Ruptures of extensor apparatus after TKA

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Review article

Extensor tendon ruptures after total knee arthroplasty

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ABSTRACT

Extensor tendon rupture is a rare but serious complication after total knee arthroplasty (TKA) that impairs active knee extension, thereby severely affecting knee function. Surgery is usually required. Surgical options range from simple suturing to allograft reconstruction of the entire extensor mechanism and include intermediate methods such as reconstruction using neighbouring tendons or muscles, synthetic ligament implantation, and partial allograft repair. Simple suturing carries a high failure rate and should therefore be routinely combined with tissue augmentation using a neighbouring tendon or a synthetic ligament. After allograft reconstruction, outcomes are variable and long-term complications common. Salvage procedures for managing the most severe cases after allograft failure involve reconstruction using gastrocnemius or vastus flaps. Regardless of the technique used, suturing must be performed under tension, with the knee fully extended, and rehabilitation must be conducted with great caution. Weaknesses of available case-series studies include small sample sizes, heterogeneity, and inadequate follow-up duration. All treatment options are associated with substantial failure rates. The patient should be informed of this fact and plans made for a salvage option. Here, the main techniques and their outcomes are discussed, and a therapeutic strategy is suggested.

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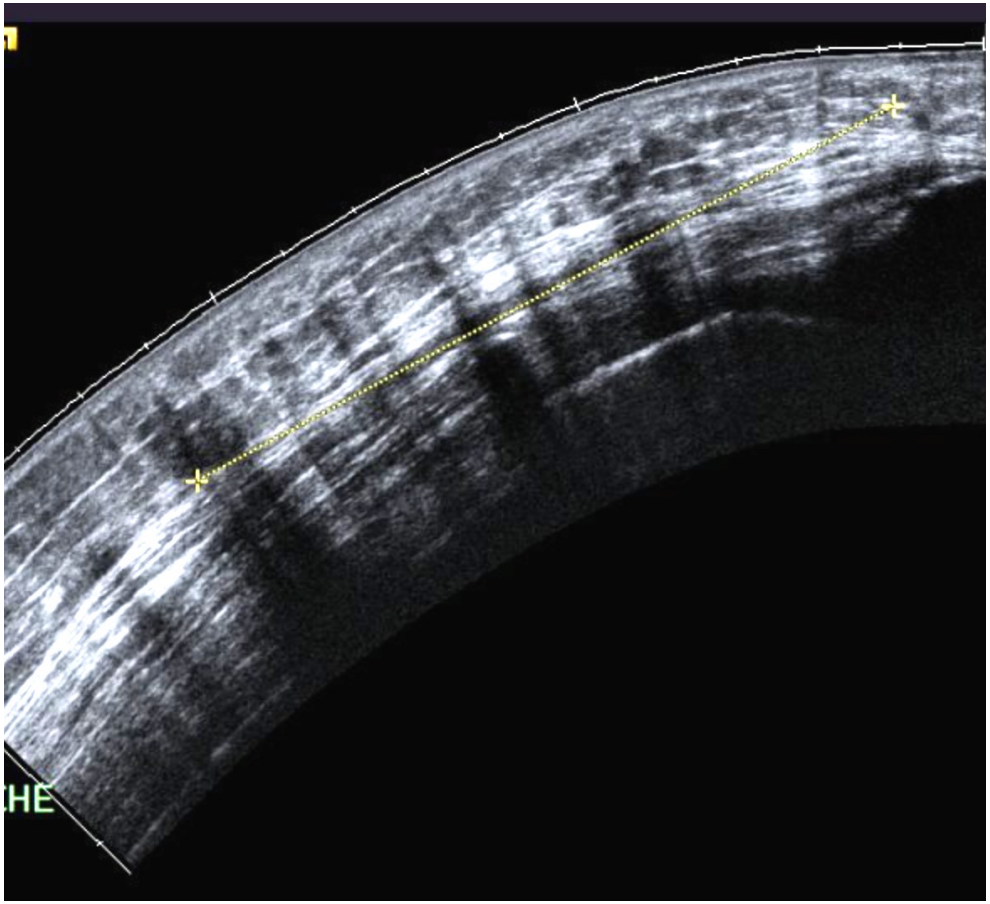
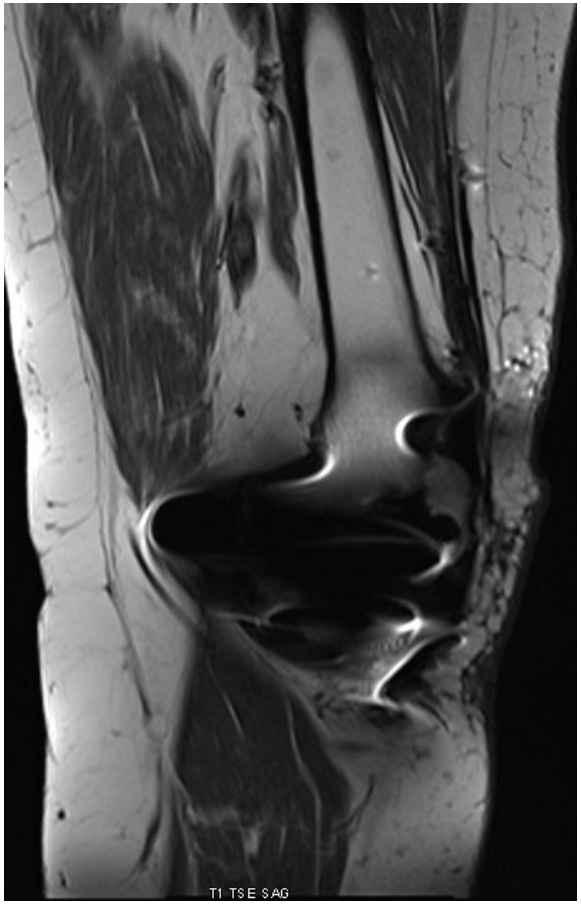
Diagnostic = Clinical exam

Loss of active extension

Defect in the tendon

Diagnostic: XR – US- MRI



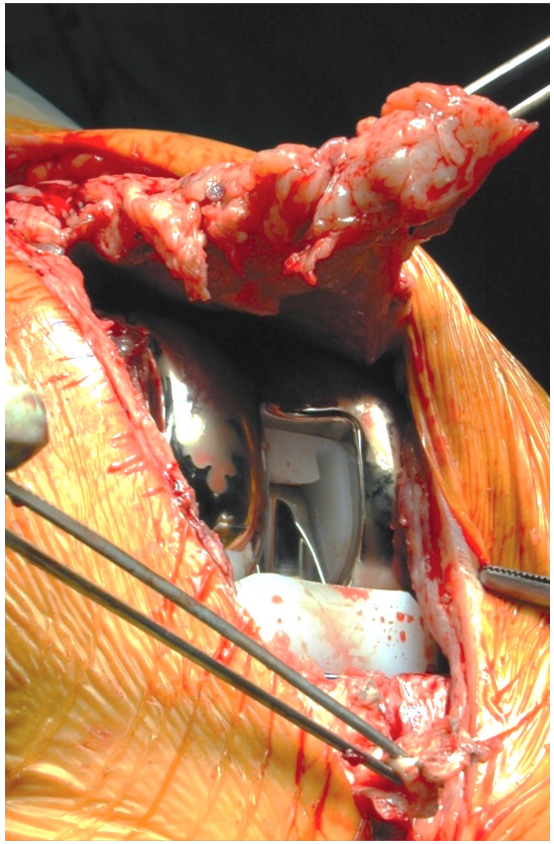


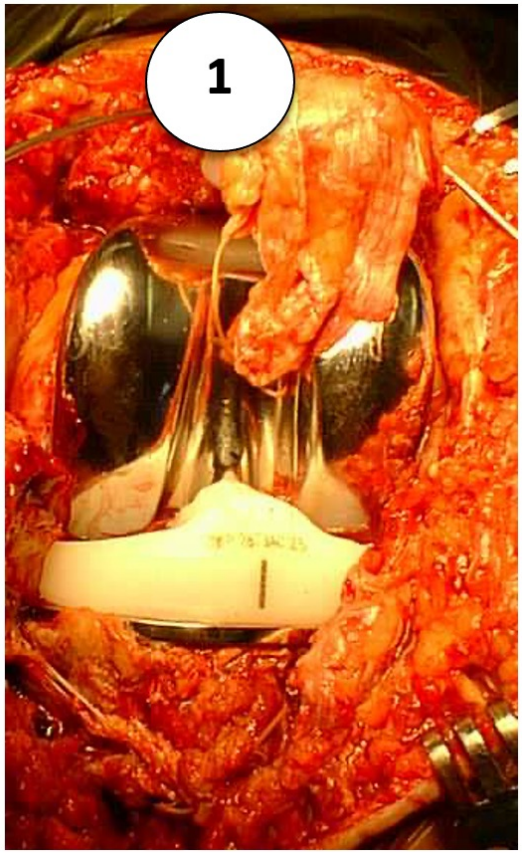
Treatment

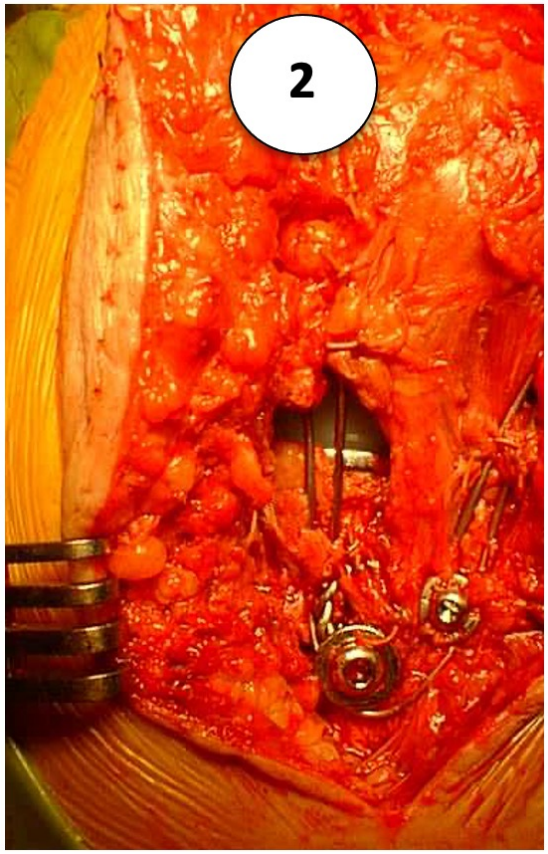
1. Recent ruptures
2. Chronic ruptures

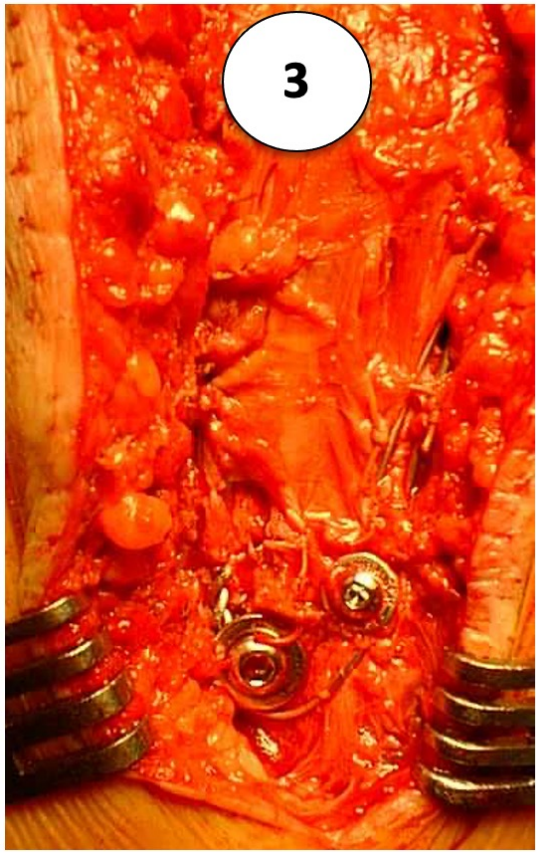
Recent rupture

Suture ± metal cables = failure



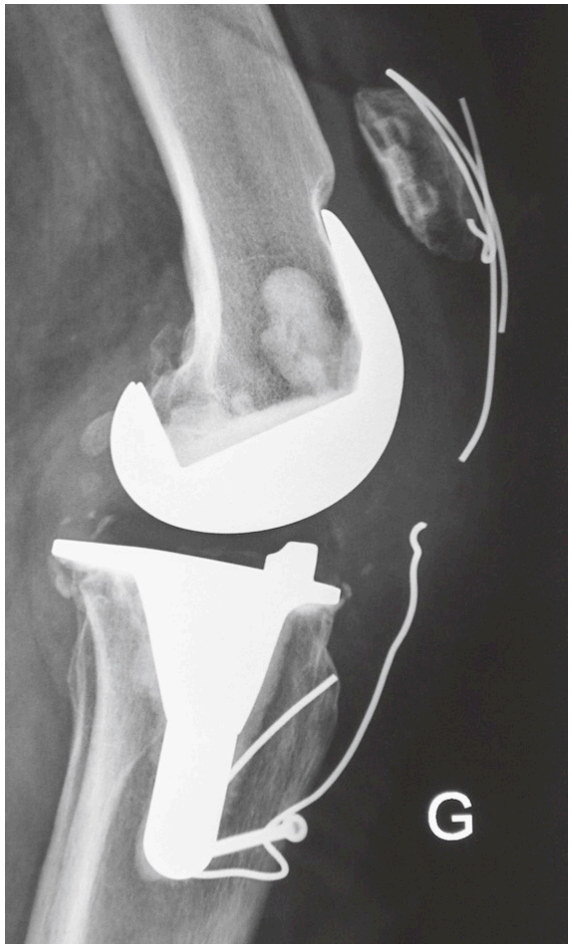






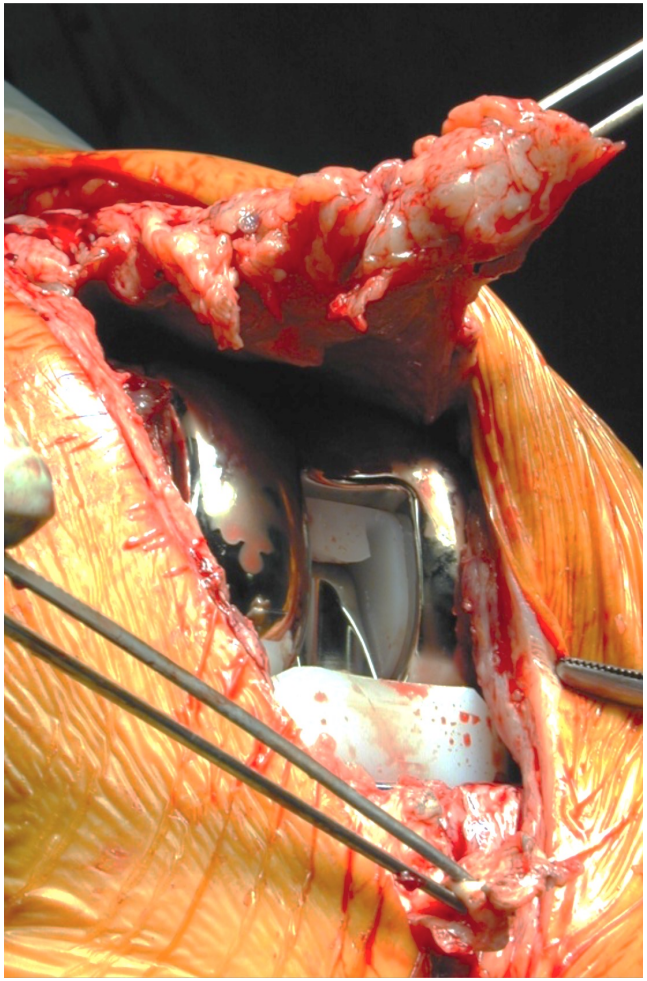
Recent rupture

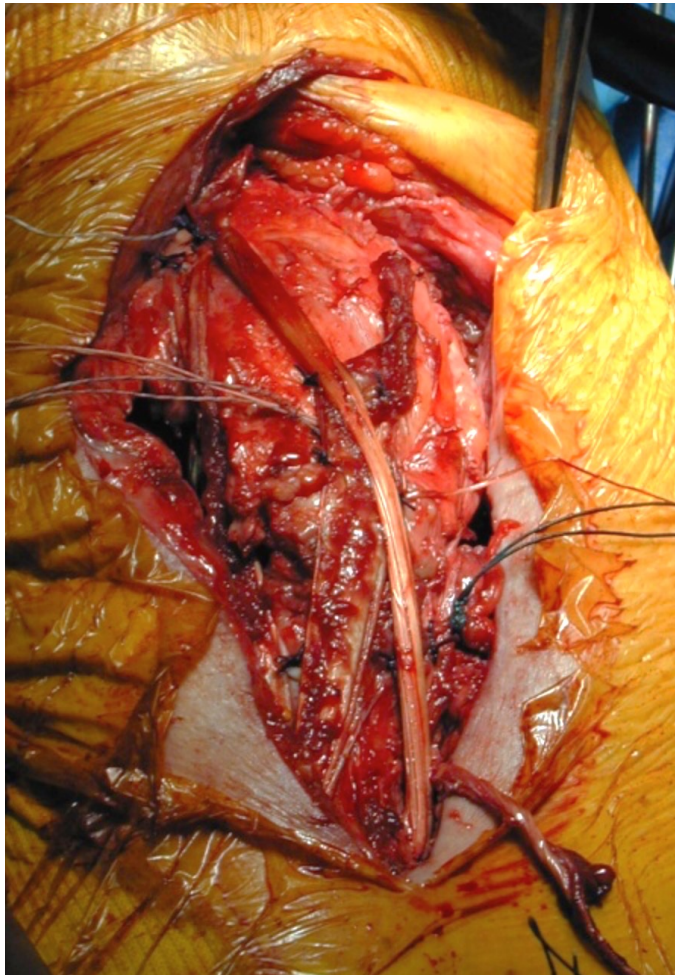
Suture ± metal cables = failure



Recent rupture

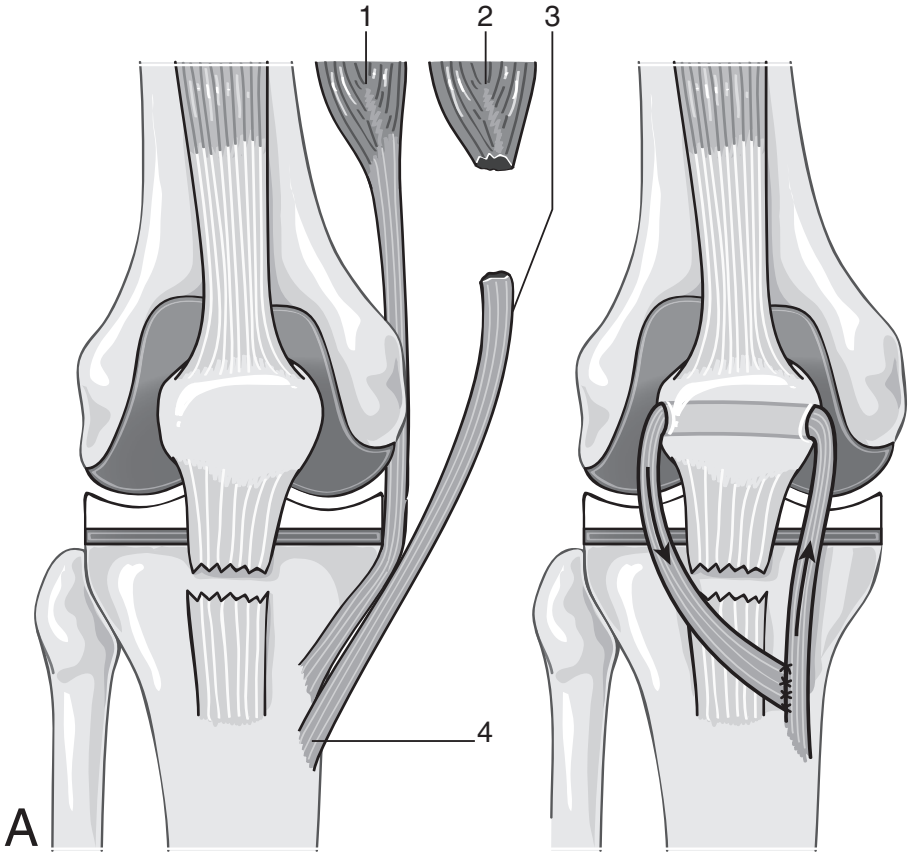
Suture +Autograft + Metal cables = Success





