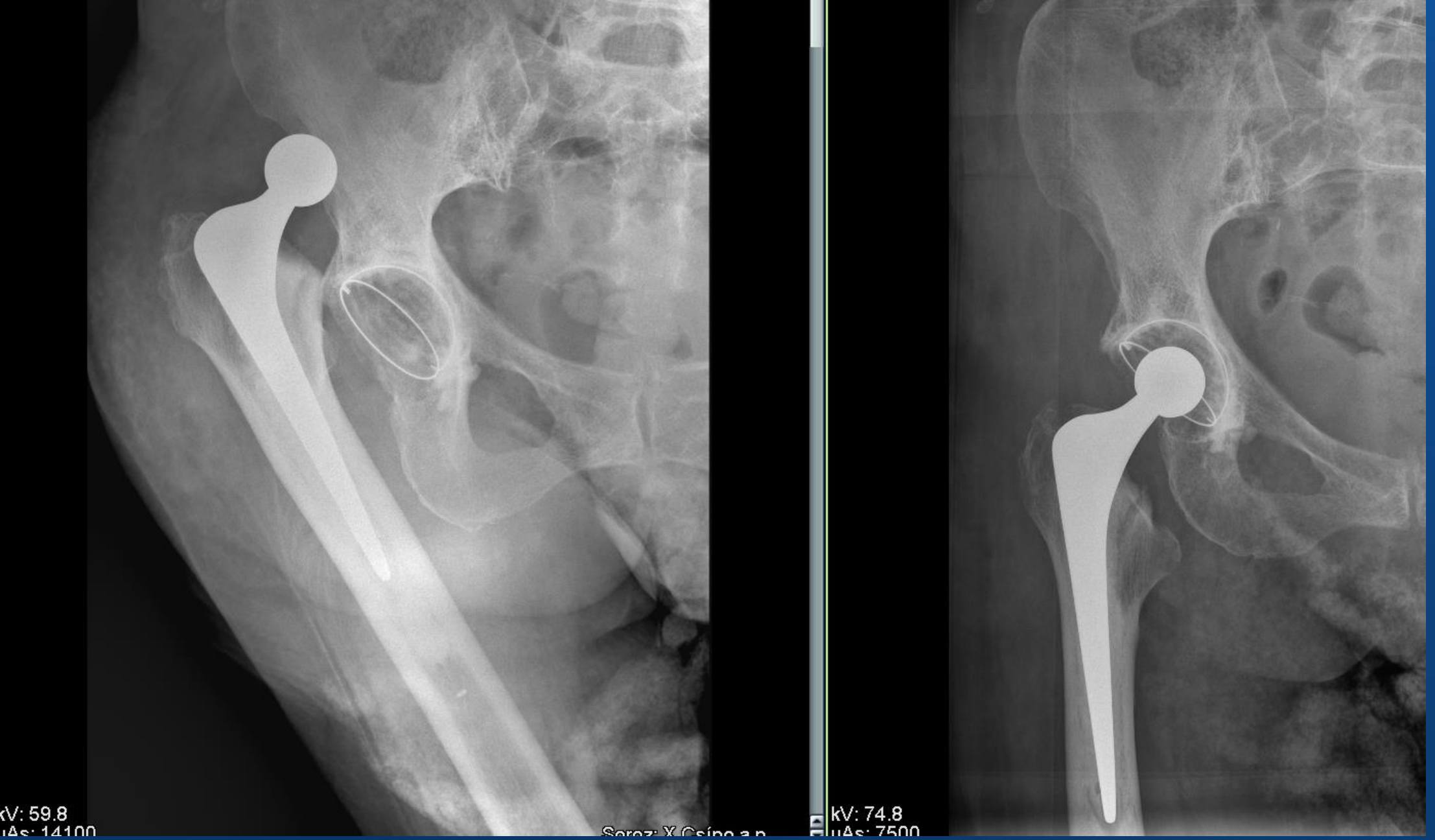
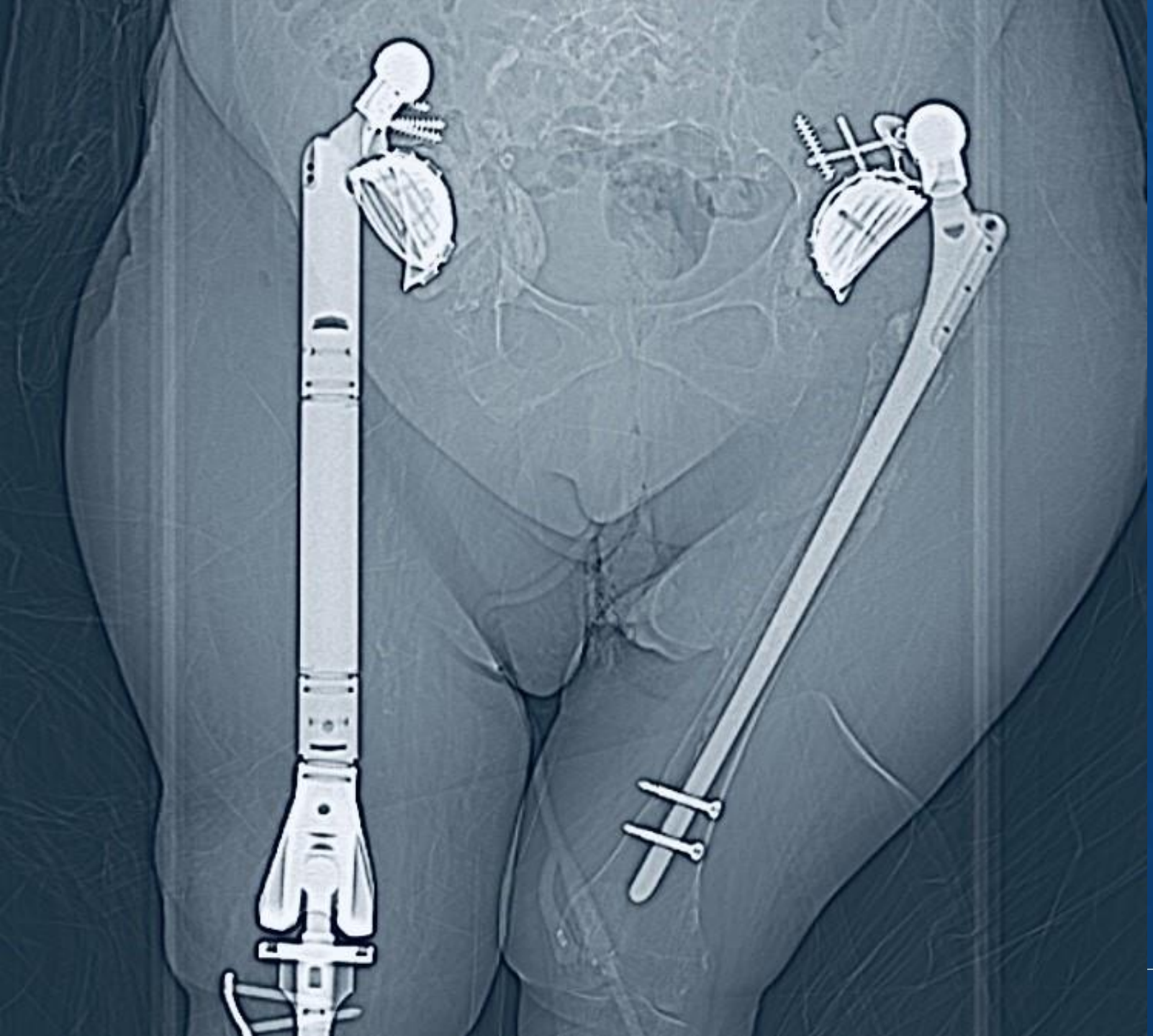
MOT PROTÉZIS KEREKASZTAL
Az instabil csípő protézis

Dr. Zahár Ákos
Centrumvezető
Mozgásszervi Sebészeti Centrum
FM Szent György Egyetemi Oktató Kórház
Székesfehérvár

TEP luxáció

gyakori és kellemetlen szövődmény


kV: 59.8
kV: 74.8




R
kV: 80.9


R
kV: 76.9

Table 3.H15 (b) Number and percentage of hip revision by indication and procedure type in last five years.

Reason	Type of revision procedure		
	Single-stage N(%) (n=31,617)	Stage one of two-stage N(%) (n=2,550)	Stage two of two-stage N(%) (n=2,085)
Aseptic loosening	11,920 (37.7)	196 (7.7)	158 (7.6)
Dislocation / Subluxation	6,128 (19.4)	106 (4.2)	65 (3.1)
Periprosthetic fracture	5,794 (18.3)	115 (4.5)	115 (5.5)
Implant wear	4,150 (13.1)	75 (2.9)	33 (1.6)
Lysis	3,988 (12.6)	190 (7.5)	83 (4.0)
Adverse reaction to particulate debris	3,213 (10.2)	93 (3.6)	49 (2.4)
Infection	2,712 (8.6)	2,225 (87.3)	1,695 (81.3)
Malalignment	1,486 (4.7)	26 (1.0)	9 (0.4)
Other indication	1,400 (4.4)	68 (2.7)	124 (5.9)
Implant fracture	1,250 (4.0)	21 (0.8)	15 (0.7)
Pain	1,241 (3.9)	38 (1.5)	24 (1.2)
Head-socket size mismatch	121 (0.4)	<4 (0.1)	<4 (0.0)

Table 3.H16 (b) KM estimates of cumulative re-revision (95% CI) by years since first revision. *Blue italics signify that fewer than 250 cases remained at risk at these time points.*

Primary in the registry where the first revision took place:	Number of first revised joints at risk of re-revision	Time since first revision						
		1 year	3 years	5 years	7 years	10 years	13 years	15 years
<1 year after primary	10,559	7.71 (7.21-8.24)	12.55 (11.91-13.23)	14.81 (14.09-15.56)	16.95 (16.15-17.78)	19.59 (18.64-20.58)	22.17 (20.96-23.44)	*23.48 (21.91-25.15)*
1 to <3 years after primary	7,598	5.43 (4.94-5.98)	10.28 (9.60-11.02)	12.98 (12.19-13.81)	15.52 (14.63-16.45)	17.90 (16.89-18.96)	19.69 (18.46-21.00)	*21.66 (19.97-23.46)*
3 to <5 years after primary	5,883	4.71 (4.19-5.30)	8.60 (7.89-9.38)	10.98 (10.16-11.87)	12.78 (11.87-13.76)	14.68 (13.63-15.80)	*17.21 (15.37-19.23)*	
≥5 years after primary	16,347	4.30 (3.99-4.63)	6.93 (6.53-7.36)	8.38 (7.92-8.87)	9.46 (8.93-10.02)	10.76 (10.06-11.50)		

Table 3.H17 (b) Number of revisions by indication for first linked revision and second linked re-revision.

Reason for revision	First linked revision		Second linked revision
	N	Subsequently re-revised, N(%)	N
Aseptic loosening	9,962	973 (9.8)	975
Dislocation / Subluxation	7,028	835 (11.9)	1,155
Periprosthetic fracture	6,355	652 (10.3)	411
Infection	6,159	1,092 (17.7)	1,483
Pain	5,019	645 (12.9)	425
Malalignment	2,679	266 (9.9)	221
Lysis	2,437	204 (8.4)	199
Implant wear	2,279	205 (9.0)	226
Implant fracture	1,306	147 (11.3)	138
Head/socket size mismatch	262	40 (15.3)	16
Other indication	3,226	438 (13.6)	291
Adverse reaction to particulate debris*	2,715	263 (9.7)	126

Luxáció előfordulása primer TEP után 0.5-9.2%

Posterior 4.1%

Hardinge 3.4%

Table 1 Published incidence of dislocation

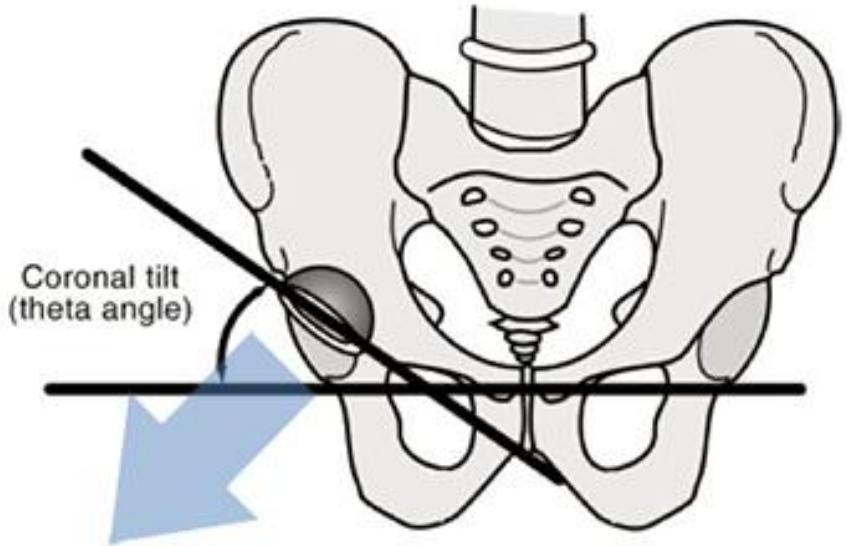
Reference	Year	Hips	Dislocations	%
Charnley[1]	1972	582	9	1.5
Eftekhar[2]	1976	1400	8	0.5
Ritter[3]	1976	502	7	1.4
Robinson *et al.*[4]	1980	316	12	4.0
Fackler and Poss[5]	1980	1443	34	2.4
Ali Khan *et al.*[6]	1981	6774	142	2.1
Woo and Morrey[7]	1982	10500	331	3.2
Ekelund[8]	1992	162	15	9.2
Turner[9]	1993	561	25	4.5
Paterno *et al.*[10]	1997	560	32	6.0
Fender *et al.*[11]	1999	1080	54	5.0

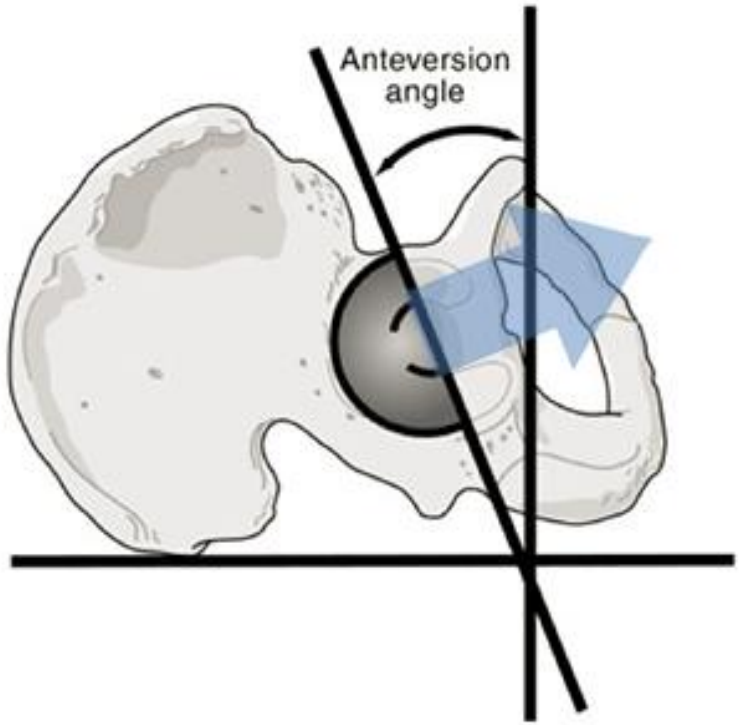
Blom AW, Rogers M, Taylor AH, Pattison G, Whitehouse S, Bannister GC. Dislocation following total hip replacement: the Avon Orthopaedic Centre experience. Ann R Coll Surg Engl. 2008 Nov;90(8):658-62.

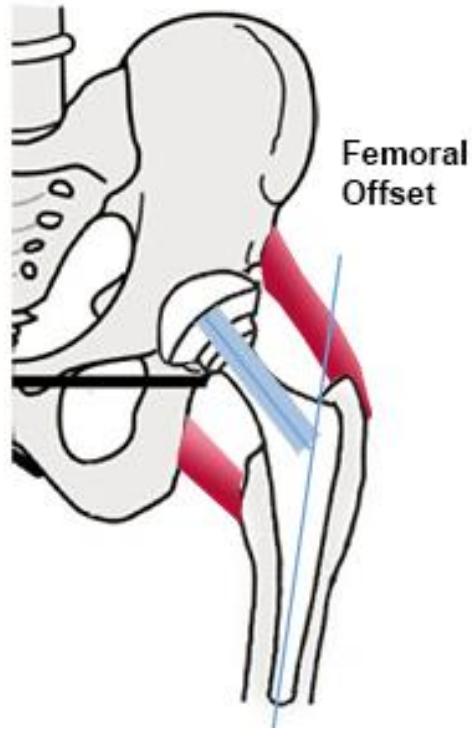
Etiológia

- Ízületi lazaság
- Trauma
- Fiziológiás ROM-on kívüli mozgás
- Posttraumás állapotok
- Impingement
- Neuromuscularis zavarok (pl. Parkinson)
- Mentális zavarok (pl. delírium)
- Malpozíció
  - Vápa inklináció 30-60 fokon kívüli range
  - Vápa anteverzió 5-25 fokon kívüli range
  - Szár antetorzió 0-15 fokon kívüli range

Zahar A, Rastogi A, Kendoff D.
Dislocation after total hip arthroplasty.
Curr Rev Musculoskelet Med. 2013 Dec;6(4):350-6.


