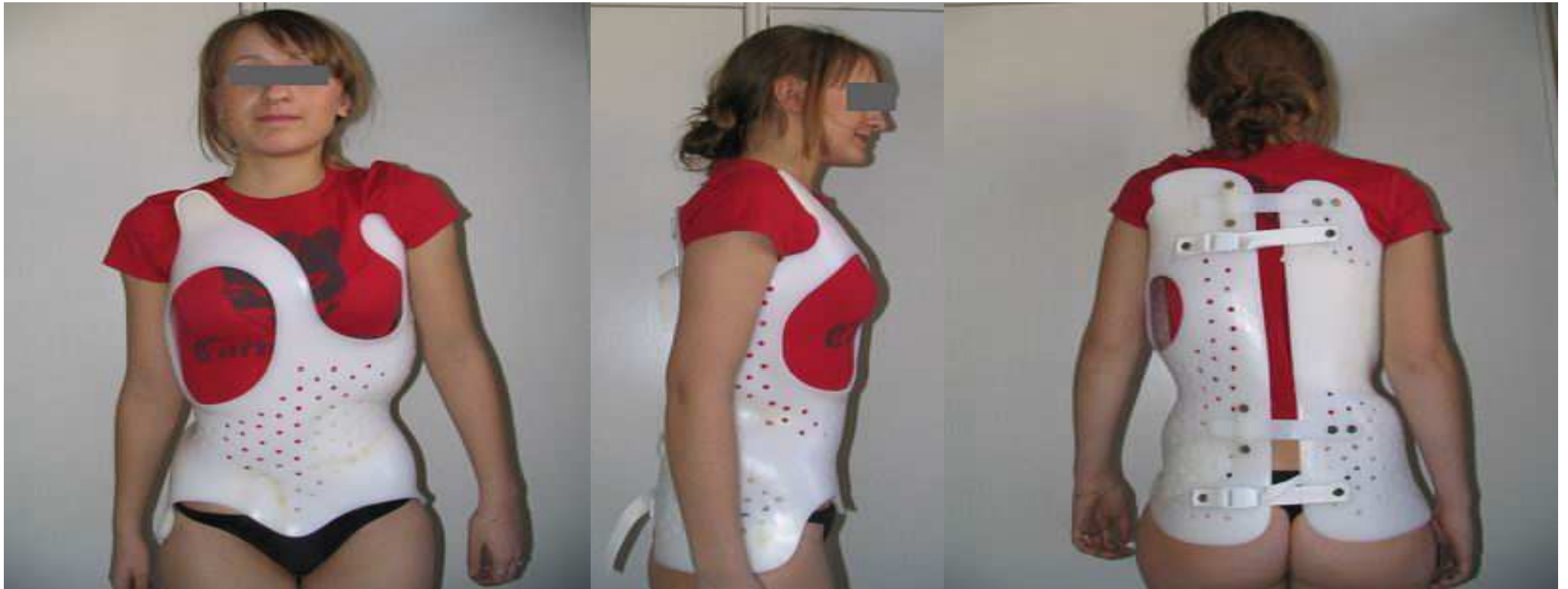


# Ortotics

= restoration of lost body functions

- weakened / lost function
- Orthoses:
  - mass produced vs. individual
  - trunk vs. extremities





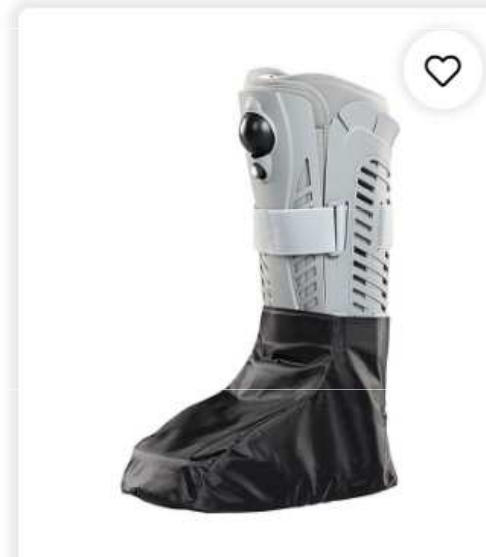
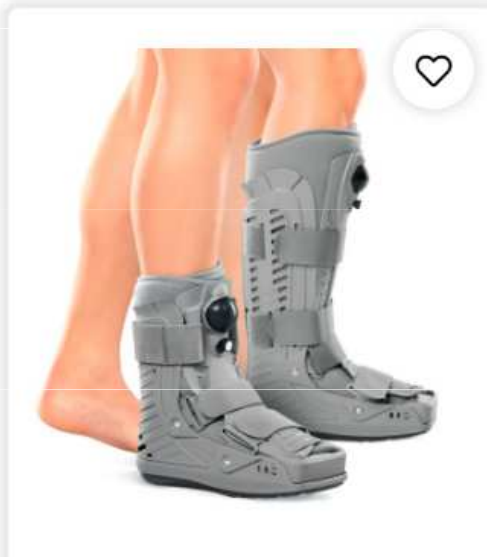
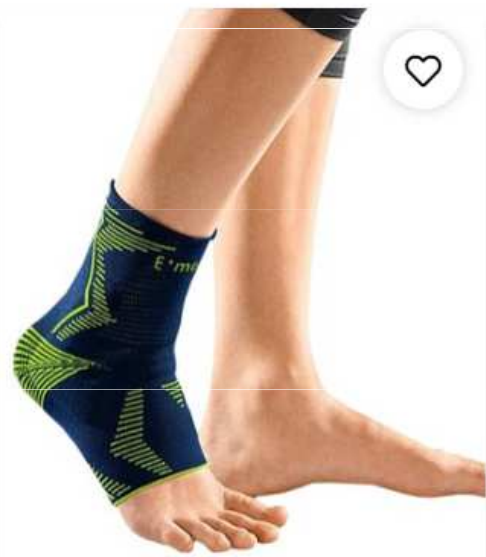
# Ortoses:

- Static:
  - Rigid without movement, relieve pain, stabilize the limb
- Dynamic:
  - Controlled movement, they replace lost or weakened functions of muscles and joints

# Ortoses:



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# Support devices

Limb motion trainers, eg. after operations

- Walkers: walking practice :



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# Support devices

Crutches: support function













- four-point, French, children's elbow crutch,
- armpits, walking sticks
- height-adjustable, folding walking sticks



# HIP JOINT & FEMUR



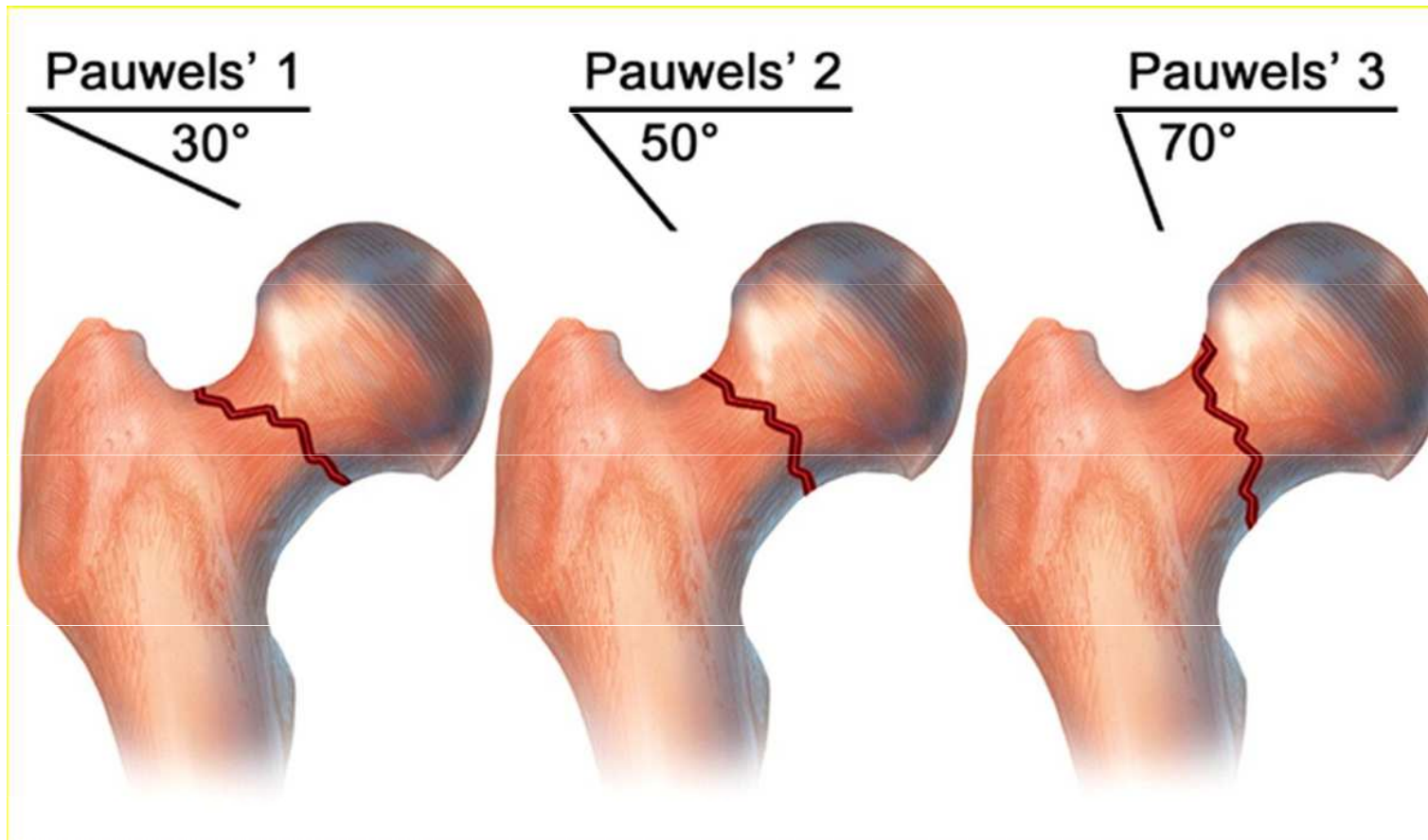
# AO classification

<b>Trochanter</b> 	<b>31-A1</b> perthrochanteric simple  <a href="#">i</a> <a href="#">▶ proceed</a>	<b>31-A2</b> perthrochanteric multifragmentary  <a href="#">i</a> <a href="#">▶ proceed</a>	<b>31-A3</b> intertrochanteric  <a href="#">i</a> <a href="#">▶ proceed</a>
<b>Neck</b> 	<b>31-B1</b> subcapital, with slight displacement  <a href="#">i</a> <a href="#">▶ proceed</a>	<b>31-B2</b> transcervical  <a href="#">i</a> <a href="#">▶ proceed</a>	<b>31-B3</b> subcapital, displaced, non impacted  <a href="#">i</a> <a href="#">▶ proceed</a>
<b>Head</b> 	<b>31-C1</b> split (Pipkin)  <a href="#">i</a> <a href="#">▶ proceed</a>	<b>31-C2</b> with depression  <a href="#">i</a> <a href="#">▶ proceed</a>	<b>31-C3</b> with neck fracture  <a href="#">i</a> <a href="#">▶ proceed</a>

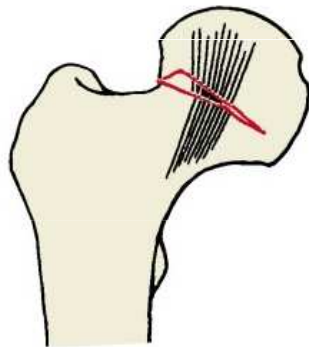
# Femoral neck fractures

- 6% of all fractures
- 2 typical groups –
  - females, older age (max. about 78 yrs), minimum stress
  - males, younger, high energy injury – traffic accidents, falls
- diagnostics –
  - anamnesis
  - clinical exam – external rotation, shortening, pain during motion
  - X-ray – pelvis + injured hip
- 2 types –
  - intracapsular – subcapital, mediocervical, transcervical
  - extracapsular – basicervical, lateral

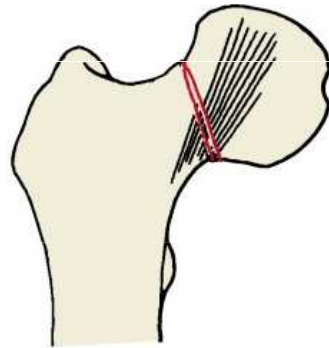
# Pauwels classif. (1951)



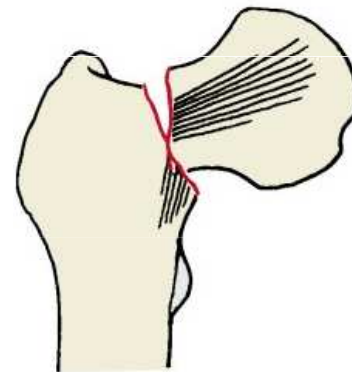
# Garden classif. (1961)



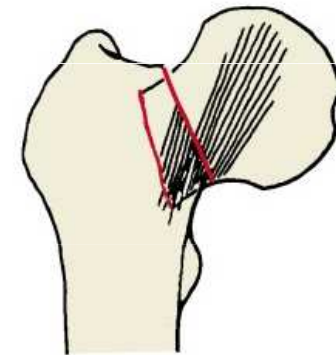
Grade I



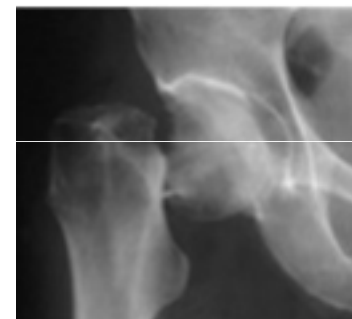
Grade II



Grade III



Grade IV



# Therapy

## Conservative

- Without dislocation + impact fractures
- Short life expectancy
- immobile pts before injury
- Contraindication of surgery

Bed rest with gradual careful physiotherapy

# Therapy

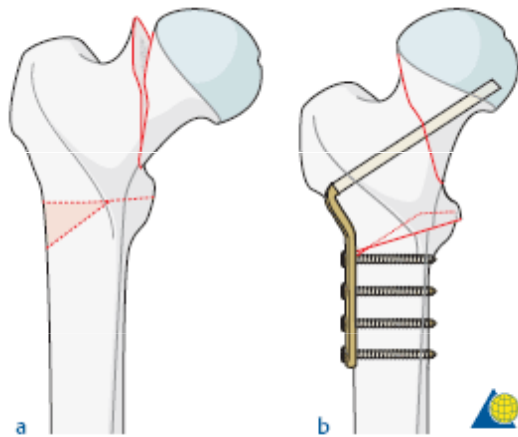
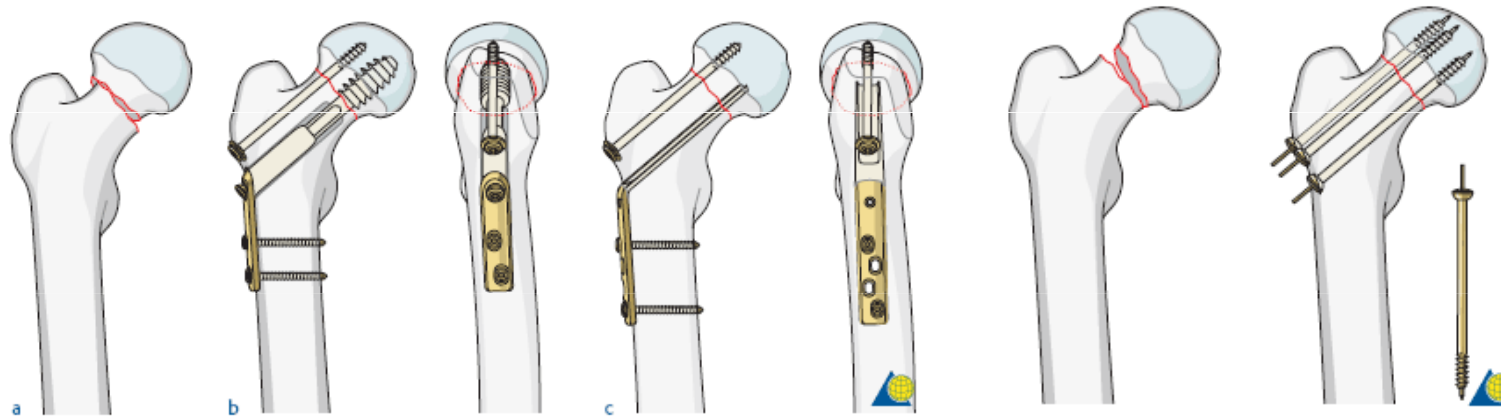
## Osteosynthesis

- Non dislocated a partially dislocated fract. without degenerative arthritis
- dislocated fract. In young pts without degener. arthritis

## Options

- DHS (dynamic hip screw)
- Lag screws
- PFN (proximal femoral nail)
- 130° condylar plate + lag screw

# osteosynthesis



valgisation osteotomy, AO plate –  
Abandoned

# DHS

Dynamic hip screw

1962 Massie

Richard Manufacturing Co.,  
USA



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PFN – proximal femoral nail



# 130° condylar plate



# Therapy

## – Alloplasty

- Older pts with degenerative arthritis
- dislocated fract
- Longer time span after inj
- Head avascular necrosis or pseudoarthrosis

## – Options

- CKP
- THA

**F, 86 yrs**

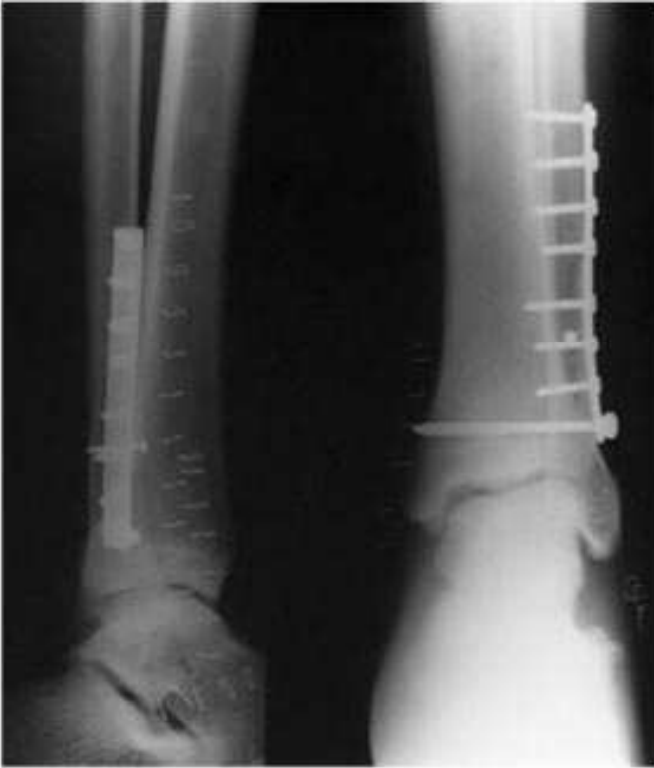
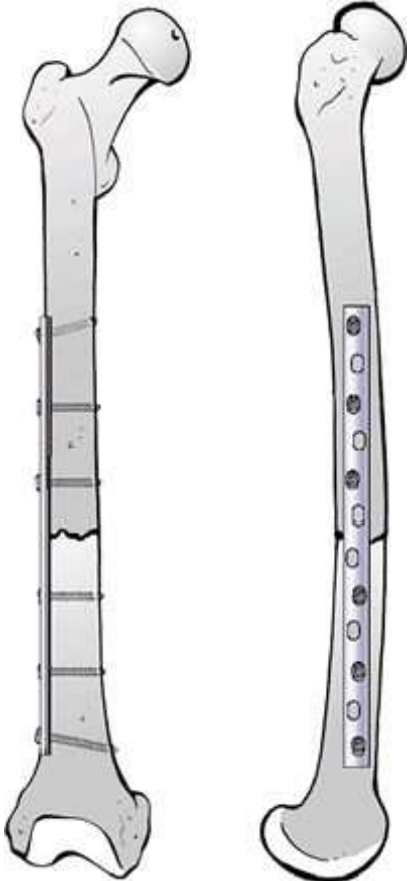


**M, 80 yrs**



# Osteosynthesis of the femur

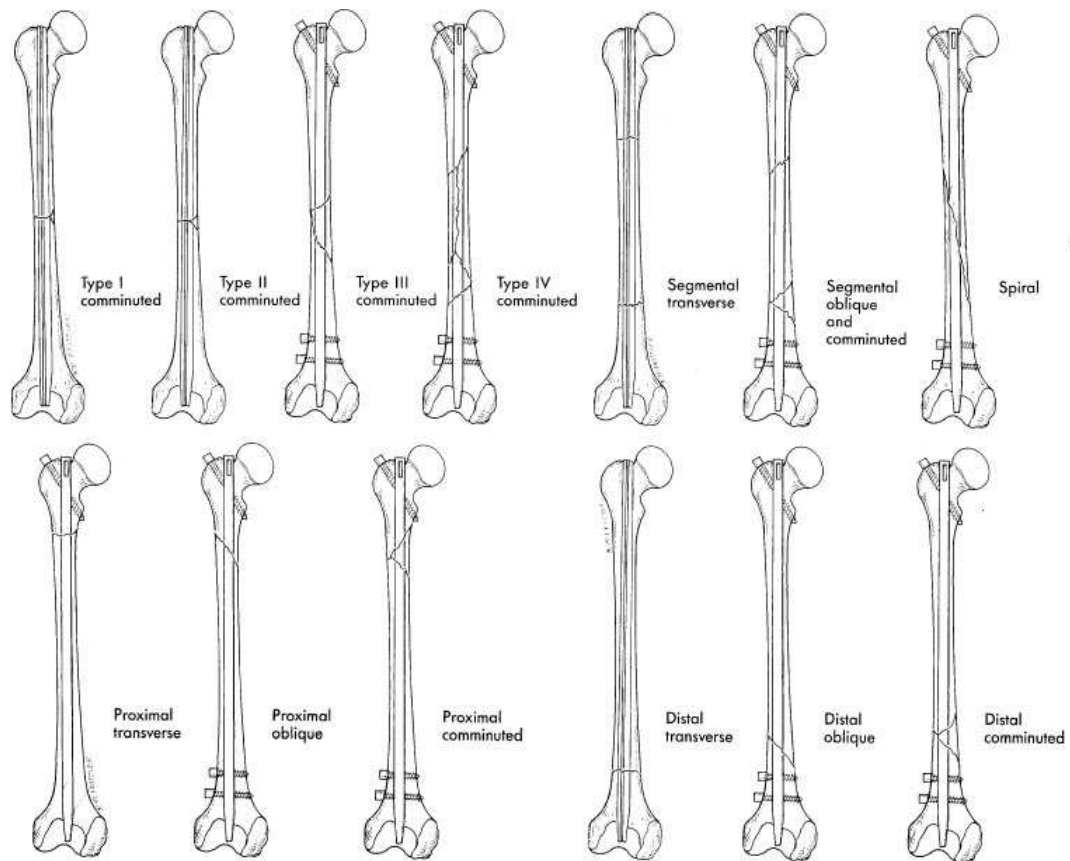
# OS with plate + screws



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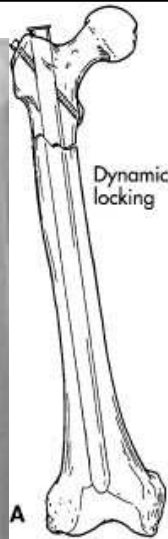
# OS w. intramedular nail



