Complex tibia plateau fracture - Circular external fixation

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Message

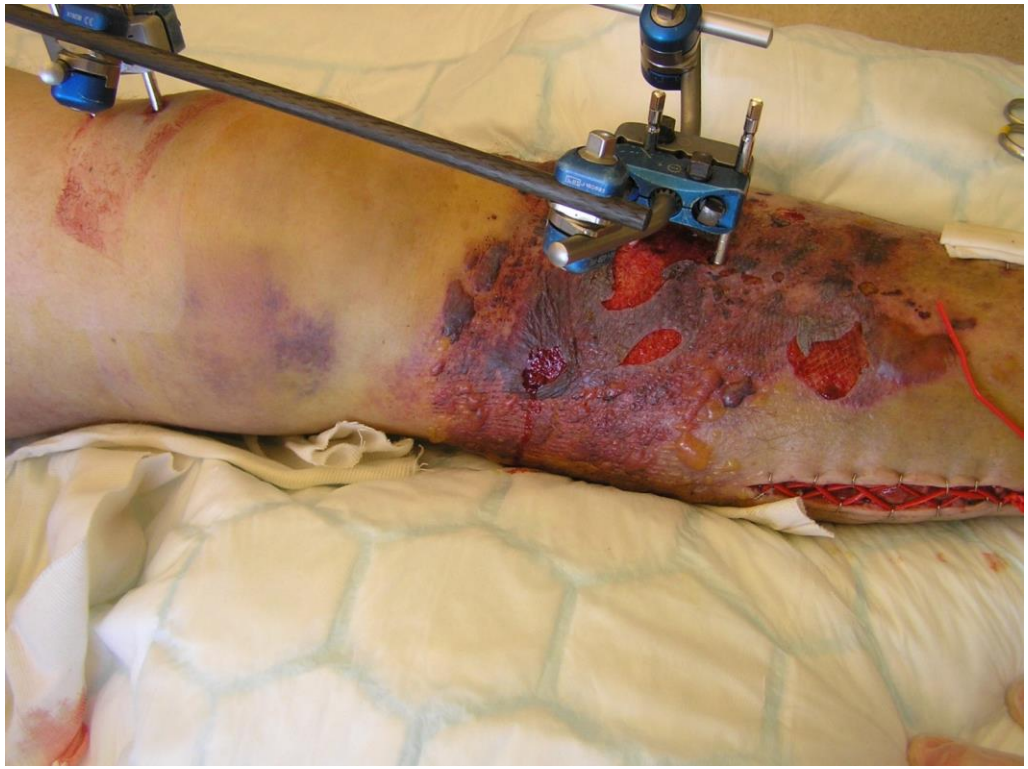
- Circular frames and plates are not competing methods, but complementary tools

- Select on the basis of fracture patterns and soft tissue status

The Canadian Orthopaedic Trauma Society
Open reduction and internal fixation compared with circular fixator application for bicondylar tibial plateau fractures. Results of a multicenter, prospective, randomized clinical trial.
J Bone Joint Surg Am. 2006; 88: 2613-2623

When **not** to use plates

- Certain open fractures
  - Gross contamination
  - Extended zone of injury



When **not** to use plates

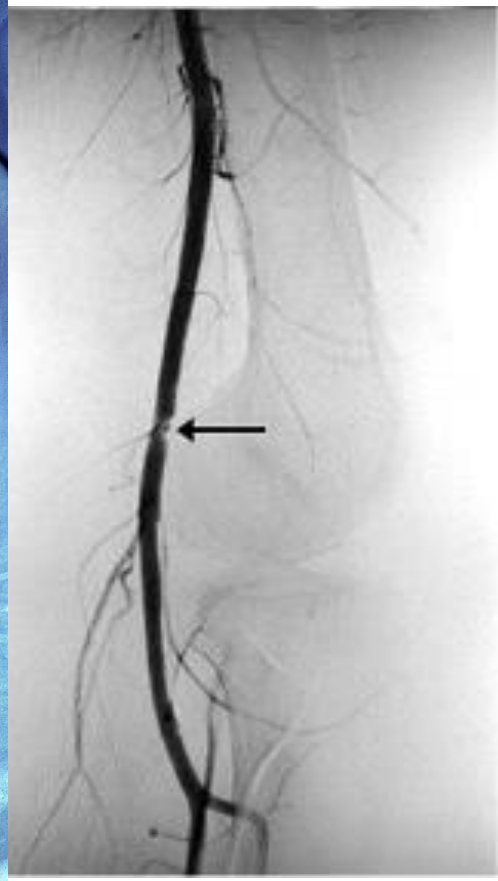
- Certain open fractures
  - Most Gustillo 3 open

