

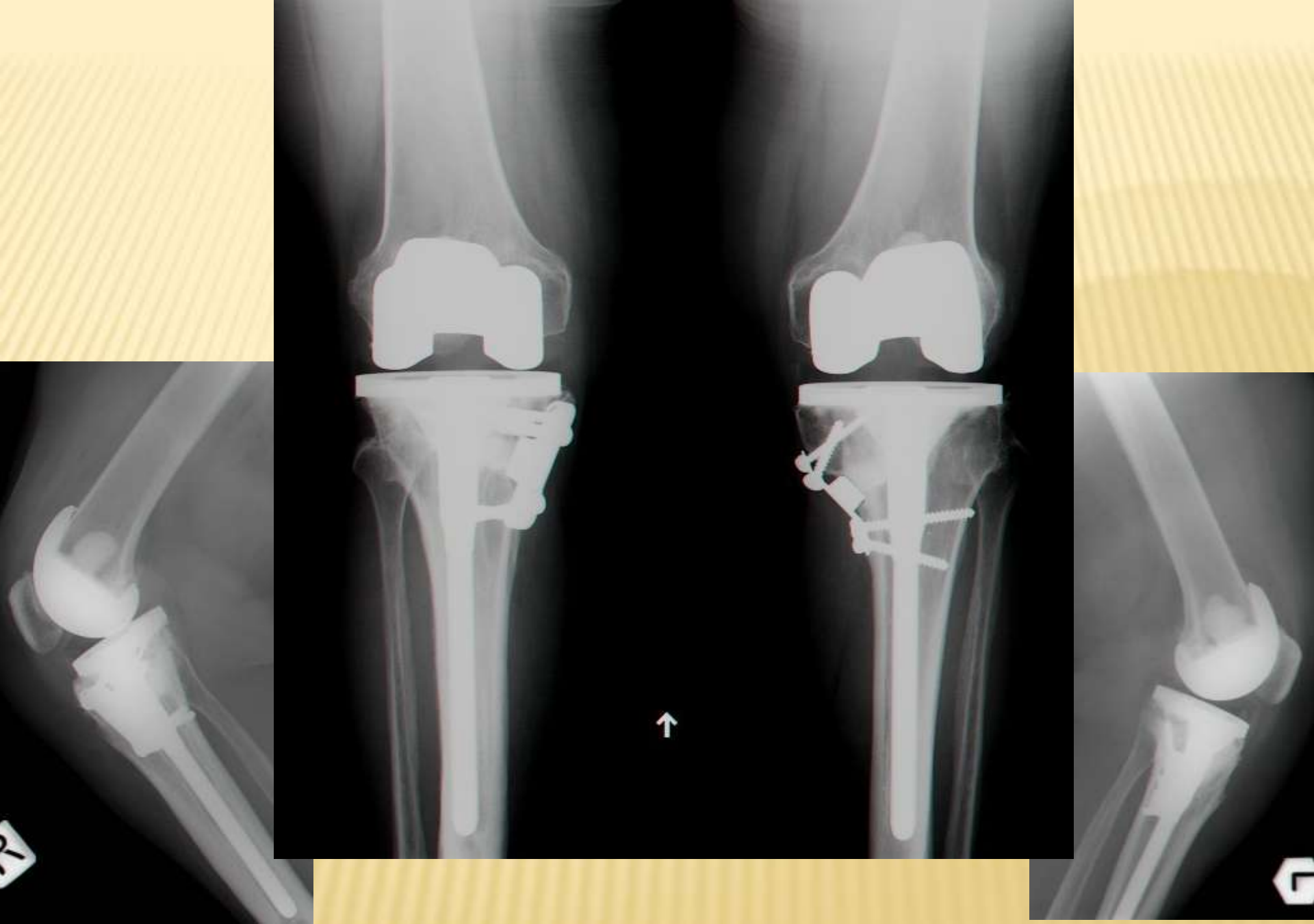


Use of Structural Allograft in Revision TKA



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Israel





PROSTHESIS SURVIVAL

97.7%

Long Term survivorship @ 20 yrs

Buechel et al, Clin Orthop and Rel Res, 2001

98.3%

Cementless survivorship @ 18 yrs

Buechel et al, Clin Orthop and Rel Res, 2001

97%

Cemented survivorship @ 15 yrs

Callaghan et al, JBJS, 2005

ASEPTIC LOOSENING

MOST FREQUENT MODE OF FAILURE

- ✗ survivorship of total condylar-type over 10-year: 90% or better

(Scuderi, G. R. et al *J. Bone Joint Surg.* 71B: 798-803, 1989.)



FAILURE OF TKR

THREE BASIC MECHANISMS

1. poor implant design
2. improper patient selection
3. incorrect surgical technique



ASEPTIC LOOSENING

MECHANICAL REASONS

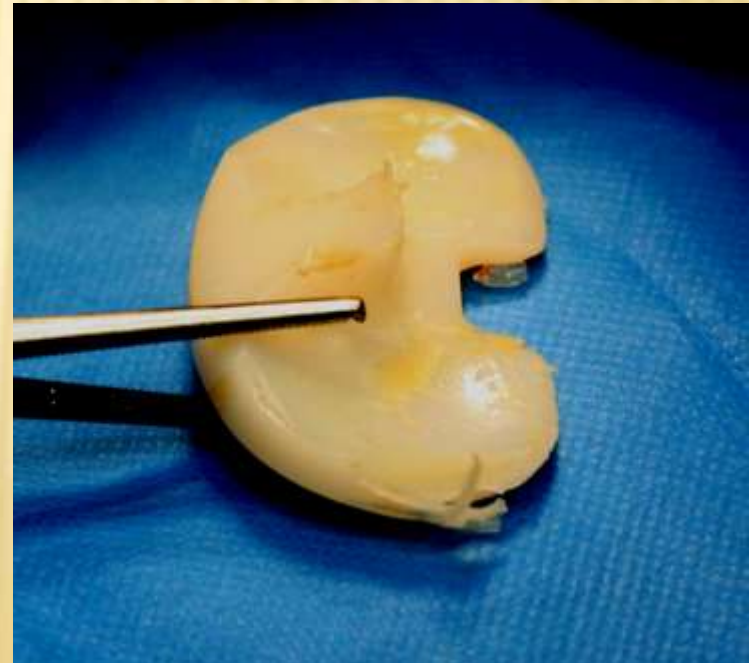
Bad surgical technique

- ✗ failure to correct limb alignment
- ✗ wrong component position
- ✗ immoral soft-tissue balance
- ✗ insufficient range of motion

ASEPTIC LOOSENING

MECHANICAL REASONS

- ✗ particulate wear debris in both cemented and cementless



ASEPTIC LOOSENING

OSTEOLYSIS

secondary bone resorption due to foreign-body response



Table 1

**Anderson Orthopaedic Research Institute
Classification of Bone Defects**

Type	Severity of Bone Deficiency Encountered
1	Minor femoral or tibial defects with intact metaphyseal bone, not compromising the stability of a revision component.
2	Damaged metaphyseal bone. Loss of cancellous metaphyseal femoral bone requiring reconstruction (cement fill, prosthetic augment, or bone graft) to provide stability of the revision component. A: Defects in one femoral or one tibial condyle B: Defects in both femoral or both tibial condyles
3	Deficient metaphyseal segment compromising a major portion of either femoral condyles or tibial plateau, occasionally associated with collateral or patellar ligament detachment.

Table 2

Bone Loss Classification of Clatworthy and Gross²

Type	Severity of Bone Deficiency Encountered
I	Contained with metaphyseal bone intact, in which restoration of the joint line can be accomplished without bone grafting or augmentation
II	Contained with damaged metaphyseal bone and requiring bone grafting, cement fill, or augments to restore the joint line
III	Noncontained, noncircumferential defects requiring a partial distal femur, partial proximal tibia, or femoral head graft
IV	Noncontained, circumferential defects requiring a segmental distal femoral or proximal tibial graft

PRE-OP EVALUATION

- ✗ prior surgeries and complications
- ✗ soft tissues evaluation
 - prior incisions: placement and quality
- ✗ extensor mechanism
- ✗ patellar alignment



ASEPTIC LOOSENING VS. LOW-GRADE INFECTION?

- ✗ bone scans

 - technetium-99

 - indium-111

 - 82% accuracy*

Rand, J. A. et al; Clin. Orthop. 259: 179-182, 1990

- ✗ *CRP + ESR*

- ✗ *culture (pre-op; inter-op)*



PRE-OP RADIOGRAPHS

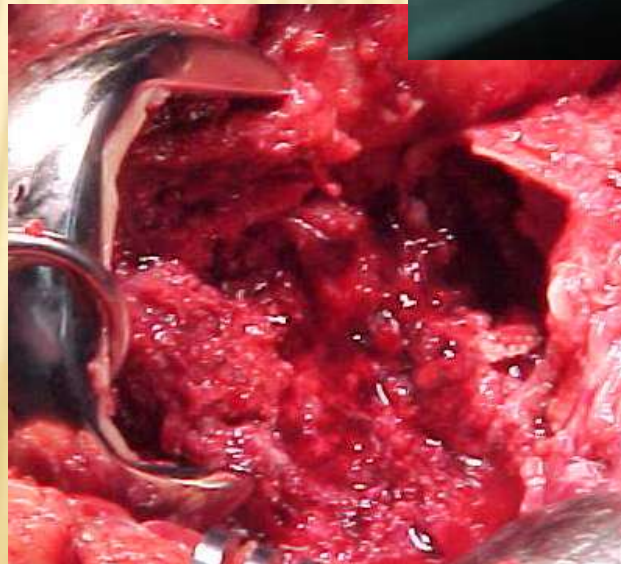
- ✗ true AP + LAT
- ✗ full length radiograph
- ✗ true LAT of opposite knee (confirm sizing)



