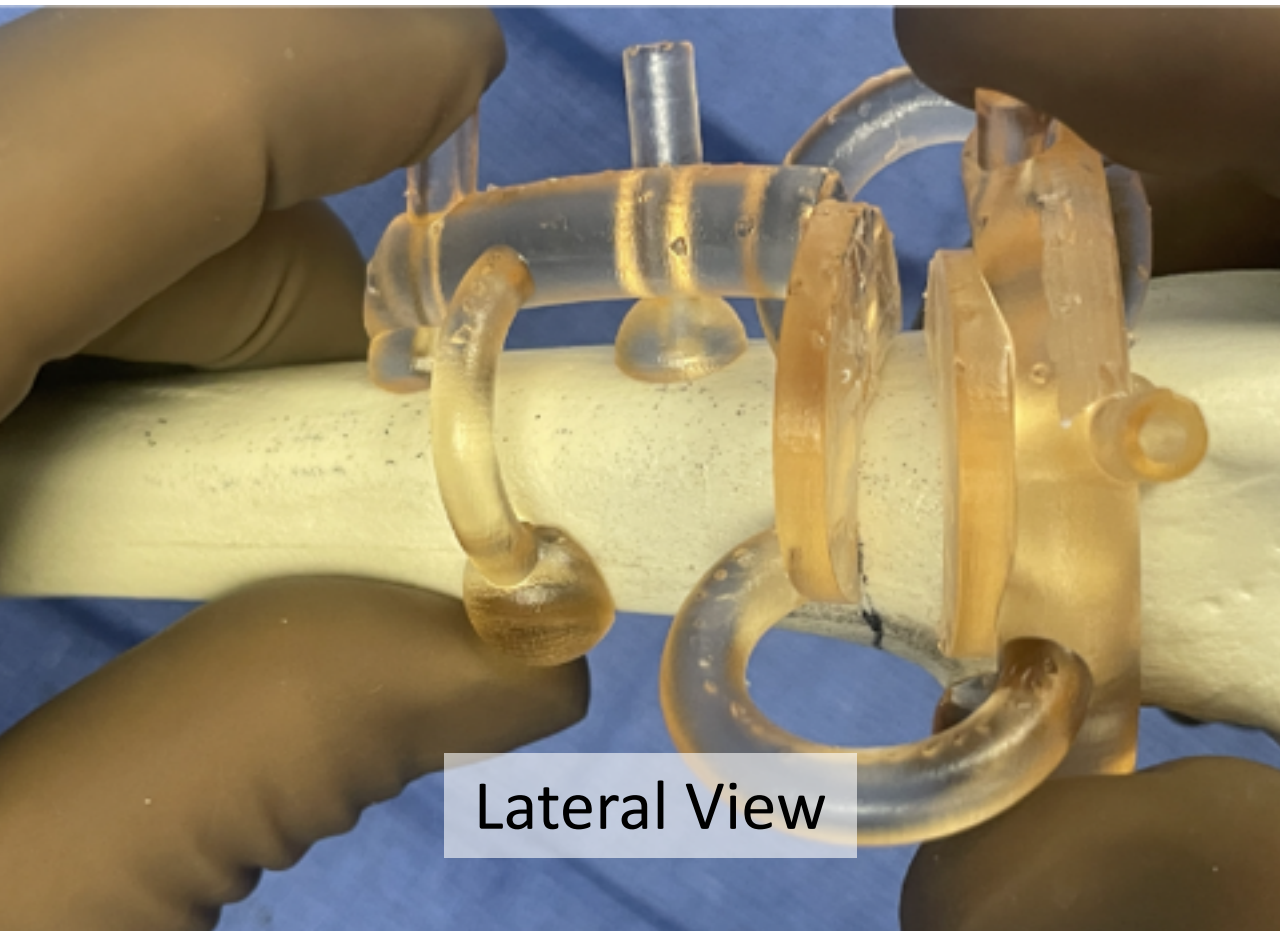
Guide feet are placed in locations to 'grab' bony prominences

This overly smooth model bone is not representative of a femur in a clinical case and guide design has been modified to compensate for this



**Important:**

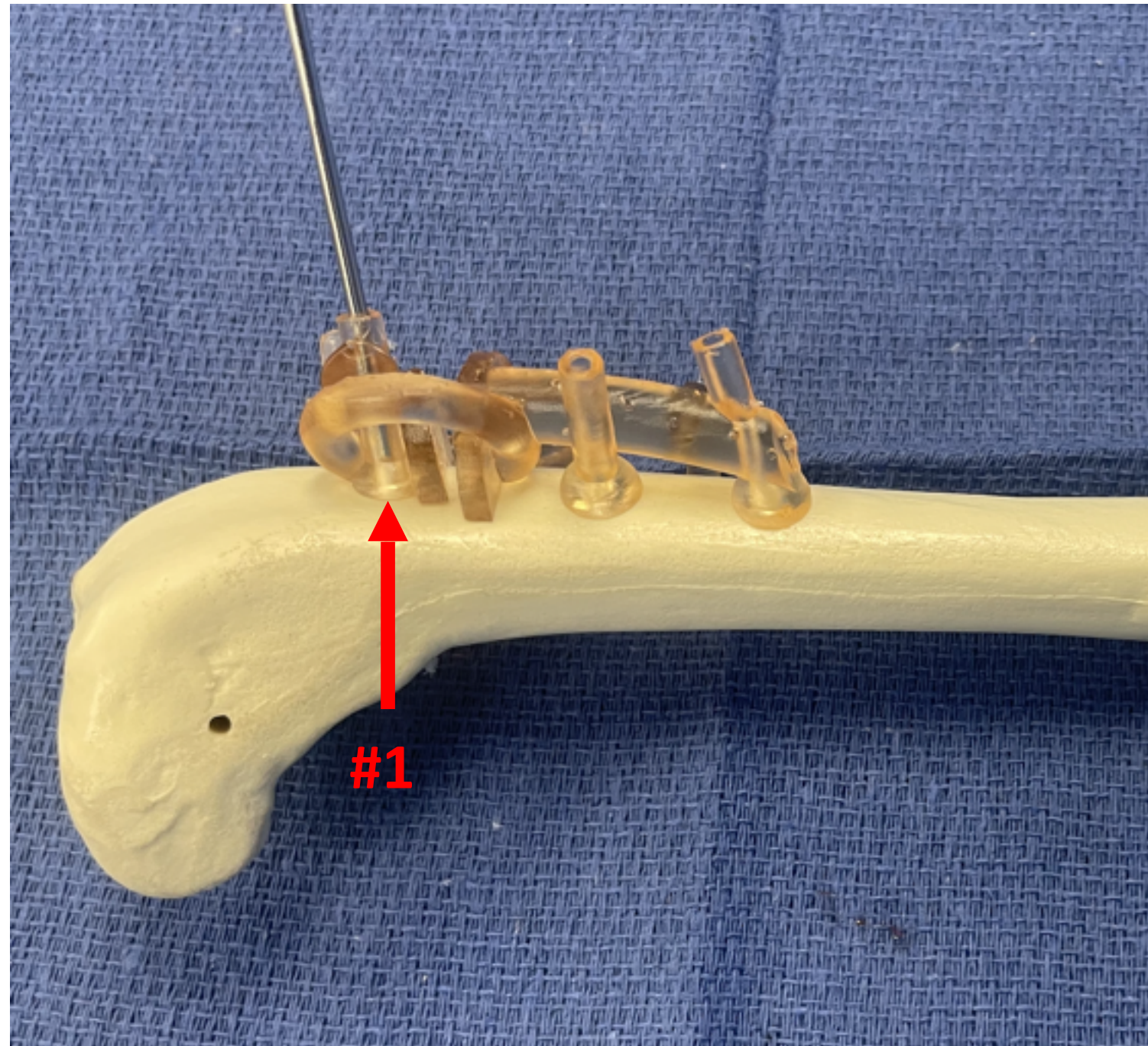
Ensure that guide feet and osteotomy shelf surfaces are in direct contact with bone surface





