## TIBIAL PLATEAU FRACTURES

The severity of a tibial plateau fracture depends on the energy imparted to the limb. Low-energy injuries typically cause depression-type fractures, whereas high-energy injuries can lead to comminuted fracture with significant soft-tissue, and NV injury.

### Evaluation

Careful clinical assessment of the soft-tissue envelope.

Neurovascular

Appropriate radiographs

CT

### Advances

Temporary joint-spanning external fixator

Locking plates

Minimally invasive techniques

Anatomically contoured plates

Biologically respectful treatment principles.

### Principles

Anatomic reconstruction of the proximal tibia with rigid fixation is rarely the goal.

Instead, indirect reduction techniques and other soft tissue–preservation methods safeguard vascularity

Emphasize restoring both joint congruity and the mechanical axis of the limb.

Therefore Safeguard tissue vascularity
Emphasizes restoration of joint congruity
Mechanical axis of the limb.

### Pathoanatomy

1.The lateral plateau is higher than the medial plateau, forming an angle of 3° of varus

2. The lateral plateau: smaller and convex
The medial plateau is large and concave.

**3.** Both medial and lateral plateau: slope front to back by 10*

4.These characteristics lead to an eccentric load distribution in which the medial plateau bears approximately 60% of the knee's load.

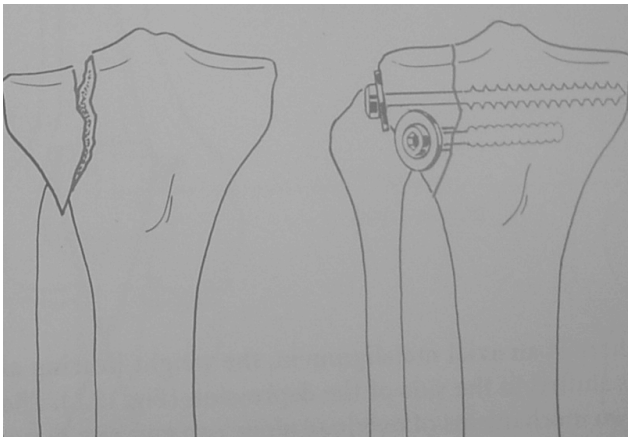
5.This asymmetric weight bearing results in increased medial subchondral bone formation and a stronger, denser medial plateau.

**Why later plateau fracture is more common?**

The relative strength of the medial plateau
The valgus anatomic axis of the lower extremity
Valgus force is more common than varus

**Classification [**Schatzker]

**Type I Split type**



**Type I**
Bending and shear force

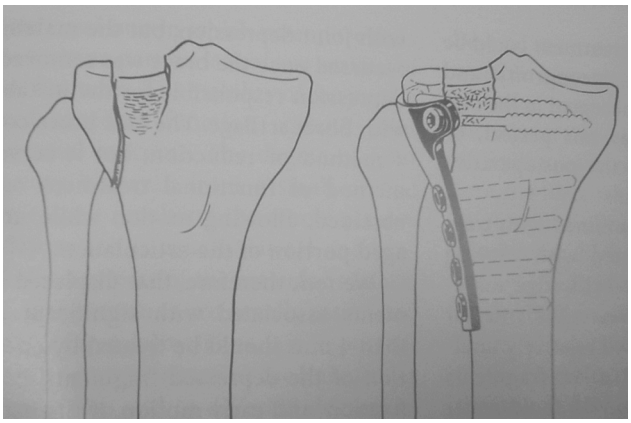
Mostly in young

Undisplaced: ROM brace and NWB

Displaced: Open or closed reduction with screws or screw and plate

Lateral meniscus may be trapped more so when widely separated.

**Type II Split depression**



**Type II**
Most common
Patient usually around 50 years
Mechanism: Bending and shearing

Depressed fragment: anterior or posterior or central or all three

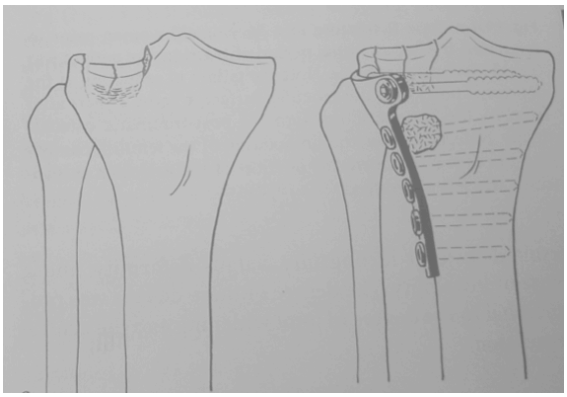
Depression calculated: lowest point on the lateral plateau to Medial plateau: >4mm is significant

