Tibial Plateau Fx. Osteosynthesis

Internal fixation
Rationale of implants

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Articular Fractures – Osteosynthesis

No advantage of 4.5 mm. plates compared to small fragment plates
Koval JOT 99

Characteristics of the LCP system

Many different traditional plates (small, large)
Angular stable screw placement (if desired)
Very few new instruments

AO / Synthes Proximal Posterior Medial Tibia Plate

Application to Sagittal Fracture Pattern
Posterior Medial Tibial Pillar
Application to Posterior Coronal Shear Pattern
Direct Posterior Plating

Proximal Posterolateral Tibia Plate

• buttress plate, angle stable locking screws (3.5 mm)
  • curved more at the proximal lateral edge
  • angle of the screws in the tibia plateau horizontal
  • distal part of the plate close to the bone

„safe zone“ to ensure „one fits for all“
Combination Articular Fx / Metaphysis / Shaft

Screw fixation of joint fragments, side plate (locking screws)

Mechanics/biomechanics of plate/screw fixation

Plate fixation with conventional screws
- Screws in tension
- Plate/bone friction
- Compression at fracture site
- Disturbed blood supply

Plate fixation with locking head screws (LHS)
- Screws in shear
- Noncontact plate
- No compression of fracture
- Preserved blood supply

Locking compression plate (LCP)

The LCP-combi hole
5.0 locking head screws (lhs)
5.0 locking head screws (lhs/cs)
4.5 cortical screw (cs)
5.0 distance holders (Spacer)
**Biological advantages**

- Reduced compression of the periosteum
- Protects blood supply to the bone
- Callus formation/bone healing under the plate

**Functions of locking head screws (LHS)**

- Bridging osteosynthesis
  - Long plates elastic fixation prevention of stress peaks

**LISS (less invasive stabilization system)**

- Proximal tibia

**LISS System Femur & Tibia**

- N., W., 23 y., MHH
  - Left side: Distal femur/Fx C2, Proximal tibia/Fx C2
  - Right side: Tibial plateau/Fx C2
LISS System Femur & Tibia

42-year-old, complex tibial shaft fracture C3, open

5 months postop

42-year-old, complex tibial shaft fracture C3, open

Multifragmentary proximal tibial fracture, 41-C2
83-year-old woman (with osteoporosis), hit by car as pedestrian

Articular fracture
Principle: absolute stability
Method: interfragmentary compression
Technique: conventional plating (ORIF)

Preoperative x-ray
Follow-up x-rays after 6 months
Follow-up x-rays after 1 year

Multifragmentary metaphyseal fracture
Principle: relative stability
Method: splinting
Technique: MIPO

Open tibial shaft fracture, 42-C2
50-year-old man, skiing injury

Simple metaphyseal fracture
Principle: absolute stability
Method: compression
Technique: ORIF

Multifragmentary shaft fracture
Principle: relative stability
Method: locked splinting
Technique: less invasive

Follow-up x-rays after 5 weeks
Follow-up x-rays after 6 months
Follow-up x-rays after 8 months

Cases from Christian Ryf, Davos
Summary/take-home message

Compression plating after anatomical reduction in articular and simple fractures.

Splinting/bridge plating in multifragmentary fractures to minimize amount of additional trauma (MIPO).

Locking head screws always with locking compression plates; better fixation, convenient in osteoporosis, technical and biological reasons.

Proximal tibia fractures - nailing

Unicondylar tibial plateau fracture and shaft fracture
Screw / plate osteosynthesis and nail
Kubiak JOT 2008, Joosten Unfallchirurg 2009