When **not** to use plates

– Decollement (Morel-Lavallée lesion)

Bløddele

- Tyndt bløddelslag
- Høj/lav energi
- Neurovaskulære forhold
- Compartment syndrom

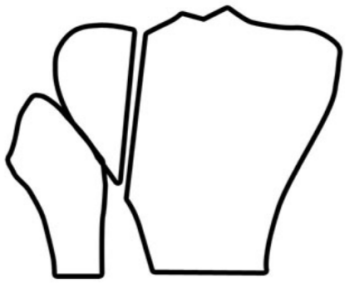


AIM

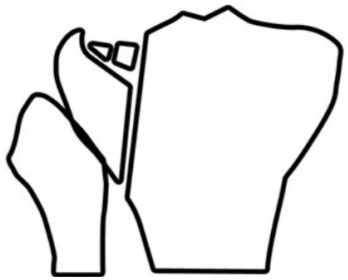
- Respecting the soft tissues
- Reducing the fracture
- Stabilizing the fracture with the appropiate method

Ring fixation

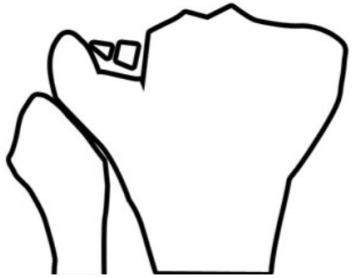
Schatzker J, McBroom R, Bruce D (1979) The tibial plateau fracture: the Toronto experience 1968–1975. Clin Orthop Rel Res 138:94–104



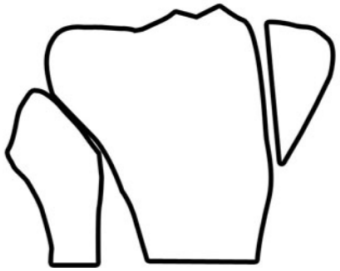
Schatzker I



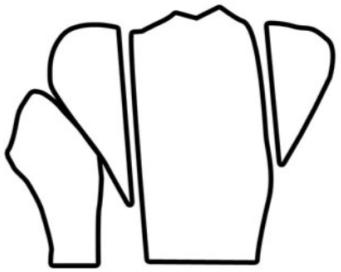
Schatzker II



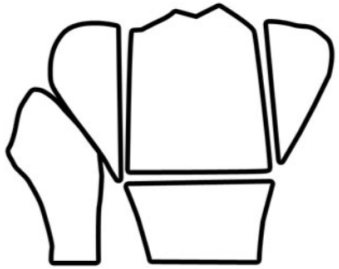
Schatzker III



Schatzker IV



Schatzker V



Schatzker VI

Peroperativt

Circular frame strategy

1) Basis frame – Femur ring: Ligamentotaxis (condylar height)

2) Open reduction: allograft; cannulated screws: absolute stability of intra-articular fragments

3) Proximal tibia ring: relative stability of metaphyseal fracture

Peroperativt

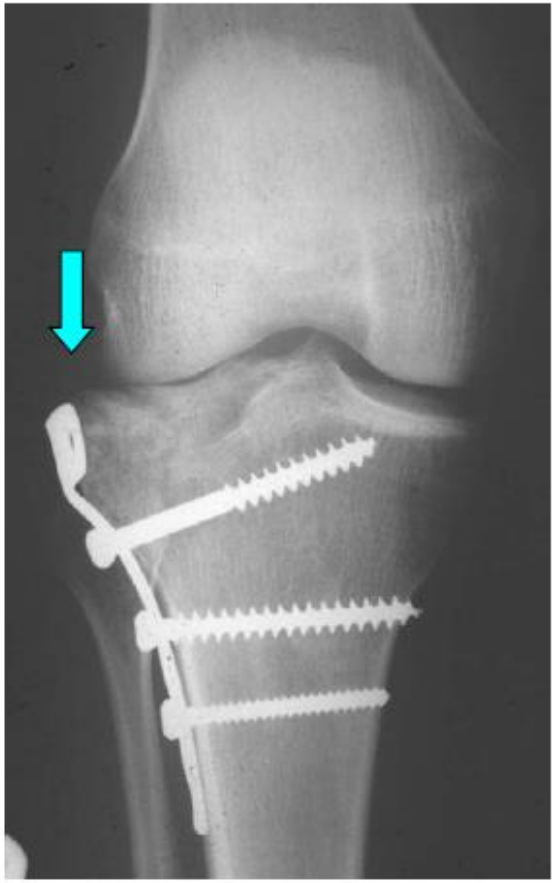
Postoperativt

Treatment Options

- what we do know:

