



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 studies¹ (>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 osteoarthritis²

1. Weigel DP, Marsh JL. High-energy fractures of the tibial plateau: Knee function after longer follow-up. J Bone Joint Surg Am 2002;84:1541-1551
2. Rademakers MV, Kerkhoffs GM, Streevelink IN, et al: Operative treatment of 108 tibial plateau fractures: Five- to 27-year follow-up results. J Orthop Trauma 2007;21:5-10

Surgical Indications

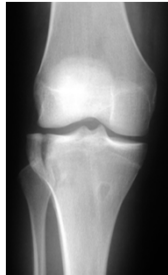
- Any condylar widening
- Clinical instability greater than 10 degrees (*alteration of limb mechanical axis)
- No clear guidelines for degree of articular incongruity (>4-10mm in literature)

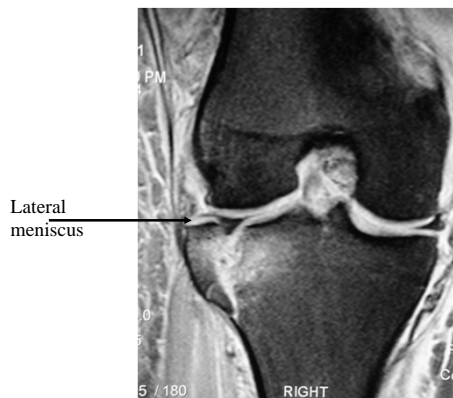
Standard Radiographic Workup

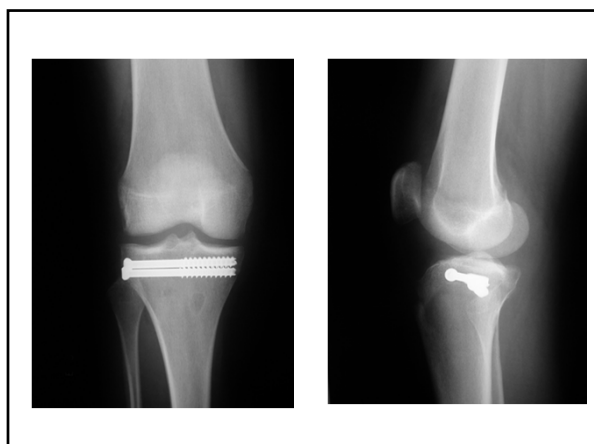
- AP, lateral, obliques knee
- AP, lateral tibia (if distal extension)
- CT scan knee

Schatzker Type I

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







Schatzker Type II

- Split Depression Fractures
- Single incision, lateral approach with submeniscal arthrotomy



Schatzker Type III

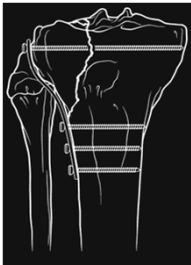
- Depression fracture; no split
- Elderly patients
- Osteoporotic bone
- Indication for surgery is instability
- Single incision, lateral approach with submeniscal arthrotomy



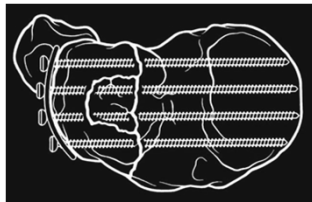
Shatzker II, III - Split Depression, Pure Depression

Open Reduction
Elevate Joint Surface
Bone Graft
Buttress Lateral Fracture

Implants: Contoured, Low Profile Plates



“Raft” of Screws



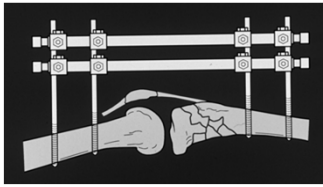
High Energy Tibial Plateau

- 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



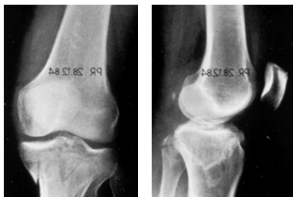
Schatzker Type IV

- 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)