Coronal tilt
(theta angle)


Anteversion
angle


Femoral
Offset

Végtaghossz szerepe

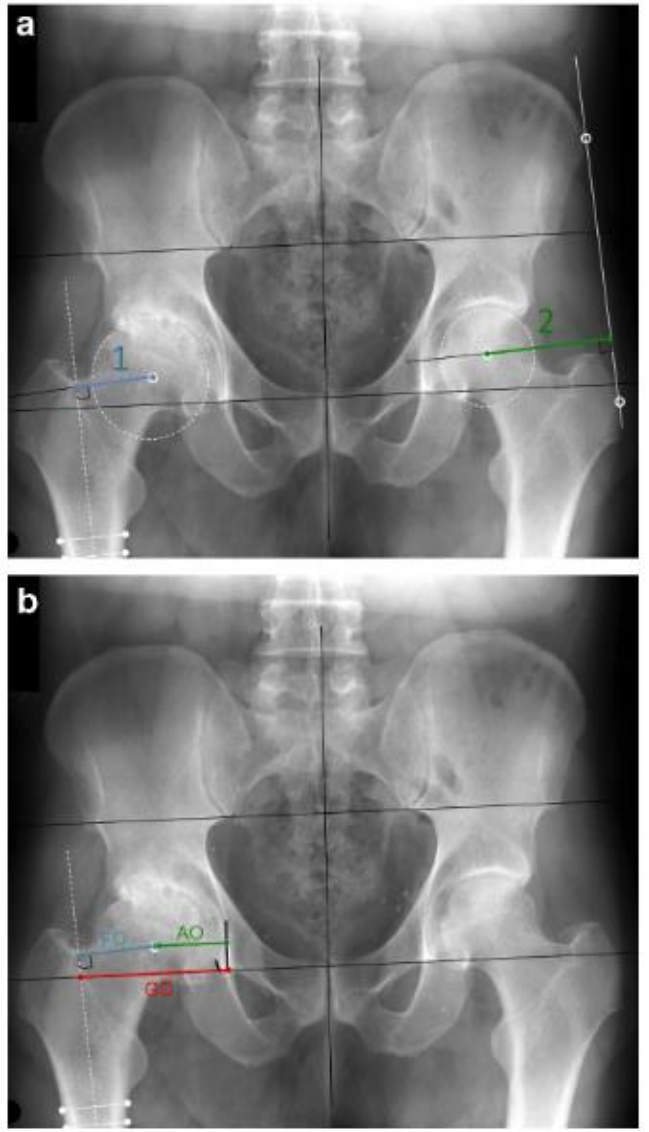
X. Flecher, M. Ollivier, J.N. Argenson.
Lower limb length and offset in total hip arthroplasty.
Orthop Traumatol Surg Res. 2016 Feb, 102(1 Suppl),S9-S20.


R

Offset szerepe

- Femoral offset (FO): perpendicular distance from the CoR of the femoral head to the line of action of the abductor muscles
- Acetabular offset (AO): perpendicular distance from the CoR of the femoral head to the vertical trans-teardrop line
- Global hip offset: FO + AO

Insufficient offset can cause a limp, require the use of a walking aid [14], and induce instability

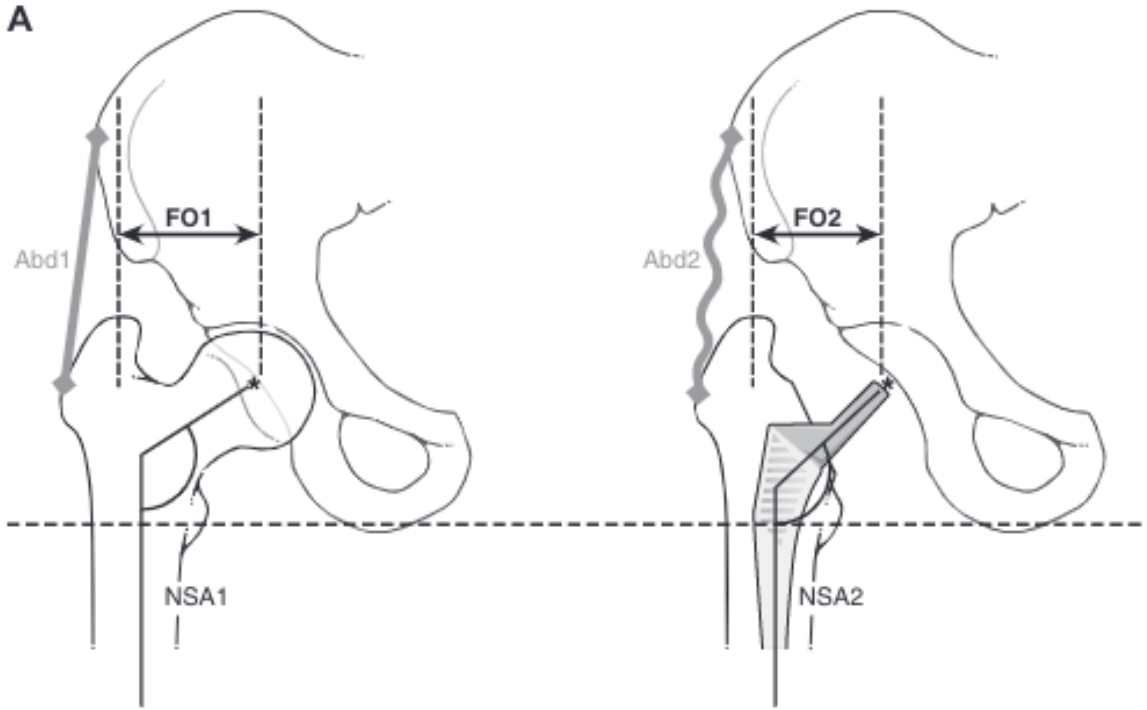


X. Flecher, M. Ollivier, J.N. Argenson.
Lower limb length and offset in total hip arthroplasty.
Orthop Traumatol Surg Res. 2016 Feb, 102(1 Suppl),S9-S20.

Offset szerepe

Jelentős offset csökkenés lehetséges következményei:

- Glutealis insufficiencia
- Sántítás
- Segédeszköz használat
- INSTABILITÁS



X. Flecher, M. Ollivier, J.N. Argenson.
Lower limb length and offset in total hip arthroplasty.
Orthop Traumatol Surg Res. 2016 Feb, 102(1 Suppl),S9-S20.

Antetorsio szerepe

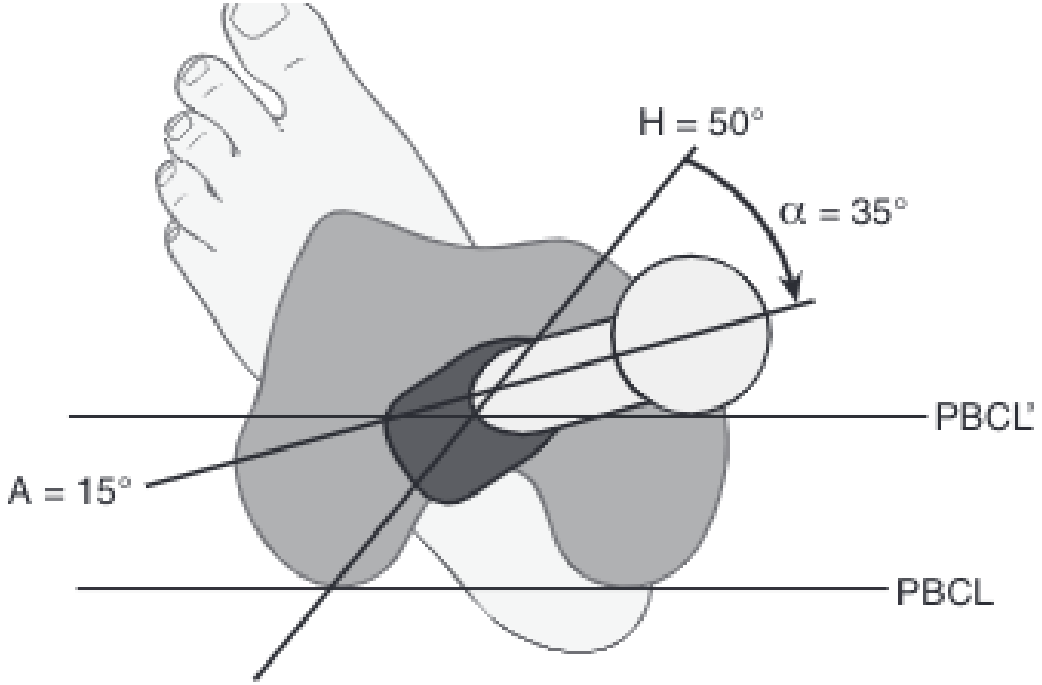
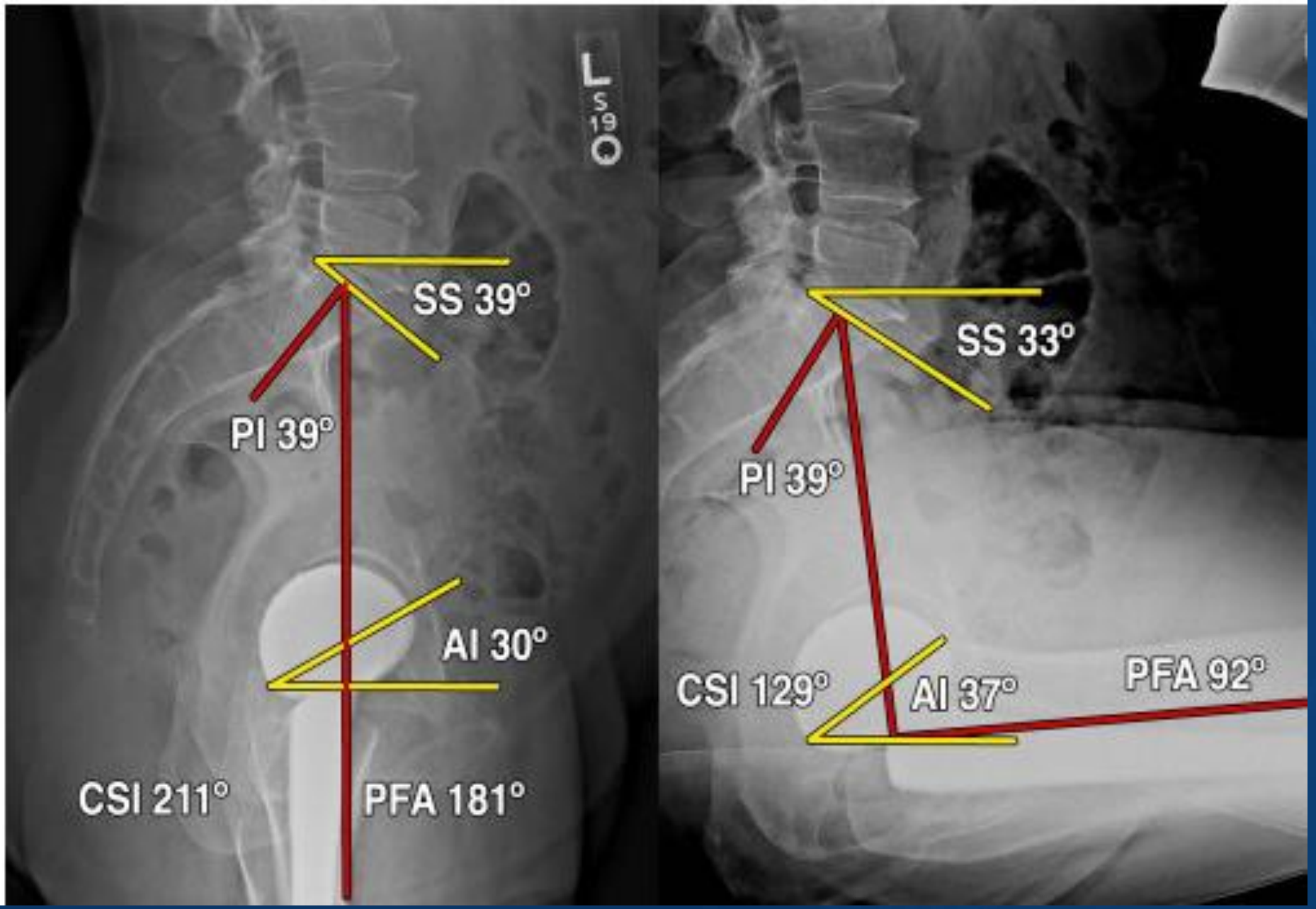
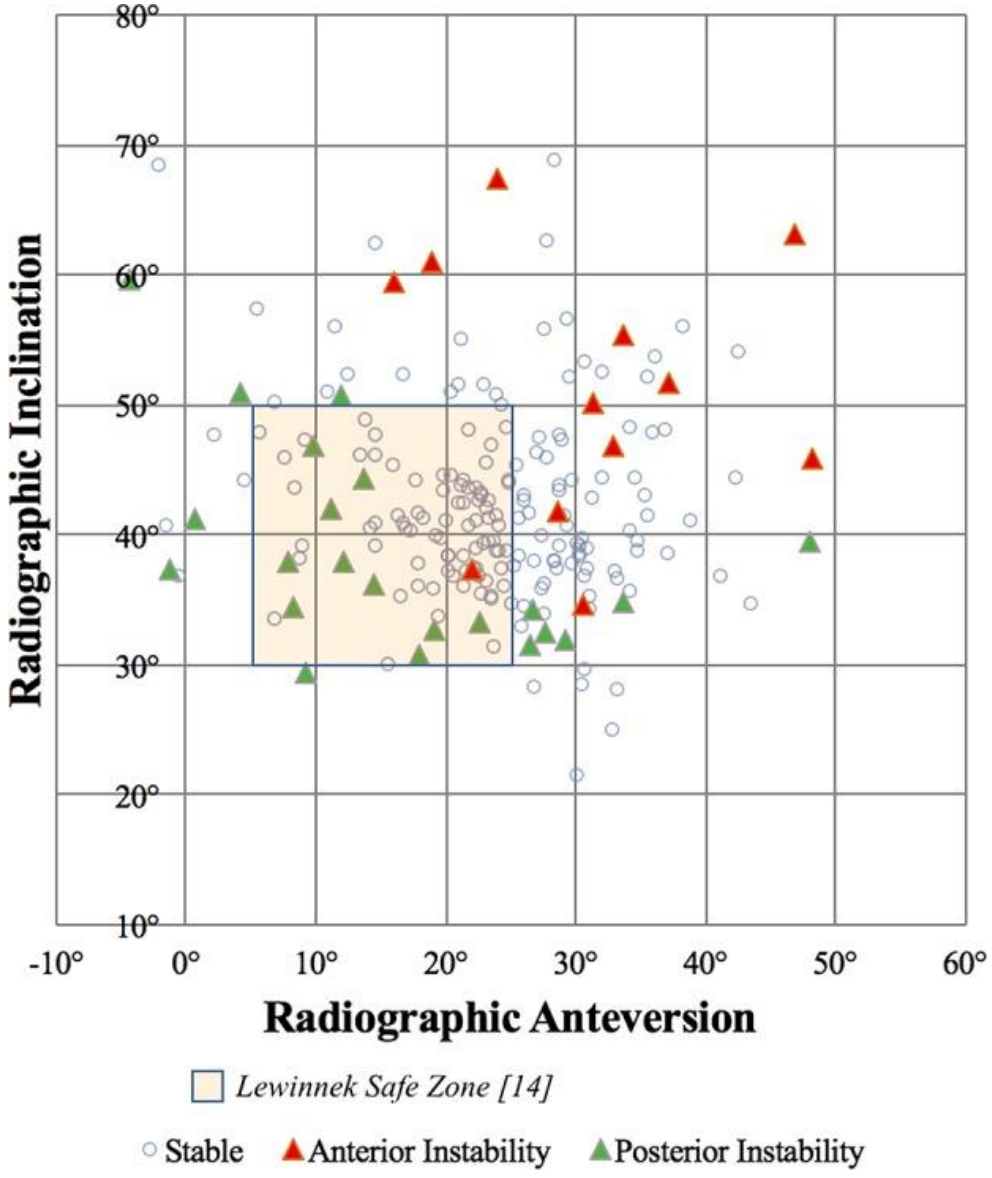


Fig. 4. Measurement of femoral anteversion, helical torsion, and the alpha angle. The posterior bicondylar line (PBCL) is translated to the level of the neck (PBCL') to allow the measurements. The desired prosthetic anteversion angle is about 15° (A). In this case, the axis of proximal femoral anteversion or helitorsion (H) is 50°. To obtain a final anteversion value of 15°, correction within the prosthetic neck or alpha angle must be −35°, i.e., 35° or retroversion.

X. Flecher, M. Ollivier, J.N. Argenson.
Lower limb length and offset in total hip arthroplasty.
Orthop Traumatol Surg Res. 2016 Feb, 102(1 Suppl),S9-S20.



Tezuka T et al.
J Arthroplasty. 2019 Jan;34(1):3-8.



„The dislocation rate for cup orientation with ***anteversion of 15 +/- 10 degrees*** *and* ***lateral opening of 40 +/- 10 degrees*** *was 1.5%, while outside this "safe" range the dislocation rate was 6.1%”*

Lewinnek GE, Lewis JL, Tarr R, Compere CL, Zimmerman JR. Dislocations after total hip-replacement arthroplasties. J Bone Joint Surg Am. 1978 Mar;60(2):217-20.

Safe zone?

