Tibial plateau fractures
The problem

• Large WB joint
• Aetiology varies
  • Osteoporotic
  • High energy
• Associated injury
  • Meniscii
  • Ligaments
  • neurovascular
Aims

- Restore motion
  - No POP
- Stability
  - #
  - joint
- Anatomical restoration articular surface
- Accurate alignment
Failure

- Displacement
- Malalignment / incongruuity
- Instability
- Pain
- Stiffness
How many tibial plateau fractures do you deal with / year?

1. 0
2. <5
3. 5 – 10
4. >10
Assessment

• History
• Exam
  • ST envelope
  • Neurovascular
  • ligaments
Assessment

- Radiology
  - AP/Lat
  - Medial - concave
  - Lateral - convex
Assessment

• Radiology
  • Oblique
  • Intra-op
Assessment
CT
3-D
Assessment
Classification

- Schatzker
- 6
  - Aetiology
  - Pattern
  - Outcomes
Schatzker I

- Age < 40
- MCL 36%
- Meniscal
Schatzker II

- MCL 36%
- Meniscus ? 90%  
  Gardner 2005
Schatzker III

- Osteoporosis
- Low energy
- Rare
Schatzker IV

- ACL / PCL  60%
- LCL  57%
- Peroneal n
Schatzker IV
Schatzker V

- Metaphysis / diaphysis intact
Schatzker VI

- High energy
- metaphyseal / diaphyseal dissociation
How many Schatzker V - VI fractures do you deal with in 6 years of training?

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Non-Schatzker
Posterior shear #s
Non- Schatzker
Posterior shear #s

- Posterior approaches
- Fibular osteotomy
Non-Schatzker
Antero-medial compression #s

• PCL
• Postero-lateral corner
Management
Schatzker I

- Meniscus
- MCL
How would you treat this #?

1. Conservatively / brace etc
2. ORIF lag screws
3. ORIF buttress plate
4. MIPO 2 screws
5. MIPO 2 screws / antiglide screw
Schatzker I
Management

• Ligamentotaxis
Schatzker I
Management

• Lag screws + antiglide

• 2 biomechanically superior

Koval 1996

• ? buttress
Schatzker II management

- Osteopaenia
- comminution
Schatzker II
Management
Schatzker II Management

Bone graft

30° flexion
Schatzker II
Management
Schatzker III

- Osteopaenia
- Comminution
- Low demand
Management
Management
Management

Patil / Port 2006
Management

- EUA
Complex
Schatzker IV
Schatzker V - VI

- High energy
- ST !!!!

[Image of knee joint]
Schatzker V - VI

Management

• ORIF
  • Single
  • Double

• LISS

• Ex Fix
Schatzker V – VI complications

- wound dehiscence
- infection
- articular collapse
- malunion
Schatzker V – VI
single plate
Schatzker V - VI management
Schatzker V - VI

double plating

• Infection
  • 20% Canadian OTS 2006
  • 10% Marti 2007
  • > 80%

• Reduction
  • 93% Marti 2007
  • 55% Mills 2006 (2mm)
Schatzker V - VI

double plating
Spanning fixator

- The incision was placed to avoid the blisters!!!!!!
- The wound was closed in layers under tension
Schatzker V – VI
locked plate

• benefits
  – soft tissue
  – infection
    • 1% Gosling 2005
    • 4% Cole 2003 inj.

• healing
Schatzker V – VI
locked plate

• Malalignment
  • 20%  Gosling 2005

• Loss of reduction
  • 14 %
Schatzker V - VI
ring fixator
Schatzker V - VI
ring fixator

- Soft tissue
  - Infection
    - 5% Canadian OTS
  - Union

- ↓ hospital stay
Schatzker V - VI
ring fixator

- anatomical reduction 80%
- delayed union 17%
- pin infection 67%
  - Chan 1997

- Stiffness

- Loss of reduction
Schatzker V - VI
Canadian OTS
ring fixator vs double plate

- ROM
- WOMAC
  - Pain
  - Stiffness
  - Function
Schatzker V - VI
Canadian OTS
ring fixator vs double plate

- 18% deep infection
- repeat surgical interventions ORIF
- hospital stay ex-fix
Factors for success

- Personality
- Surgical Ability
- Implant

Diagram showing the interconnection of these factors.
Schatzker V - VI
ring fixator vs double plate

- Severe soft tissue
- Metaphyseal-diaphyseal comminution
- # extension into shaft
- Less intra-articular displacement

- Extensive intra-articular displacement
- Large medial fragment
- Coronal split medial fragment
- Forgiving ST envelope
Management
Outcome

- 1971  80% good up to 10mm!!
- Schatzker  80%  4mm
- Mills 2006  -  2mm
- OTS 2006  40%  OA
- Outcomes vary widely
- Comparison of types not available
Summary

- Anatomic reduction of articular surface
  - Absolute stability
- Stable fixation
  - Allow movement
- Restore alignment
- Restore stability
Summary

- Know your limits
- Range of personality
  - #
  - Pt
  - Surgeon
- Be aware of complications relevant to # personality
- Avoid complications