Semi-Tendinosus

- Cadambi 1992
- Järvela 2005



Semi-Tendinosus

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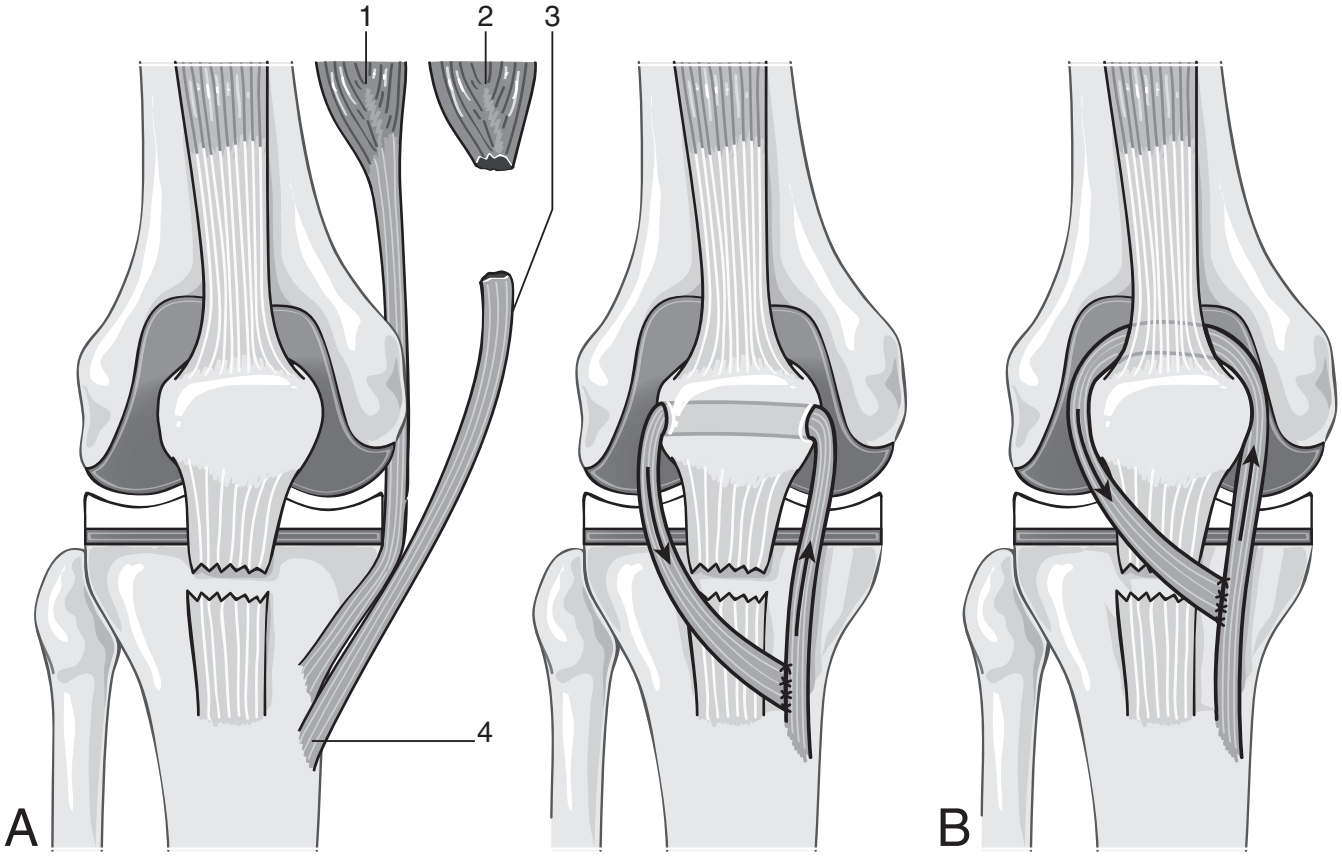

Semi-Tendinosus

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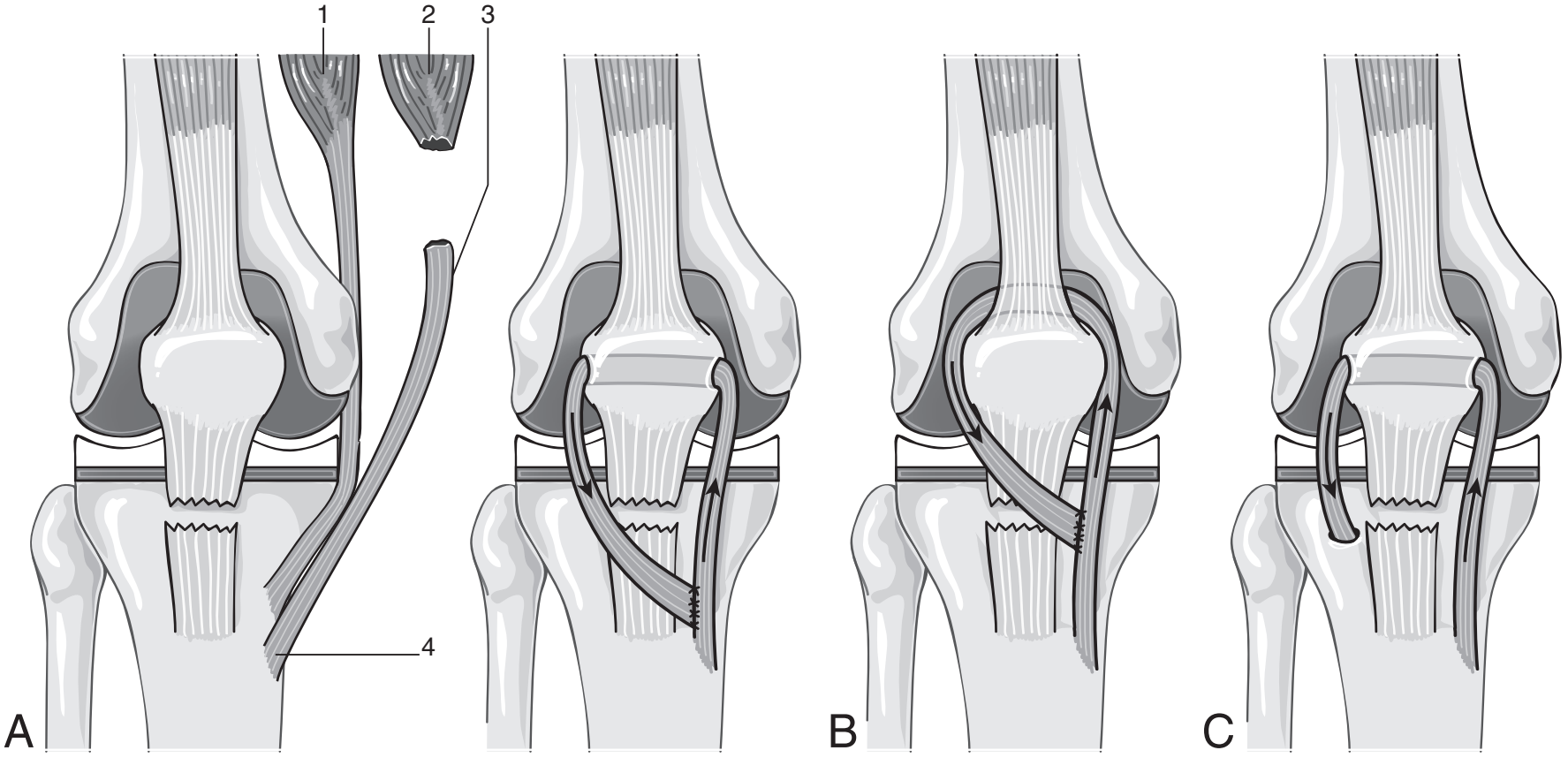


Chronic rupture

- ✓ Artificial ligt
  - Hanssen
- ✓ Allograft
  - Partial
  - Complete (app.extenseur)
  - Achilleus
- ✓ Salvage techniques
  - Gastrocnemius ± vastus
  - Arthrodesis

Hanssen technique in 10 points

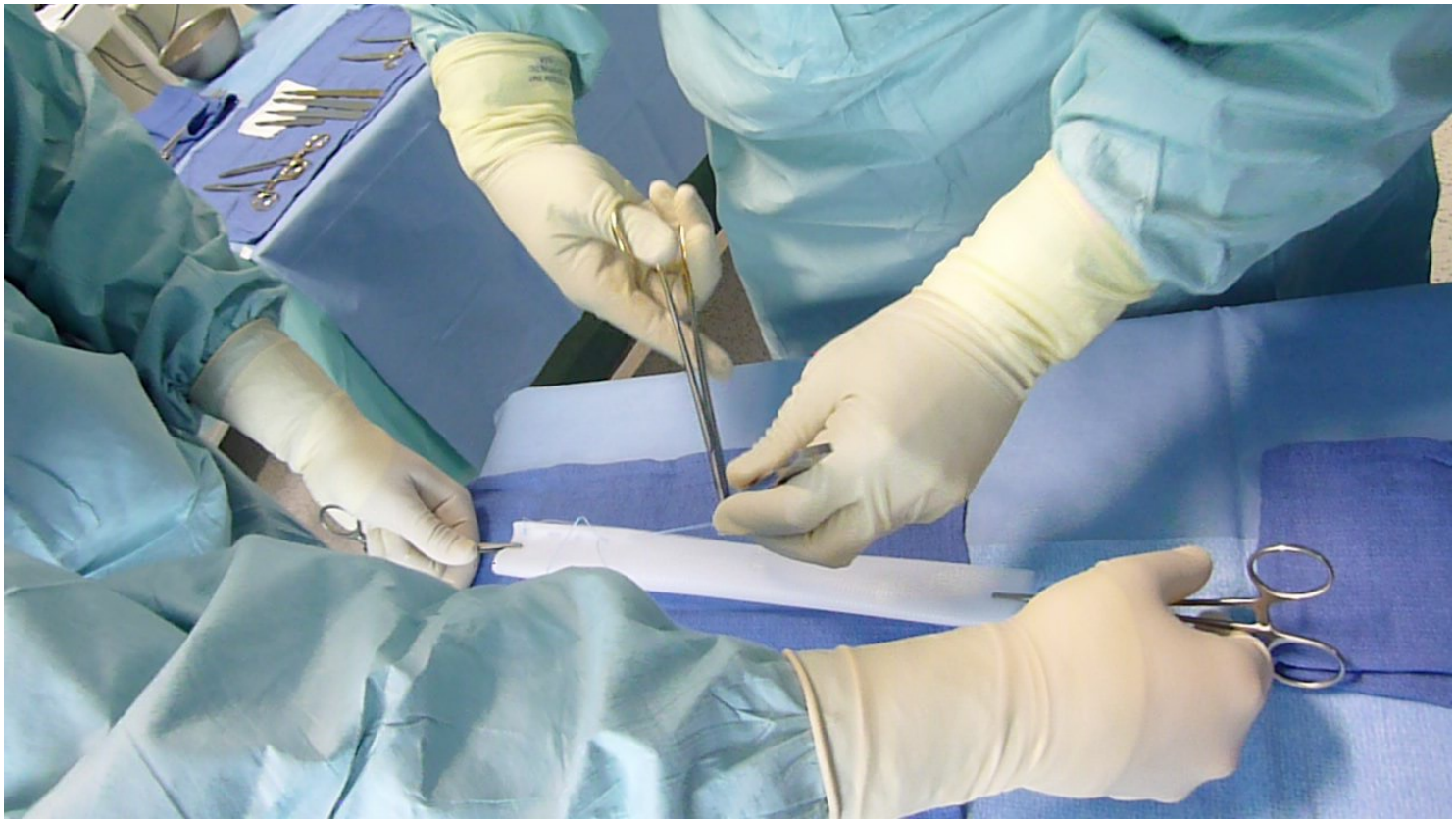
Browne J and Hanssen A. *JBJS Am 2011*

1- Suture of the plate

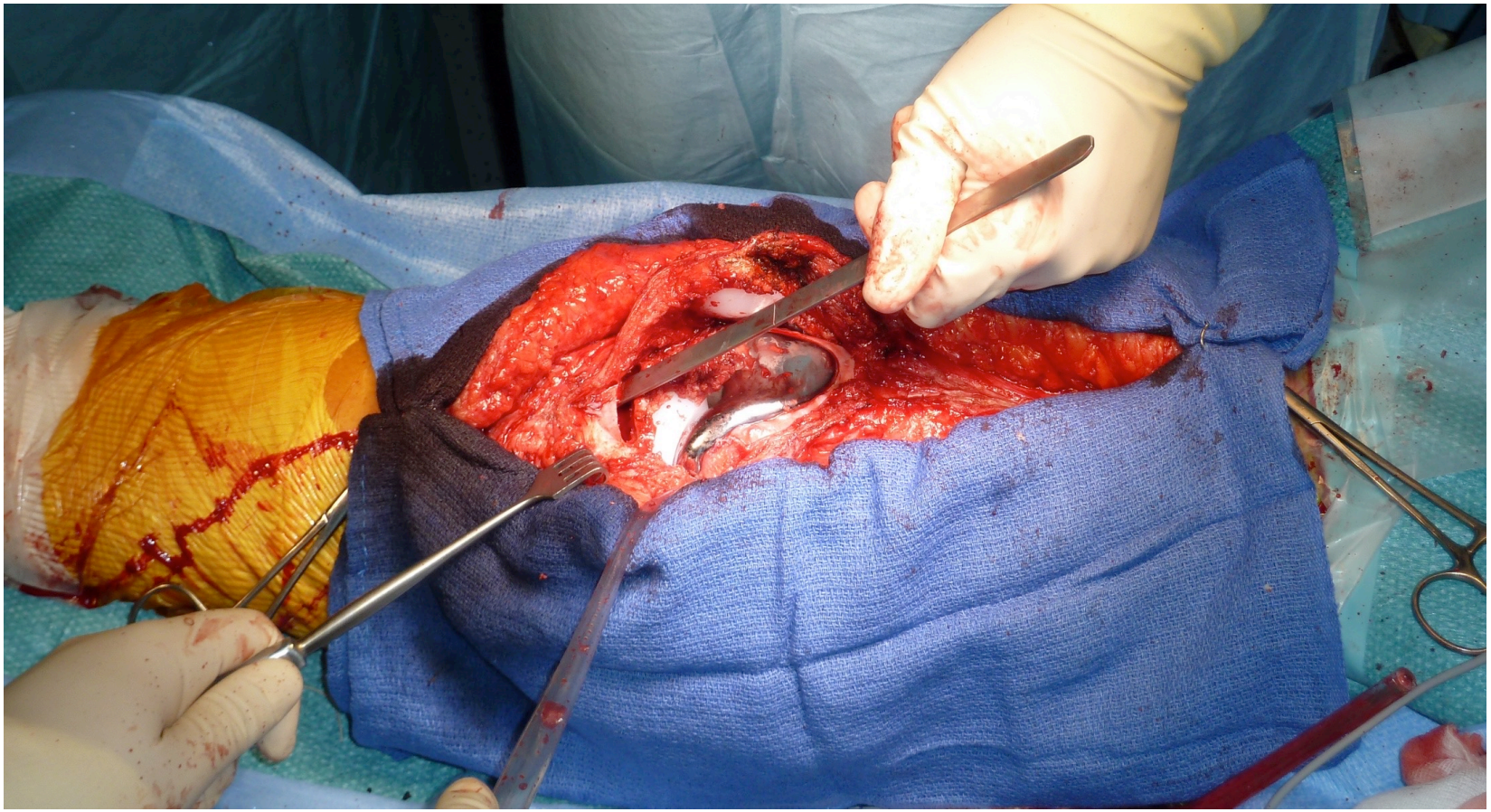
Courtesy S Lustig Lyon

Polypropylène plate 30cmx30cm

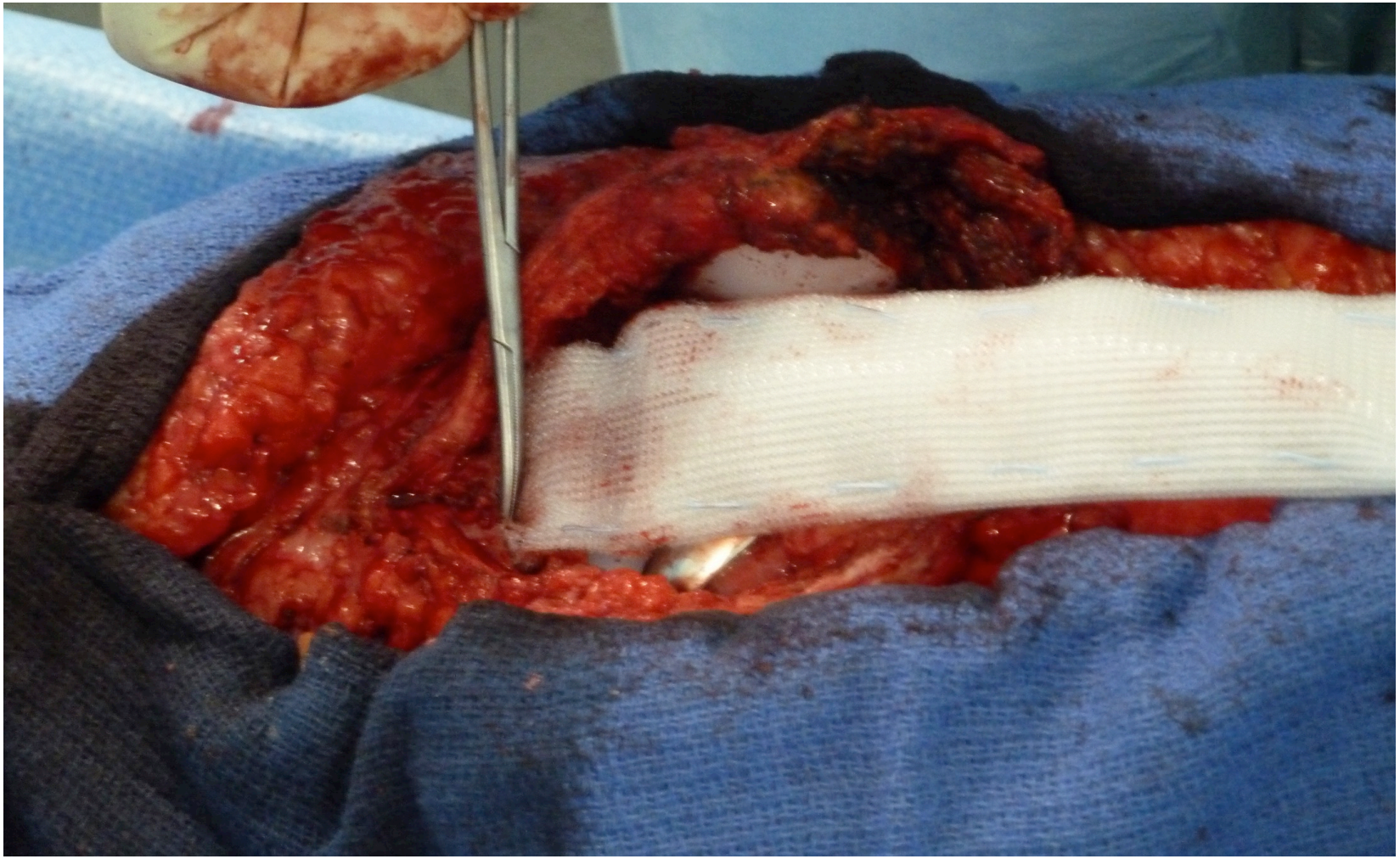
Non resorbable suture (Fiberwire® Arthrex)



