100 év ortopédia - 50 év traumatológia

Feltárások szerepe: anterior – (antero) lateralis – posterior. Előnyök és hátrányok. Van-e evidencia?

Udvarhelyi Iván

- Protézis kerekasztal
- 2022.november 26

Primer csípőprotézis szövődmény, malfunctio/ instabilitás

- Betegválasztás, életkor, nem, testsúly
- Feltárás
- Diagnosis, pathoanatomia
- Implantátum választás, design
- Vápa positio
- Szár positio
- Implantátum impingement
- Sebészi gyakorlat, rutin

Preoperativ tervezés

1. Feltárás
2. Radiológia, dysplasia, post OT, (post)trauma
3. Implantátum választás, press fit
4. Contractura (flexiós, adductiós)
5. Végtaghossz, offset
6. Korábbi beavatkozás, feltárás
7. Csontos reconstructio

Feltárás

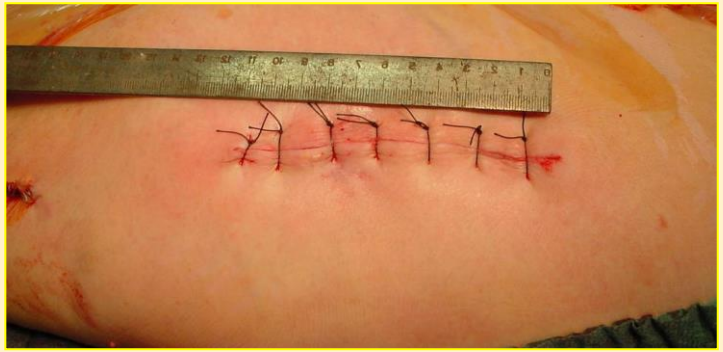
- Csípő feltárások – pontosan definiált technikák, eredmények
- Feltárás conceptio- sebészi dissectio racionalizálás
- Változtatás – eredmények kompromisszum mentes értékelése.
- Izom, ín, szalag struktúrák megtartása
- Neurovascularis szövődmény megelőzése

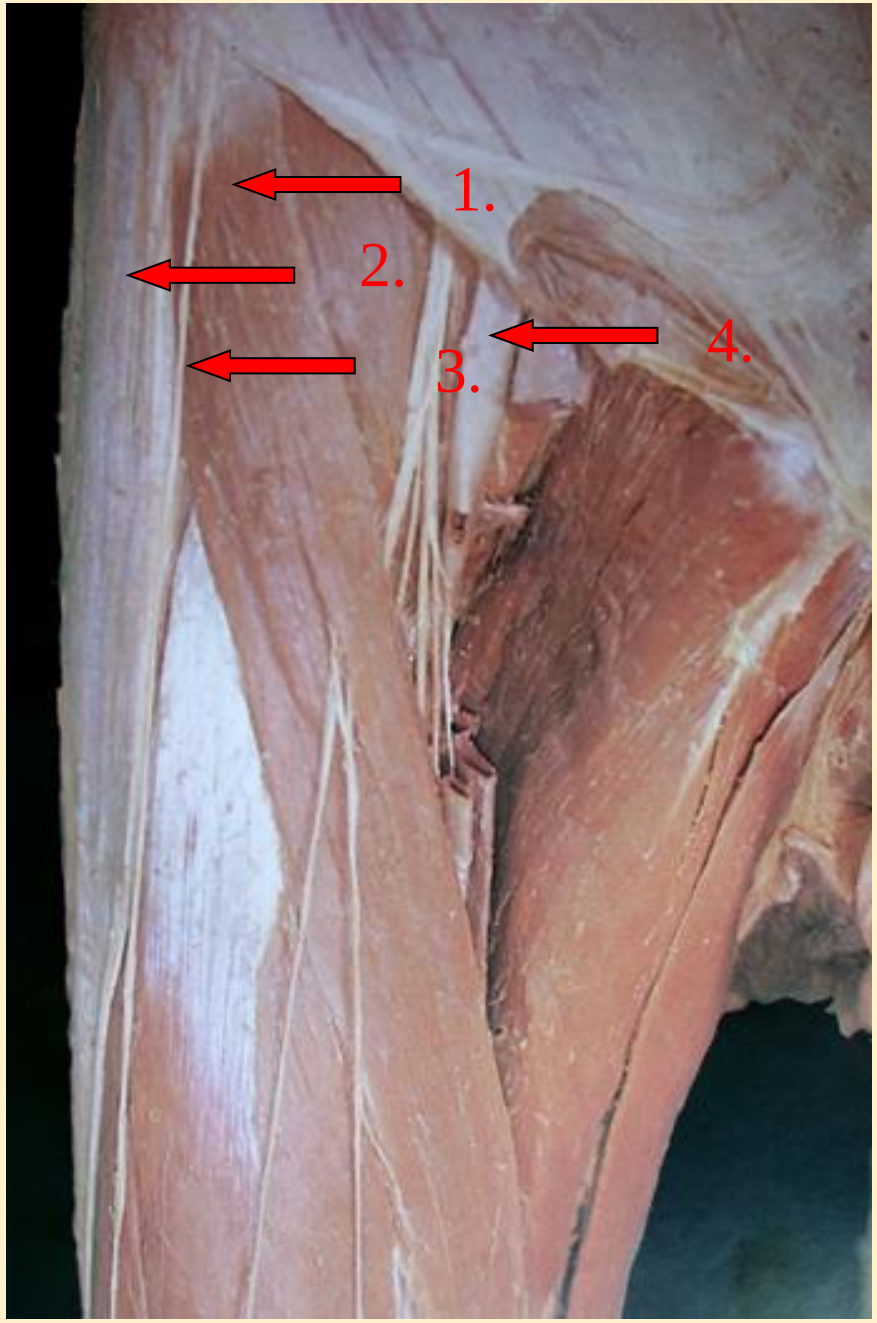
1. Standard: Watson-Jones
   Módosított Watson-Jones

2. Anterior supine - controversy
3. Lateral - controversy
4. Posterior– controversy
5. Two incision - controversy

Indicatiós Szempontok

- Testsúly, proportionalitás, BMI?
- Életkor
- Pathoanatomia, csontminőség, korábbi műtétek
- Compliance





Anatómia

1. m. sartorius
2. m. tensor fsc. latae
3. n. cutaneus fem. lat.
4. femoral vessels & nerve
5. m. gluteus medius
6. m. rectus femoris

Employ intermuscular route
Clarify neurovascular hazards:
anterior: femoral vessels
lat.fem. cut..n.
ant. circumflex a.
posterior:gluteal vessels
sciatic n.

Cup position + tribology+reconstruction techniques

- wear of bearing surfaces
- the second dislocation of the implant
- implant and patient related factors
- inappropriate tensional forces due to malposition of acetabular cup
- possibly prosthesis impingement
- the incidence of early dislocation - on average between 3 and 5%.
- cup malposition - major cause of dislocation
- impingement - restricted ROM and higher stresses on bearing surfaces
- correct position of cups reduce dislocation, subluxation, and material failure
- alternative bearing surfaces, other than polyethylene
- better tribological properties

Paul F. Lachiewicz, Justin R. Kauk

- Anterior iliopsoas impingement and tendinitis - poorly understood and likely under-recognized

- History and physical examination findings - usually suggestive, symptoms frequently subtle.
- Diagnosis - imaging studies, cross-table lateral radiograph, CT, MRI, and ultrasonography, in combination with a confirmatory diagnostic injection.
- Surgical management - release or resection of the iliopsoas tendon, alone or in combination with
  - acetabular revision for an anterior overhanging component

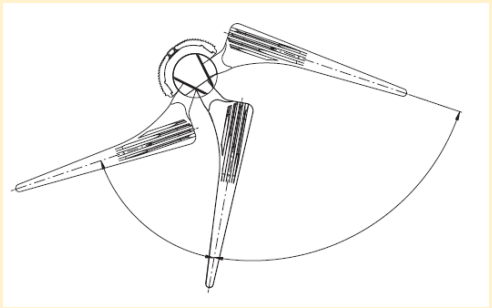
J Am Acad Orthop Surg, Vol 17, No 6, June 2009, 337-344.

Range of Motion and Joint Stability

The effect of large diameter femoral heads on range of motion (ROM) and joint stability

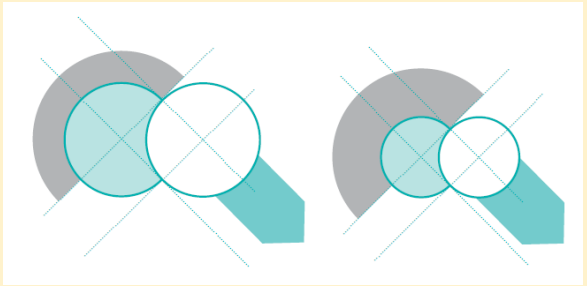
Larger femoral heads increase ROM

- An increased articulation diameter enhances ROM
- An improved ratio between femoral head and neck diameter enhances large ROM



Larger femoral heads enhance stability

- Large diameter femoral heads increase the distance the head must displace before dislocating



International Orthopaedics Volume 32, Number 5 / October, 2008

Rob Zwartele

- primary cementless THR in RA patients and compared with OA patients
- Zweymueller threaded cup and a tapered, rectangular Zweymueller stem
- average of 12.5 yrs
- revision was defined as exchange of cup, stem or both
- no differences in survival rates
- RA group : increased rate of malposition of the cup, avulsions of the greater trochanter, and increased bone resorption in the trochanteric region
- altered biomechanical properties of rheumatoid bone, mechanical stability and osseous integration of cementless prosthesis are not compromised
- higher complication rate - excellent long-term survival

Dysplasia parameters

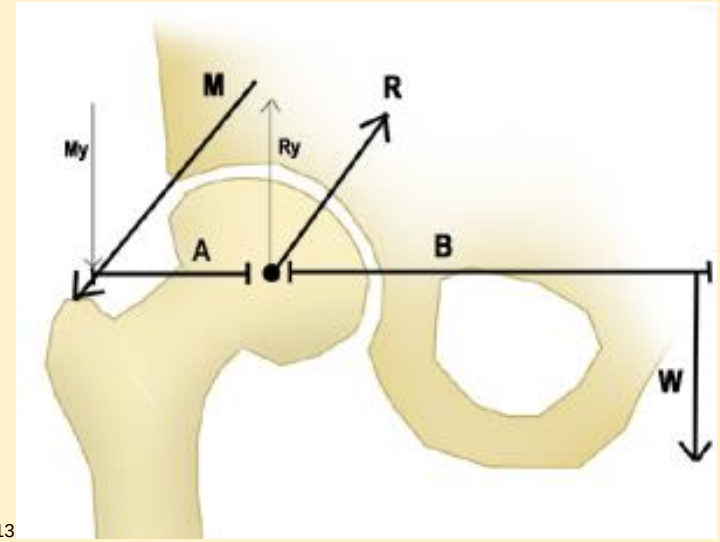
1. segmental deficiencies of the acetabular rim (superiorly, anteriorly, and posteriorly)
2. amount of anteversion
3. depth and opening (the distance between the anterior and the posterior rim) of the true acetabulum
4. the amount of acetabular bone stock (superiorly, anteriorly, and posteriorly)
5. the presence of osteophytes in the area of the true and false acetabula.
6. Iliofemoral ligament stregnth

Indicatio / Luxatio, instabilitás

1. Vápa, szár malpositio
2. Impingement
3. Poliethylen kopás
4. Osteolysis
5. Progressiv protrusio
6. Asepticus – septicus lazulás
7. Periprotheticus femur törés
8. Periprotheticus acetabulum törés
9. Posttrauma

Biomechanika

- Csípő forgáscentrum emelkedés: max.: 3 cm
- Átlagos növelés offset : 1,7 cm
- Acetabulum centrum: nem-lateralisált
  - centralis ileum terhelés
- Paralel szár offset növelés
  stabilitás+abductor



Harris (1998)

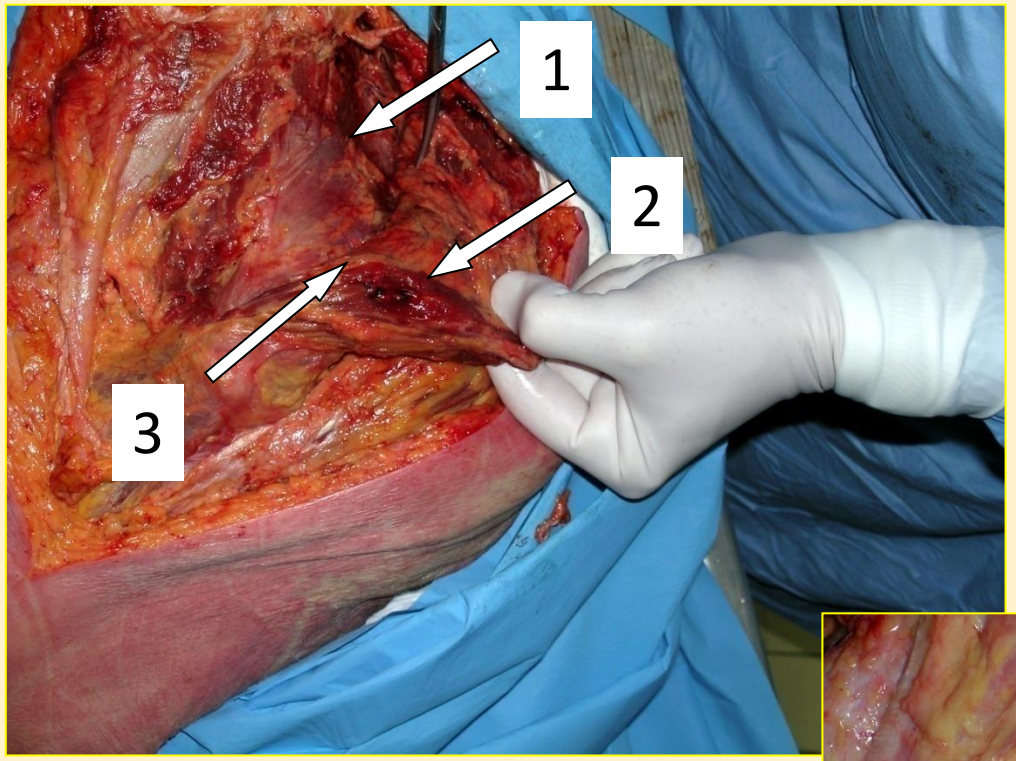
- superior displacement -relative to the inter-tear drop line;
- minor superior -1-2 cm of displacement, 3-4 cm more significant;
- time proven method - least number of technical pitfalls;
- indicated for an oblong cavity
- contact between the host bone and the acetabular component
- bone to grow into a cup
- component in contact with living host bone;
- structural graft under some conditions
- high hip center is not a biomechanical disadvantage
- technique requirements:
- sufficient bone stock for cylindrical reaming;
- hip center is not lateralized
- acetabulum is shaped into a hemisphere
- limb length - correctable
- long-neck or calcar-replacement femoral component.