BONE STOCK

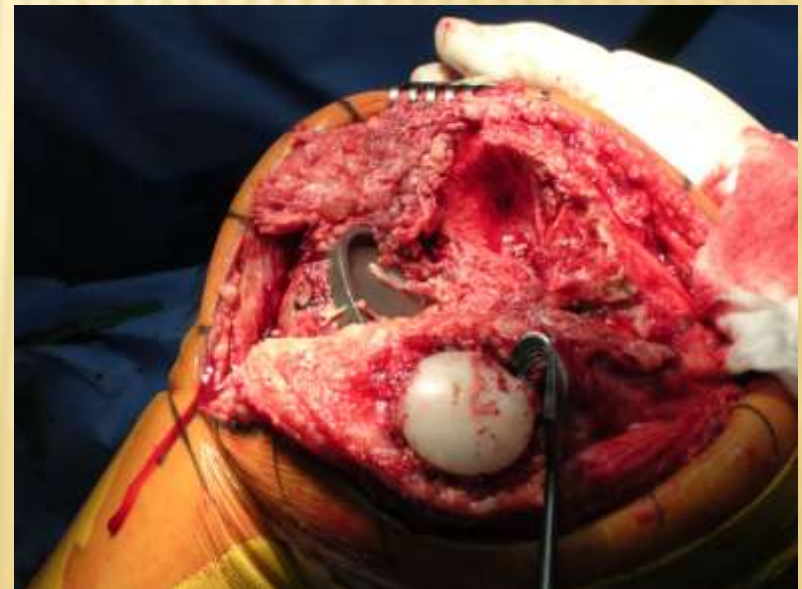
carefully judge

- × Circumferential
- × Noncircumferential
- × Contained
- × Uncontained



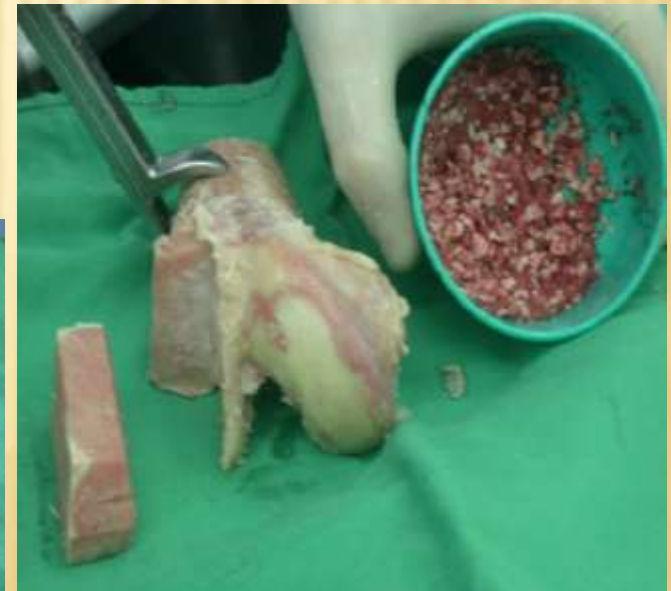
BONE STOCK

- ✖ be ready to surprise
allograft
modular system



MANAGEMENT OF SEVERE BONE LOSS

- ✖ Prosthetic augments
- ✖ Allograft
- ✖ Autograft
- ✖ Bone cement
- ✖ Arthrodesis



BONE STOCK

- ✗ patellar bone loss should not be ignored
- ✗ less than 12 mm- risk of fracture





STRUCTURAL ALLOGRAFT



ALLOGRAFT PROCUREMENT

- ✗ Grafts were produced under sterile conditions
/ American Association of Tissue Banks /
- ✗ We used freeze-dried bone allograft :
 1. Distal Femur -26
 2. Proximal Tibia-8



STRUCTURAL ALLOGRAFT REASONS

Versatility

Customization

Sculpturing defect filling

Biological potential (?)

METHODS

Structural distal femoral allograft for major bone loose (14 years experience)



CONDITIONS

- ✗ Condition for primary TKA – OA; RA
- ✗ Conditions of Revision TKA :
 - Aseptic Loosening -23
 - Periprosthetic fracture-11