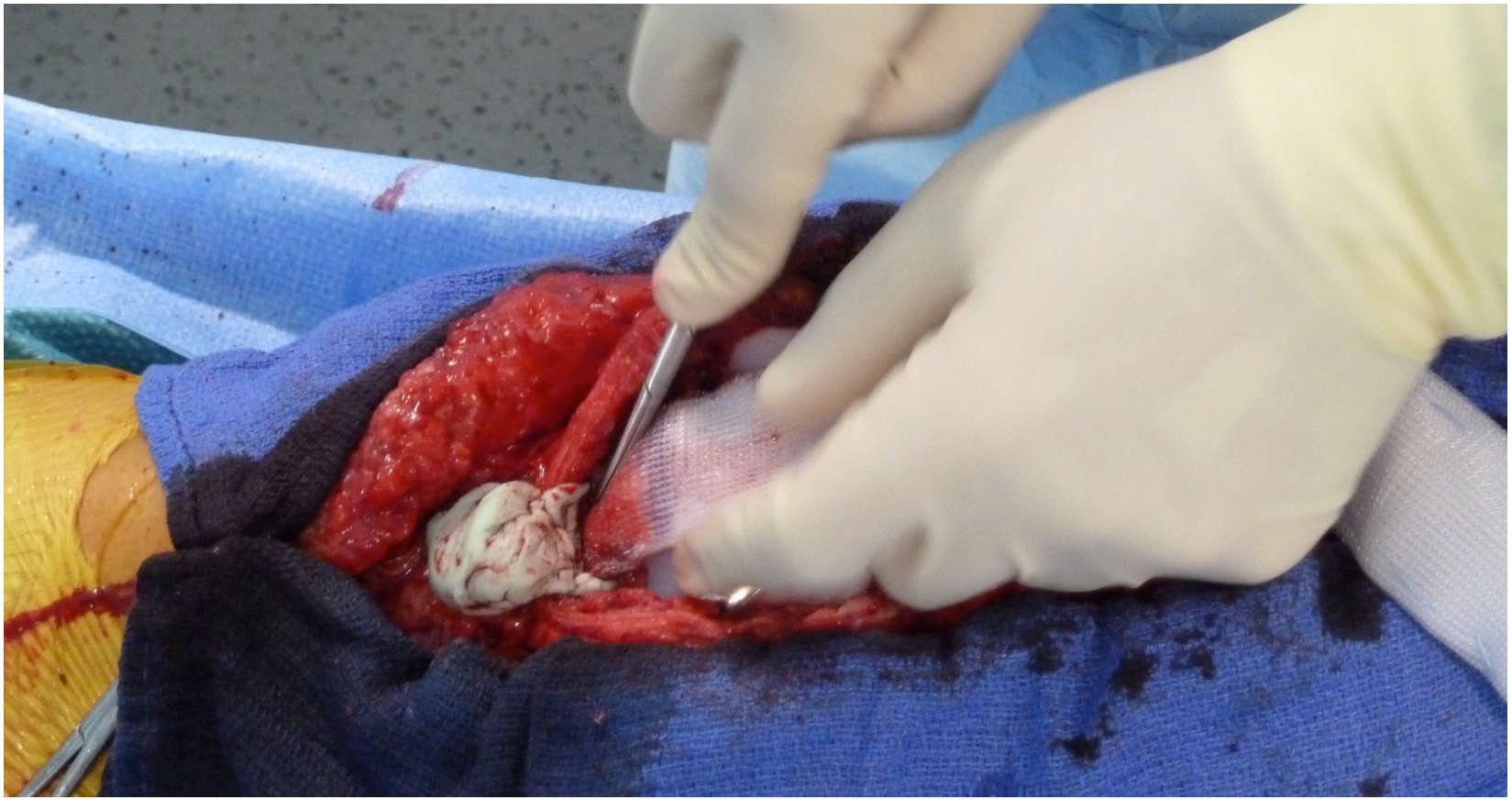
2- Ant^{re} groove on the tibia



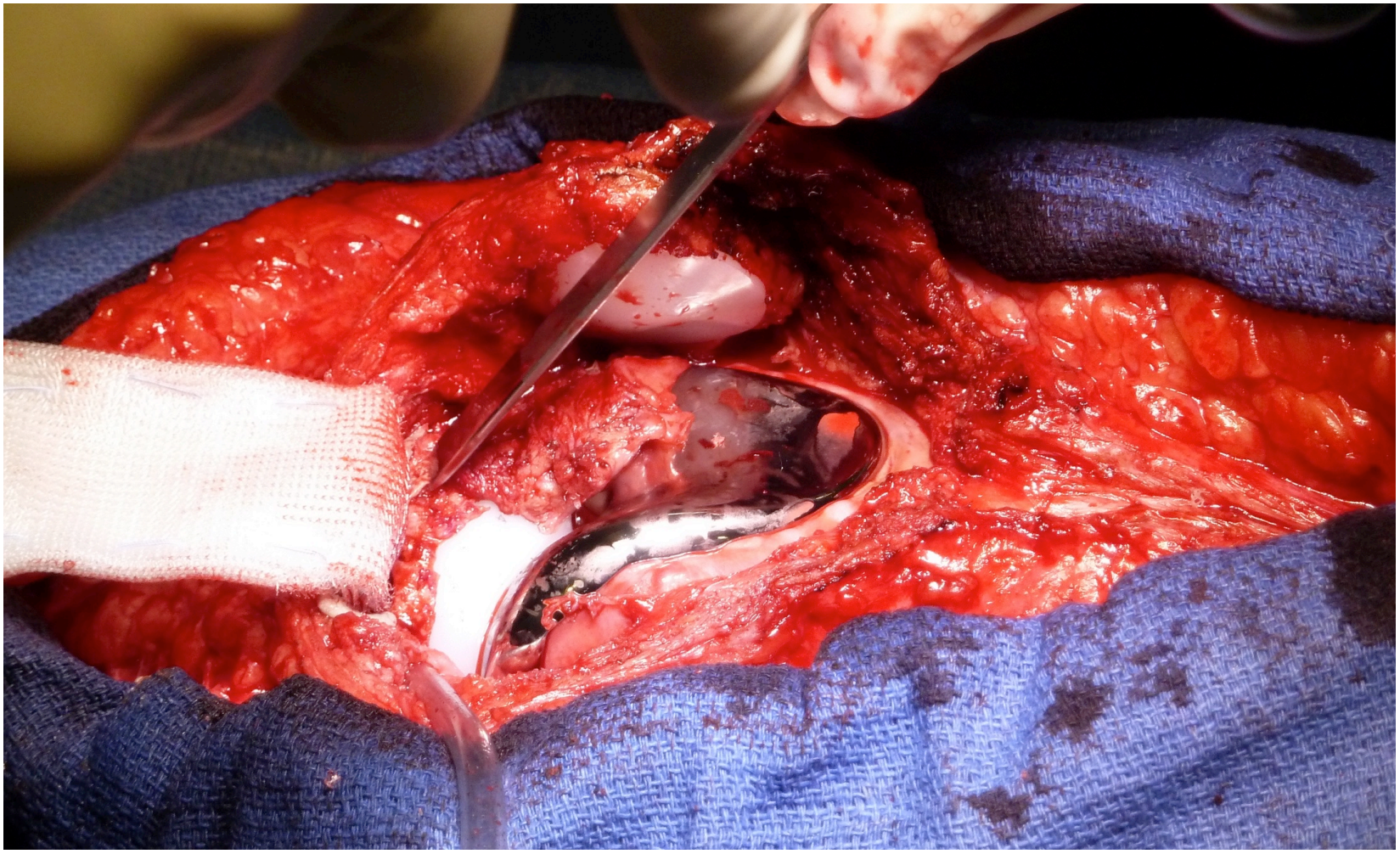
3- Insertion of the plate



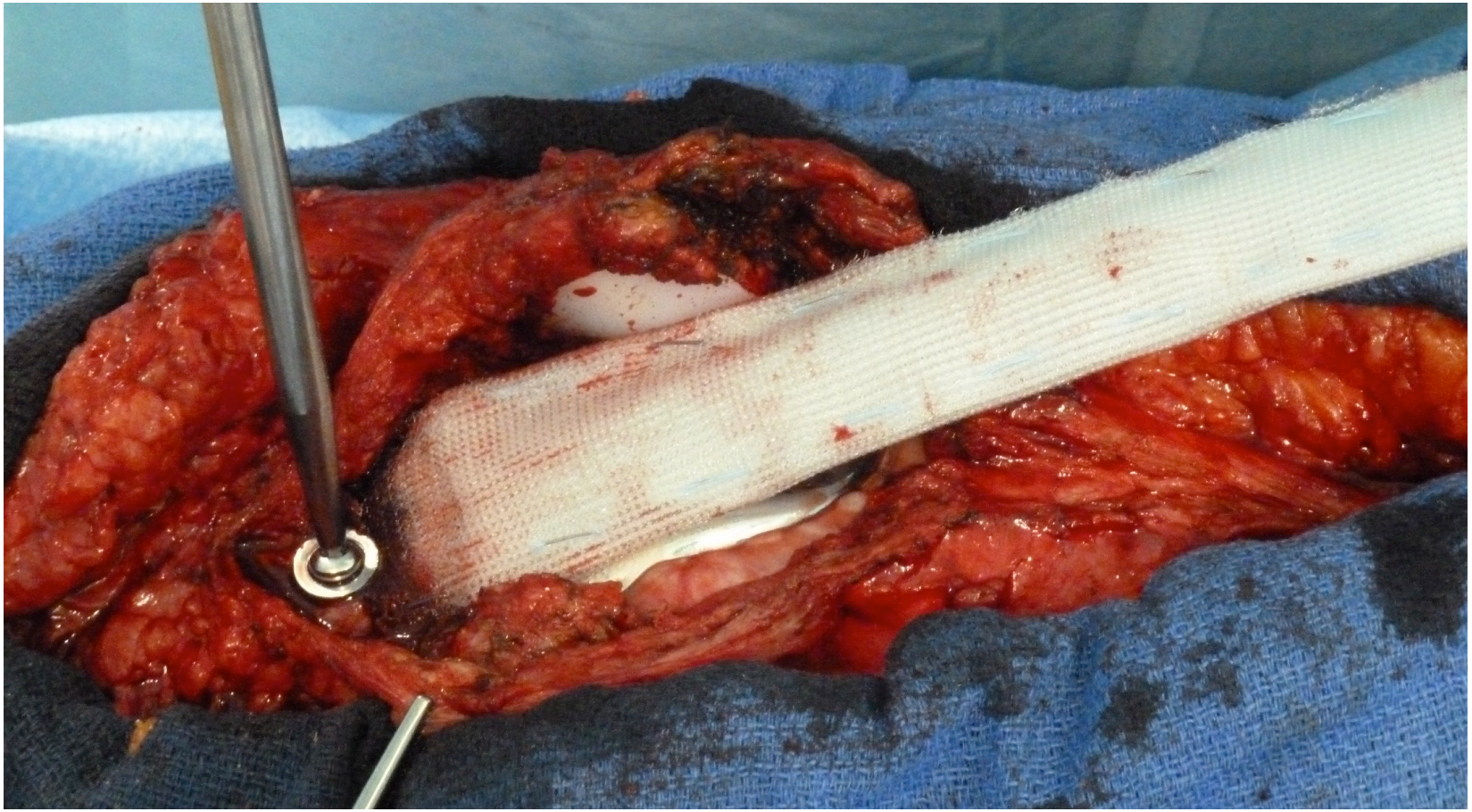
4- Fixation with cement



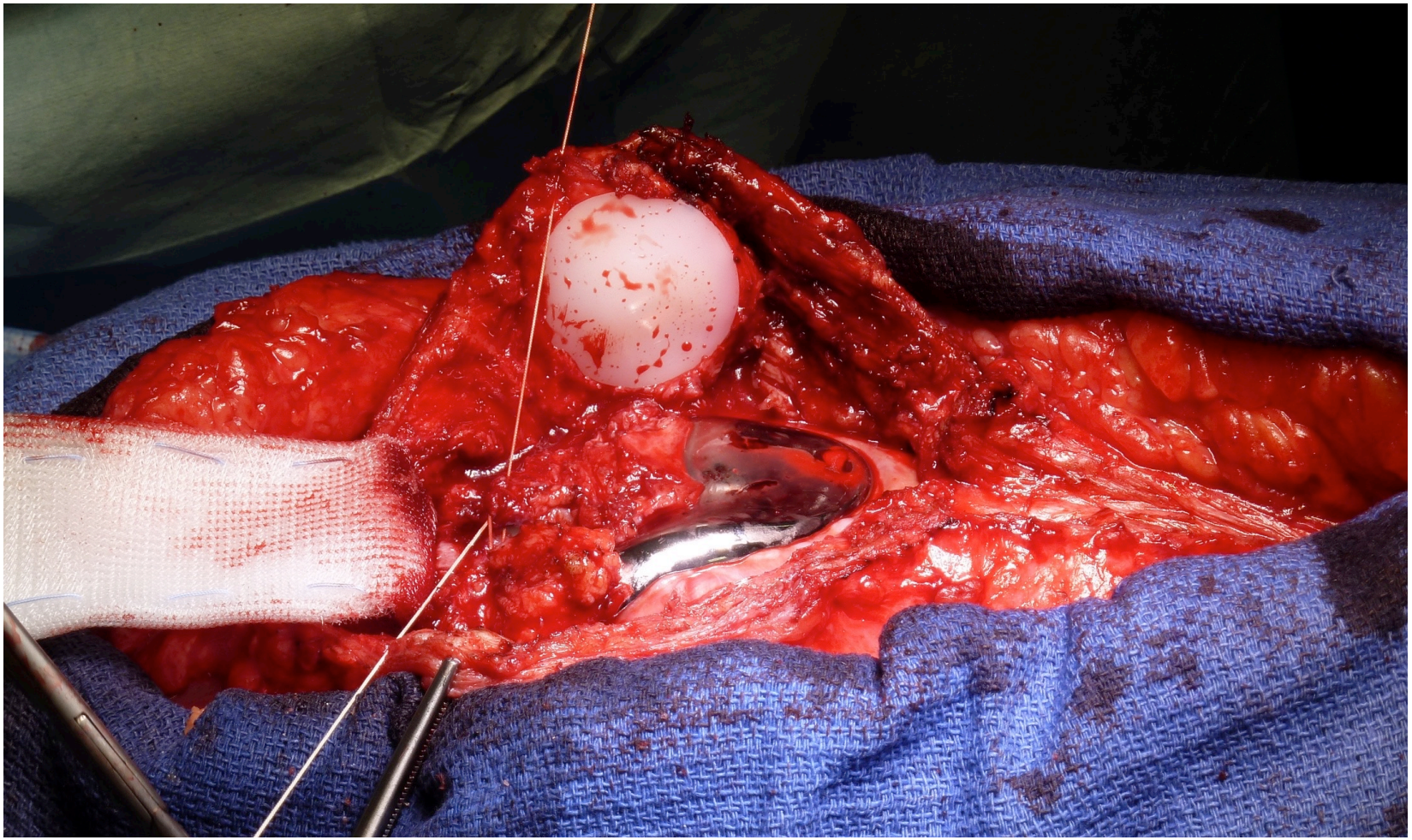
5- Check impingements



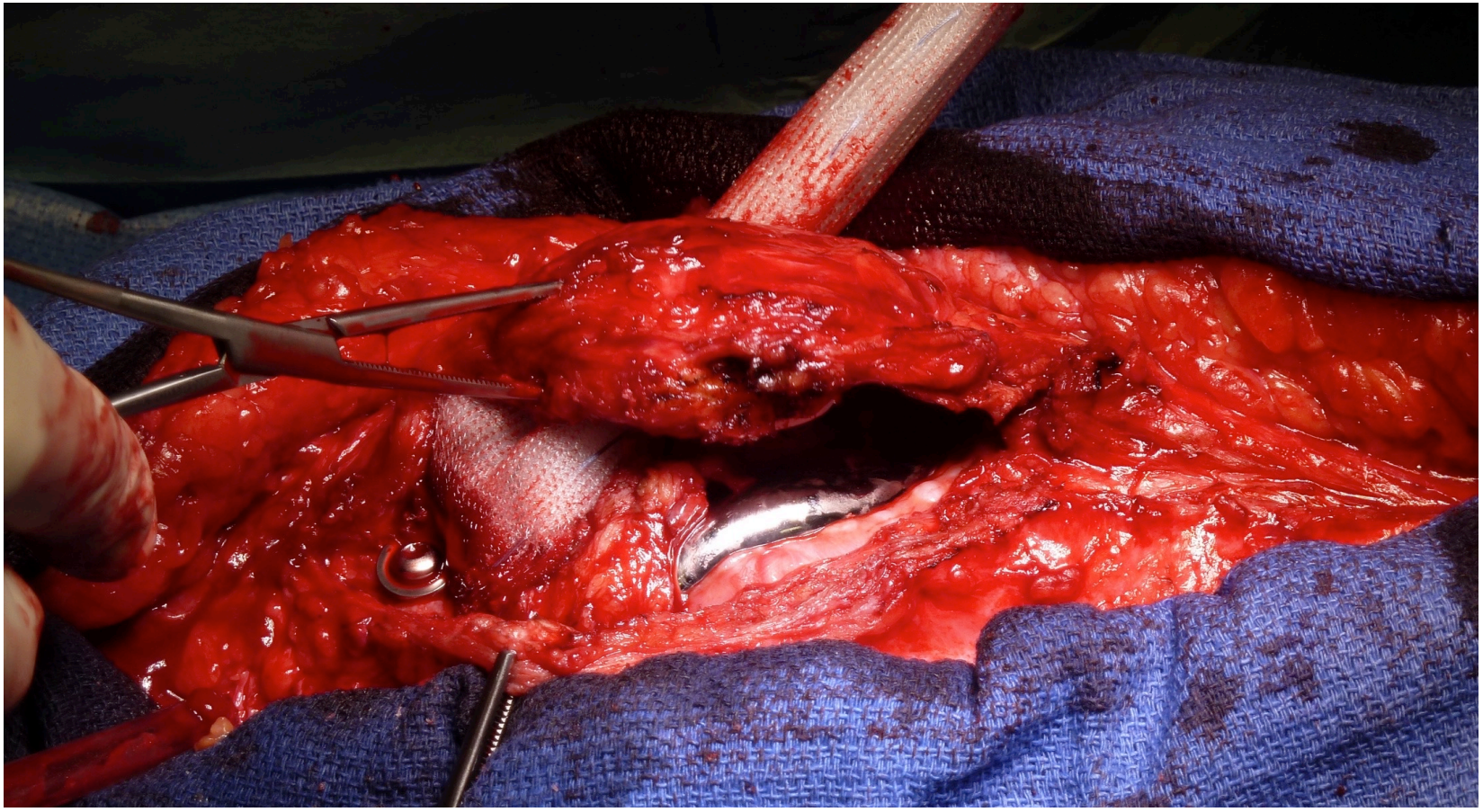
6- Screw



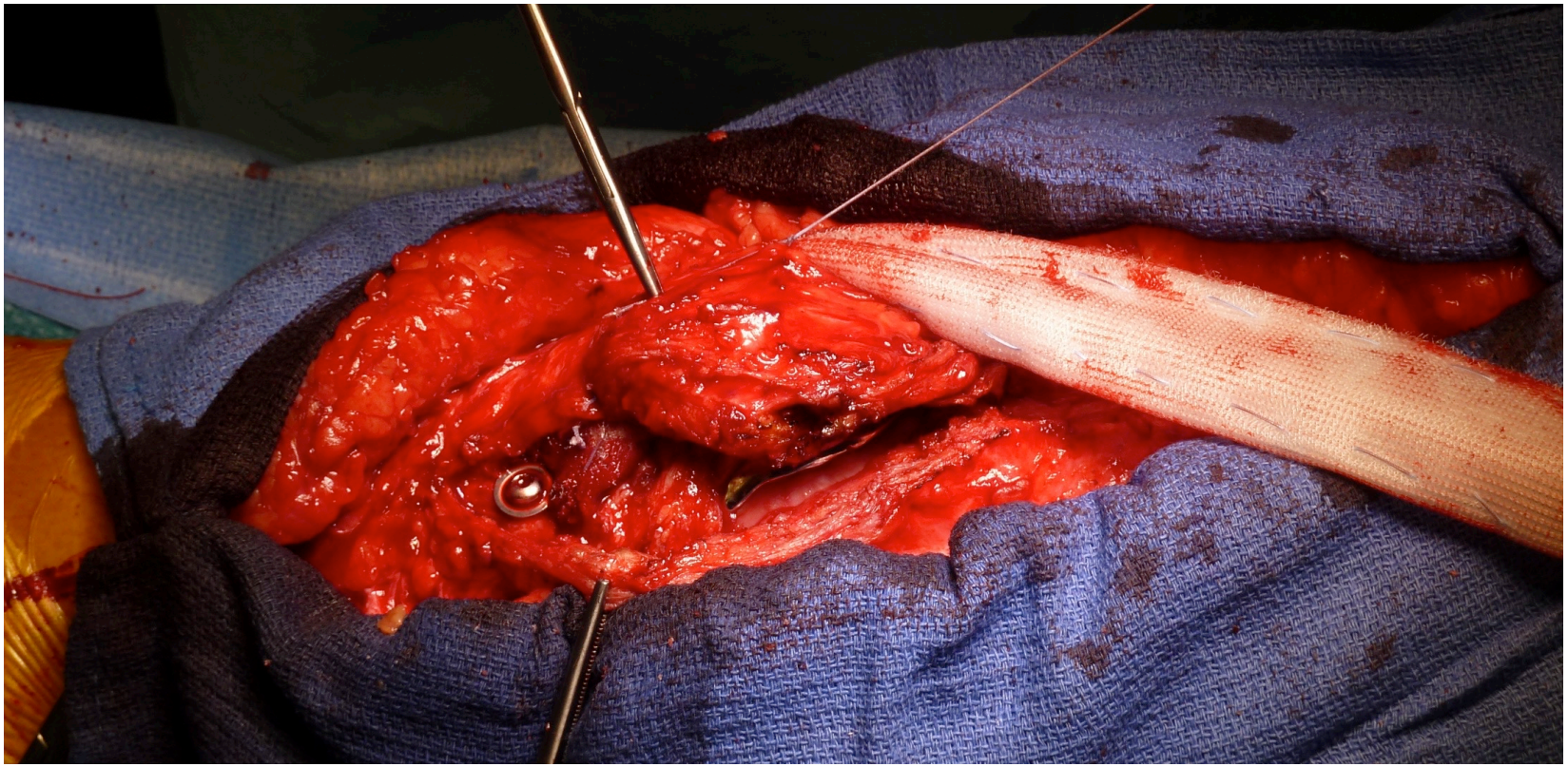
7- Protective tissues between plate and PE



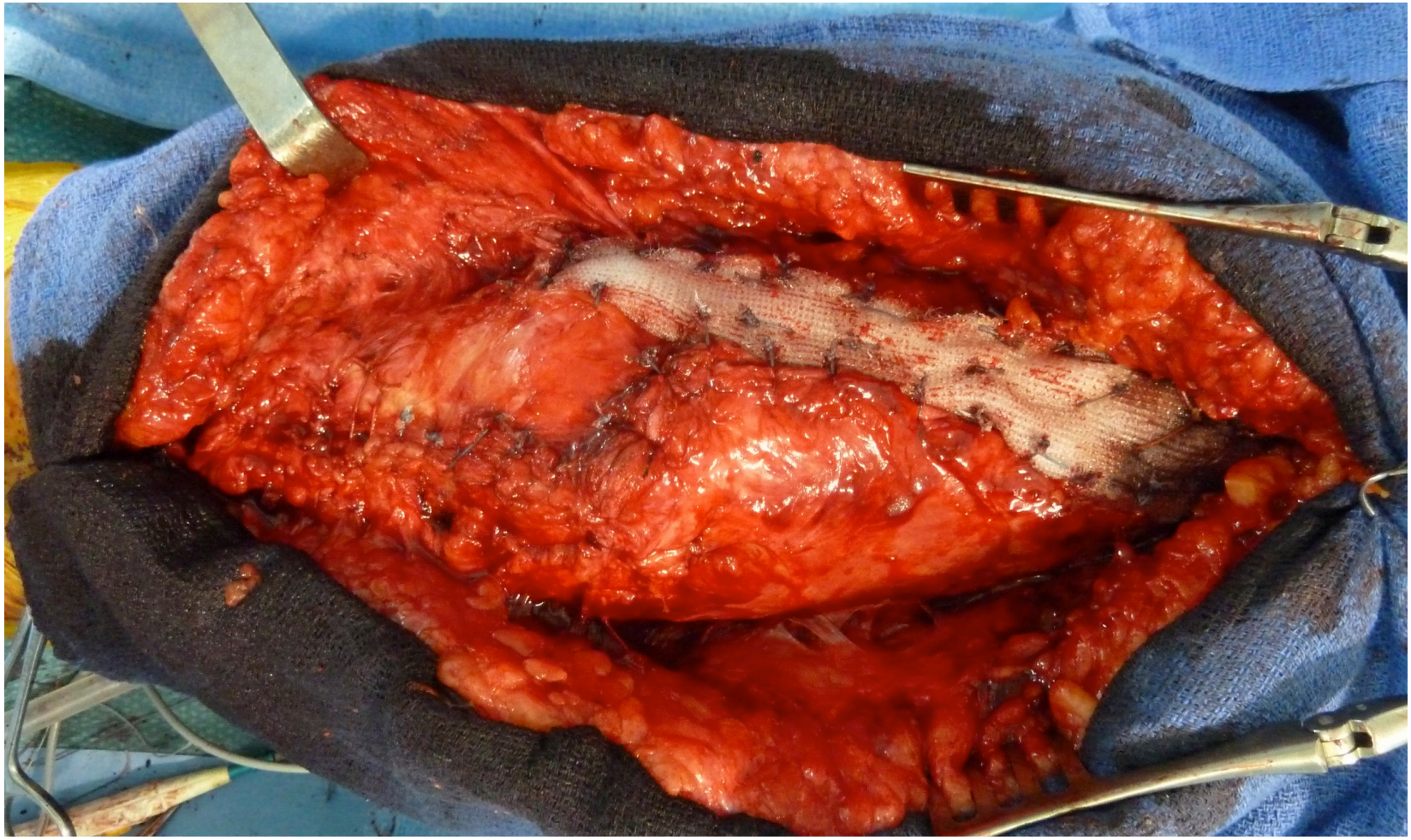
8- lateral arthrotomy



9- Suture on patellar tendon in extension