## Step 2: Secure Osteotomy Guide

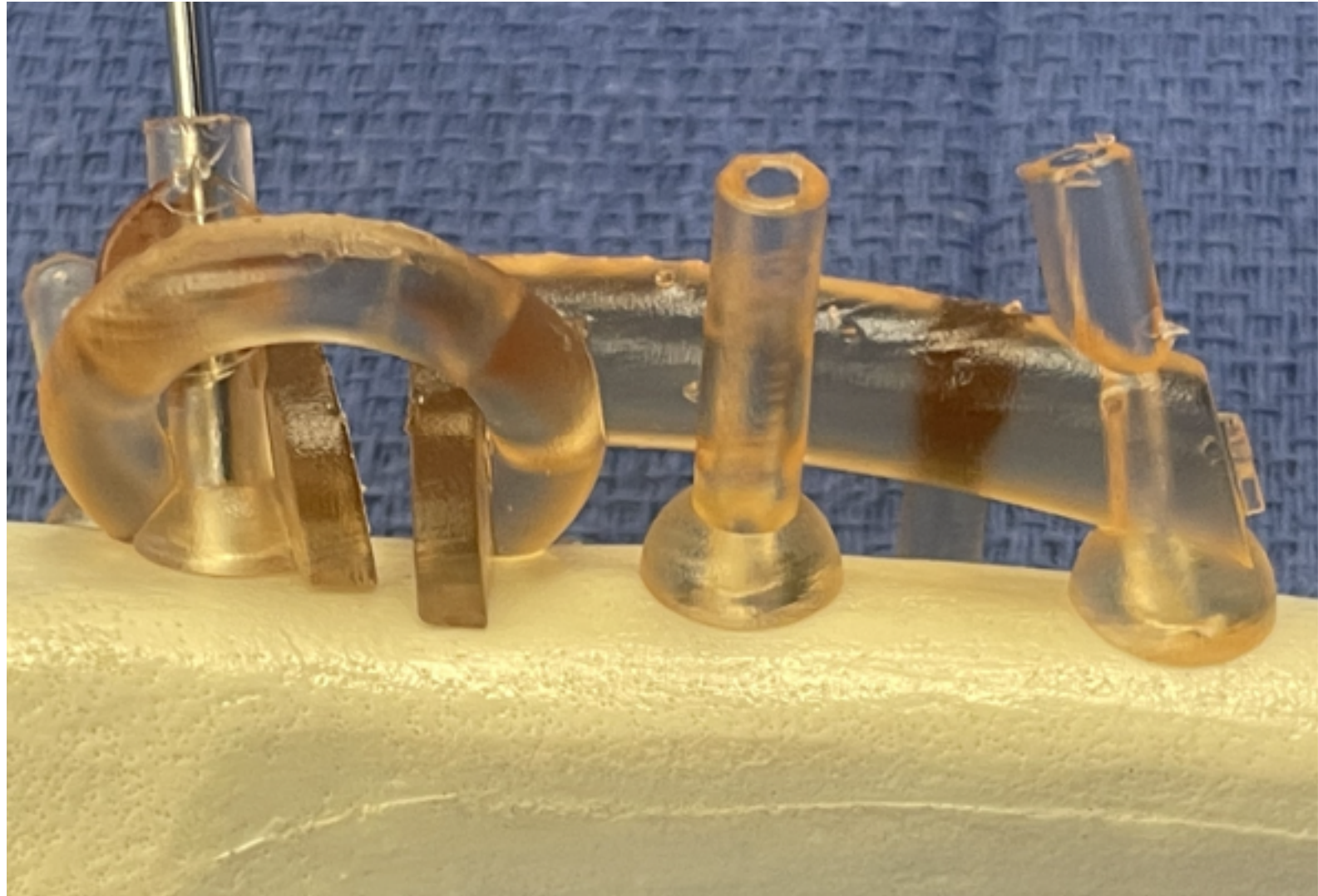
- Drill 5/64" Steinmann pin through Drill Guide #1
- Pin should have bicortical bone purchase



## **Important:**

Maintain correct guide position  
during pin application

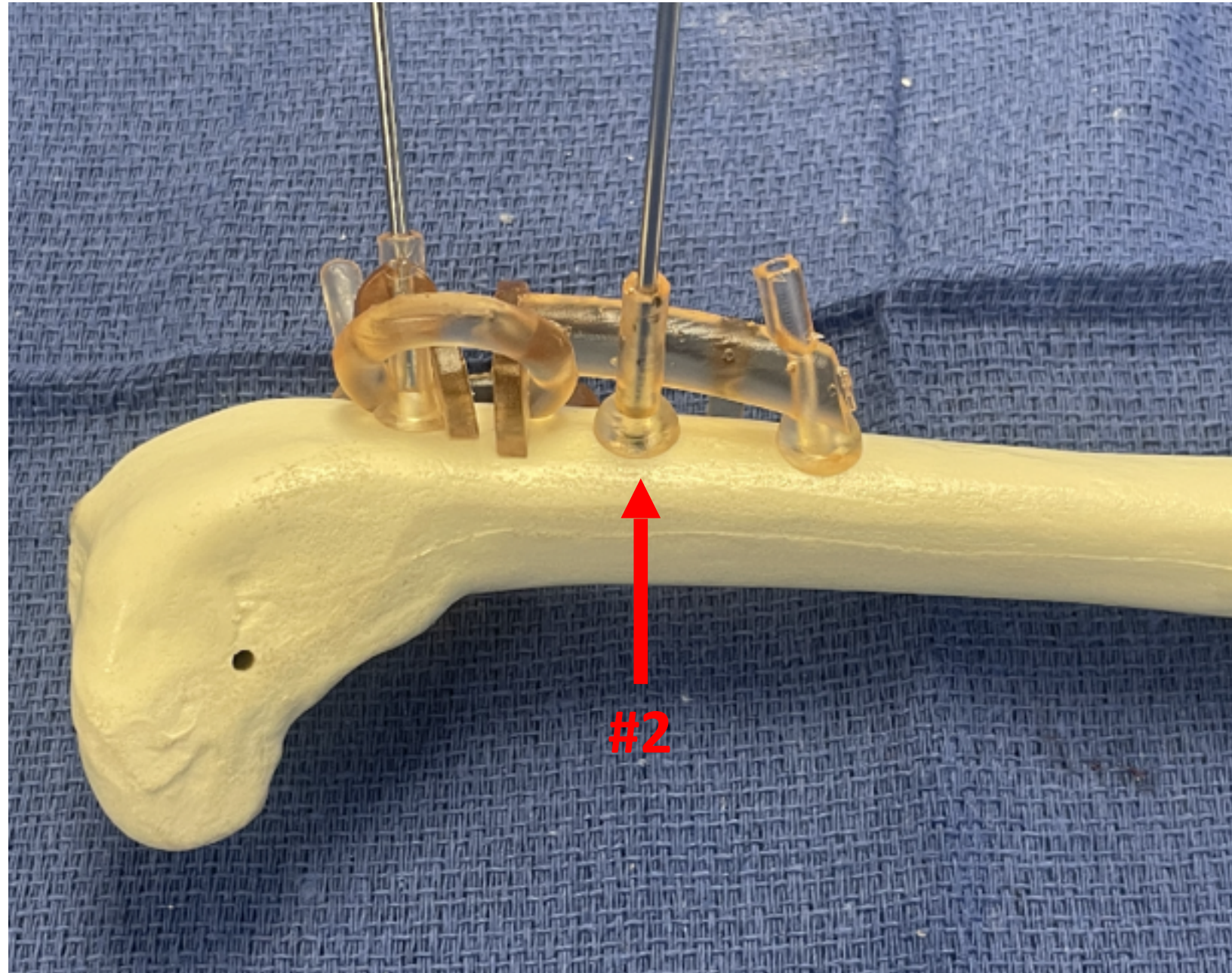
Translation of guide during  
application will result in  
suboptimal results





