

Tibial plateau Fractures

Mechanism :

- 1- Varus or valgus force and axial loading .
- 2- Car striking pedestrian (bumper #)
- 3- Fall from a height .

Pathologic Anatomy:-

Type I :- vertical split of lateral condyle.



- Fracture through dense bone
- Usually younger people .
- May be displaced or wedged shaped condyle fragment may be pushed inferiorly and tilt .
- Damaged lateral meniscus may be trapped in the crevice.

Type II:- vertical split of lateral condyle combined with depression of the adjacent load bearing part of the condyle .



- Wedged fragment vary in size from small to large & displaced laterally .
- Joint looks widened .
- If # not reduced may later develop valgus deformity.

Type III



- Depression of articular surface with intact condylar rim .
- Occur in older osteoporotic people.
- It is usually due to low energy trauma.
- The joint is usually stable and may tolerate early movement.

Type IV – fracture medial tibial condyle .



- A- Depressed crush fracture of osteoporotic bone in elderly person (low energy lesion).
- B- High energy # resulting in condylar split which run obliquely from inter condylar eminence to medial cortex.

- The mechanism may be severe enough to rupture LCL. And CPN.

Type V- fracture of both condyles and tibial shaft is wedged between them .



Type 6

- Combined condylar and subcondylar #.
- This high energy injury which may result in severe comminution .



CIF

- Swelling of the knee .
- Deformed
- Bruising is extensive
- Tissue feel doughy (haemarthrosis) .
- Gentle exam.(E.U.A) may suggest medial or lateral instability .
- Examine leg. & foot for vascular or neurological inj.
- Traction inj. Of tib.N or peroneal N. is not uncommon .

X-ray

- AP
- Lateral
- Oblique
- Stress view (under prash)
- CT → Degrees of comminution
→ involvement of post condylar component .

N.B

- With crush lateral condyle MCL is often intact.
- With crushed medial condyle LCL is often torn.

R1

Controversial

- Treatment with simple traction often produces well functioning knee but residual angulation is not uncommon.

- On other hand obessional surgery may produce good x-ray appearance and stiff knee especially operation is followed by prolonged immobilization .

Type I



- Undisplaced # can be treated conservative .
 - Aspirate haemarthrosis.
 - Compression bandage
 - CPM (continues passive motion) mach.
 - Begin knee movement .
 - Once pain & swelling subside → hinged cast brace is fitted and patient is allowed up.
 - Don't allow wt bearing until 8 wks .
- Displaced # :- open reduction & I.F i.e. one or two lag screws .

Type II

A

- If depression less than 5mm.
- Knee not unstable .
- Patient is old and osteoportic



R1 conservative R1.

1. Aspirate the joint
2. Compression bandage
3. Skeletal traction through the tibia 7cm below the #.
4. Sequences the joint into shape & knee flexed and extended several time to mould upper tibia on opposing femoral condyle .
5. Leg is cradle on pillow with 5kg traction in placed .
6. Encouraged active exercise every day.

Cont. alternative method

- CPM
- Remove machine after a week begin active exercise.
- As soon as # sticky (3-4 wks) remove traction pin.
- Hinged cast brace.
- Patient allowed up on crutches.
- Full wt bearing for another 6 wks.

Type II

B

1. Young patient
2. Depression of more than 5mm

R1 → ORIF with buttress plate

- + bone graft
- post operative → CPM few days
 - active exercise
 - 2 wk allow up with cast brace until # has united.

Type III

- Depressed fragment usually need to be elevated through a window in the metaphysis.
- Reduction should be checked by X-ray or arthroscopy .
- Support elevated fragment with bone graft .
- The whole segment is fixed in position with screw or buttress plate.
- Begin exercise as soon as possible .
- After 2 wk patient is allowed up with cast brace .



Type 4:-

Undisplace and osteoporotic crush # of medial condyle treated conservatively like type II crush lateral plateau.

- Depressed medial condyle # in young people need ORIF to rest lateral lig, if it ruptures it must be repaired at same time.



Type V & IV :- severe injuries carry the risk of compartmental syndrome.

- Elderly patient → traction .
- Young , more complex # with comminution are better managed operatively b y ring ext. fix..
- The danger is that wide exposure necessary to gain access to both condyles may strip the surrounding soft tissue thus increasing the risk of wound break down , and delayed union or non union .

So I.F by double butters plate should be avoided.

An effective alternative screw fixation with aring Ext.

fixation .



Complication

Early :-

Compartment syndrome (5&6)

Late

- Joint stiffness
- Deformity.
- O.A.









Quiz





Summary:

Non surgical treatment of T P # is indicated when :

1. undisplaced #.
2. associated OA(total knee replacement TKR.)
3. overlying skin and soft tissues are so badly damaged (necrosis)preclude surgery.
4. elderly peoples with osteoporosis.

Surgical treatment:

1. Intraarticular step off(5-10 mm).
2. increase valgus or varus angulation when the knee is extended
3. associated lig. Injuries.
4. floating knee.

Thank you