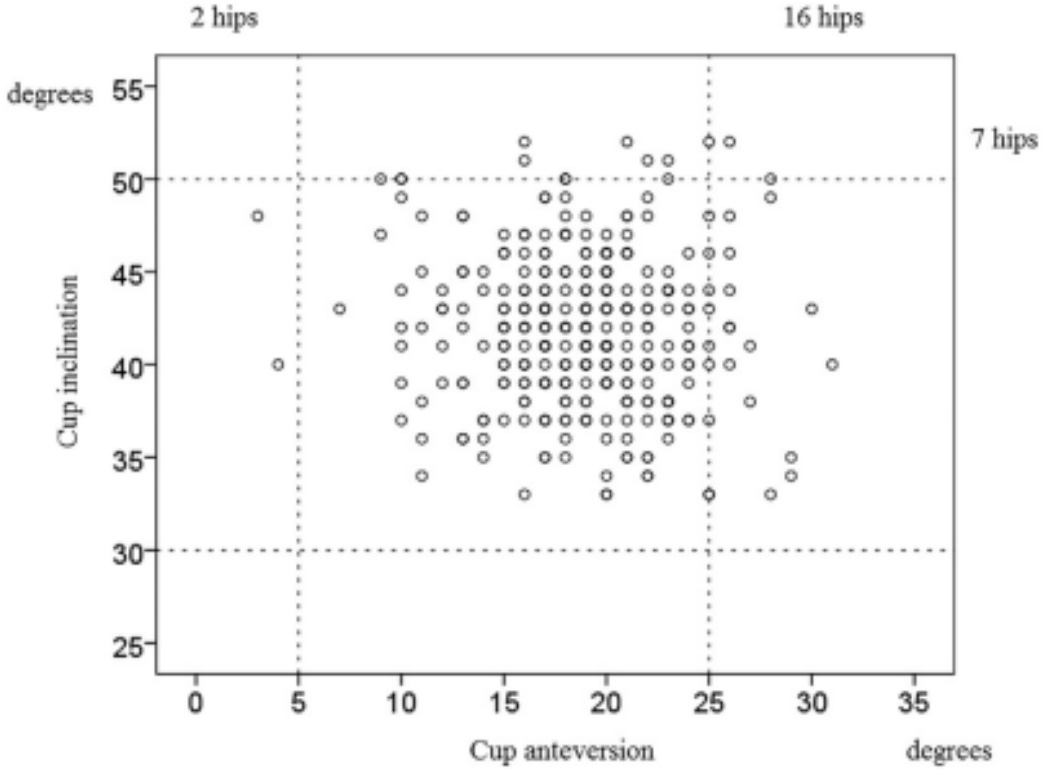
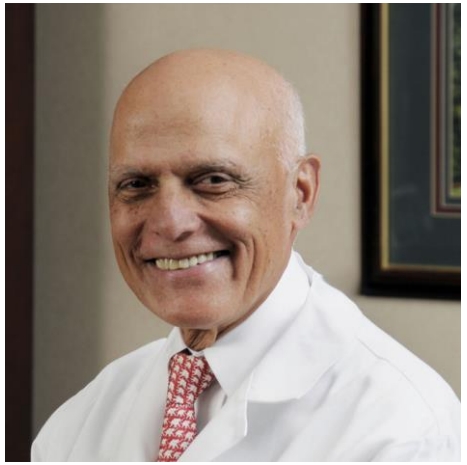


Fig. 3. Scattergram of cup anteversion and inclination according to the Lewinnek safe zone. Three hundred two hips are within the cup anteversion normal range and 313 within the cup inclination normal range. In total, 296 hips had both inclination and anteversion in the Lewinnek safe zone. There were 7 hips above 50° of cup inclination, but the maximum inclination was 52°. Sixteen hips had cup anteversion >25° and 2 cups were below 5°, but all these hips had normal combined anteversion.

Tezuka T, Heckmann ND, Bodner RJ, Dorr LD.
Functional Safe Zone Is Superior to the Lewinnek Safe Zone for Total Hip Arthroplasty: Why the Lewinnek Safe Zone Is Not Always Predictive of Stability.
J Arthroplasty. 2019 Jan;34(1):3-8.

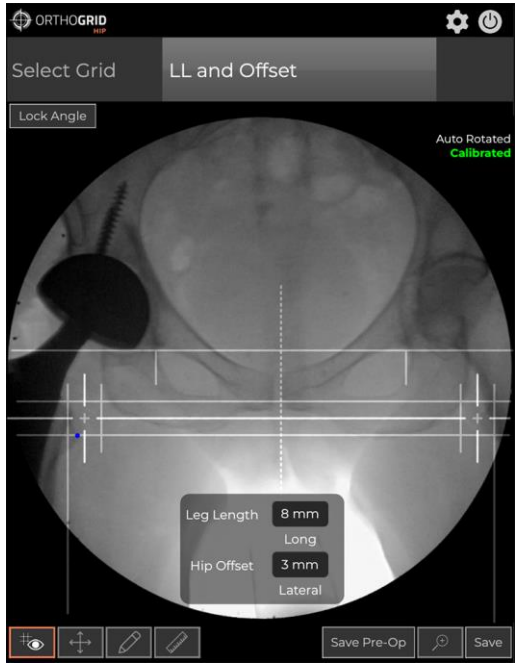
Ranawat-teszt



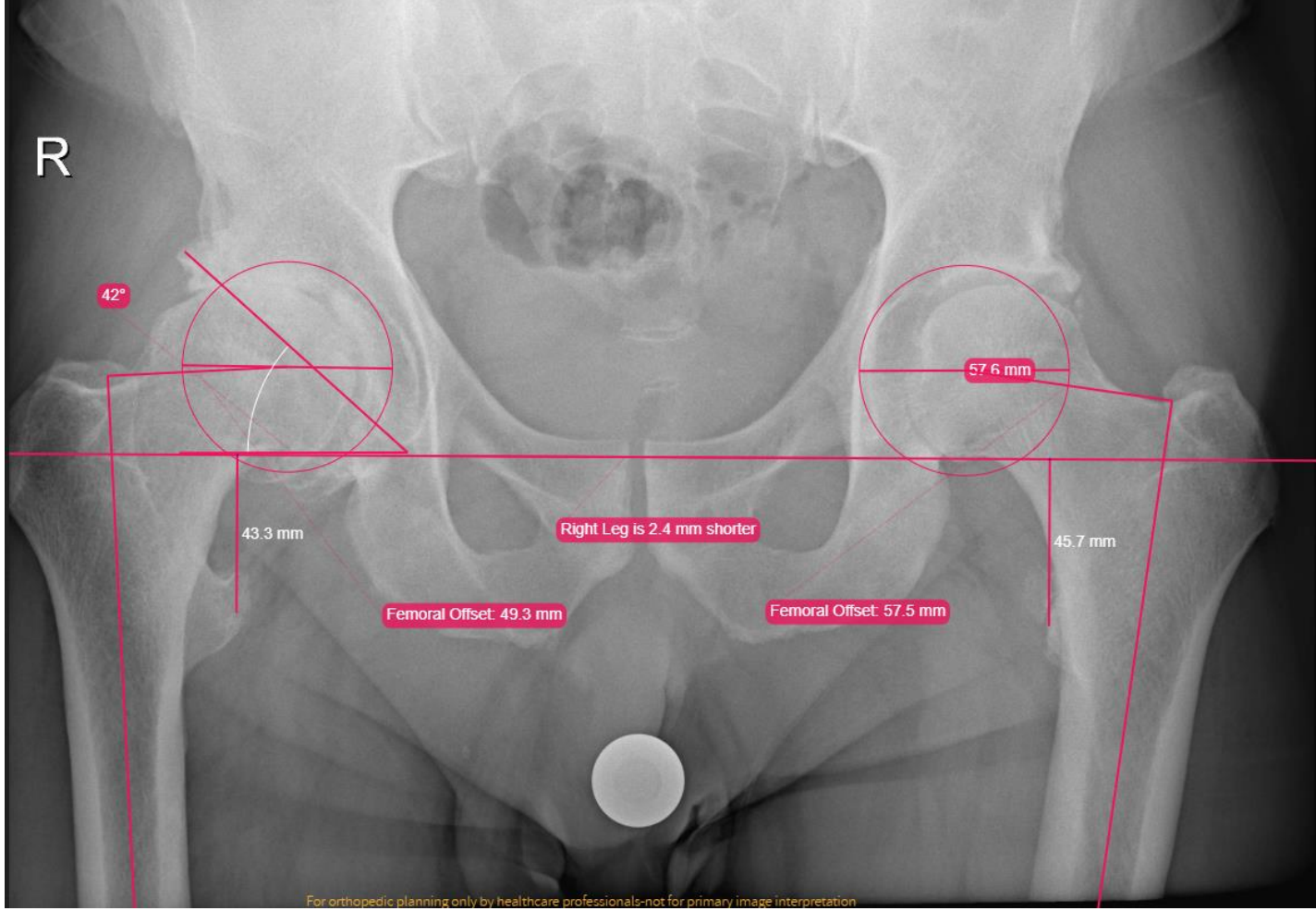
vápa AV + szár AT = 35 fok

Orientációs segítség

- Anatómiai landmarkok (SIAI-incisura)
- Képerősítő
- Mechanikai eszközök (pl. „nyúkláb”)
- Műtő felső sarka
- Computer navigáció
- AI



*„Intraoperative anatomical landmarks, that might be used are the **anterior inferior iliac spine** and the **incisura of acetabulum**, an imaginary line between these 2 structures has an angle of **40°–45° to the horizontal axis**, if anatomy is normal”*



Biedermann R, Tonin A, Krismer M, Rachbauer F, Eibl G, Stöckl B.
Reducing the risk of dislocation after total hip arthroplasty: the effect of orientation of the acetabular component.
J Bone Joint Surg Br. 2005;87:762–9

Meftah M, Yadav A, Wong AC, Ranawat AS, Ranawat CS.
A novel method for accurate and reproducible functional cup positioning in total hip arthroplasty.
J Arthroplasty. 2013;28:1200–5.

CASE INFO
PROCEDURE: RIGHT Fluoro THA
IMPLANT: G7/Avenir Complete
PATIENT ID: DDU84DR35AK21UH

SHELL SIZE 58G

STEM SIZE 6

ATTACH INS

Reference Overlay

BLEND

Controls

- ML Axis
- Reference Landmarks
- Overlay Landmarks

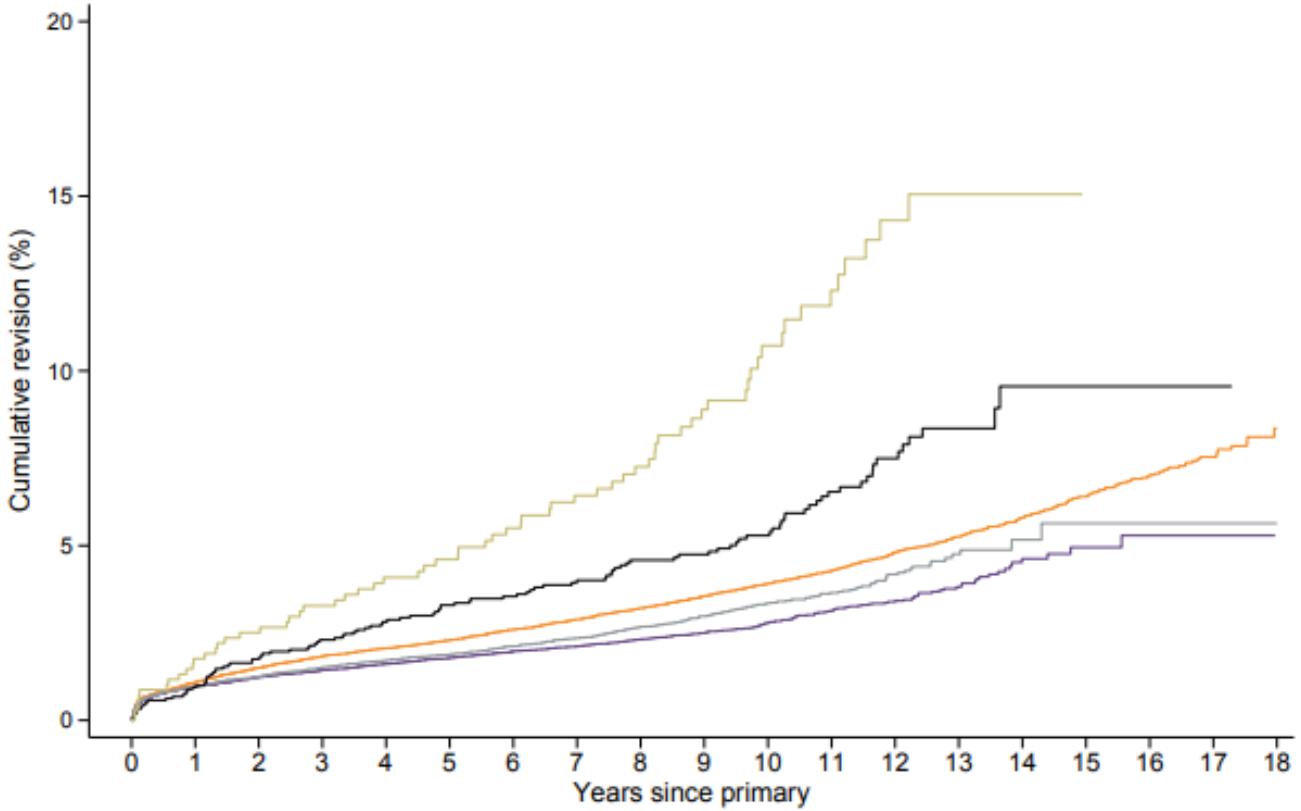
Overlay

- Calibration
- Navigation
- Cup Verification
- Trial
- Final Validation

Close

ZIMMER BIOMET ROSA

Figure 3.H10 (c) KM estimates of cumulative revision of primary uncemented MoP hip replacement by head size (mm). *Blue italics in the numbers at risk table signify that fewer than 250 cases remained at risk at these time points.*



Key:	Numbers at risk									
28	59,296	55,145	49,238	42,036	33,521	24,746	16,036	8,309	3,106	340
32	88,043	75,547	56,206	37,126	21,178	9,846	3,581	923	*166*	
36	41,996	34,306	25,559	17,743	11,150	5,657	1,937	272	*31*	*<4*
40	1,929	1,806	1,670	1,506	1,266	926	477	*81*	*<4*	
44	686	646	576	518	424	263	*135*	*19*		

Fej átmérő
32-36 mm

www.njrcentre.org.uk

Spinopelvikus megfontolások

Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

Primary Arthroplasty

Total Hip Arthroplasty Patients With Fixed Spinopelvic Alignment Are at Higher Risk of Hip Dislocation

Christina I. Esposito, PhD [a,*], Kaitlin M. Carroll, BS [b], Peter K. Sculco, MD [b], Douglas E. Padgett, MD [b], Seth A. Jerabek, MD [b], David J. Mayman, MD [b]

[a] Department of Biomechanics, Hospital for Special Surgery, New York, NY
[b] Adult Reconstruction and Joint Replacement Division, Department of Orthopaedic Surgery, Hospital for Special Surgery, New York, NY

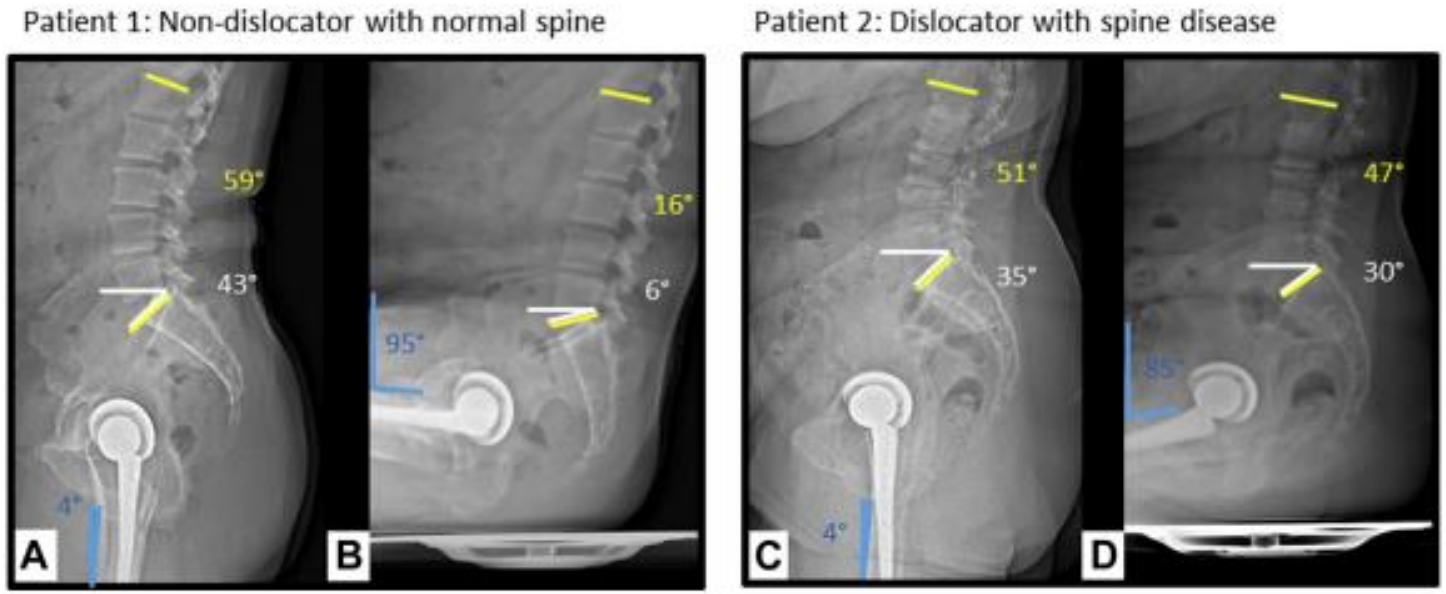


Fig. 1. (A) Standing lateral and (B) sitting lateral 2-dimensional radiographs of the spine and pelvis of Patient 1, a 60-year-old man without spine arthrosis. Patient 1 stands and sits with 43° and 6° of sacral slope, respectively. Therefore the patient's pelvis has more posterior pelvic tilt (rotated backward 37°) in sitting position. In contrast, (C) standing lateral and (D) sitting lateral 2-dimensional radiographs of the spine and pelvis of Patient 2, a 56-year-old woman with spine disease, show little change in sacral slope angles from 35° in (C) standing to 30° sacral slope in (D) sitting. Patient 1 experienced 43° of spine flexion (59°−16°) and 54° of hip flexion (95°−4° + 6°−43°). Patient 2 experienced less of spine flexion (4°) compared to Patient 1 and therefore more hip flexion (76°). Yellow lines and numbers show the lumbar lordosis angles, white lines and numbers show the sacral slope angles, and blue lines and numbers show the proximal femoral angles.