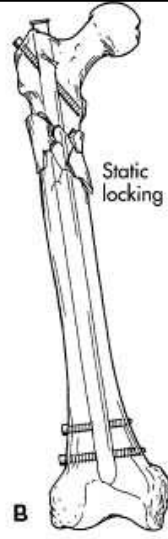
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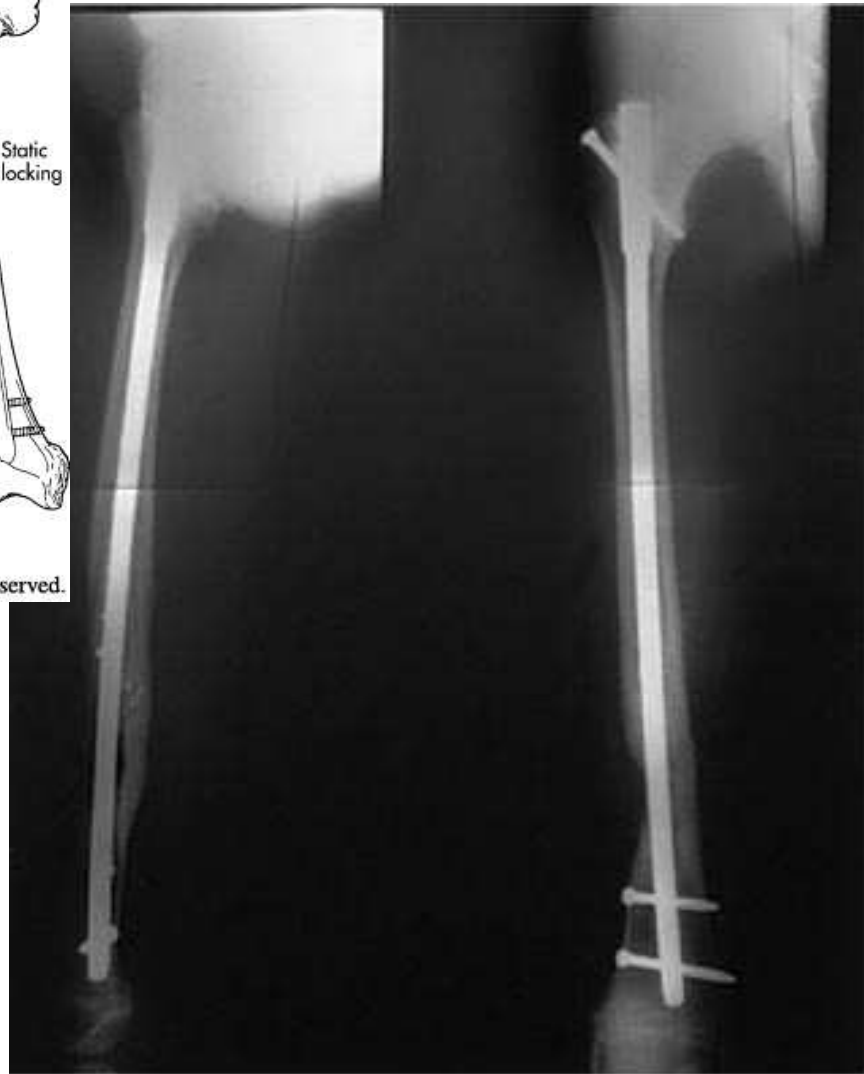


Dynamic locking



Static locking

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# Hip degeneration

## Osteoartrosis

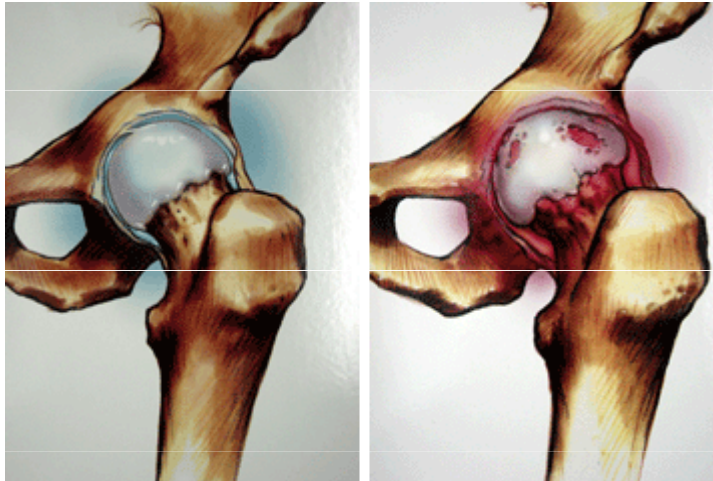
= non-inflammatory degenerative joint disease  
characterized by degradation of articular cartilage  
hips, knees, arms and small joints of the spine

## Osteoarthritis

### Signs:

- narrowing of the joint space
- loss of bone mass & sclerotization
- soft tissue changes

## Coxartrosis



## Gonartrosis



# Coxartrosis, Gonartrosis

## Risc factors:

**Age**

Sex

Genetic predispozition

Trauma

**Obesity**

# **Coxartrosis, Gonartrosis**

## **Therapy:**

Regime measures (activity, adequate body weight)

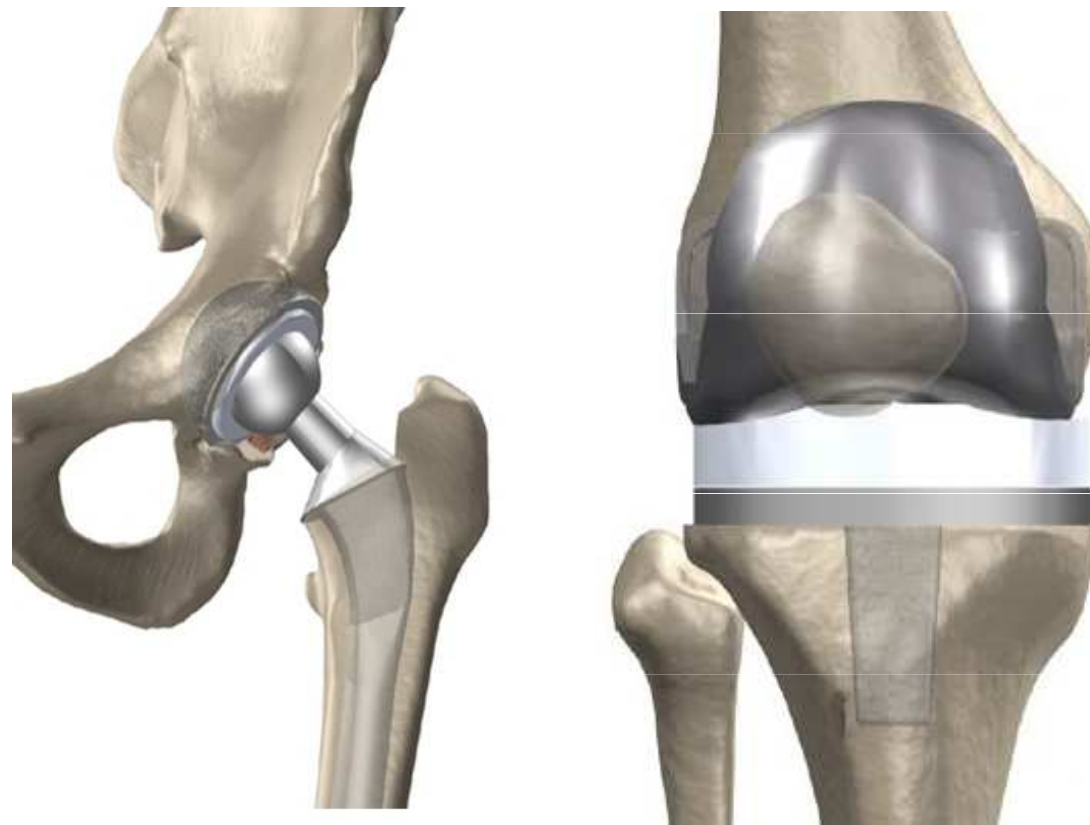
Farmakologic (analgetics, chondroprotectives)

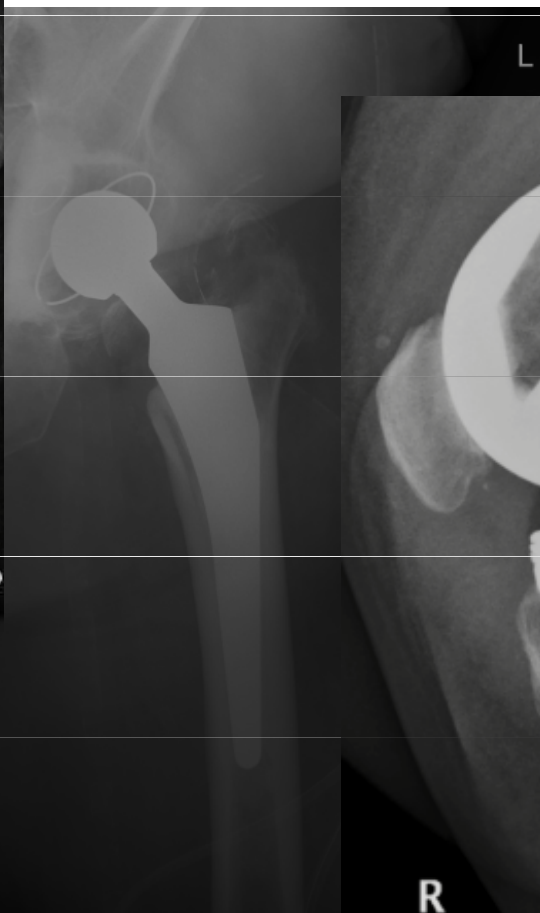
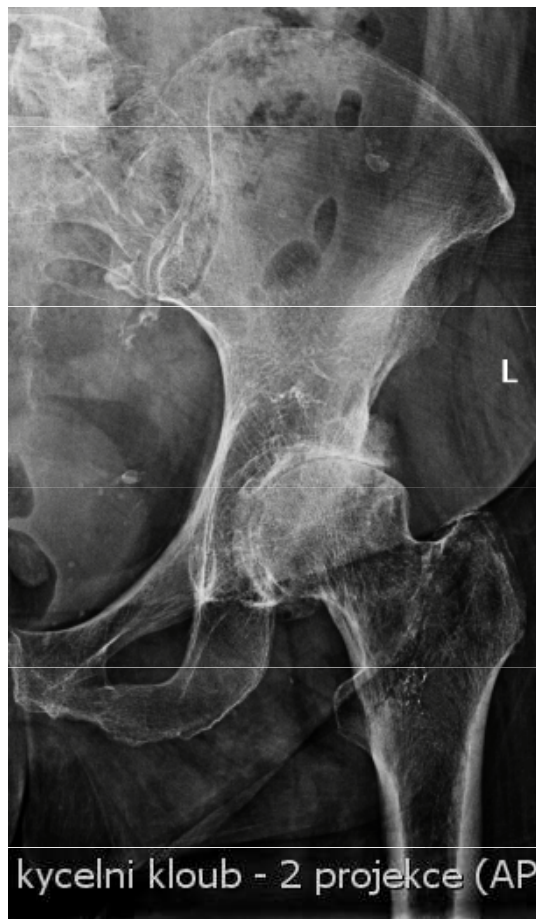
## **Surgical**

## Coxartrosis, Gonartrosis

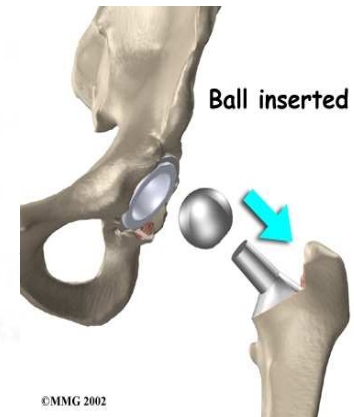
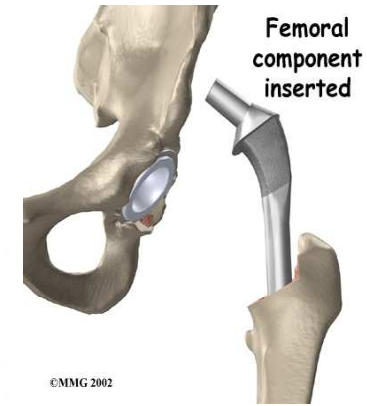
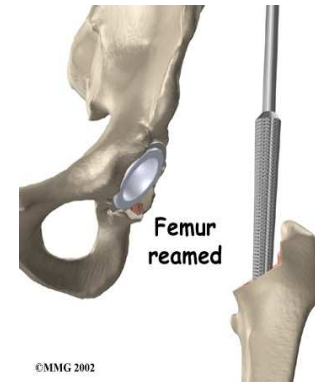
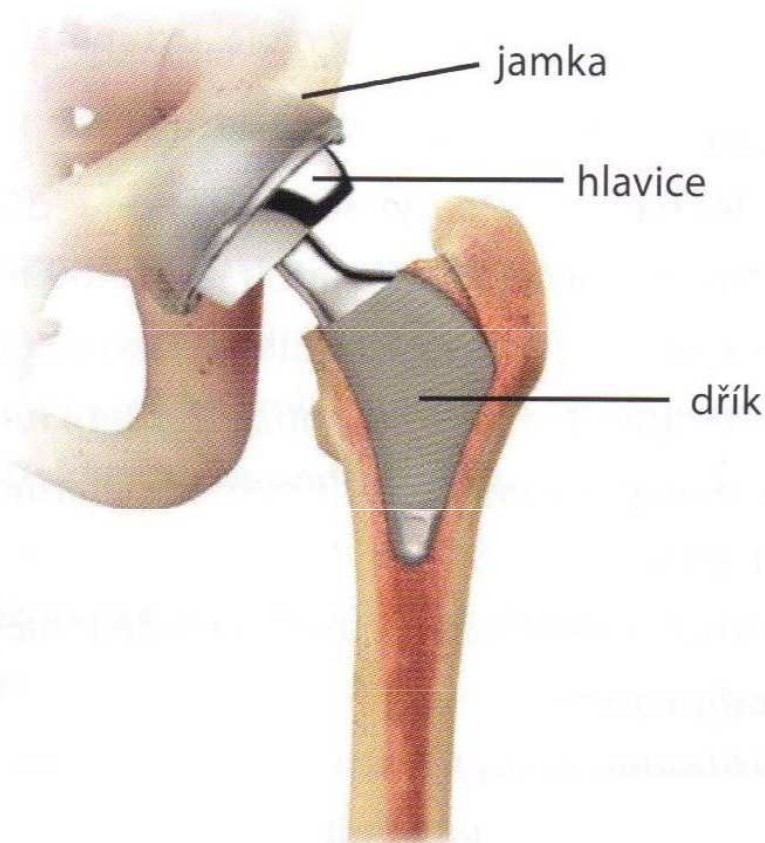
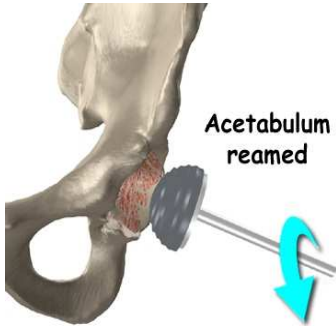
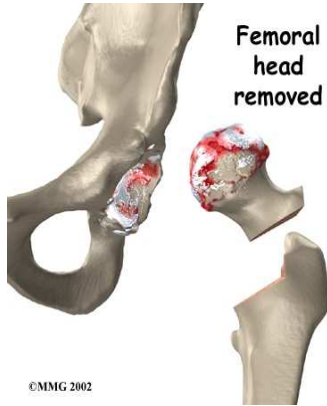
Therapy:

Surgical – Total Joint Arthroplasty (**THA / TKA**).

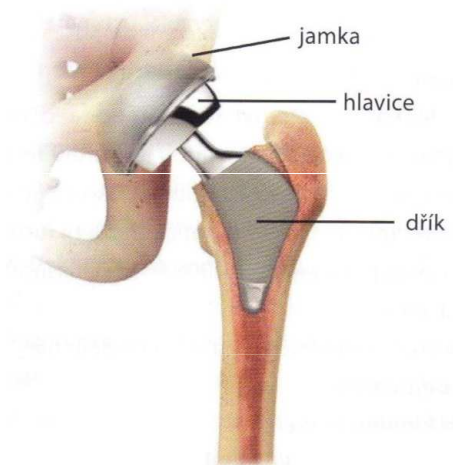




# THA







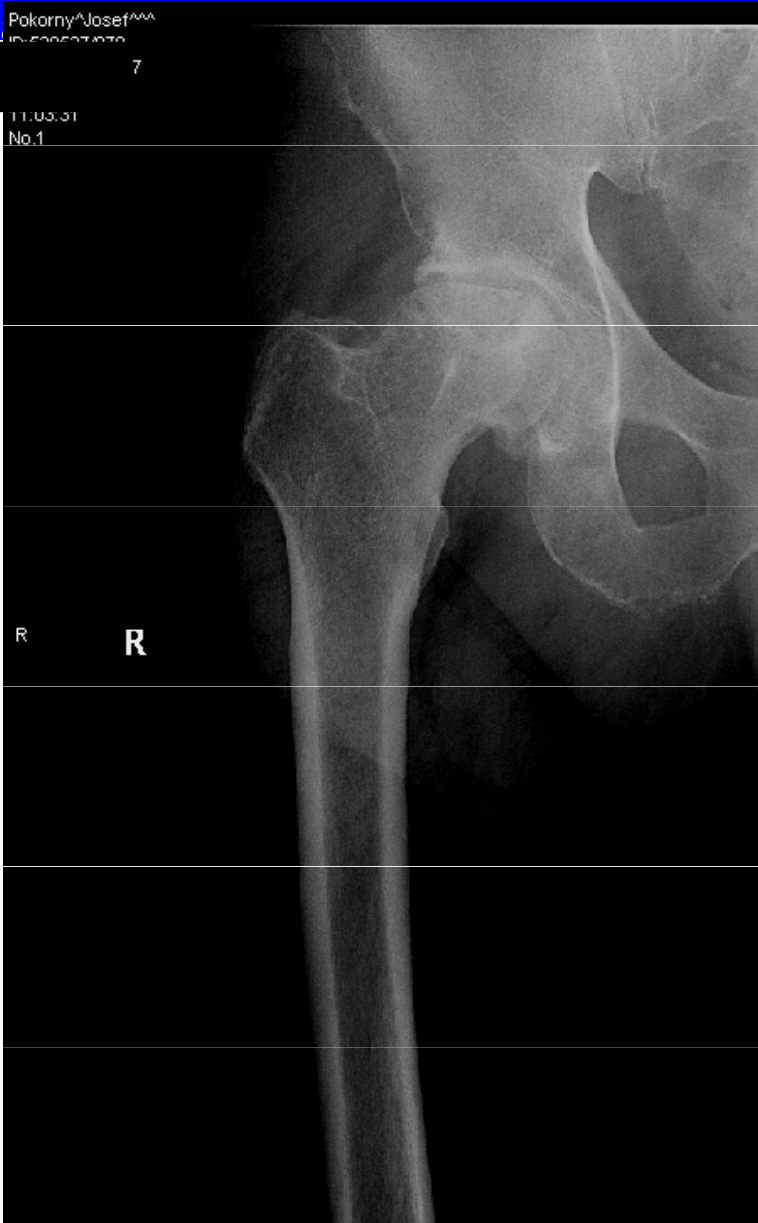
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7

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No.1

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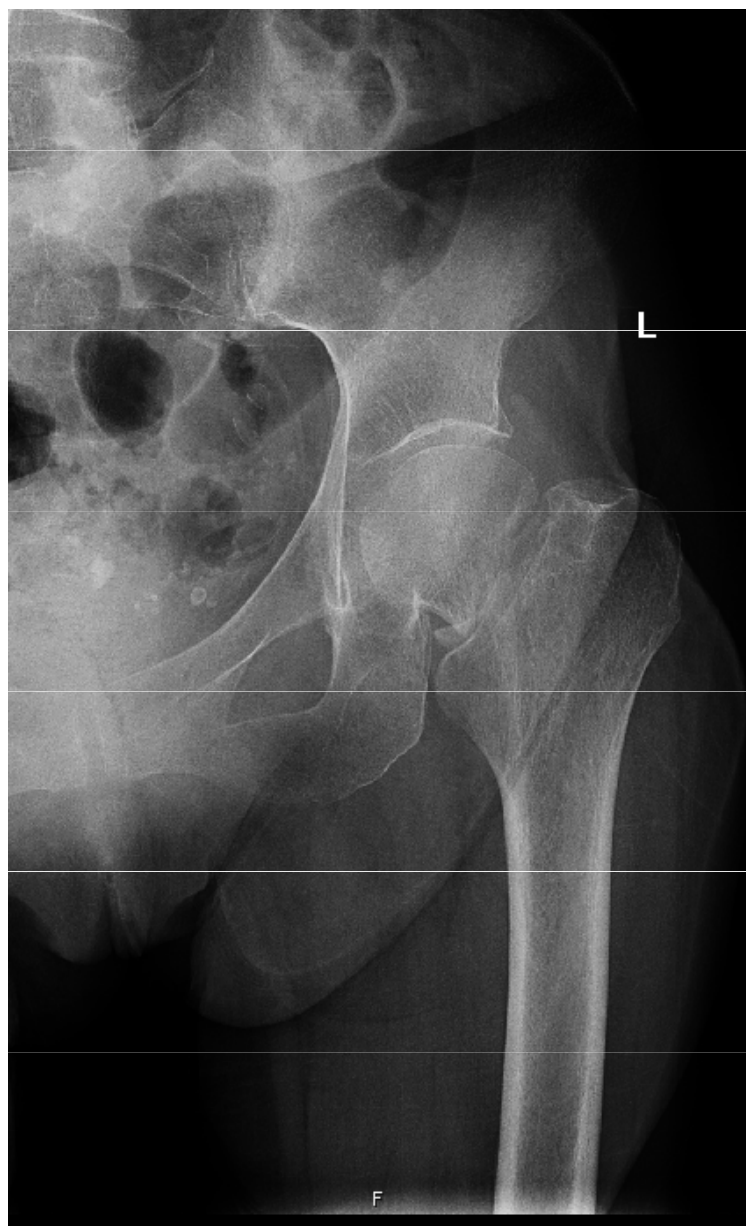


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nar. 1980. posttraumatic osteoarthrosis

2008-04-18  
11:01:58  
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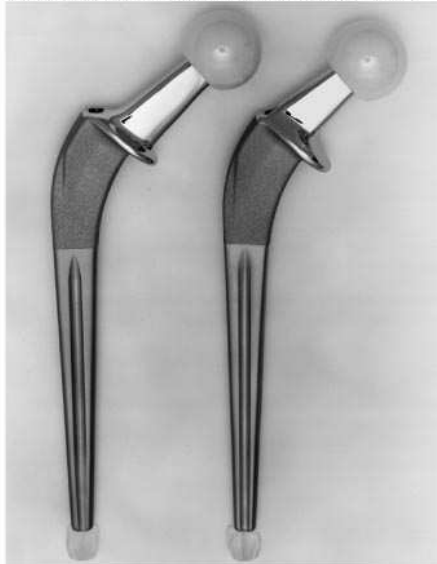




# Uncemented THA - stem



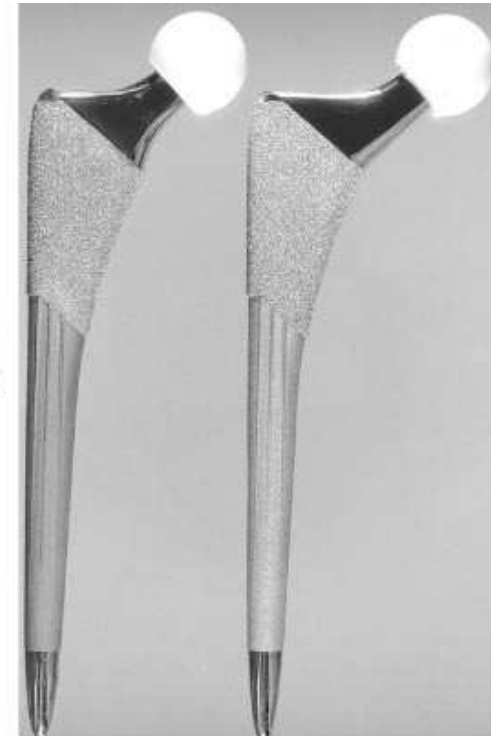
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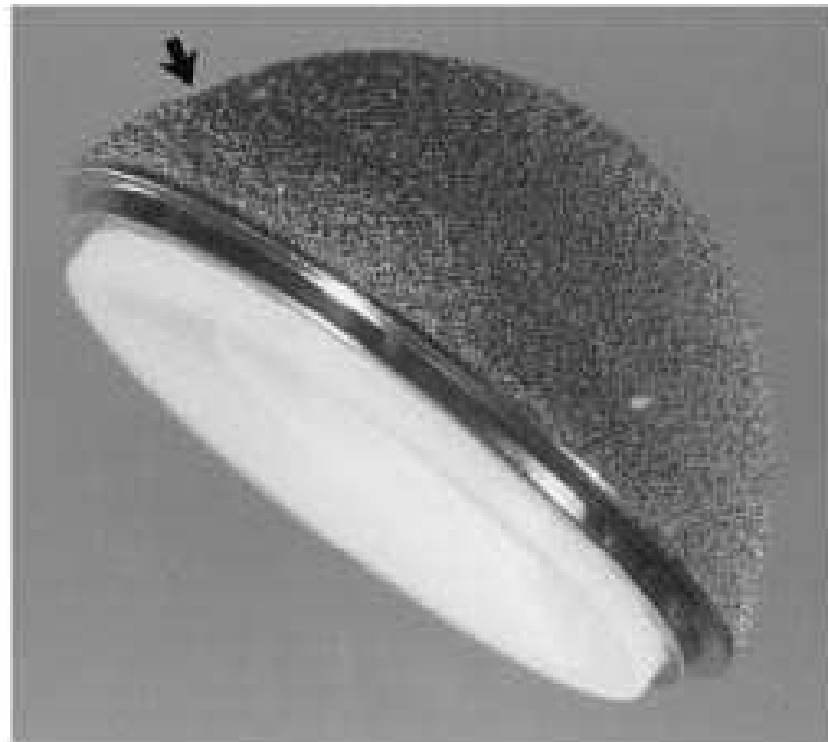
37  
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# Uncemented THA – cup