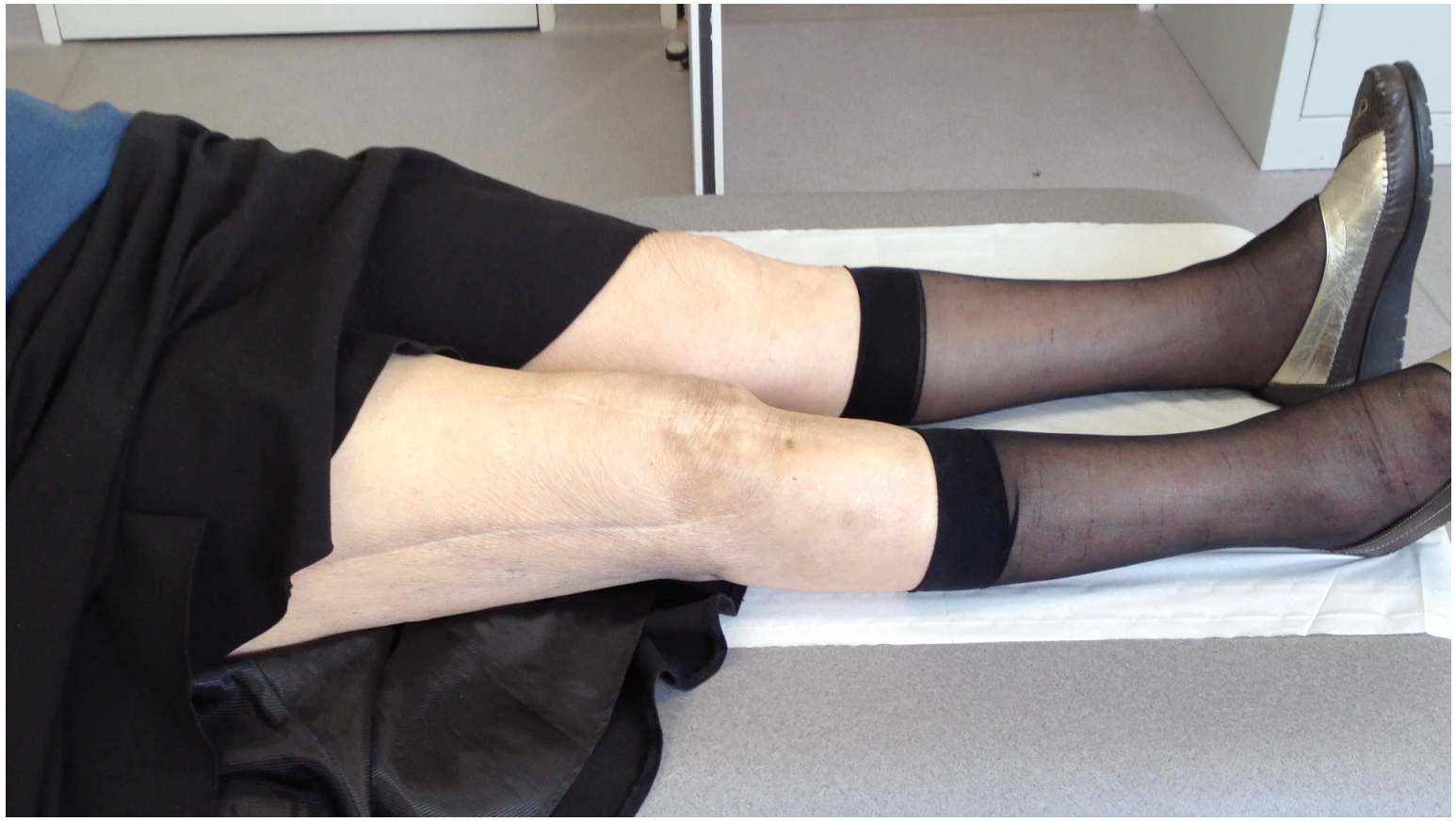
10- Suture on Quad. tendon



Post op

- Full weight-bearing
- Cruro-malleolar cast in extension
- No flexion during two months
- 0°/60° during 45 days (2m à 3m½)
- 0/90 another 45 jours (3m½ à 5 m)

One year postop



Allograft in 10 points

Emerson *CORR 1990*

Improvement by Nazarian et Booth (1999)

1. Cryoconserved graft.

2. No patellar resurfacing.

3. Remove the native patella.

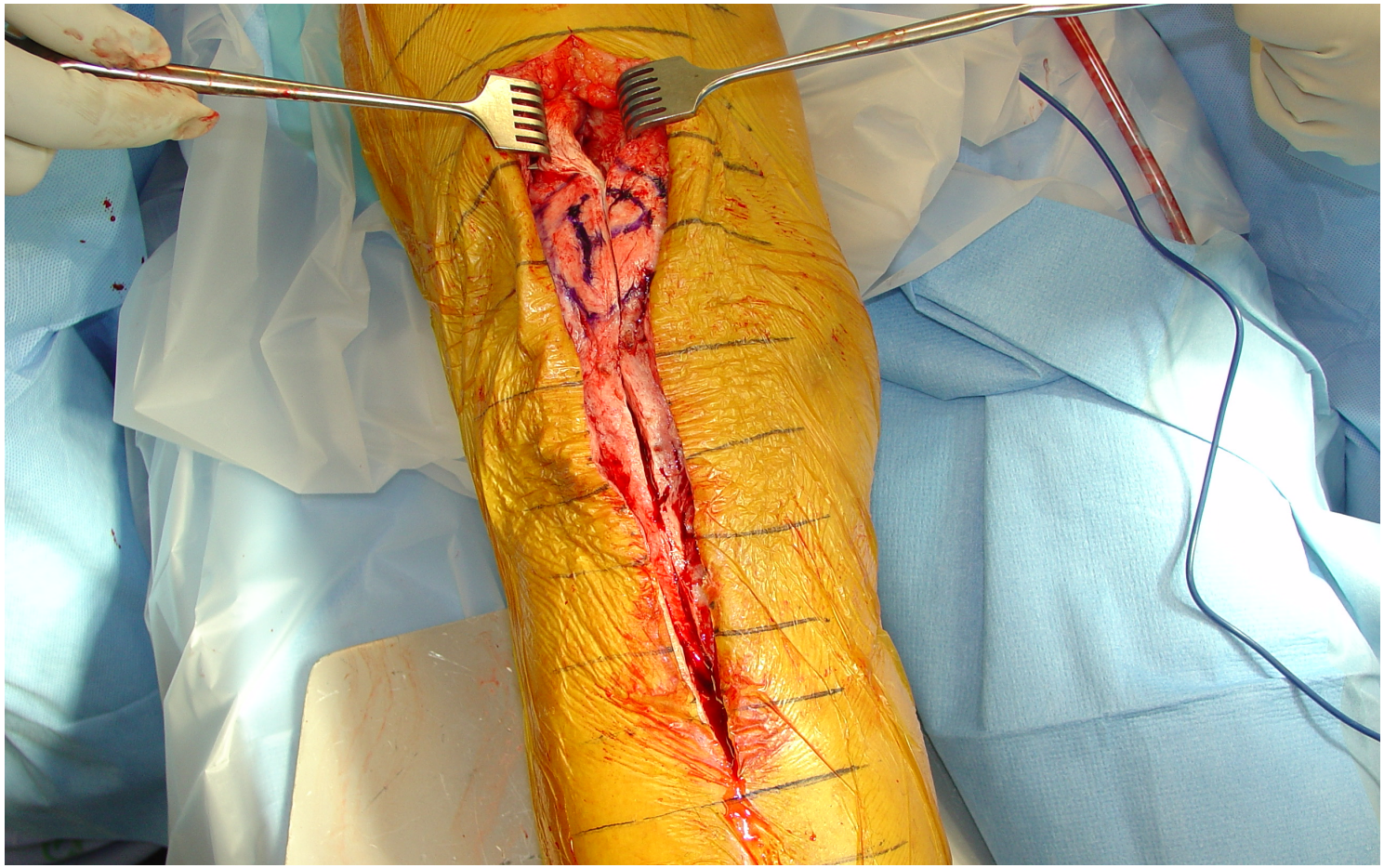
4. Max Tension knee in extension.

