

## Periarticular Osteotomies for Fracture Malunion

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## Distal Femoral Osteotomy Proximal Tibial Osteotomy

### Indications

- Post traumatic deformity with compartment overload and pain
- Diaphyseal malunion
  - Shaft osteotomy and IM fixation
- **Periarticular malunion**
  - *DFO or HTO close to the joint*

### Diaphyseal

- **malunion**
- **-delayed union**



- revision with IM rod



## Complications

### ■ Late

- Infection
- Nonunion
- **Malunion**
  - Knee stiffness
  - Posttraumatic Osteoarthritis



## Complications of Fractures

### Early

- Infection (<1% in closed, approaches 20% in open)
- **Malreduction**
- **Fixation failure**
  - Poor bone stock
  - Lack of patient compliance post-operatively
  - Poor surgical plan or poor execution of surgical plan

## Malalignment : malunion


- Correct alignment is the most important component of lower extremity reconstruction
- Stiff / arthrofibrotic knee will compromise outcome

## Approach to Malunion

- *“There is nothing that can’t be made worse by surgery”*  
Hughston

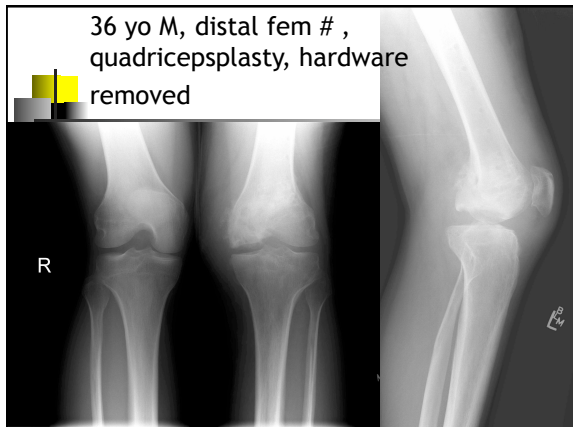
36 yo M  
medial condyle defect  
post fracture  
varus alignment  
ROM 20-40 deg  
thigh atrophy

→ Need to align the knee  
**But need motion**



36 yo M, distal fem # ,  
quadricepsplasty, hardware  
removed


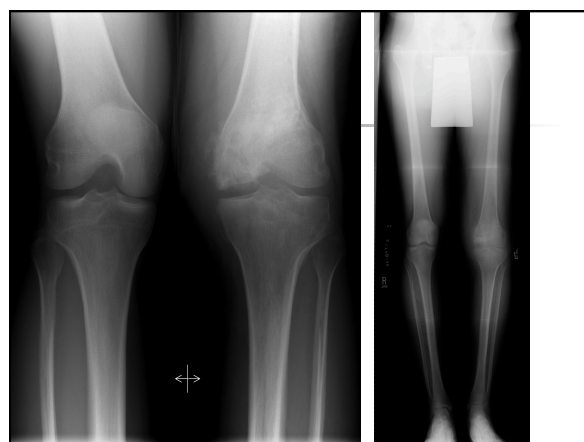
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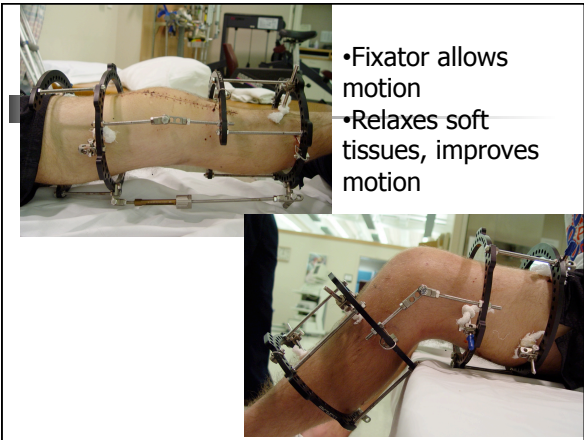
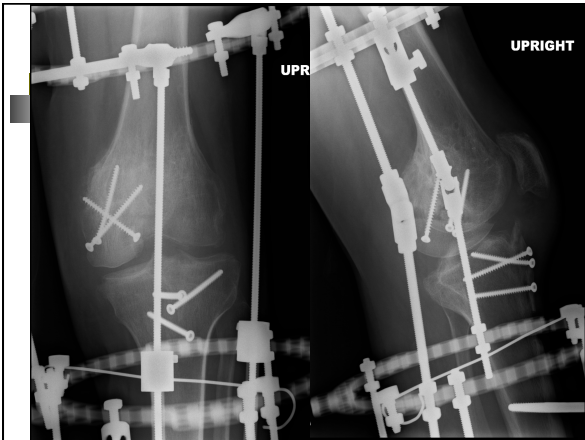