Parameters	Normal Spine Non-Dislocator (n = 106)	DDD Spine Non-Dislocator (n = 40)	Normal Spine Dislocator (n = 1)	DDD Spine Dislocator (n = 11)	All THA Patients (n = 158)
Standing lumbar lordosis angle (°)	58 ± 10	47 ± 13	57	49 ± 11	54 ± 12
Standing sacral slope angle (°)	40 ± 8	32 ± 10	33	34 ± 6	38 ± 9
Standing femur angle (°)	7 ± 6	9 ± 6	4	6 ± 4	7 ± 6
Sitting lumbar lordosis angle (°)	35 ± 16	34 ± 14	25	35 ± 10	35 ± 10
Sitting sacral slope angle (°)	23 ± 11	23 ± 10	6	25 ± 8	23 ± 10
Sitting femur angle (°)	89 ± 6	90 ± 5	90	88 ± 6	89 ± 5
Spine flexion (°)	23 ± 13	12 ± 9	32	14 ± 8	20 ± 13
Change in sacral slope from standing to sitting (°)	17 ± 10	9 ± 8	27	9 ± 6	15 ± 10
Hip flexion (°)	65 ± 12	73 ± 10	59	72 ± 8	67 ± 12

Data are expressed as mean ± standard deviation.

„Surgeons should consider implant design options

- *large diameter*
- *or dual mobility bearings*

to improve hip stability in patients with fixed spinopelvic alignment as they may be at higher risk of dislocation.”

Funkcionális anteversio hiánya miatt hátsó luxáció következhet be, a posterior stabilitás illetve fedettség hiánya miatt

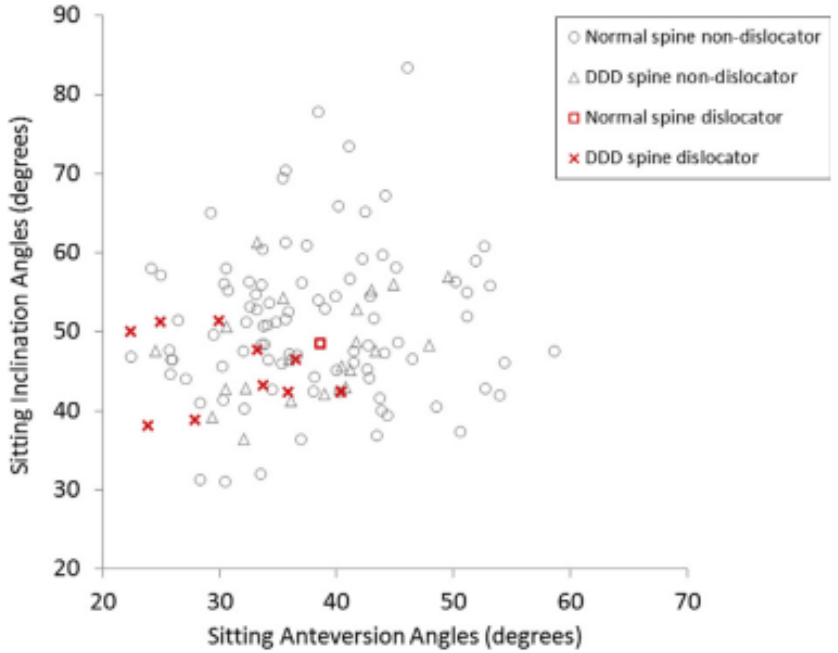


Fig. 4. A scatterplot showing sitting anteversion and inclination angles in patients who did and did not experience dislocation in the first year following THA. Dislocators had lower sitting inclination angles ($P = .04$) and lower sitting anteversion angles ($P < .01$) compared to non-dislocators.

TEP luxáció?

megelőzés

kezelés

Műtéti tervezés lehetőségei

- PDP is reliable for predicting implant size in THA:
  87% of adequately planned femoral components,
  78% of adequate acetabular components

- PDP should be integrated as a **routine part in the preoperative management of THA**

- higher levels of experience lead to significantly more precise predictions of stem size

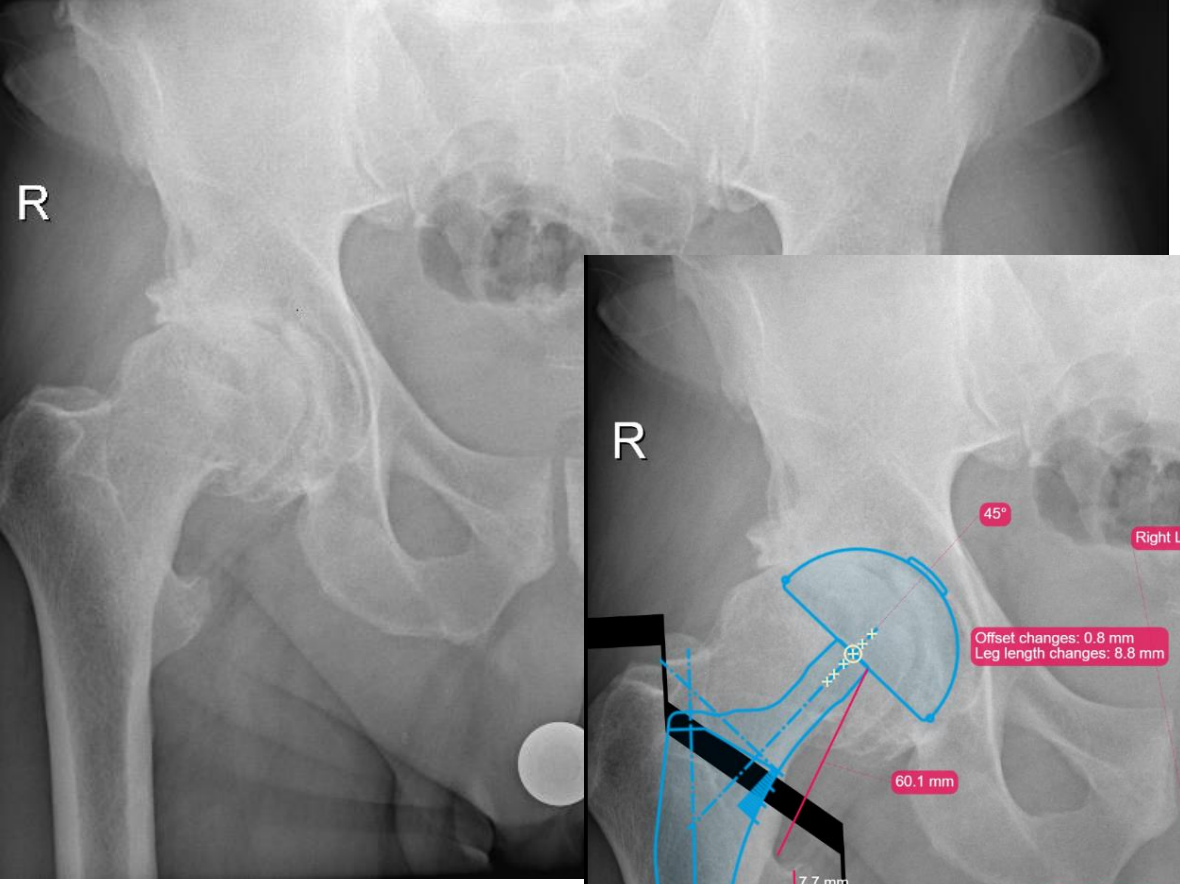
- BMI partly influences digital templating: overweight is related to inaccurate PDP more often

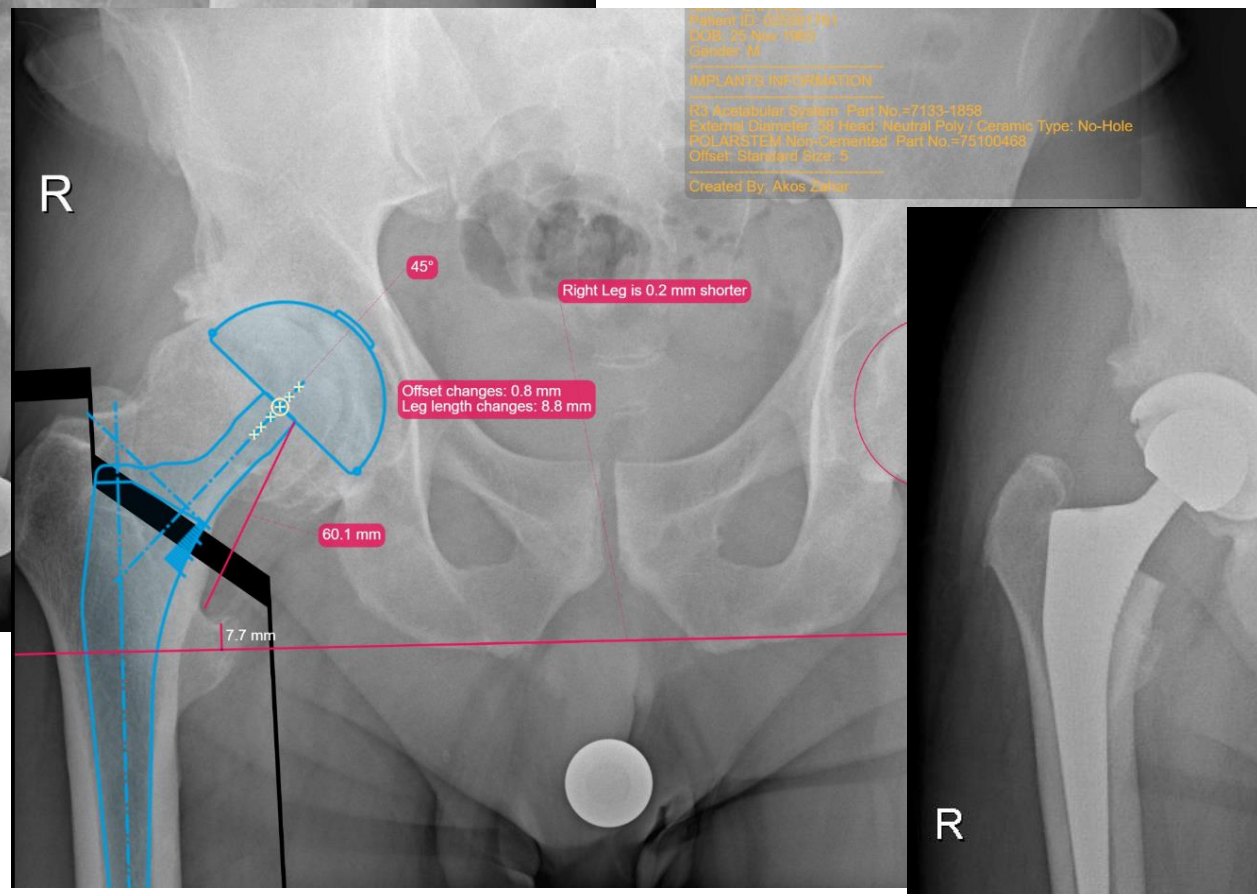
Holzer LA, Scholler G, Wagner S, Friesenbichler J, Maurer-Ertl W, Leithner A. The accuracy of digital templating in uncemented total hip arthroplasty. Arch Orthop Trauma Surg. 2019 Feb;139(2):263-268.

Műtéti tervezés lehetőségei

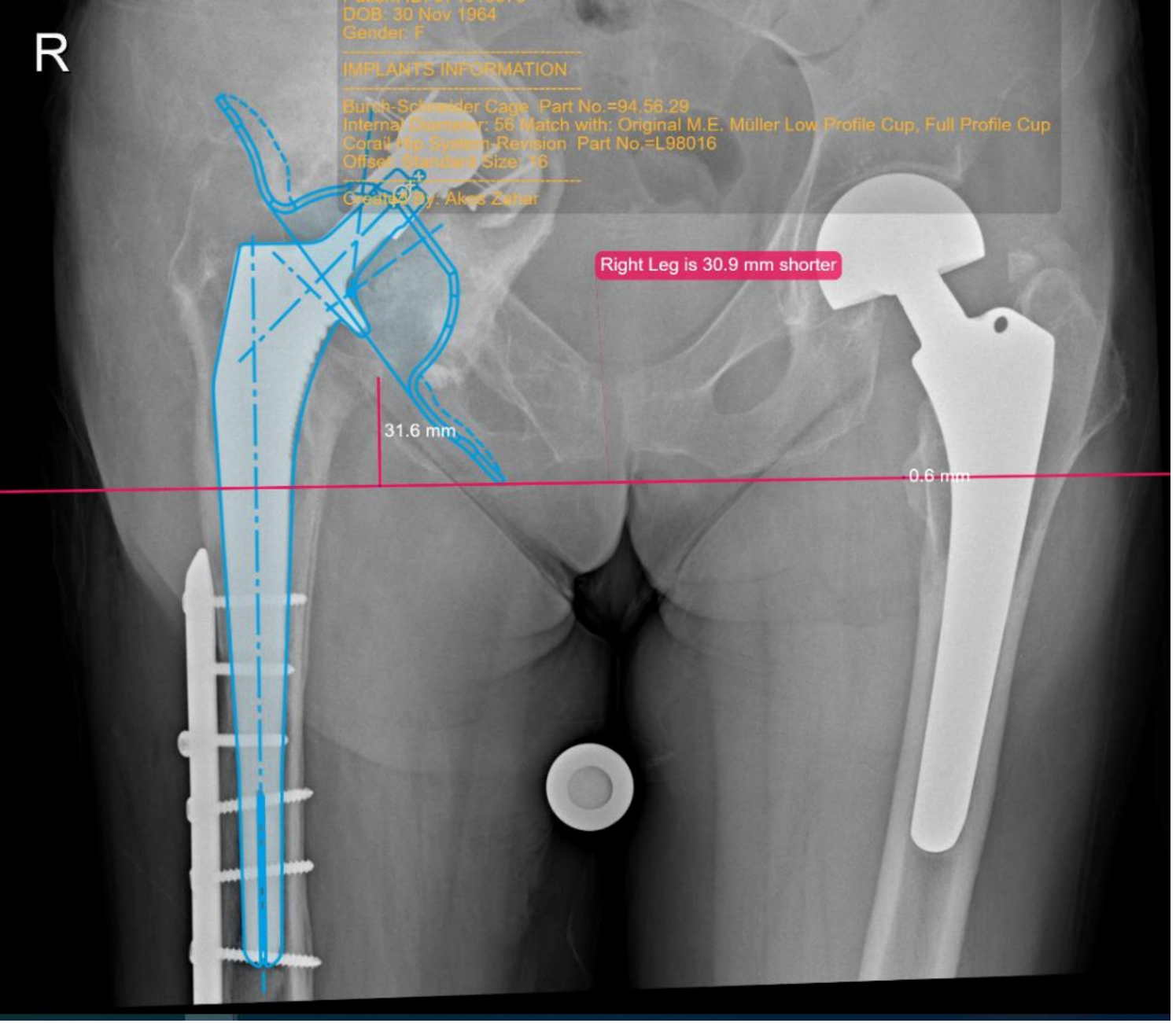
- Fóliás rajzok (analóg vagy digitalis RTG)
- 2D tervező szoftver PACS kompatibilis képekkel
- PSI tervező szoftverek
- digitális 3D tervezés (CT alapú)

