



Fracture Sequelae

Preop. Assessment : Clinical & Imaging

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6th Advanced Course on Knee surgery

January 31st – February 5th, 2016 Val d'Isère - France



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Nicolas TARDY, M.D.

Fractures around the knee: problematic?

— A. Bone sequelae:

- Secondary deformities/Malunion: intra or extra-articular
- Poor bone quality :Non-union/Osseous defect
- Post-traumatic osteoarthritis

— B. Soft tissues damages: (to decide surgical approach)

- Skin problems: previous scarring
- Latent infection
- Knee stiffness
- Ligament incompetence?
- Peripheral pulse

— C. Retained internal fixation devices?



Parratte et al. Total knee replacement following intra-articular malunion. *OTSR* 2011.

Benazzo et al. Total knee replacement in acute and chronic traumatic events. *Injury* 2014.

Weiss et al. Total knee arthroplasty in post-traumatic arthrosis of the knee. *J Arthroplasty* 2003.

Bone sequelae: how to evaluate it?

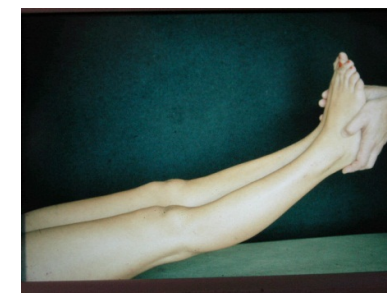
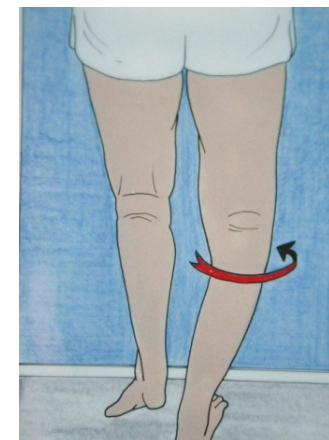
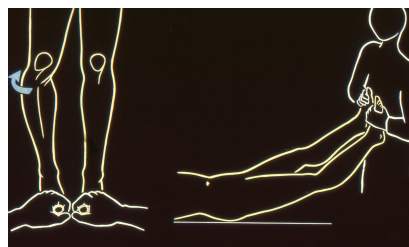
1. Clinical examination:

– Weight-bearing++/ Walking examination

- Limb alignment (frontal and sagittal!)
- Decoaptation?
- Lameness?

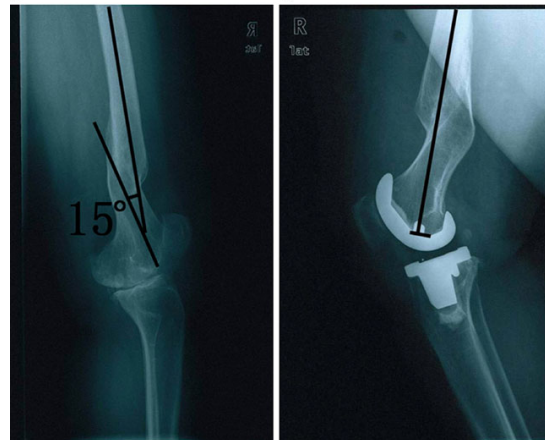
– Lying down:

- Length inequality?
- Deformity reducible? Ligament balancing.
- Torsional disorders?