A



B



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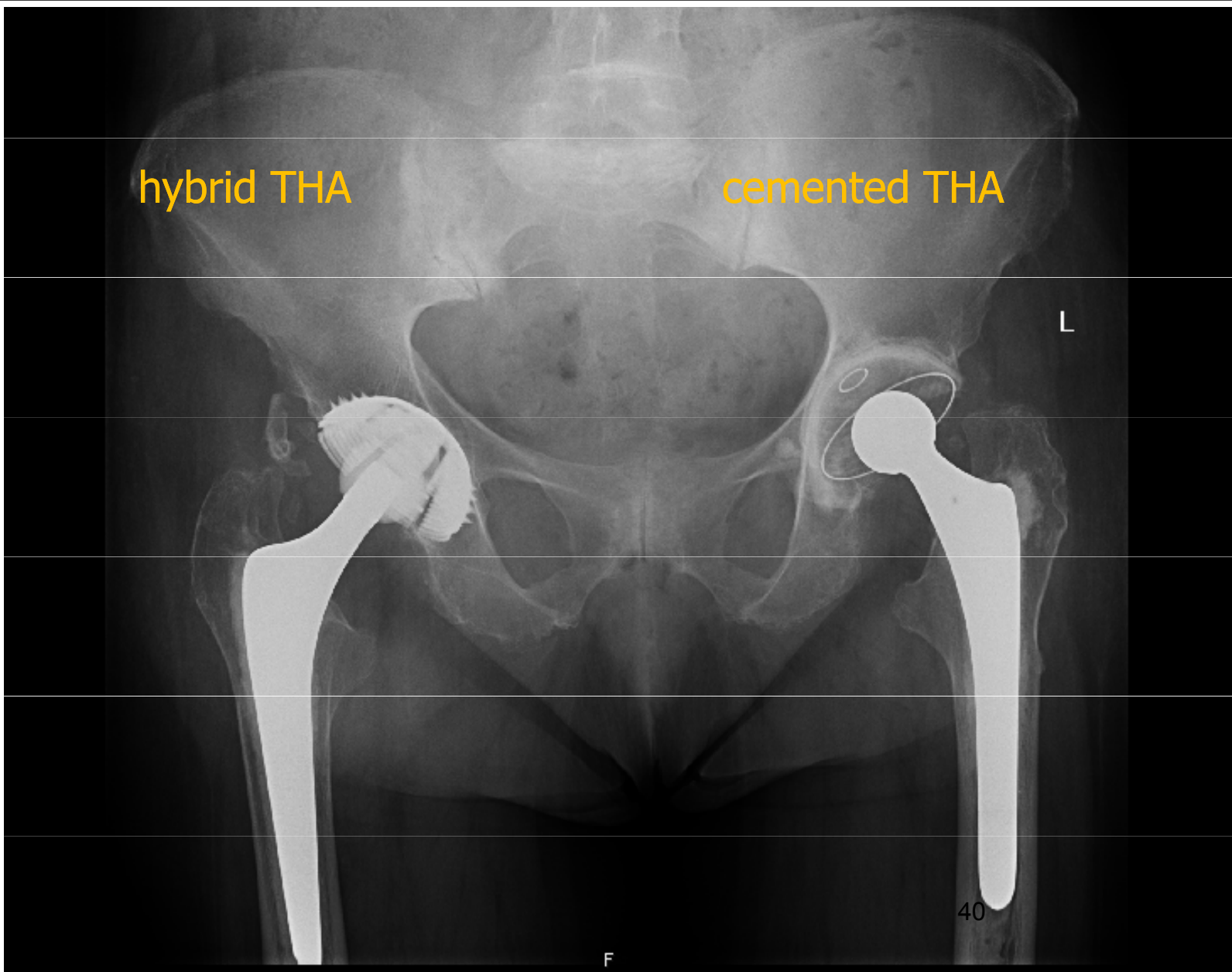
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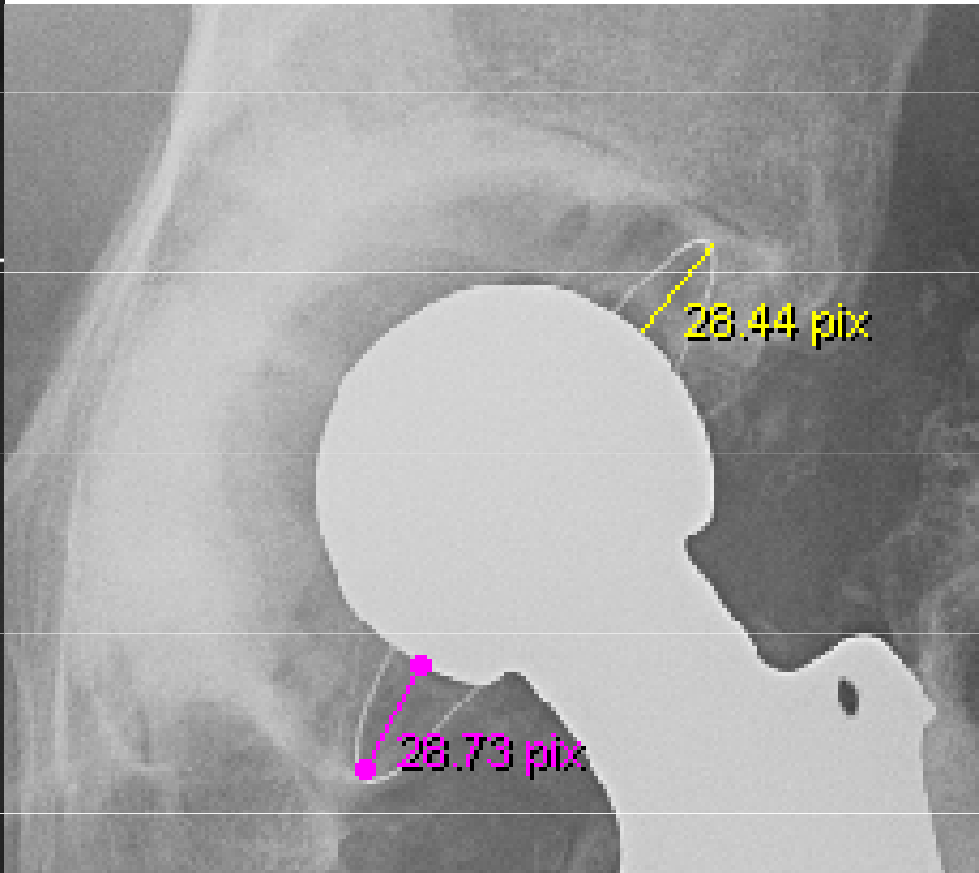
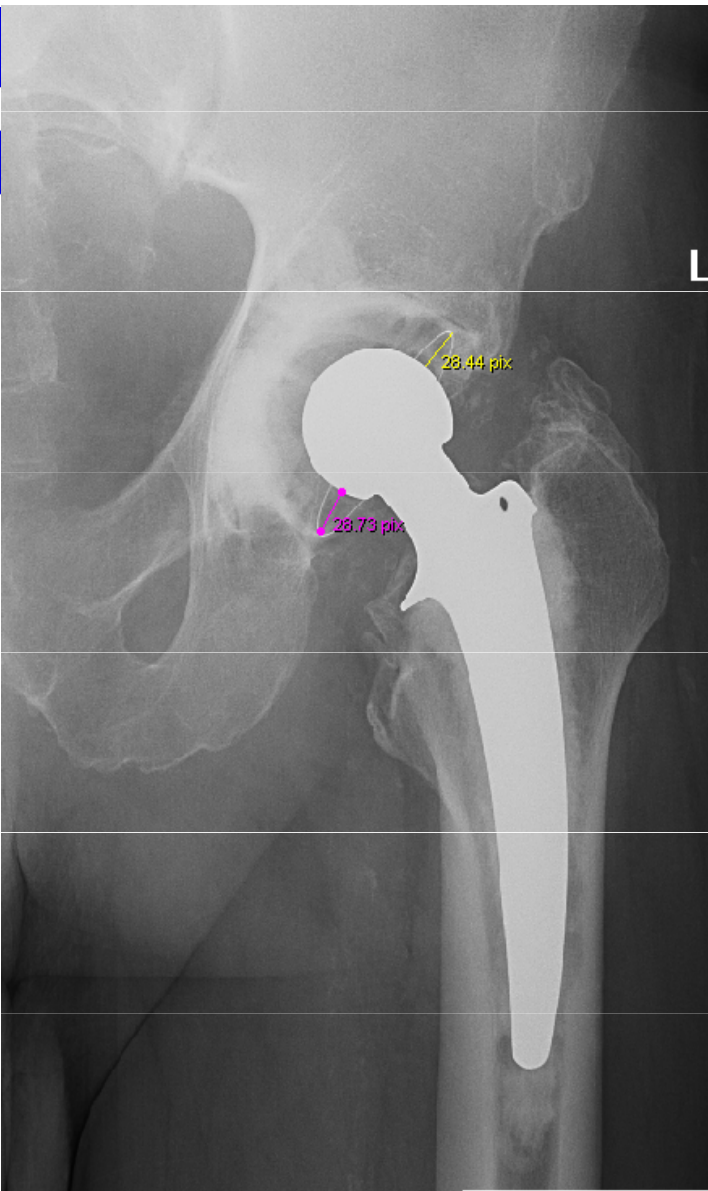


hybrid THA

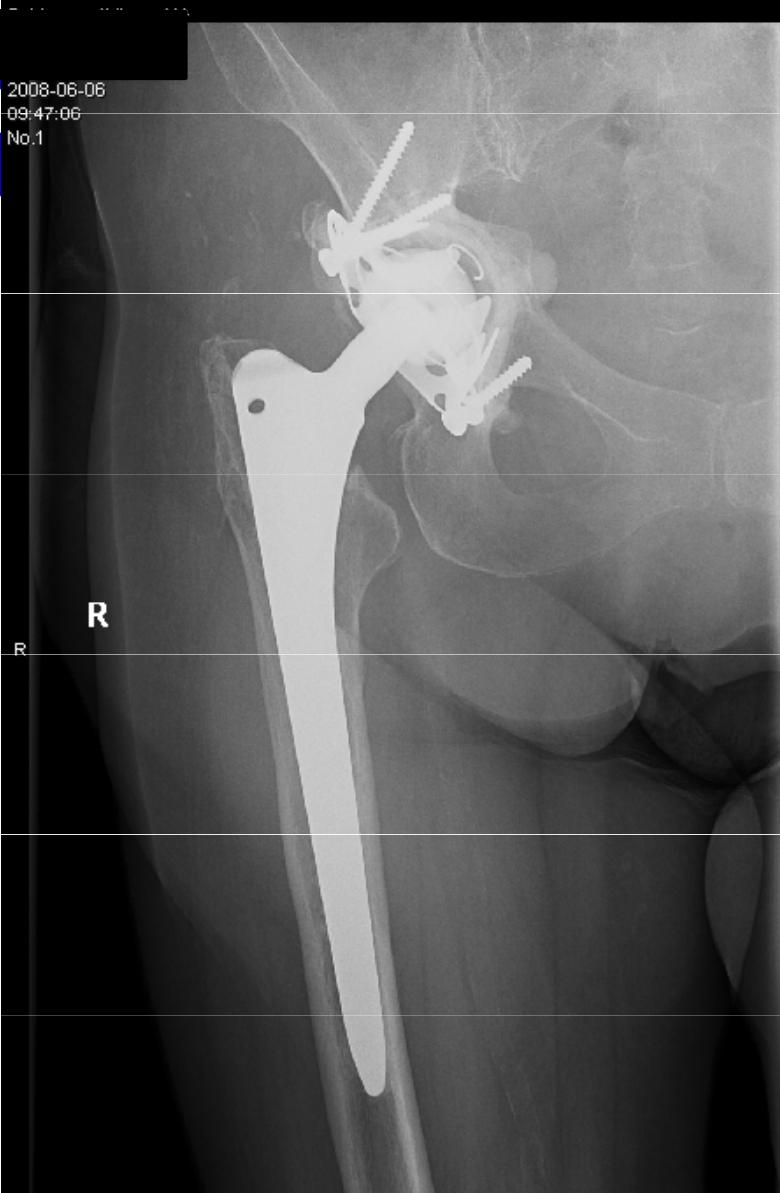
cemented THA







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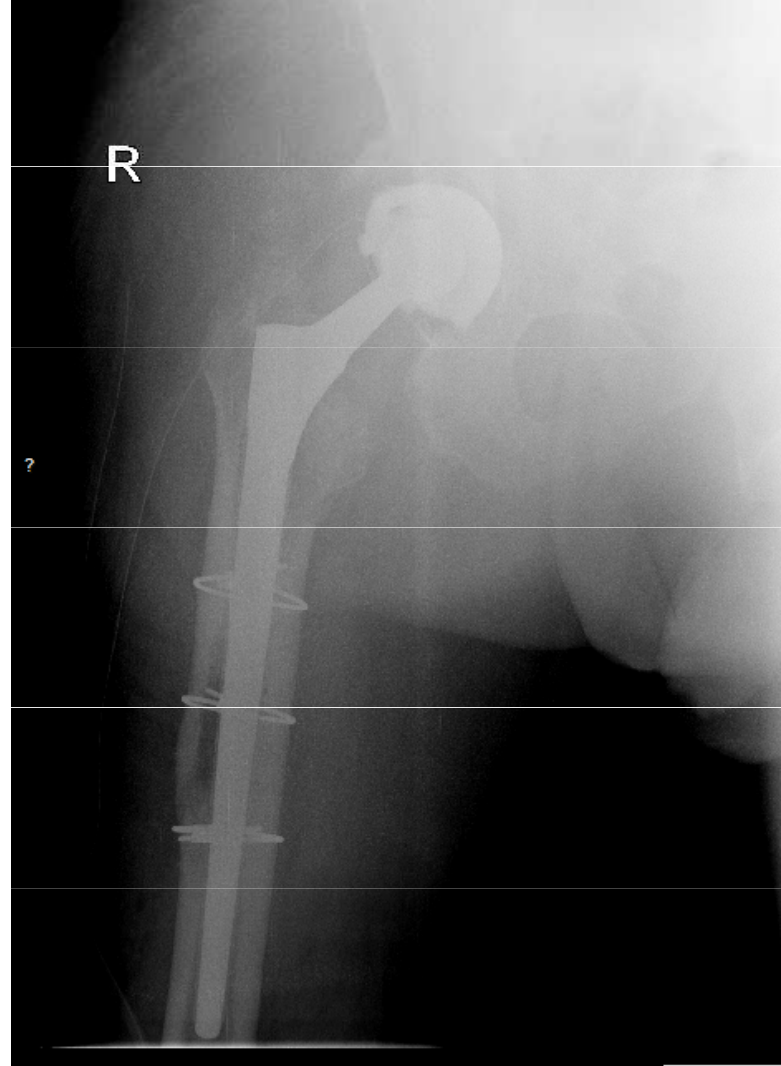


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2009-01-09  
09:09:08  
No. 1

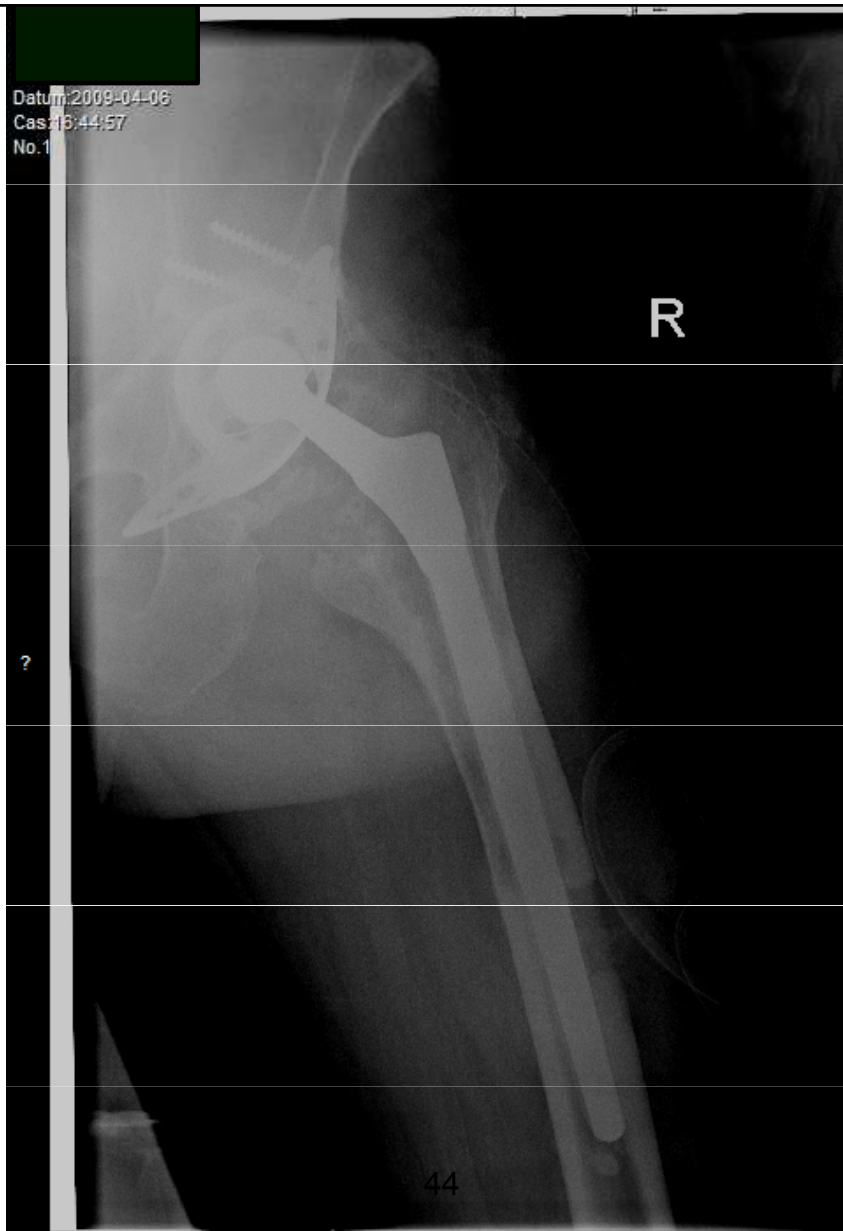
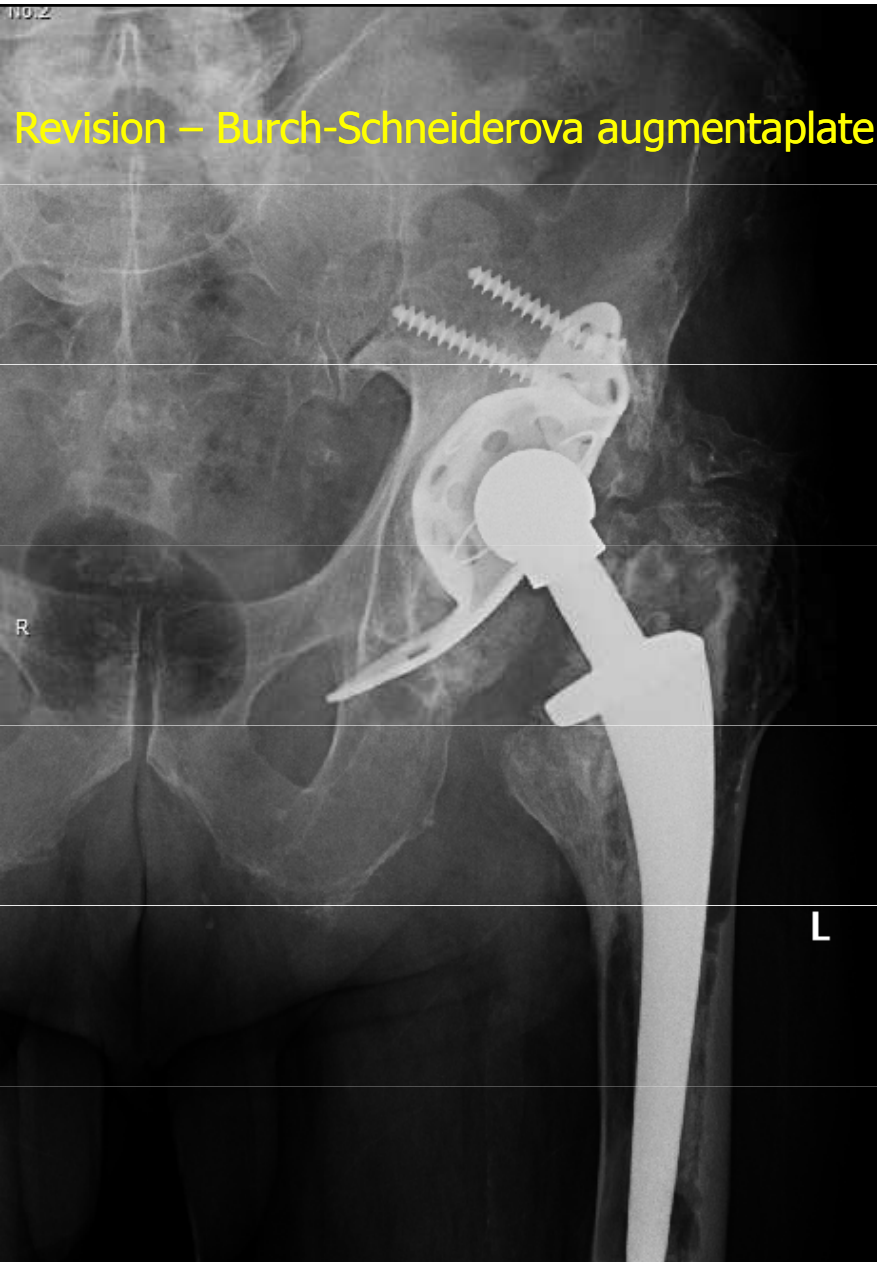


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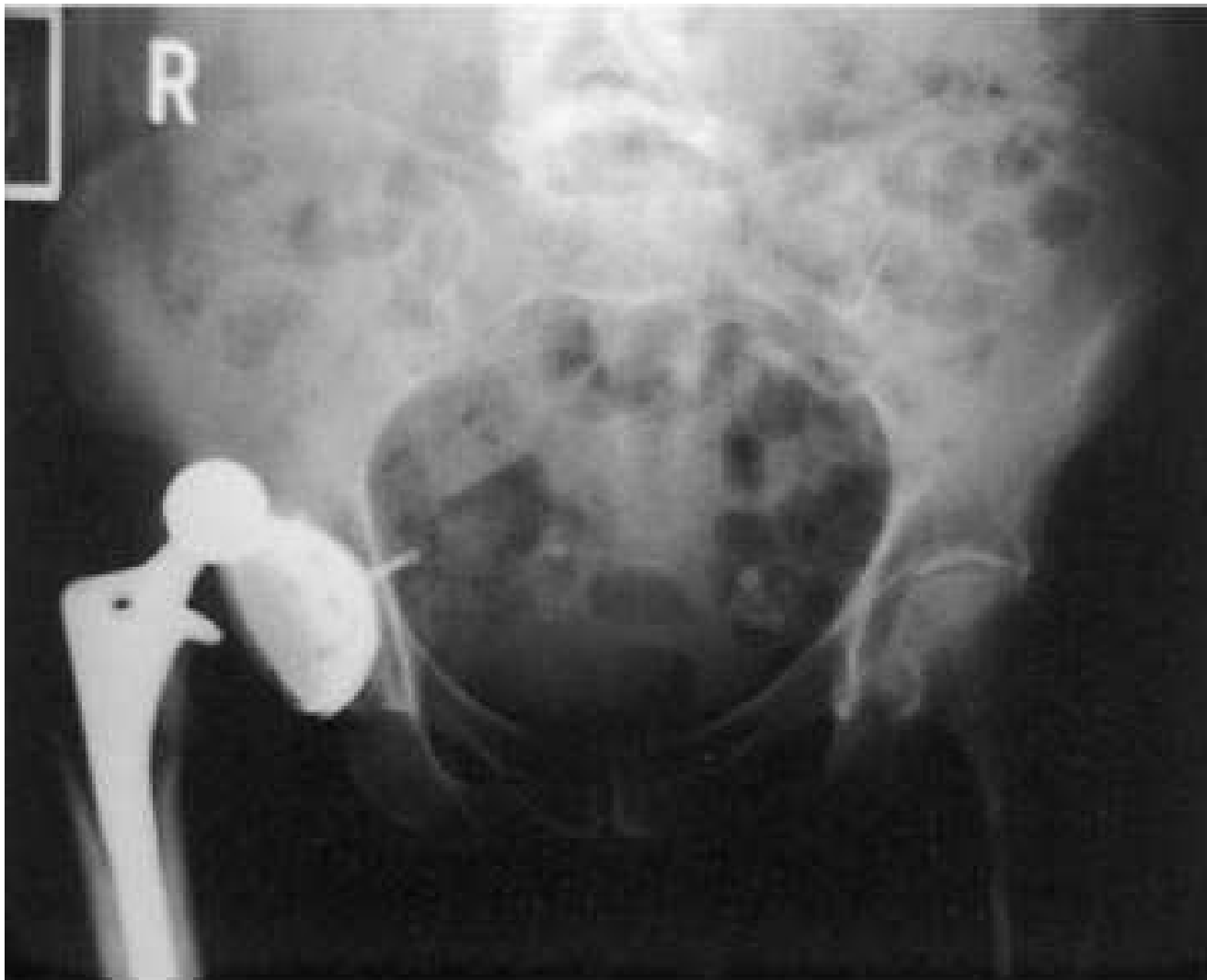
110,2

# Revision – Burch-Schneiderova augmentaplate



## Dislocation of endoprosthesis

- the patient is at risk at any time, even years after surgery
- **necessity to comply with the regime measures** postoperatively !!