5. Suture native tissues above the graft.

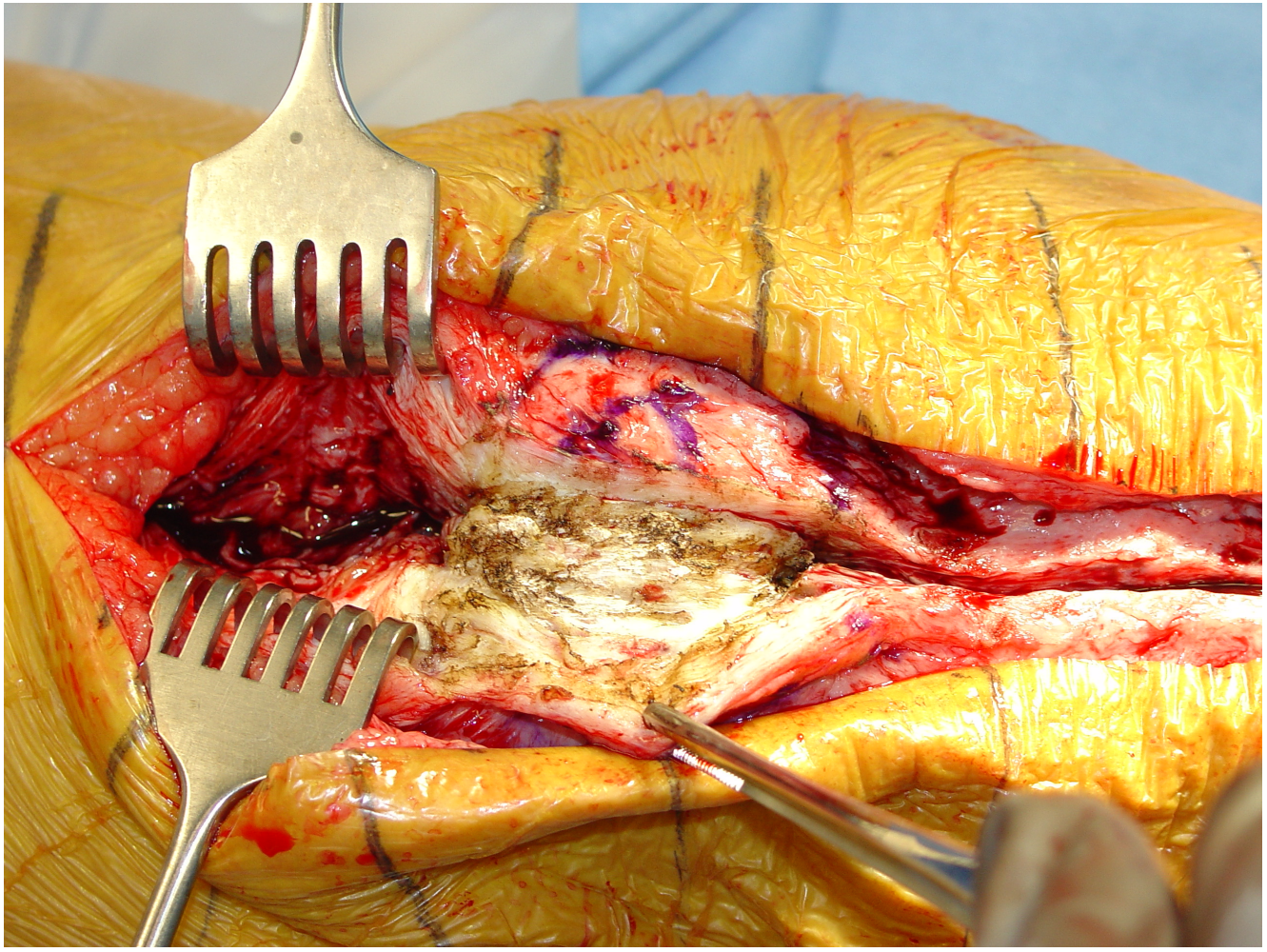
6. Cast 8 weeks in full extension

1- Preservation of native tissue

Courtesy Alexander Shah Chicago



2- Patellectomy



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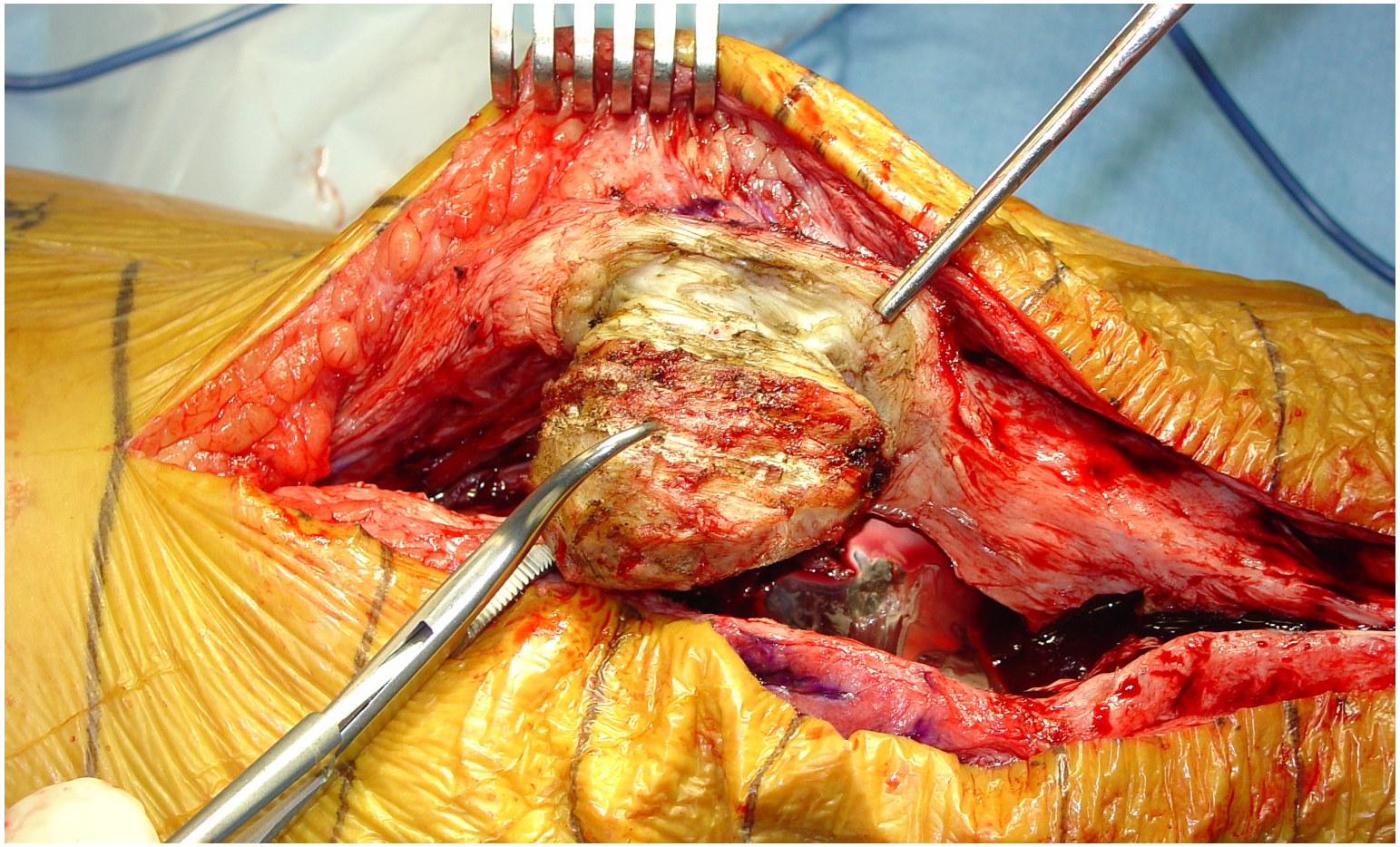
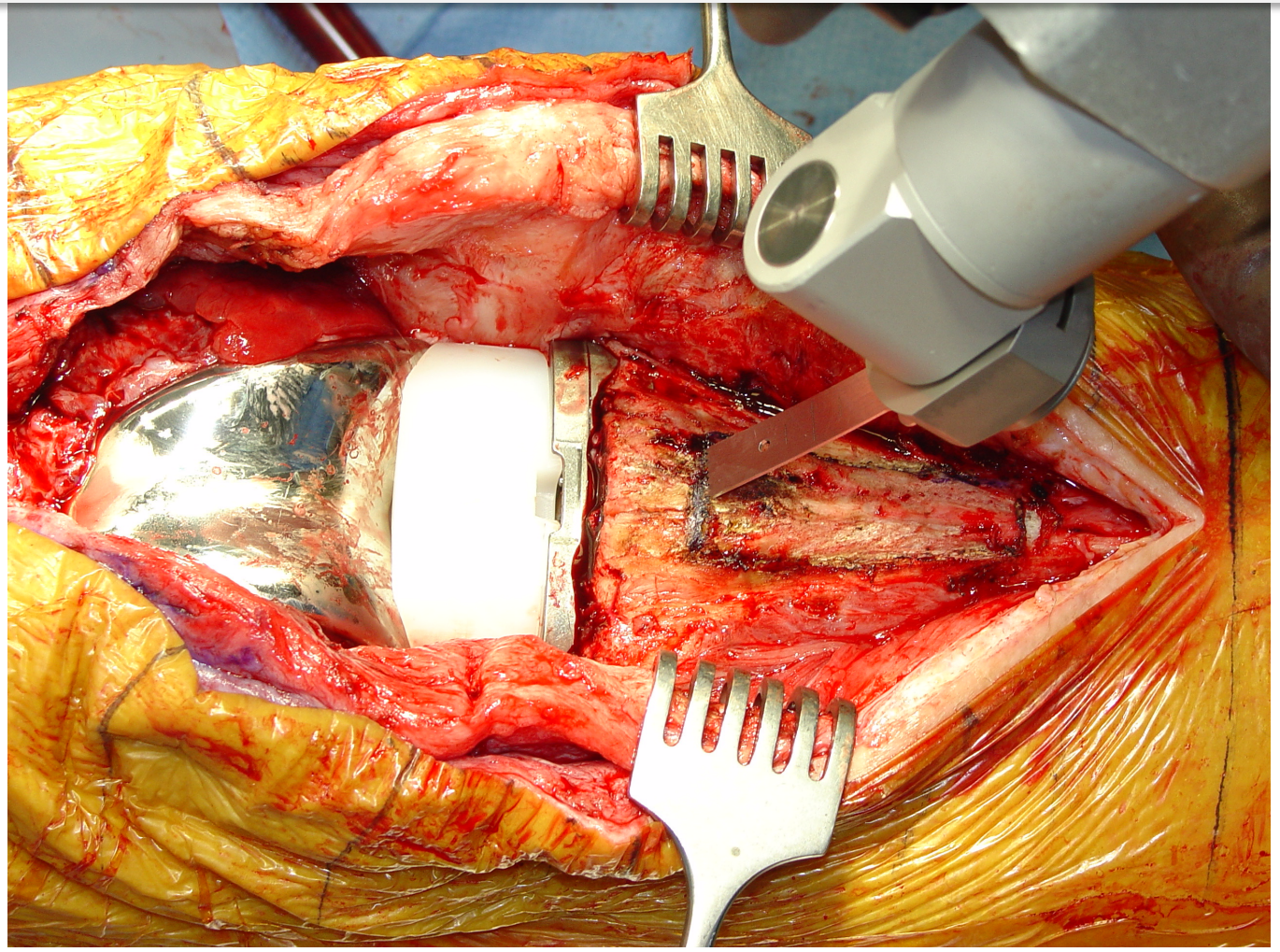
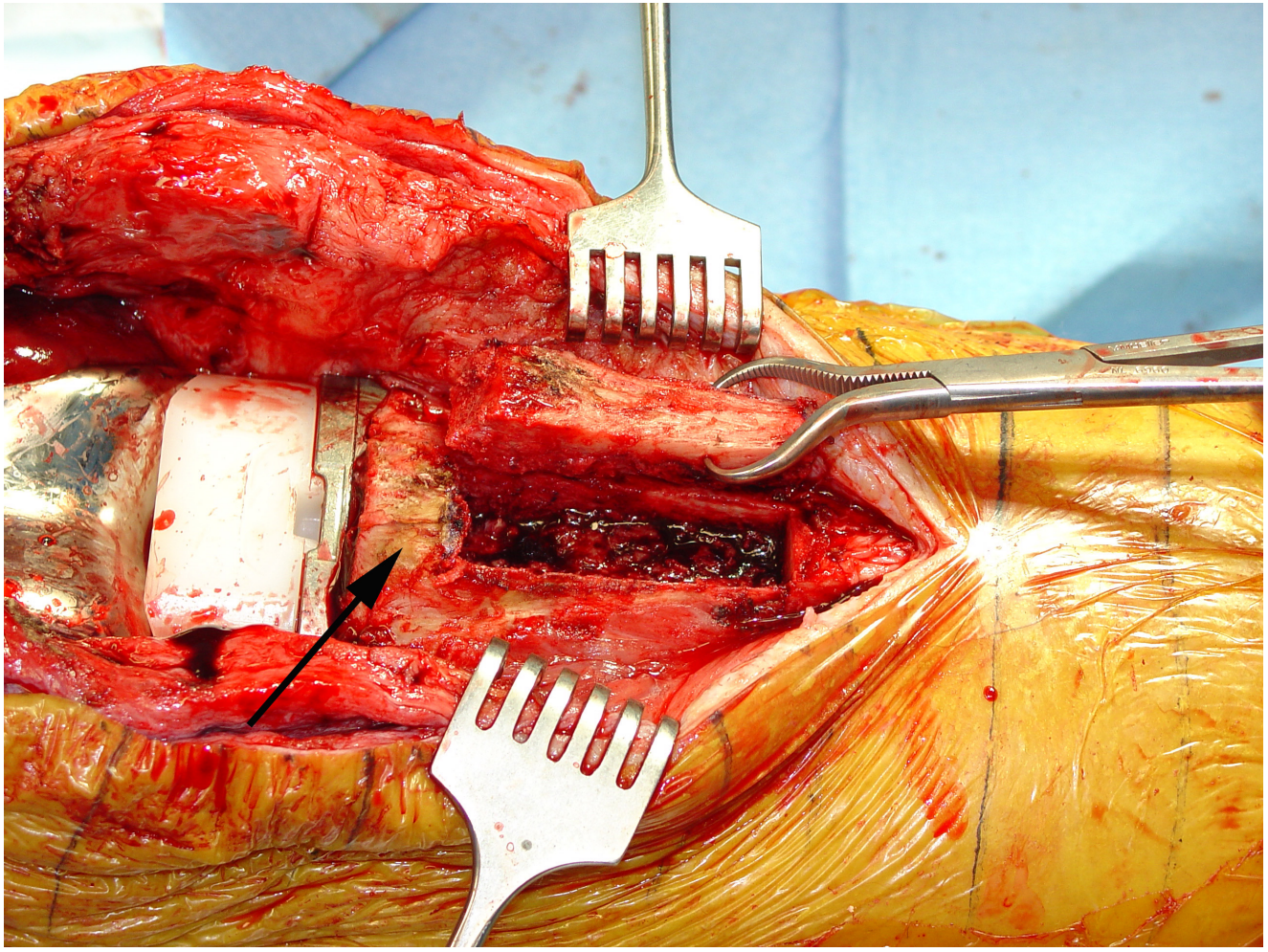