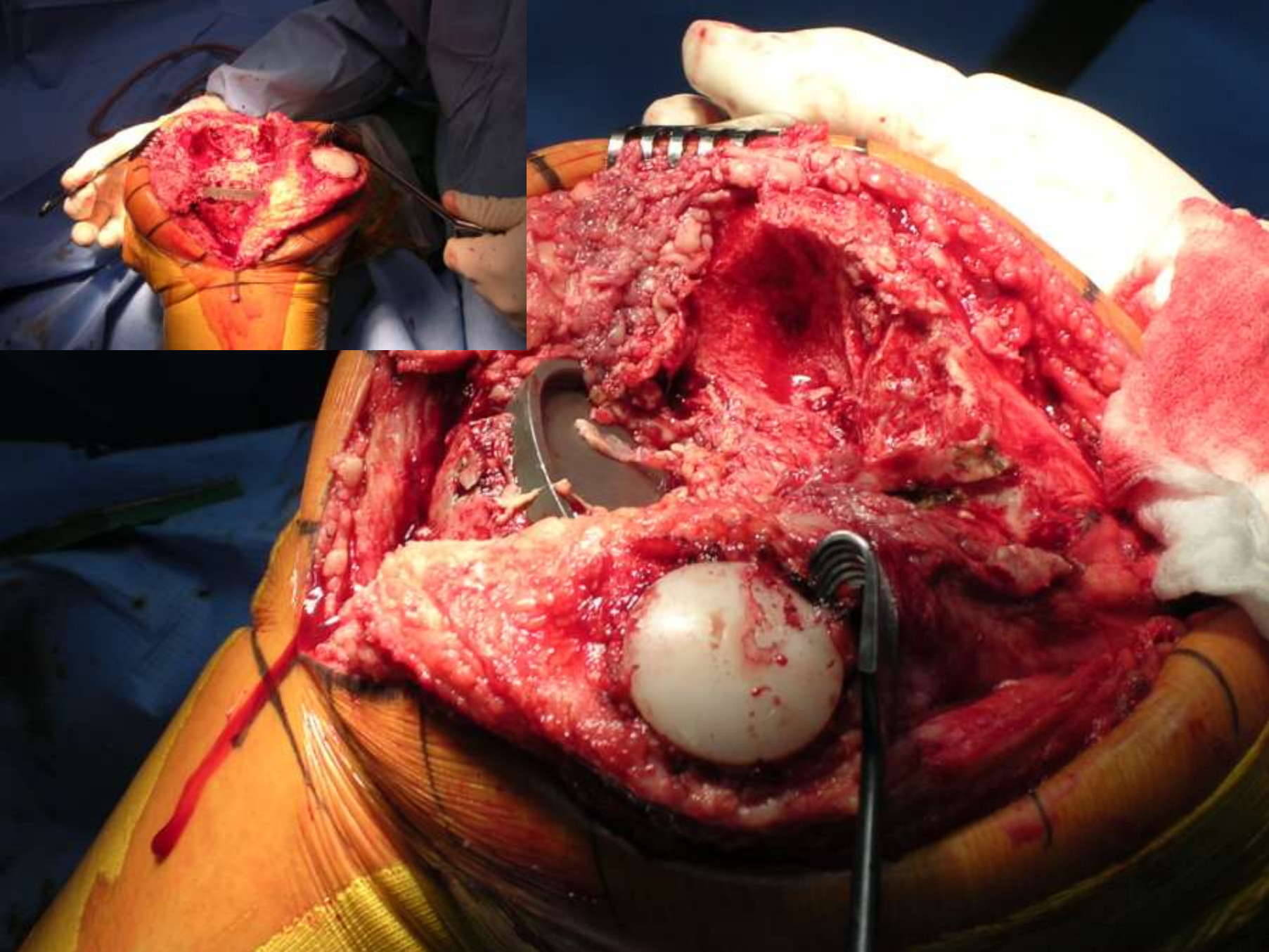
SURGICAL TECHNIQUE – 1

ASEPTIC LOOSENING



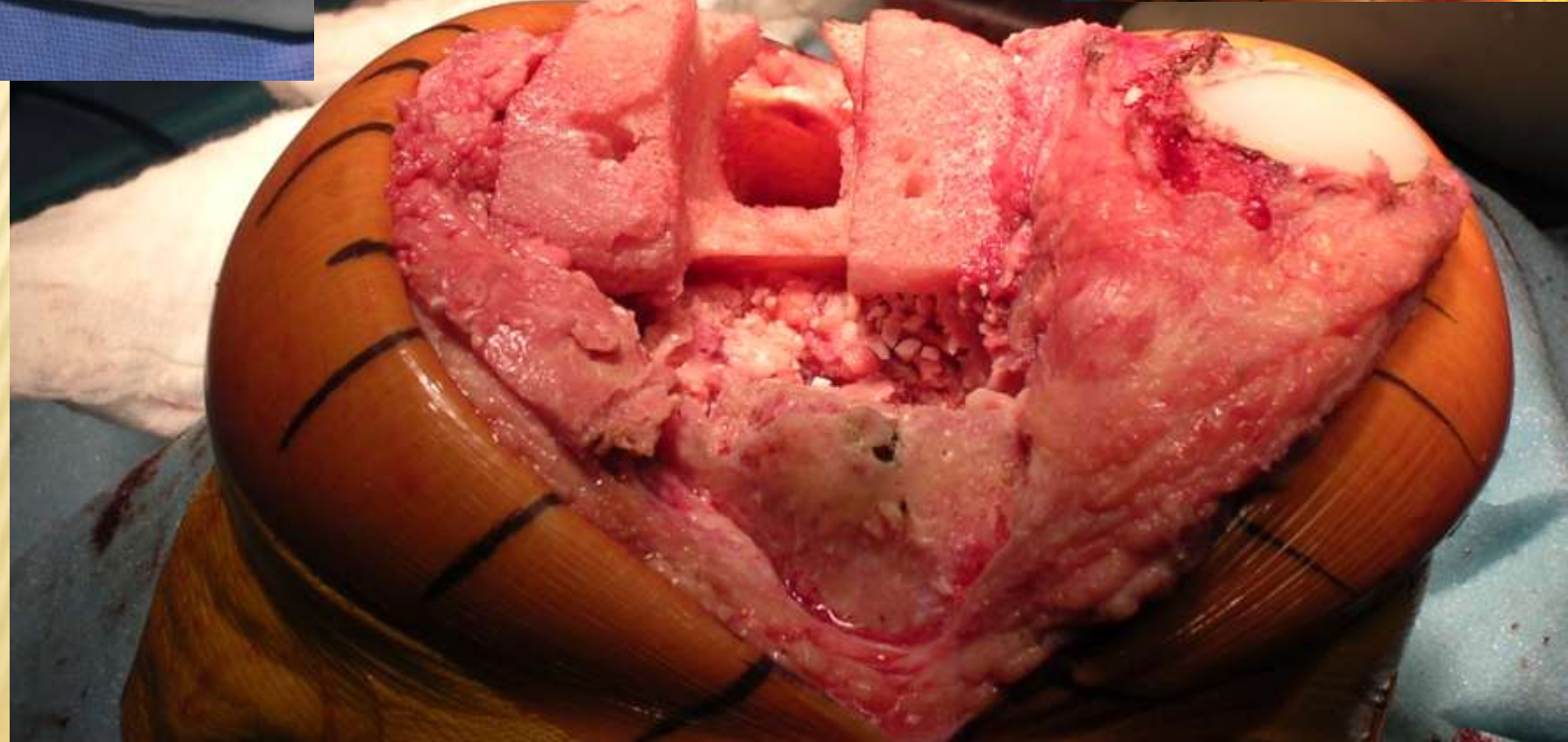












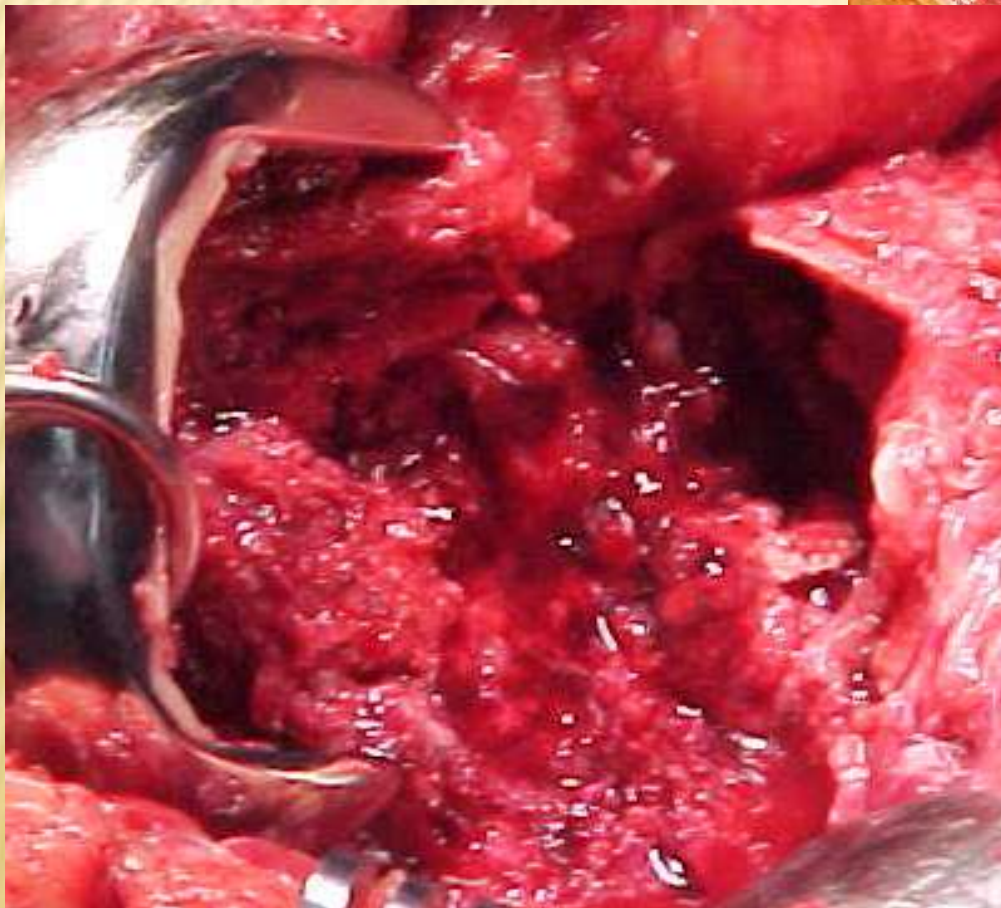
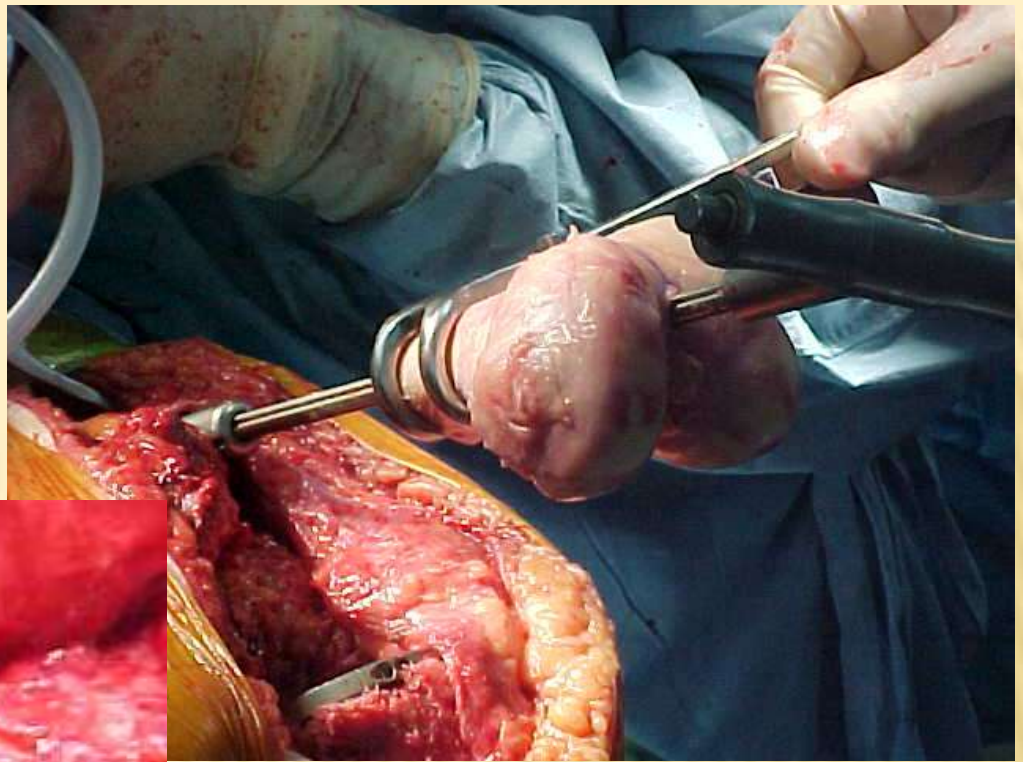


