Tibial Plateau Fractures
Reduction Tips and Implant Selection

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We have discovered: good judgement comes from experience and experience comes from BAD judgement

Surgical Timing?
Surgical Timing?

Special Equipment
C-Arm Radiolucent Table

Reduction Tools
Positioning Aids or Bumps
Reduction Tools
Femoral Distracto or Ex Fix

Reduction Tools
Traction

Reduction Tools
Clamps
Distraction and Clamp Combination

Reduction Tools
Specialized Bone Tamps

Elevation of Depressed Segments
- Open
- Arthroscopic
- Percutaneous C-Arm
Elevate the depressed central fragment from below.
Buttress Plate as a Reduction Tool

Surgical Exposures

Surgical Exposures
Anterolateral Exposure
The Medial Plateau

- Coronal Fx
- Posteromedial Fragment
- Sagittal Fx
- Separates Entire Medial Plateau
Direct Posterior Approach


Optimizing the Management of Moore Type I Postero-Medial Split Fracture Dislocations of the Tibial Head: Description of the Lobenhoffer Approach

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Direct posterior approach

- Prone position
- Minimal soft tissue dissection
- Semimembranosus (*) and medial gastrocnemius (*) are preserved
- Partial subperiosteal detachment of popliteus

(*) Medial head of gastrocnemius

Direct posterior approach
Direct posterior approach

Arthroscopic Assisted Reduction

- Tibial Plateau
  - Numerous reports
  - Successful
  - Specific patterns
Arthroscopic Reduction: When?

- Shatzker 1, 2, 3
- Observe reduction
- Remove meniscus from fracture
- Repair meniscus
- Observe chondral and ligamentous damage

Problems with the Scope

- Obtaining view with perc clamp distorting the knee joint
- Compartment syndrome
- Not helpful in higher energy frxs
- Doing something with what you see!

Potential Issues
Flouroscopic Reduction

- Allows multiplanar view
- Familiar landmarks
- Your hands are not required
- We know what we are seeing (usually)

Problems with Flouro

- Overestimating the reduction
- Don’t See The Meniscus
- Doing something with what you see!

Type 1 – Split Fractures

- Techniques
  - Ligamentotaxis
  - Arthroscopy for Joint Reduction
  - Flouroscopy
- Fixation
  - Screws
    - Large or Small
  - Buttress Plates
- No Locked Plates
Type 1 – Split Fractures
- Think Meniscus
  - Widely Displaced Splits
  - Widening of the Condyle
  - Incomplete Reduction

Type I

Type I
Split Fractures of the Lateral Plateau
- 3 x 6.5 mm cancellous screws
- 2 x 6.5 mm cancellous screws + 4.5 screw with washer as an antiglide
- 6 hole L buttress plate
- NO difference in stability
  - Koval, J Orthop Trauma, 1996

Type II
- Techniques
  - Ligamentotaxis for split
  - Elevation for Depressed Segment
  - Arthroscopy for Joint Reduction
  - Fluoroscopy / Percutaneous Fixation
- Fixation
  - Screws
    - Small
    - Raft Screws
  - Buttress Plates
- No Locked Plates

42 y.o male - closed injury
- Split depression
  - Work through split
  - Bone graft or sub.
Meniscus!

Raft plate / periarticular plate
concept – not an implant!

Type III – Depression Fractures

- +/- Arthroscopy
- Cortical window
  - elevate joint surface
  - insert bone graft
- ORIF
  - Screw Fixation
  - Small Screws
  - Raft
- Meniscus?
Type IV – Medial Plateau Fx

- High Energy
  - Neurovascular Injury
  - Ligamentous (LCL) (ACL)
  - Poor Soft Tissues
  - Compartment Syndrome
- Techniques
  - Ligamentotaxis
  - Distractor/Fixator
  - Post Medial Approach
  - Buttress plate
  - Avoid Varus

Will This Work?

How Not To Do IT!

Lateral Locked Plate?
Medial plateau

Low profile non-locked plate

Type V & VI Bicondylar Fractures

- Techniques
  - Soft Tissue Assessment !!!
  - +/- Temporary Bridging ExFix
  - Must Support both sides With Fixation
    - Two Plates
    - Lateral Locked Plate
  - DO NOT approach through midline incision
  - Two surgical approaches has less morbidity

High load to the implant!
Reduction Strategy
Medial First

44 y.o. female MVA closed injury
8 days s/p injury

Reduction strategy:
medial side first
• close coronal split
• buttress medial side

lateral side
• correct flex/ext
• reduce sagittal split
• buttress lateral side
3.5 mm periarticular plate

No intervening stripping

Case Example
Keep Trying To Improve

Gracias!