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# Solution of hip THA complications

## luxation:

- articulation without / with anesthesia, surgery
- orthosis, event. plaster spike
- reoperation (replacement of components)
- TEP extraction

## □infection

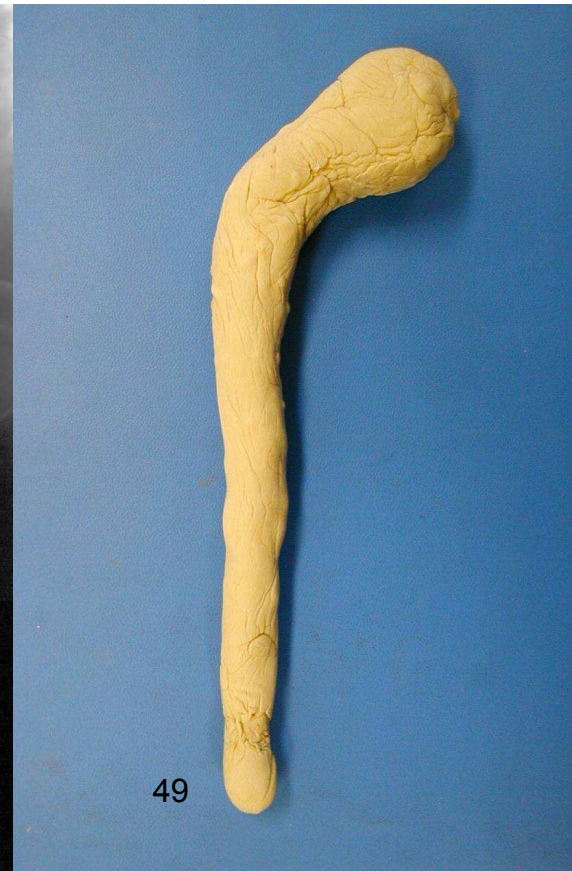
- flush drainage, antibiotics
- temporary removal of TEP, rinsing or carrier with antibiotic, possibly. spacer
- permanent removal of the endoprosthesis

**Infect** - septic release of the endoprosthesis



# Infection loosening of THA

- spacer (cement with gentamicin) introduced after extraction





SPACER



Extraction of THA



reimplantation  
THA uncemented

# Extracted THA




# Periprotetic fx.





Fakultní nemocnice Bohunice  
"Thunder Platform"

Q: 95% 

Skarda\*Stanislav  
ID:390313/410  
DoB:1939-03-13  
2007  
12:17  
No.2

C: 7299  
W: 15916

L

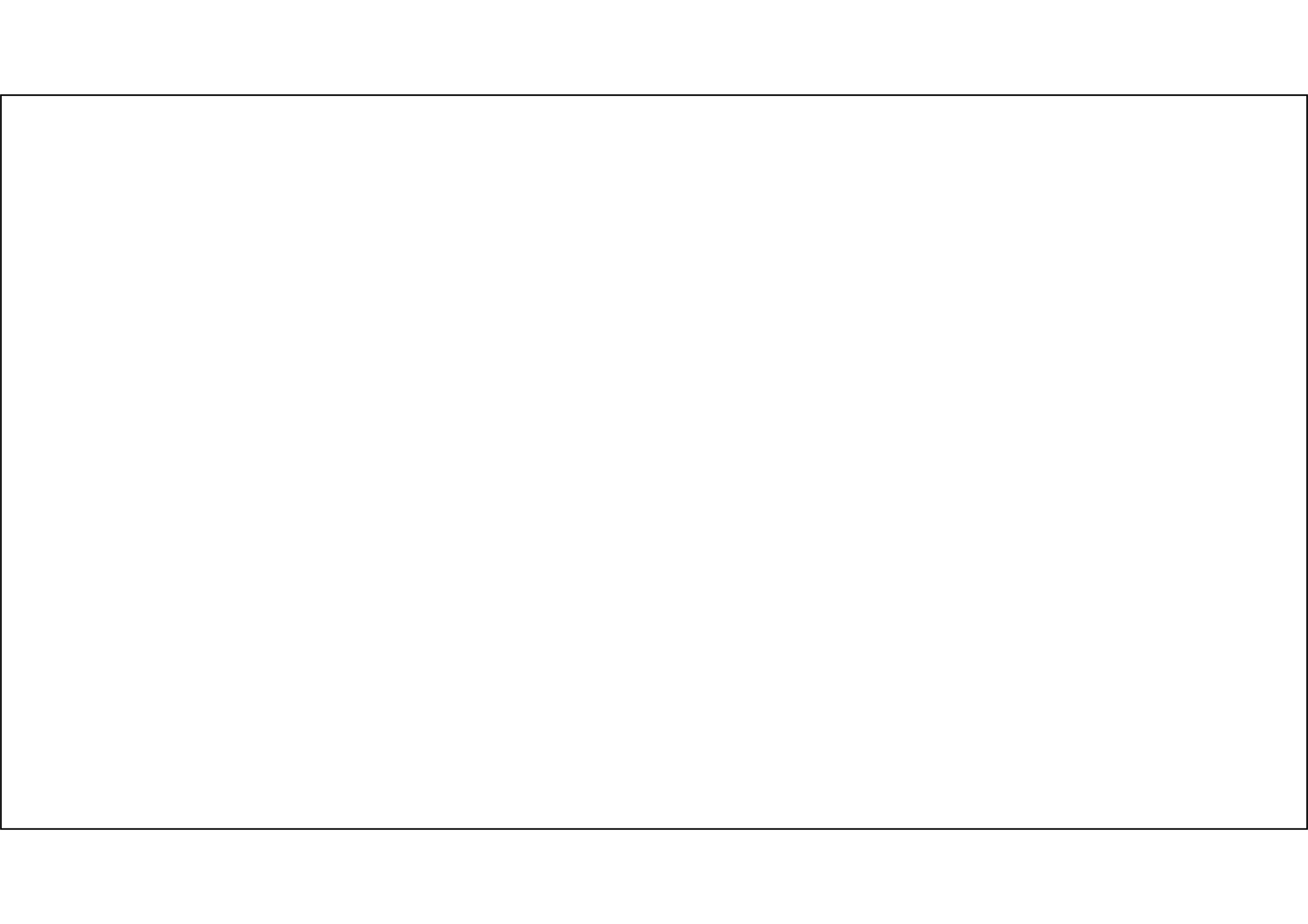
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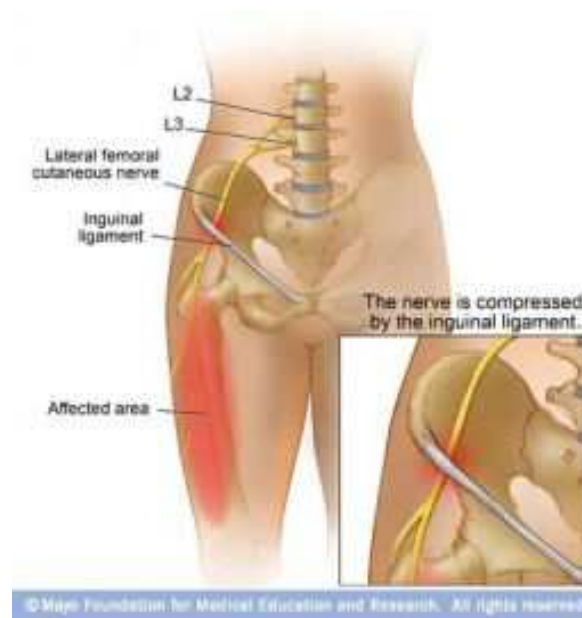
53

F



# Meralgia paresthetica

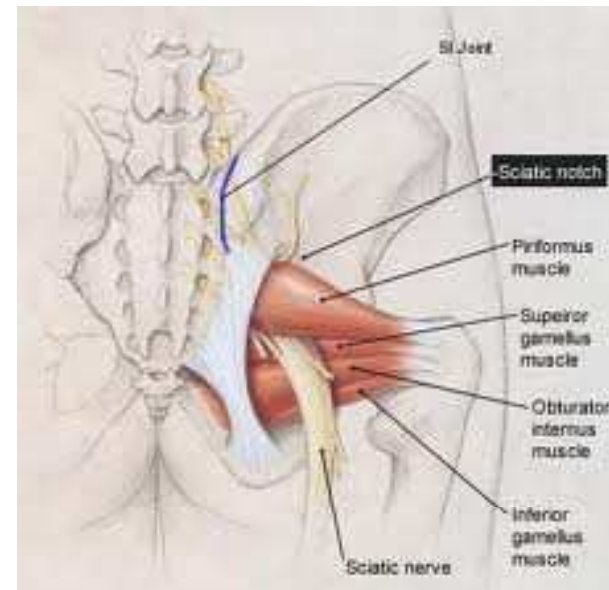
- Compression of the *cutaneus femoris lateralis* during passage to the thigh in the fibrous canal of the fascia lata medially from SIAS
- Burning pain and
- hypesthesia on the external
- thigh area
- Disposition - **obesity**, tight clothing
- Therapy - regime measures,
- NSAID, corticoid injection,
- (surgical resection)



# Piriformis syndrom

=irritation of n.ischiadicus  
rare  
nerve compression by m.piriformis  
rigid fibers as it passes through the  
foramen infrapiriforme

Buttock pain, tingling with  
propagation along the back of the  
thigh and lower leg





Gluteus maximus  
(cut)

Superior gluteal  
nerve, a. & v.

Inferior gluteal  
nerve, a. & v.

Sacrospinous  
ligament

Ischial tuberosity

Gluteus medius m.

Piriformis m.

Superior gemellus m.

Obturator internus m.

Inferior gemellus m.

Sciatic nerve

Quadratus femoris m.

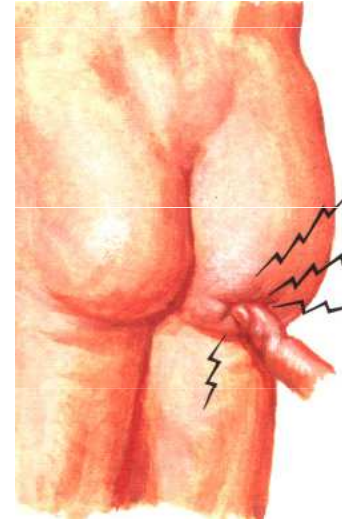
Thieme Atlas of Anatomy  
Fig. 27.32 C, pg. 438



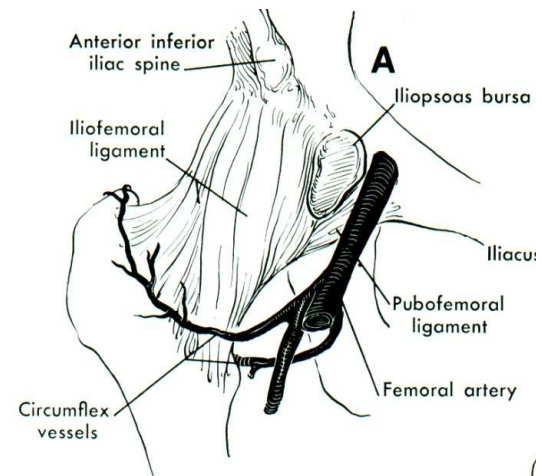
MUNI  
MED

# Bursitis and enthesopathy in the hip area

Trochanter maior  
Tuber ossis ischii  
Bursa ileopectinea  
Gracilis syndrom (natažené třísla)  
Spina iliaca ant. sup.  
Spina iliaca ant inf.



Obr. 9



Obr. 10

**KNEE**

# Soft tissues injury of the KNEE

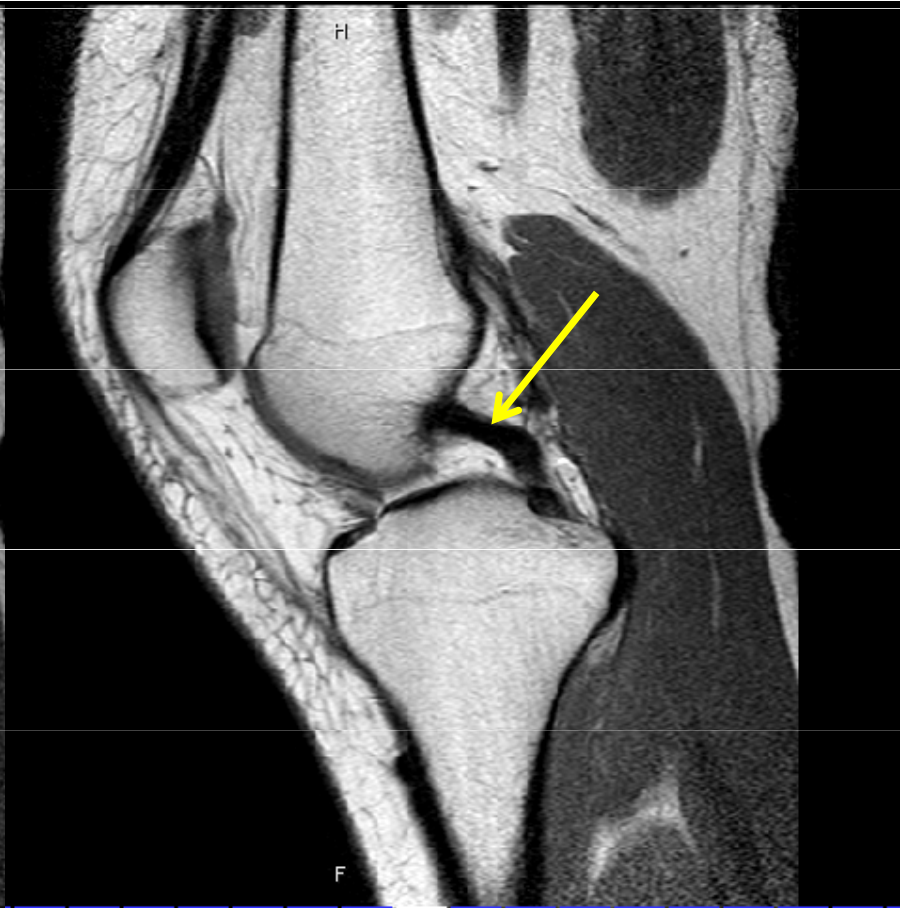
NMR examination



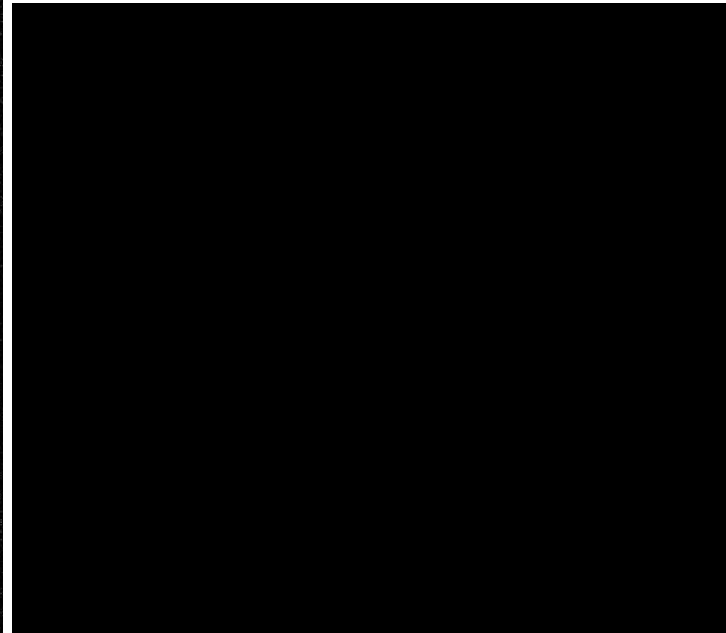
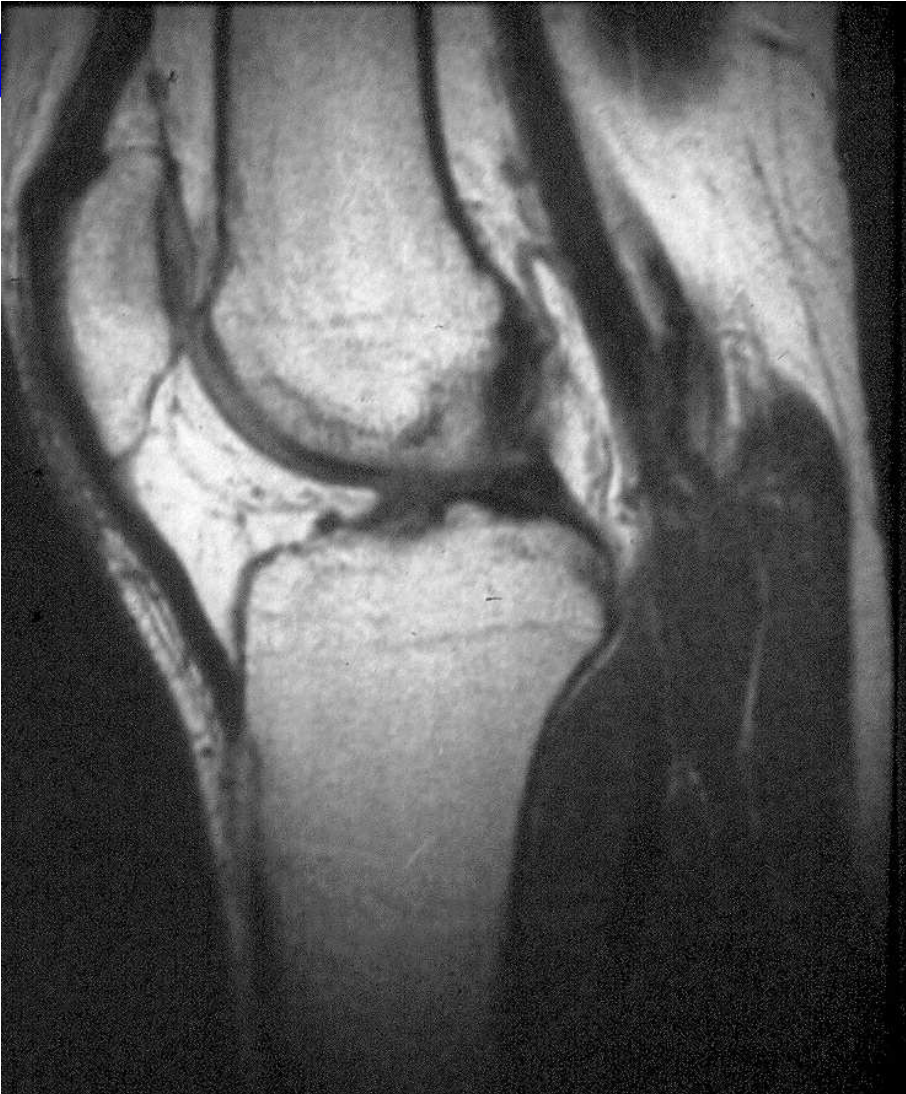
ACL – anterior cruciate lig.



PCL – posterior cruciate lig.



Rupture of ACL



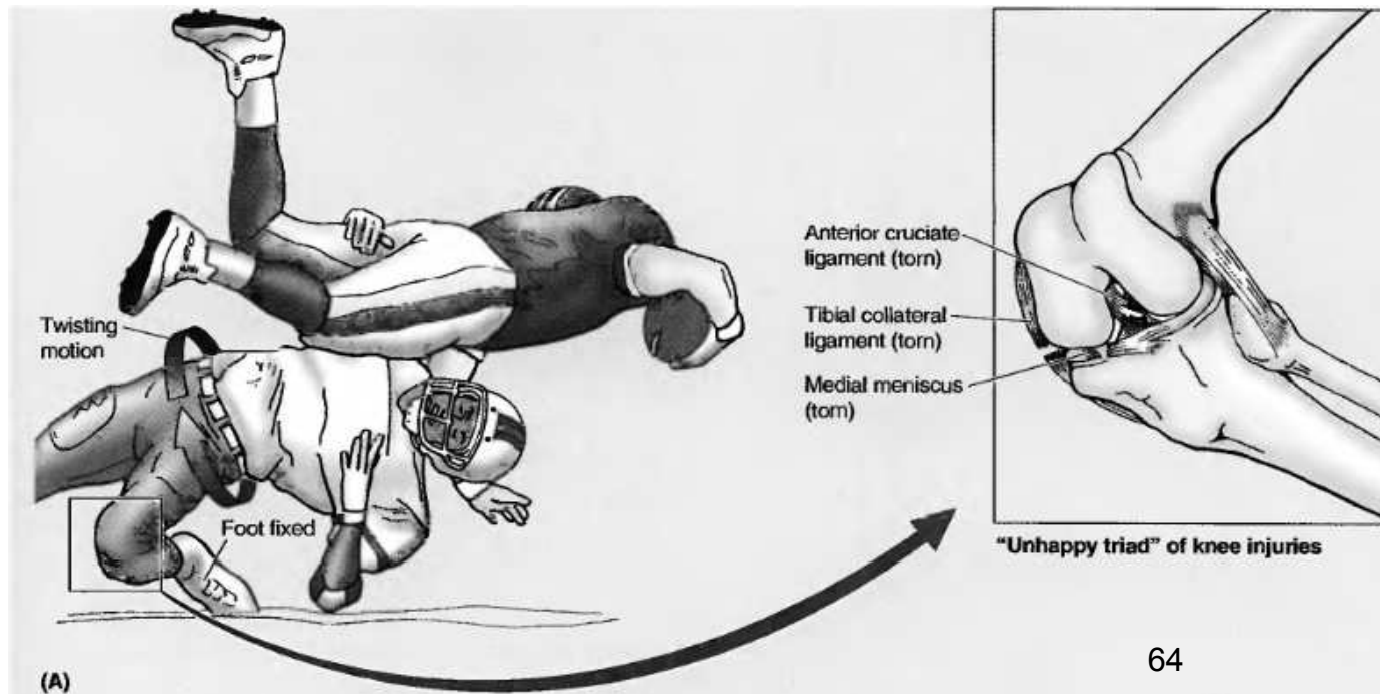
## Injury of the soft tissues of the knee