R. S. Kotwal

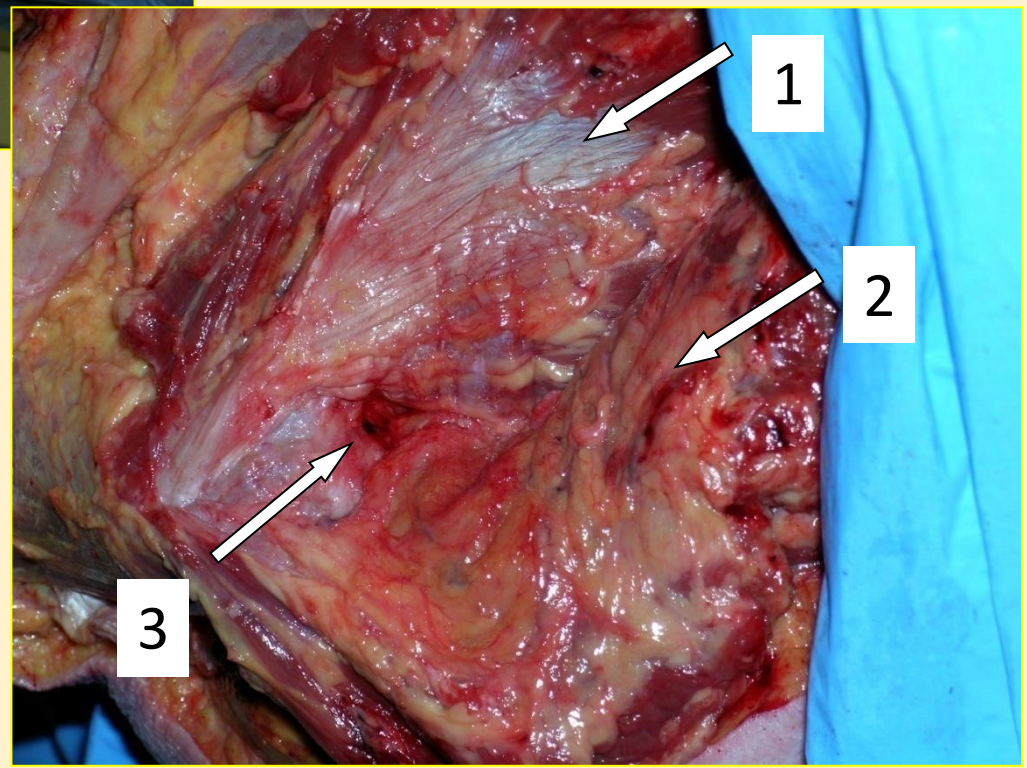
- Study of the natural history of a first episode of dislocation after primary (THR)
- Incidence of recurrent dislocation
- Need for subsequent revision
- Quality of life of these patients.
- Over a 6-year period, 99 patients (101 hips) -first dislocation of a primary THR.
- A total of 61 hips (60.4%) had dislocated more than once
- Minimum follow-up of one year 48 revision for instability (51% in total)
- 7 re-dislocated and 4 needed further surgery
- The quality of life - Oxford Hip Score and the EuroQol-5 Dimension (EQ-5D)

  Mean follow-up of 4.5 years (1 to 20), the mean Oxford Hip Score was 26.7 (15 to 47) after one episode of dislocation, 27.2 (12 to 45) after recurrent dislocation, 34.5 (12 to 54) after successful revision surgery, 42 (29 to 55) after failed revision surgery and 17.4 (12 to 32) in the control group

Journal of Bone and Joint Surgery - British Volume, Vol 91-B, Issue 3, 321-326.

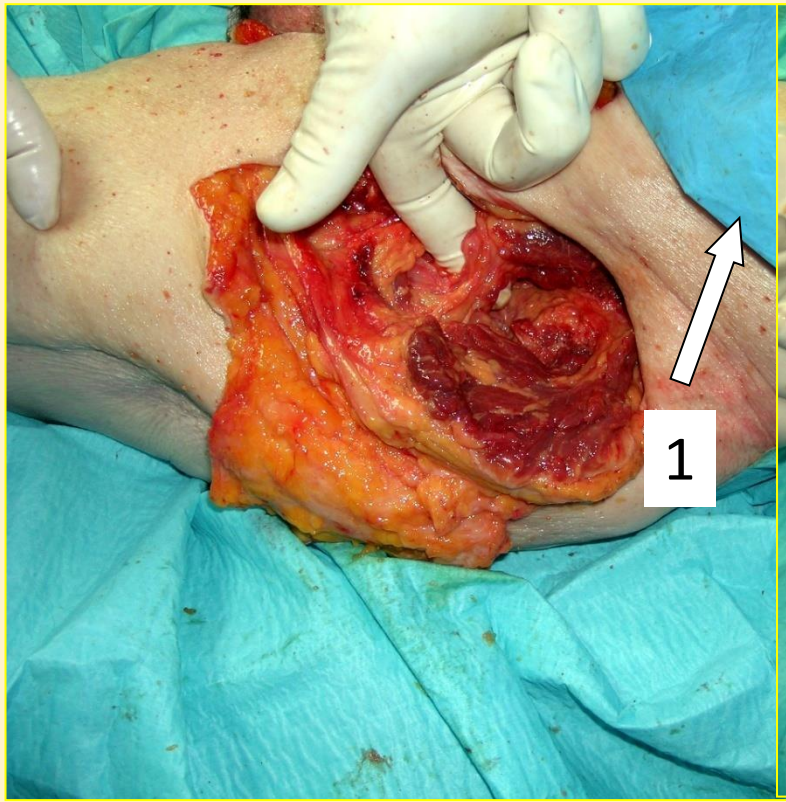


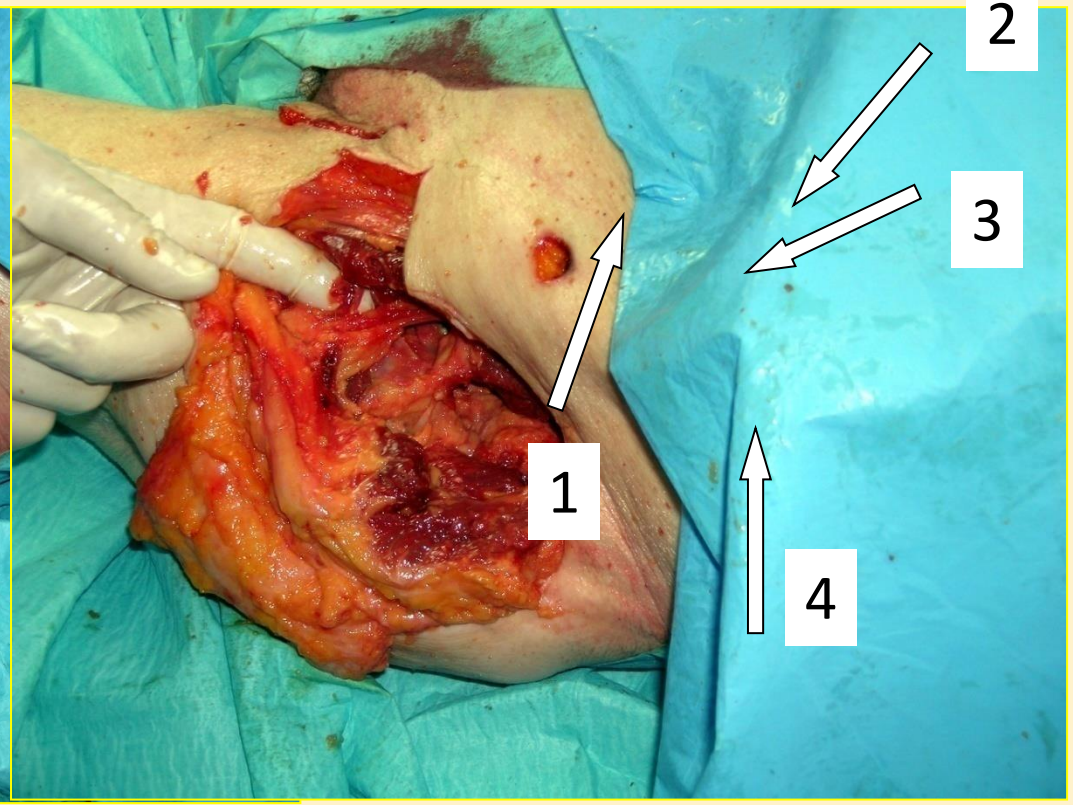
1. m. gluteus med.
2. m. gluteus max. with split
3. femoral entry
   in trochanteric fossa



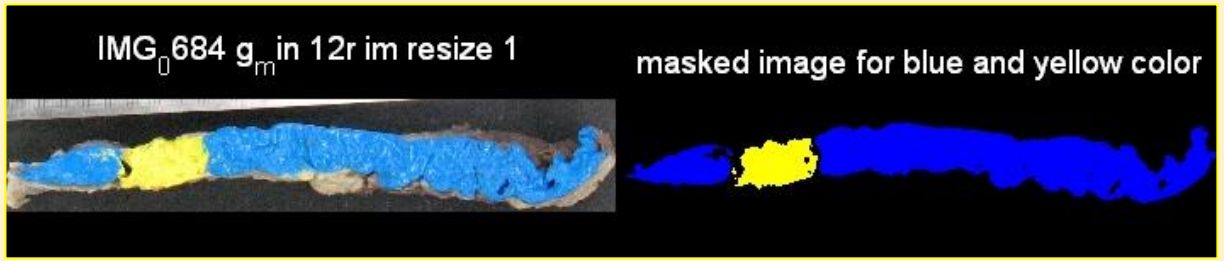
Femoral preparation:
Landmarks:

1. Greater trochanter
2. Patella
3. Transepicondylar line
4. Navigation



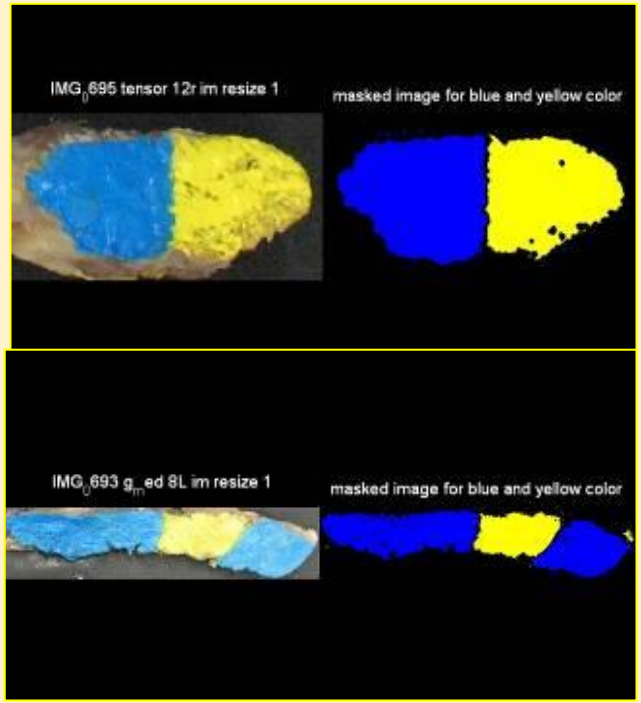


1. lig. ilifemorale prox. band
2. lig. ischiofemorale
3. piriformis tendon
4. dissected gluteus muscles