Poor results: are due to residual depression

Always ORIF + Bone graft or substitute

Concomitant MCL: Repair or ROM brace

**Type III Joint Depressant**



**Type III**
In old people, Osteoporotic bone

Low velocity injury

Stability of the joint is rarely affected

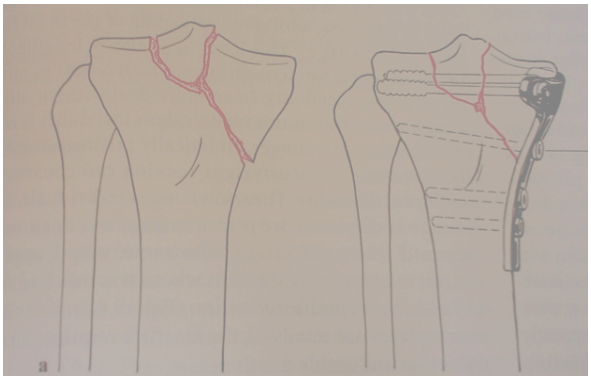
Depression is lateral and central portion

Assess under GA: with valgus at different flexion.

If no instability: Rx Non-op

Make window and elevate and bone graft and screws

**Type IV Medial Plateau fracture**



**Type IV**
High velocity injury
Younger individuals

Poor result: due to ligament laxity and joint instability

Often associated with intercondylar eminence fracture; ACL rupture

There is lateral ligament disruption [avulsion from the fibula]

Rarely Peroneal nerve palsy

Medial buttress plate with or without intercondylar eminence

**Type V Bicondylar fracture**

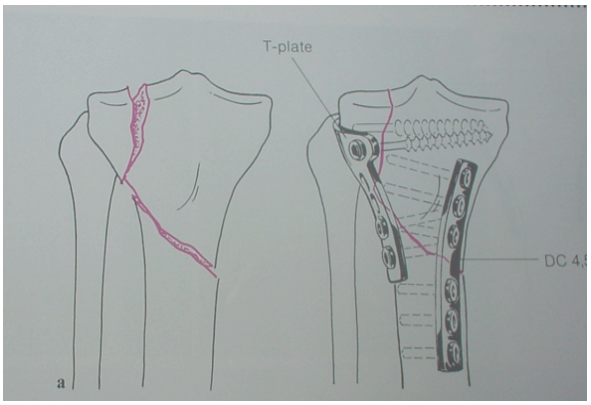
**Type V**
Mechanism: Equal axial thrust
There is no depression of articular cartilage

Prognosis depends on whether fracture line is extra-articular ie., near the eminence or not

Traction is an acceptable treatment and can achieve reduction

However: many tends to telescope.
Therefore ORIF with a double plate [single or double incision] or
Single locking plate or
Hybrid fixation

**Type VI**




**Type VI**

Complex fracture

Intra-articular fracture with metaphyseal fracture

Always surgery

Rx: Like V but may need hybrid or double plate

**Factors for good result**

1. Split or compression?
2. Velocity of injury
3. Osteoporosis
4. Medial or lateral plateau**.** Is isolated medial plateau is an analogue of lateral plateau? .No. Higher level of damage associated with more severe mechanisms

of injury. Typically involve both LCL and ACL. More likely to have associated injuries of the popliteal artery and peroneal nerve.

**Diagnosis**

1. X rays: AP, Lateral

2. CT. Chan demonstrated that taking CT scans. CT modifies the surgical plan, in >25% of cases. The degree of articular depression often is underappreciated on plain radiographs.

3.MRI for soft-tissue imaging : ligamentous and meniscal injuries

**Principle of treatment**

1. > 3 mm of displacement: ORIF

2. Varus or valgus instability in extension> 10° compared to opposite knee: indication for ORIF

3. Type of fracture: Split and split depression are unstable and joint depressant is usually stable

4. Midline incision is preferred: in anticipation of possible TKR

5. Split ITB

6. Divide the coronary ligament between meniscus and tibia and lift up the menisci

7.In Bicondylar fracture: fix medial condyle first