### Unhappy trias:

anterior cruciate - rupture

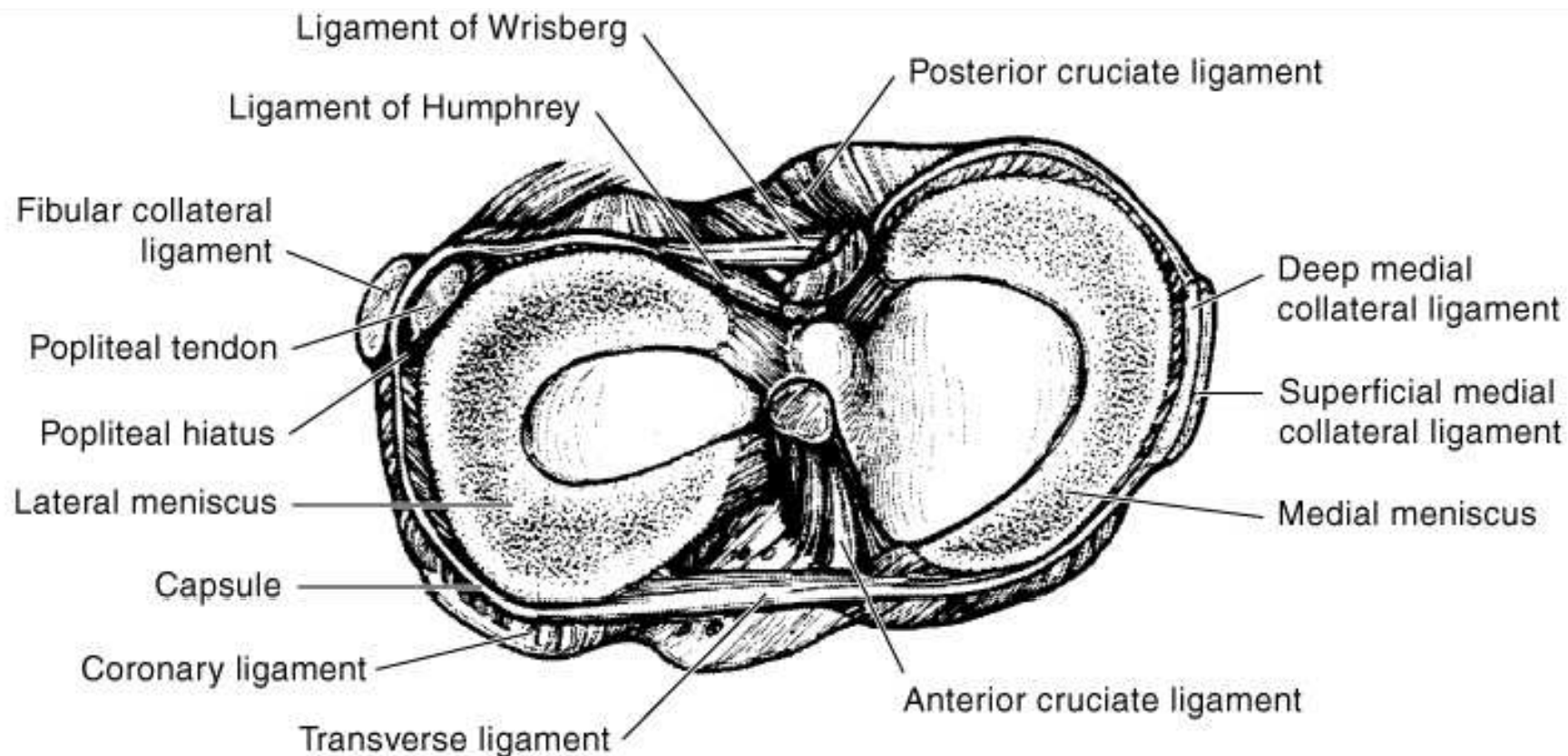
medial collateral - rupture

mediální meniskus - rupture

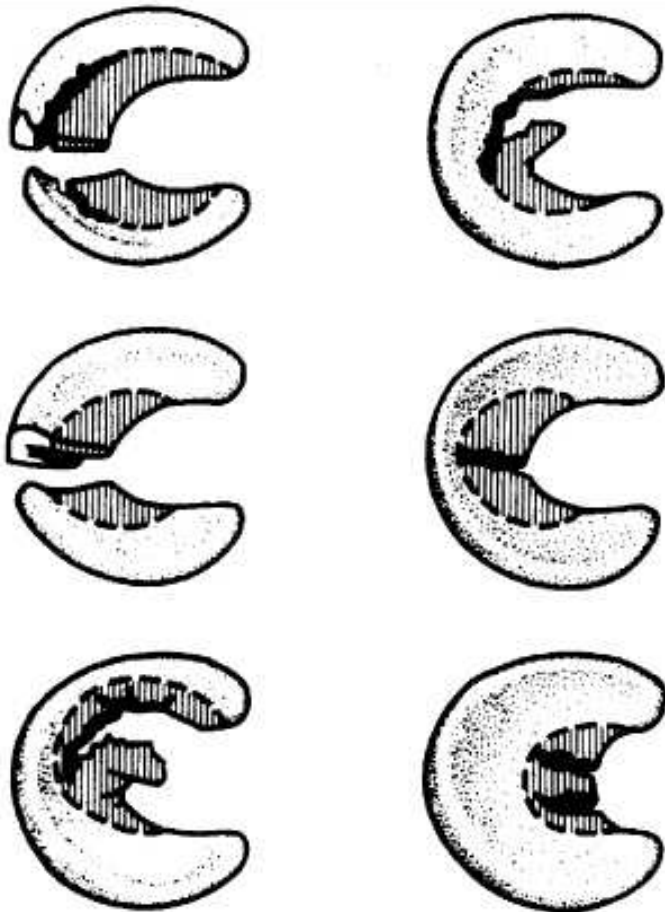




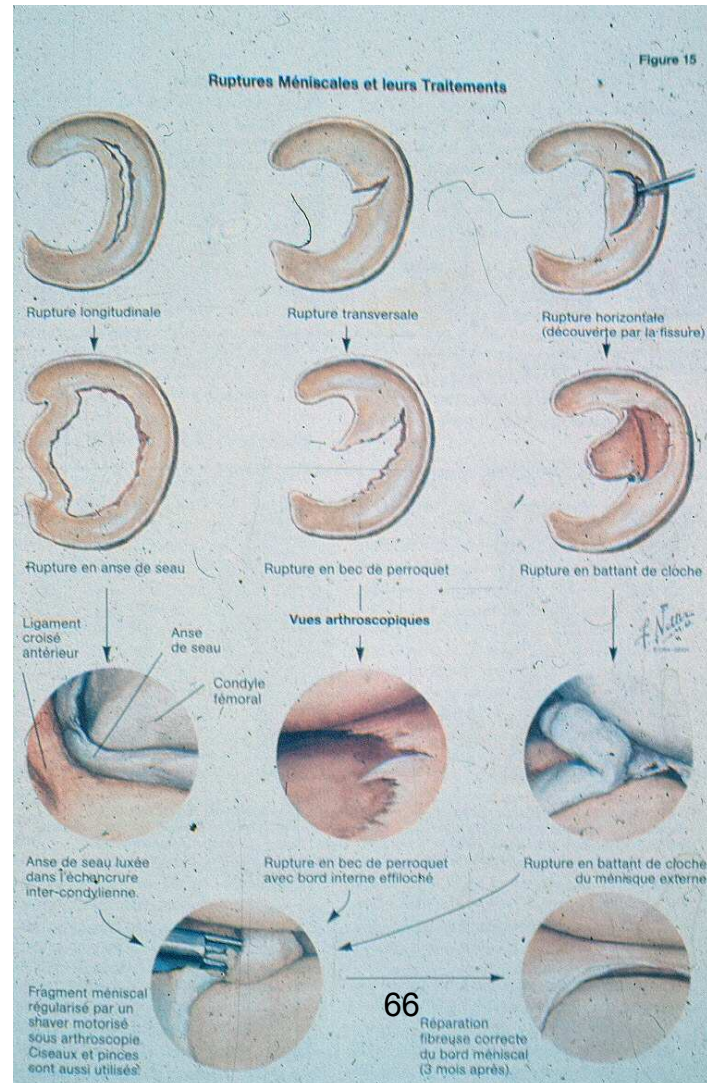
# Injury of the soft tissues of the knee - meniscal tear



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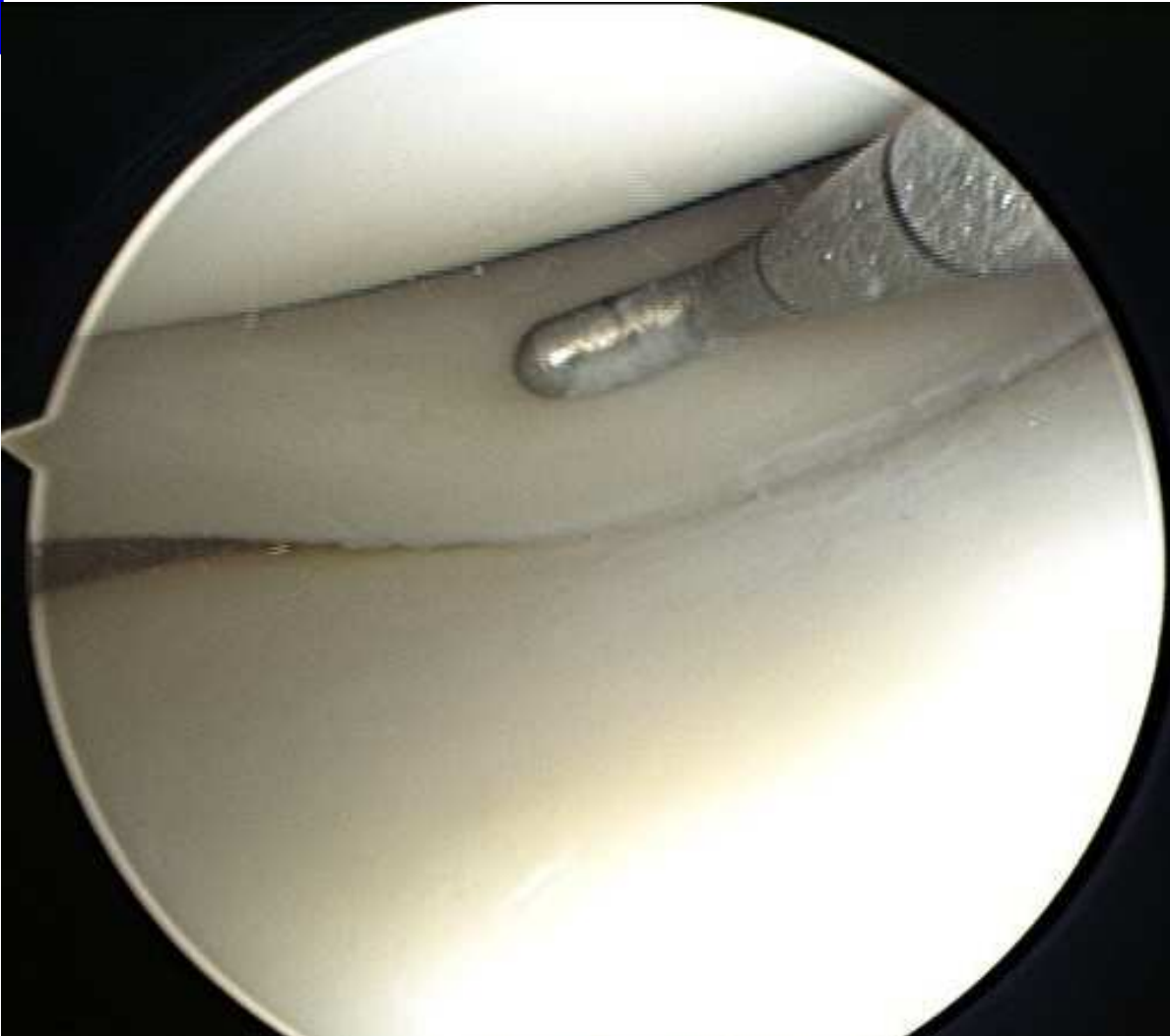


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M E D

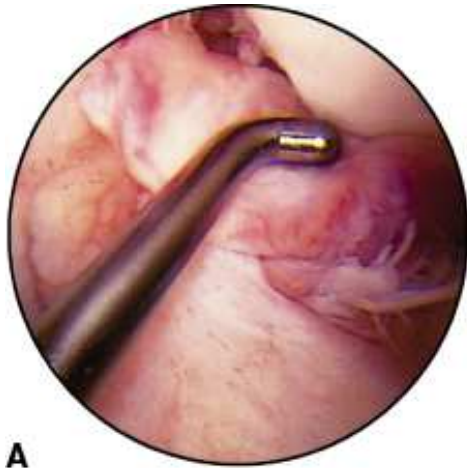
Injury of the soft tissues of the knee  
- meniscal tear



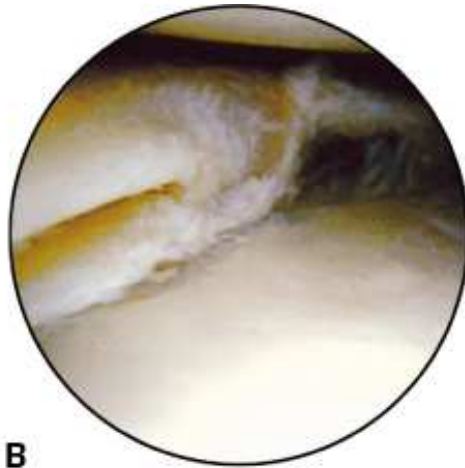
Injury of the soft tissues of the knee  
- meniscal tear



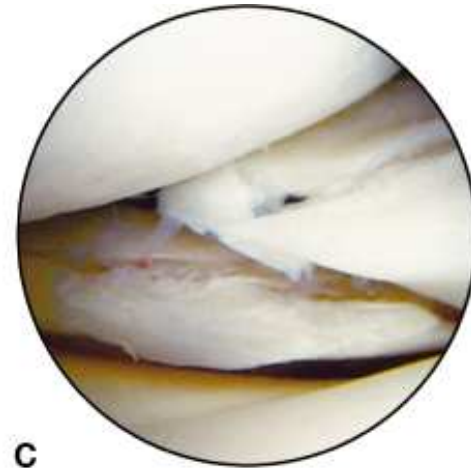
Normal  
meniscus



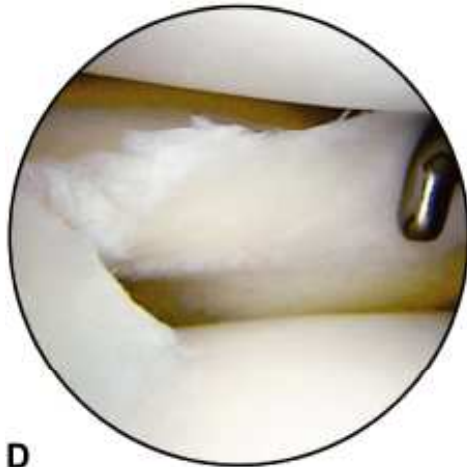
A



B



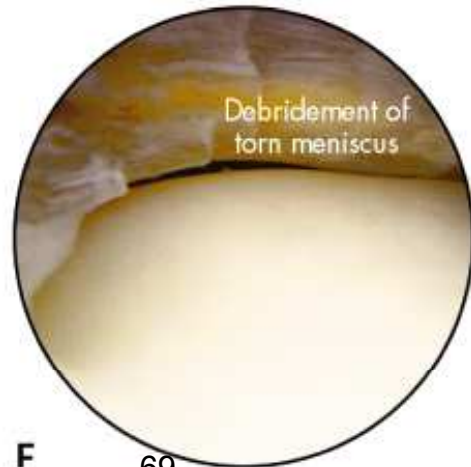
C



D



E



F

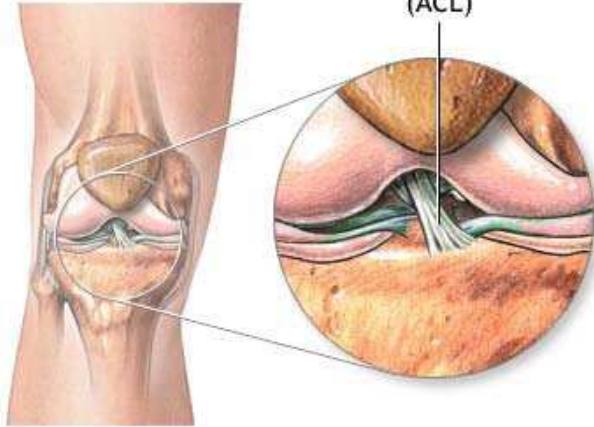
69

# ACL reconstruction

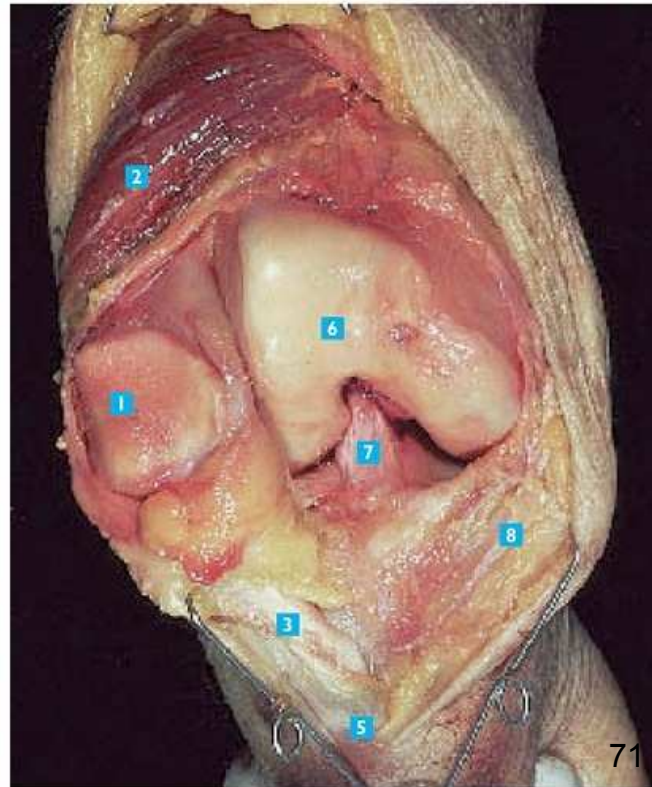
# M U N I M E D

## Injury of the soft tissues of the knee ACL rupture

Front of right knee Anterior cruciate ligament (ACL)

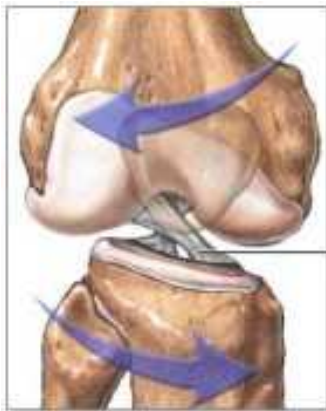


ACI



- 1 Patella
- 2 Vastus Medialis
- 3 Patellar Tendon
- 4 Fascial Edge
- 5 Tibial Tubercle
- 6 Femoral Condyle
- 7 Anterior Cruciate Ligament
- 8 Edge of Capsule

# Injury of the soft tissues of the knee ACL rupture



ACL

ACL injuries occur when bones of the leg twist in opposite directions under full body weight



ADAM.



Tear of the anterior cruciate ligament

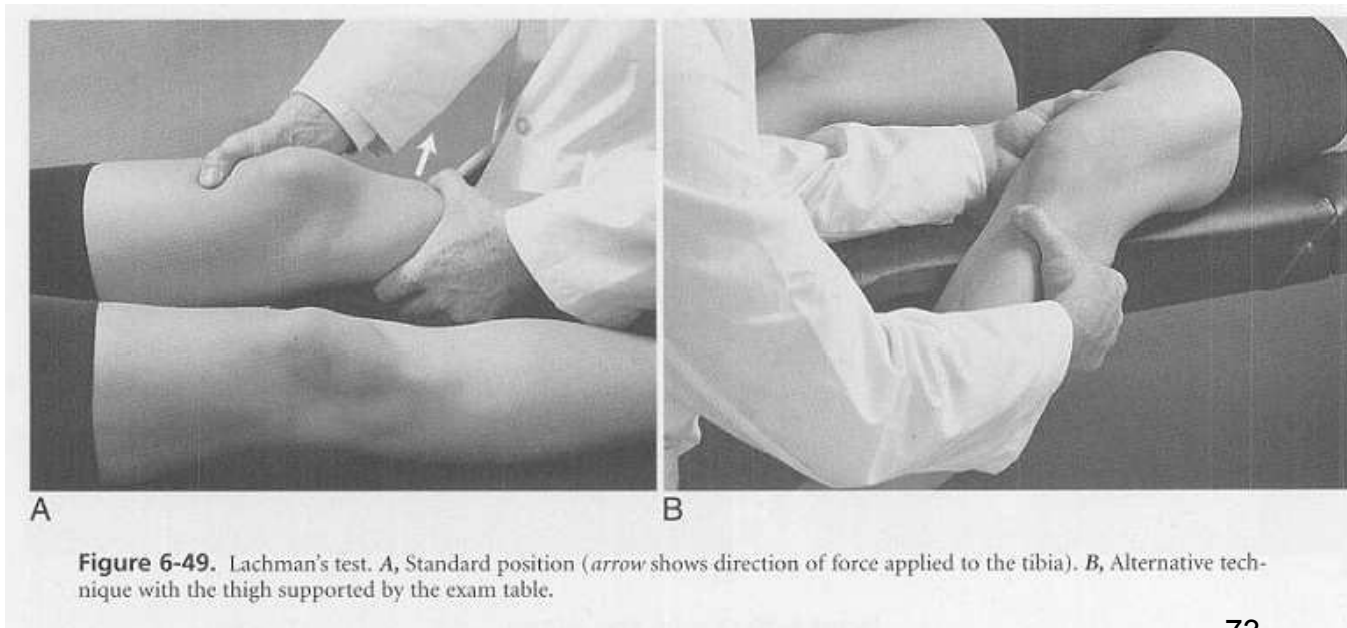


ADAM.



# Injury of the soft tissues of the knee ACL reconstruction

## Lachman test – ventral drawer test in 30° flexion



Injury of the soft tissues of the knee  
ACL rupture

The most difficult diagnosis is in the acute phase!

In 70% of cases of joint bleeding, the anterior cruciate ligament is injured

Acute arthroscopy or long-term follow-up

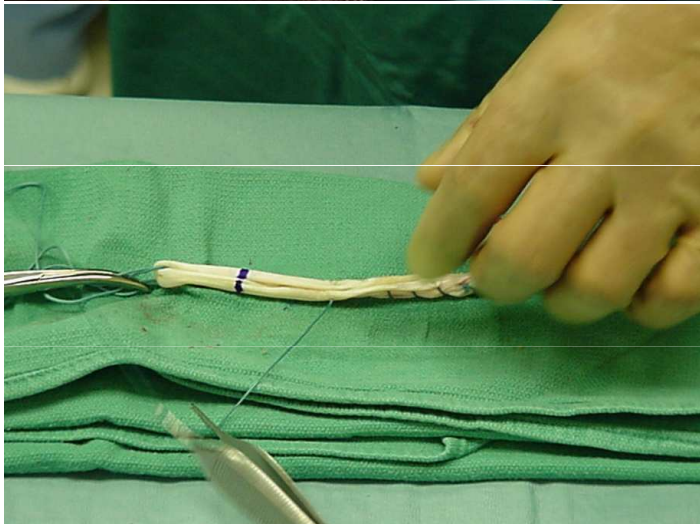
Indications for cruciate ligament surgery are limited

Injury of the soft tissues of the knee  
ACL rupture

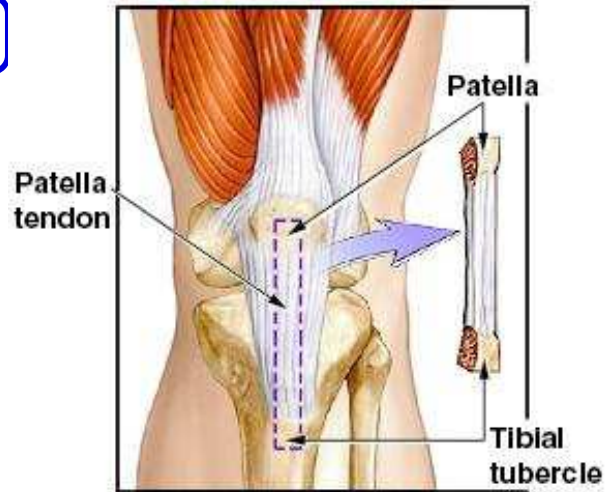
1. autograft (bone-tendon-bone graft from ligamentum patellae, or tendon graft)
2. Alo- graft (cadaver)
3. artificial material (dacron, ribbon)
4. xenograft (animal graft - abandoned)

# Injury of the soft tissues of the knee ACL reconstruction

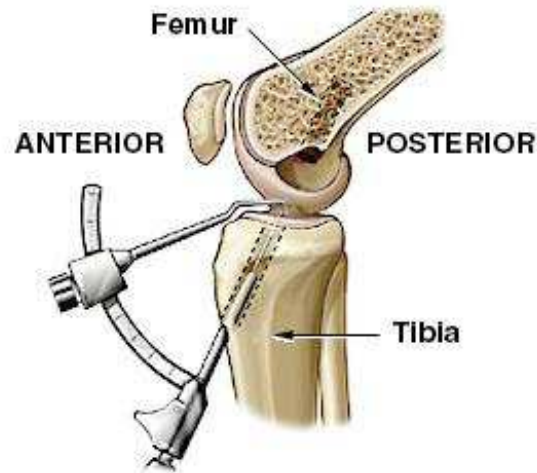
Reconstr. with m. semitendinosus  
autograft