2. Standard X-Rays +++:

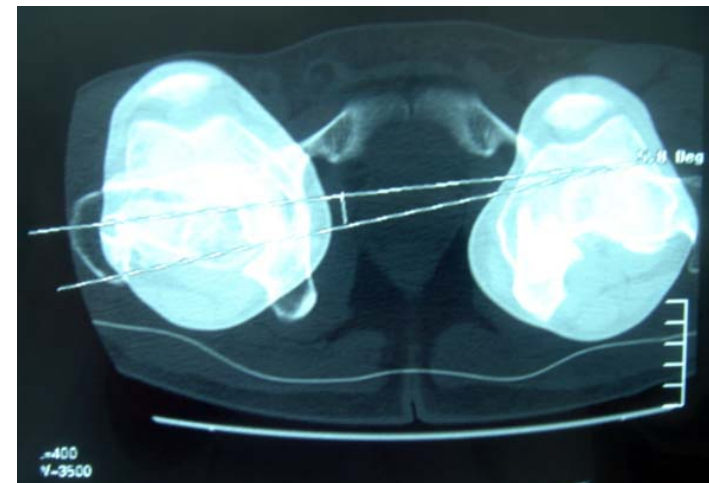
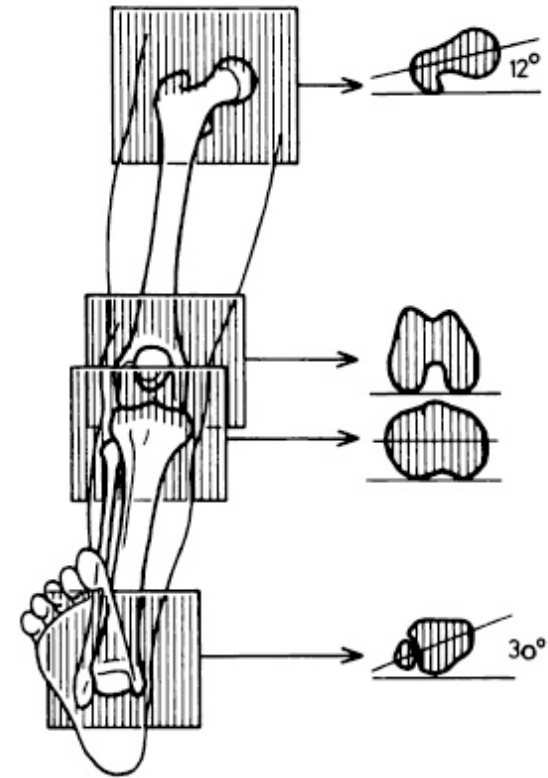
- ➔ Both knees/Comparative
- ➔ Long standing weight-bearing X-Rays
 - global deformity++: frontal and sagittal !
 - Level of the deformation: intra or extra-articular?
- Schuss: osteoarthritis?
- AP/Lateral views:
 - Tibial slope
 - Patella Baja? (TTO?)
 - Metallic Hardware?
- Patellar axial view



Wang et al. TKR with intra-articular resection of bone after malunion of femoral fracture: can sagittal angulation be corrected? *JBJS Br* 2010.

3. CT-Scan:

- Bone defects
- Mal or non-union
- Limb malrotation ++



Soft tissues damages

1. Clinical examination:

- Latent infection?
 - Swelling, redness, local temperature
- Knee arthrofibrosis?
 - Knee ROM ++
- Skin damages?
 - Scars?
 - Skin retraction?



Ries et al. Medial gastrocnemius flap coverage for treatment of skin necrosis after total knee arthroplasty. *CORR* 2006.

Bégué et al. One-stage procedure for total knee arthroplasty in post-traumatic osteoarthritis of the knee with wound defect. Usefulness of navigation and flap surgery. *The Knee* 2012

Soft tissues damages

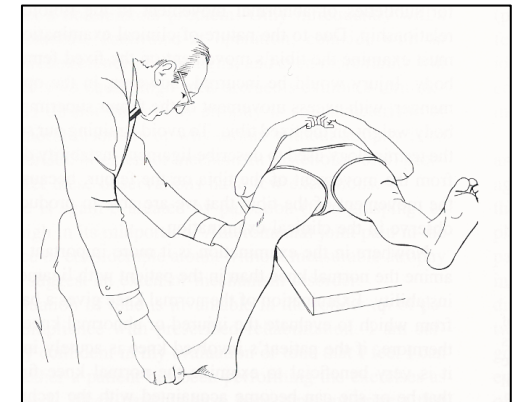
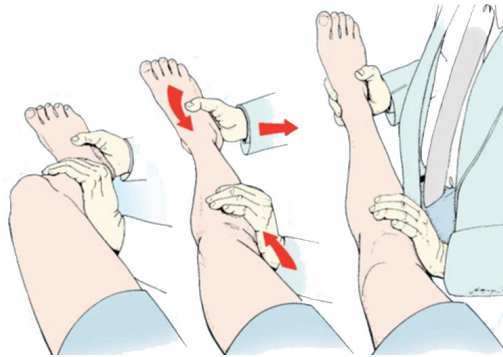
1. Clinical examination:

