Tibial Plateau Fractures

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Introduction

- Incidence, Epidemiology & aetiology
- Anatomy
- Classification
- Management
- Cases
- Summary
Who gets them?

- 1% of all fractures (8% in old age)
- Young (high energy injuries - men) and old (especially osteoporotic women)
- RTAs – 25% caused by car bumpers.
- Falls and axial load cause majority of #s, others made up by twisting injury
- Race – affects all equally
Anatomy

- **Muscles:**
  - Quads
  - Hamstrings
  - Sartorius
  - Gastrocnemius
  - Popliteus
  - Tib ant and dorsi flexors lower

- **Bony structures:**
  - Tibia
  - Femur
  - Fibula
  - Patella
Anatomy continued

- The popliteal fossa:
  - popliteal vessels
  - tibial and the common peroneal nerves (lower part of the posterior femoral cutaneous nerve, the articular branch from the obturator nerve)
  - termination of the short saphenous vein
  - few small lymph glands
Pathophysiology

- Force is directed from the femoral condyles onto the medial and lateral portions of the tibial plateau, resulting in fracture.
- Lateral > medial plateau!
- In younger patients, the most common pattern is splitting, older, osteoporotic patients, depression fractures typically sustained.
- Soft tissue injuries (eg. cruciate and collateral ligaments) occur in approximately 10%
Management

• Resuscitate as per ATLS protocol (Marine “sir, yes sir!”)

• History
  – likely mechanism
  – AMPLE
  – social

• Examination – tenderness, n/v status, other injuries
  2nd survey, systemic.
Investigations

- Bloods inc G&S
- X-rays 2 views +/- oblique views. NB ? lipohaemartrosis
- CT operative planning
- MRI – concurrent injuries
- Angiography
If for theatre - consent

General complications
Specific:
Early – bleeding, nerve damage, ischaemia (pop vessels/tournique)
Intermediate – compartment syndrome, infection, DVT/PE,
Late – OA, infection, failure of fixation, r/o metalwork
Classification - Schatzker

- Toronto, Canada.
- Published in 1979 after looking at fractures of the tibial plateau since 1968.
- More widely used than AO.
Schatzker I

- Lateral split – car bumper to outside of the leg
- Common
- Treated conservative or ORIF
e.g.
Schatzker II

- Lateral split, depression
- Most common fracture pattern
- ORIF unless medically unfit
- Can be laparoscopically assisted or assessed intra-operatively
Schatzker III

- Lateral depression
- ORIF unless medically unfit
- Can be laparoscopically assisted or assessed intra-operatively
- Elderly get this fracture
Schatzker IV

- Medial split
- Indicates higher force of injury
- Less common than lateral as i. medial condyle is stronger bone, ii. normal valgus angle of knee, iii. Contra-lateral leg protection
? Type
Schatzker V

- Lat and medial split
- High energy
- Worse prognosis than I-IV
- ORIF more tricky
Schatzker VI

- Mother ..... of all injuries to tibial plateau
- Operative planning, Ex-fix options
- Ass with soft tissue injuries often.
Treatment options:

- Non-operatively – ROM and mobilise if possible early
- Screw
- ORIF +/- arthroscopic assisted
- External Fixator
Operative management

- Indications – joint congruency, unstable
- Timing of surgery
- Planning of surgery
- Incision – 1 cm lateral of midline
- Role of arthroscopy – ligament/meniscus injury (10%), joint line
- Grafting/ bone putty for depressions
Outline

- Supine
- Betadine prep, draped
- Antibiotics
- +/- tourniquet
- 1 cm lateral to midline longitudinal incision
- Skin, subcut, reflect muscles with periosteum laterally
- Through split or cortical window and elevate joint surface.
- Fix/bone graft
- Close in layers vicryl
Rehab post stable fixation

- Hinged brace
- Continuous PROM 0-30
- Active / active assisted ROM
- Touch WB
- F/U clinic 2 weeks, 4 weeks, 3 months, 6 months
Get you up and running....
Prognosis

- Non-operative and operative have risk of arthritis.
- Prognosis worsens as Schatzker rises.
- Infection (can be open fractures) is a nightmare for all involved.
Summary

- Types 3-6 high energy NVI
- Associated soft tissue injury
- CT
- Early mobilization
- Remember Schatzker
References


2. Google images


4. Gray H. Gray’s anatomy. 1918