## Step 2: Secure Osteotomy Guide

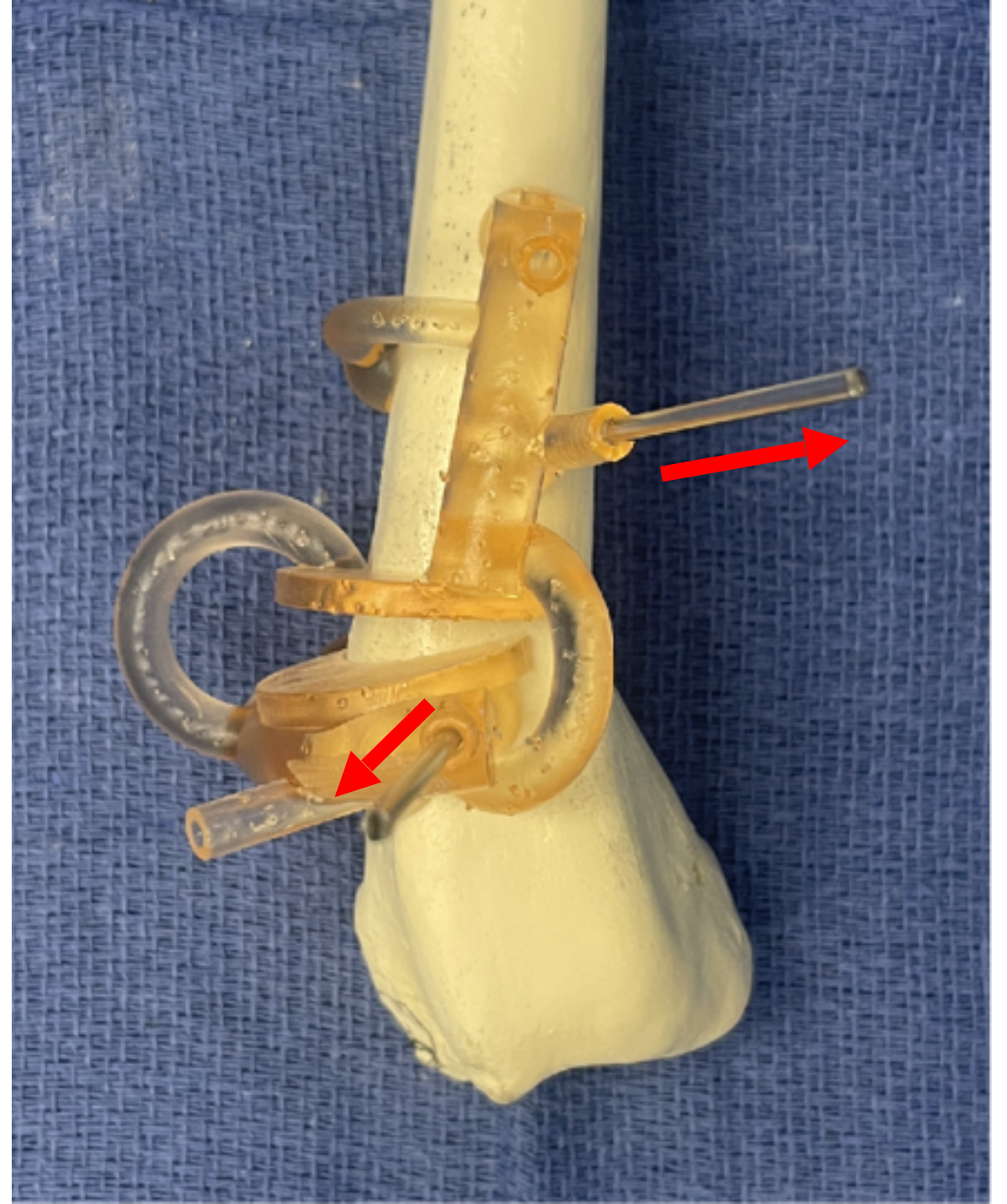
- Drill 5/64" Steinmann pin through Drill Guide #2
- Pin should have bicortical bone purchase





**Note:**

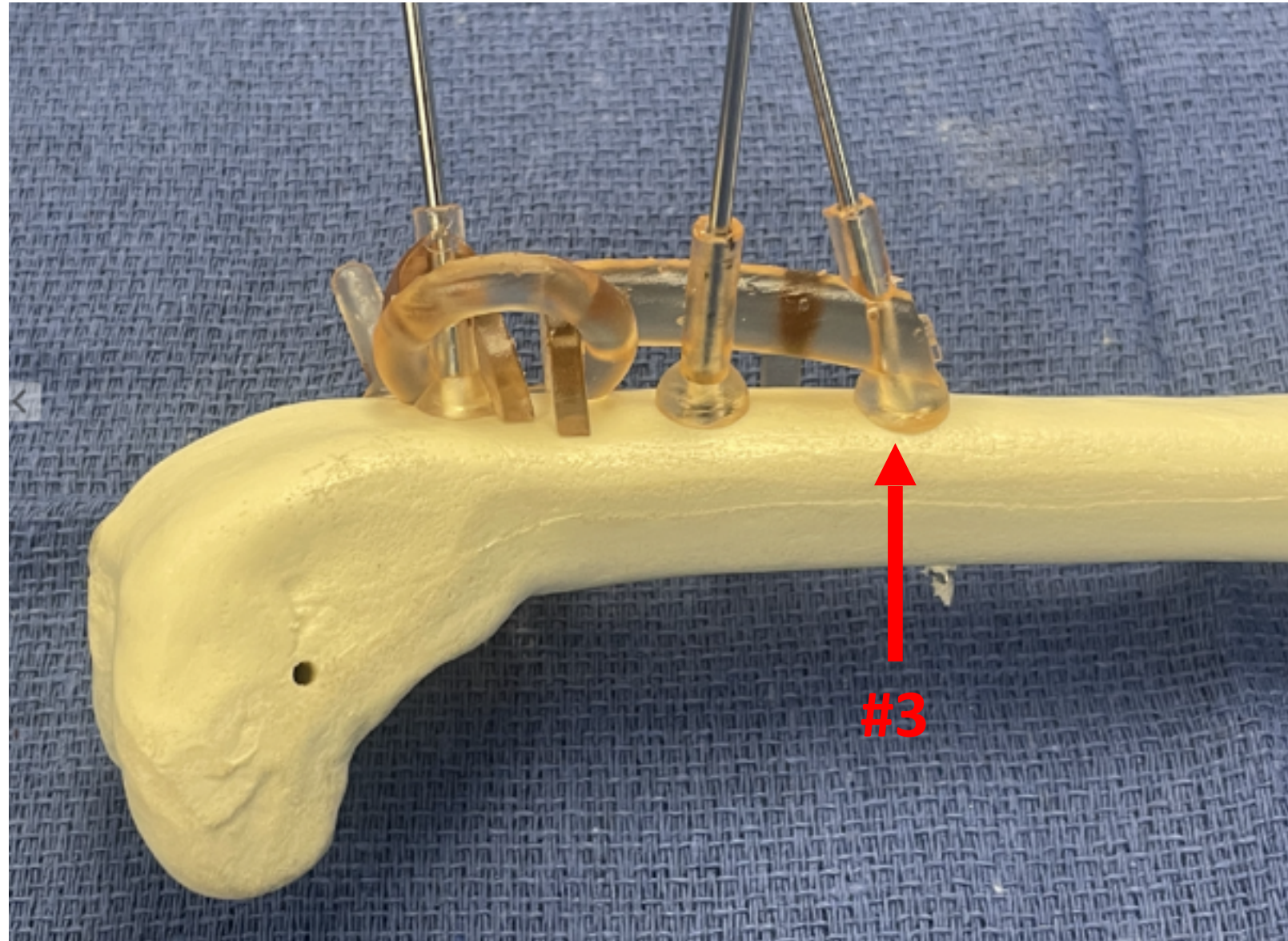
Pins 1 and 2 are divergent in the osteotomy guide but parallel in the reduction guide, once desired correction is achieved