3- Preparation /calibration of the graft

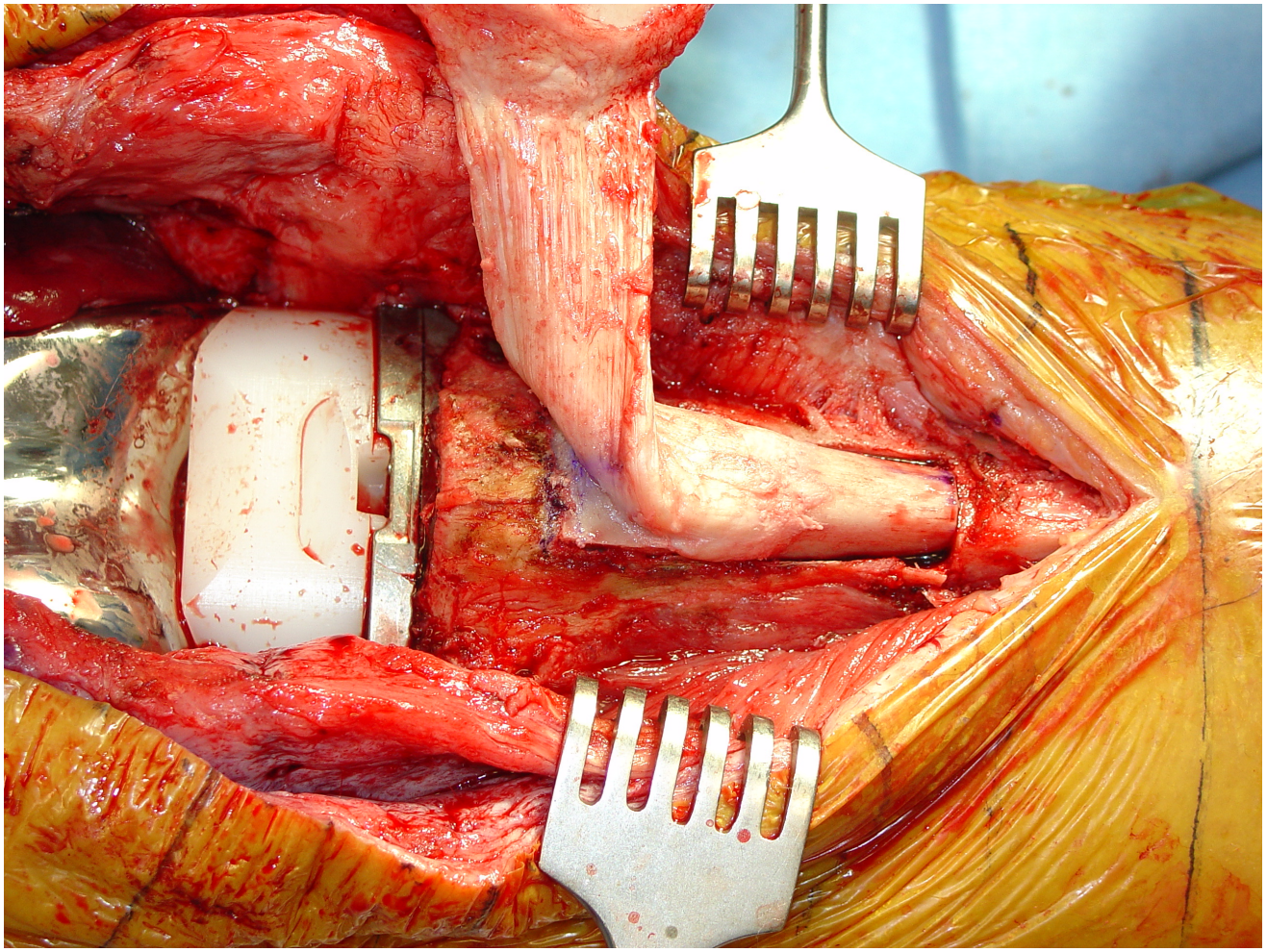
4- Groove at the ATT



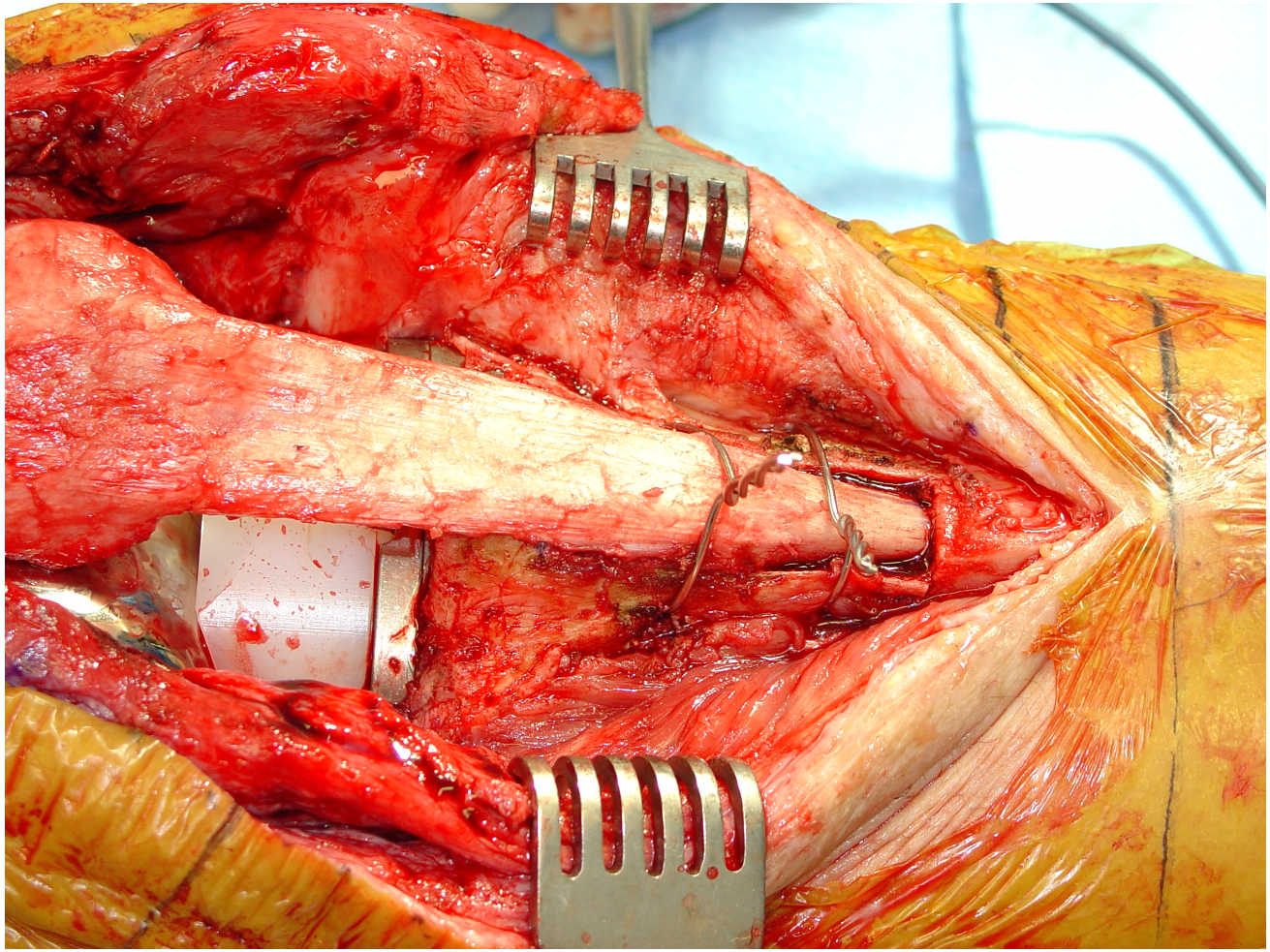
4- Groove at the ATT



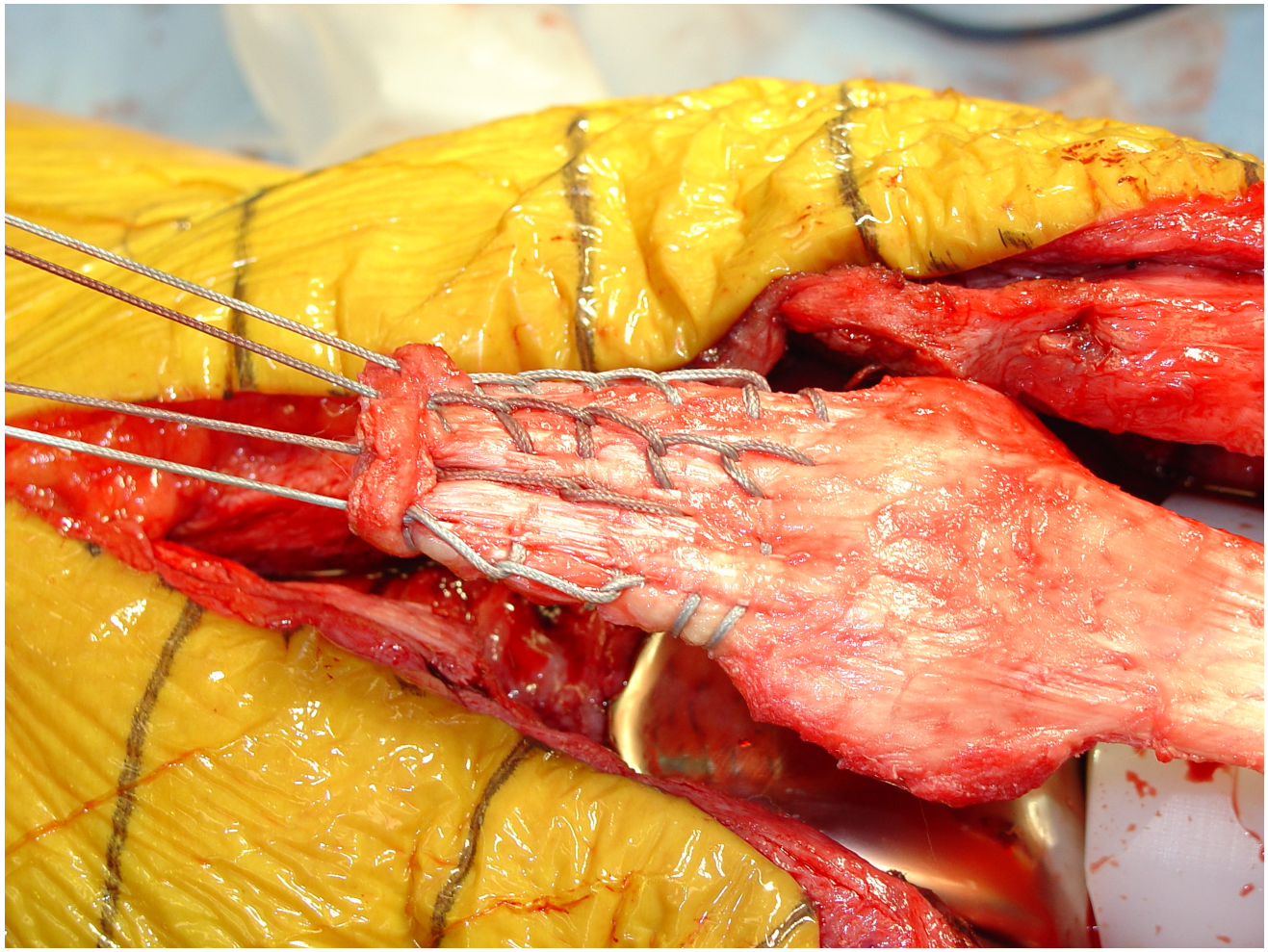
5- Plug the “allo-ATT” in the groove



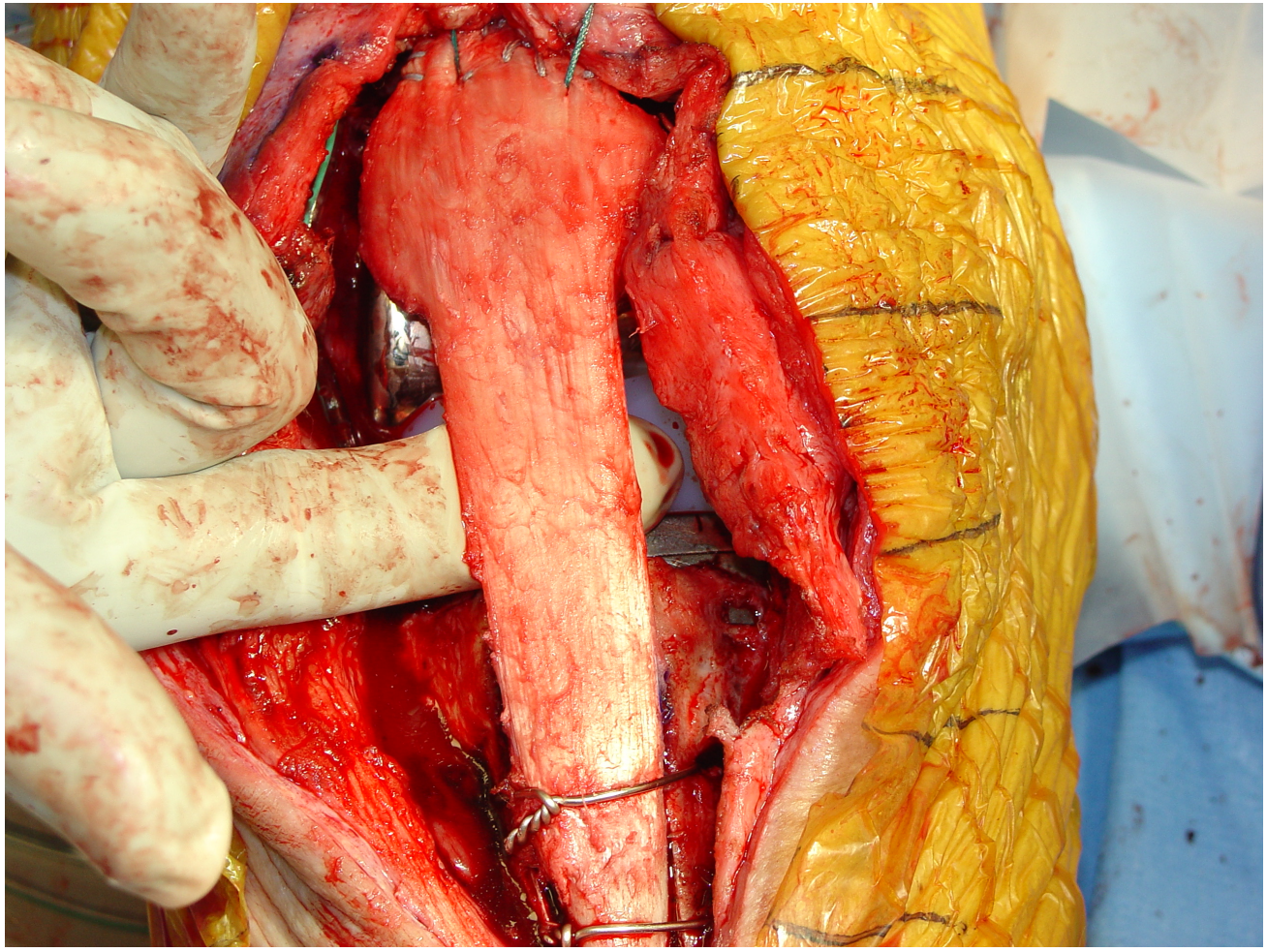
5- Fix the “allo-ATT” in the groove



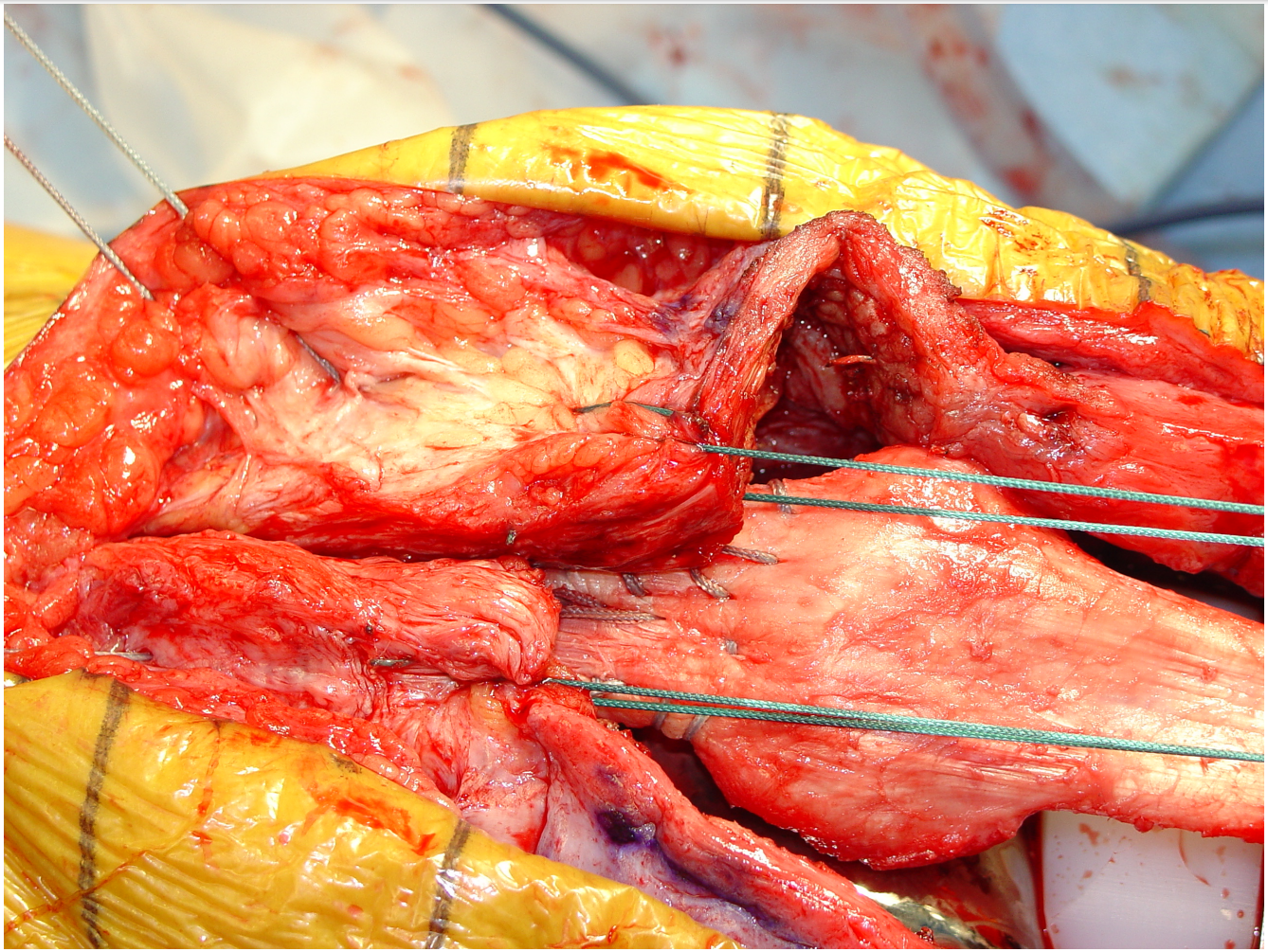
6- Suture the Quad Tendon



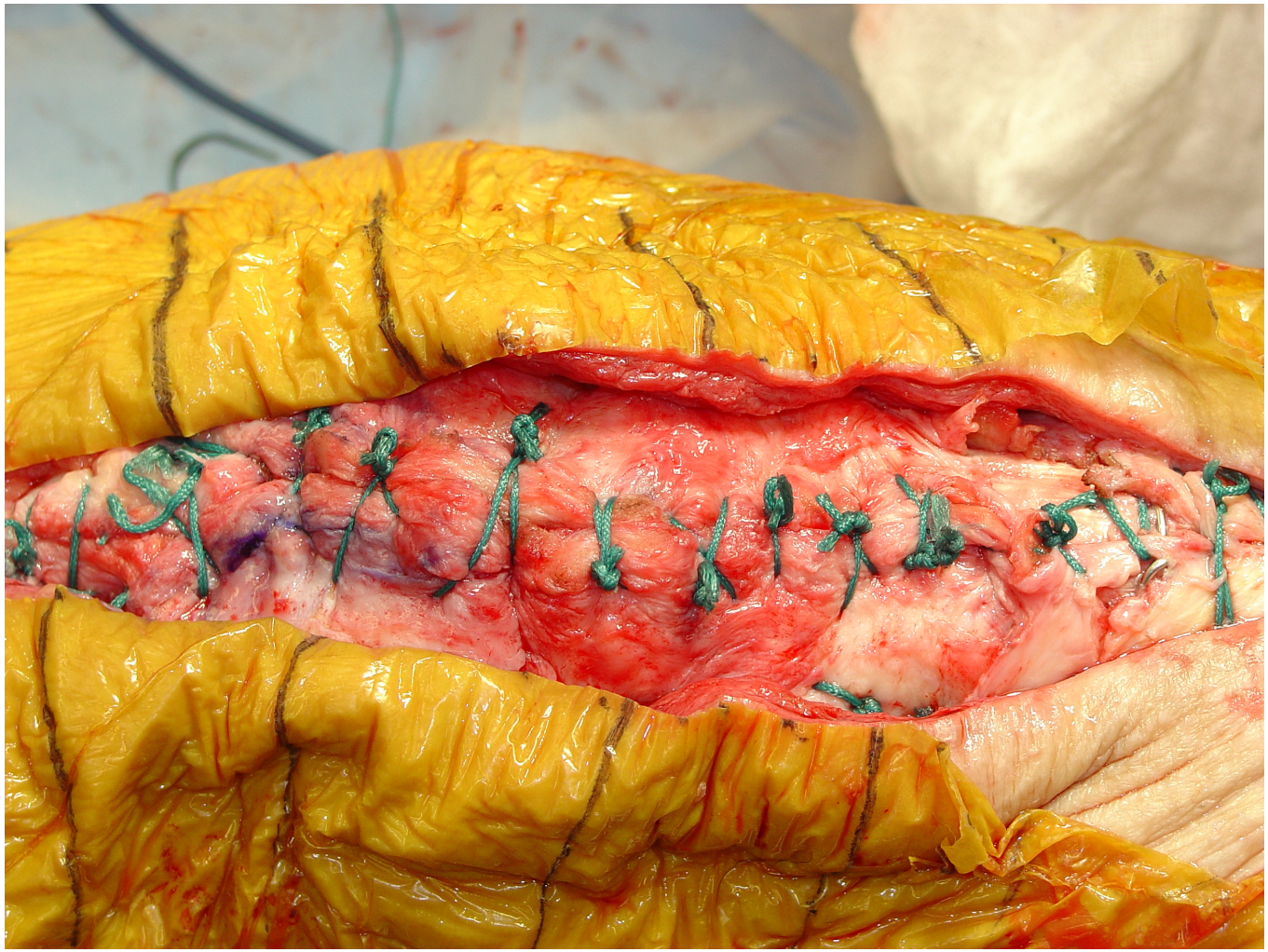
7- Adjust tension (in extension)



8- Cover with native tissues (in extension)



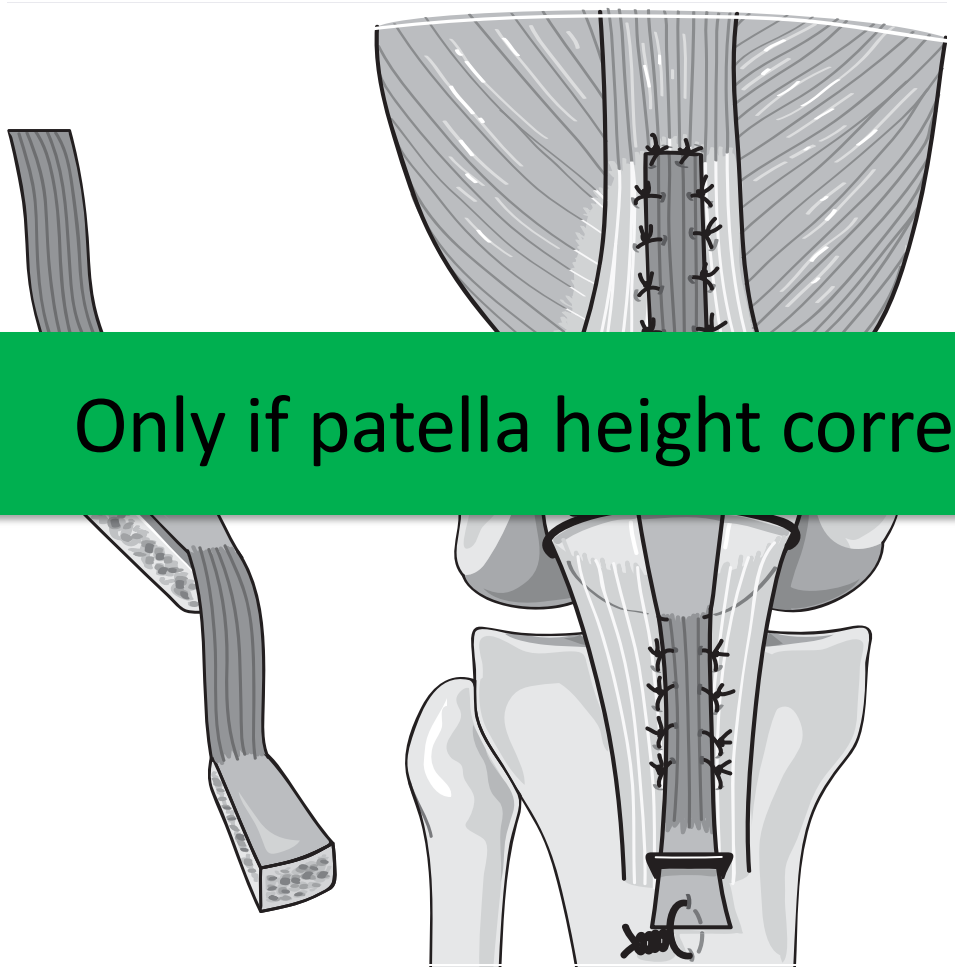
9- Definitive suture (in extension)



