

Complex intraarticular distal femur fracture



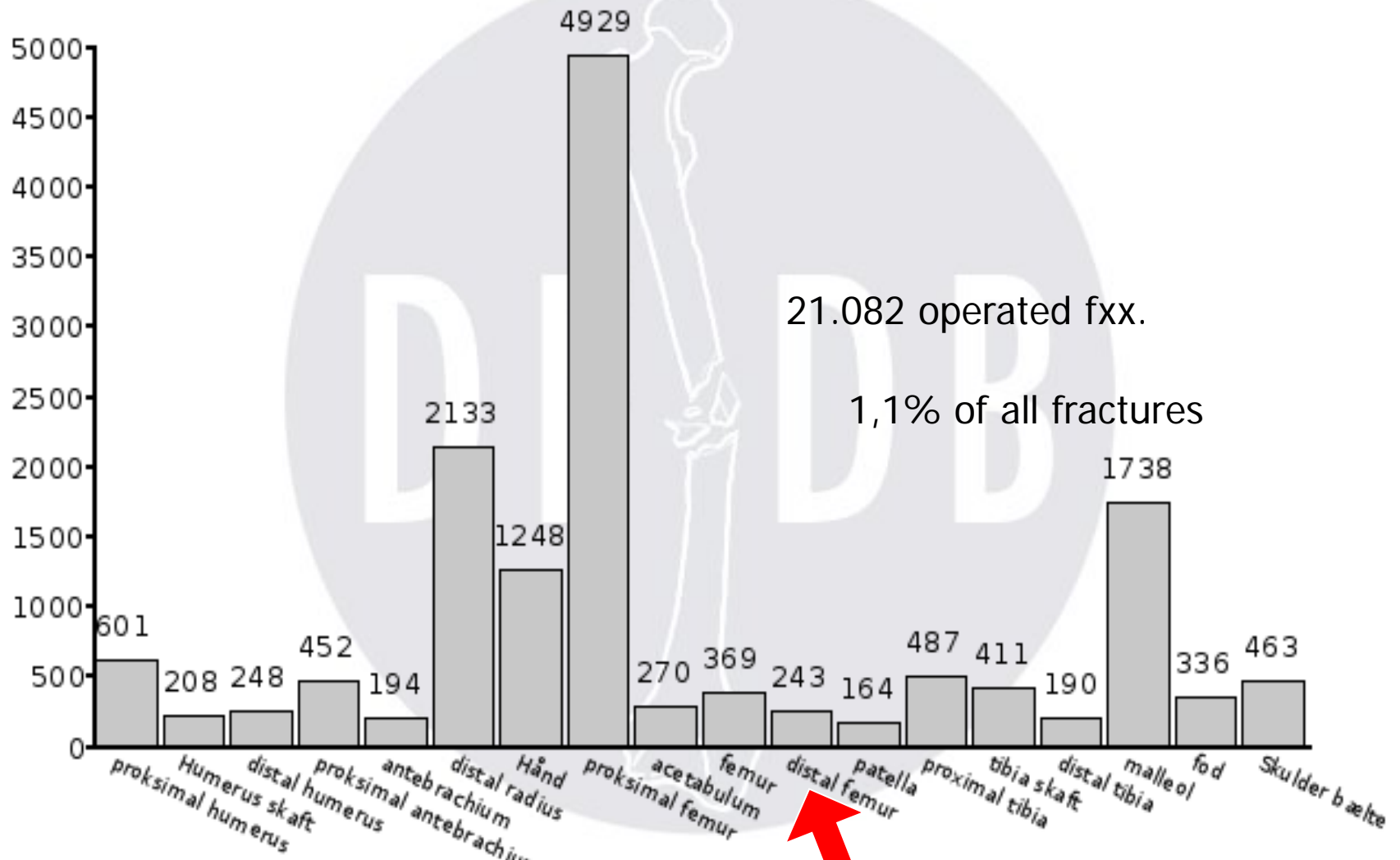
Michael Brix

Ass. Prof. Consultant Orthopaedic Trauma Surgeon
Dept. Of Orthopaedic and Traumatology
Odense University Hospital
Denmark

Background

- ▶ Complex intra-articular fracture of the distal femur is a rare fracture.
- ▶ Remains a surgical challenge even for experienced trauma surgeons.
- ▶ Re-operation rates are high (up to 60%)
- ▶ One year mortality is 25% (in people above 60 years)

AO klassifikation, voksne

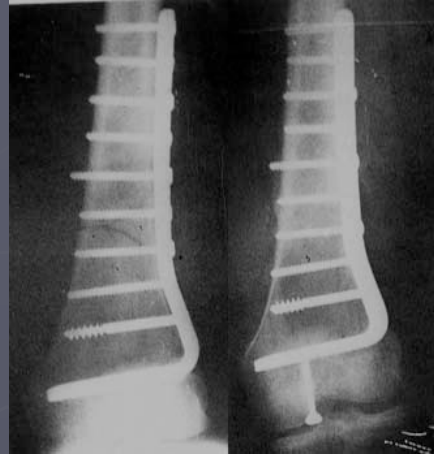


Implants, change over time

Compression plate.