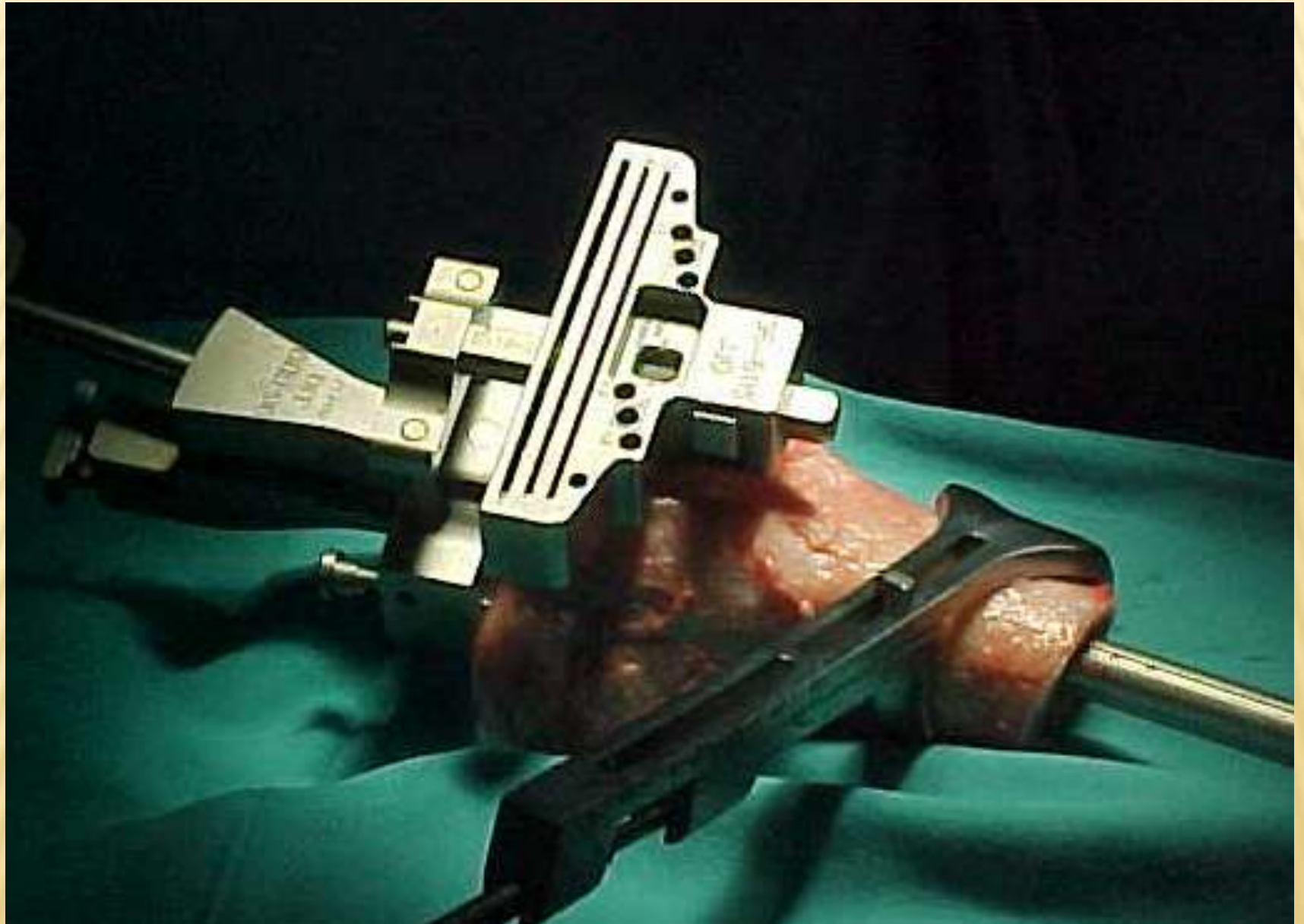
SURGICAL TECHNIQUE – 2

PERIPROSTHETIC FRACTURE

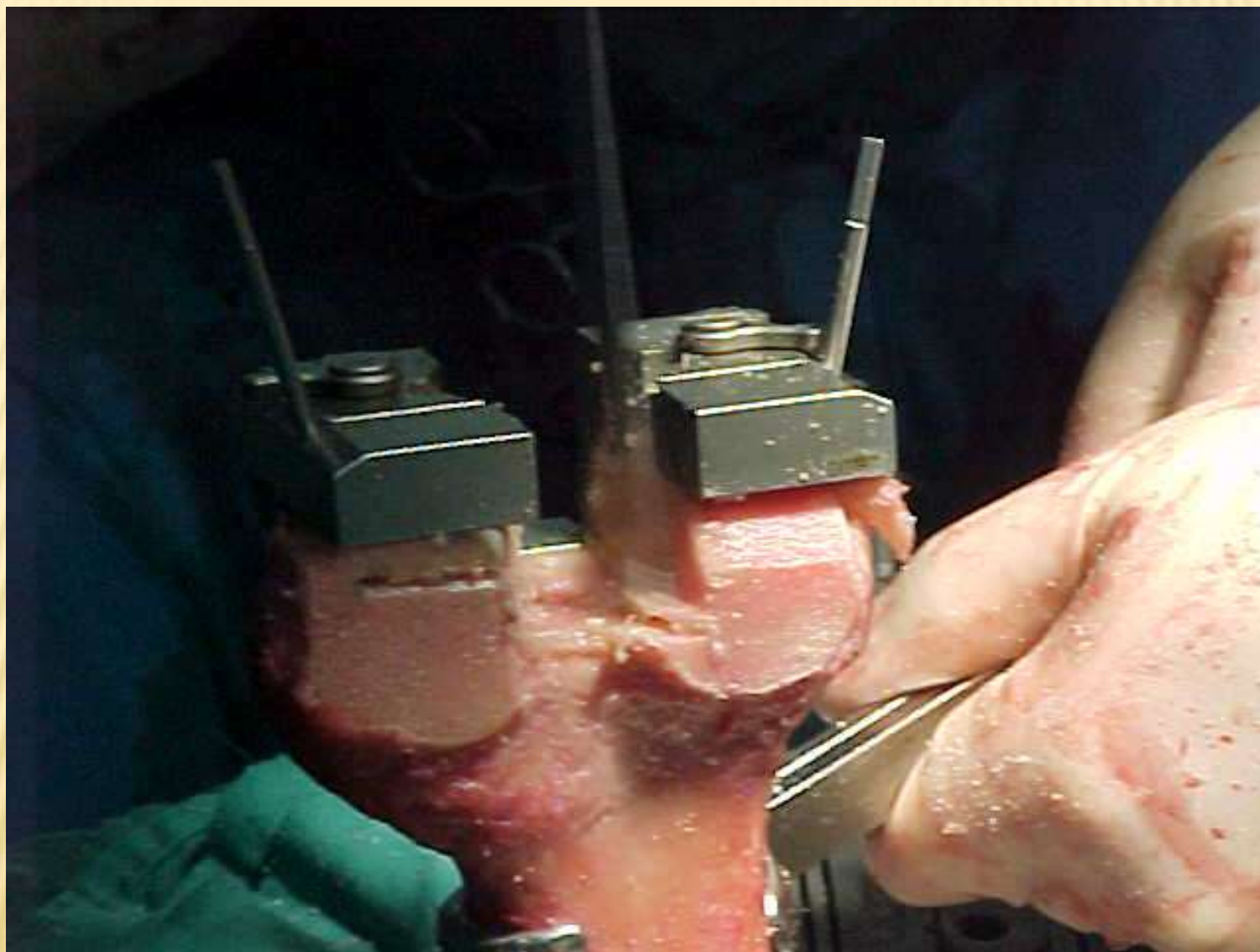




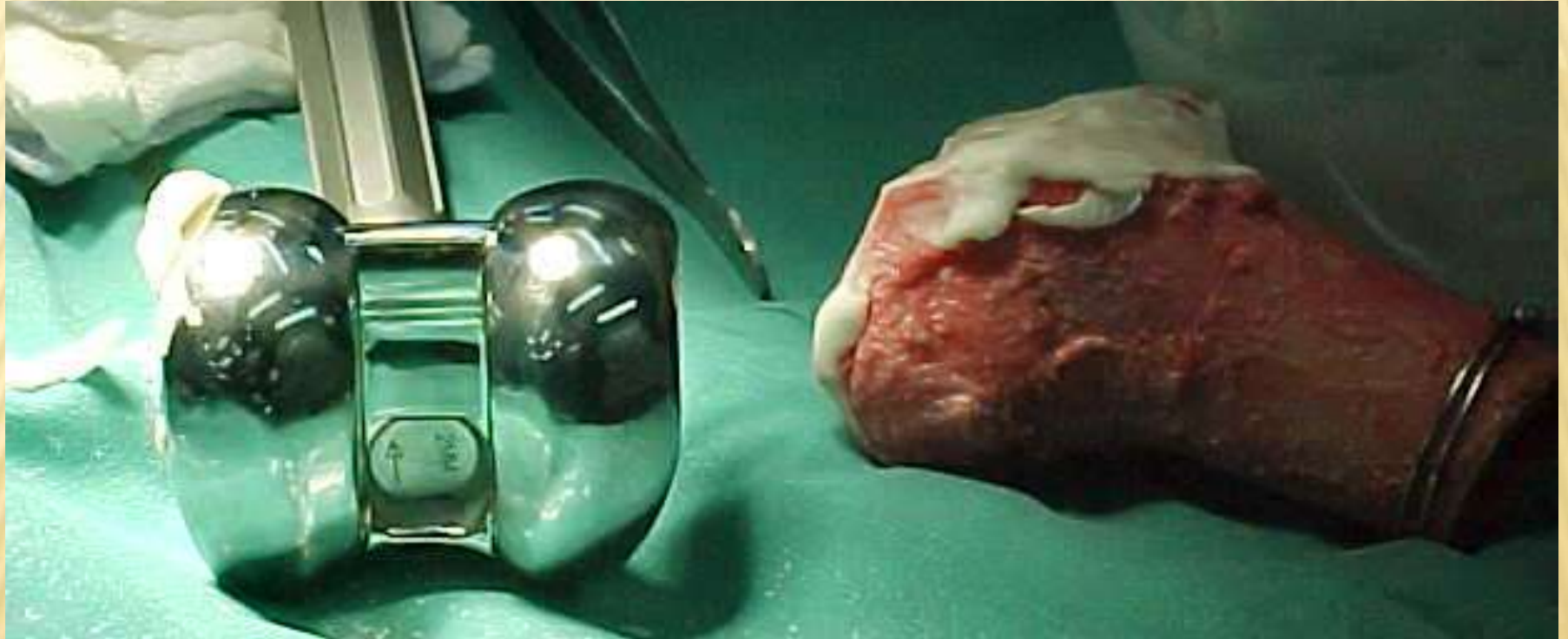




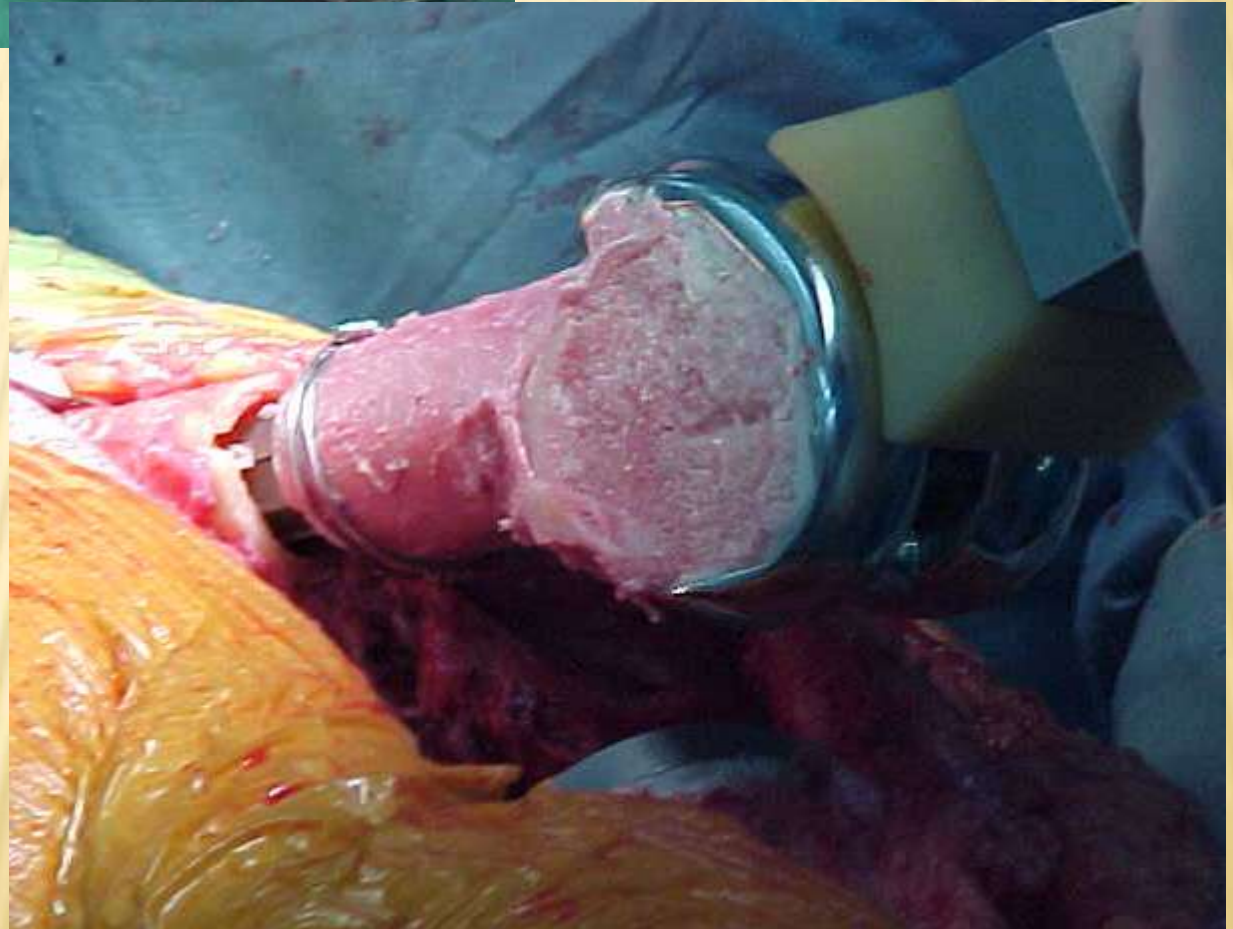
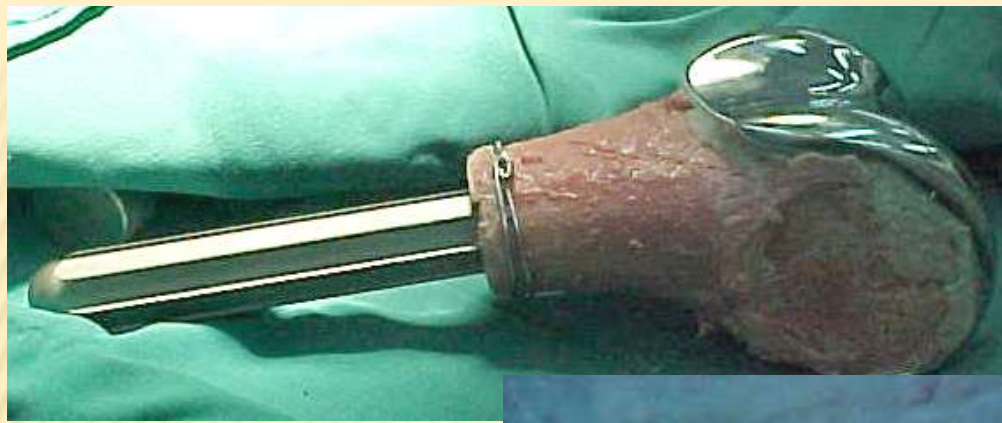