- Poor outcome likely with knee instability
- instability is more commonly due to depression / malreduction than ligament damage

Apley 1979, Sarmiento 1979, Schatzker 1979, Blokker 1984, Moore 1987, Kettlekamp 1988, Jensen 1990,



Treatment Options

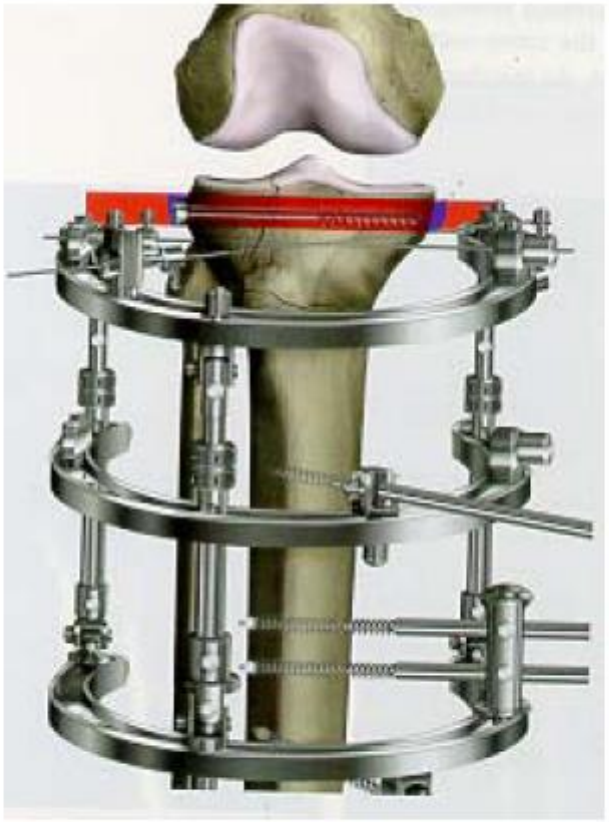
- what we do know:

- **Deep infection is common with operative treatment in complex fractures:**

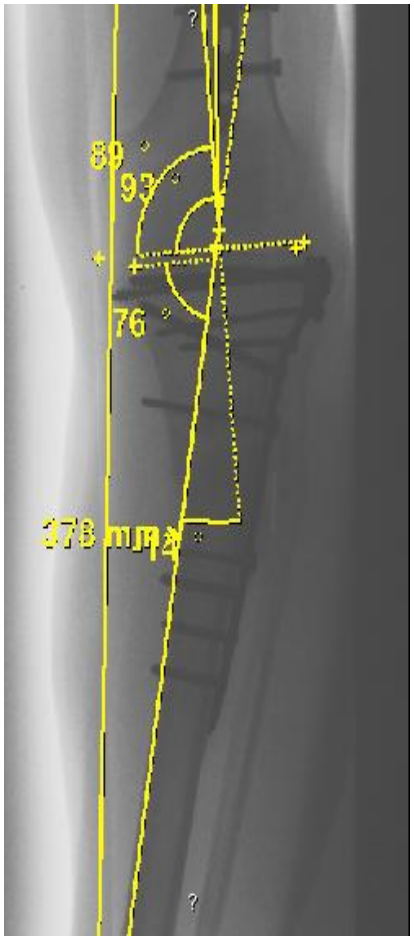
overall	2 - 5%
inexperienced	9.5%
expert	1%