## Step 2: Secure Osteotomy Guide

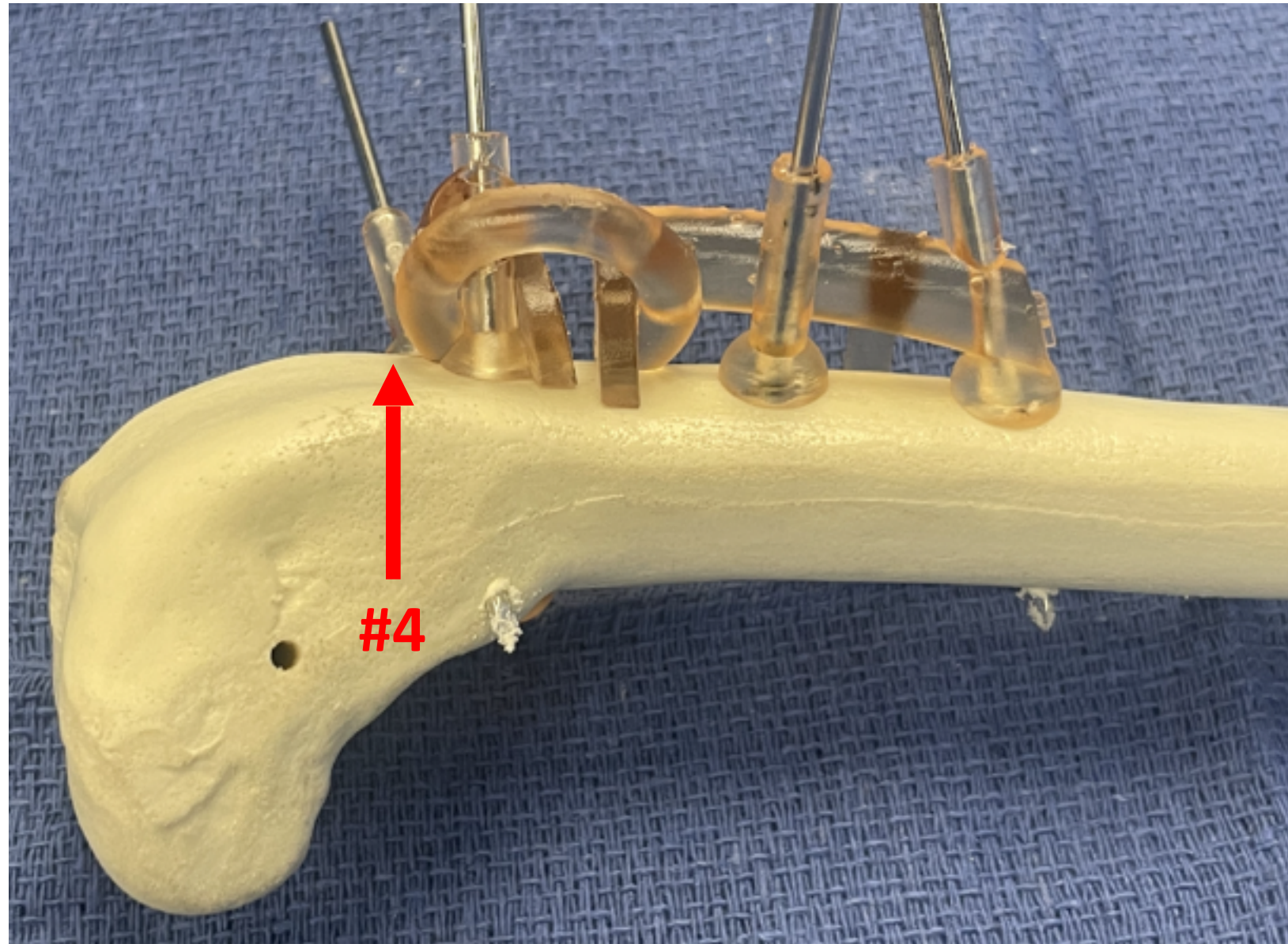
- Drill 5/64" Steinmann pin through Drill Guide #3
- Pin should have bicortical bone purchase



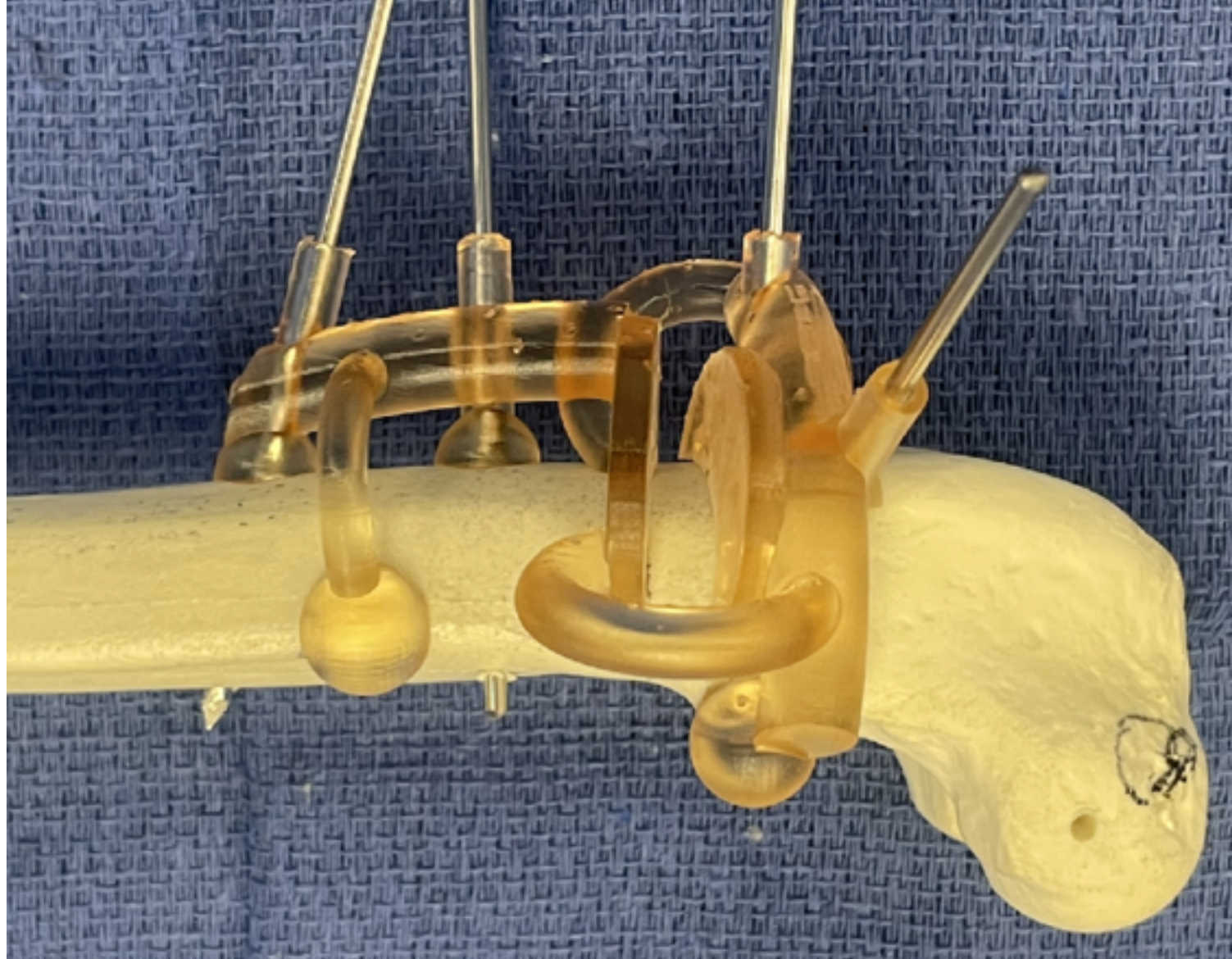


## Step 2: Secure Osteotomy Guide

- Drill 5/64" Steinmann pin through Drill Guide #3
- Pin should have bicortical bone purchase