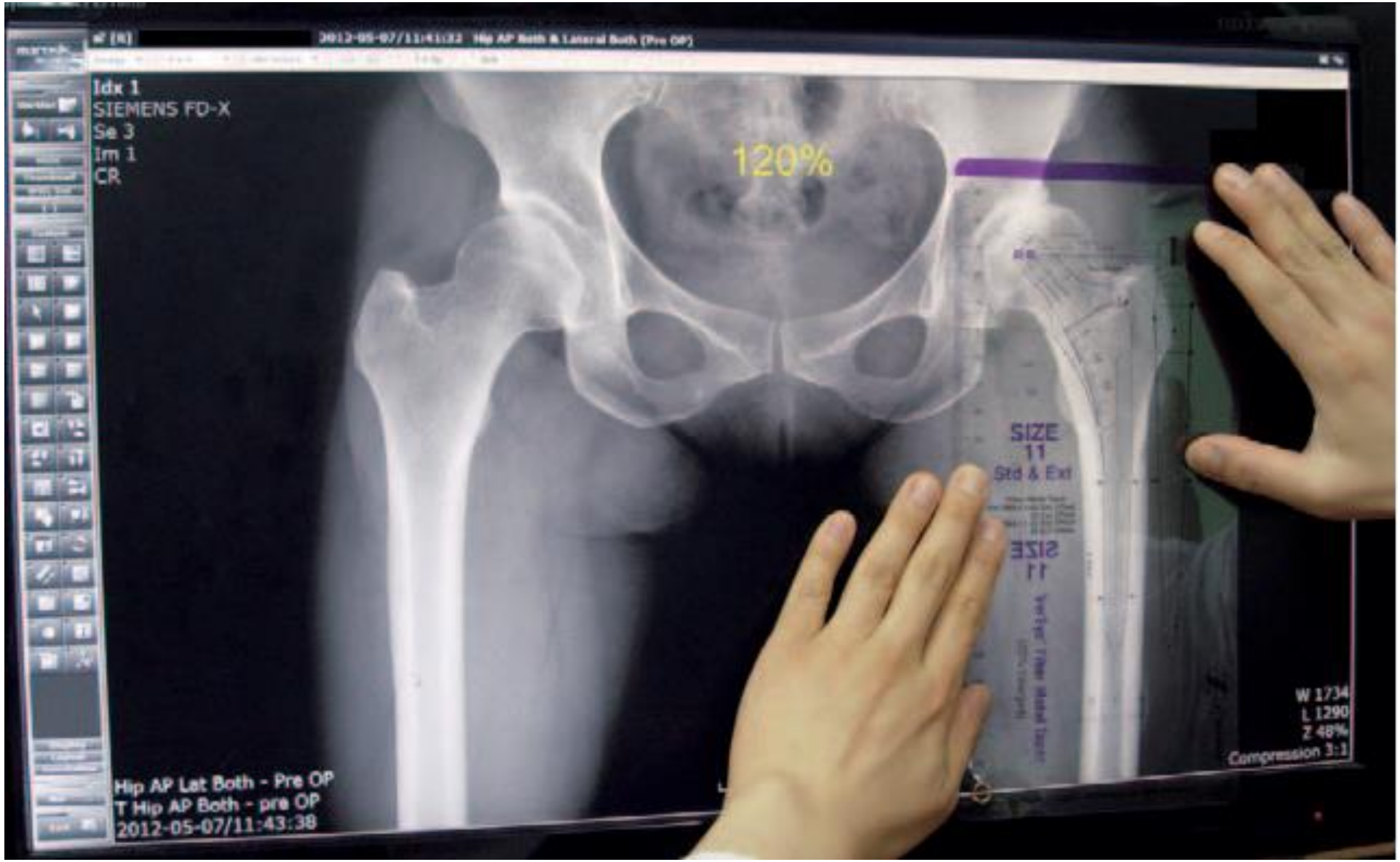
Mirghaderi SP, Sharifpour S, Moharrami A, Ahmadi N, Makuku R, Salimi M, Mortazavi SMJ. Determining the accuracy of preoperative total hip replacement 2D templating using the mediCAD® software. J Orthop Surg Res. 2022 Apr 10;17(1):222.

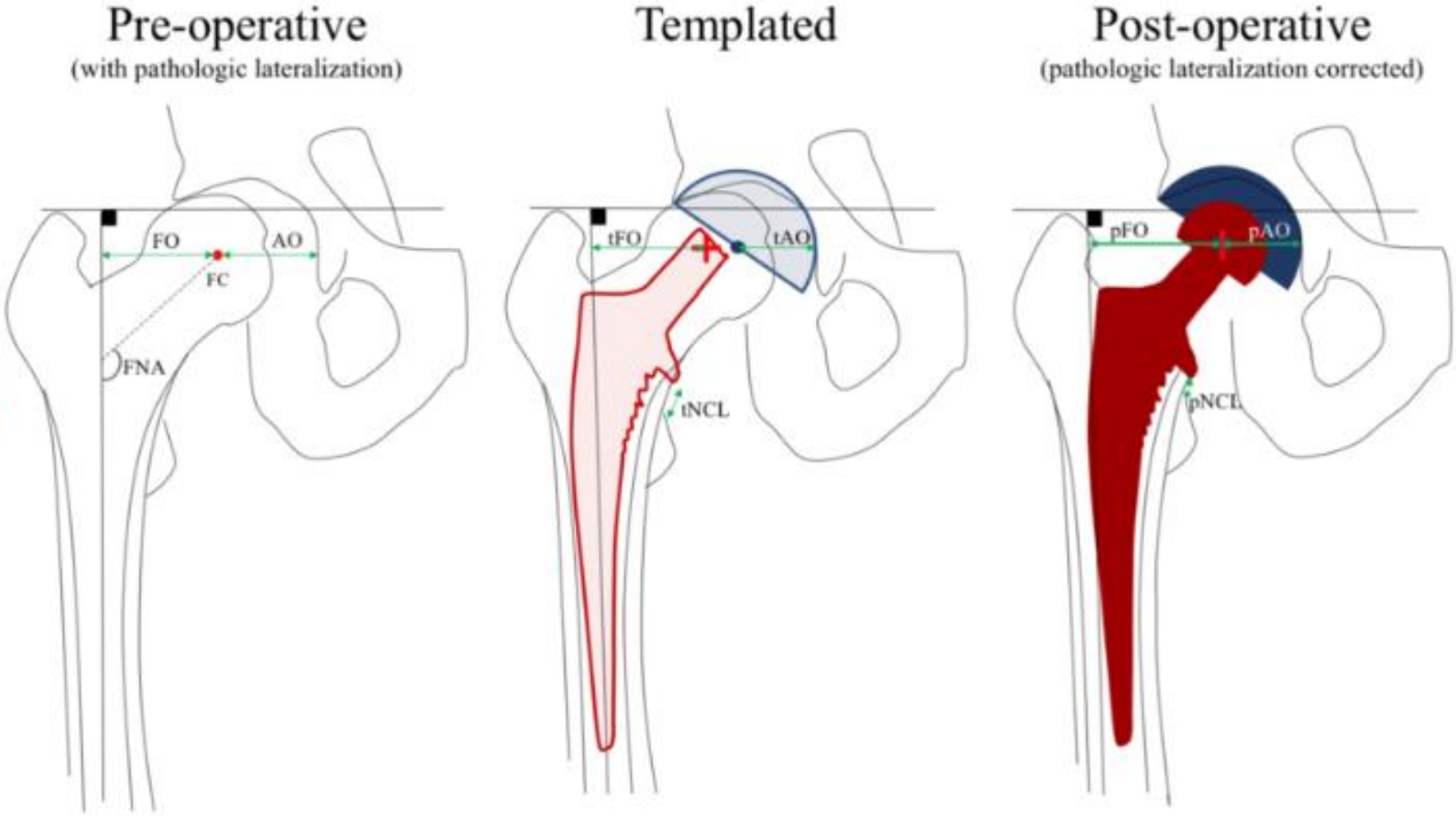

R

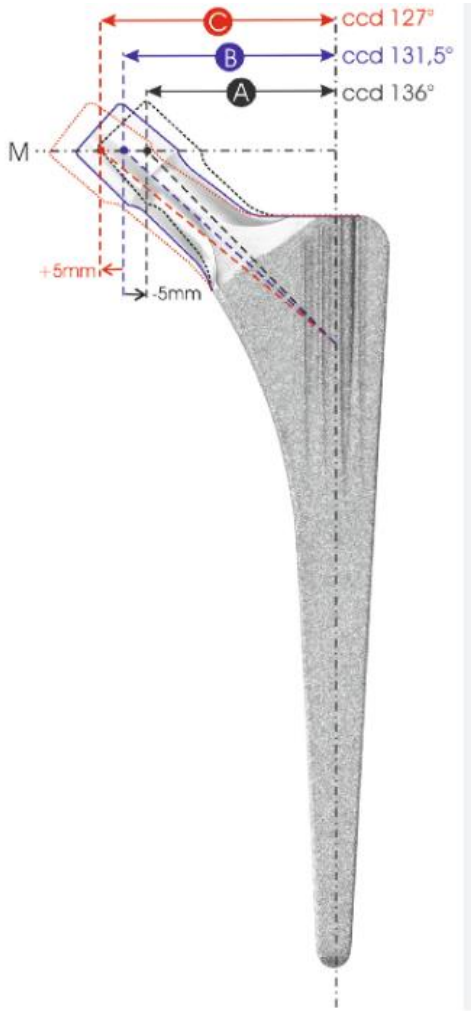

R
Patient ID: 0000000
DOB: 25 Nov 1965
Gender: M
IMPLANTS INFORMATION
R3 Acetabular System Part No.=7133-1858
External Diameter: 58 Head: Neutral Poly / Ceramic Type: No-Hole
POLARSTEM Non-Cemented Part No.=75100468
Offset: Standard Size: 5
Created By: Akos Zakar
45°
Right Leg is 0.2 mm shorter
Offset changes: 0.8 mm
Leg length changes: 8.8 mm
60.1 mm
7.7 mm


R


R
DOB: 30 Nov 1964
Gender: F
IMPLANTS INFORMATION
Bursch-Schneider Cage Part No.=94.56.29
Internal Diameter: 56 Match with: Original M.E. Müller Low Profile Cup, Full Profile Cup
Corail Hip System-Revision Part No.=L98016
Offset: Standard Size: 16
Right Leg is 30.9 mm shorter
31.6 mm
0.6 mm

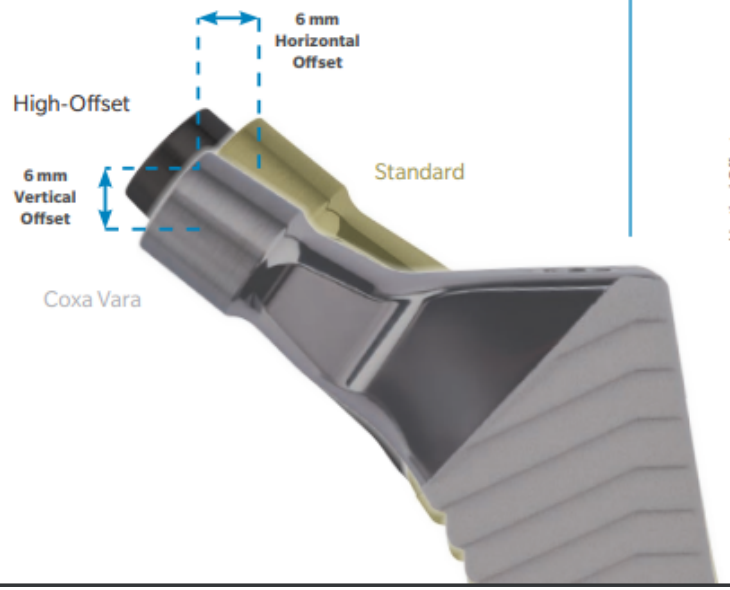

Idx 1
SIEMENS FD-X
Se 3
Im 1
CR
120%
SIZE
11
Std & Ext
W 1734
L 1290
Z 48%
Compression 1:1
Hip AP Lat Both - Pre OP
T Hip AP Both - pre OP
2012-05-07/11:43:38


Pre-operative
(with pathologic lateralization)
FO
AO
FC
FNA
Templated
tFO
tAO
tNCL
Post-operative
(pathologic lateralization corrected)
pFO
pAO
pNCL


C
ccd 127°
B
ccd 131,5°
A
ccd 136°
M
+5mm
-5mm

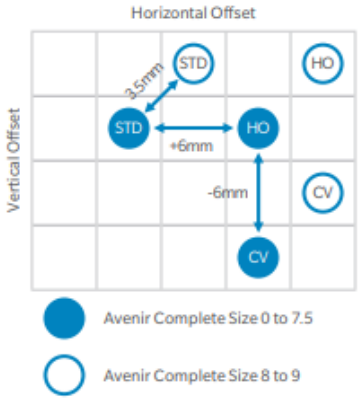
Simple Offset System

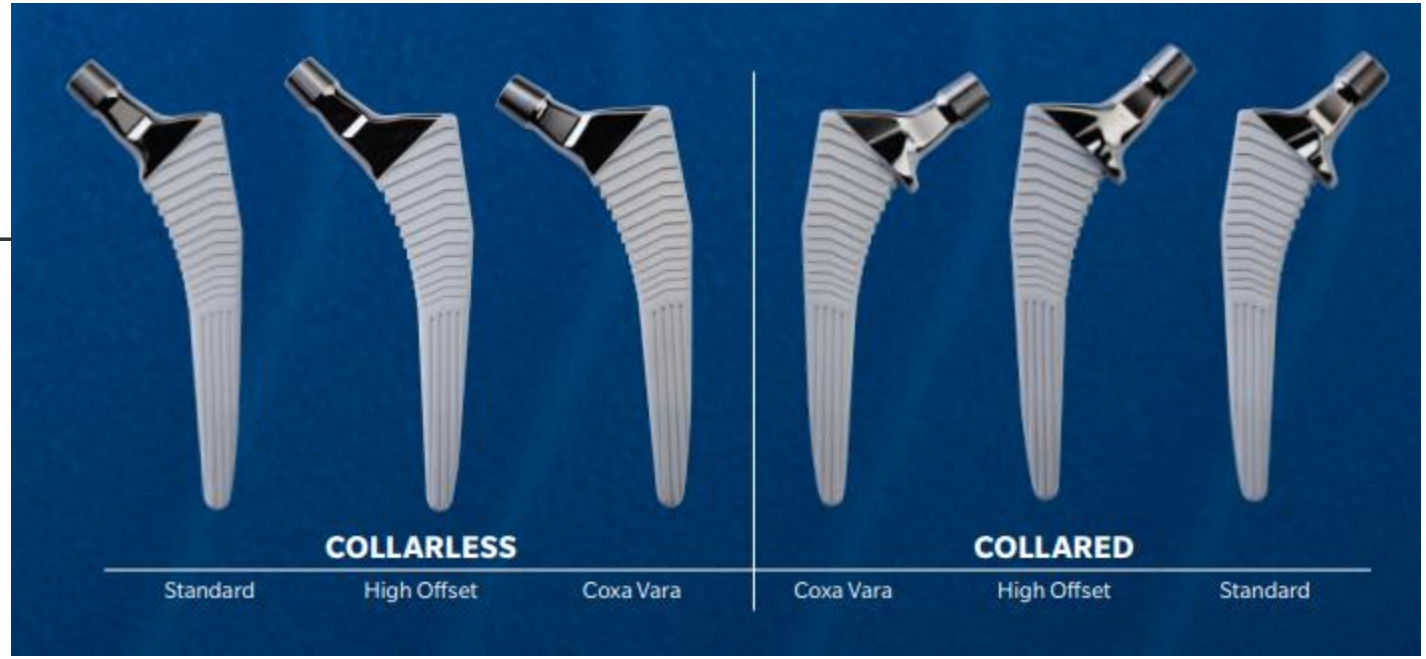
Tissue tensioning is achieved through a simple 6mm offset system. The standard and high offset versions maintain a constant 135° neck angle. The high offset stem is lateralized by +6mm versus the standard offset stem increasing tissue tension without affecting leg length. The coxa vara neck angle is 126.5° and vertical offset is reduced by -6mm versus the high offset stem.

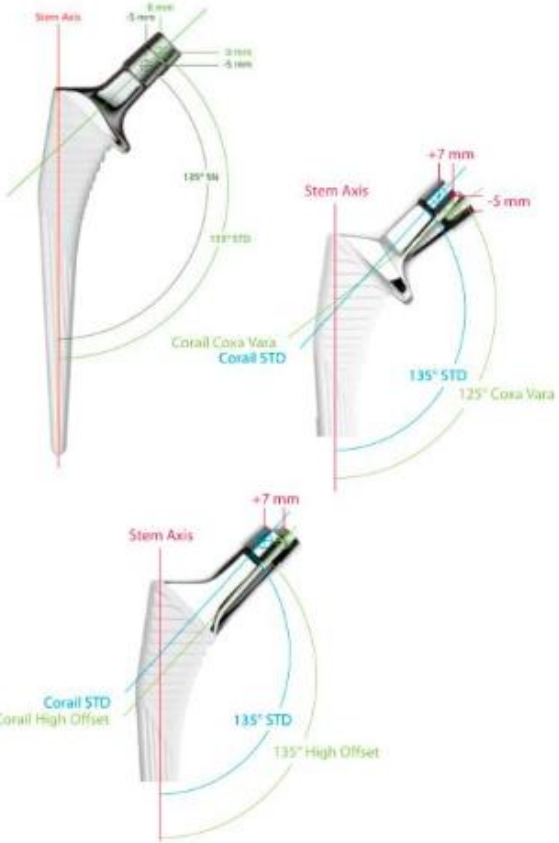


Neck Length

Neck length remains constant from sizes 0-7.5 and increases by 3.5mm for the three largest sizes (8-9). This provides a uniform system where sizes 0-7.5 can achieve a short neck length while providing additional neck length where needed in the largest sizes.



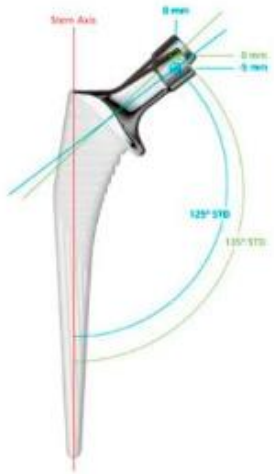




Collarless and Collared Stem Options

Short Neck, Standard Offset, and High Offset stems are available in both Collarless and Collared options to provide surgeons with options based on their preference.