36 yo M  
medial condyle defect  
varus alignment  
ROM 20-40 deg  
thigh atrophy

Plan :

- Open medial condyle allograft
- HTO
- Distraction arthroplasty with hinged fixator



## Malunion : approach

1. **Need a quiet knee if possible**
  - May need to wait despite stiffness
2. **ROM**
  - Need adequate motion
  - If knee is stiff need to obtain motion first
3. **Need stable fixation to allow early rehab**

## Pre operative evaluation

### Routine X-rays

- Long leg views
- Standing AP
- Standing tunnel
- Lateral
- Infrapatellar

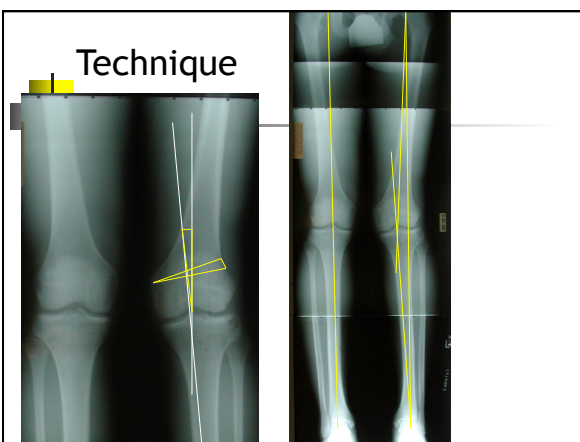


## Distal Femoral Osteotomy

- **Pre operative Planning**
  - Standing tunnel view for diagnosis
  - Standing radiographs hips to ankles for alignment
- **Aim : shift mechanical axis to medial tibial spine**