# Injury of the soft tissues of the knee ACL reconstruction



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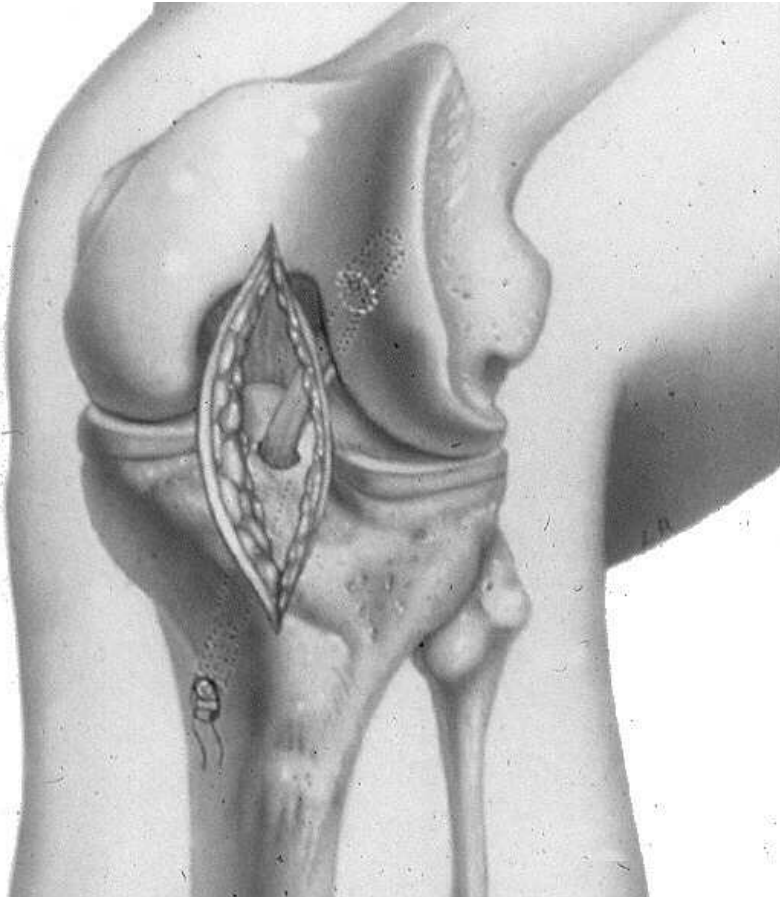
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„GOLD standard“ = bone-tendon-bone  
(BTB) graft from ligamentum patellae

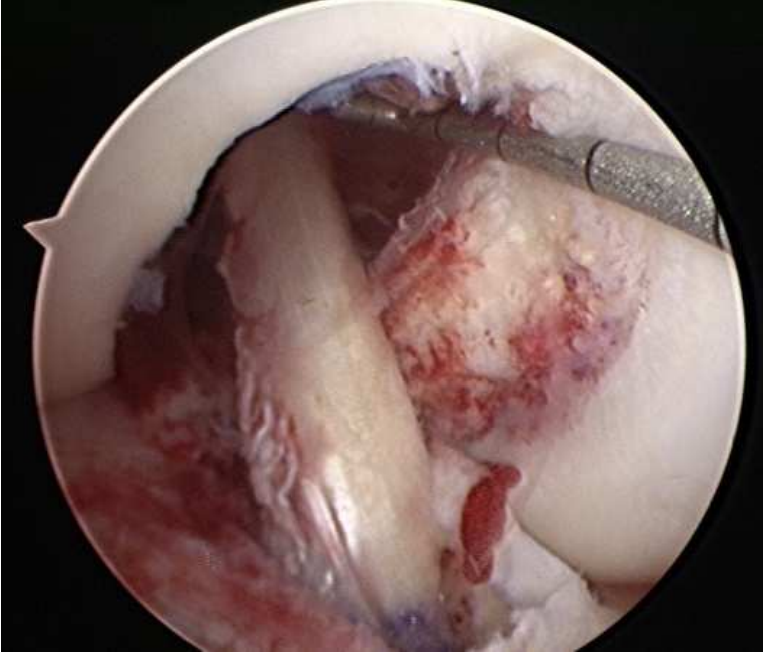
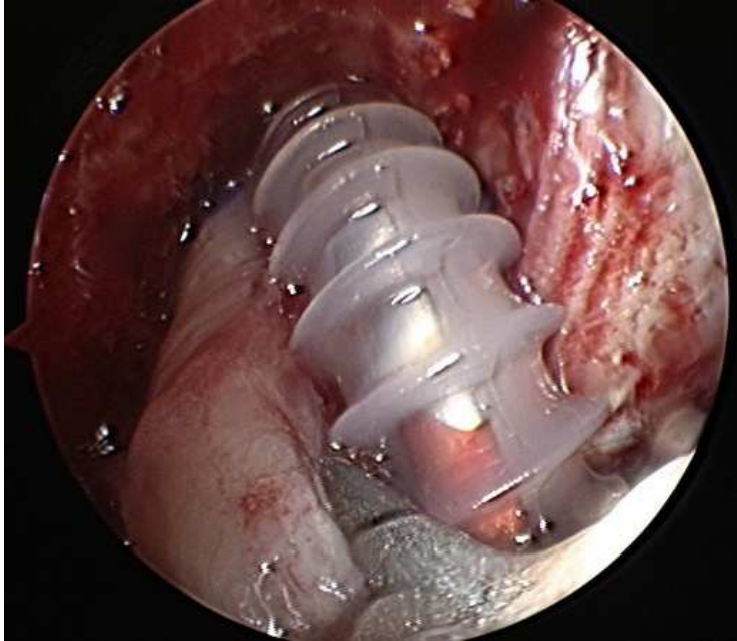
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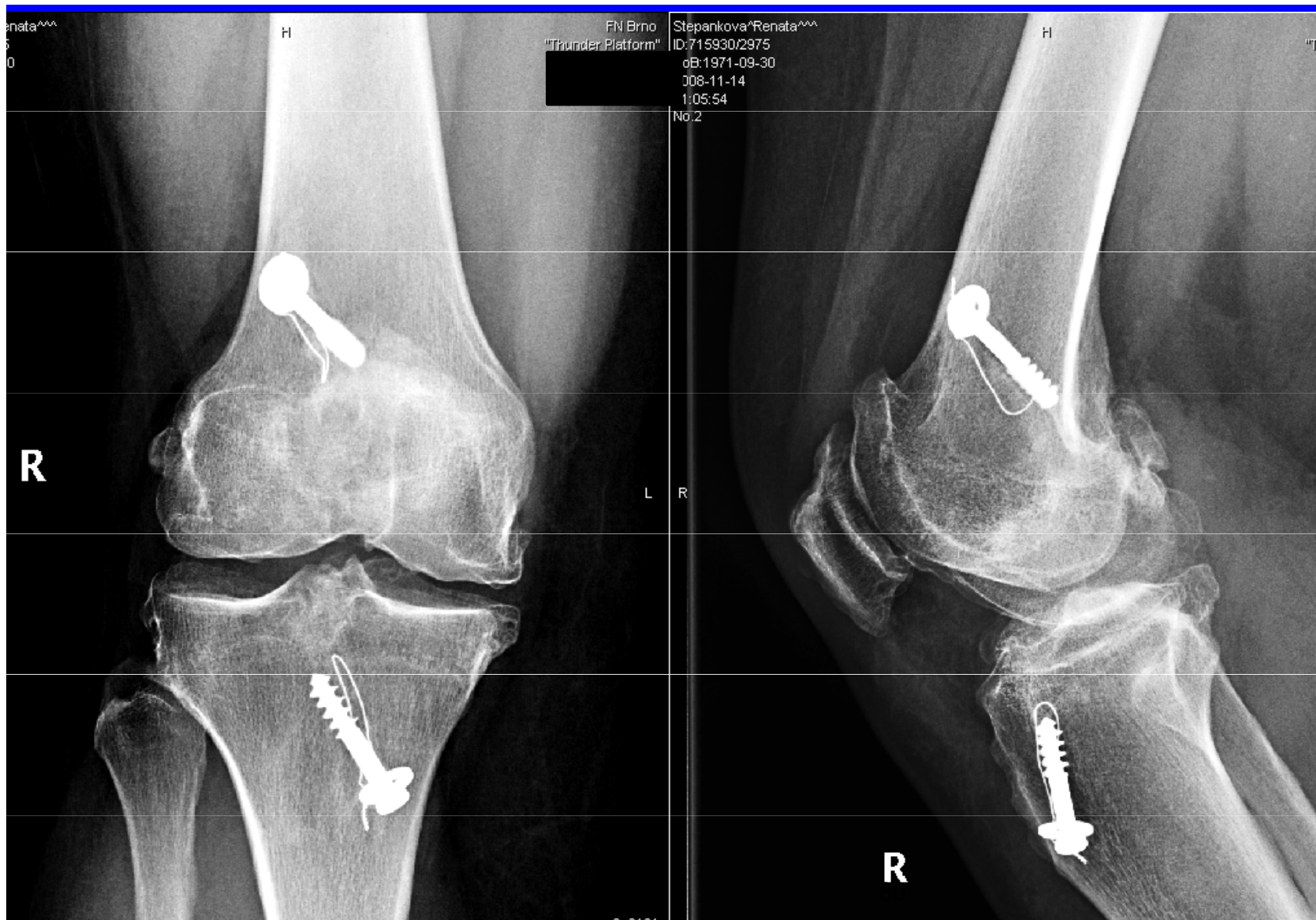
Injury of the soft tissues of the knee  
ACL reconstruction

B-T-B graft



Injury of the soft tissues of the knee  
ACL reconstruction







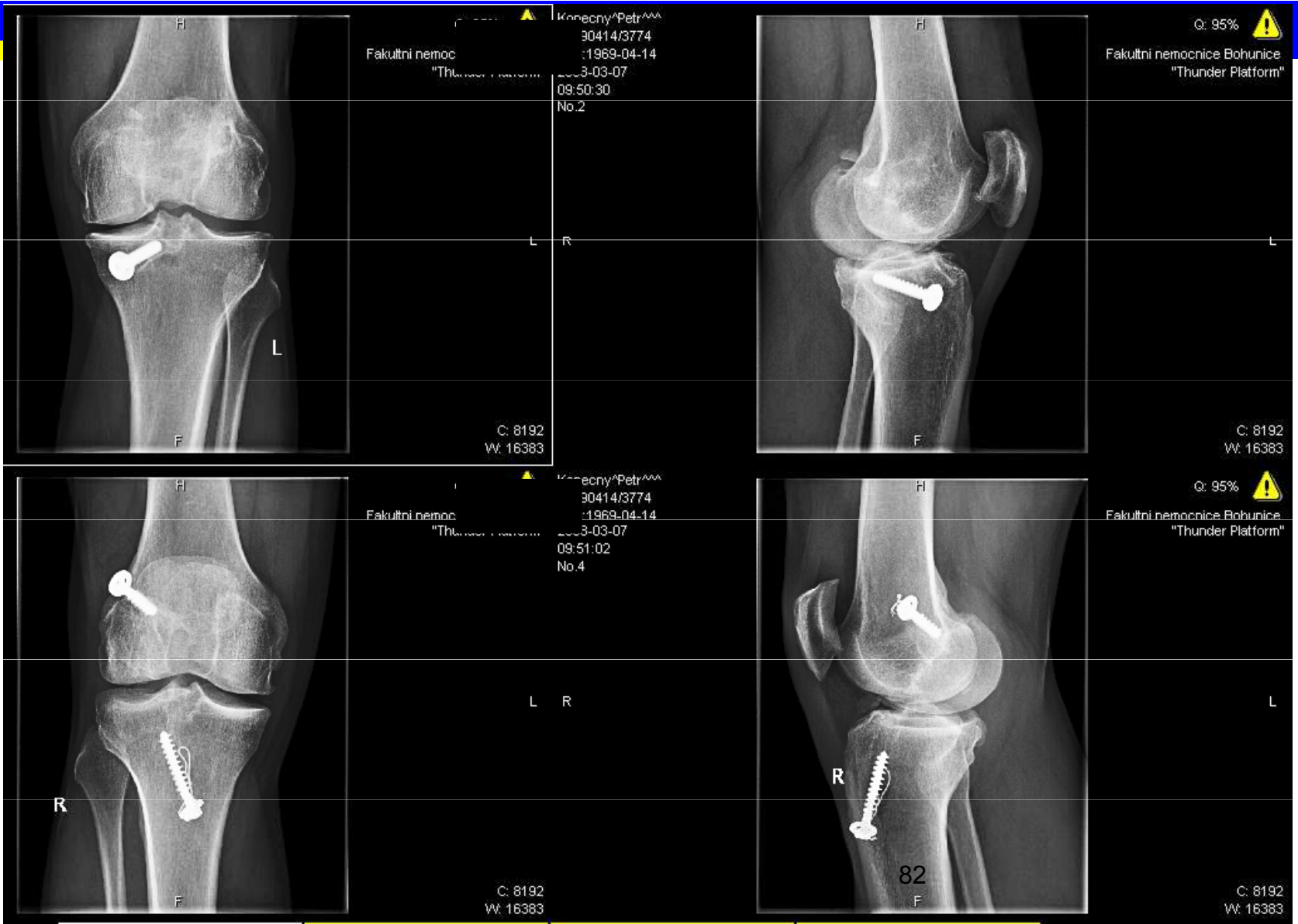


"Thunc  
L R

ir"Michal^^^  
930/453  
944-09-30  
2008-07-18  
09:12:50  
No.2  
C: 8192



"Thunder

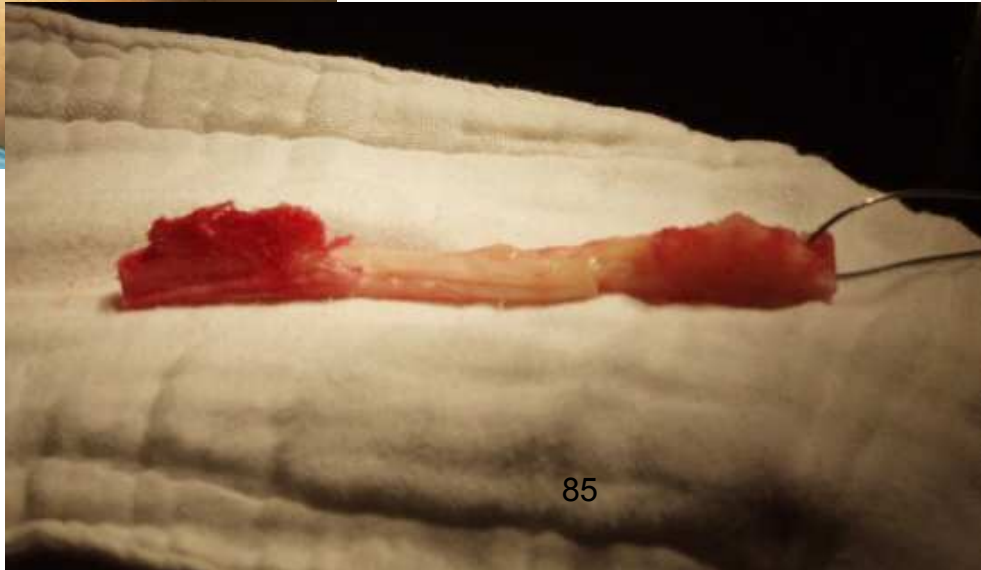
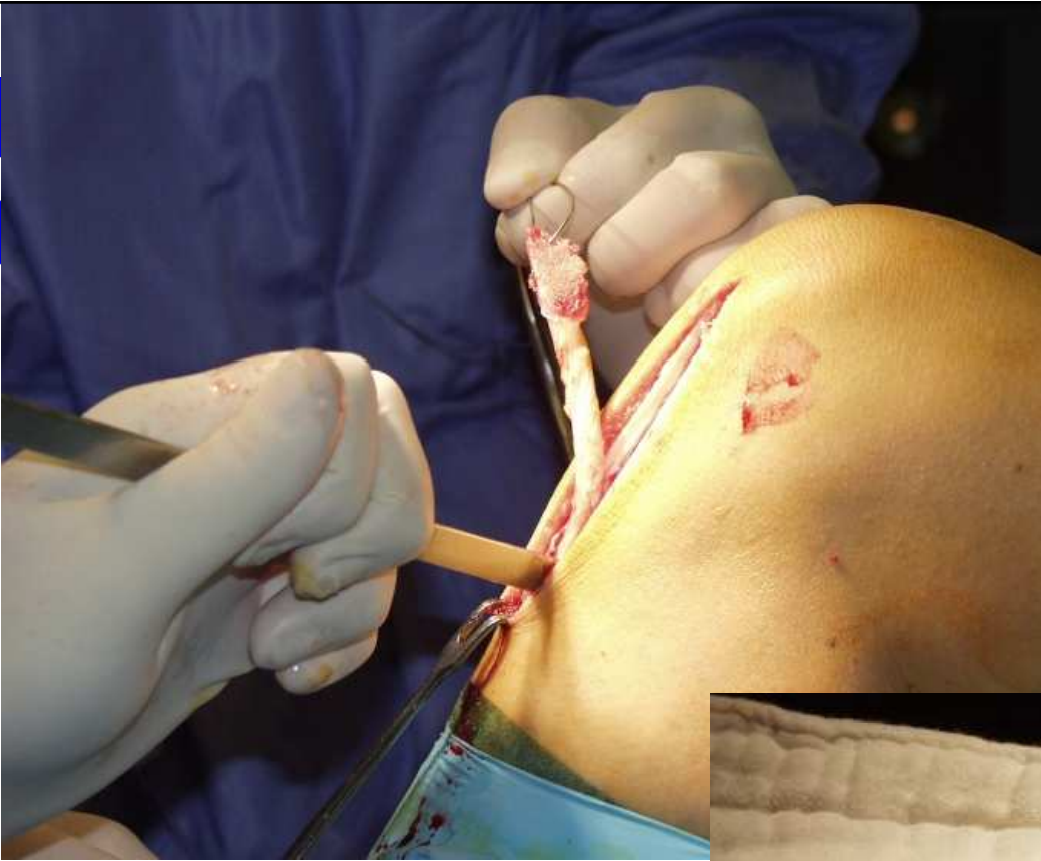


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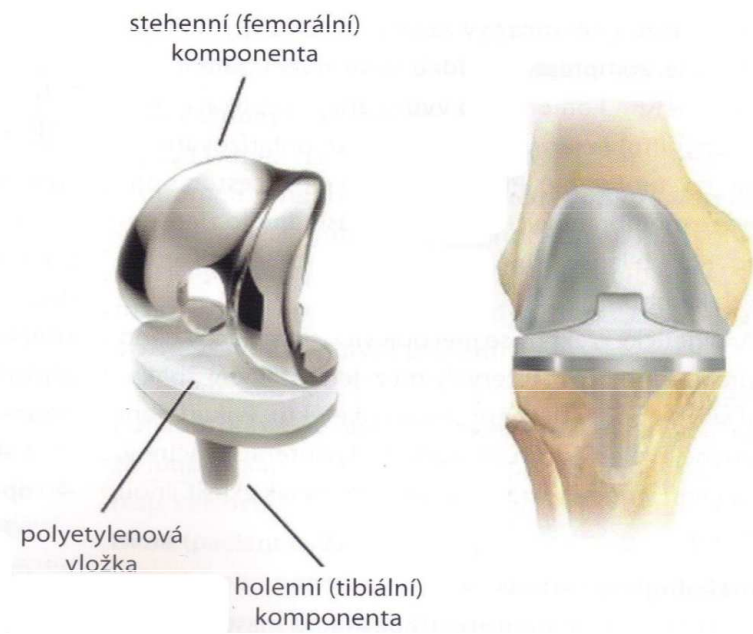
## Postoperative fixation – LIMITED MOTION CAST



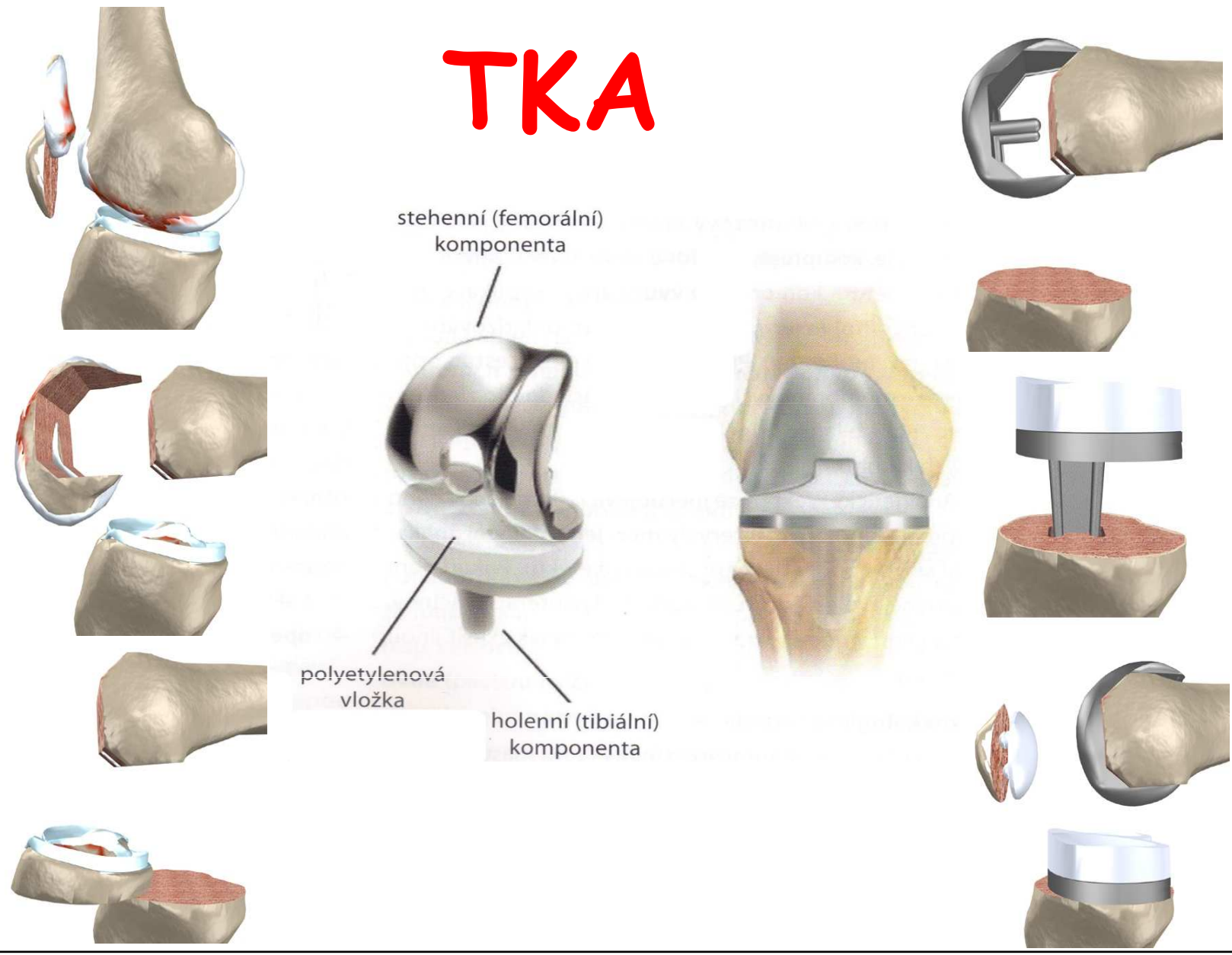


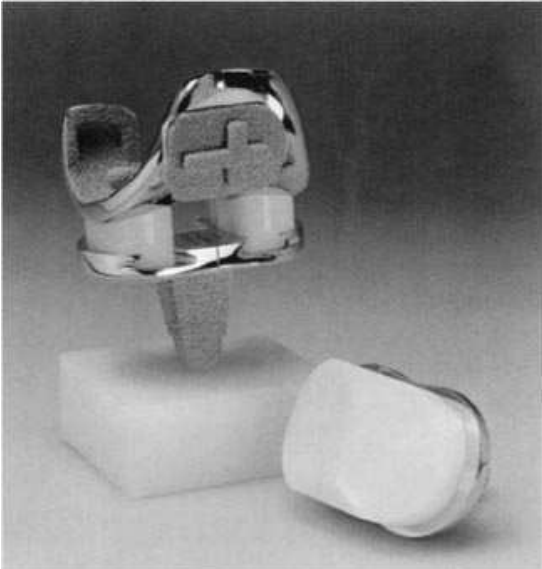
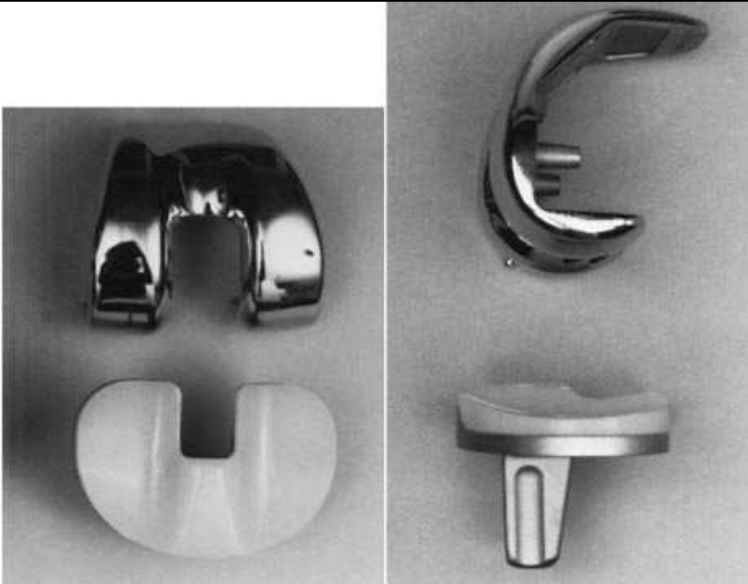
# Degenerative knee disease