High offset options add +7mm of offset through direct laterilization to restore hip biomechanics in a wider range of patients.



Collared Stem Options

Coxa Vara High Offset option is available in a Collared version only. Coxa vara collared neck option offers an increased offset and varus neck angle for femoral restoration and proper soft-tissue tensioning of varus neck angled patients.

Collared stems are available to control subsidence and add rotational stability in patients with osteopenic bone.

Standard collarless
Collar: no
Angle: 135°
Offset (mm): 38.3-45.8

Standard collared
Collar: yes
Angle: 135°
Offset (mm): 38.3-45.8

Coxa vara collared
Collar: yes
Angle: 125°
Offset (mm): 45.6-52.8

High offset collarless
Collar: no
Angle: 135°
Offset (mm): 45.7-52.9

4.1.1 | Pannon-C / LAT-C protézisszár

REX acél

Pannon-C	Pannon LAT-C	
Kat.szám	Kat.szám	Méret
411800001	411804001	1
411800002	411804002	2
411800003	411804003	3
411800004	411804004	4
411800005	411804005	5
411800006	411804006	6
411800007	411804007	7
411800008	411804008	8
411800009	411804009	9
411800010	411804010	10

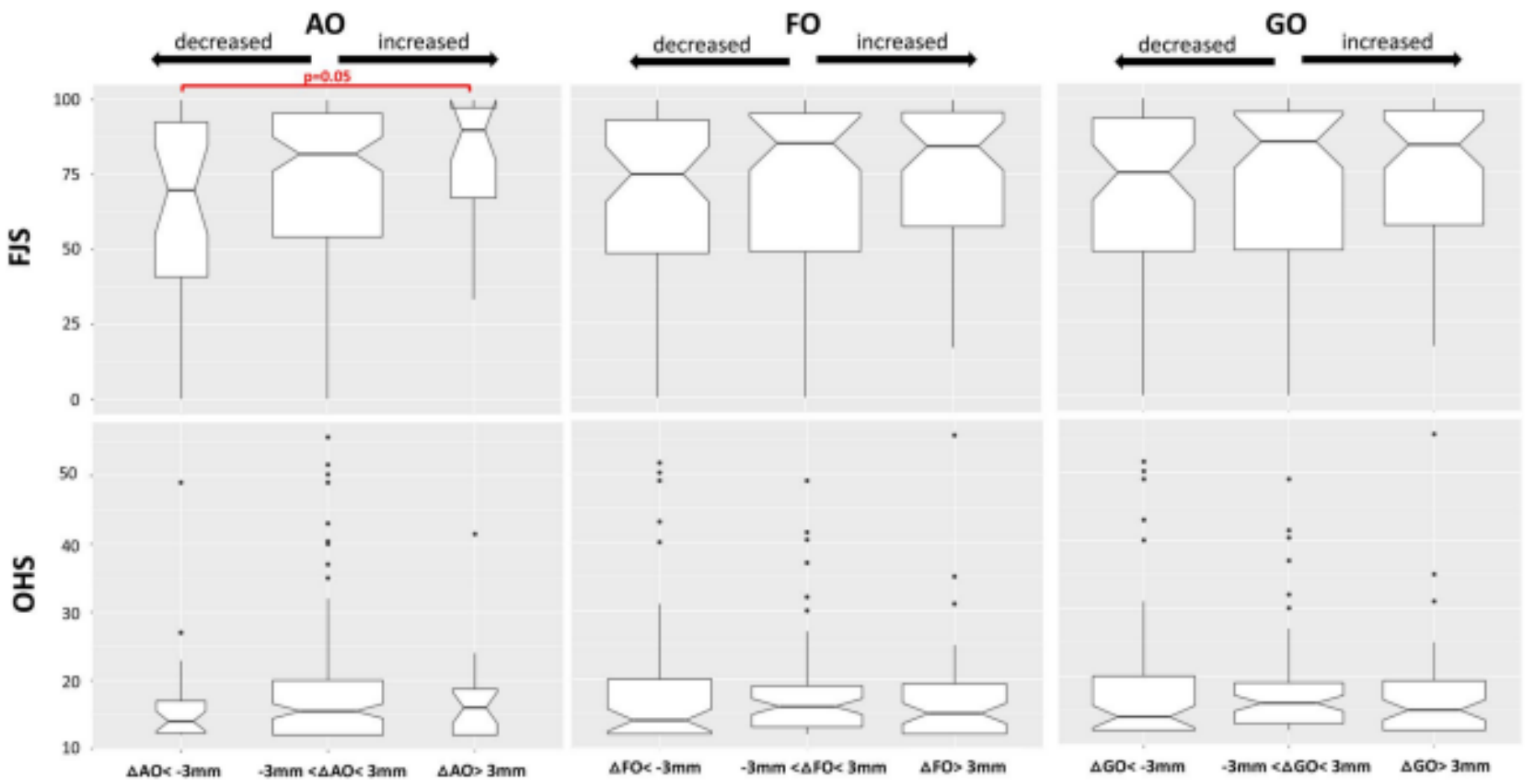
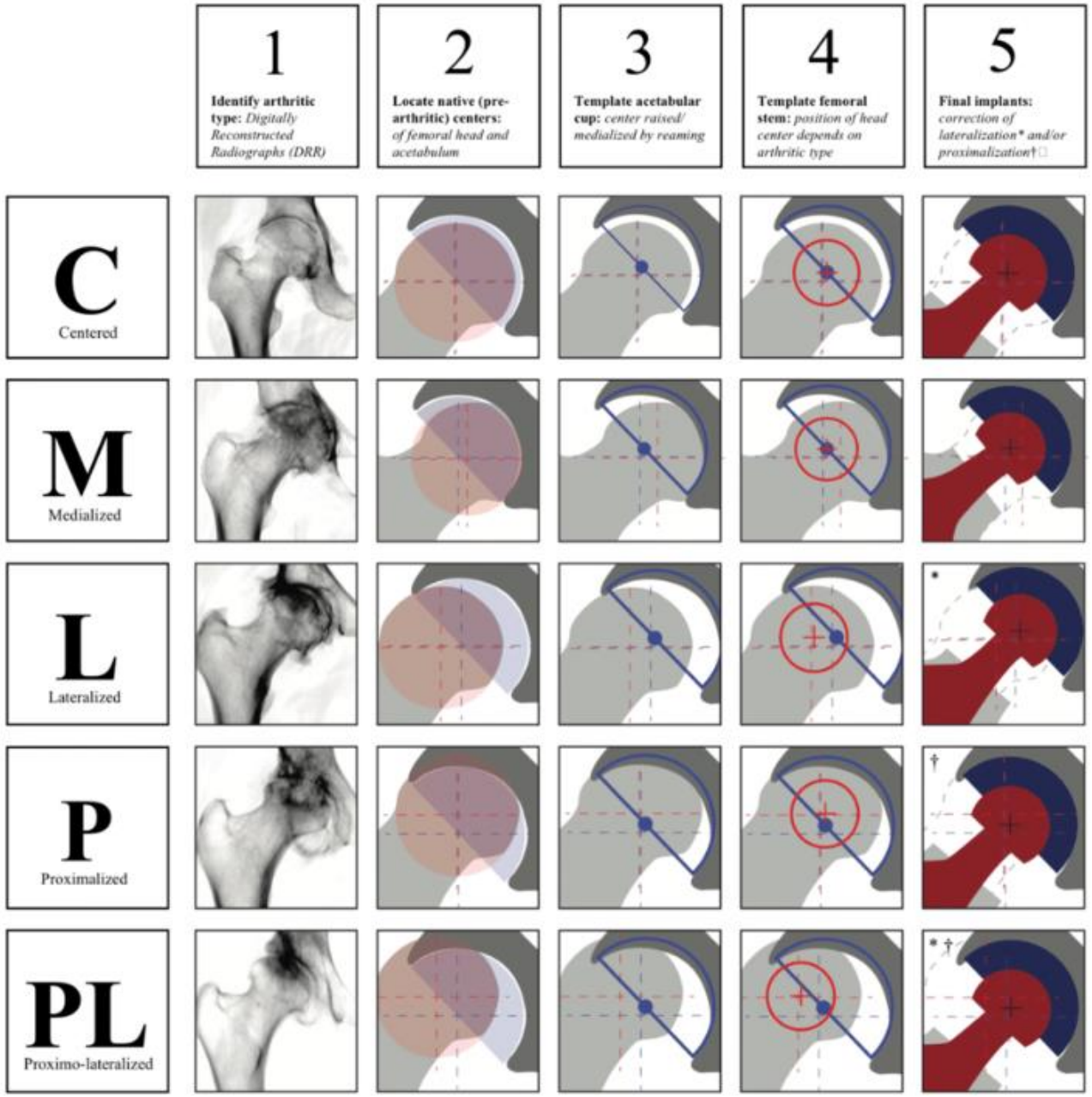


Fig. 4 Forgotten Joint Score (FJS) and Oxford Hip Score (OHS) related to acetabular offset (AO), femoral offset (FO) and global offset (GO) differences between post-operative and planned hip architecture. The plots illustrate median values (bold lines), interquartile ranges (white boxes), 95% confidence interval (whiskers) and outliers (dots). *p* values indicated only where statistically significant differences were found

Cech A, Kase M, Kobayashi H, Pagenstert G, Carrillon Y, O'Loughlin PF, Aït-Si-Selmi T, Bothorel H, Bonnin MP. Pre-operative planning in THA. Part III: do implant size prediction and offset restoration influence functional outcomes after THA? Arch Orthop Trauma Surg. 2020 Apr;140(4):563-573.



Cech A, Kase M, Kobayashi H, Pagenstert G, Carrillon Y, O'Loughlin PF, Aït-Si-Selmi T, Bothorel H, Bonnin MP.
Pre-operative planning in THA. Part III: do implant size prediction and offset restoration influence functional outcomes after THA?
Arch Orthop Trauma Surg. 2020 Apr;140(4):563-573.

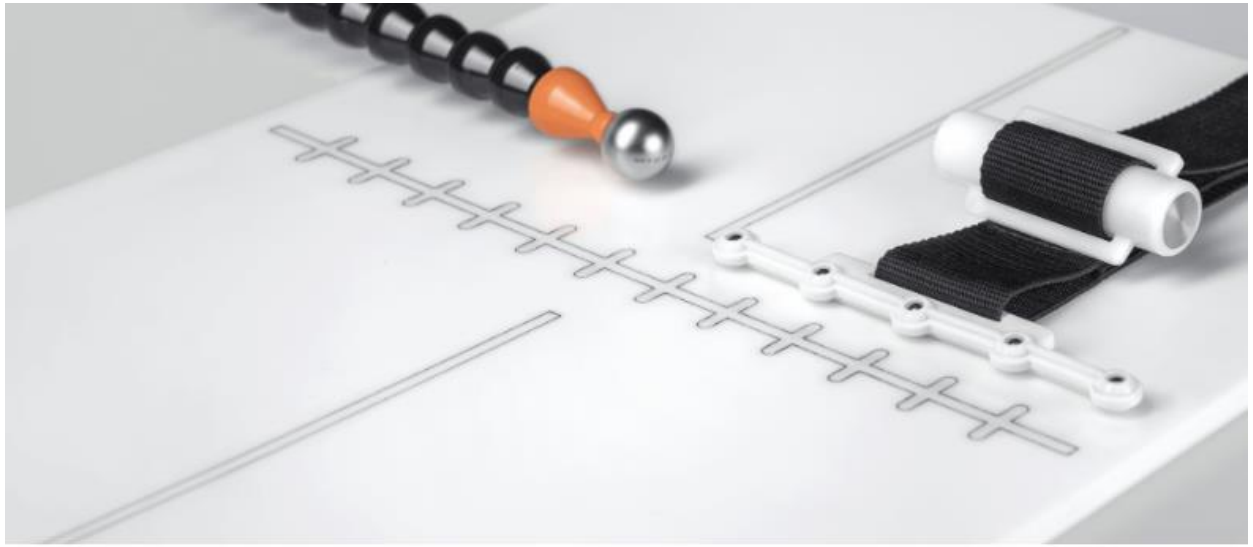
King Mark
mediCAD-system from Hectec
MATLAB software from MathWorks
Merge Healthcare
Apple’s Keynote presentation software
TraumaCad system from Brainlab
EndoMap
EOS imaging
OrthoView

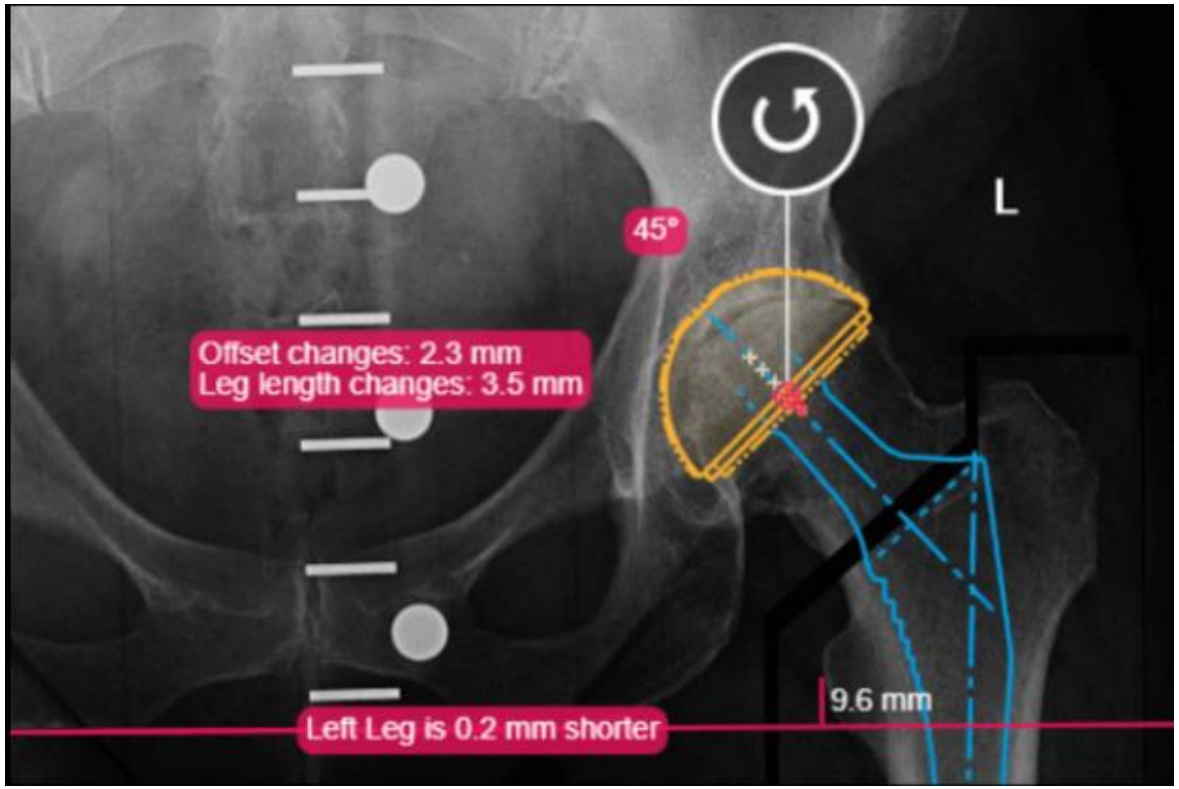
mediCAD®
The Orthopedic Solution
www.mediCAD.eu

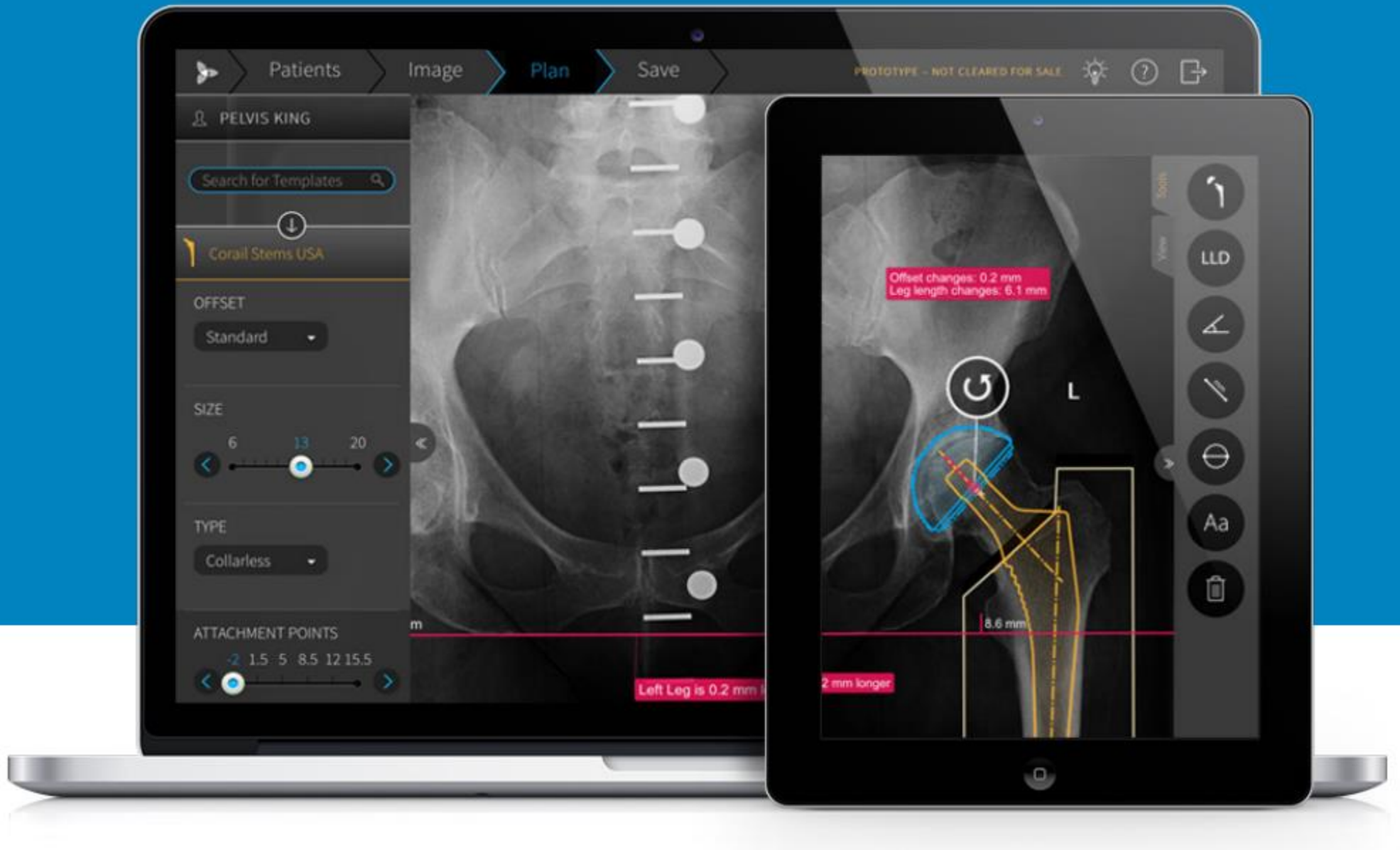
BRAINLAB

Mirghaderi SP, Sharifpour S, Moharrami A, Ahmadi N, Makuku R, Salimi M, Mortazavi SMJ. Determining the accuracy of preoperative total hip replacement 2D templating using the mediCAD® software. J Orthop Surg Res. 2022 Apr 10;17(1):222.