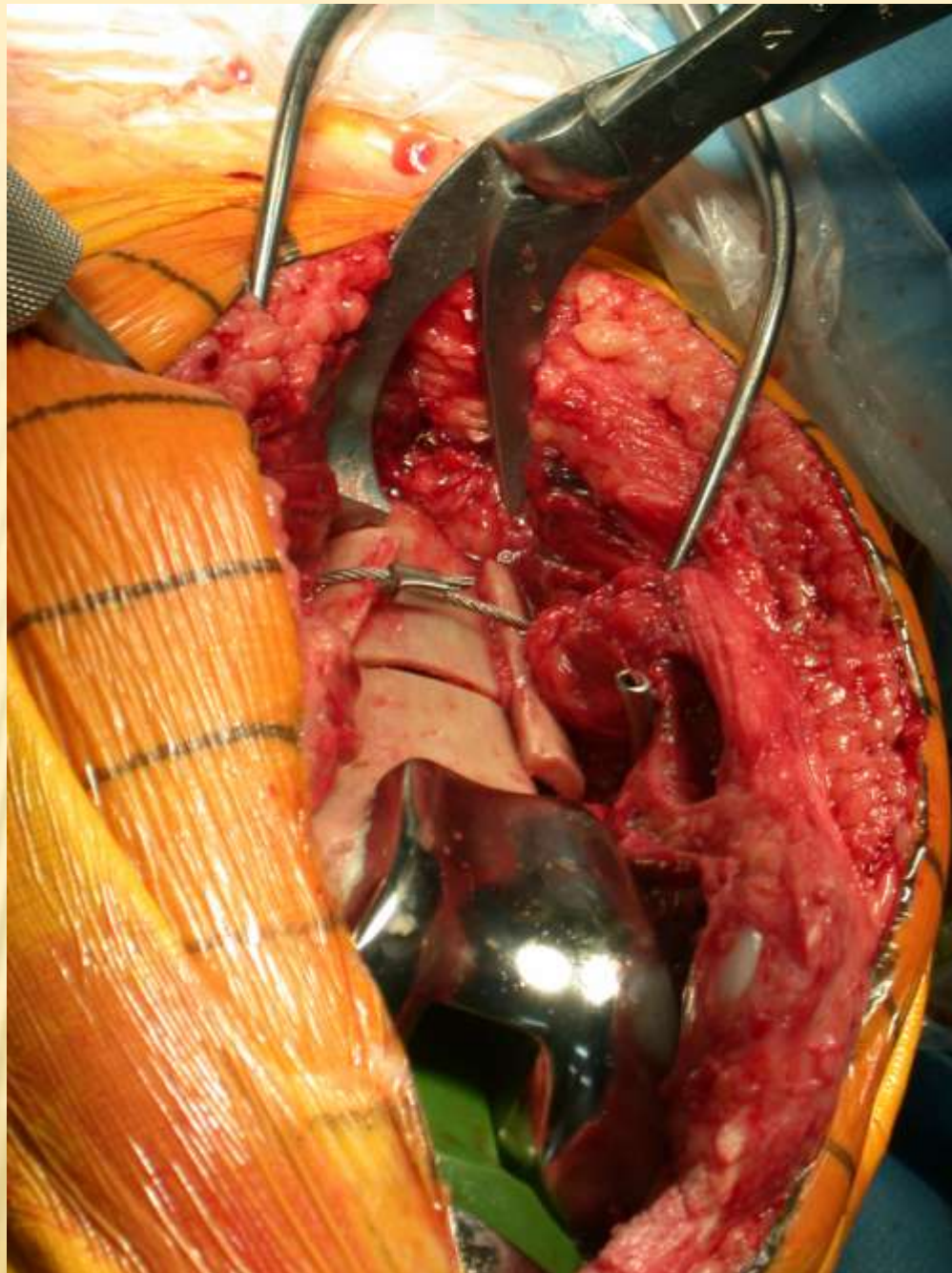














RESULTS

34 CASES

- ✗ Mean follow-up time 72.2 months (longest 168; shortest 16)
- ✗ On x-Ray none of allograft had resorption
- ✗ Implant position was preserved in all patients
- ✗ HSS knee score had improved from 39.1 to 84.1
- ✗ ROM improved from 75.0 \pm 42.0 to 103.5 \pm 12.5
- ✗ Before revision all patients used walker or crutch, after operation only one used cane

- ✗ Four complications :
 1. 3 Superficial wound infection /without need of surgery revision/
 2. Mild medial instability /knee immobilizer 4 weeks/

45 MONTH FOLLOW UP



53 month follow up



62 MONTH FOLLOW UP



13 YEARS FOLLOW UP

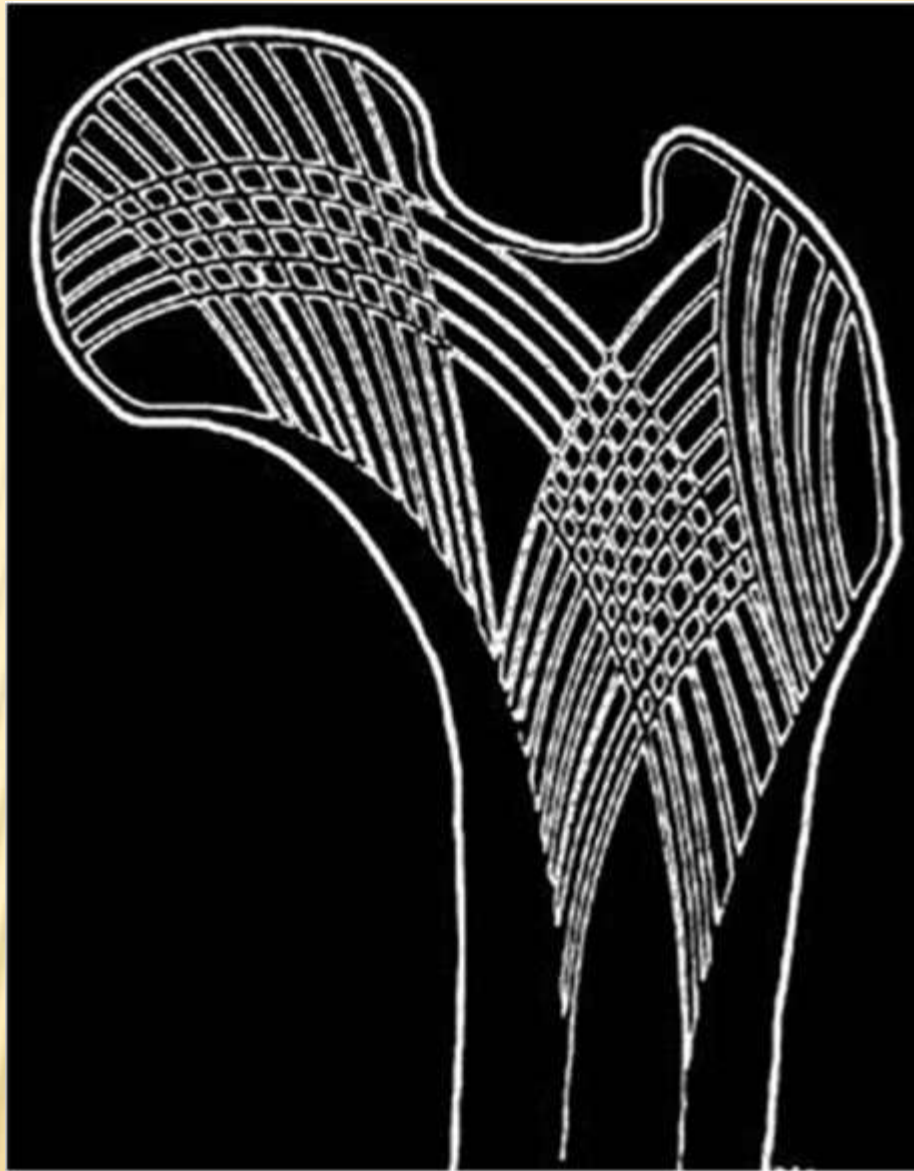


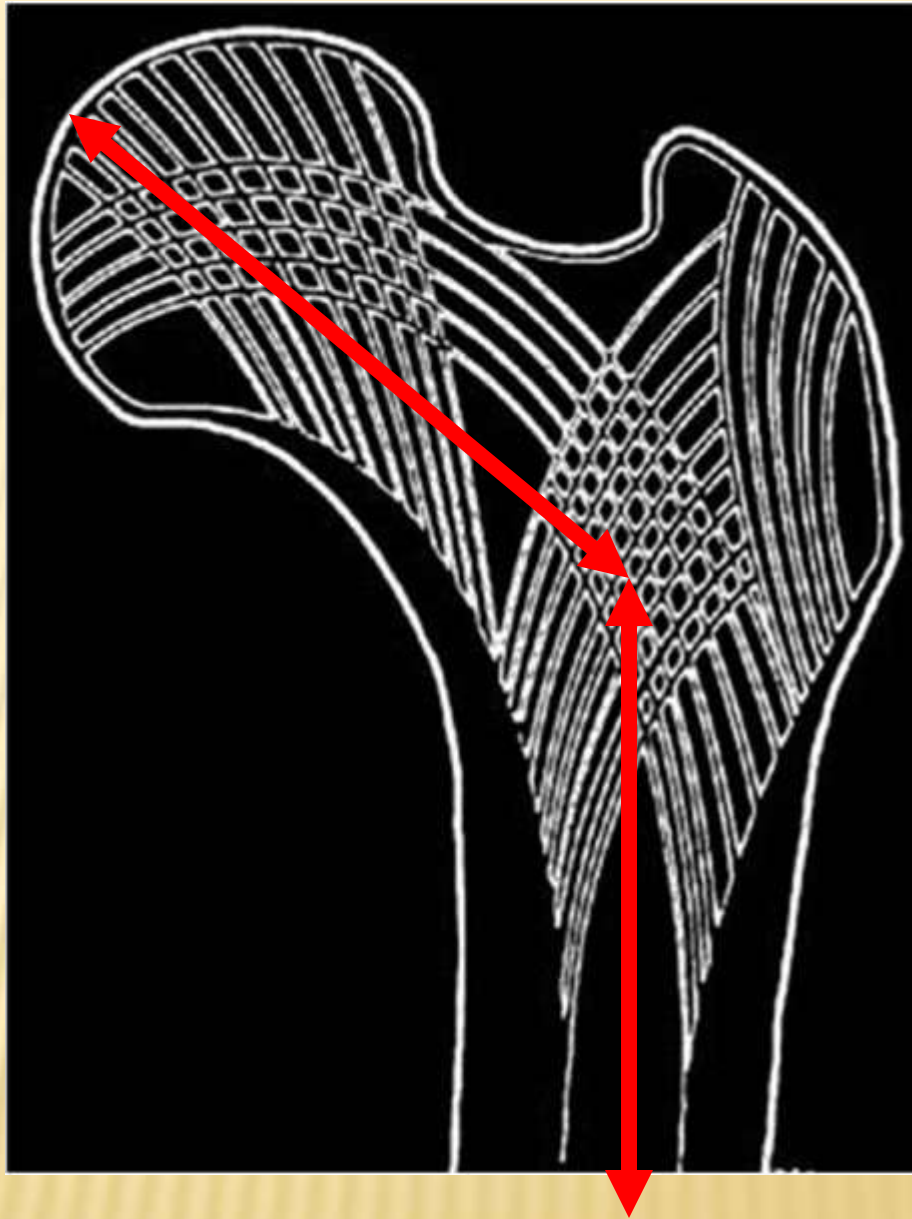
THANK YOU !