AO type C #s

double plate	**70%**
ORIF (min)	**10-13%**
circ. frame	**6-12%**



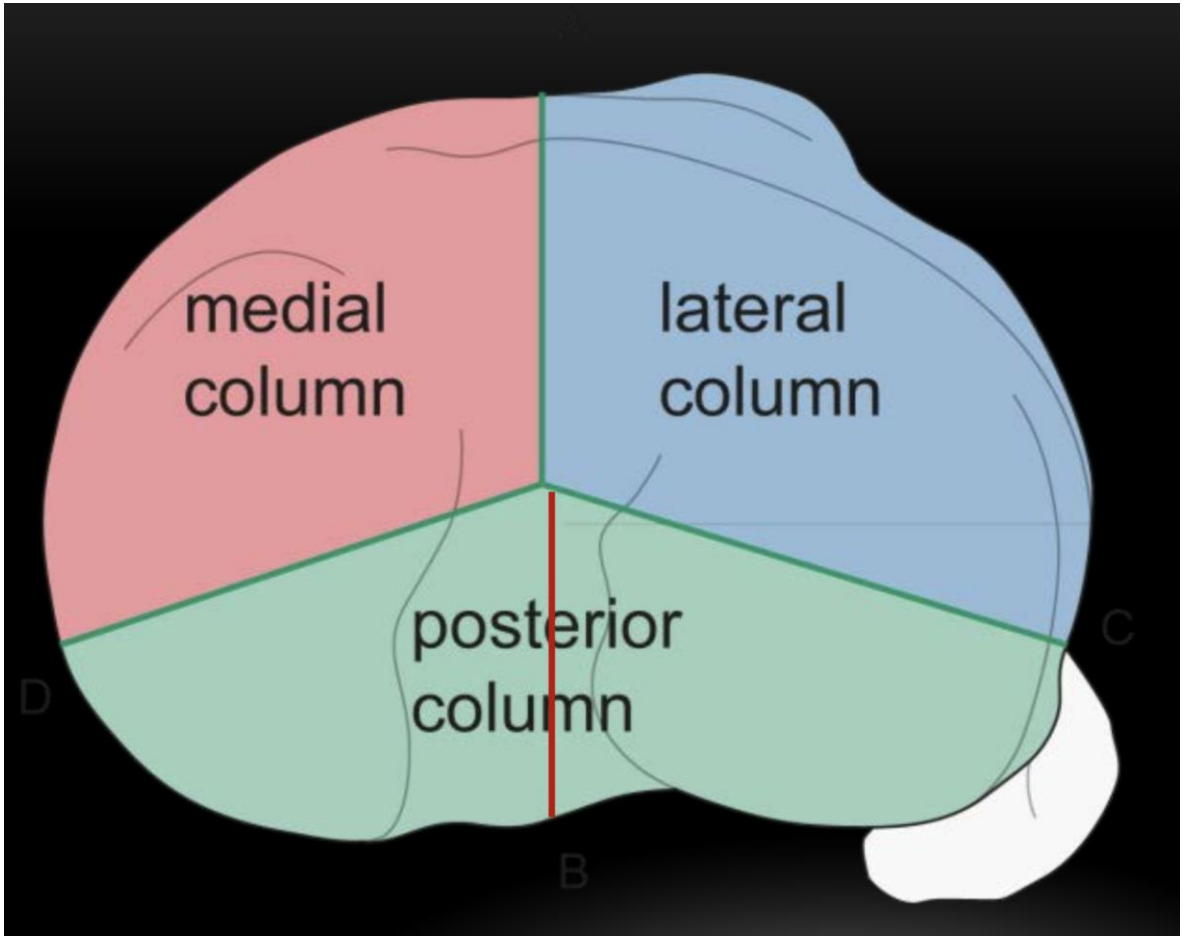
Alignment/ malalignment



- Drape both legs to avoid malalignment

Preoperative planning: 3 column concept

Medial approach in supine position



Lateral approach in supine position

Postero-medial / posterior approach in prone position

Tibial Plateau Fracture Characteristics: Computed Tomography Mapping of Lateral, Medial, and Bicondylar Fractures

Rik J. Molenaars, BSc, Jos J. Mellema, MD, Job N. Doornberg, MD, PhD, and Peter Kloen, MD, PhD
Orthotrauma Research Center Amsterdam, Academic Medical Center, Amsterdam