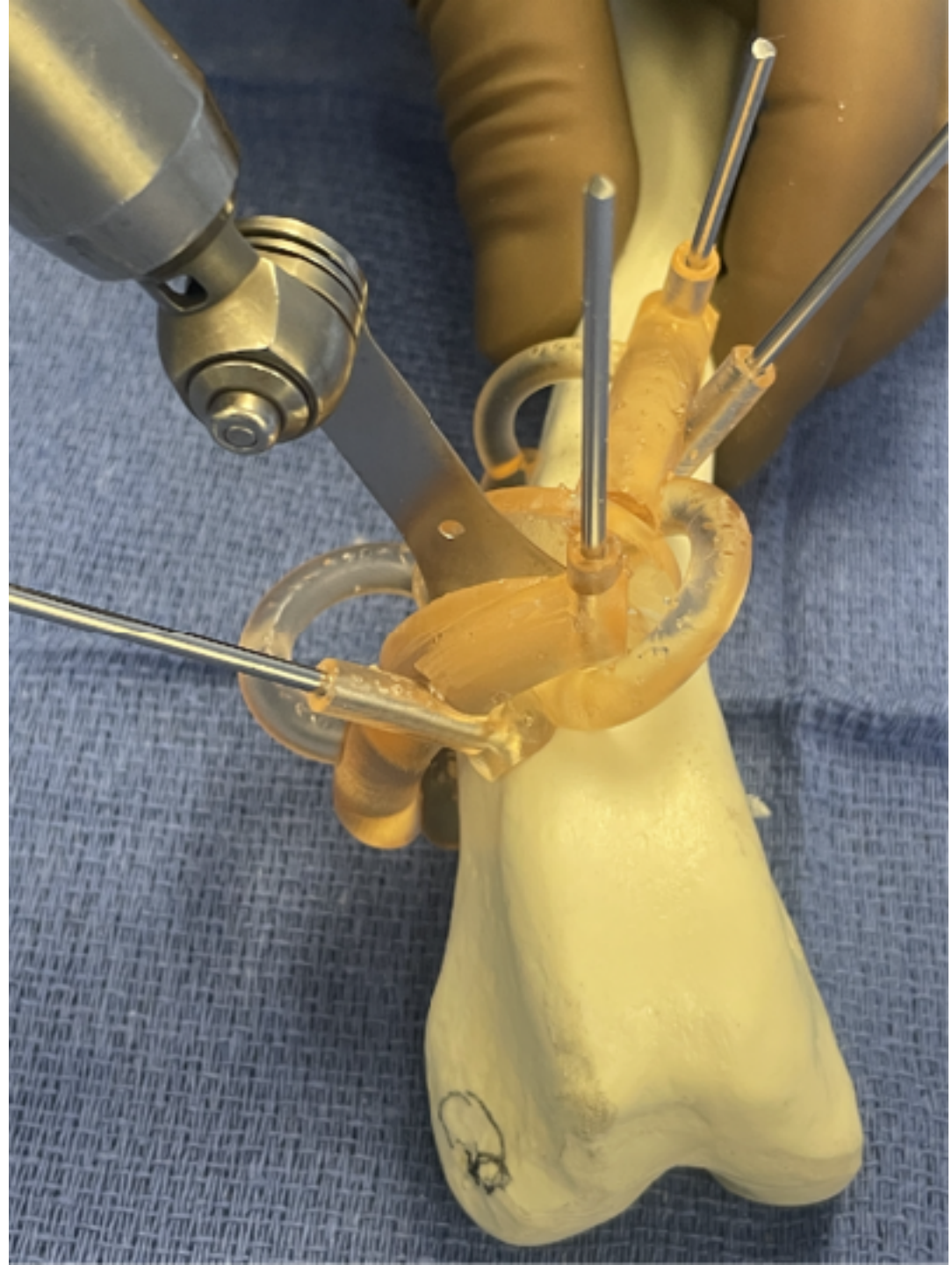




Lateral View of Femur with Osteotomy Guide Secured

## Step 3: Create Osteotomies

- Use a sagittal saw to perform osteotomy along the osteotomy shelves



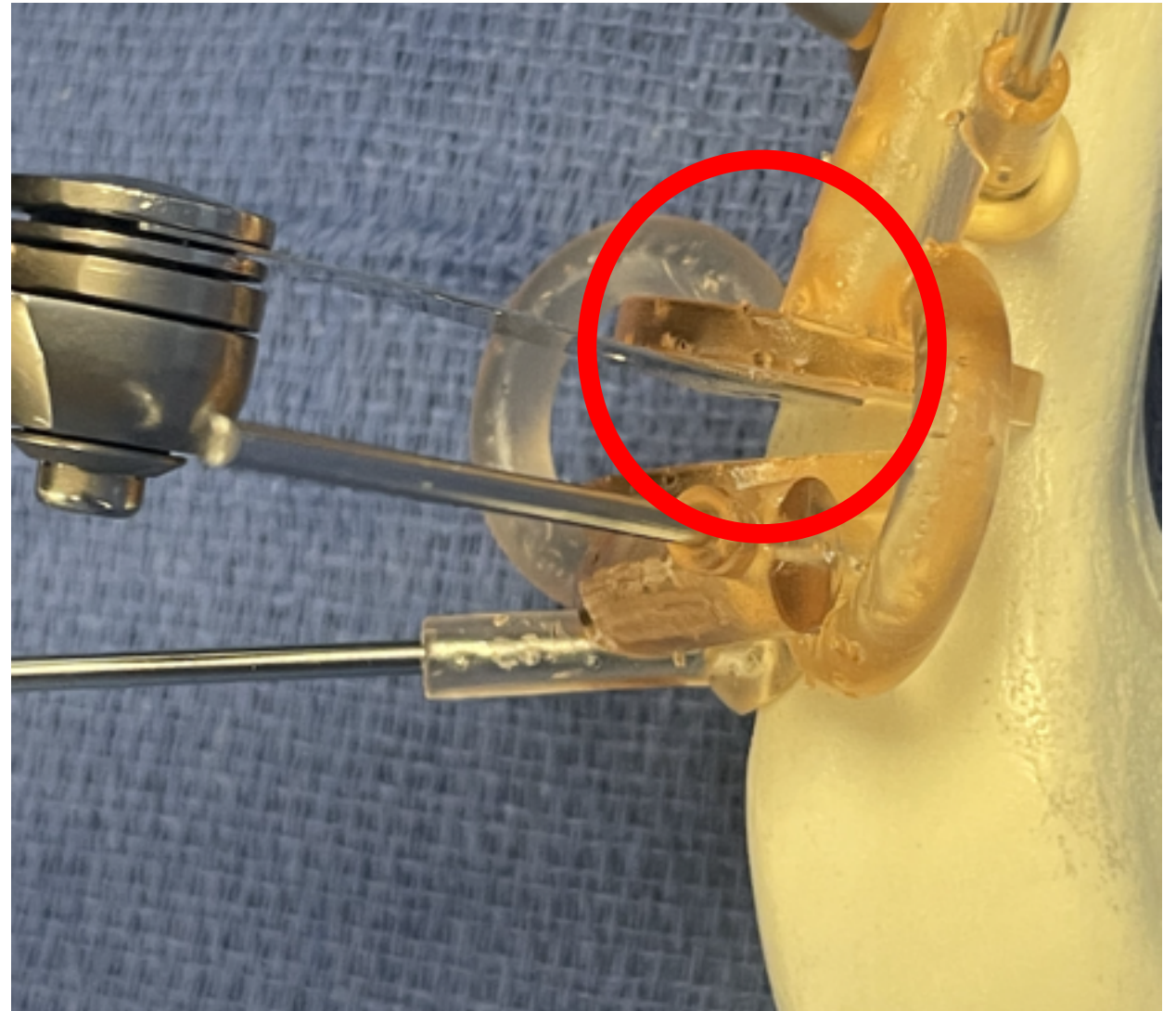