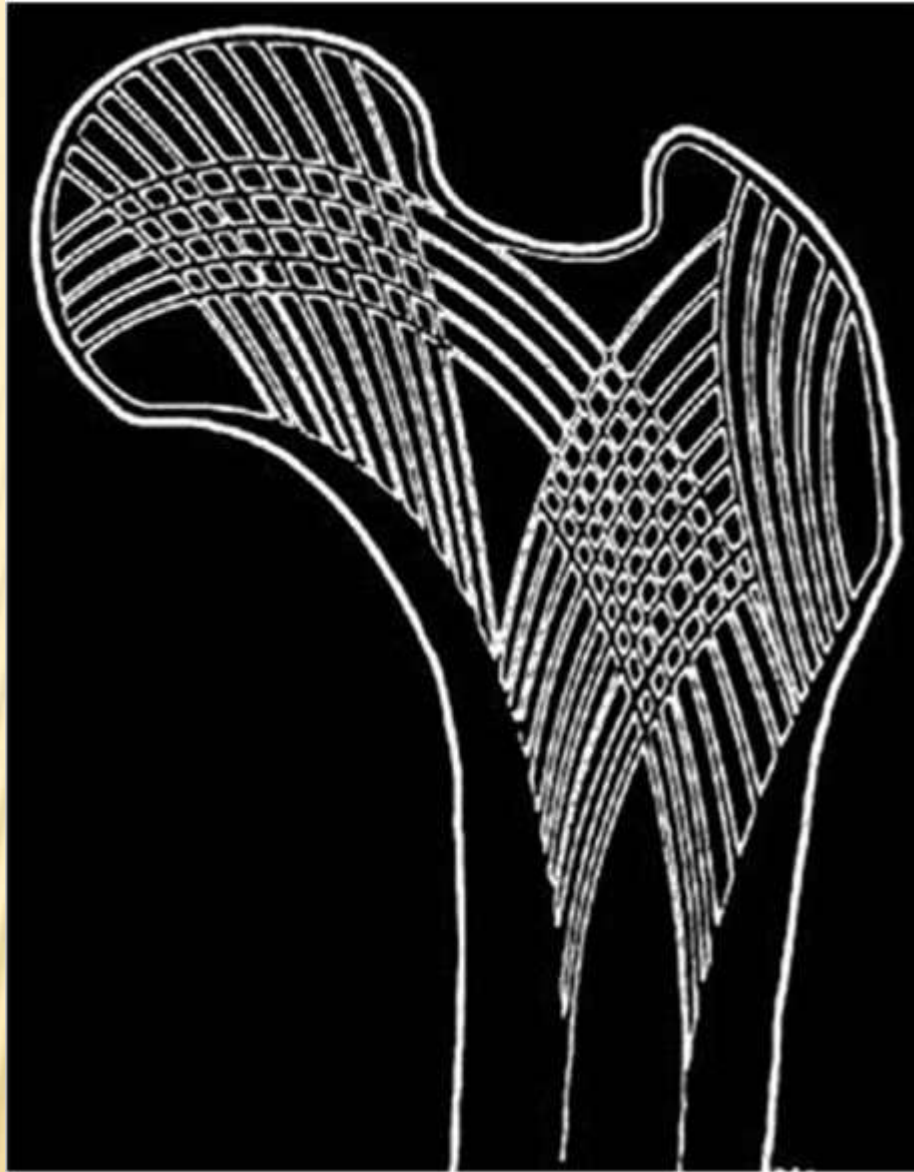
“The last thing you want to do is to go back and do it all again”