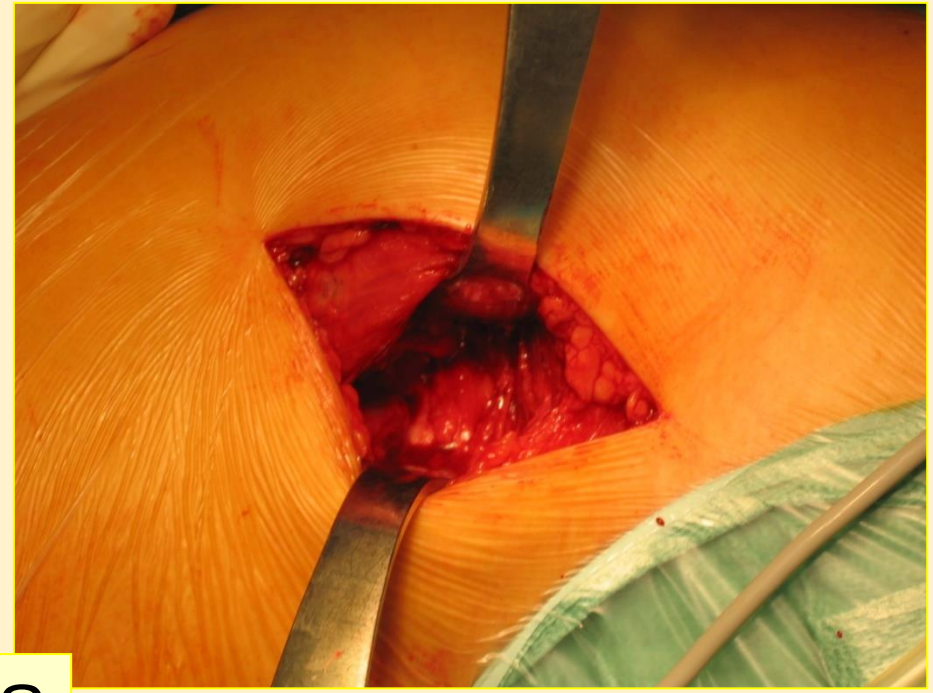
University of Amsterdam
Schafroth - Oldenrijk

But of course you are most interested in the (preliminary) results.
We see an advantage of the 2-incision mainly on preservering much of the gluteus minimus muscle.
While all approaches do damage the gluteus medius muscle, damage to this muscle is very little and in one case even 0%(!) with the 2-incision approach.

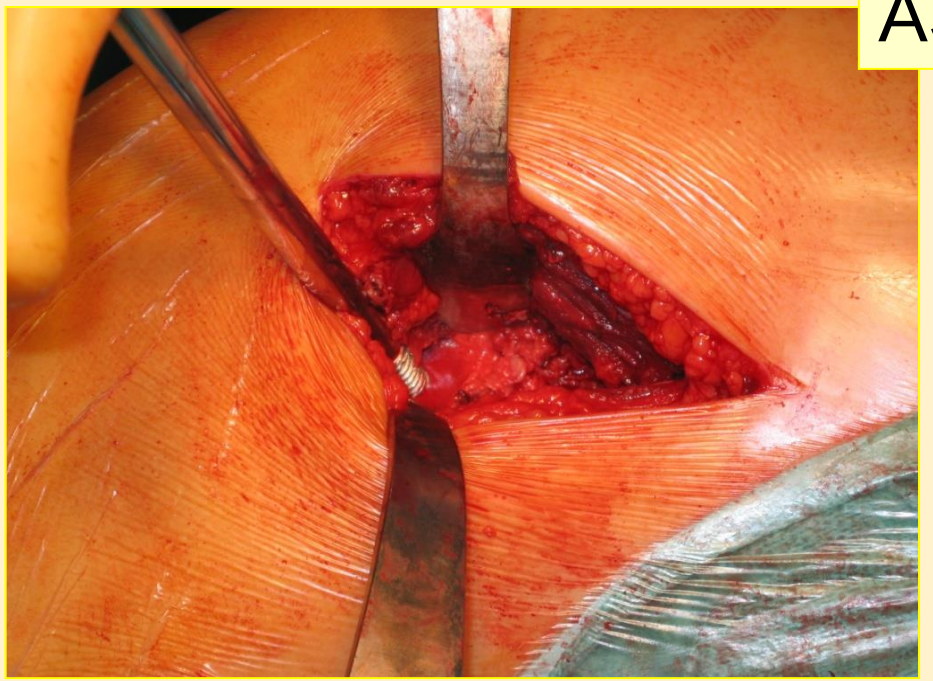


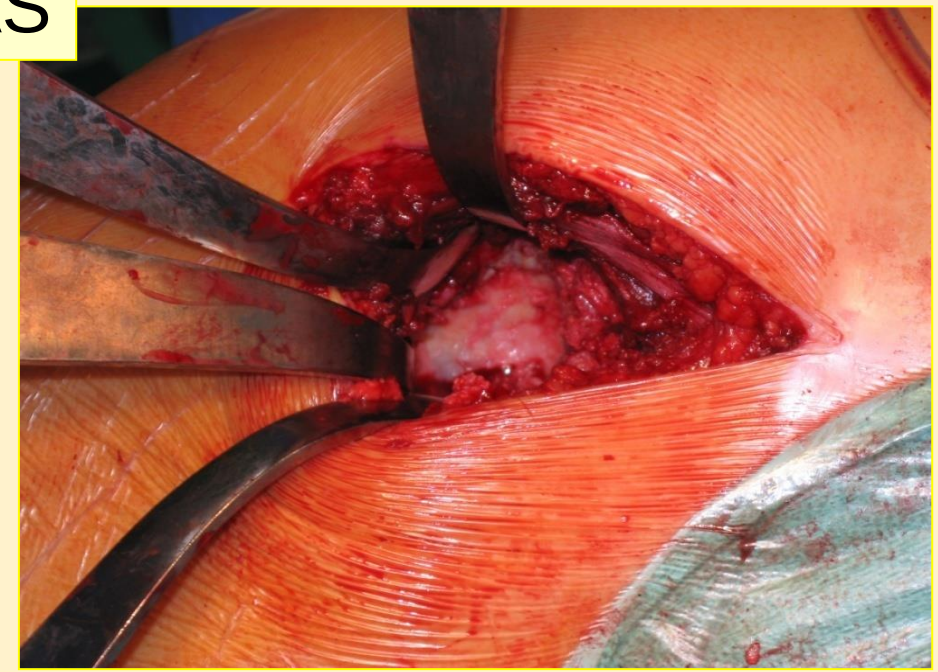
Example of muscle damage measurement on the gluteus minimus. Upper left: extracting the muscle. There is a split fibre incision, with disruption and release of a small portion of muscle. Upper right: physiological cross-sections. Lower picture: yellow: the amount of damage to the physiological cross-sectional area of muscle fibres.

With use of a semi-automatic computer programme (Matlab), specially programmed for this project, three independent assessors measured the amount of yellow and blue pixels.
Damage to the muscle was defined as the amount of yellow pixels divided by the total amount of pixels. We reached in intra- and interobserver reliability of between 0.93 and 1.0, which is excellent.