10- Contol correct tension

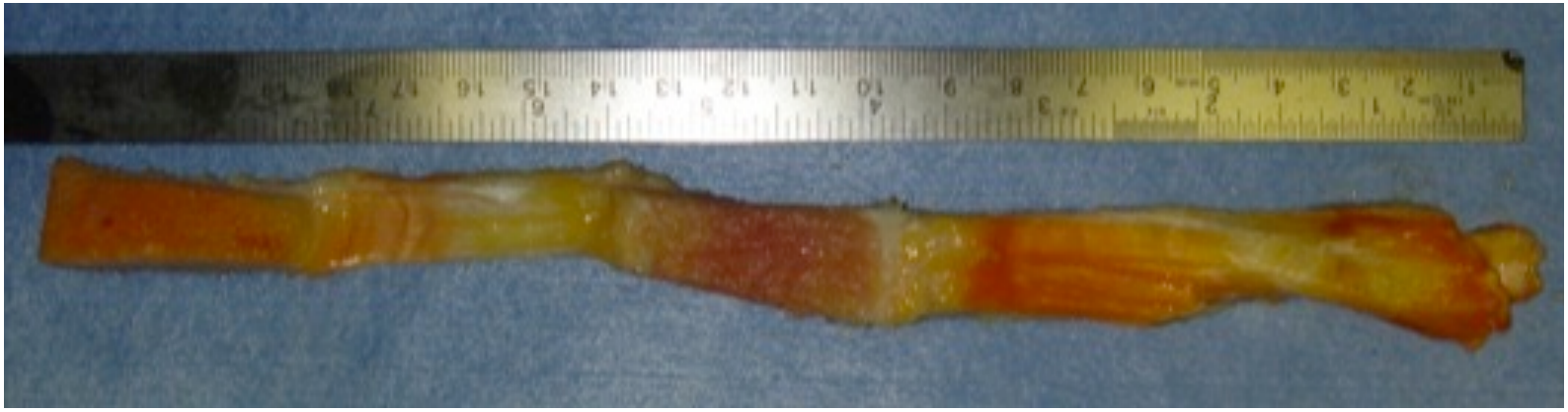
Partial allograft

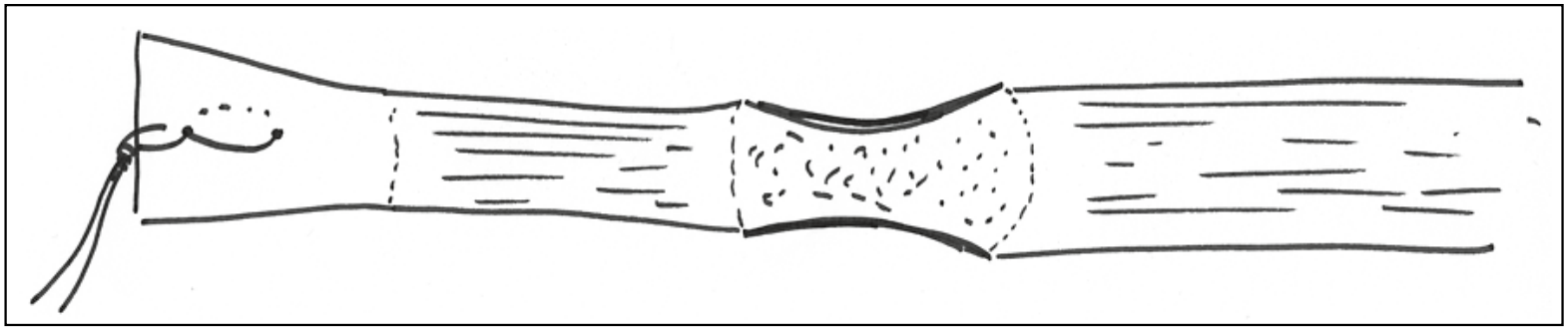
Conservation of native patella



Only if patella height correct

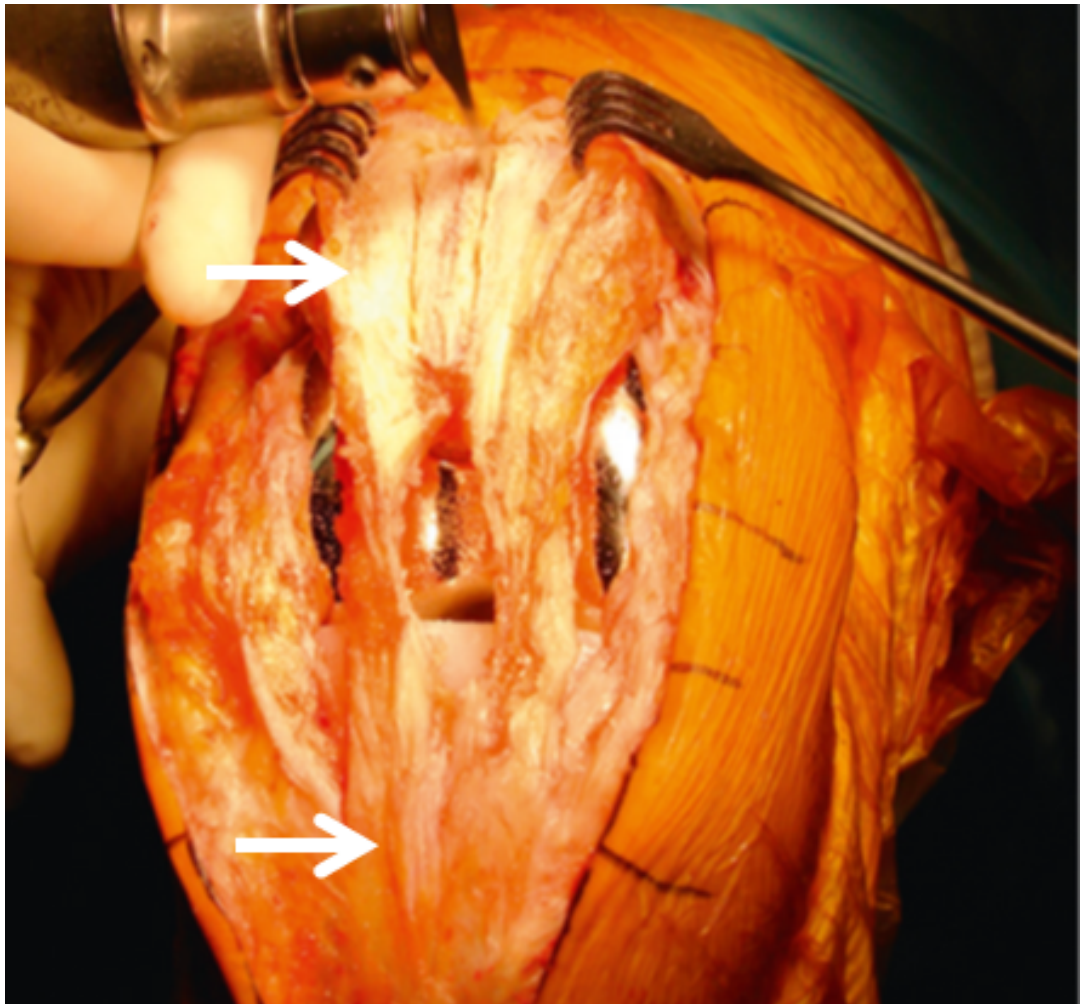
Calibration of the graft / defect



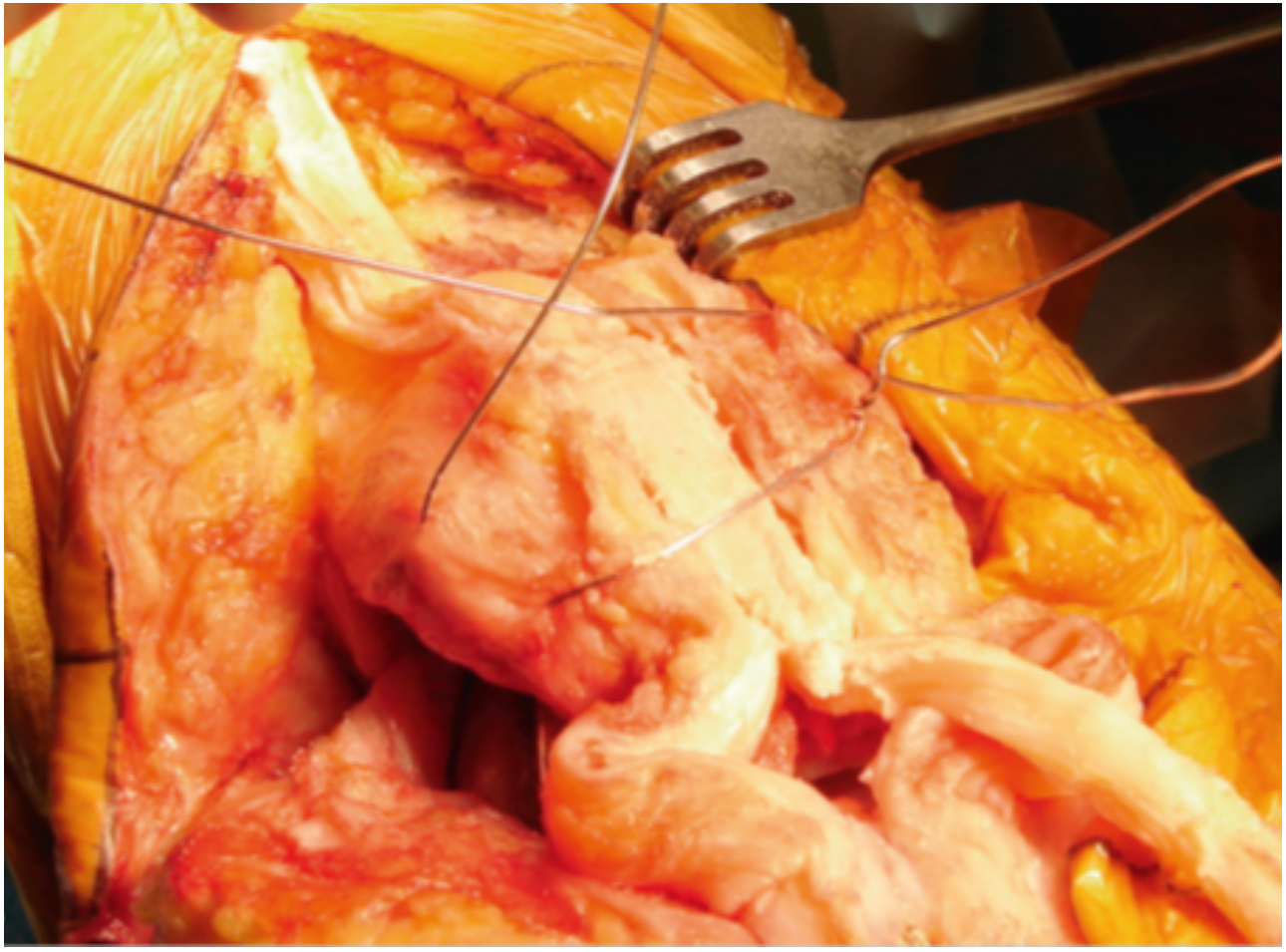


Patellar and tibial grooves

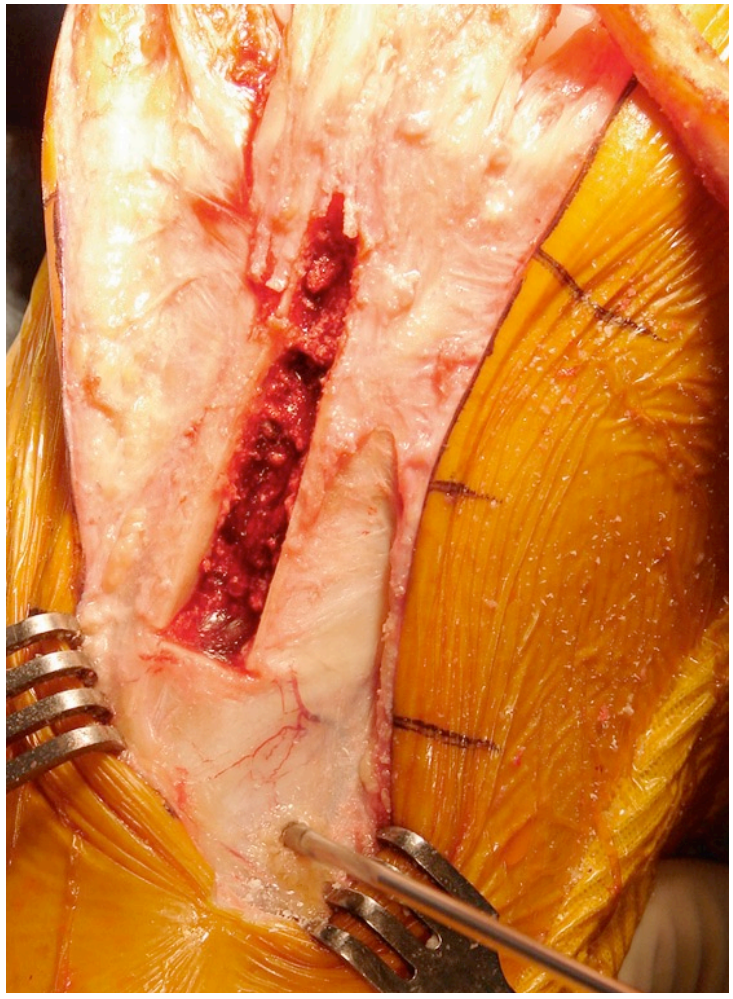
Courtesy P Neyret and S Lustig. Lyon

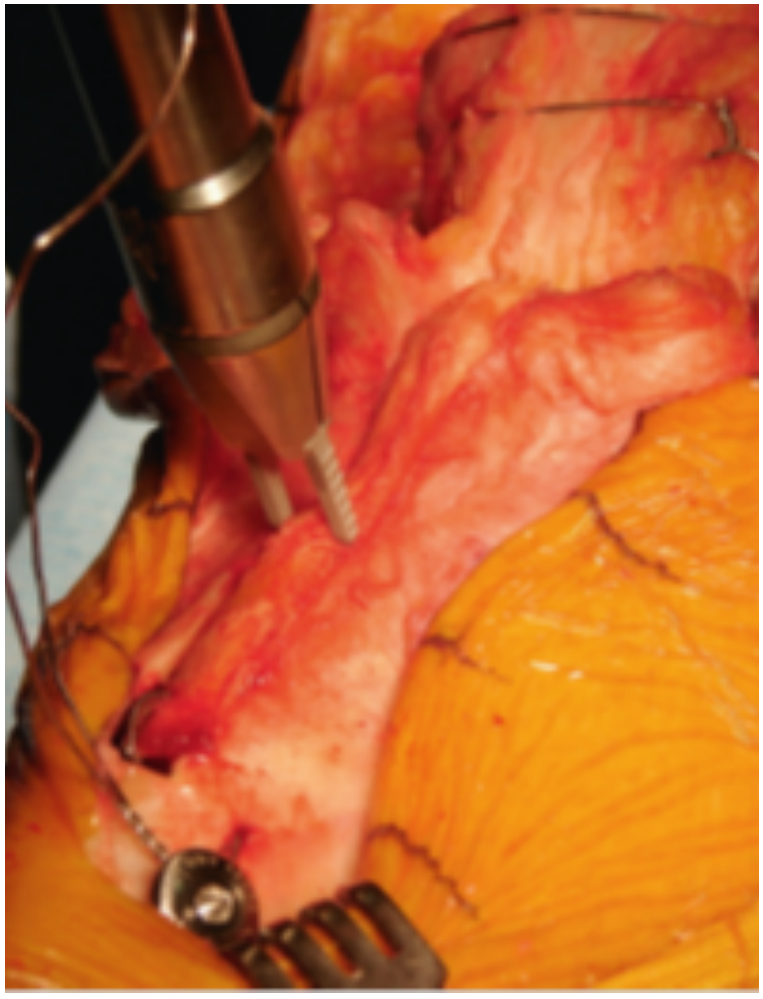


Patellar fixation

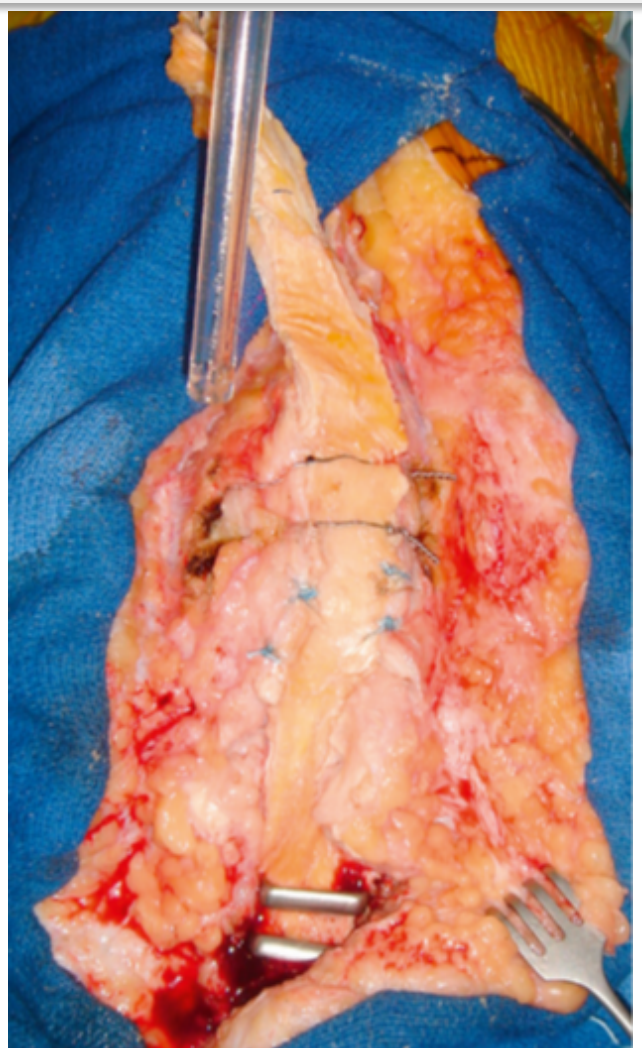


Tibial fixation





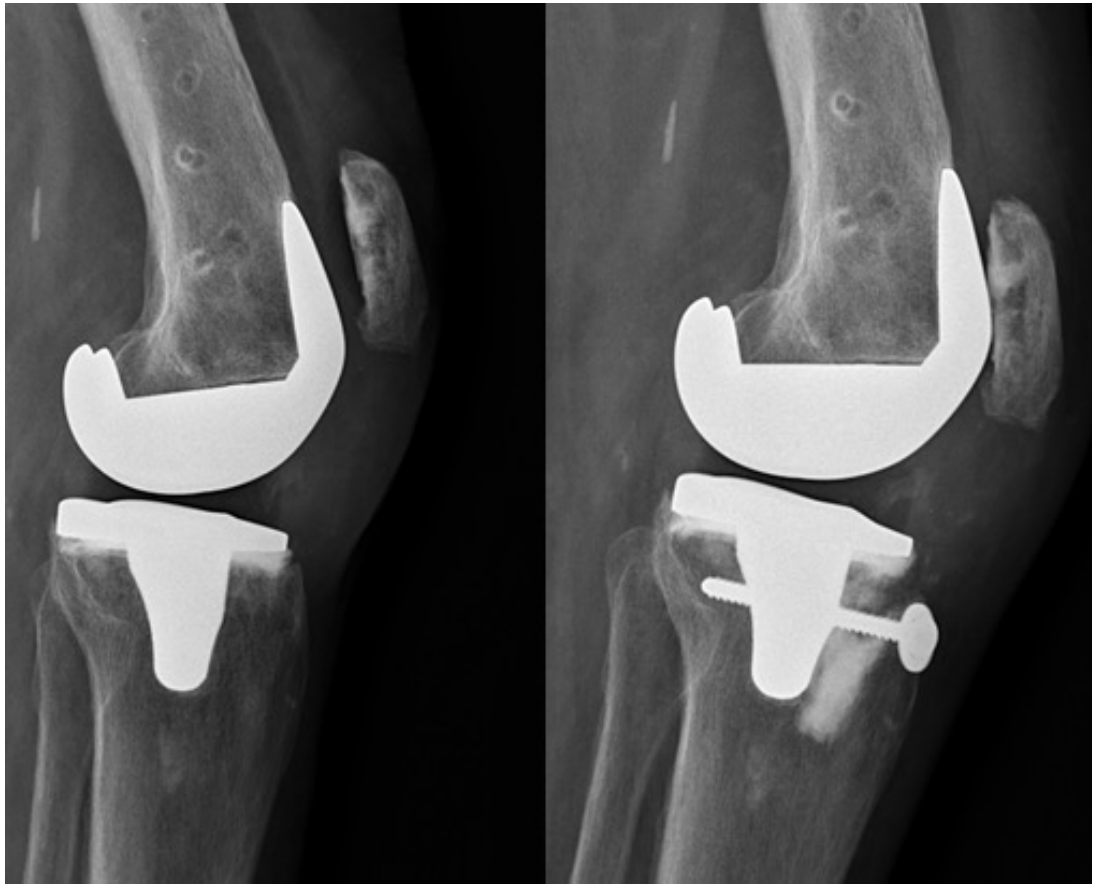
Proximal fixation



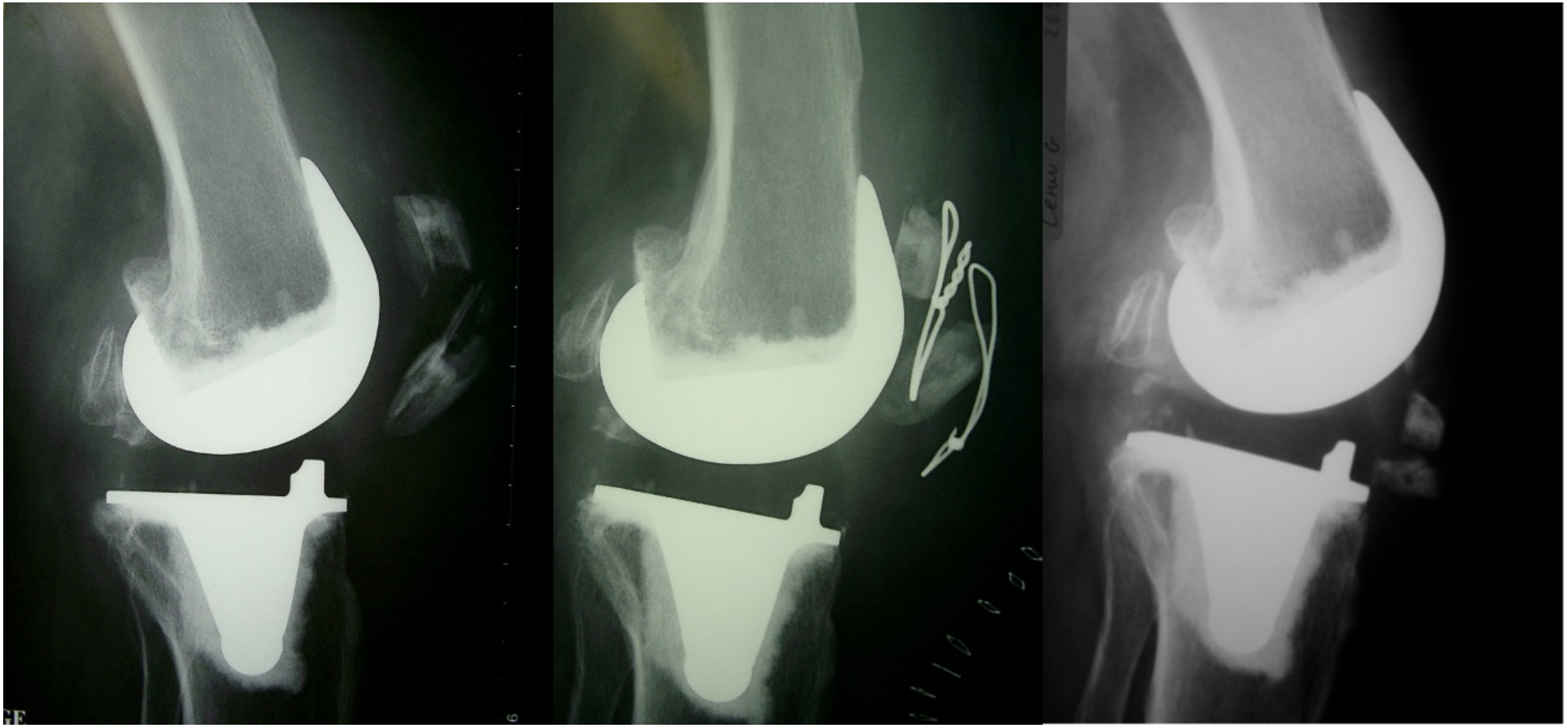
Strategy for chronic rupture

1- Patellar height and quality correct

- ✓Partial allograft partial
- ✓Full allograft
- ✓Hanssen

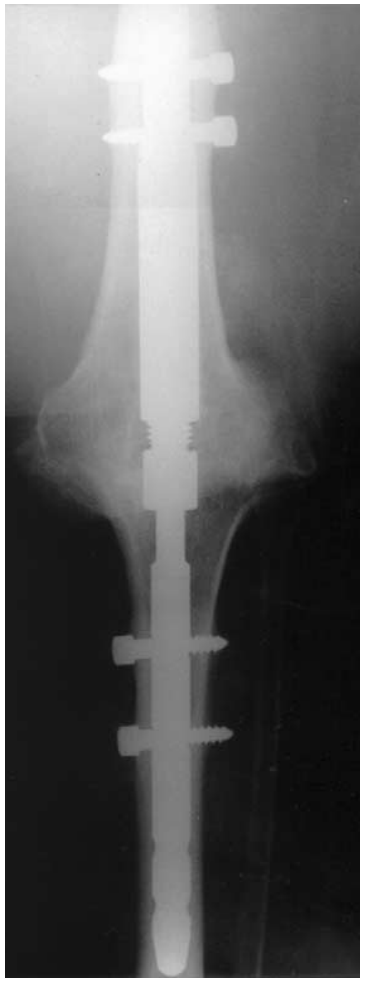
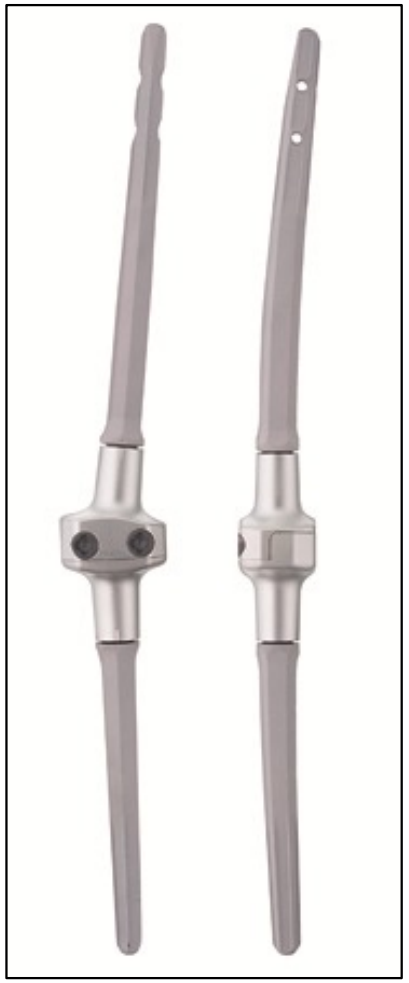


2- No residual patella : complete allograft



3- Septic risk: arthrodesis



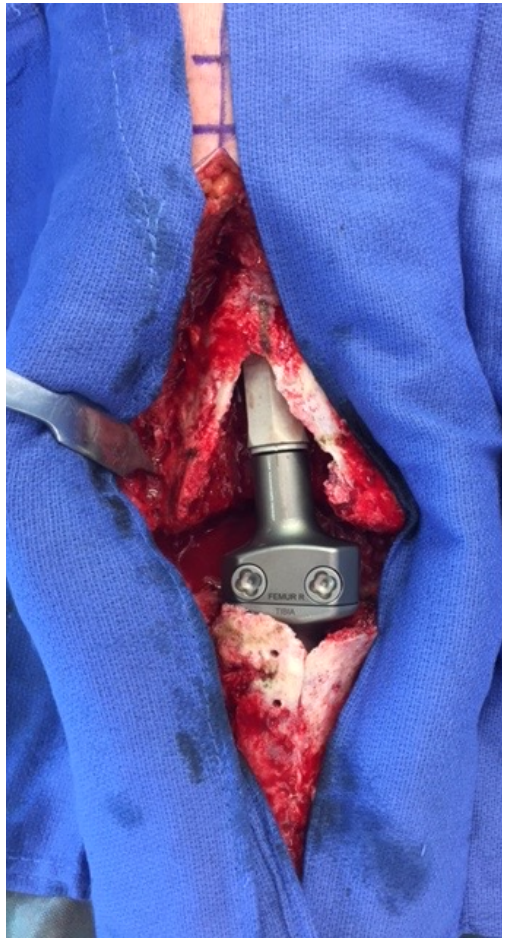