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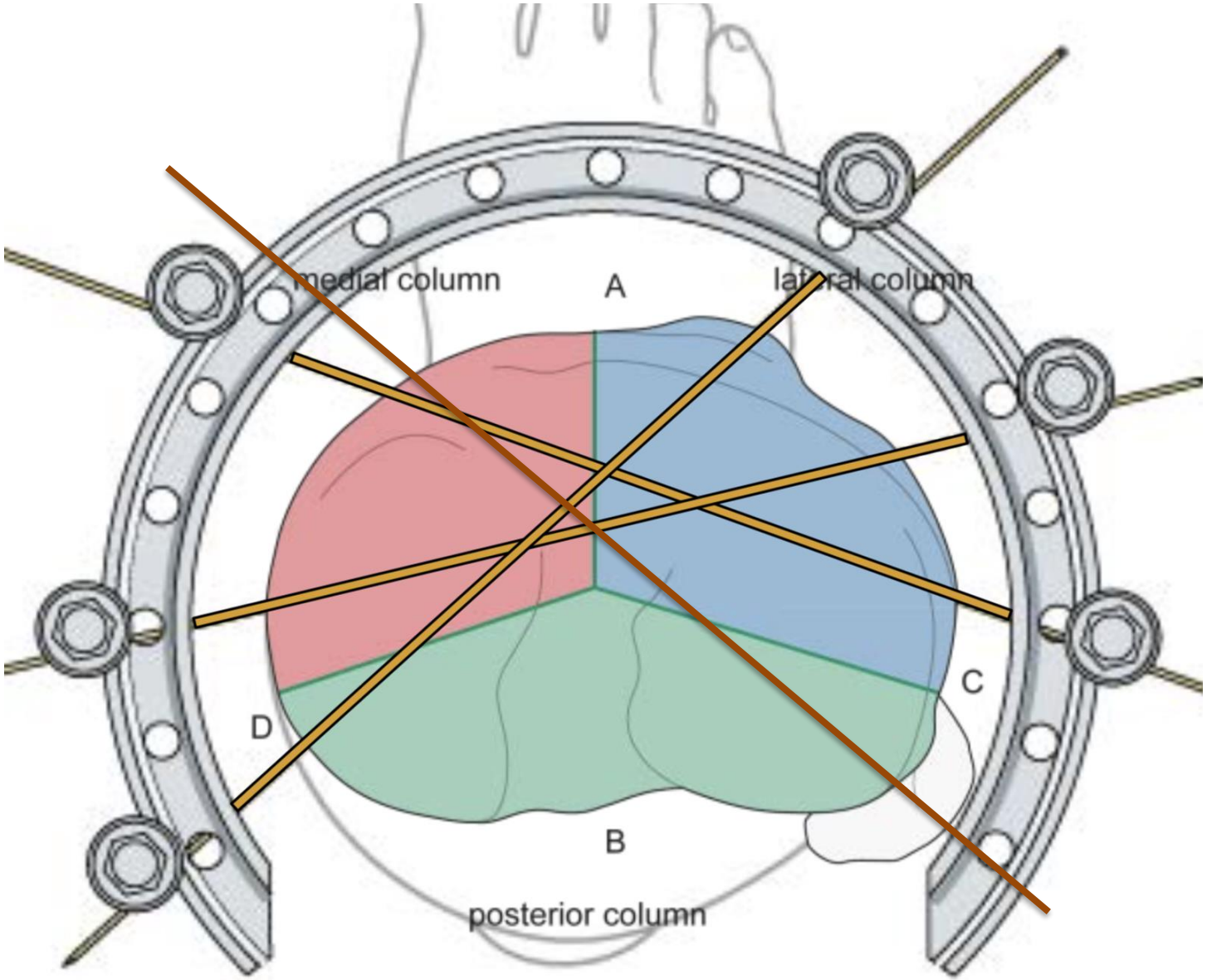
Preoperative planning



Results

- 35/35 fractures has healed
- 3 fractures still in fixation
- Fixation time was median 15 weeks (5-50 weeks)
- Healing time was median 17 weeks (11-50 weeks)
- 10 patients had their fixator removed before healing

Results

- Infection
  - Almost all patients had pin-tract infection requiring antibiotics at some point.
  - 2 patients had infection located at screw-heads 4 and 6 months postop. Both healed after removal and local revision.
  - 3 patients (7,9%) had deep infection in the knee joint or at the fracture site. All healed, after revision, but the fracture collapsed in two patients, and both are candidates for knee arthroplasty.

Take Home Message

Circular frames and plates are not competing methods, but complementary tools

Select on the basis of fracture patterns and soft tissue status