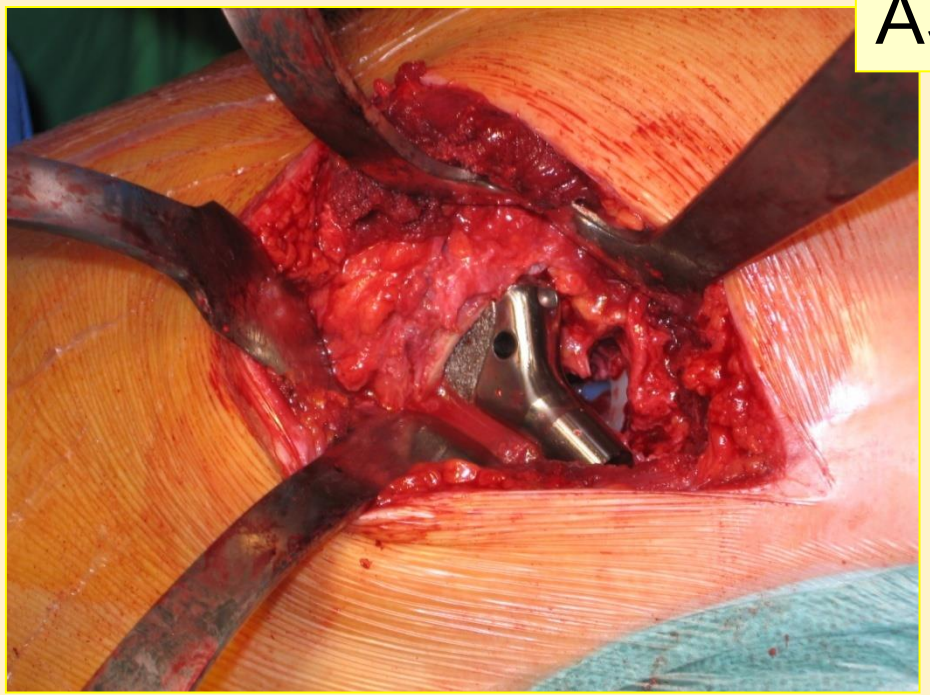


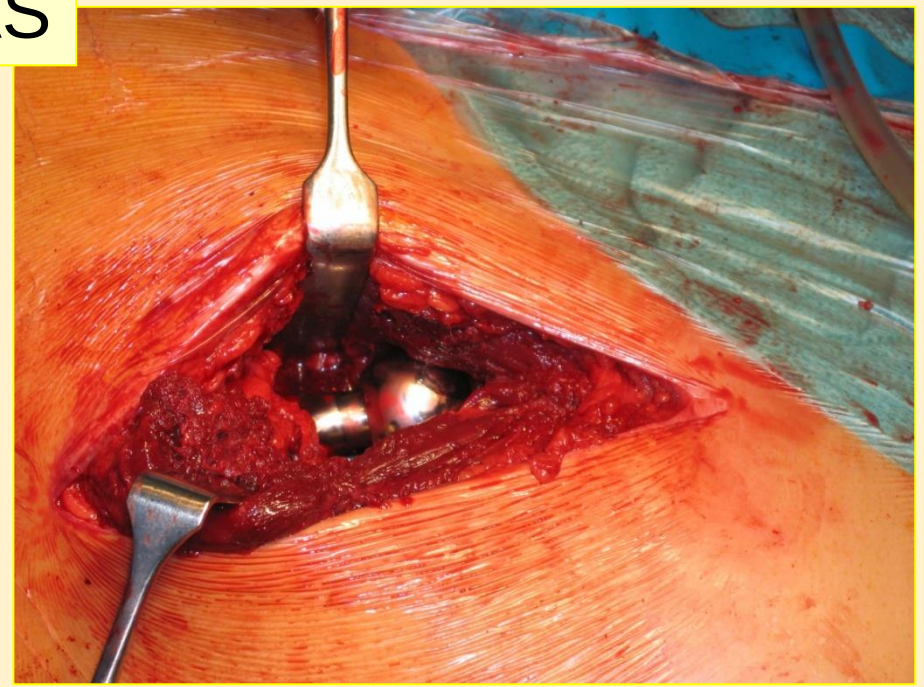
AS

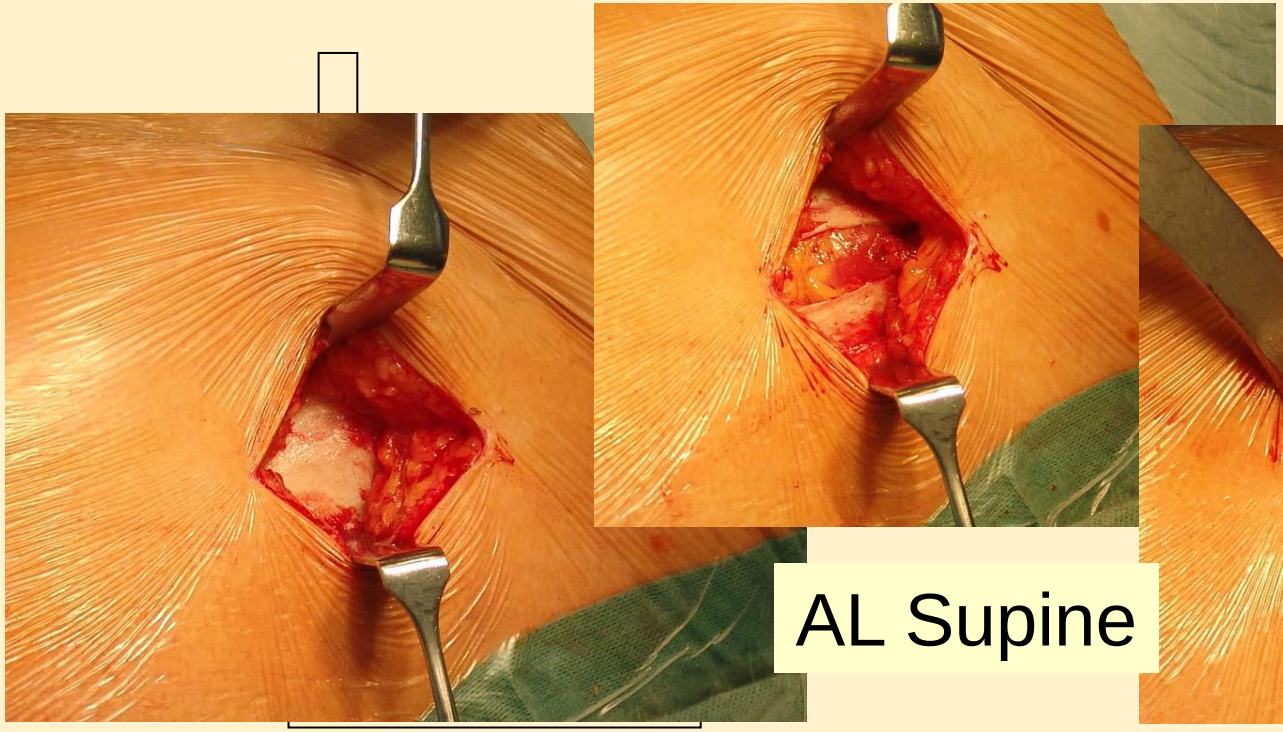


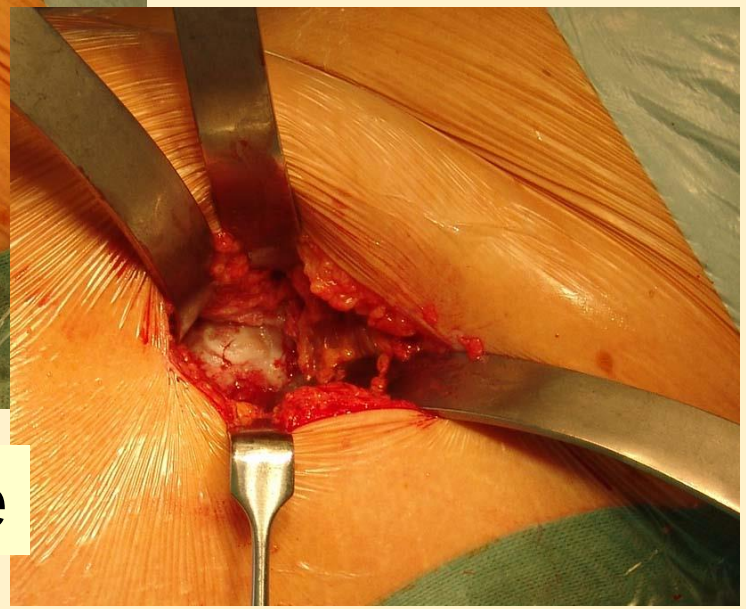


AS

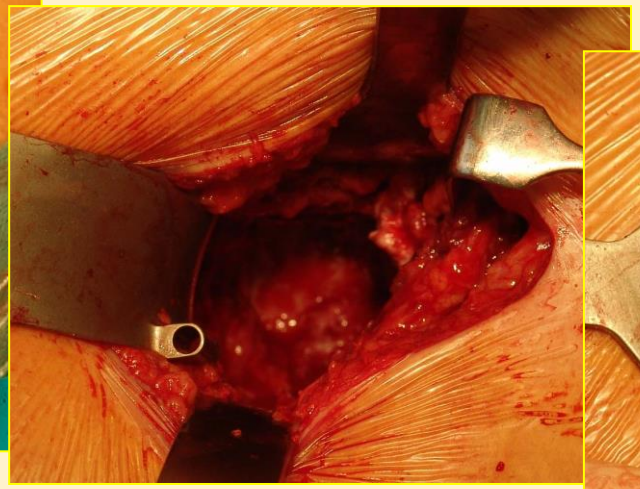


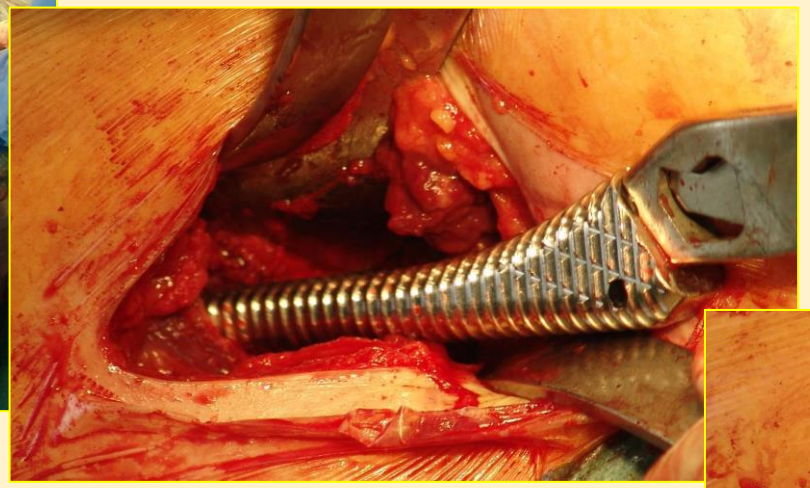
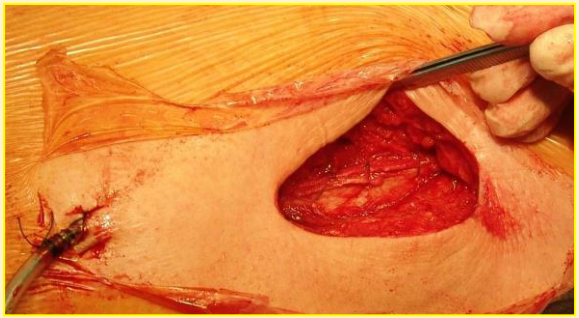
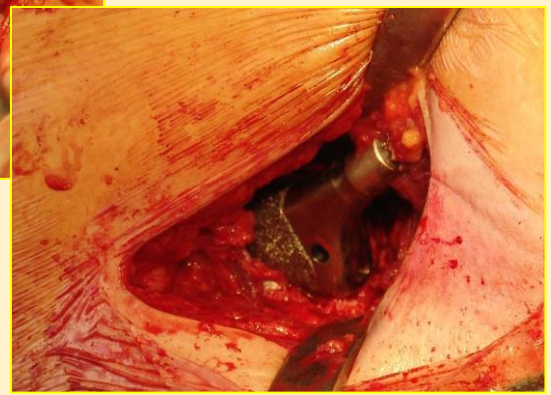