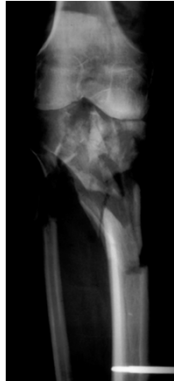
Schatzker Type V

- 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)

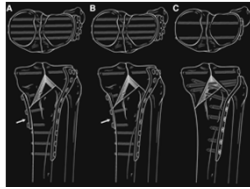
- Medial comminution => varus collapse
- High complication rates associated with early reports with dual plating from anterior extensile approaches
- Current techniques: soft-tissue sparing dual incisions for dual plating techniques

The Era of Fixed Angle Periarticular Plates Tibia

Did we do away with dual plating?

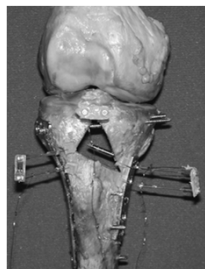
Questions

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

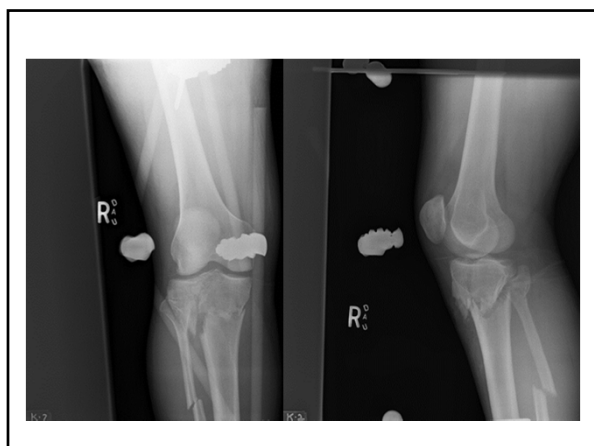


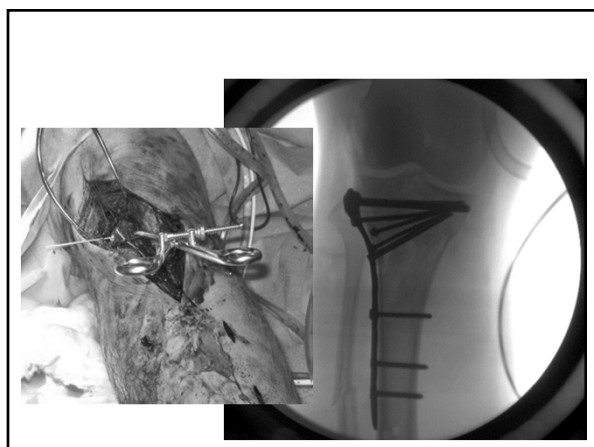
Tibial LISS vs dual plating

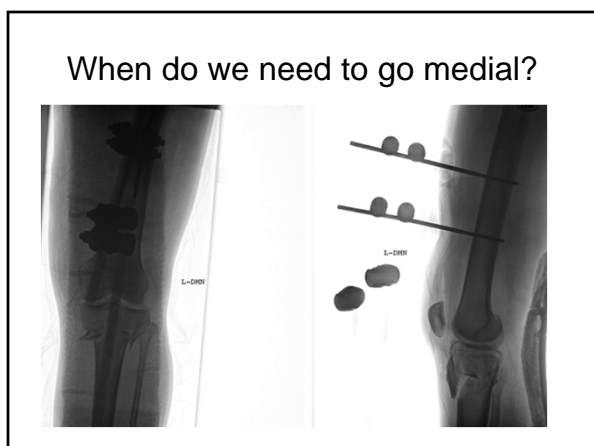
- Under axial loading conditions, overall construct stiffness similar for LISS vs. Dual plating *with medial cortex perfectly reduced

