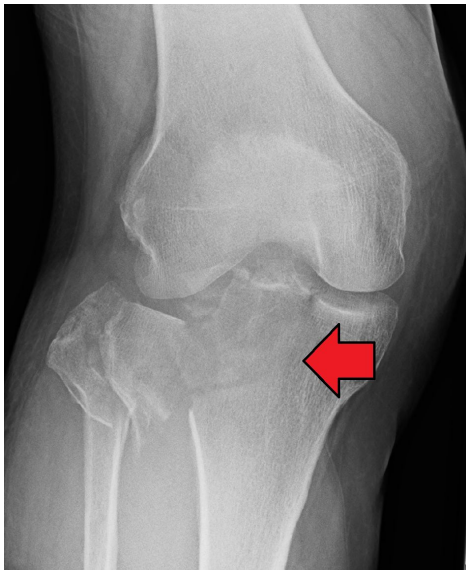


Ep 24- Tibial Plateau Fractures - Dr. Michael Githens

History/Physical

- Represents 1% of fractures in adults

-- Pay close attention to examine the soft tissues about the lower extremity must be carefully examined (Swelling, contusions, fracture blisters, Open wounds)
-- A thorough neurovascular exam is important for vascular or neurologic injury is a possible complication with fracture
-- Check for signs of Compartment syndrome (Schatzker IV & Schatzker VI) and should undergo serial exams
(Tense compartments, pain w/ passive stretching)
-- Knee exam to evaluate for ligamentous injury but may be limited due to pain

The physical examination of the knee and leg is key but fracture type and the soft tissue envelope often guides surgical management

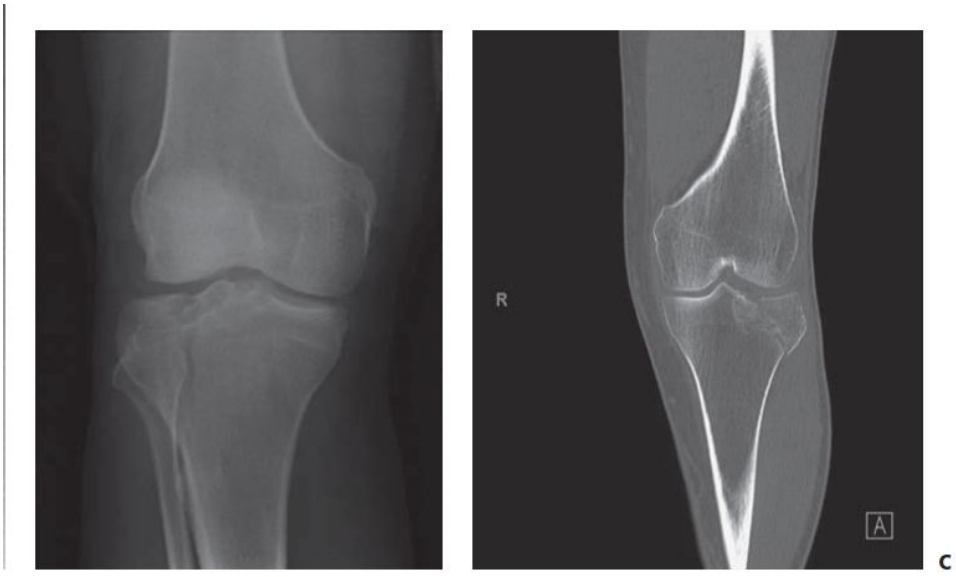
Imaging-

- *Radiographs*

-- Diagnosis typically made on plain radiographs
-- Appropriate views: AP, Lateral, and an AP view in the plane of the plateau (10-15 degree caudal tilt)

- *CT Scan*

-- Provide excellent details of the fracture
-- delineates articular displacement and comminution better than plain films
-- Preoperative planning (location of depressed fragments, size of articular segments, orientation of fracture lines, etc)
-- **Aligning fracture w/ spanning fixation before CT scan will enhance quality of the study**



Anatomy/Mechanism

- Elderly patients usually sustain a simple fall which most commonly leads to lateral sided fractures (**most common split depression type**)
- Higher energy injuries are typically seen in younger patients from MVAs,Fall from heights, and pedestrian struck injuries.
- The greater the energy absorbed by the tibia, the more severe the fracture

-- **Valgus force** loads the **lateral tibial plateau** to failure from direct impact with the lateral femoral condyle
-- Combination of valgus and axial compression produces lateral side depression, split depression, or lateral split
(Younger patients with good bone tend to have less depression vs elderly patient with osteopenic bone have greater depression)

-- **Varus force** lead to failure of the **medial tibial plateau; C**an involve the entire medial plateau and may extend into the medial plateau

-- There is typically some component of **axial loading** as well. Axial forces are more rapid and release greater energy than angular forces