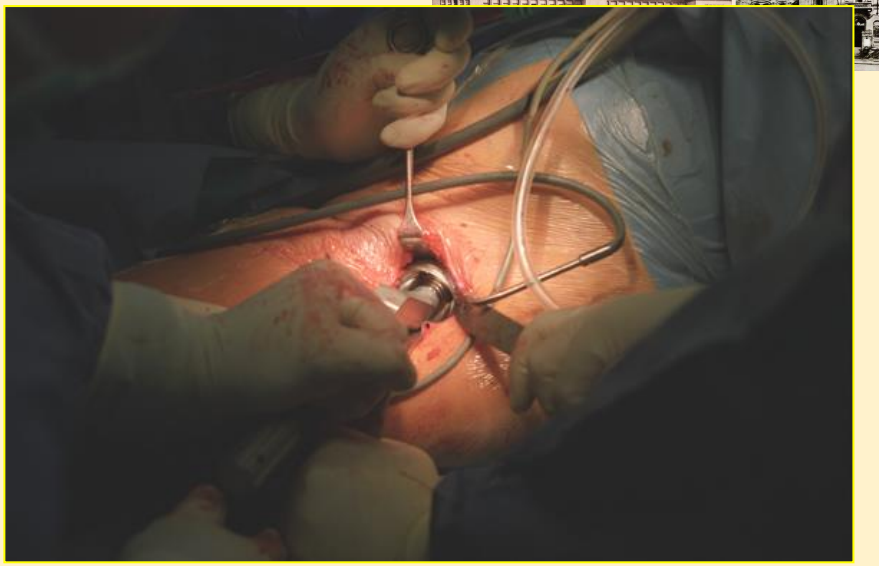


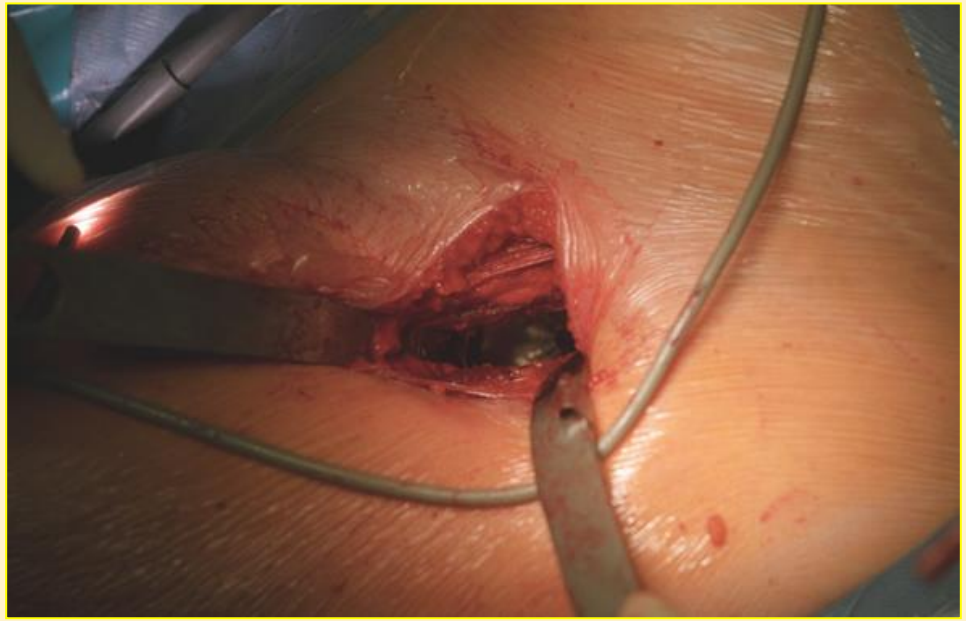
AL Supine

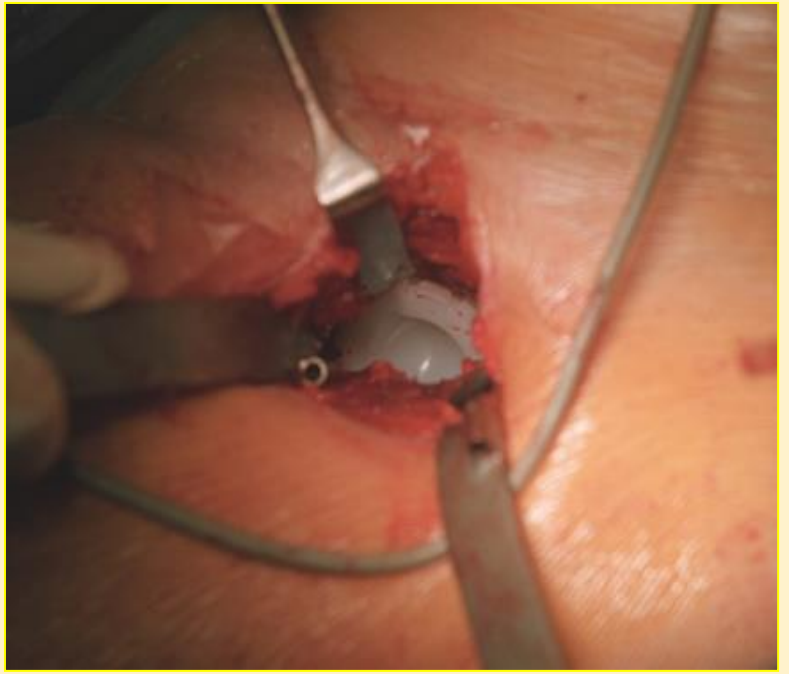



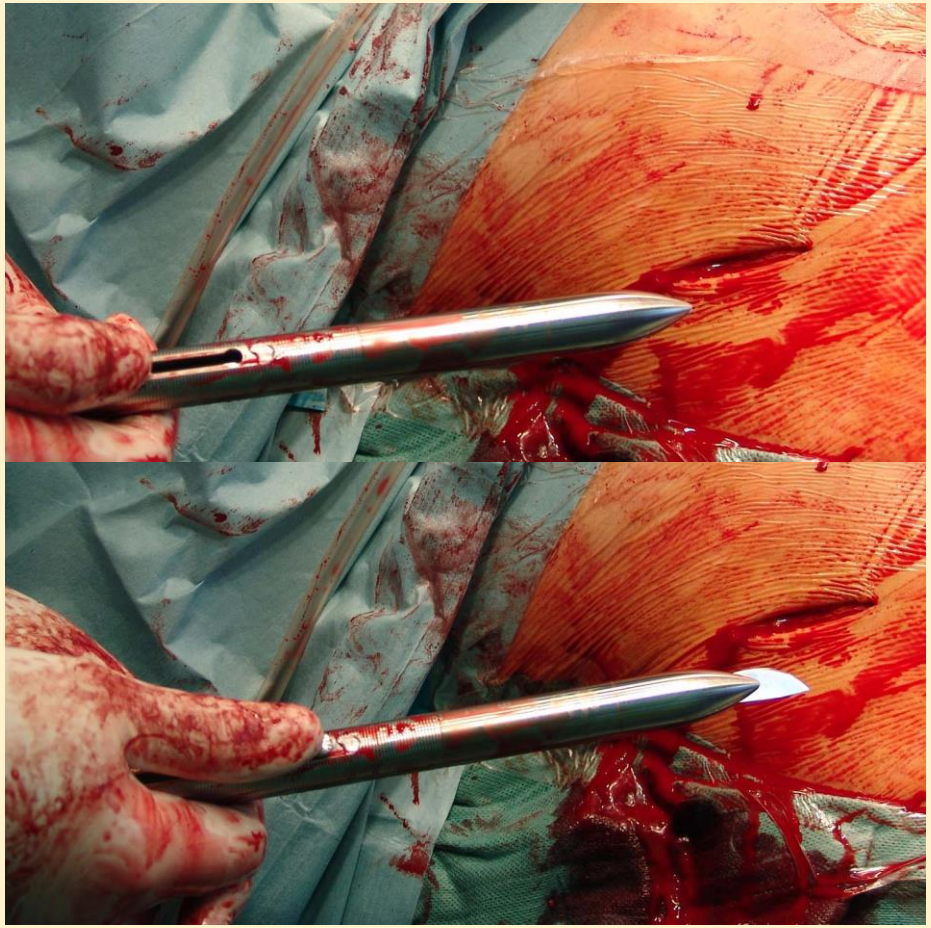





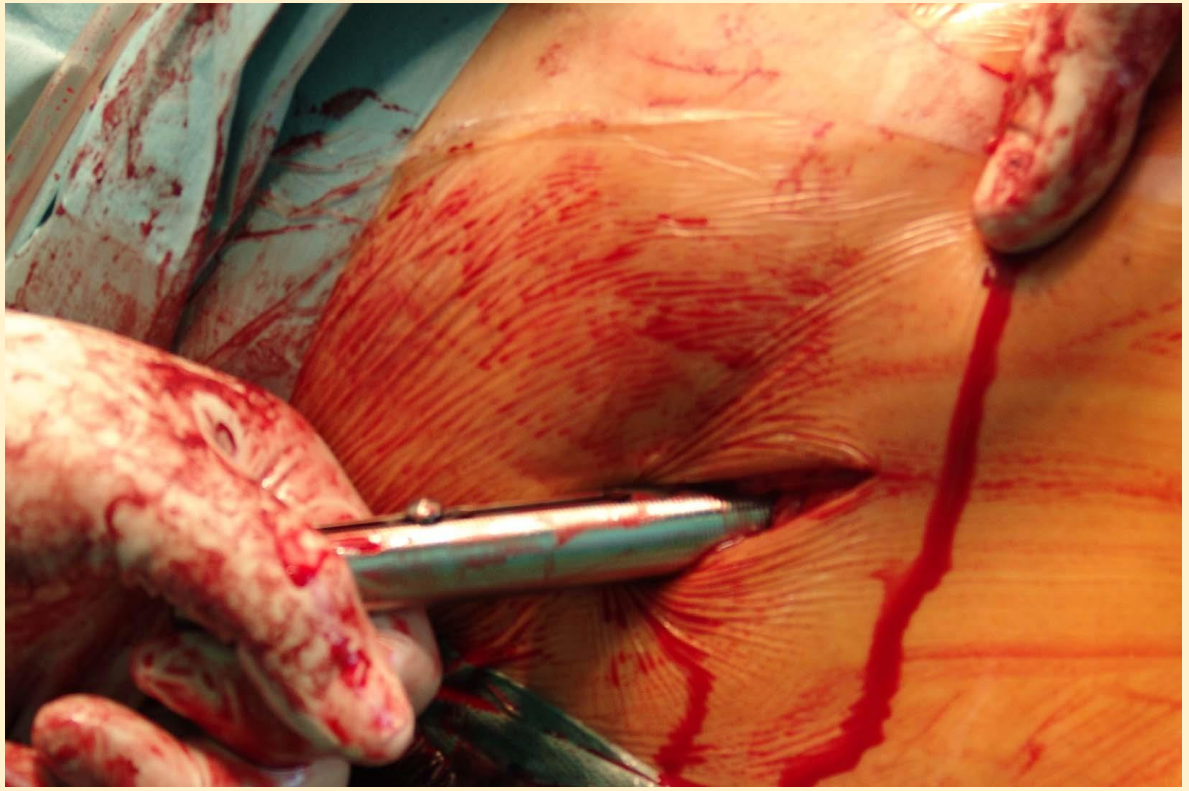

Supine

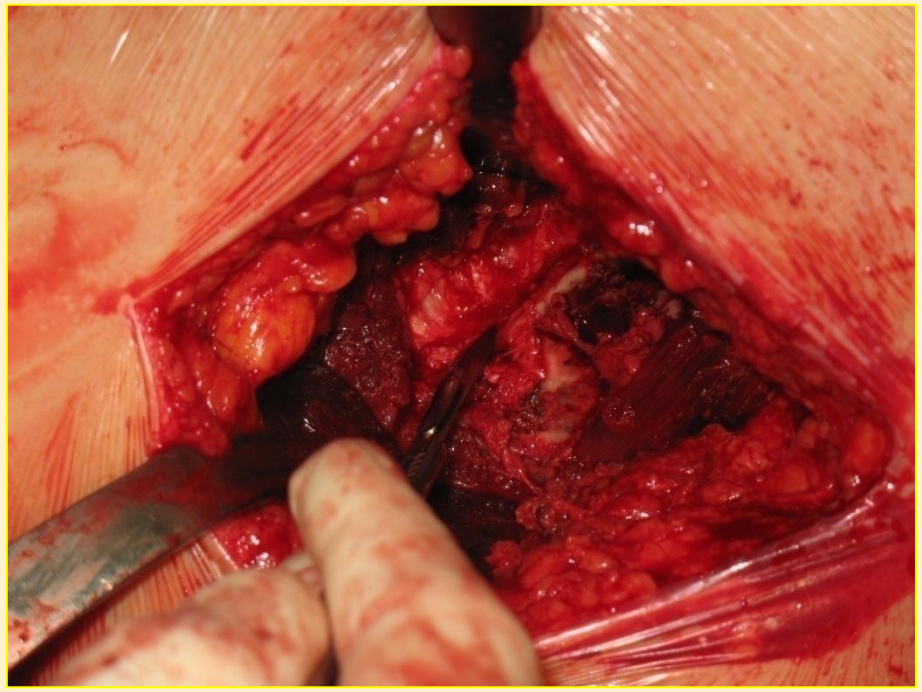


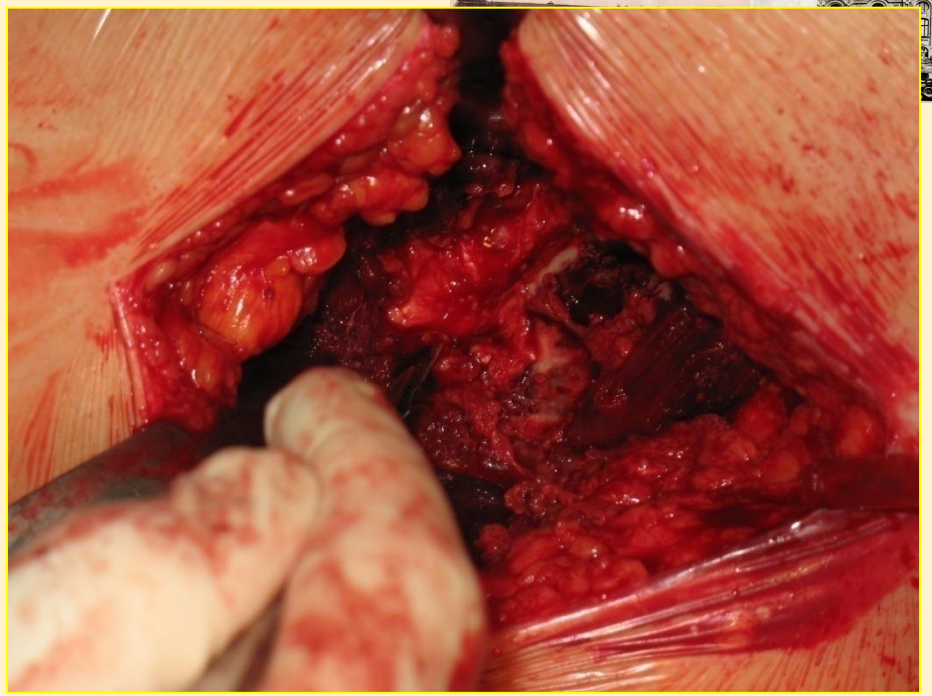


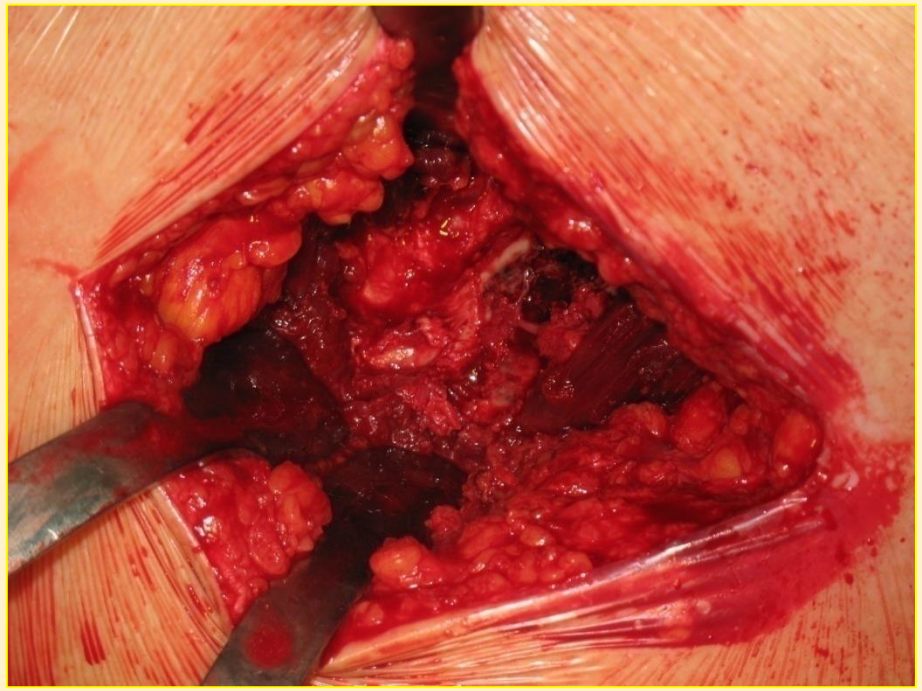










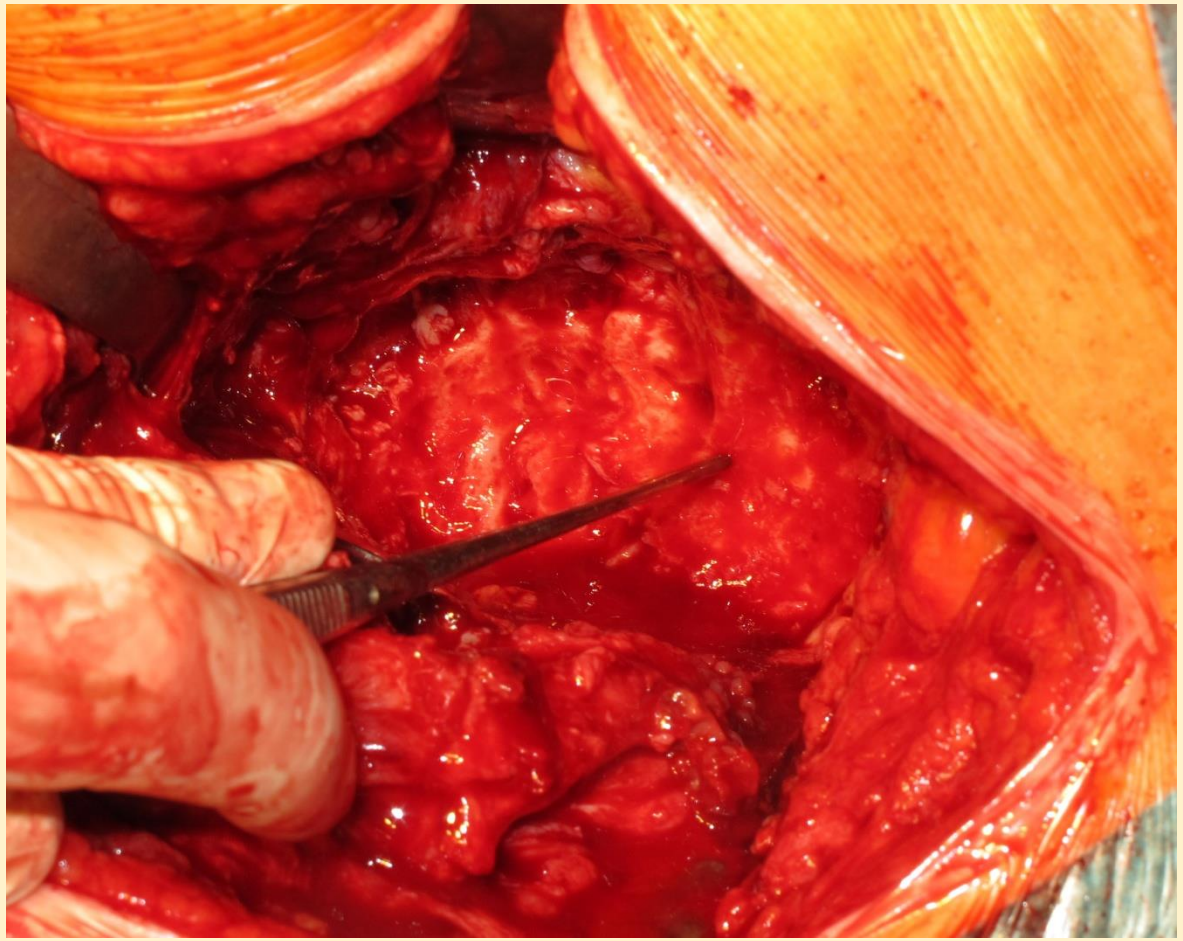