Blade plate



Dynamic compression screw



Monoaxial locking plate



Polyaxial locking plate



Problems stay the same

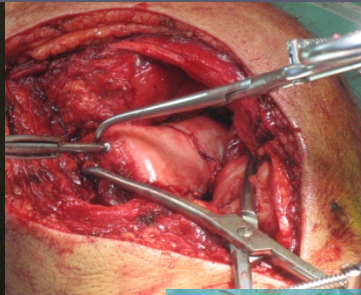
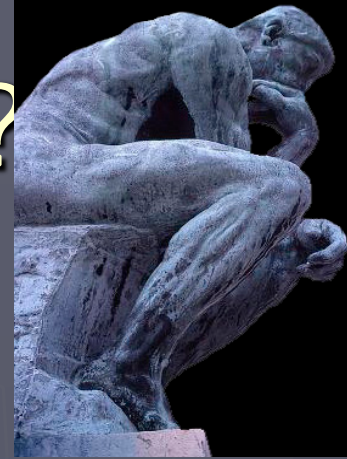
High re-operation-rates

- ▶ NON – Unions
- ▶ Infections
- ▶ Mal – Unions
- ▶ Hardware problems
- ▶ Secondary loss of reduction
- ▶ Loss of bone stock
- ▶ Heterotopic ossification
- ▶ Decreased Range of motion (ROM) (60-140)
- ▶ High Mortality Rates 25% (one year)
- ▶ The list is long

The aim

- ▶ Anatomical reduction
- ▶ Stable Fixation
- ▶ Early mobilisation
- ▶ Full range of motion
- ▶ Fast healing
- ▶ No complications

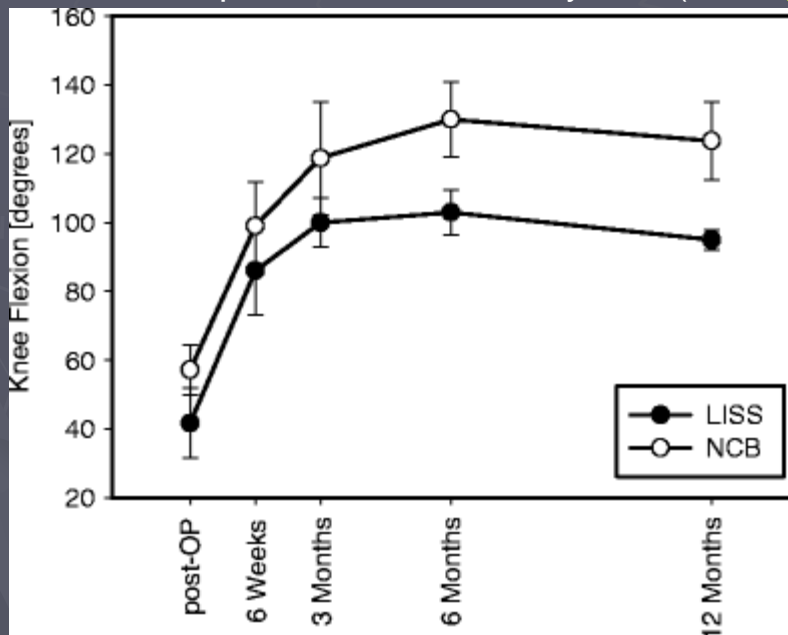
What is (more) important??



Mono or polyaxial screws (RCT study)

- ▶ [Int Orthop](#), 2014 Apr
- ▶ Mono- versus polyaxial locking plates in distal femur fractures: a prospective randomized multicentre clinical trial.
- ▶ [Hanschen M1](#), [Aschenbrenner IM](#), [Fehske K](#), [Kirchhoff S](#), [Keil L](#), [Holzapfel BM](#), [Winkler S](#), [Fuechtmeier B](#), [Neugebauer R](#), [Luehrs S](#), [Liener U](#), [Biberthaler P](#).

scores as compared to the LISS® system (Table 3).



Conclusion

No significant difference

Tendency to better ROM
With polyaxial screws

Not important

Anatomical reduction of the joint?

Correlation between step off and POA

Distal radius >2mm

Acetabulum >3mm

Distal femur ?? Rabbit joints

Tibial Plateau > 5-10mm

POINT 3 – incongruity and instability

Important

the sensitivity to step-offs was inversely correlated with cartilage thickness

Injury

2010, Review. Articular step-off and risk of post-traumatic osteoarthritis. Evidence today

P.V. Giannoudisa, ...

C. Tzioupisa, A. Papathanassopoulou, O. Obakponovwea, C. Roberts

High Mortality

Clin Orthop Relat Res. Apr 2011; 469(4): 1188–1196.