## Technique

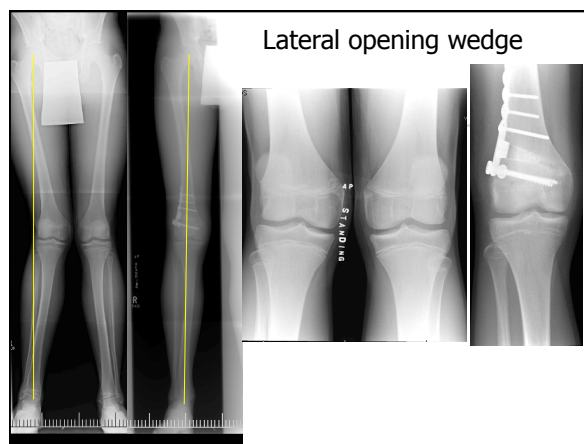
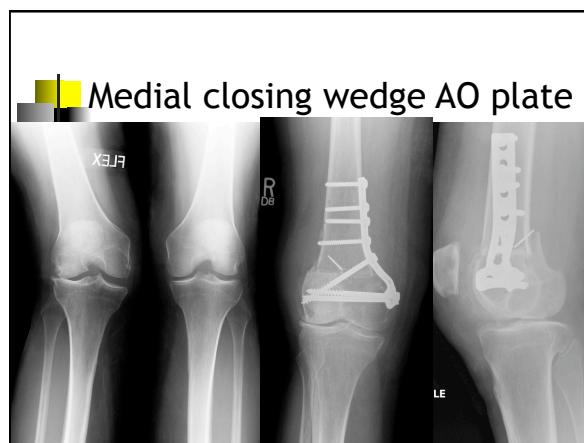
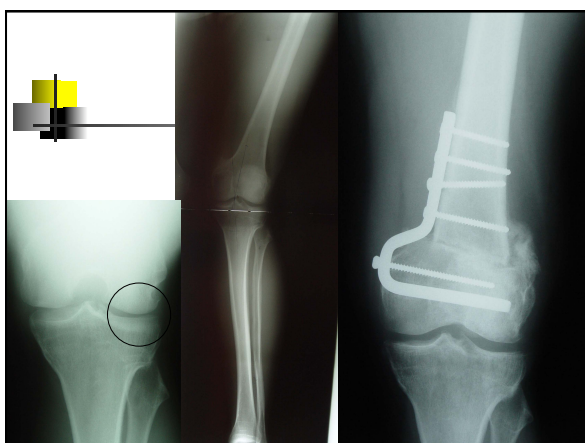
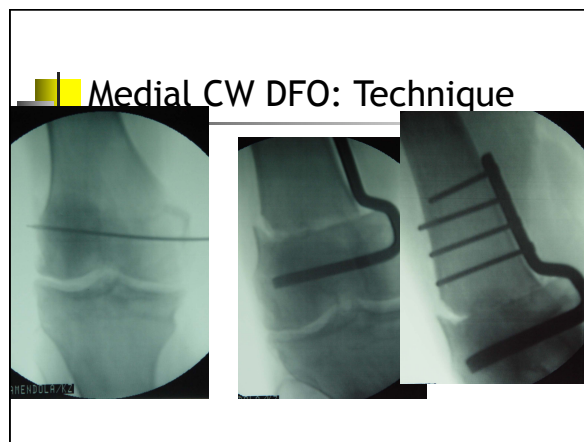
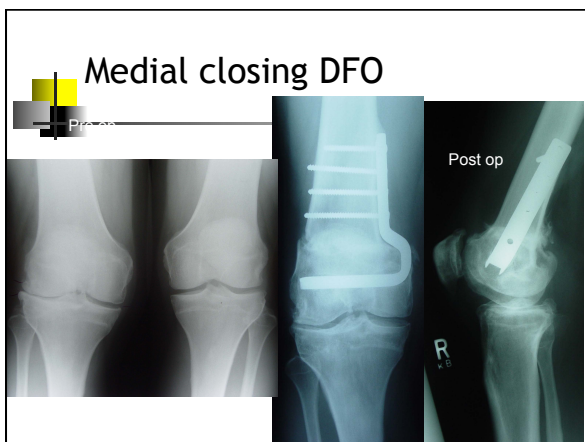