Release: hátsó tok, heg

Fractura megelőzés

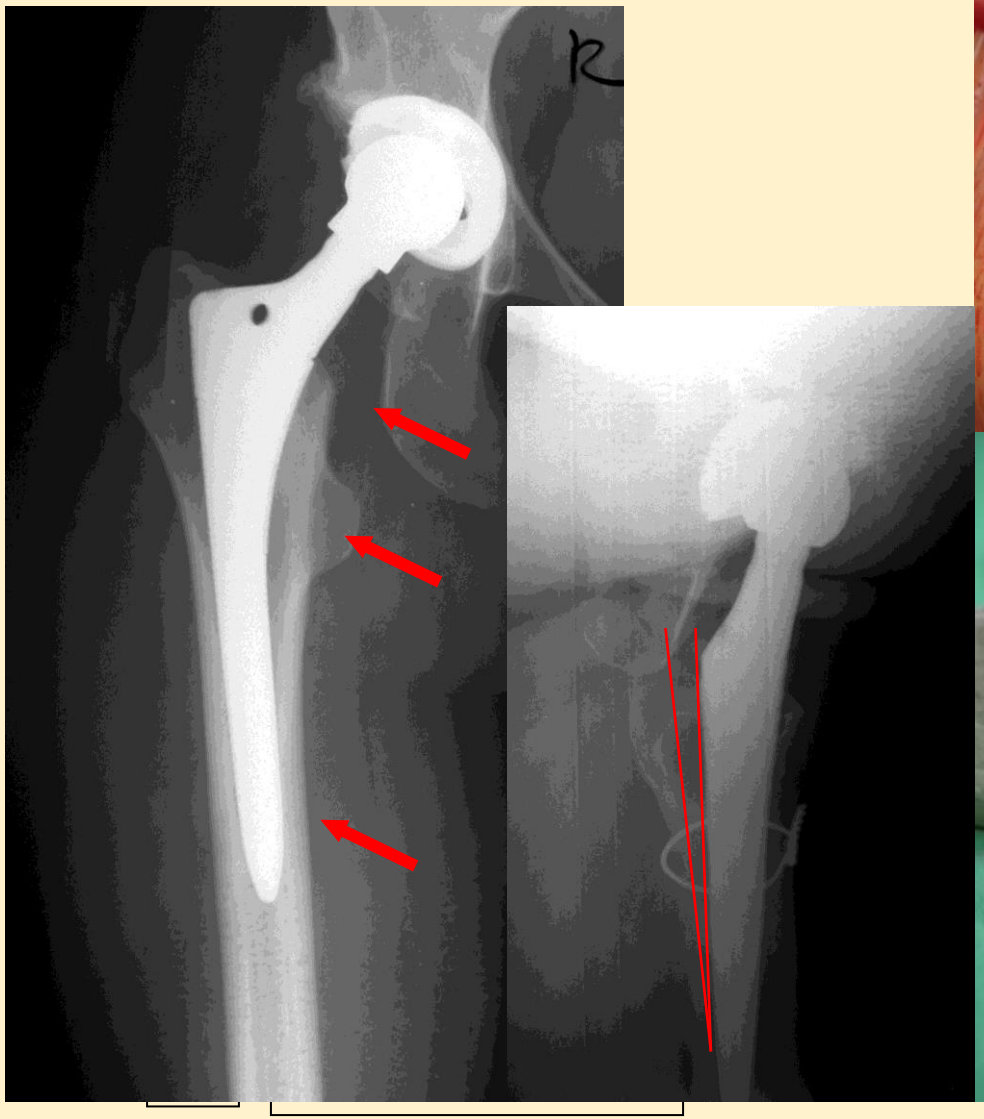
Vápa feltárást megelőzi

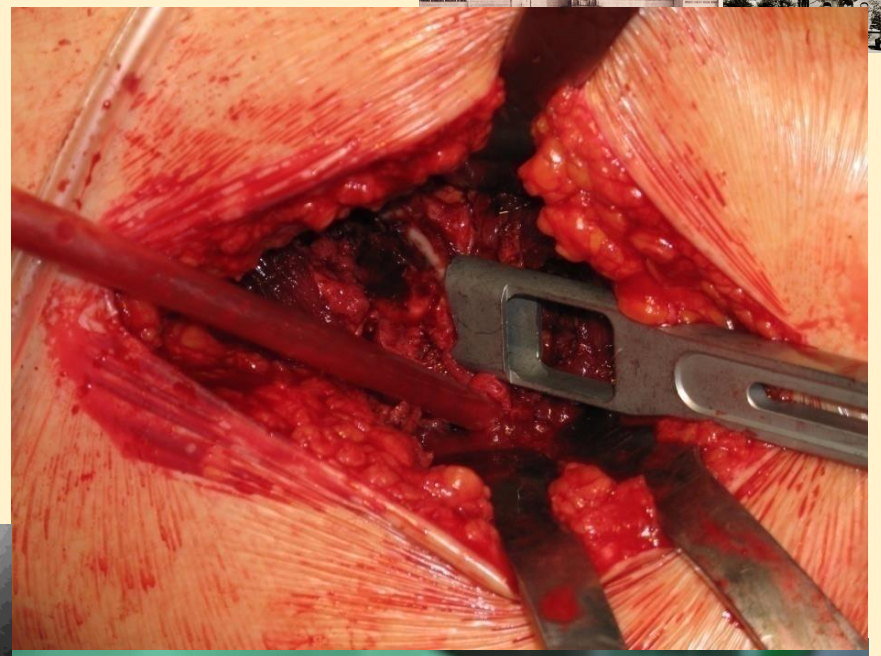
Vápa destruált anatómia

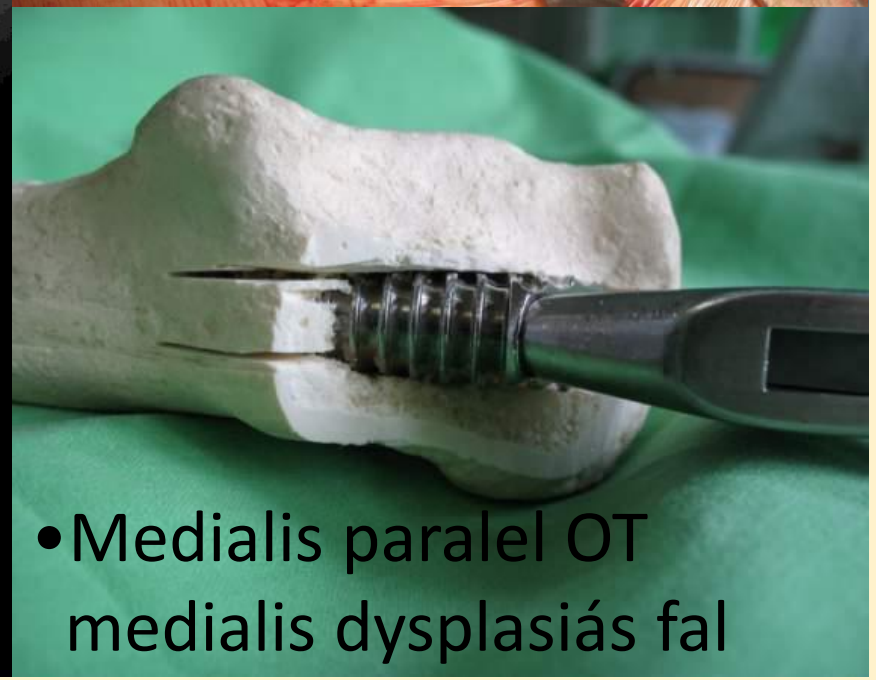


- Vápa feltárás
- Vápa és cement eltávolítás
- Csavar positio-safe zone-
  a.obturatoria
- Ér képletek identifikálása
- Vápa fenék stabilitás
- Dorso-superior stabilitás