**Important:**

Saw blade **must** be maintained in a position flat against the osteotomy shelf

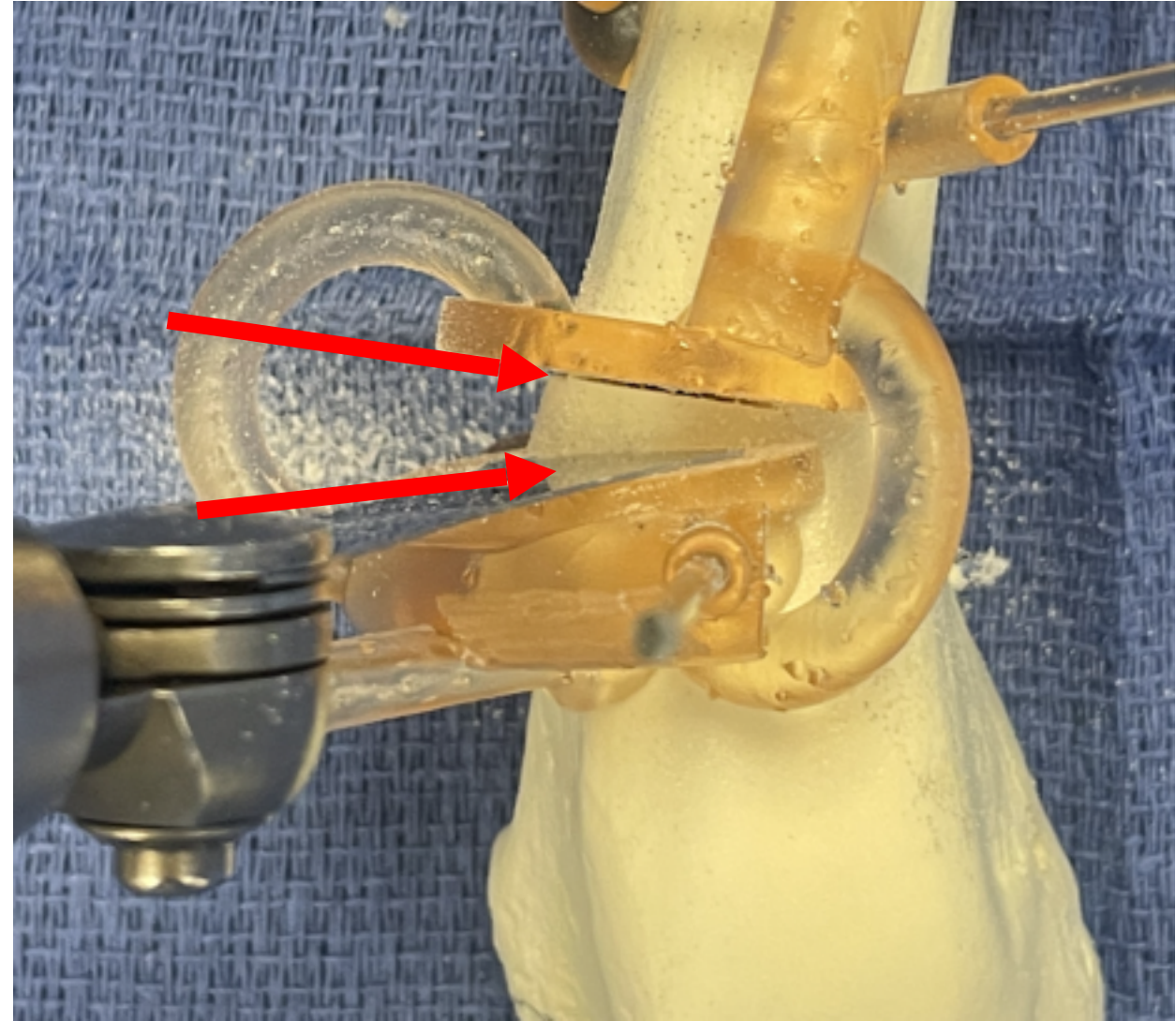
**Tip:**

Start with a short saw blade as it will be less likely to bend while cutting



**Tip:**

Score cortex of proximal and distal osteotomies prior to completion of either cut