Classification

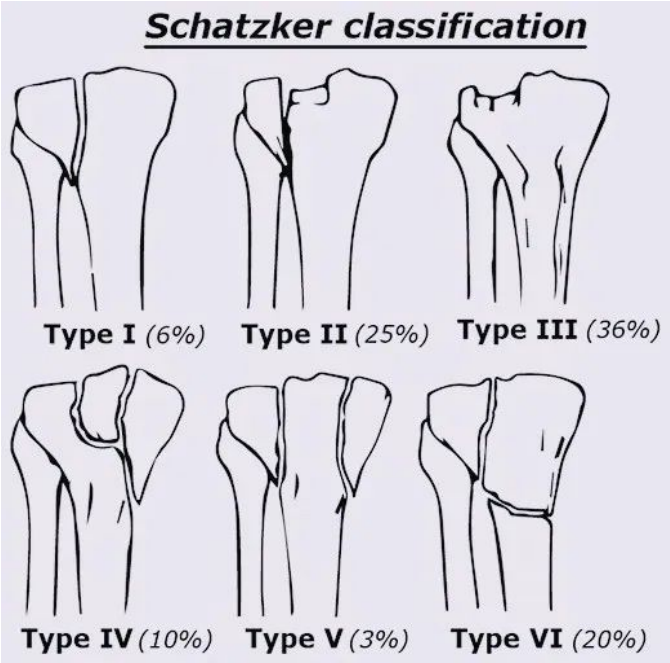
-- The tibia is 4
-- Proximal tibia is 1 (so **plateau region is 41**)
-- **Type A - Non-articular fractures** of the proximal tibia
-- **Type B - partial articular fractures**

B1 - simple articular split
B2 - split depression
B3 - comminuted split depression

-- **Type C - Complete articular fractures** (bicondylar fractures)
C1 - noncomminuted total articular fractures
C2 - metaphyseal comminution with simple articular fracture lines
C3 - total comminuted articular fractures including articular surface

- *Schatzker Classification (**Most Commonly Used**)*

-- Type 1: Split fracture - single fracture line across the lateral plateau (Occur more commonly in younger patient)
-- Type 2: Split depression - split fracture associated with marginal impaction at the edge of the split fragment (**Most common**)
-- Type 3: Pure depression - Lateral local compression. Frequently small minimally displaced split fx (Older patients)
-- Type 4: Medial condyle fx - Entire condyle is split as a single fracture or may have comminuted joint depression component (**Associated with Knee Dislocation**)
-- Type 5: Bicondylar fracture - both the medial and lateral tibial plateaus are fractured with the metaphysis and diaphysis remaining intact and not fractured
-- Type 6: Shaft dissociated from the metaphysis (Confusion between 5 & 6)



Associations
Types 1 to 3 were described as lateral and less severe
Types 4 to 6 more severe and **higher rate of complications**

Lateral Meniscal tears associated with Type 2
Medial Meniscal tear associated with Type 4

Knee dislocation with Type 4

<u>Treatment-</u>
Nonoperative-

-- indicated for tibial plateau fractures that will heal without a significant deformity or for elderly patients or patients where operative intervention is high risk/undesirable

Hinged Knee Brace
Non - or minimally displaced fractures
Small depressions of the lateral plateau w/o deformity
Patients w/ significant comorbidities
Elderly low demand patients

- *Operative management*

-- indicated for displaced unstable tibial plateau fractures where near normal limb alignment can not be predicted based on fracture pattern

Approaches
-- Anterolateral
-- Posteromedial

External Fixation
-- often used as a temporary treatment by spanning the knee. Restores length and aligns the fracture during soft tissue recovery before final fixation
-- **remember tibial pins should be placed in a way not to interfere w/ subsequent procedures for internal fixation**

FIGURE 55-21 A picture of a simple pin to bar joint spanning external fixator.

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Visualize the articular reduction

-- Can be assessed by fluoroscopy, arthroscopy, or directly through an arthrotomy to see the articular surface

-- Joint spanning femoral distractor can be used to aid in visualization

-- The meniscus may be incised anteriorly or elevated w/ a submeniscal arthrotomy. May be repaired during closure

-- **proper reduction of the articular surface is key for outcome of patient; Bone graft/fillers may be used for any voids of the metaphysis to support articular segment**

Ligament Repair ?

Plate and Screw Fixation

-- Lag screws - compress simple fracture lines in isolation or in conjunction w/ other fixation devices

-- Partially threaded screws can be used for compression as well

-- Plates can serve different functions depending on fracture pattern and placement

-- Precontoured **buttress plate** to the lateral tibia (Multiple holes in the head of the plate allows screws to be placed parallel and close to the articular surface for support) - **Rafting screws**

-- **Antiglide plate** on the posteromedial tibia to resist shearing forces. A screw near the apex of the fracture helps with close apposition of the plate

-- **Dual plating** is sometimes used for bicondylar fractures as well

Complications

Loss of reduction
Wound infection and breakdown
Knee stiffness
Tibial nonunion
Posttraumatic arthritis

Nailed It Ortho podcast episode

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