- Tips & tricks
- Entry point post & lat

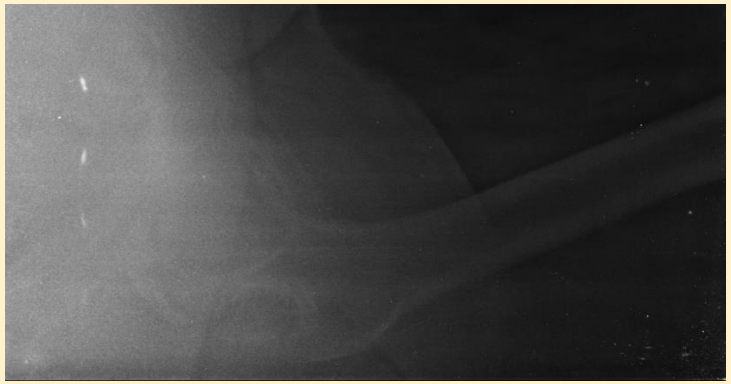


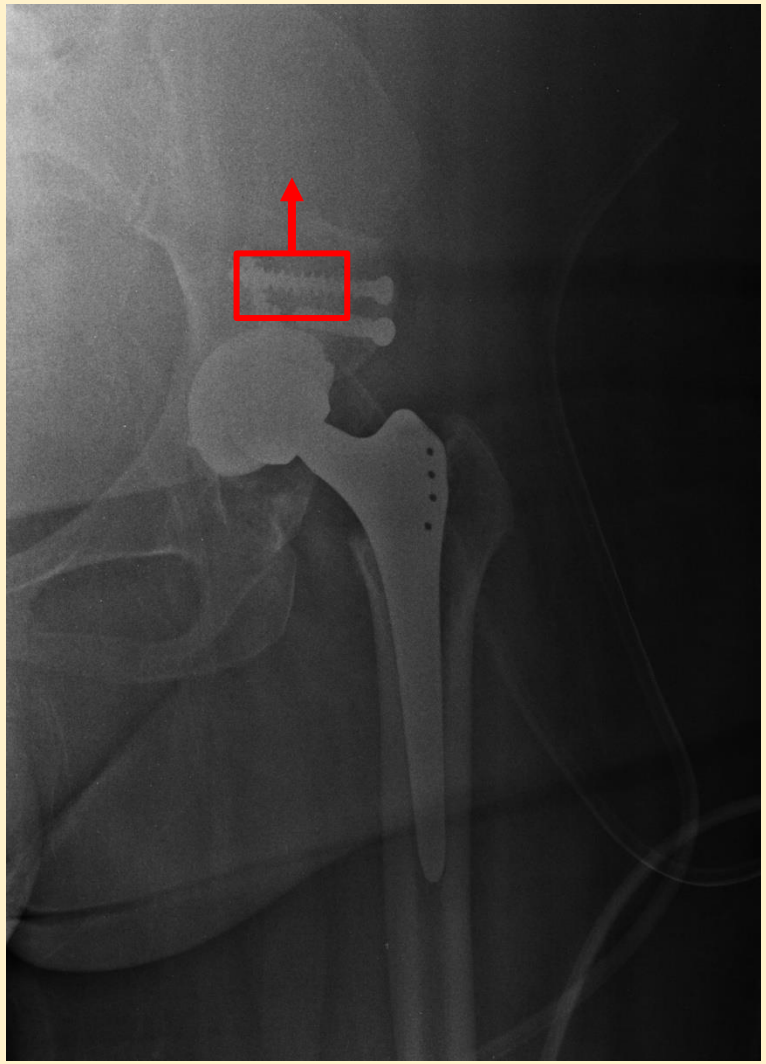


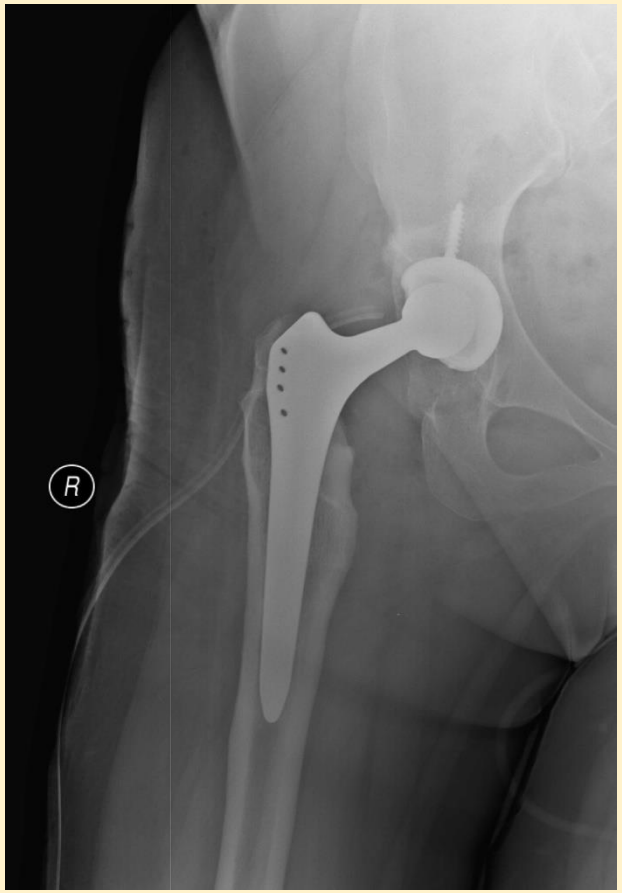


- Medialis paralel OT medialis dysplasiás fal

Harris – Udvarhelyi sr



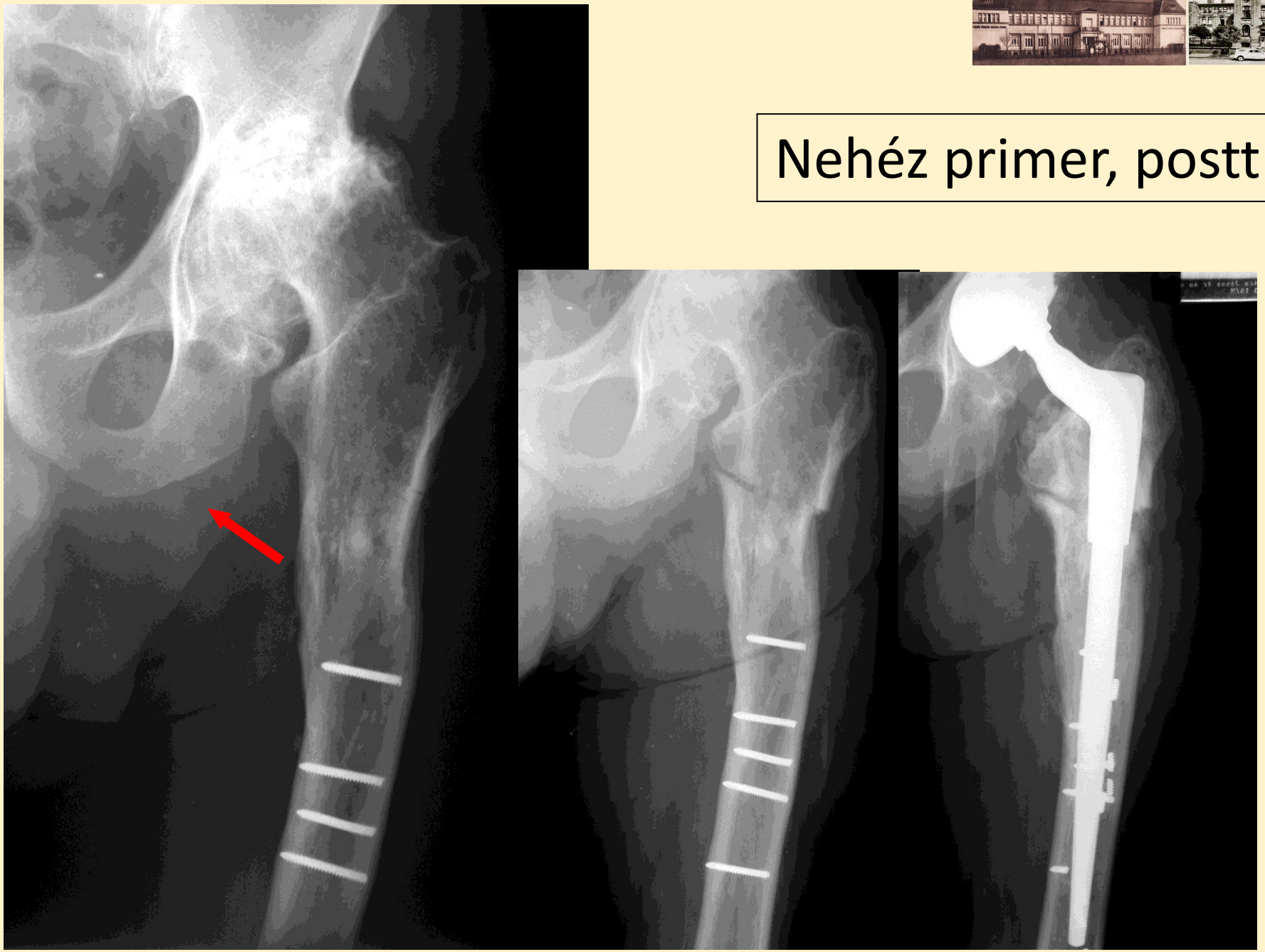




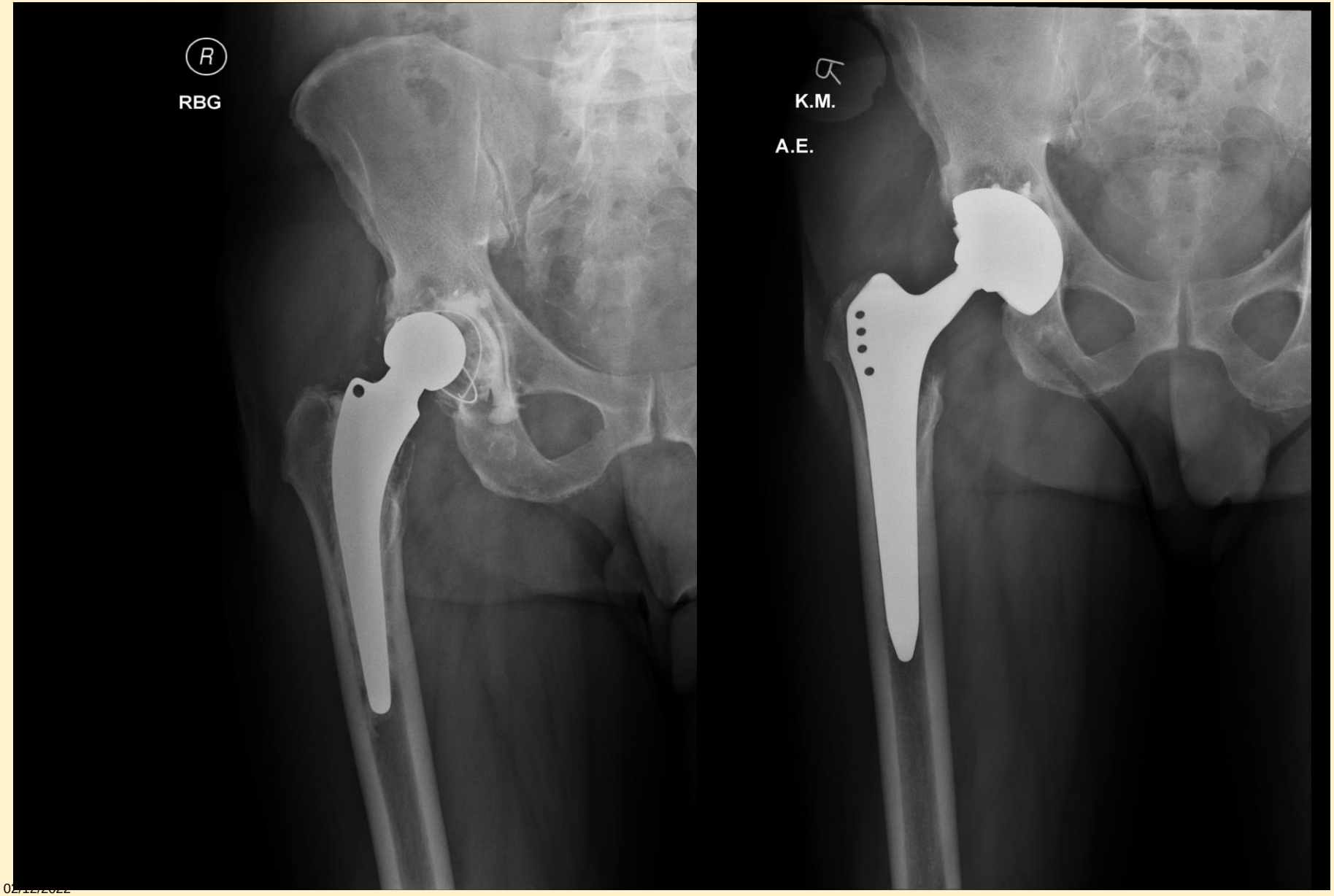
Korábbi osteotomia reconstructio

forgás centrum offset

Nehéz primer, posttrauma



P II b Revisio, primer szár, offset

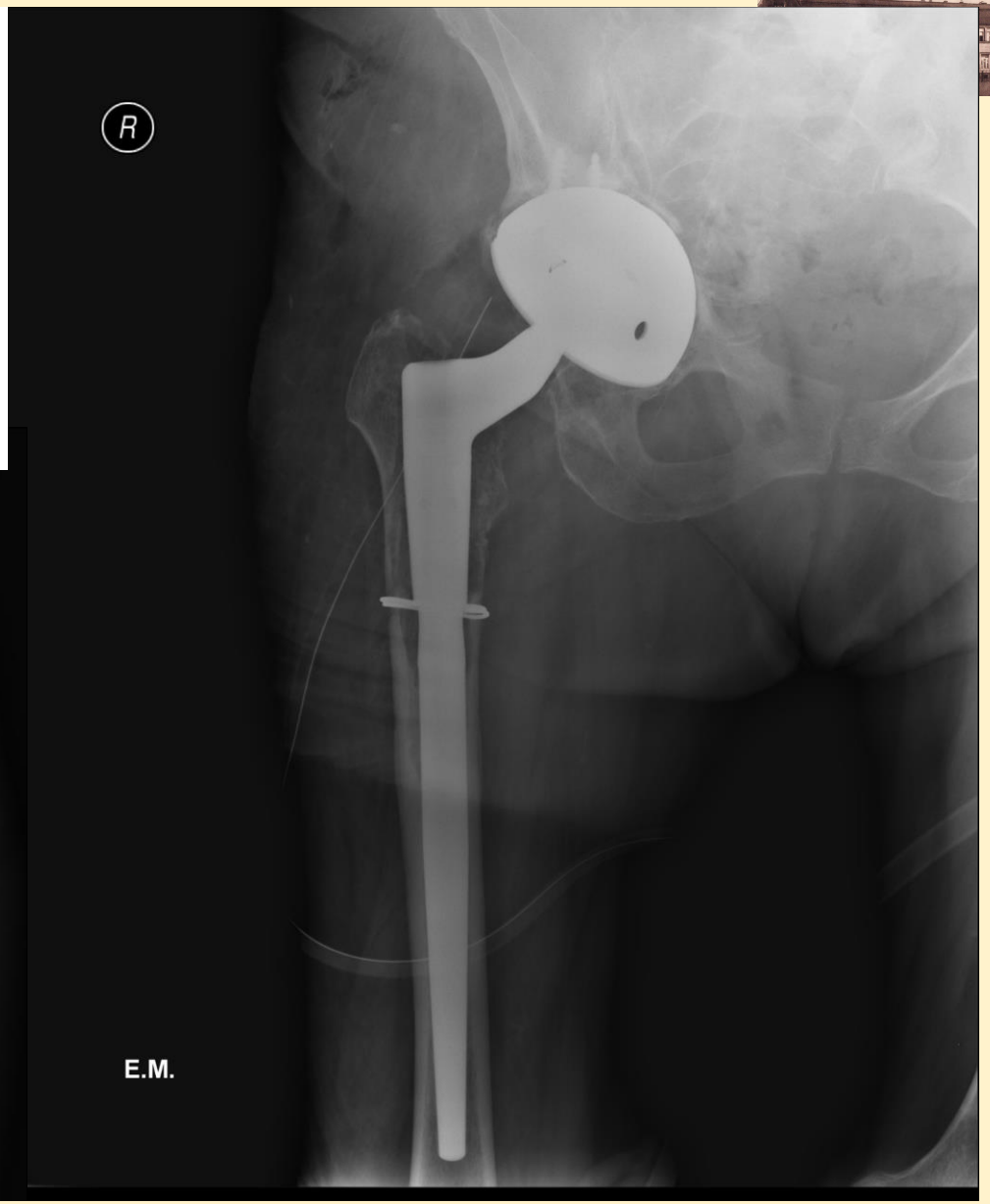


P III B

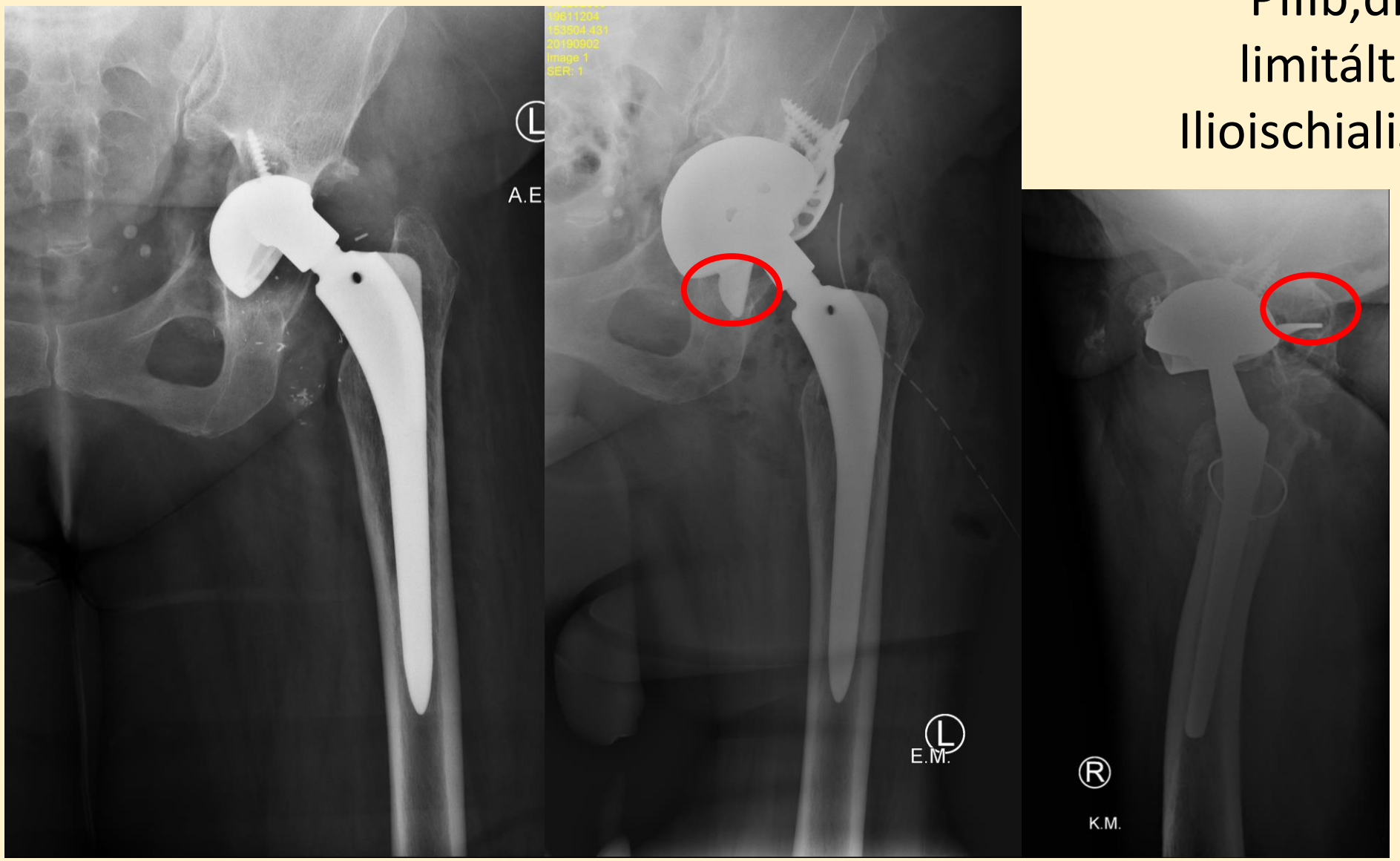
magas forgás centrum

70 mm vápa

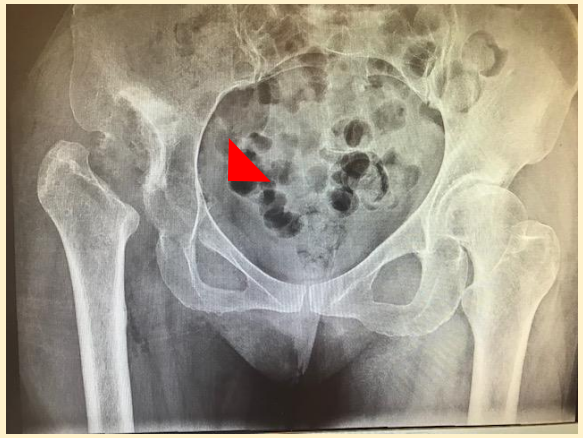
offset rev. szár



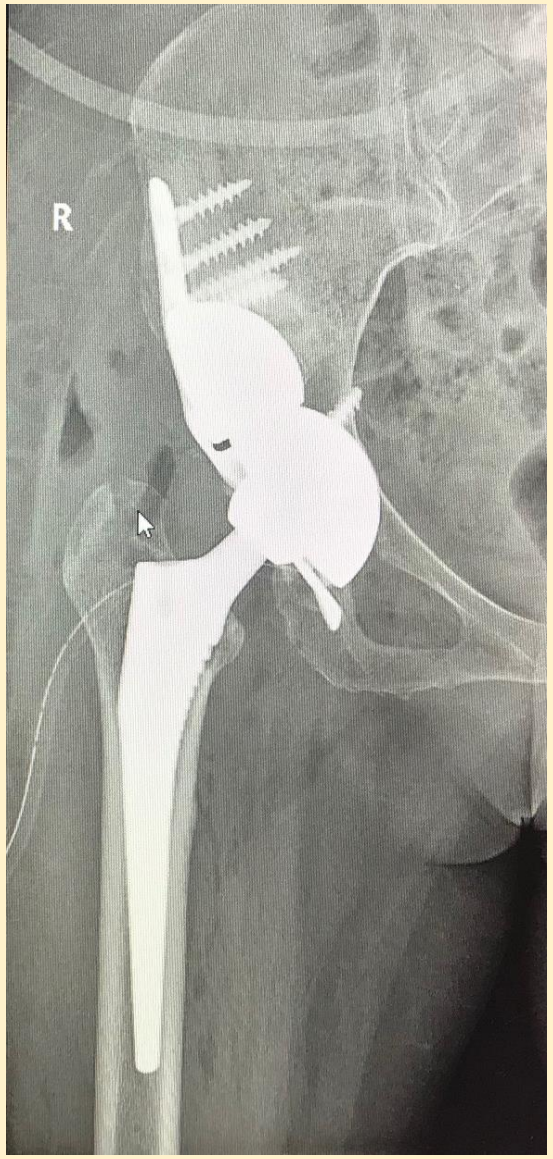
PIIIb,discontinuitás
limitált csont felszín,
Ilioischialis transfer.offset
vápa recon



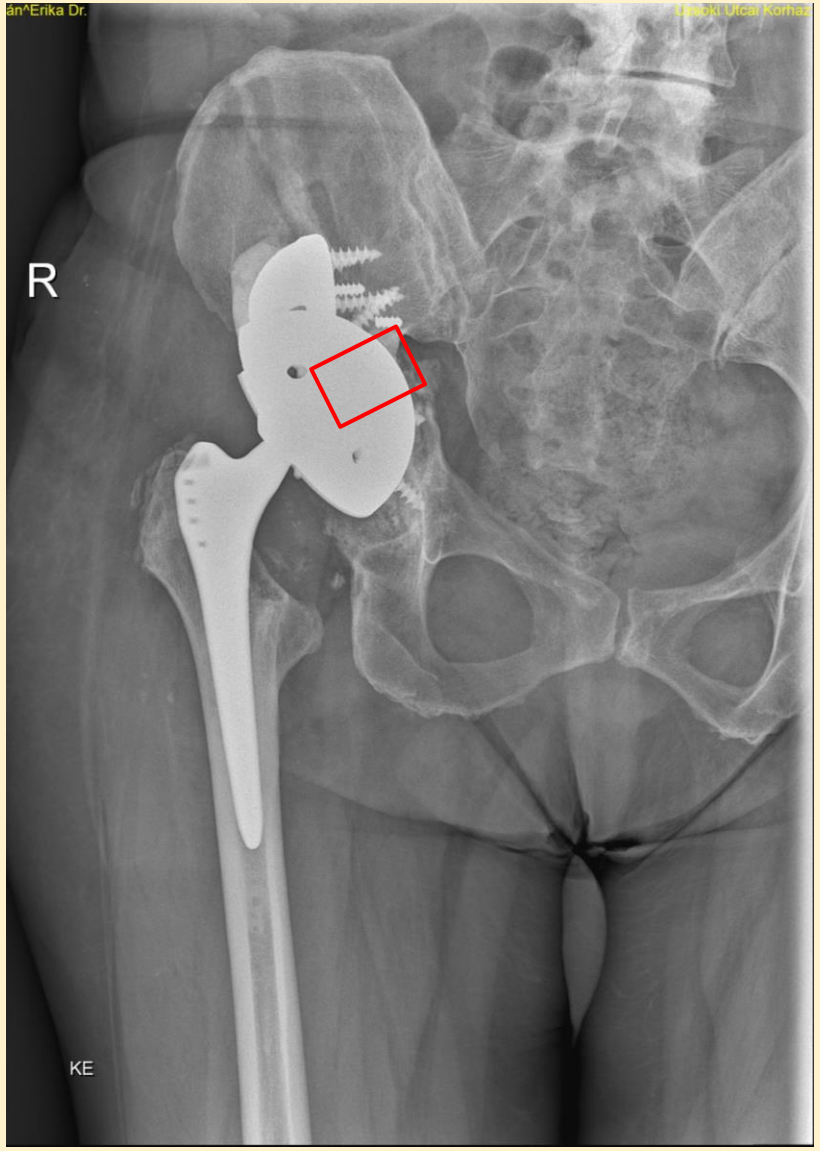
Cup and Cage PIIIb – extensiv művi destructio



Post dysplasia
Primer struct. károsodás
Primer vápa
Low offset szár



Structuralis graft distractio, Butress szerű augment, Vápa reconstructio + Primary-revisiós szár



Melman WP, Mollen BP, Kollen BJ, Verheyen CC. First experiences with the direct anterior approach in lateral decubitus position: learning curve and 1 year complication rate. Hip Int. 2015;25:251–7. doi:10.5301/hipint.5000221.

Spaans AJ, van den Hout JA, Bolder SB. High complication rate in the early experience of minimally invasive total hip arthroplasty by the direct anterior approach. Acta Orthop. 2012;83:342–6.

Hansen BJ, Hallows RK, Kelley SS. The Rottinger approach for total hip arthroplasty: technique and review of the literature. Curr Rev musculoskelet Med. 2011;4:132–8.

Rottinger H. The MIS anterolateral approach for THA. Orthopade. 2006;35(708):10–5.

Primary and revision anterior supine total hip arthroplasty: an analysis of complications and reoperations
Keith R. Berend, Adolph V Lombardi jr
Annual 2013 IC (Vol. 62) American Academy of Orthopaedic Surgeons

.

Meneghini RM, Smits SA, Swinford RR, Bahamonde RE. A randomized, prospective study of 3 minimally invasive surgical approaches in total hip arthroplasty: comprehensive gait analysis. J Arthroplasty. 2008;23:68–73.