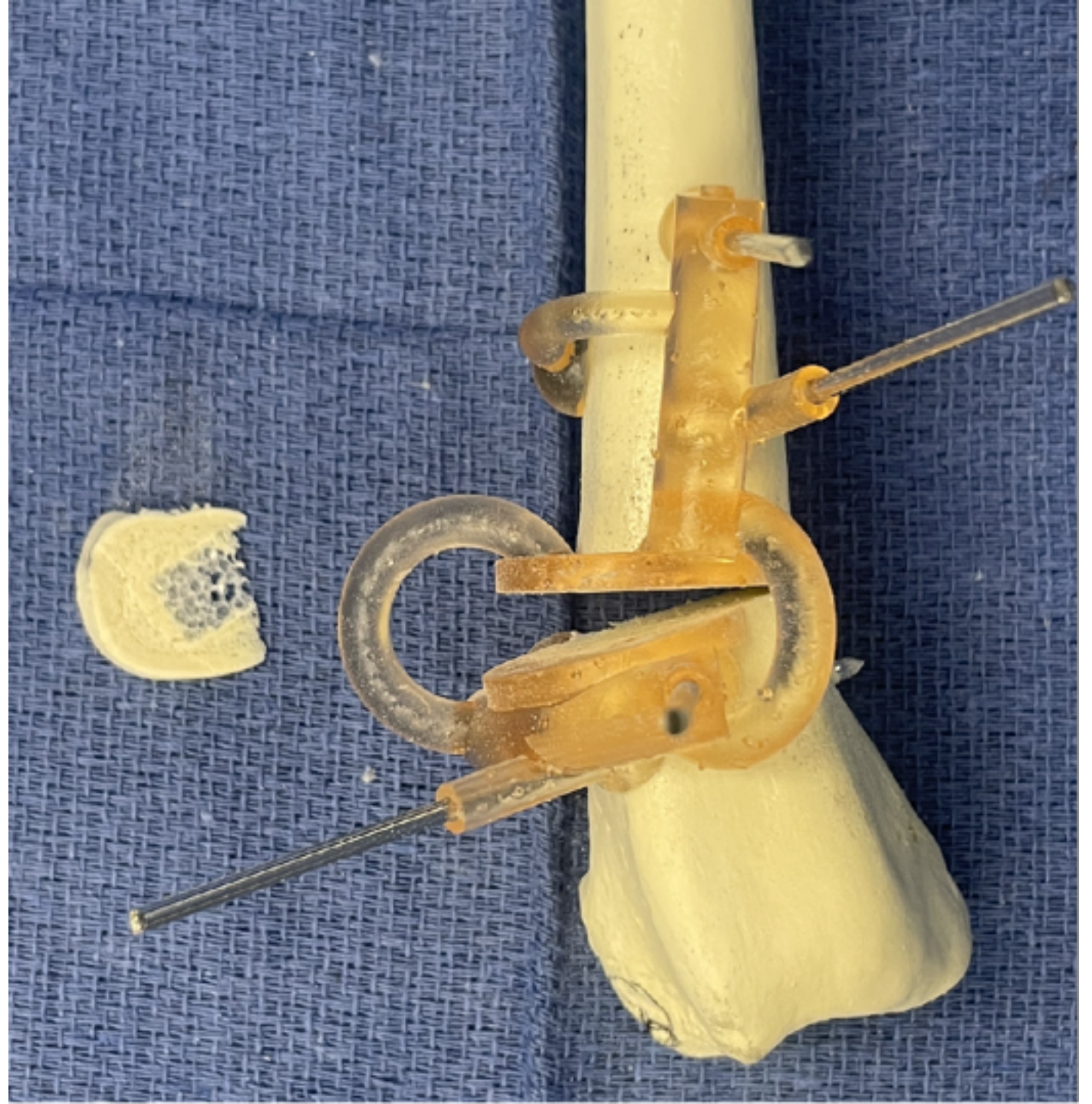


# Ostectomy



## Ostectomy Complete

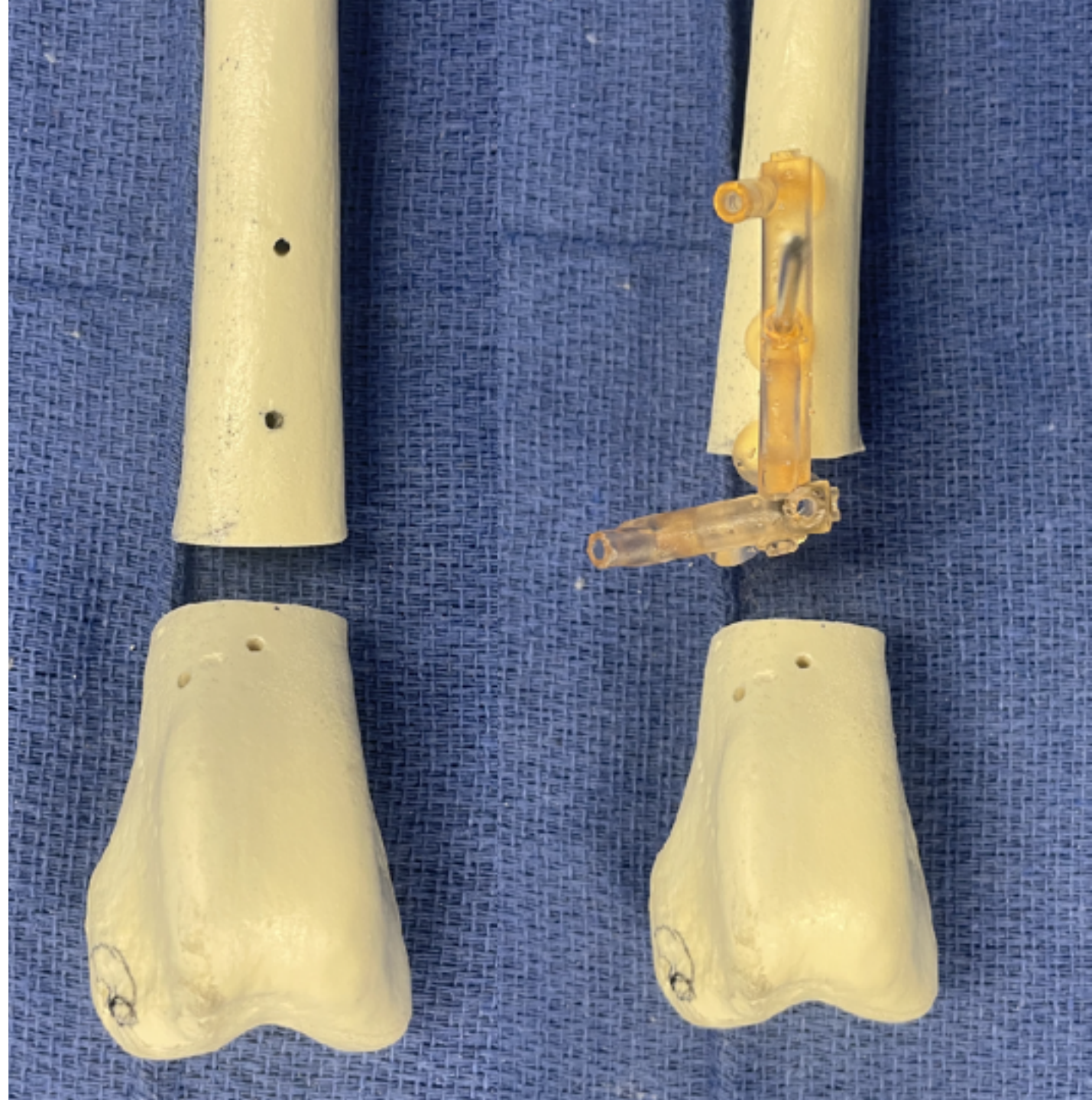
Osteotomies should have smooth, sharp edges that are flush with the osteotomy shelves





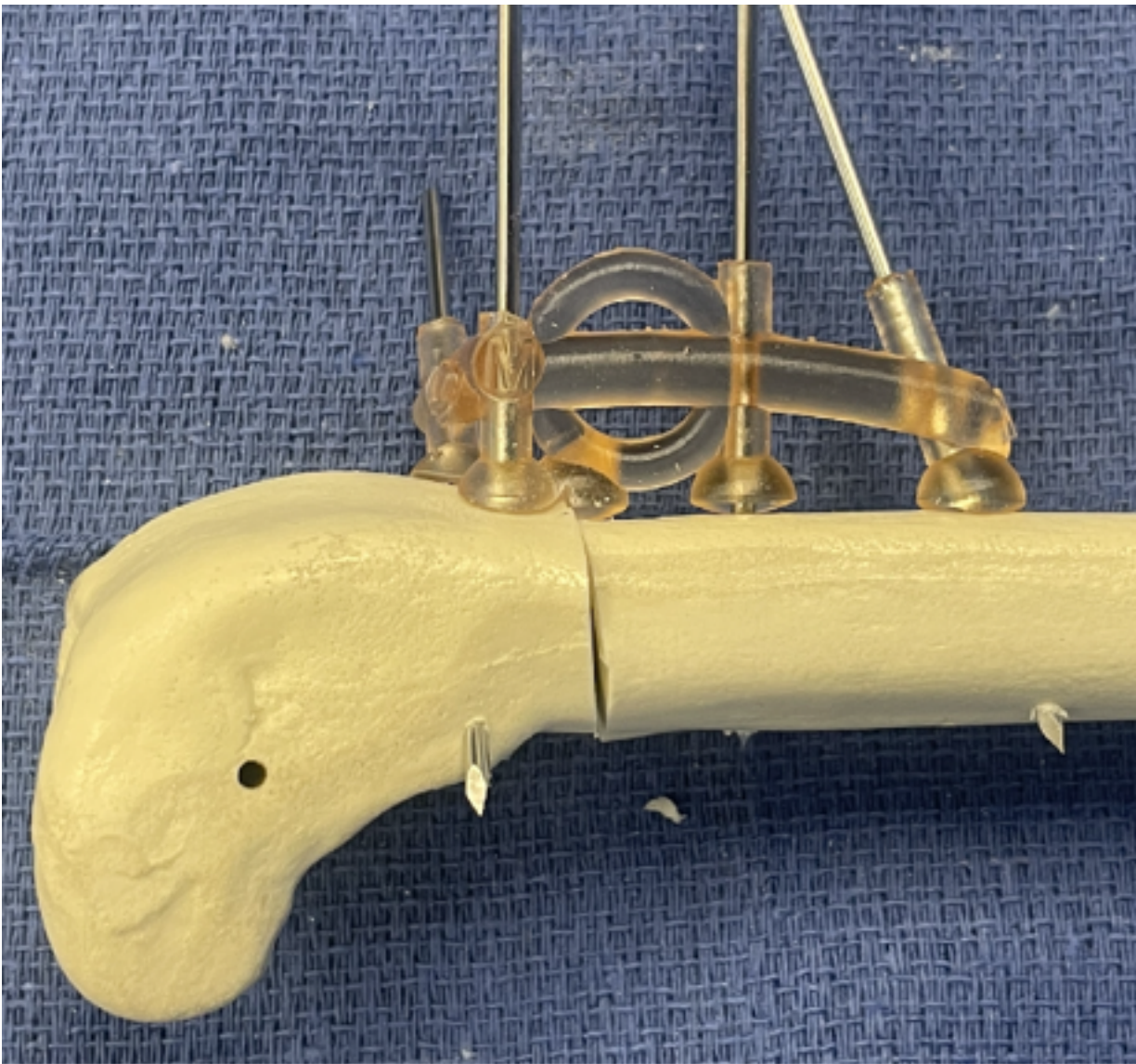
## Step 4: Remove Osteotomy Guides and Apply Reduction Guide