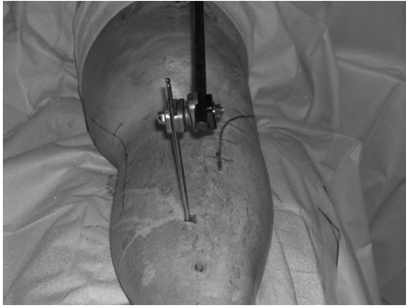


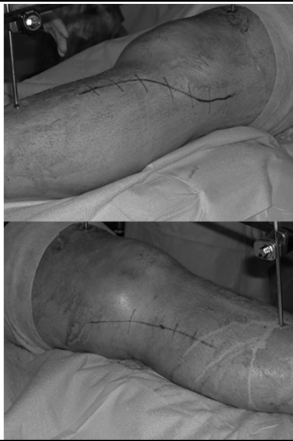
Mueller et al, CORR, 2003

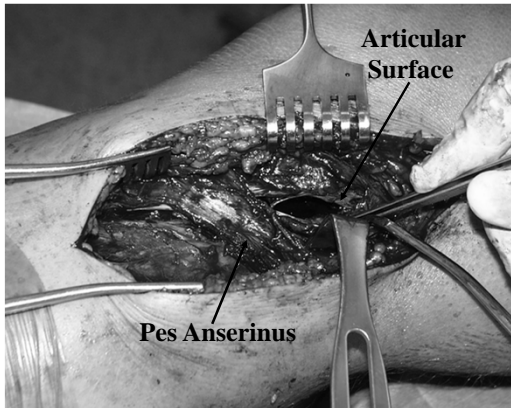


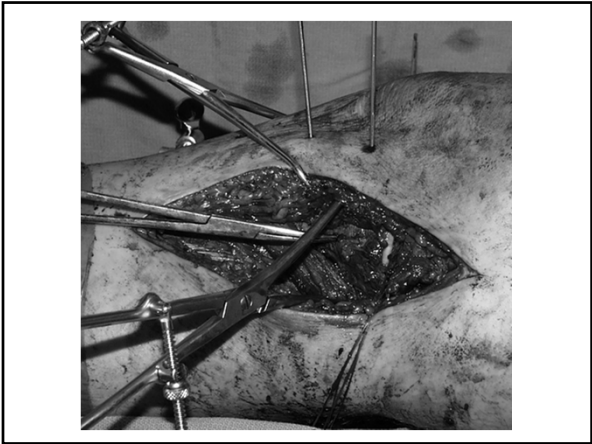


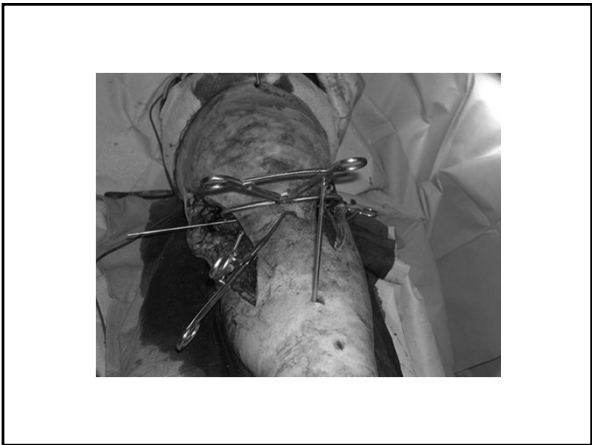






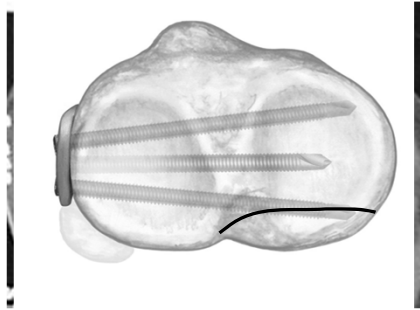








*Posteromedial fragment





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
