Tibial Plateau Fractures
One vs. two incision techniques

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Literature

• No universal agreement on amount of articular depression that can be accepted
• Long term studies\(^1\) (>20 years) indicate lack of correlation between residual osseous joint depression and development of arthrosis
• Joint deformity or depression producing instability is predictive of a poor result
• Malalignment of the limb greater than 5 degrees increases the rate of degenerative osteoarthritis\(^2\)


Surgical Indications

• Any condylar widening
• Clinical instability greater than 10 degrees (*alteration of limb mechanical axis)
• No clear guidelines for degree of articular incongruity (>4-10mm in literature)
Standard Radiographic Workup

- AP, lateral, obliques knee
- AP, lateral tibia (if distal extension)
- CT scan knee

Schatzker Type I

- Simple split fracture
- Most common in young adults
- 15% incidence of meniscal injury
- Single incision lateral approach

Lateral meniscus
Schatzker Type II
- Split Depression Fractures
- Single incision, lateral approach with submeniscal arthrotomy

Schatzker Type III
- Depression fracture; no split
- Elderly patients
- Osteoporotic bone
- Indication for surgery is instability
- Single incision, lateral approach with submeniscal arthrotomy
Shatzker II, III - Split Depression, Pure Depression

Open Reduction
Elevate Joint Surface
Bone Graft
Buttress Lateral Fracture

Implants: Contoured, Low Profile Plates

“Raft” of Screws

High Energy Tibial Plateau

- Medial plateau (IV)
- Bicondylar (V)
- Bicondylar with metaphyseal-diaphyseal disassociation (VI)

“length unstable” injuries
PreOp Management

• Full radiographic evaluation
• Spanning external fixator if definitive surgery delayed
• Monitor for compartment syndrome

Schatzker Type IV

• Medial tibial plateau
• High energy
• Watch for knee dislocation, arterial injury
• Poor prognosis in many
• Single incision medial approach
• *evaluate for posterolateral ligament injury (may require surgical repair)

Schatzker Type V

• Bicondylar fracture
• Easy to misjudge articular incongruity
Schatzker Type VI

- Metaphysis separated from diaphysis
- Degree of articular incongruity highly variable

Surgical Tactics for V and VI

- Medial or lateral or combined incisions
- Do not use anterior midline approach to get to the back of the tibia

Bicondylar tibial plateau fxs (pre-fixed angle plate fixation)

- Medial comminution => varus collapse
- High complication rates associated with early reports with dual plating from anterior extensile approaches
- Current techniques: soft-tissue sparing dual incisions for dual plating techniques
The Era of Fixed Angle Periarticular Plates Tibia
Did we do away with dual plating?

Questions
- Can a fixed angle plate provide similar fixation to a dual plating construct?

Tibial LISS vs dual plating
- Under axial loading conditions, overall construct stiffness similar for LISS vs. Dual plating *with medial cortex perfectly reduced

Mueller et al, CORR, 2003
When do we need to go medial?
*Posteromedial fragment

Shatzker VI fractures
Tibial Plateau Fractures

- Open reduction techniques to critically evaluate joint reduction, address associated meniscal pathology
- Stability and early motion critical to good outcome
- Fixed angle plates – role for bicondylar fractures
  - Beware of medial comminution
  - Beware of posteromedial fracture fragments
- Delay, dual incision approach proven satisfactory outcomes
Thank You