- Remove Steinmann pins and osteotomy guide
- Apply reduction using original drill holes and Steinmann pins

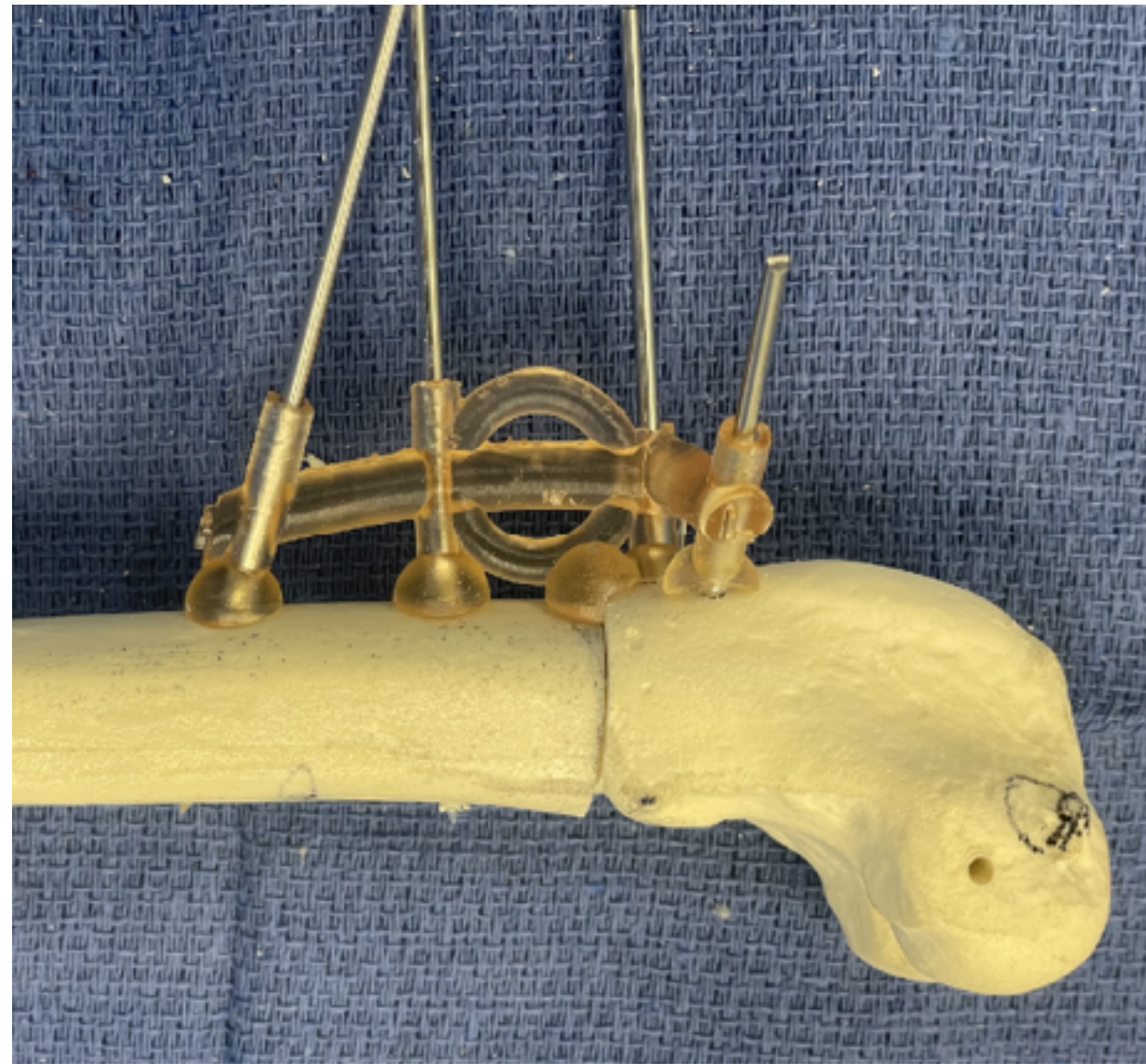




# Medial View

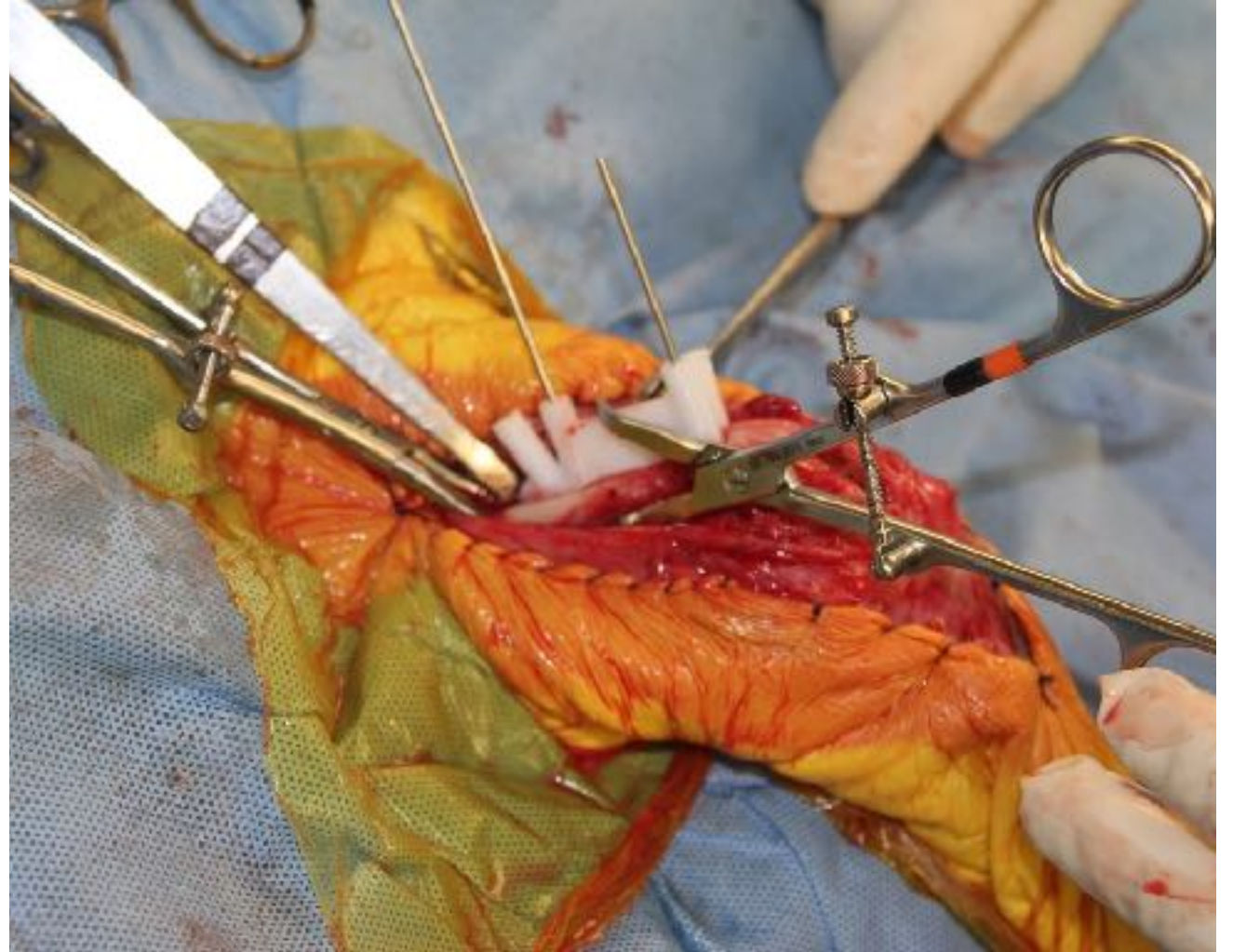


# Lateral View





Clinical Tip:  
Compress guide to aid in  
securing reduction





## Step 5: Secure Contoured DFO Plate and Remove Guide