Bertin KC, Rottinger H. Anterolateral mini-incision hip replacement surgery: a modified Watson-Jones approach. Clin Orthop Relat Res. 2004;429:248–55.

Jerosch J, Theising C, Fadel ME. Antero-lateral minimal invasive (ALMI) approach for total hip arthroplasty technique and early results. Arch Orthop Trauma Surg. 2006;126:164–73.

Chomiak J, Huracek J, Dvorak J, et al. Lesion of gluteal nerves and muscles in total hip arthroplasty through 3 surgical approaches. An electromyographically controlled study. Hip Int. 2015;25:176–83.

Martin CT, Pugely AJ, Gao Y, Clark CR. A comparison of hospital length of stay and short-term morbidity between the anterior and the posterior approaches to total hip arthroplasty. J Arthroplasty. 2013;28:849–54.

Laffosse JM, Chiron P, Molinier F, Bensafi H, Puget J. Prospective and comparative study of the anterolateral mini-invasive approach versus minimally invasive posterior approach for primary total hip replacement. Early results. Int Orthop. 2007;31:597–603.

Laffosse JM, Accadbled F, Molinier F, Chiron P, Hocine B, Puget J. Anterolateral mini-invasive versus posterior mini-invasive approach for primary total hip replacement. Comparison of exposure and implant positioning. Arch Orthop Trauma Surg. 2008;128:363–9.

Muller M, Tohtz S, Springer I, Dewey M, Perka C. Randomized controlled trial of abductor muscle damage in relation to the surgical approach for primary total hip replacement: minimally invasive anterolateral versus modified direct lateral approach. Arch Orthop Trauma Surg. 2011;131:179–89.

Mandereau C, Brzakala V, Matsoukis J. Functional recovery, complications and CT positioning of total hip replacement performed through a Rottinger anterolateral mini-incision. Review of a continuous series of 103 cases. Orthop Traumatol Surg Res. 2012;98:8–16.

Nyomorék Gyermekek Országos Otthona - Uzsoki Kórház

100 év ortopédia - 50 év traumatológia

Malpositio
Fractura
Neurovascularis
Instabilitás
Sebgyógyulás

- Protézis kerekasztal
- 2022.november 26

Köszönöm a figyelmet!