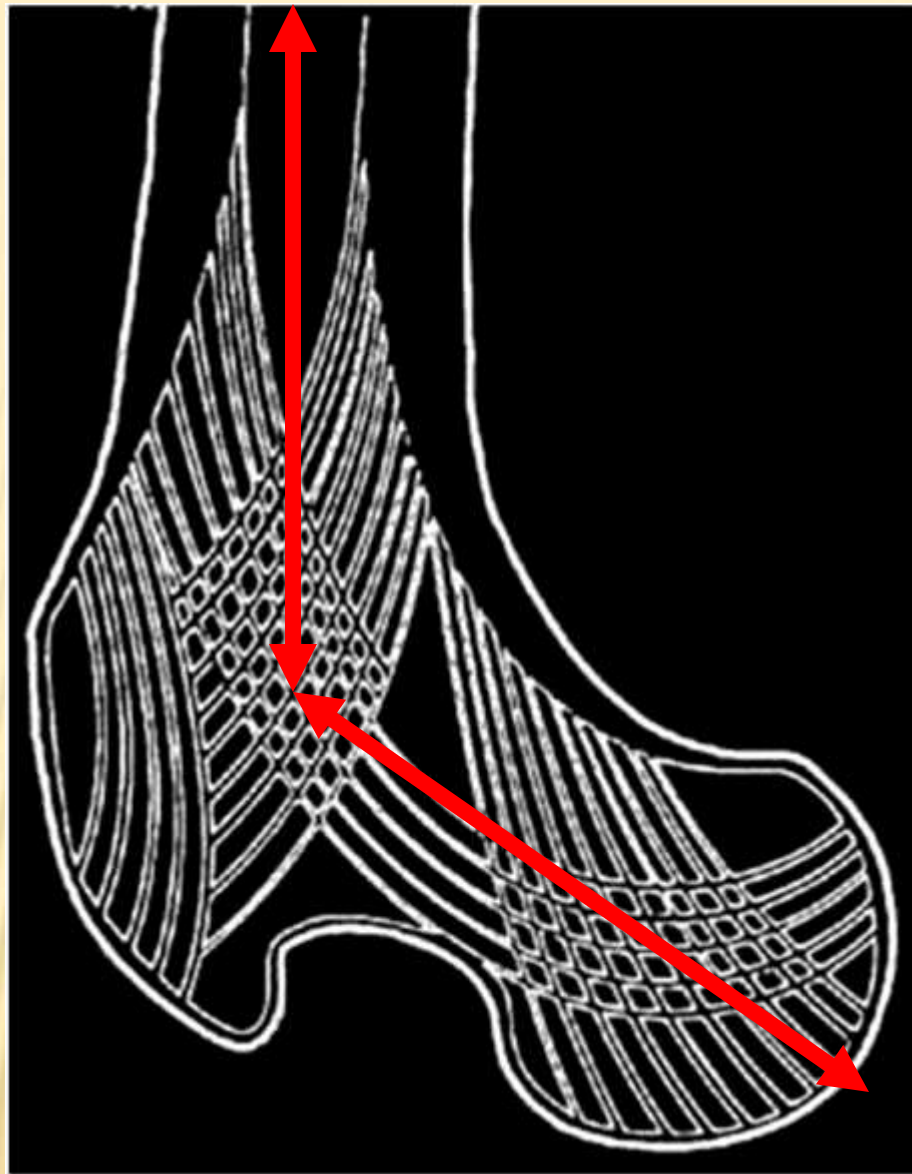
Dr. Lawrence S. Crossett, USA

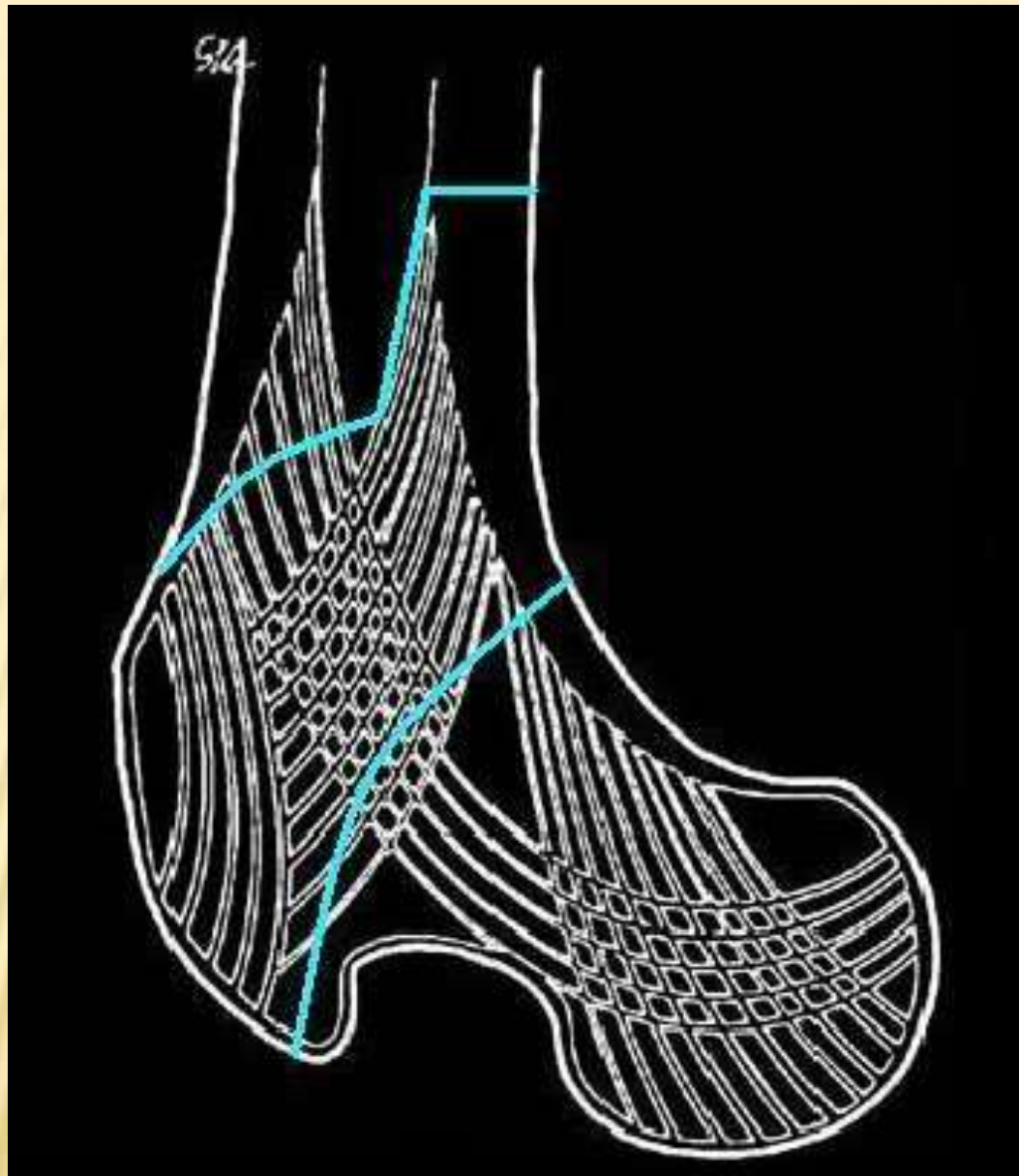


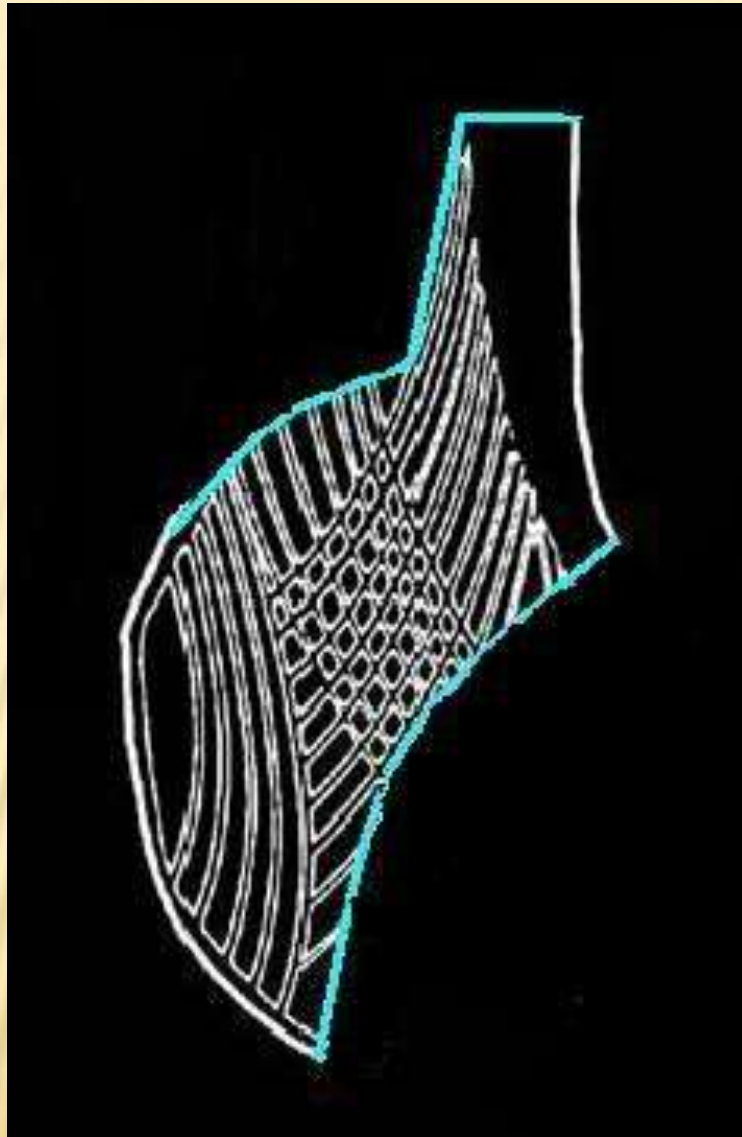


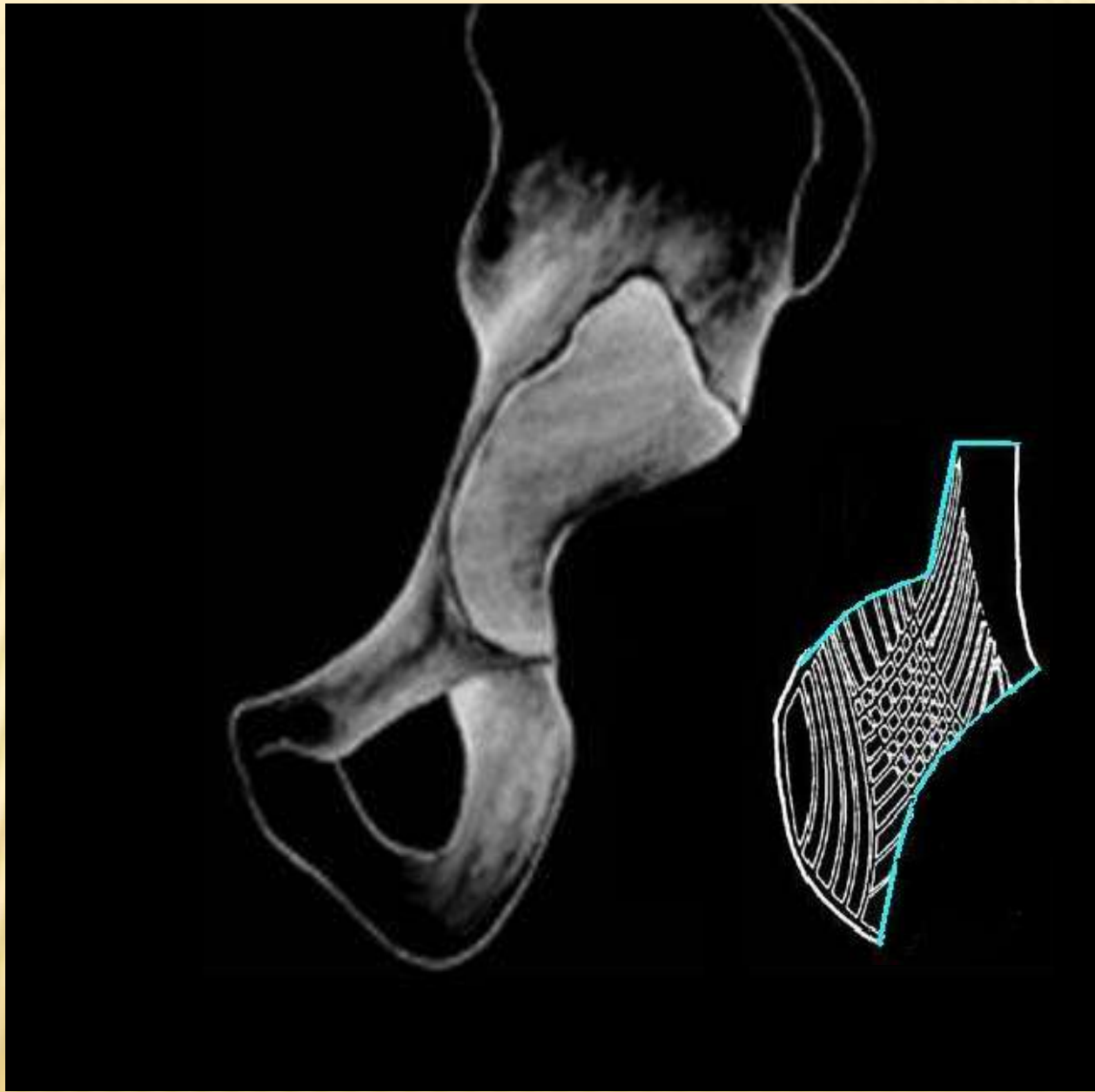


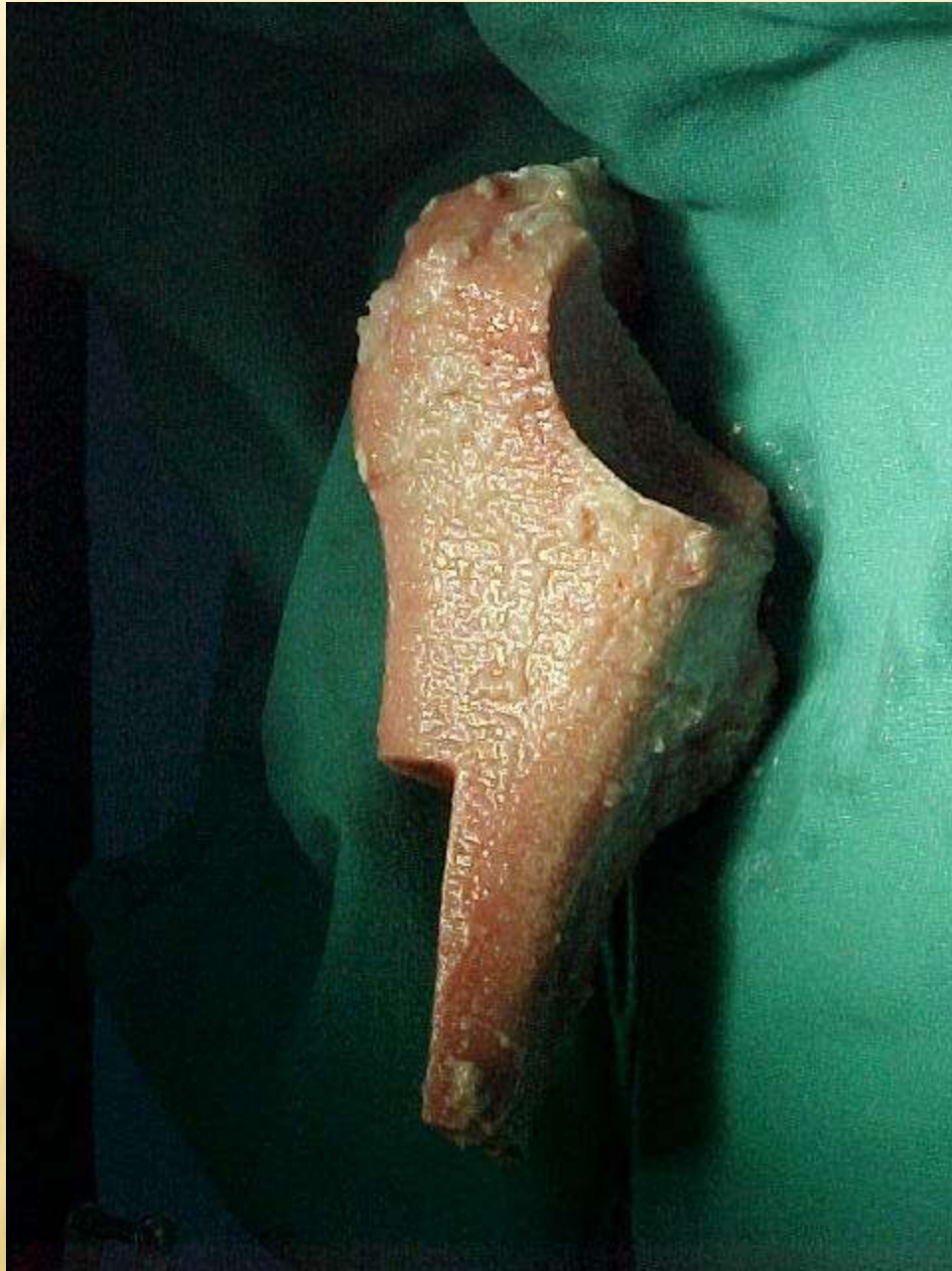






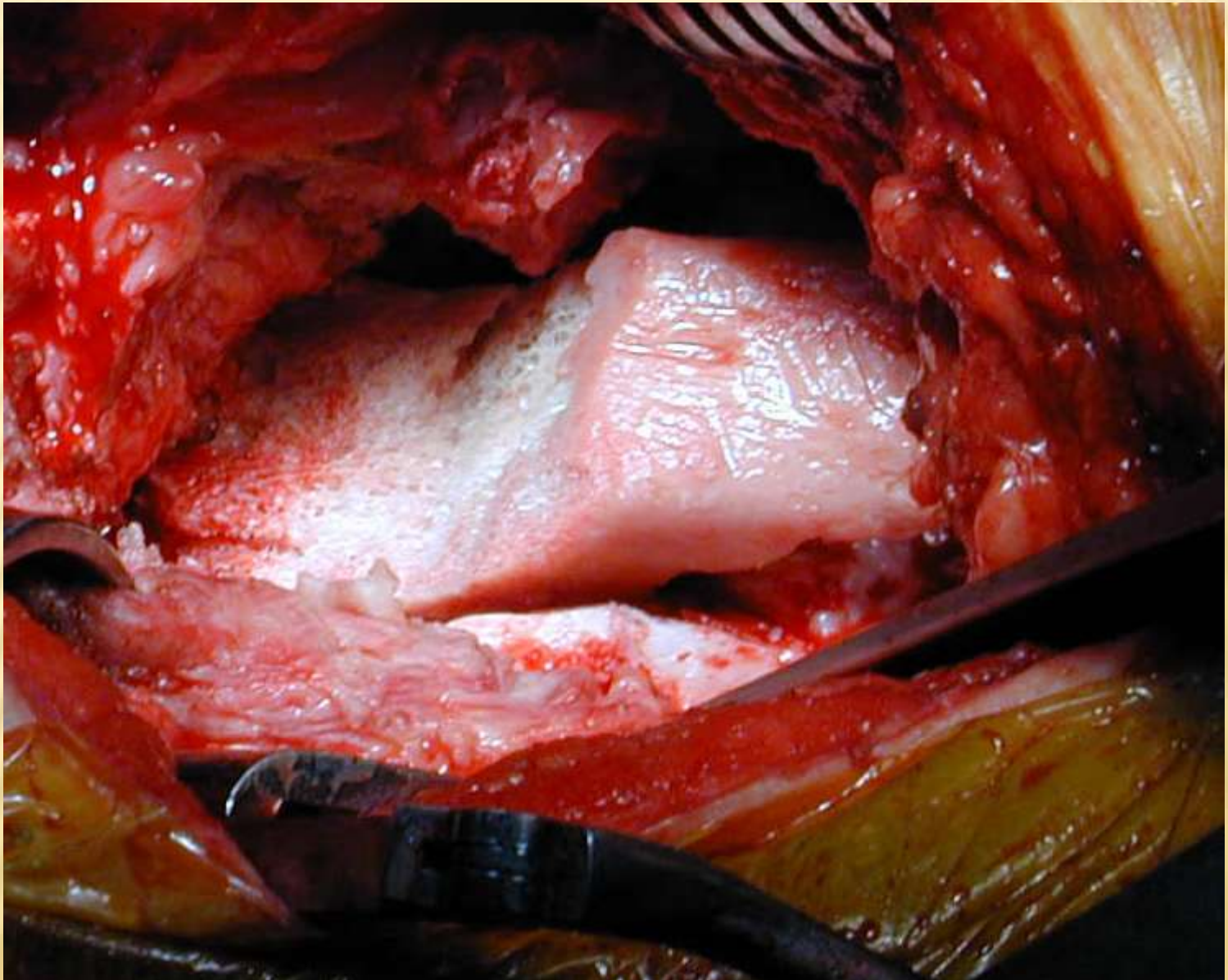