# Gonartrosis- TKA



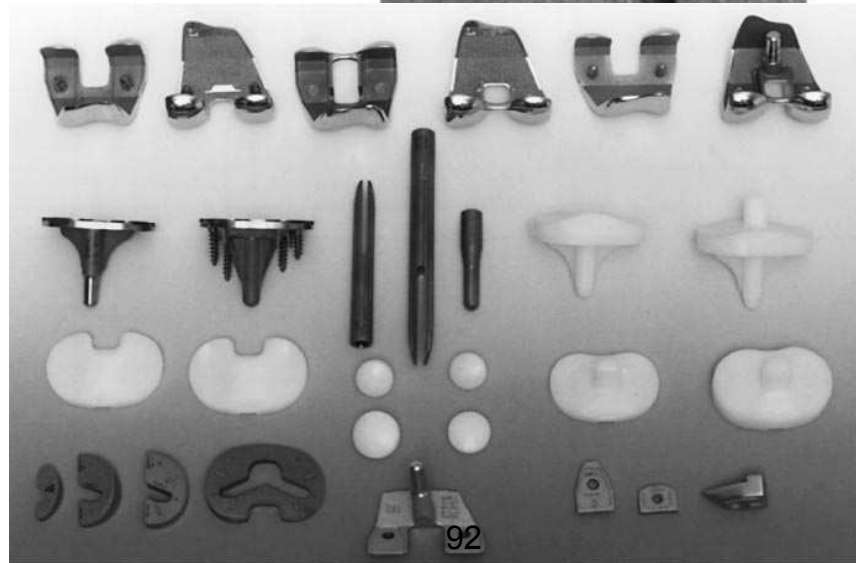
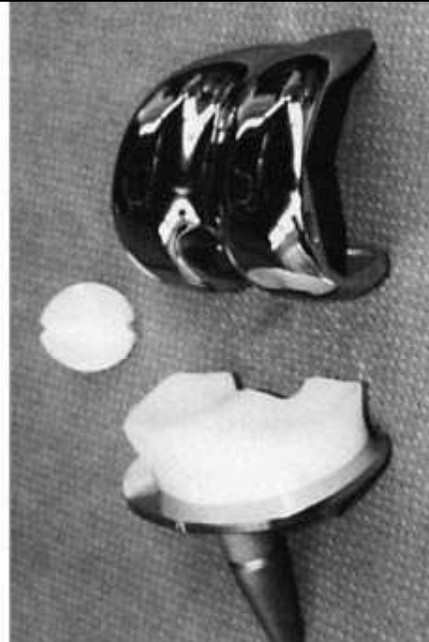
# TKA





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# TKA instrumentarium



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**TKA**  
**instrumentarium**

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# Total knee arthroplasty implantation



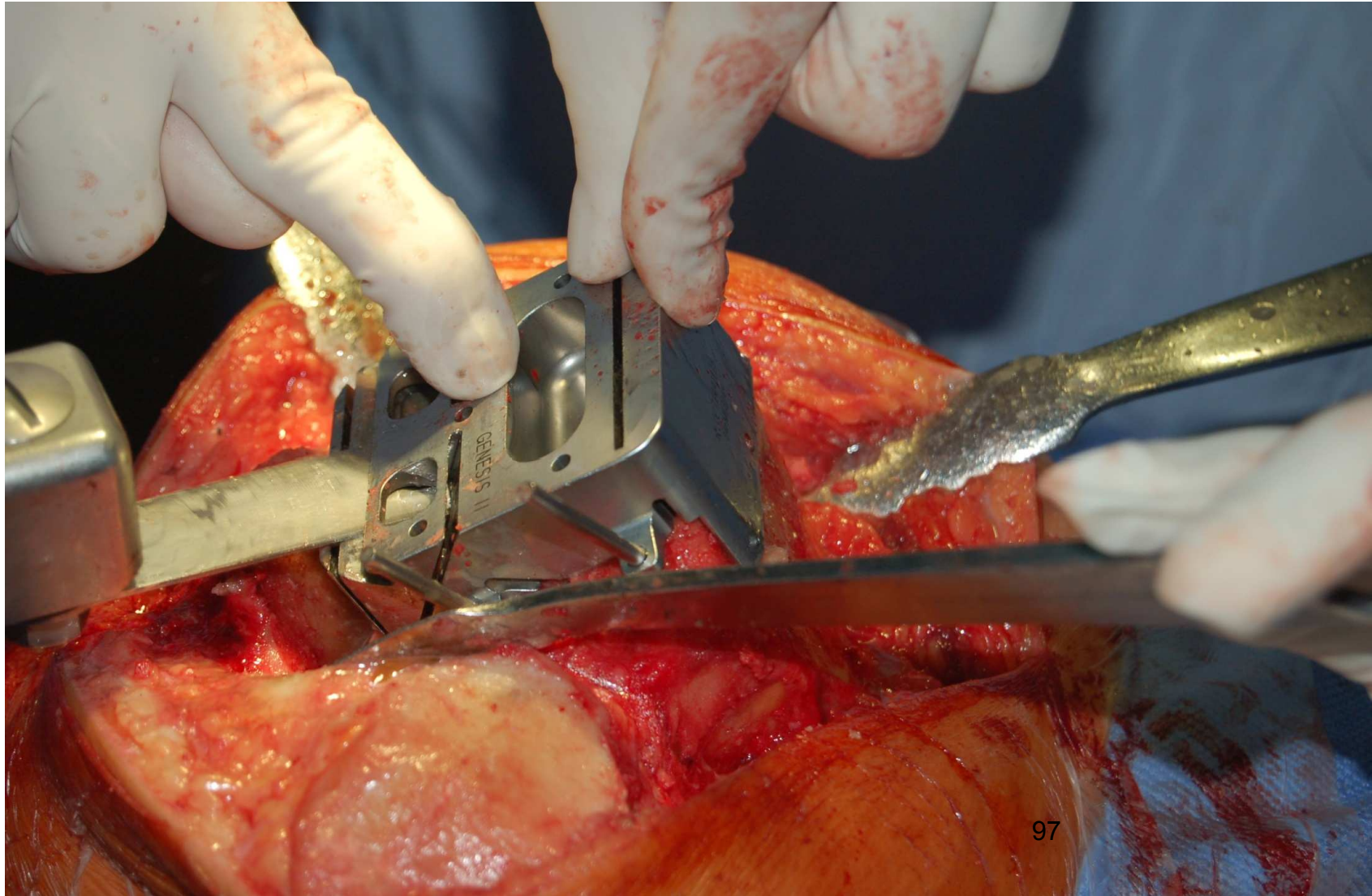
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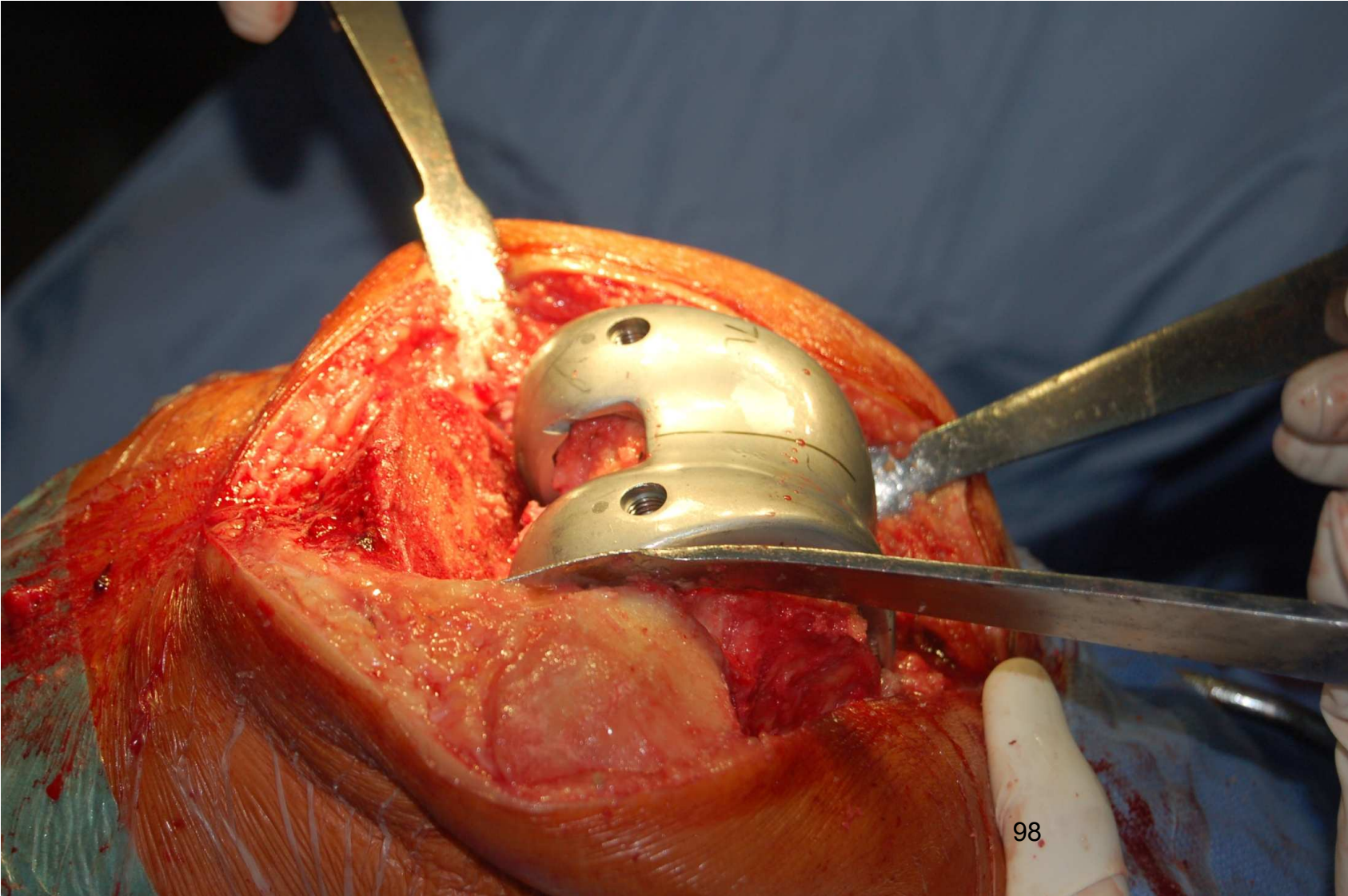
# Total knee arthroplasty implantation



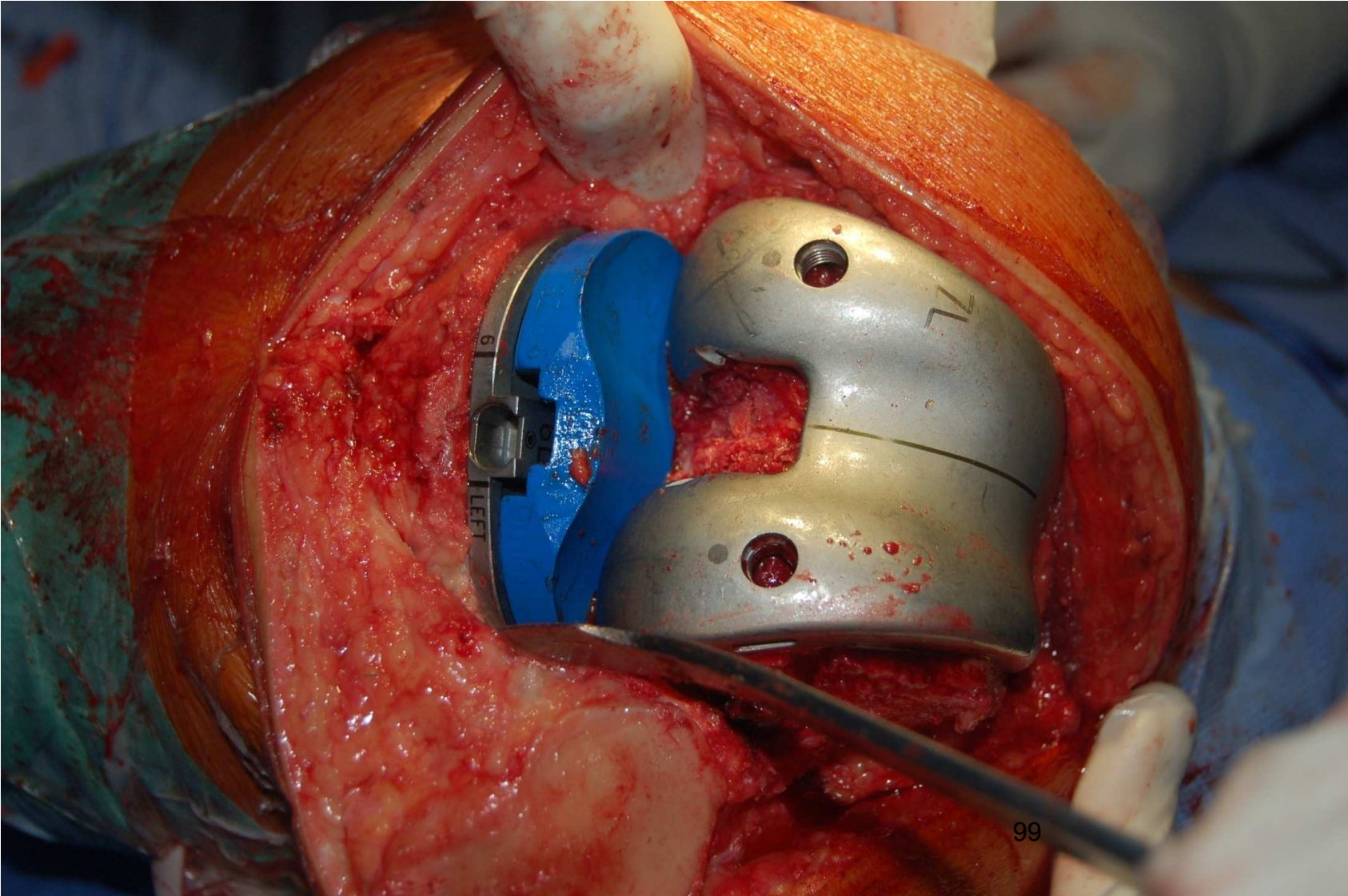


# Total knee arthroplasty implantation

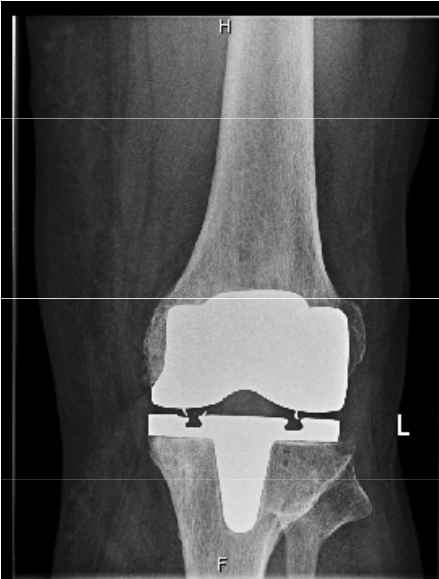




98



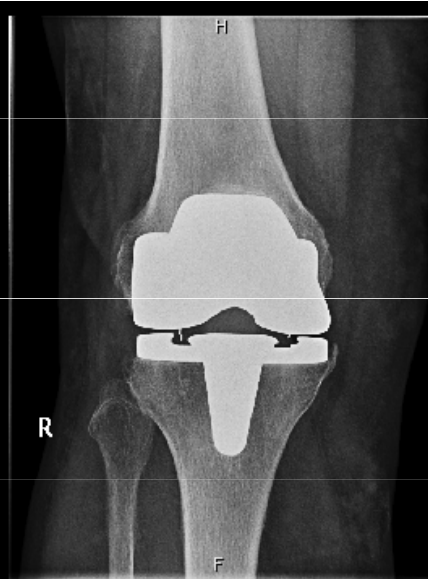




Q: 95%  
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No.2

L R

C: 8192  
W: 16383



Q: 95%  
Fakultni nemocnice Bohunice  
"Thunder Platform"

L

C: 8192  
W: 16383



Q: 95%  
Fakultni nemocnice Bo  
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No.4

L R

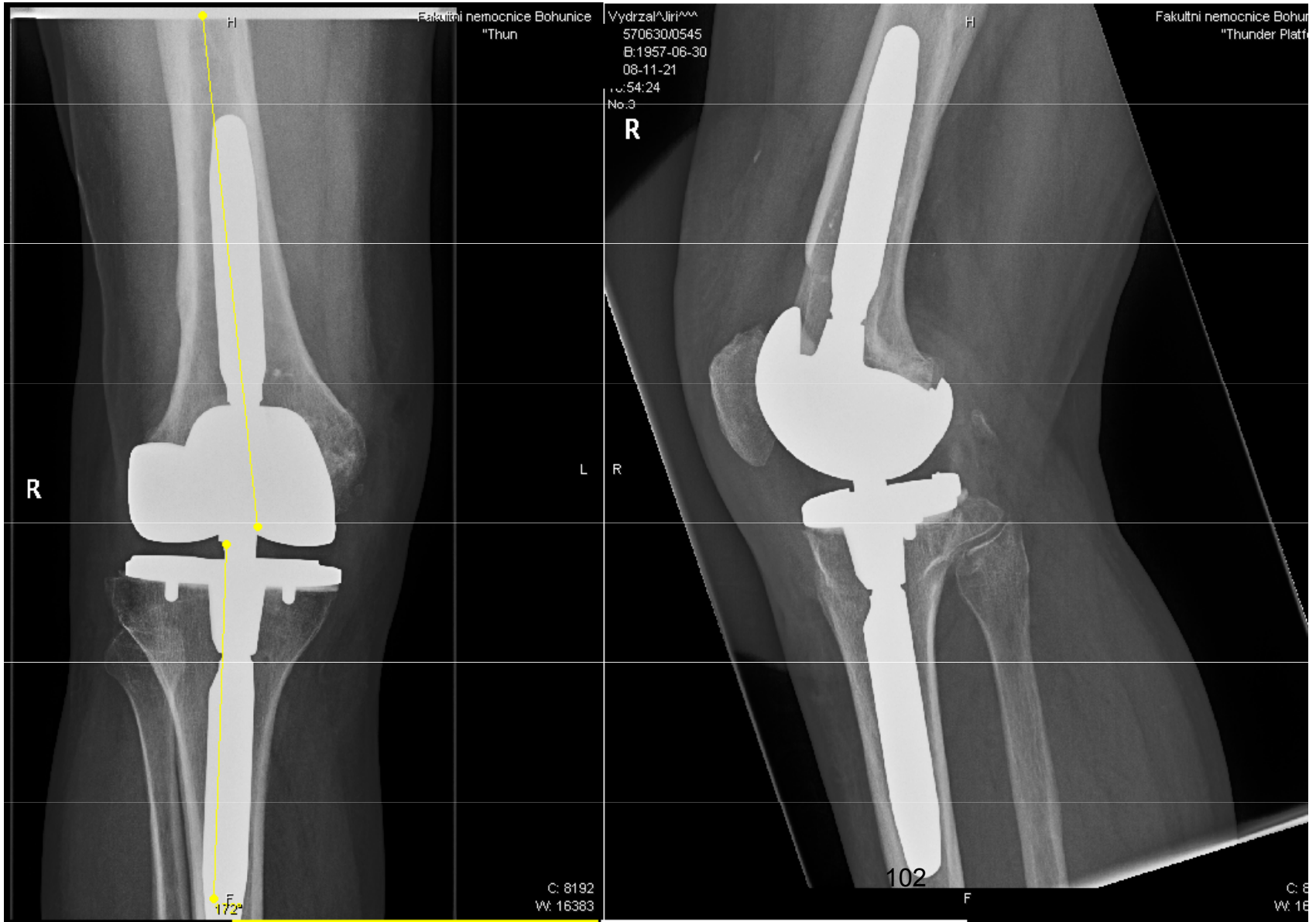
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Q: 95%  
Fakultni nemocnice Bohunice  
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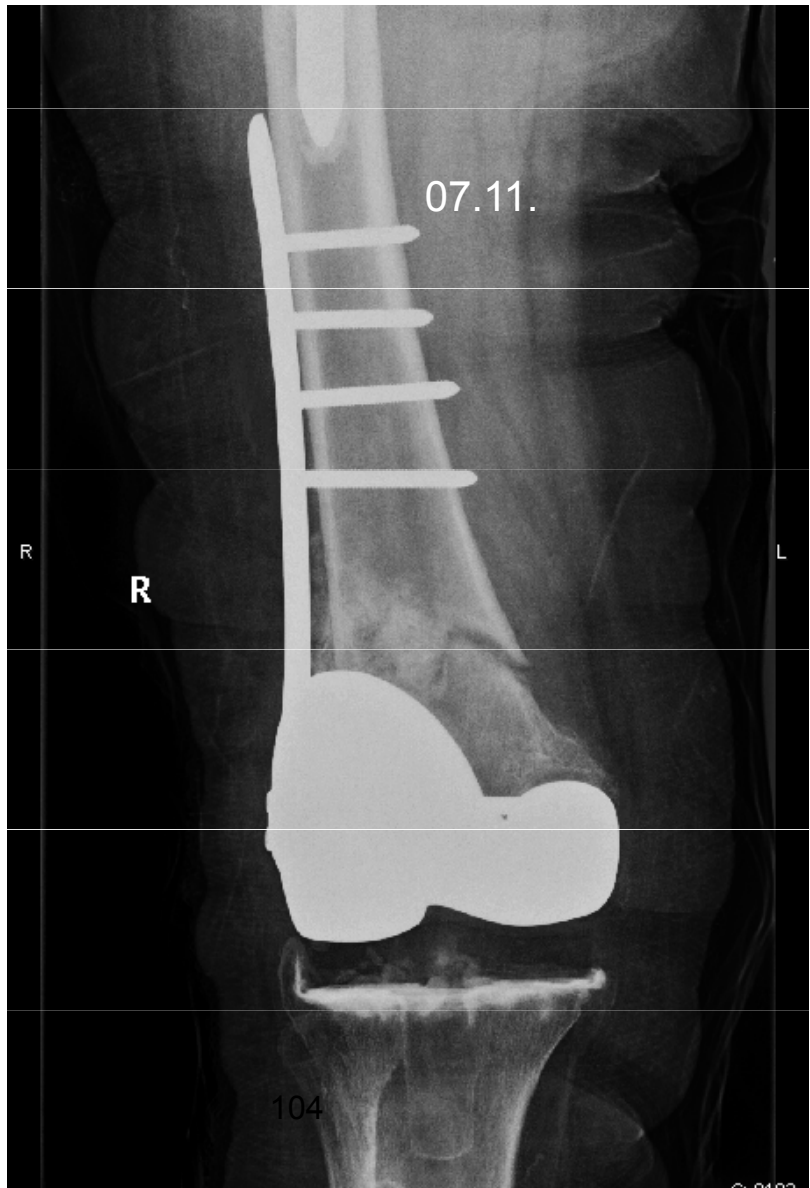
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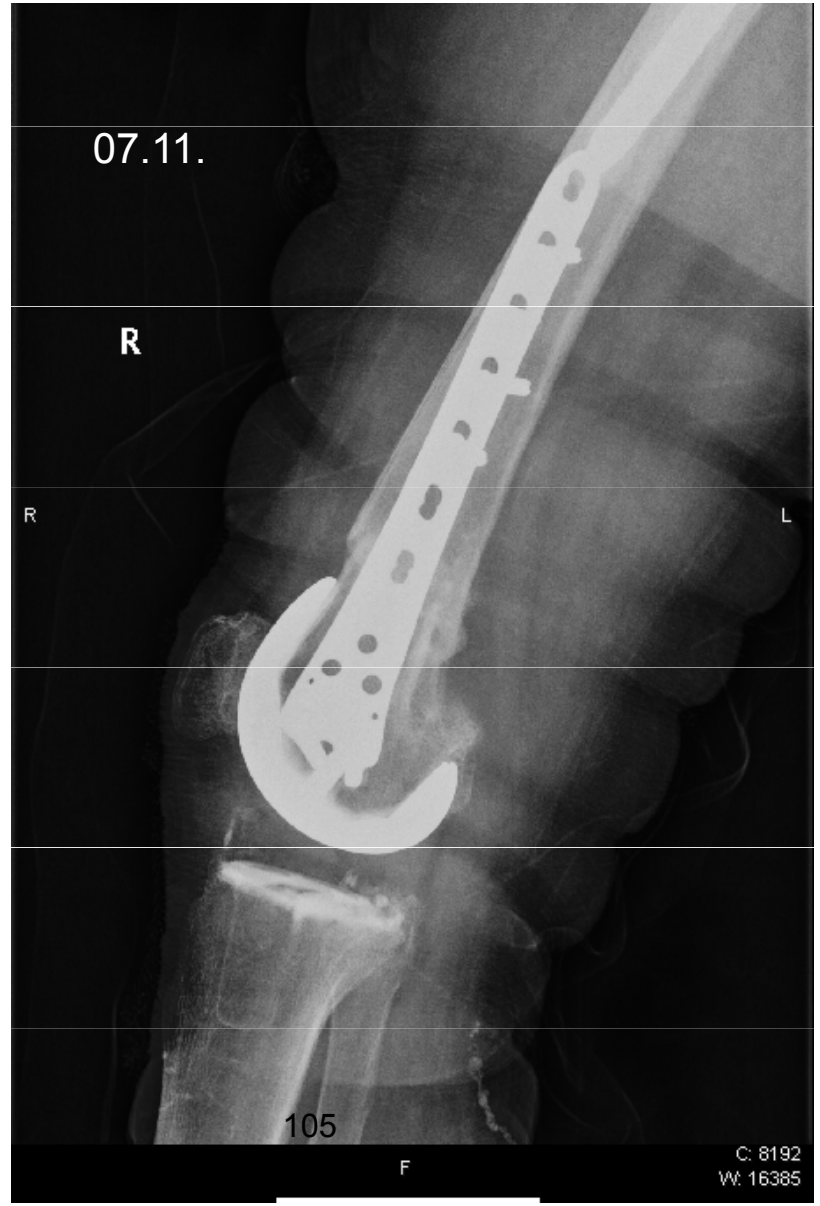
# Complications of TKA