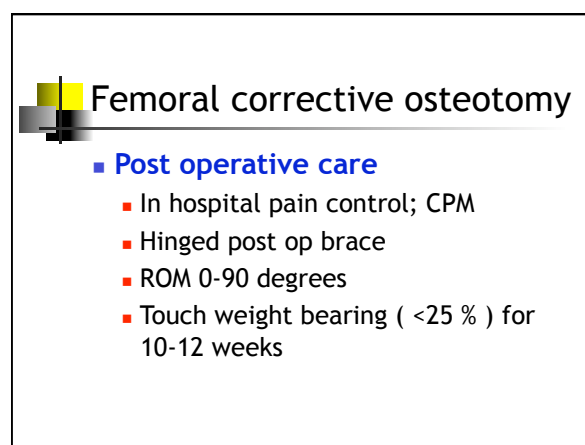
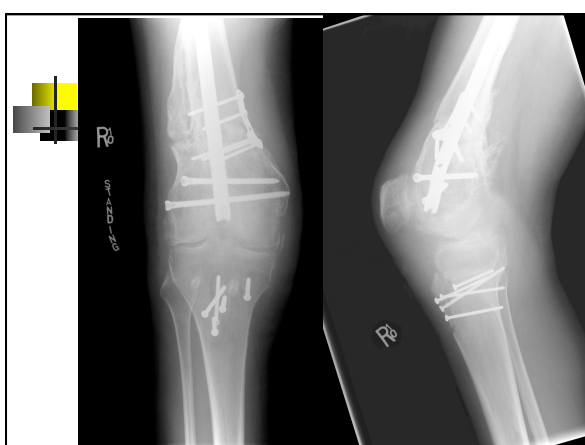
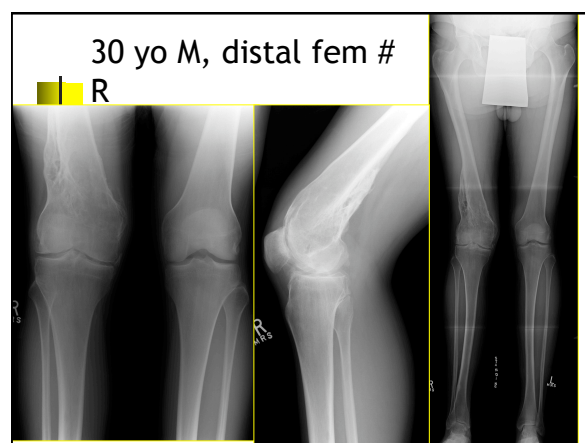
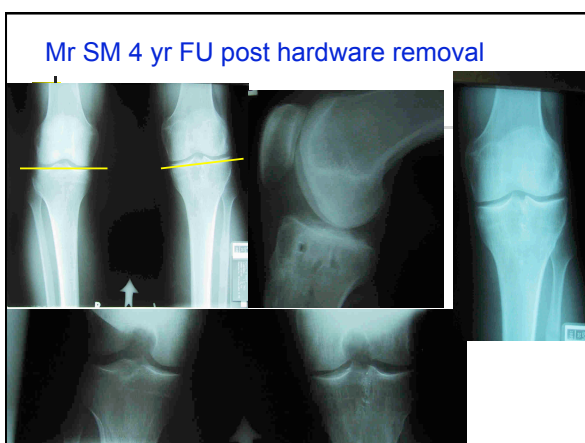
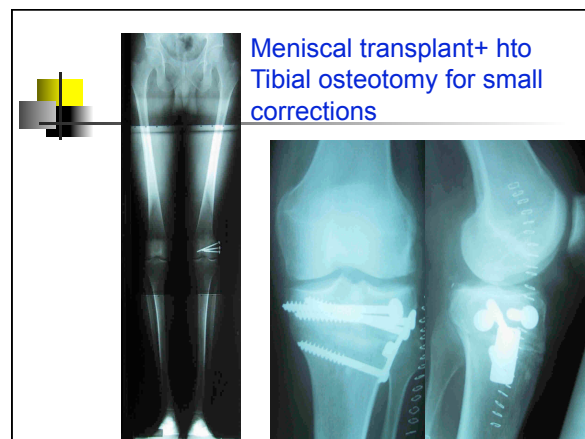
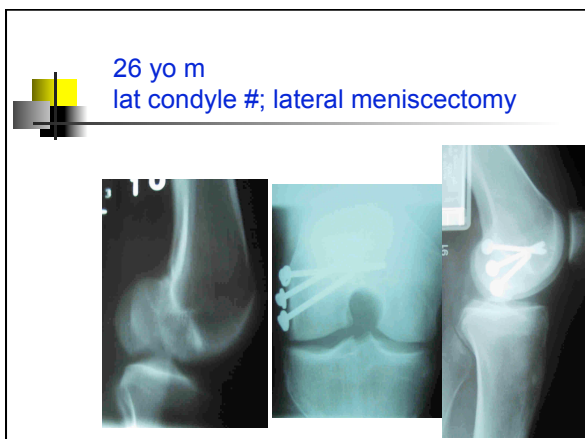
## Distal Femoral Osteotomy