EX#1: Index TKA rupture Ext. App. : suture with ½ T
1rst revision TKA (post op)

Sepsis: Two step revision

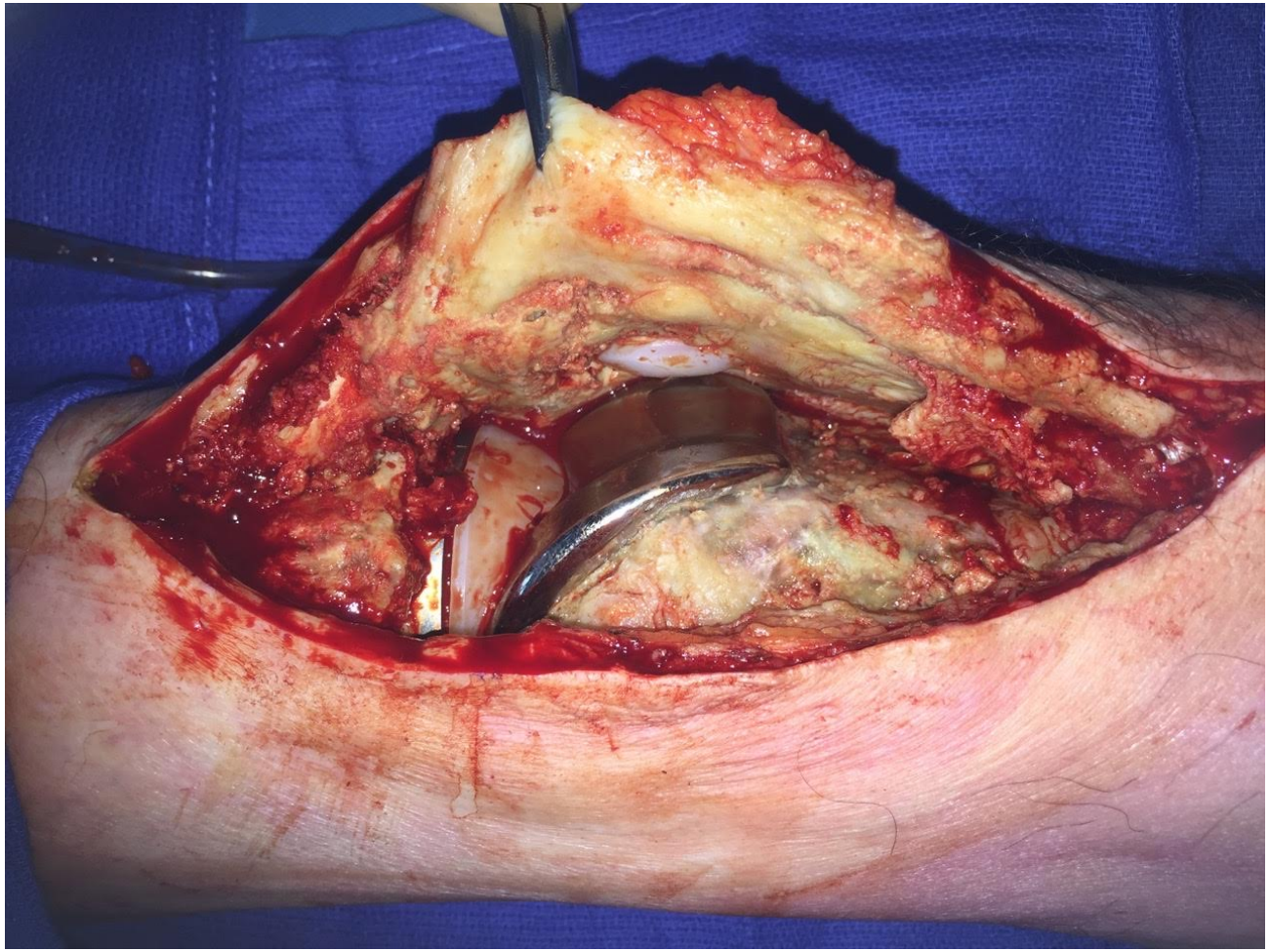
New infection ☞ Necrosis of ext apparatus

Arthrodesis



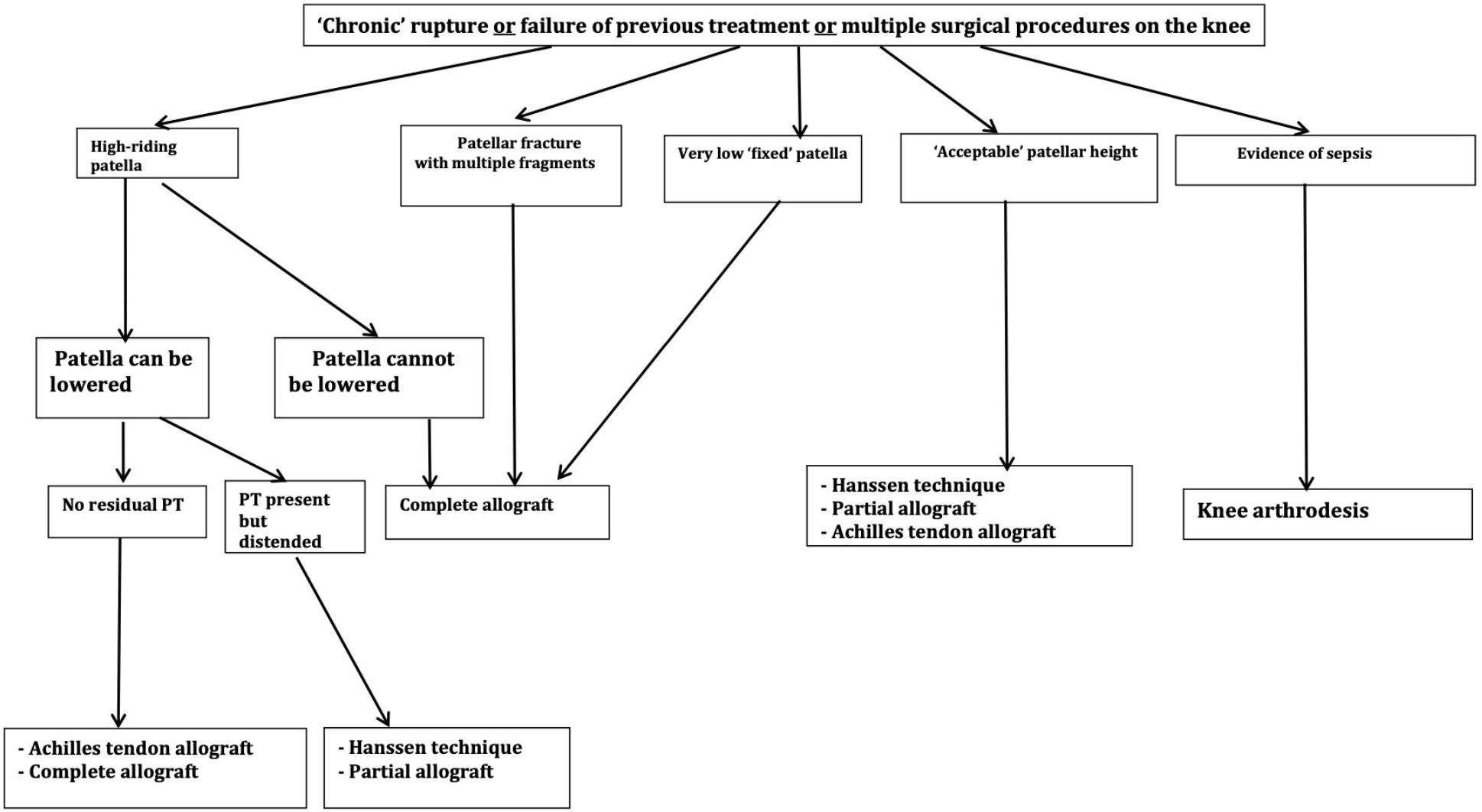
4- Tissue reconstruction with Gastrocnemius flap

Chronic rupture of patellar tendon



Reconstruction and coverage with medial Gastroc flap

Reconstruction and coverage with medial Gastroc flap


'Chronic' rupture or failure of previous treatment or multiple surgical procedures on the knee
High-riding patella
Patellar fracture with multiple fragments
Very low 'fixed' patella
'Acceptable' patellar height
Evidence of sepsis
Patella can be lowered
Patella cannot be lowered
No residual PT
PT present but distended
Complete allograft
- Hanssen technique
- Partial allograft
- Achilles tendon allograft
Knee arthrodesis
- Achilles tendon allograft
- Complete allograft
- Hanssen technique
- Partial allograft


Thank you
Toutes les photos de LYON ! http://www.Lyon-Photos.com