- technical error during operation
- nerve palsy after surgery (n. peroneus)
- vascular postoperative complications
- knee instability after surgery
- deep infection early or late
- restriction of movement (stiffness)
- aseptic release of components
- wear of the tibial component

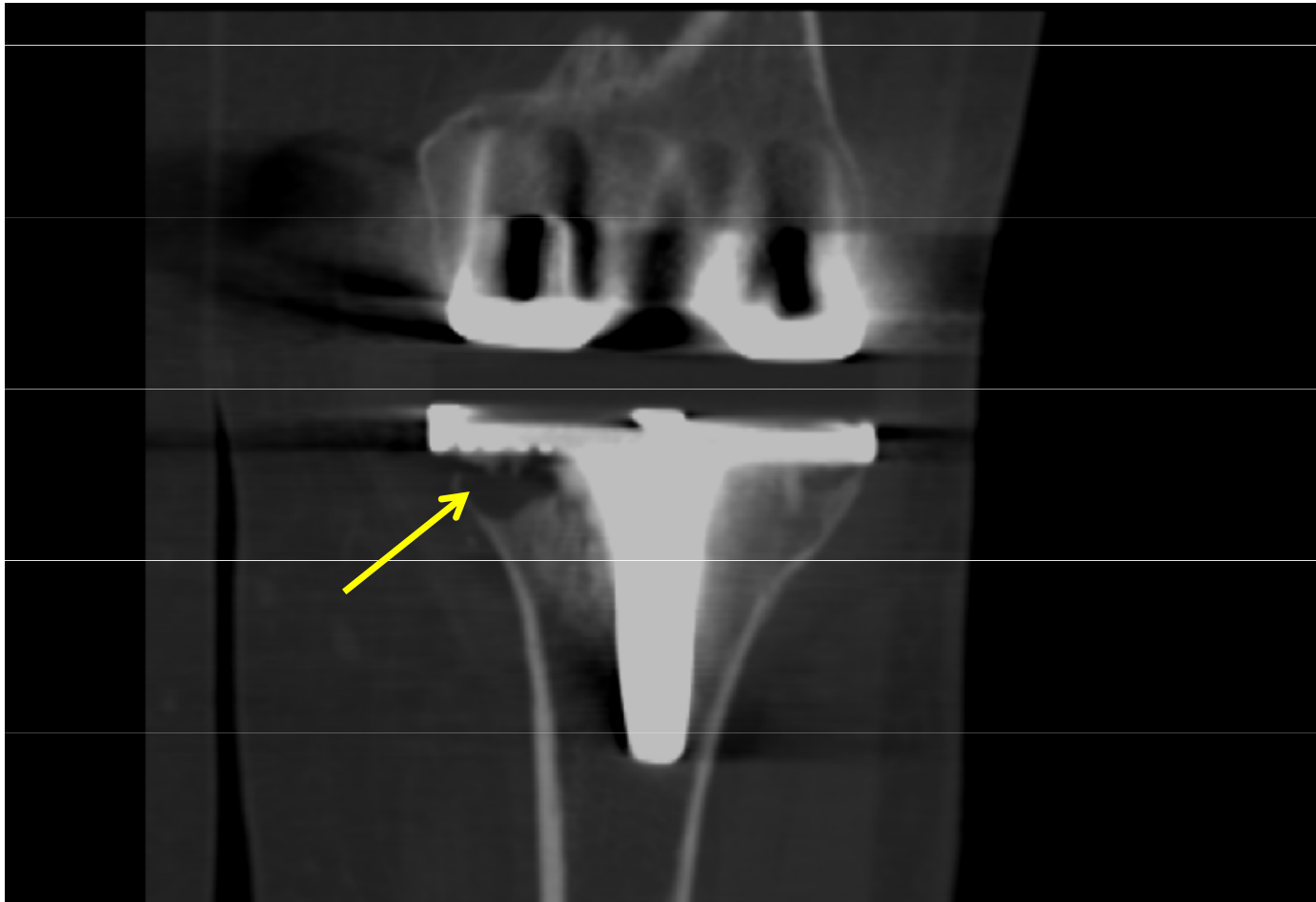




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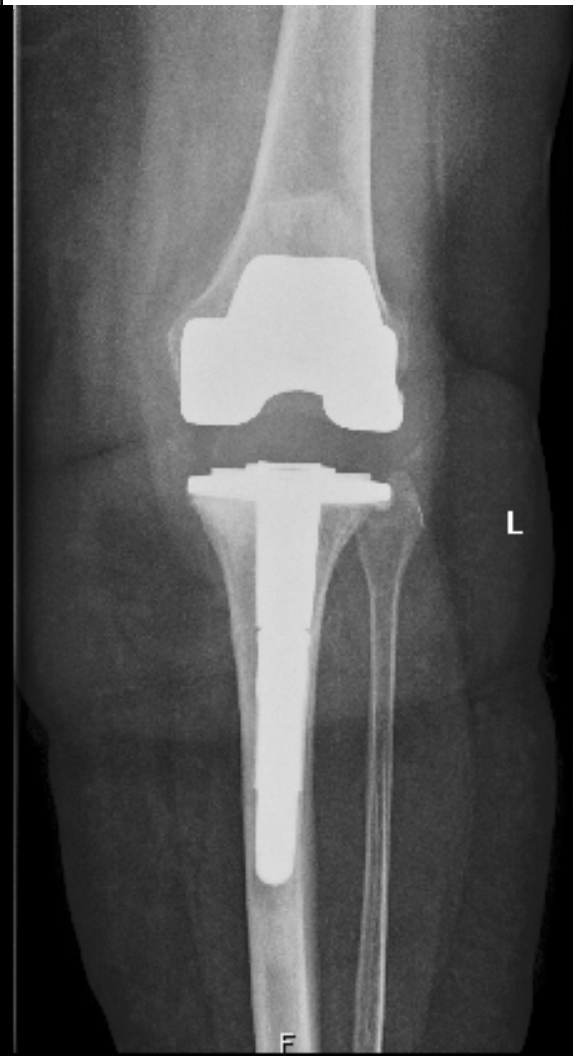


## CT scan of TEP with signs of tibial component loosening









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09:06:28  
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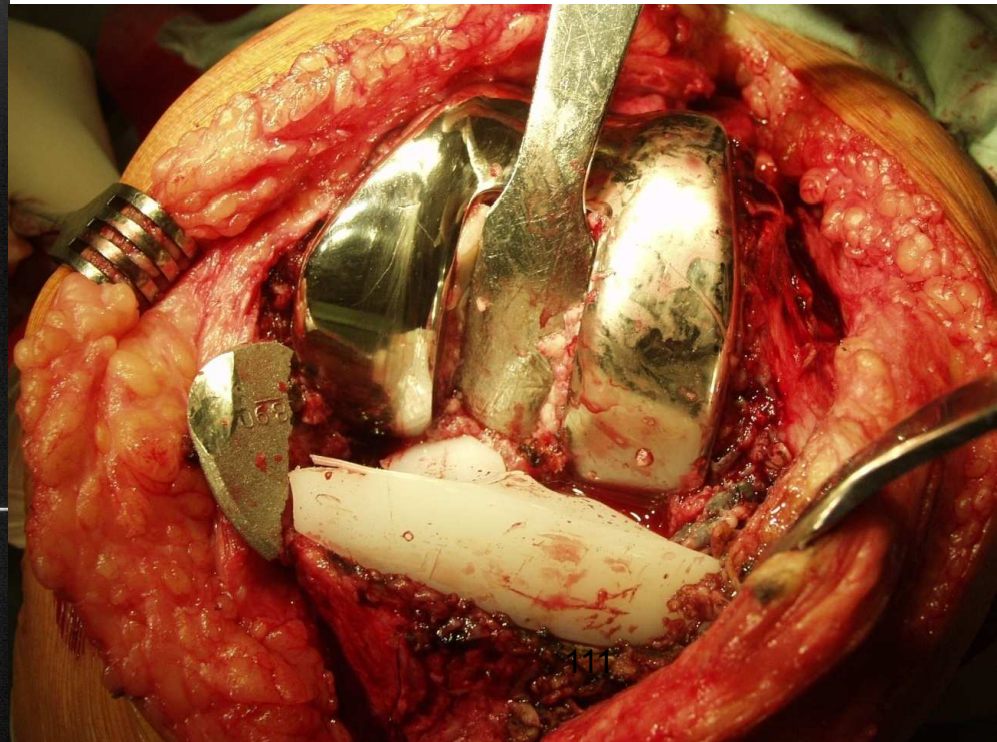
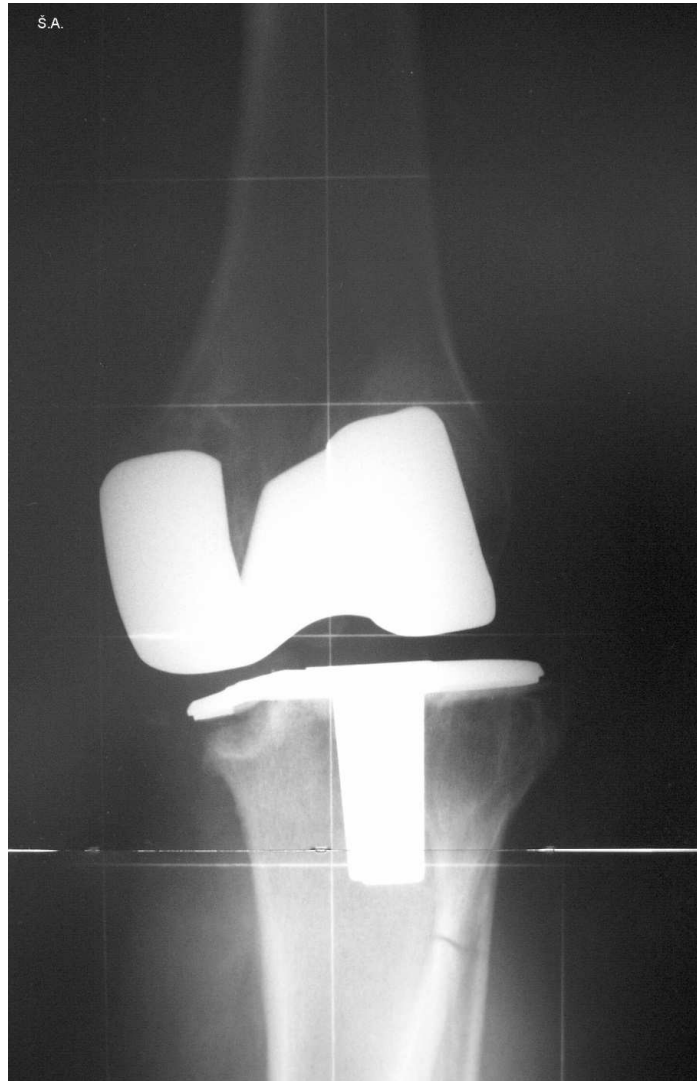
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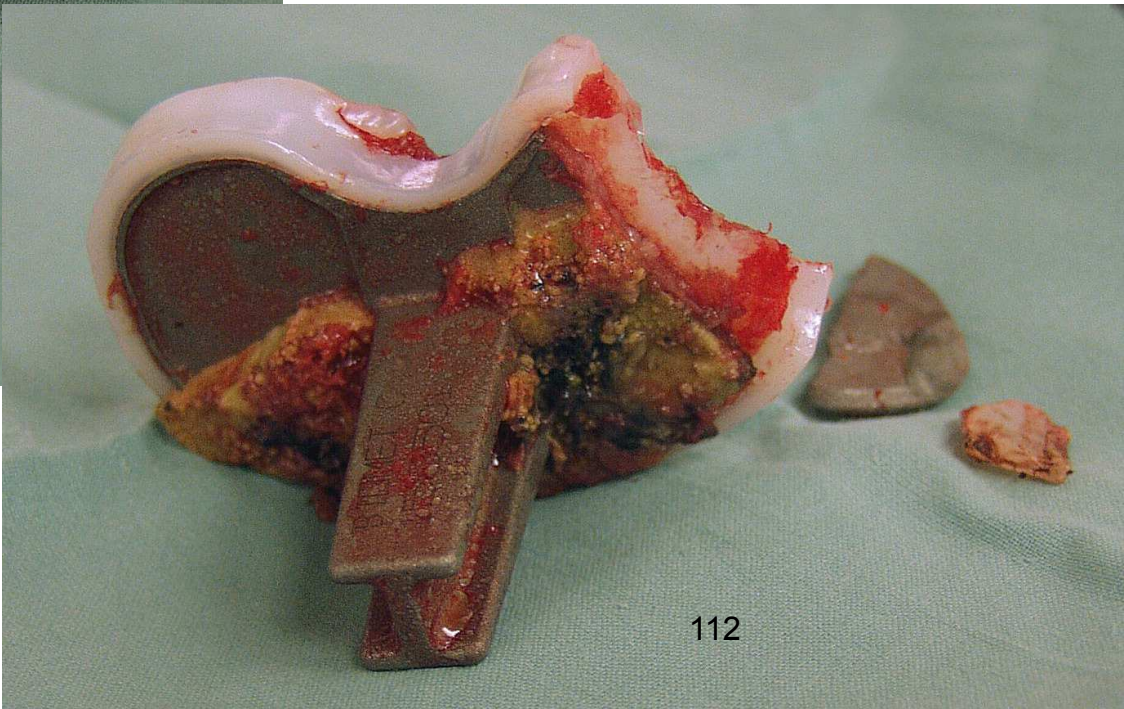
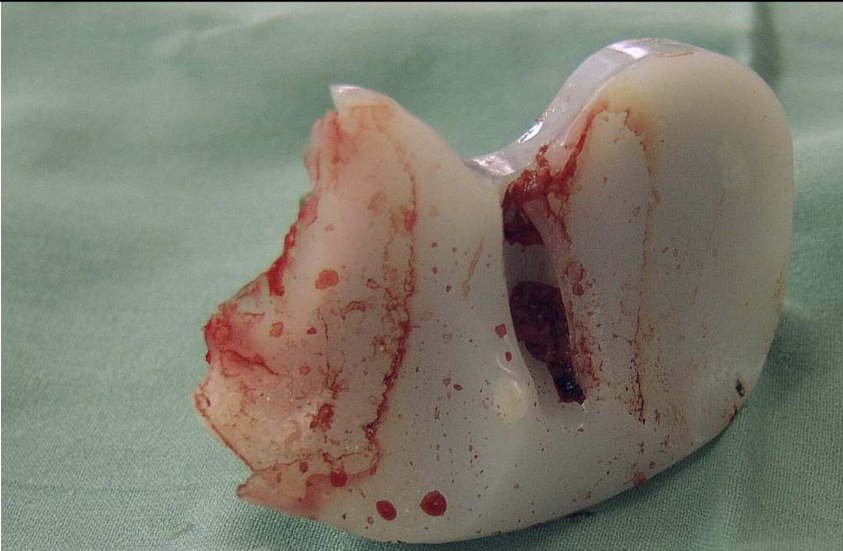
# Ortosis after TKA - indications

- solution of knee instability
- additional treatment during suture of the ligamentum patellae



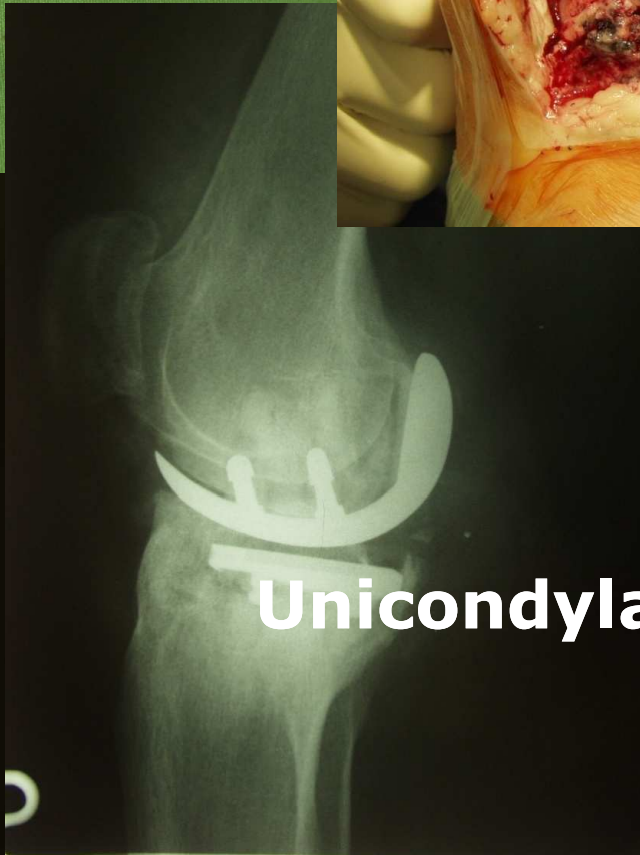
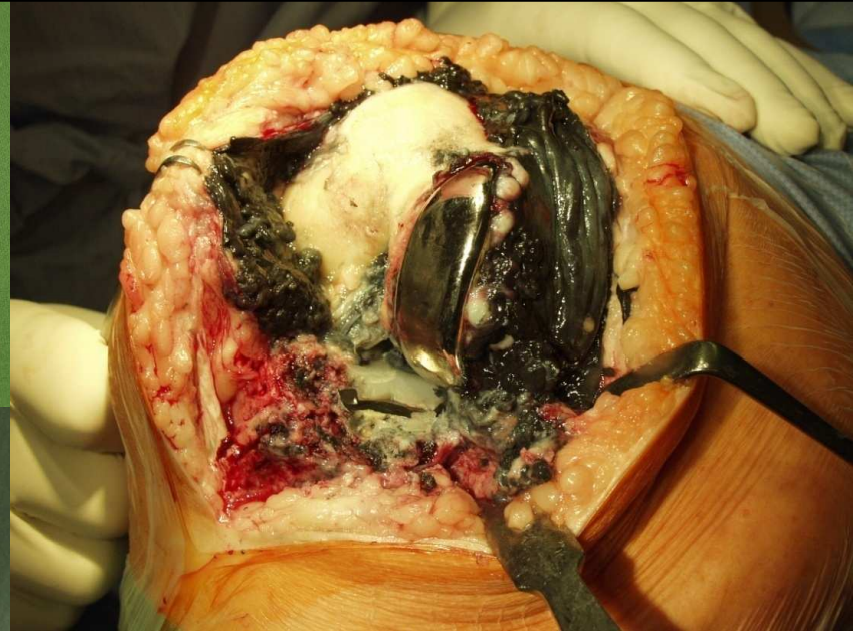
# TKA - failure





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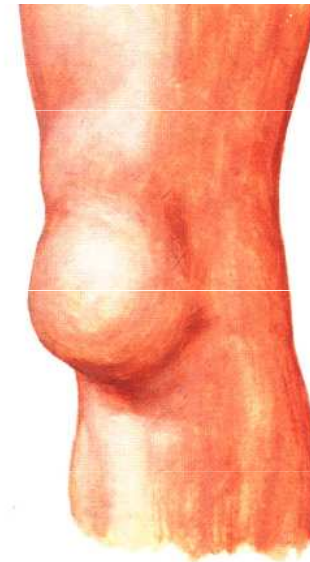
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# Bursitis in the knee area

Bursitis praepatellaris  
Bursitis pedis anserini  
Bakerská cysta

Therapy:  
rest  
puncture + loc. Corticosteroids  
NSAID  
extirpation



Obr. 11



Obr. 12

# Baker's cyst

Bursa gastrocnemio- semimembranacea connects to the articular cavity of the knee

Arching in the fossa poplitea

In adults, it is secondary to the process inside the knee

Swelling, tension, pain

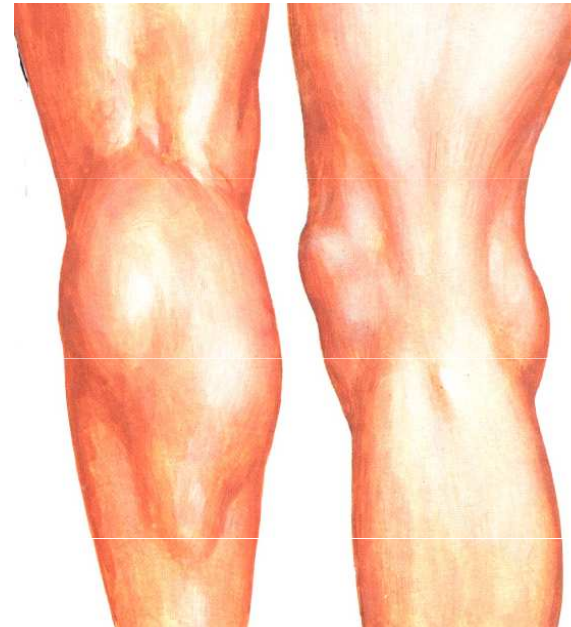
Restrictions on movement

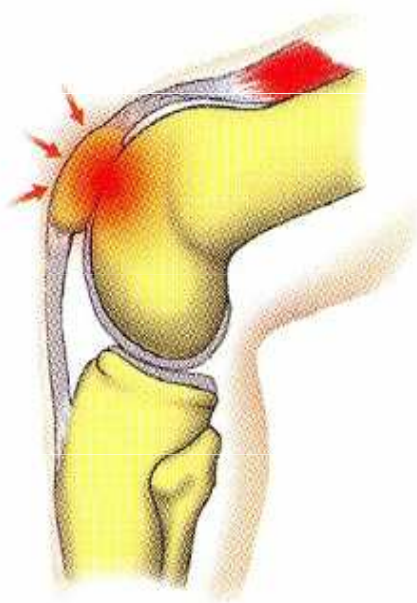
Oppression of venous trunks

Therapy:

Conservative- puncture, corticoid, NSAID

Operational extirpation





Patelofemoral syndrome

# Achillodynia

Painful condition in progress  
and the attachment of Achilles' tendon

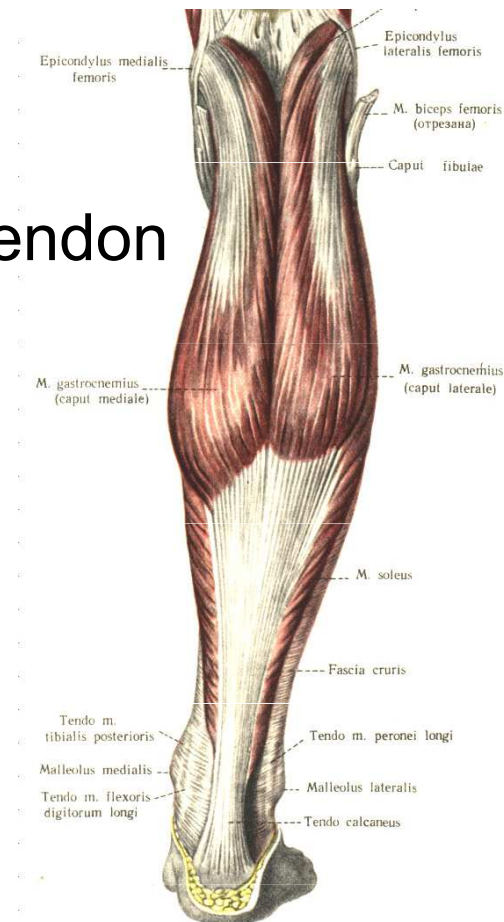
Causes:

Degeneration

Haemorrhage, cracks

Peritenonitis

Risk of transition to partial  
or complete ruptures



# Achillodynia

Conservative treatment:

Calmness, taping, antiphlogistics

Heel increase

Physiotherapy

Immobilization

Prohibition of corticosteroids

Surgical treatment:

Peritenonectomy

Excision of necrotic tissue