- **Primary choice :Medial closing wedge**

### Indications:

- Large corrections
- Moderate to severe OA
- smokers , obese, large corrections

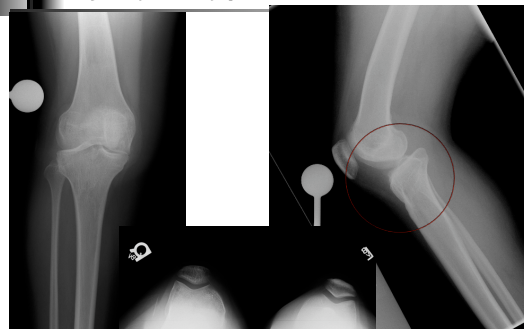




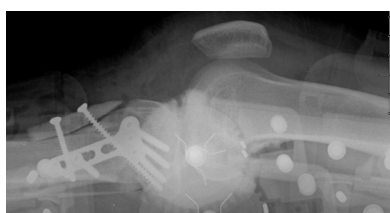
## Tibial osteotomy

- **For varus deformity**
- **Uniaxial , mild to moderate correction**
  - Acute correction and plating
- **Multiaxial deformity, large correction**
  - External fixation, slow correction

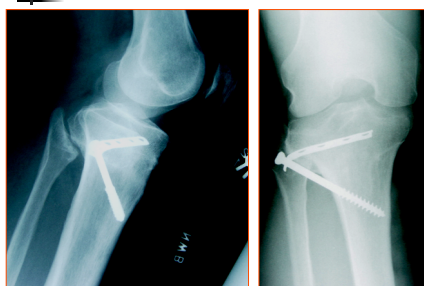
## Case 1 : 18 f growth plate injury , hyperextension varus



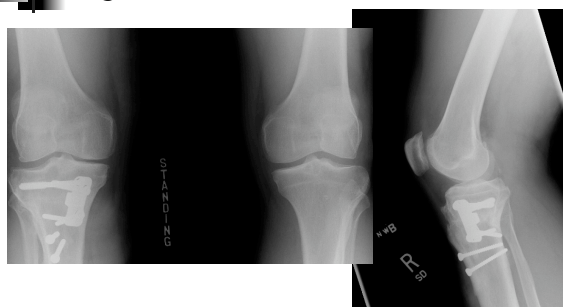
## Case 1 : flexion osteotomy to correct slope anterior opening wedge tibial tubercle osteotomy



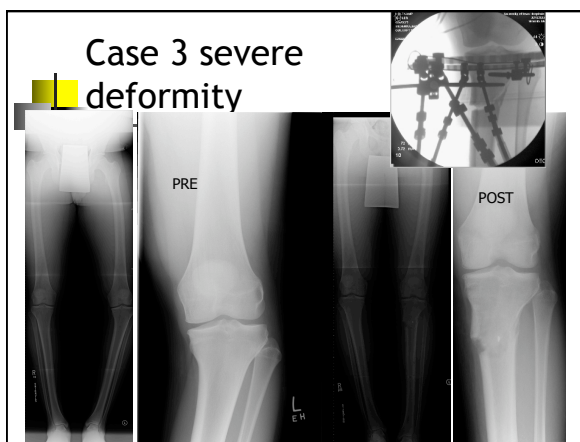
## Case 2: 50 yo malunited HTO



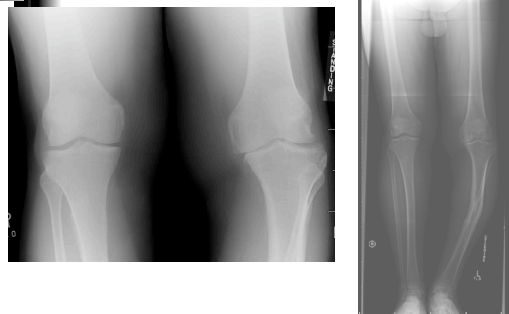
## Case 2: 50 yo malunited HTO revision OWO to correct slope and valgus ; TTO



## Case 3 severe deformity



Case 4 severe deformity  
Spatial frame to allow multiaxial  
correction



Case 4 severe deformity  
Spatial frame to allow multiaxial  
correction



## Summary

- *Need to assess alignment in coronal, sagittal and rotational plane*
- *Need a good knee with good ROM for success post osteotomy*
- *Acute correction for mild to moderate deformity*
- *Ex fix ( spatial frame ) for severe deformity*

Thank you