– Vascular lesion?

- Peripheral pulses

– Ligament injuries?

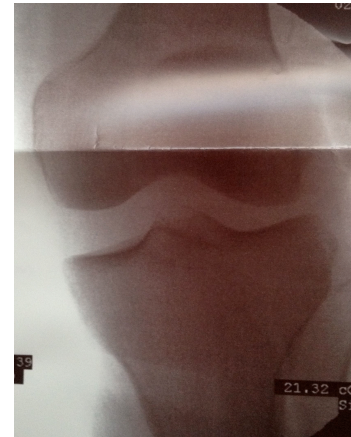
- ACL/PCL++ (Uni?)
- Medial/Lateral ligaments



Soft tissues damages

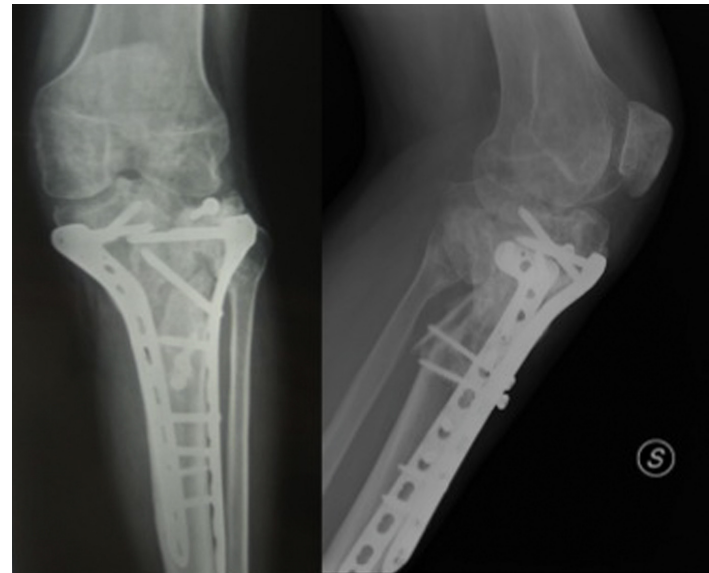
2. Additional tests:

- Latent infection?
 - **Biological test** (CRP/ White Blood Cell Count, ESR)
 - **Pre-operative joint aspiration** with culture
 - **MRI or Tc99 bone scan**
- Vascular lesion?
 - **Angio-CT or Doppler**
- Ligament injuries:
 - **Stress X-Rays** (Varus/valgus; Telos)



Retained internal fixation devices

- Type and exact position of the devices++:
 - Operative report
 - X-rays
- Hardware removal and TKA by the same incision?



Manzotti et al. Post traumatic knee arthritis: Navigated total knee replacement without hardware removal. *The Knee* 2014

CONCLUSION

➔ The pre-op assessment: anticipate the TKA implantation +++:

- Approach (TTO?)
- Choice of the implant and the level of constraint:
 - Uni or TKA?
 - Custom-fit TKA?
 - Long stem?
- Bone grafting or Metal augments (trabecular metal cones...)?
- Additional osteotomy?
- Additional plastic surgery or arthrolysis?
- Hardware removal?

And, sometimes TKA is not the best solution...



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Thank You!

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2016

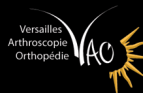
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