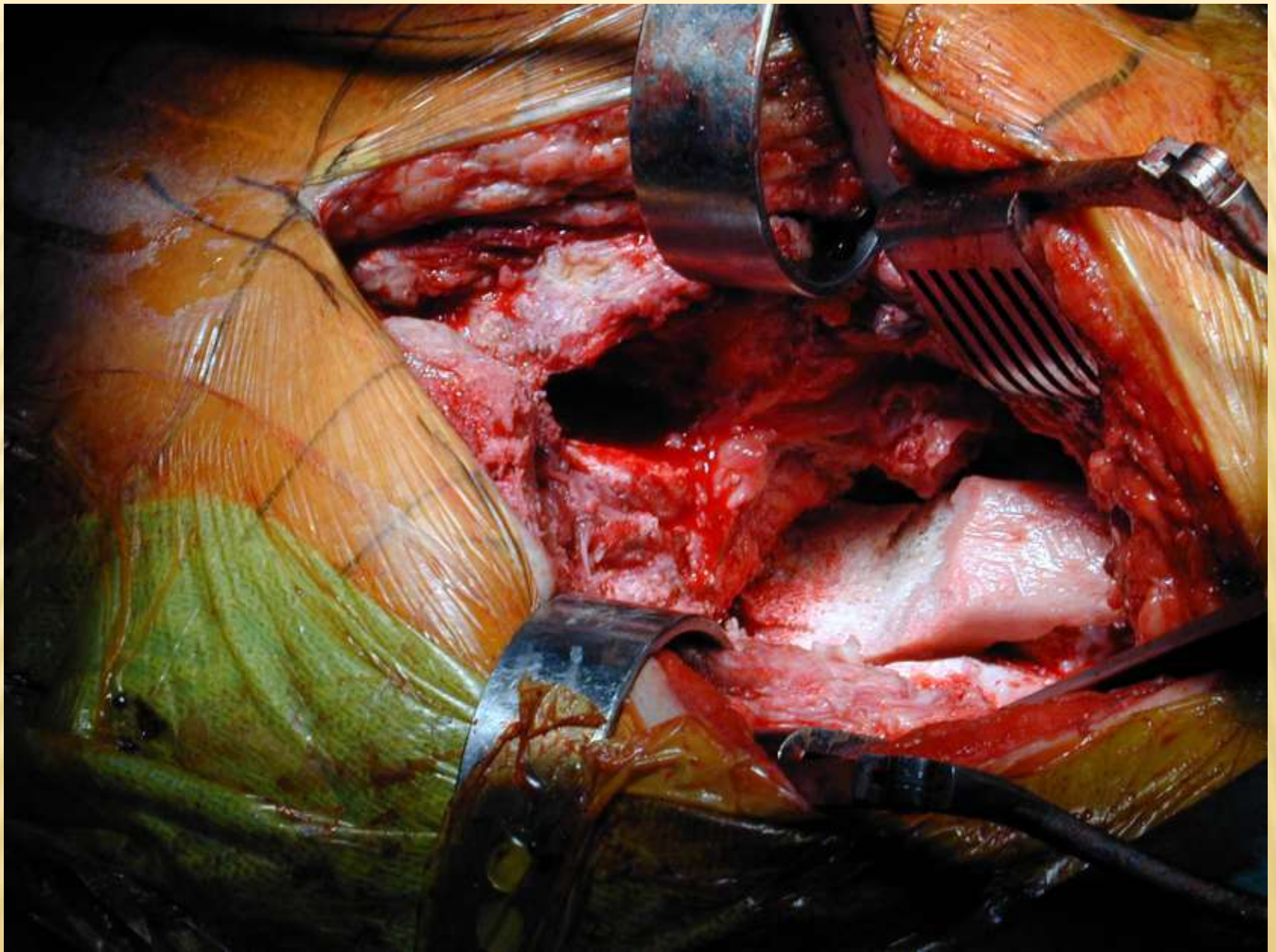


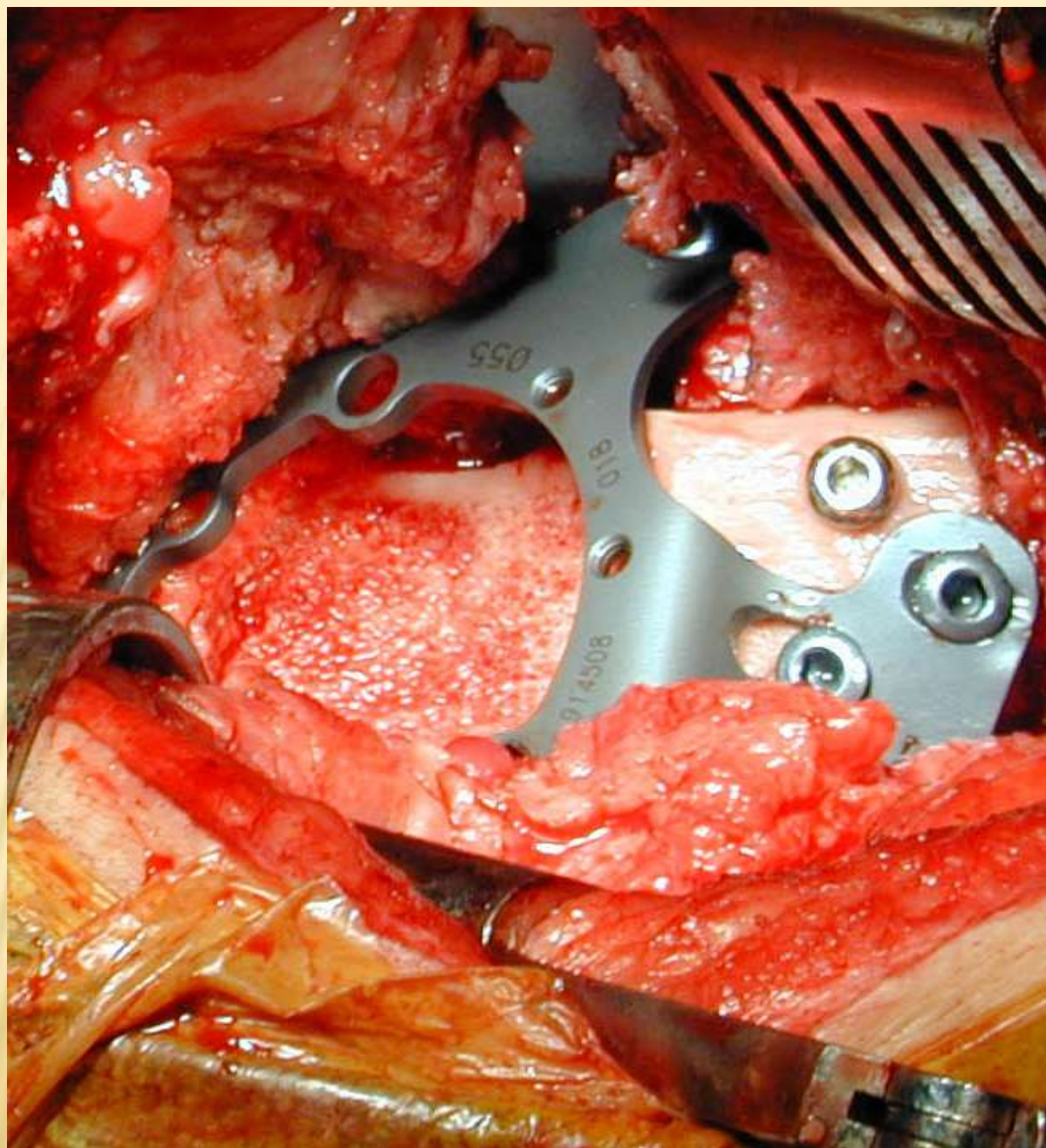












10 YEARS FOLLOW UP



CONCLUSIONS

- ✗ Our modest experience demonstrate that structural allografts used in revision joint arthroplasty improve clinical and functional outcomes.