TRAUMACAD SERVER	TRAUMACAD WEB	TRAUMACAD MOBILE
		 Available on the App Store
For multi user environment, Medium/Large Healthcare Facilities	Monthly subscription for Small/Medium Healthcare Facilities and Personal use	Complimentary with TraumaCad Web
Server-client software	Web based software	HTML5 Web application
Access anywhere within the hospital network	Access with any internet connected PC	For iPad and any PC or Mac web browser
Joints, Trauma, Deformity, Pediatrics, Spine & 3D	Joints, Trauma, Deformity, Pediatrics, Spine & 3D	Total Joints Replacement
Integrates with Quentry cloud service for image sharing	Secured Quentry cloud service including 5GB storage & sharing	Secured Quentry cloud service including 5GB storage & sharing




45°
L
Offset changes: 2.3 mm
Leg length changes: 3.5 mm
9.6 mm
Left Leg is 0.2 mm shorter


Patients
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PROTOTYPE - NOT CLEARED FOR SALE
PELVIS KING
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Corail Stems USA
OFFSET
Standard
SIZE
6
13
20
TYPE
Collarless
ATTACHMENT POINTS
-2 1.5 5 8.5 12 15.5
Left Leg is 0.2 mm
Offset changes: 0.2 mm
Leg length changes: 6.1 mm
L
LLD
Aa
8.6 mm
2 mm longer

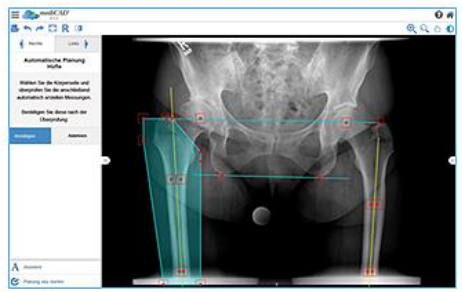

Name
Manufacturer
Part No.
Quantity
Coral Cemented Stem
Pinnacle Acetabular Cup
Measurements
AP View
Leg Length Discrepancy Tool
Cup Inclination
Hip Parameter Measurements

Web Hip

Das Modul Hüfte unterstützt bei der Planung von Hüftimplantaten. Es basiert auf gängigen, vormals manuell durchgeführten Planungsmethoden der Hüftendoprothetik mittels Röntgenbildern und Prothesenschablonen.

*** Mit der neuesten Version 2.x ist eine automatische Hüftplanung auch mit .jpeg oder .png Dateien möglich, was eine größere Flexibilität bei der Wahl der Bilddaten ermöglicht. ***

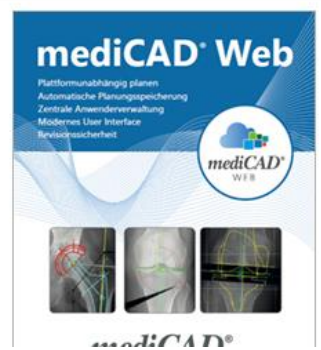
Automatische Planung:



Nach der Wahl der Körperseite werden die folgenden Landmarken automatisch erkannt:

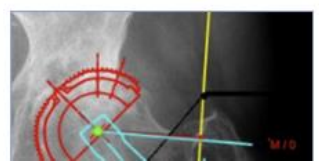
- Referenzlinie
- Beinlängendifferenz
- Femurschaftachse links/rechts
- Trochanter Major links/rechts
- Hüftgelenksmittelpunkt links/rechts
- Femur ausschneiden
- Femorales Offset

Erkannte Punkte können bei Bedarf manuell angepasst werden. Nach Bestätigung der Landmarken können direkt Pfannen und Schäfte eingesetzt werden. **mediCAD® Web** bietet mit diesem Modul eine sehr schnelle und und effiziente endoprothetische präoperative Planung an



Manuelle Planung:

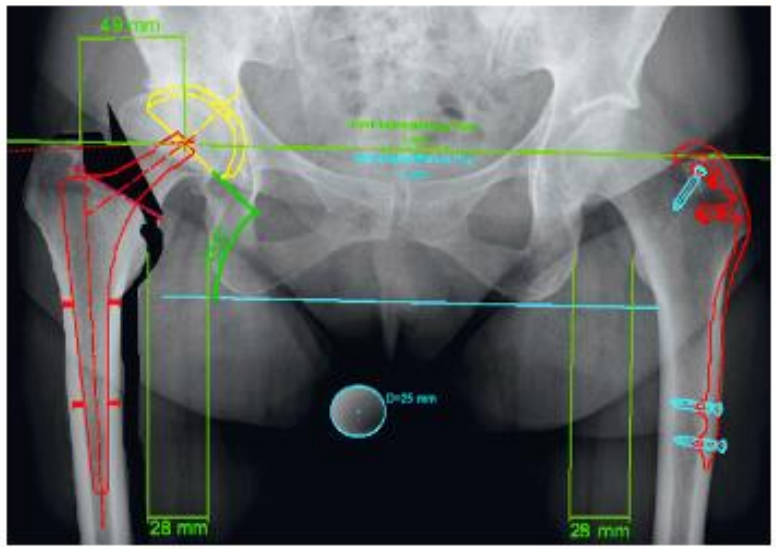
Mit der manuellen Planung können folgende Bemaßungen durchgeführt werden:



- Hüftgelenksmittelpunkt
- über 2 Punkte
- über 3 Punkte
- Frei
- Femurschaftachse

2D Hüfte

Das Modul Endoprothetik unterstützt Sie bei der Planung von Hüftimplantaten. Es basiert auf gängigen, vormals manuell durchgeführten, Planungsmethodender Hüft-Endoprothetik mittels Röntgenbildern und Prothesenschablonen.

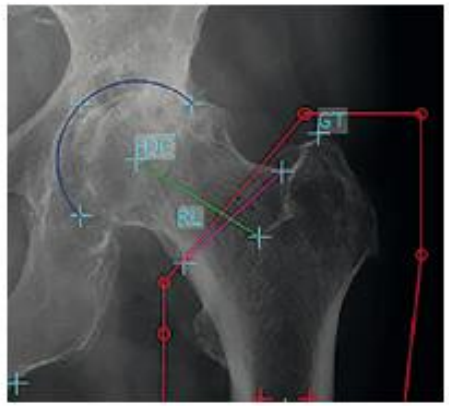


Schnell und gezielt können Sie:

- Eine geeignete Pfanne-, Schaftkombination einpassen
- Eine Adduktion oder Abduktion korrigieren
- Den Beinlängenausgleich präoperativ und postoperativ ermitteln und auf dem Bild darstellen
- FAI-Modul, welches aus enger Zusammenarbeit mit Dr. med. Wolfgang Zinser entstand
- Berechnung und Durchführung von intertrochantären Osteotomien

Automatische Planung

Mit der Funktion "Automatische *Planung*" im Modul Hüfte können Schäfte und Pfannen nach automatischer Erkennung der relevanten Landmarken vorgeschlagen werden. mediCAD® bietet mit dieser Funktion eine sehr schnelle und effiziente endoprothetische präoperative Planung an. Unter Verwendung einer Favoritenliste kann die automatische Bestimmung auf eine individuell bevorzugte Hersteller- oder Implantatkonfigurationen begrenzt werden.



Easy access to the planning software via browsers

No dependency on a specific work center

No need to install the system on the client

Custom start page for each user, with automatic planning storage

Easy to connect referring physicians to a central hospital

Uncomplicated, central administration of users

Goldpartner

Adler Ortho

Aesculap

alloPlus

Amplitude

ARTIQO

DePuy Synthes

DJO Surgical

Innovative Design Orthopaedics

Implantcast

ImplanTec

Lima Lto

Link

Mathys

Medtronic

Merete

MicroPort

Signus

Smith & Nephew

Zimmer Biomet

Silberpartner

Arthrex

Arthrosurface

Ceraver

Corin

Dedienne Sante

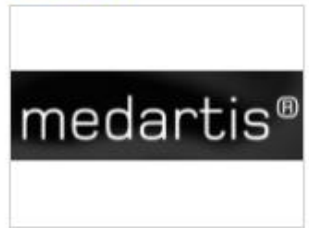
Exactech

FH Orthopedics

Groupe Lepine

Medacta

Medartis



MatOrtho

Orthofix

Peter Brehm

Stryker

Ulrich GmbH & Co. KG

Wright Medical

MOVE-UP

MTM

Teijin Nakashima Medical

NexMed International

ODEV Ortho Development

OHST

OMNIlife science

Orange Spine GmbH

OrthoPediatrics Corp.

OsteoMed

Permedica

Protetim Orvosi Műszergyártó

SAMO SpA

Sanatmetal

SEM science-et-medeci

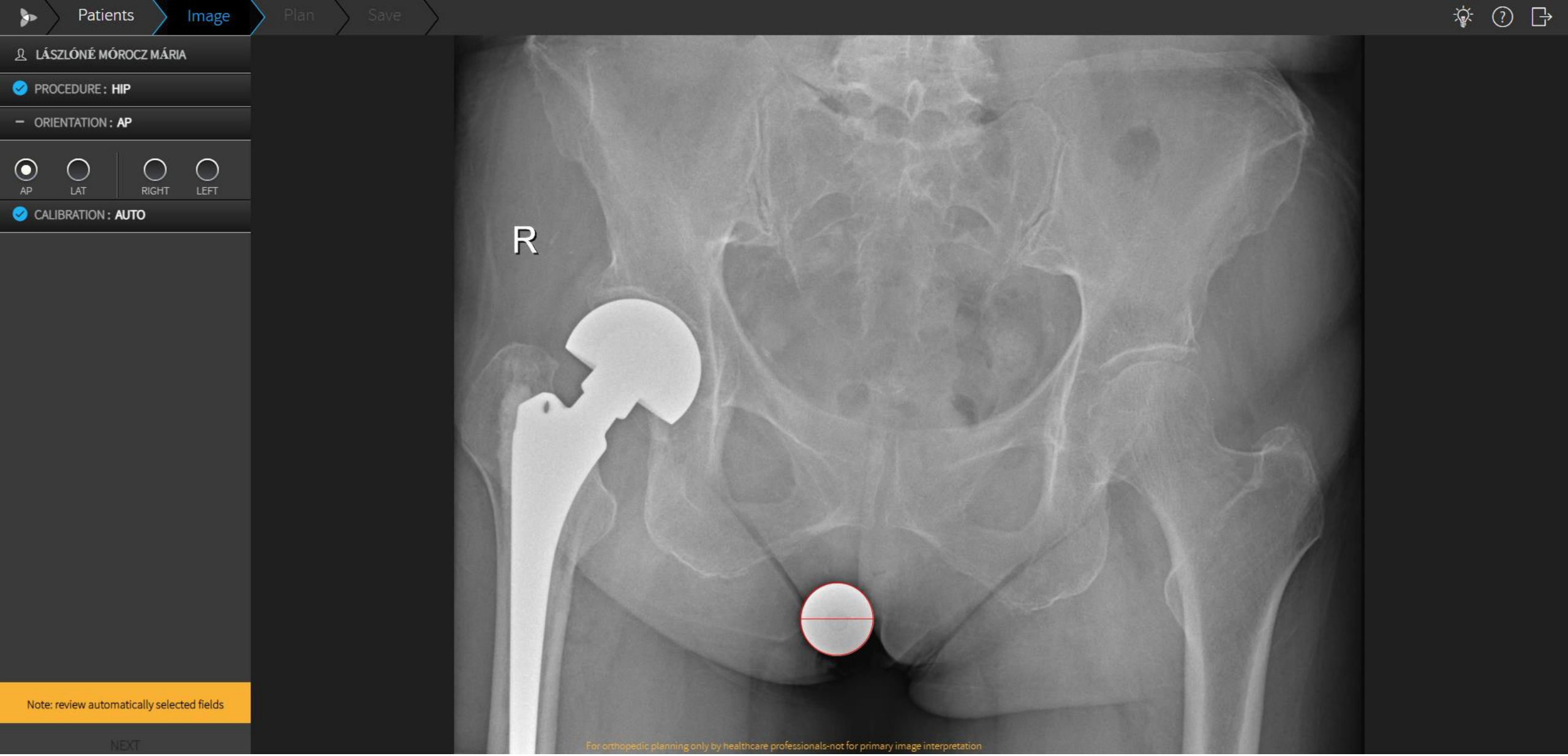
Secure BioMed

SERF

S&G Implants

Signature Orthopaedics

Silony Medical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LÁSZLÓNÉ MÓROCZ MÁRIA
PROCEDURE : HIP
ORIENTATION : AP
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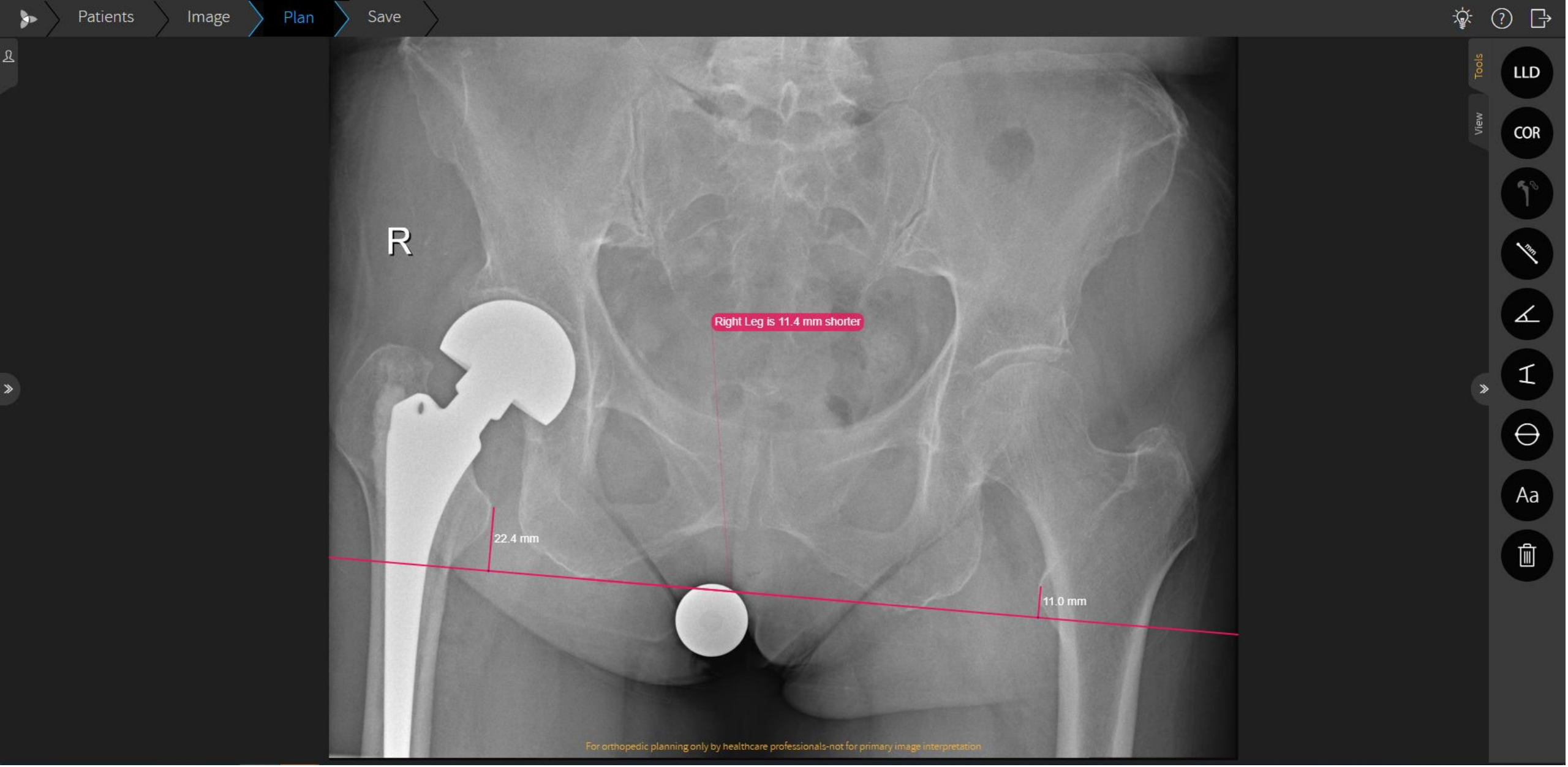
CALIBRATION : AUTO
Note: review automatically selected fields
NEXT
R
For orthopedic planning only by healthcare professionals-not for primary image interpretation