PMCID: PMC30

Published online Sep 10, 2010. doi: [10.1007/s11999-010-1530-2](https://doi.org/10.1007/s11999-010-1530-2)

Mortality After Distal Femur Fractures in Elderly Patients

[Philipp N. Streubel, MD](#), [William M. Ricci, MD](#), [Ambrose Wong, BS](#), and [Michael J. Gardner, MD](#)

[Author information](#) ▶ [Article notes](#) ▶ [Copyright and License information](#) ▶

Fractures of the distal femur carry a mortality risk comparable to that of hip fractures.

One year mortality 25%

Important

The Open Orthopaedics Journal, 2014

Mid Term Results of Distal Femoral Fractures Treated with a Polyaxial Locking Plate: A Multi-Center Study

J.B. Erhardt*,¹, M. Vincenti¹

J. Pressmar², F.A. Kuelling¹, C. Spross¹, F. Gebhard² and G. Roederer²

Conclusion:

These fractures are often combined with concomitant injuries. Using modern locked implants high union rates can be achieved with a good function and patient satisfaction when respecting biologic and biomechanical principles.

Important

Non-union in young patients

Patient factors: Age, Comorbidity, bone-quality, medication, smoking

Trauma factors: High energy, soft tissue, loss of bone stock

Surgery factors: Experience, MIPO/Open, bone-stripping.....

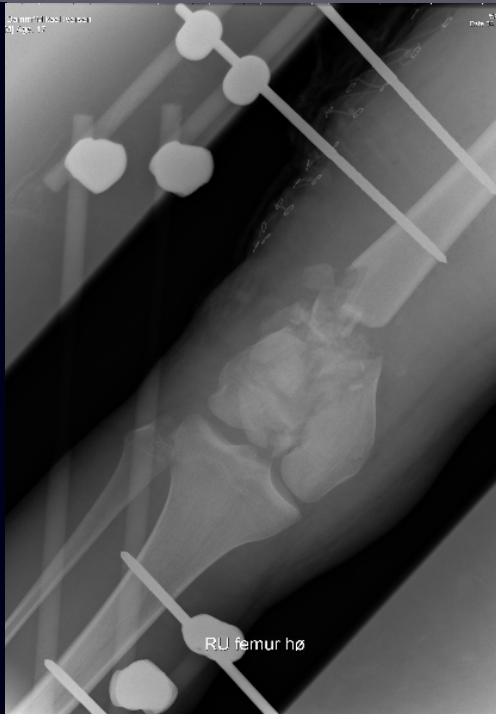
Implant factors: Design, features, strenght,

Construct factors: One or two column construct, stiffness, screws etc.....

Many different strategies can be chosen

Our clinic – about 40 Cases/Year

Staged protocol



Staged protocol



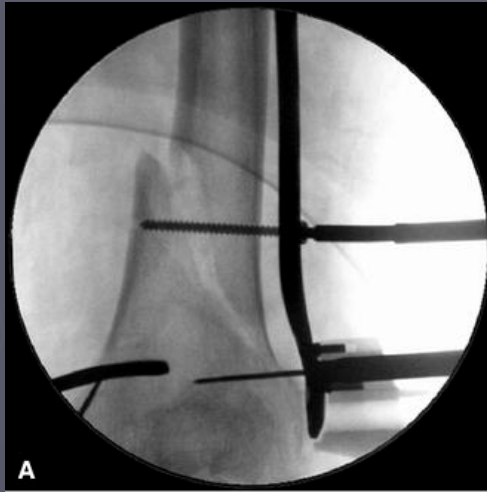
Some Pitfalls

Stiffness of the construct

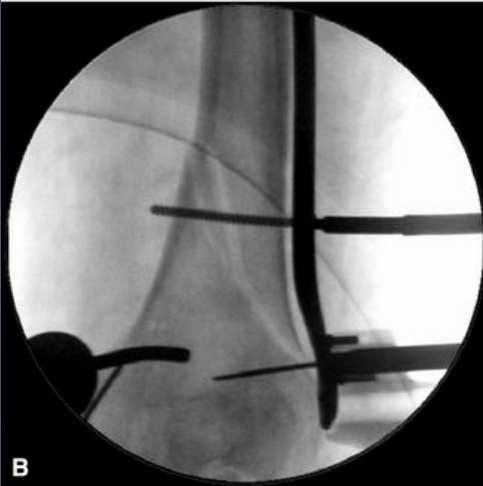
The medial column

Autograft-Pelvic/RIA

Dynamization of locked plating on distal femur fracture



A



B



A



B



C

Stiffnes of the construct



A



B

The importance of the medial column



Reaming-Irrigation-ASpiration



Take home message

1. Analyze and form a strategi for each individual case.

1. Know the pitfalls

2. Delayed Union??-find them and treat them