Patients
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mm
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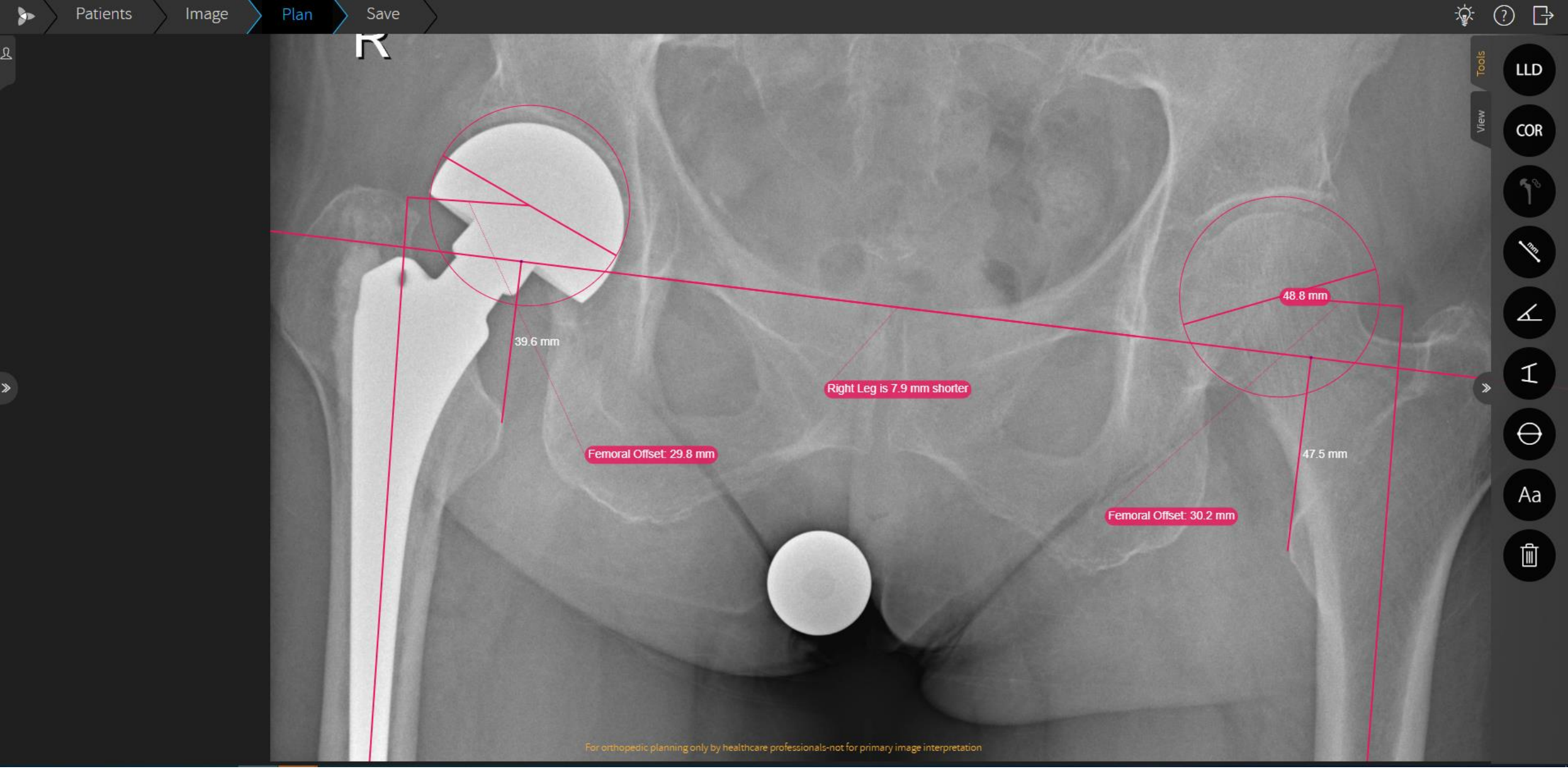
Right Leg is 11.4 mm shorter
22.4 mm
11.0 mm
For orthopedic planning only by healthcare professionals-not for primary image interpretation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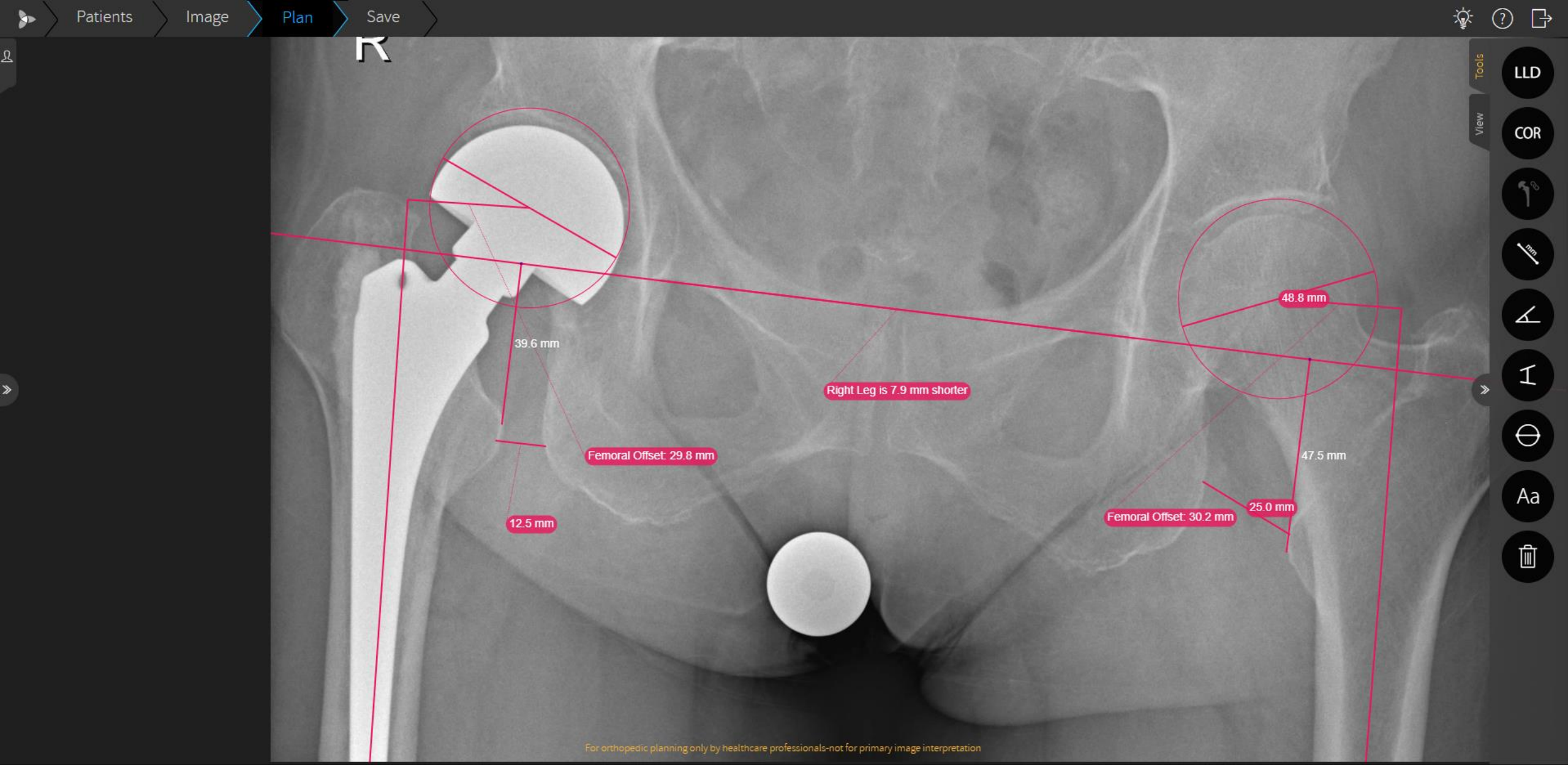
48.8 mm
39.6 mm
Right Leg is 7.9 mm shorter
Femoral Offset: 29.8 mm
47.5 mm
Femoral Offset: 30.2 mm
Aa
For orthopedic planning only by healthcare professionals-not for primary image interpretation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Femoral Offset: 29.8 mm
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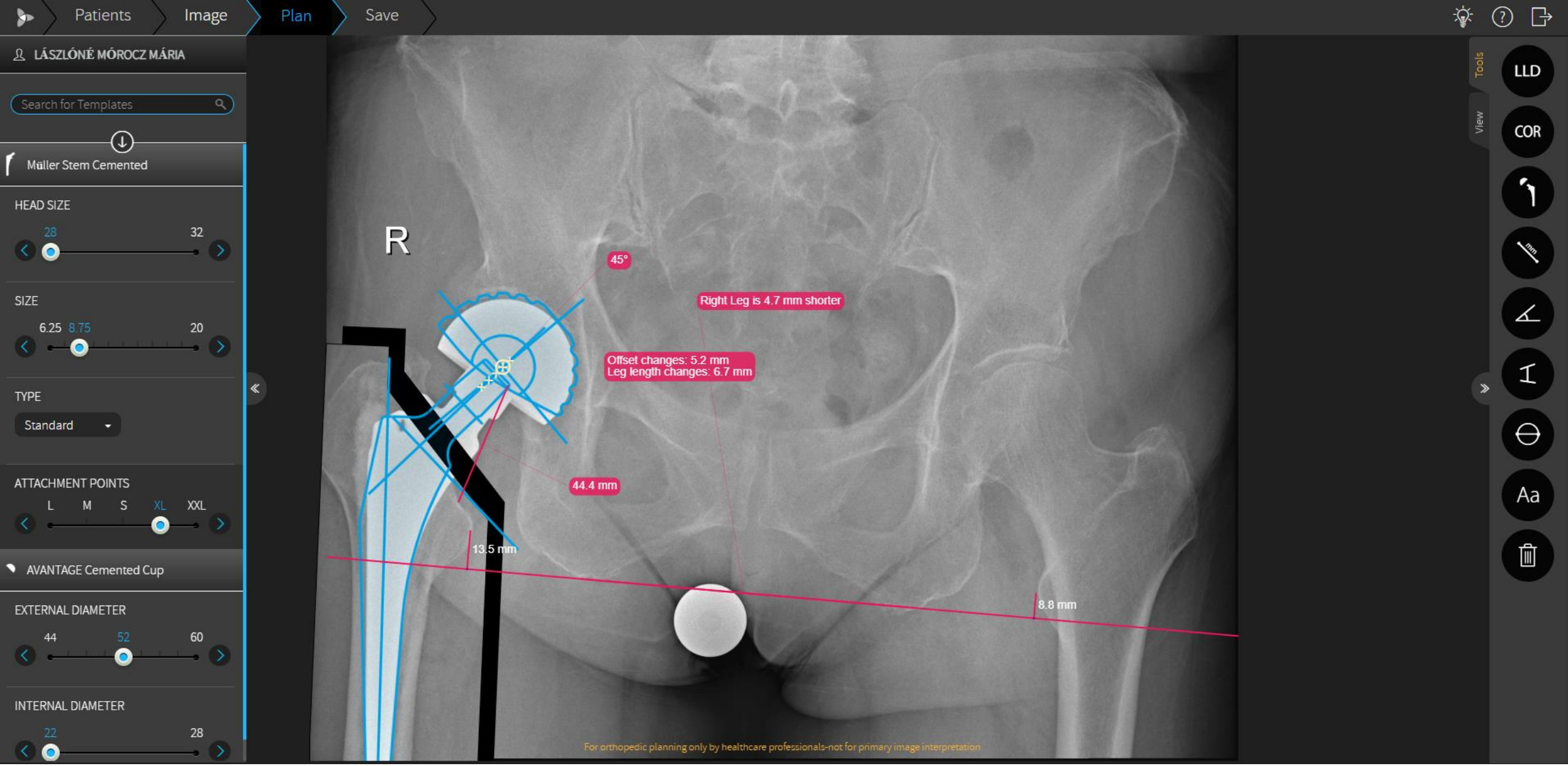
Right Leg is 7.9 mm shorter
48.8 mm
47.5 mm
25.0 mm
Femoral Offset: 30.2 mm
For orthopedic planning only by healthcare professionals-not for primary image interpretation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32
SIZE
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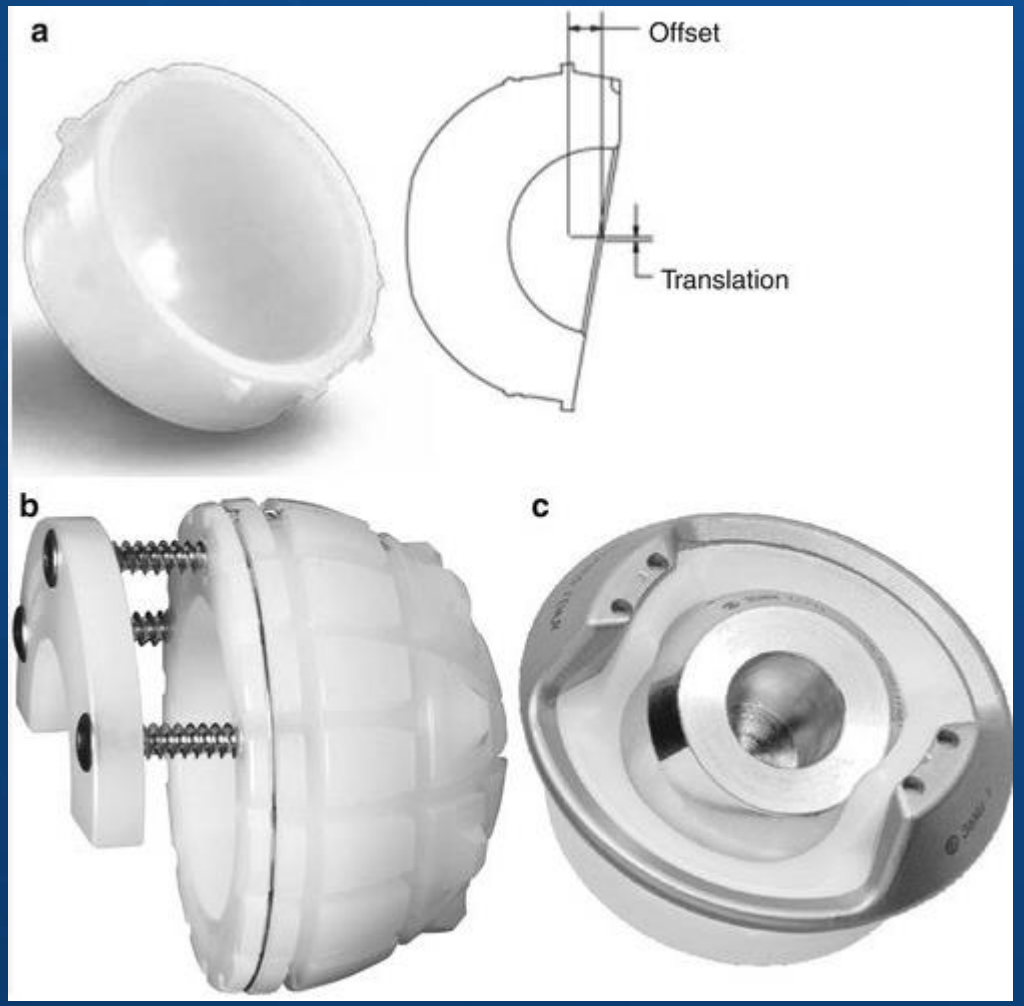
20
TYPE
Standard
ATTACHMENT POINTS
L M S XL XXL
AVANTAGE Cemented Cup
EXTERNAL DIAMETER
44
52
60
INTERNAL DIAMETER
22
28
R
45°
Right Leg is 4.7 mm shorter
Offset changes: 5.2 mm
Leg length changes: 6.7 mm
44.4 mm
13.5 mm
8.8 mm
For orthopedic planning only by healthcare professionals-not for primary image interpretation
Tools
View
LLD
COR
Aa

Dual mobility, constrained vápa vagy lágyrész rekonstrukció?

*„Overall, our study shows a **high dislocation and revision rate** after revision arthroplasty of the hip despite the use of constrained liners. The study population was limited to complex cases with a **history of multiple revision surgeries and infections**, which inherently has a high likelihood for **poor outcomes**."*

Unter Ecker N, Piakong P, Delgado G, Gehrke T, Citak M, Ohlmeier M. What is the failure rate of constrained liners in complex revision total hip arthroplasty? Arch Orthop Trauma Surg. 2022 Apr 4. doi: 10.1007/s00402-022-04419-z.


RIGHT
1


a
Offset
Translation
b
c


R

Luxáció profilaxis vagy terápia lehetőségei

- constrained vápabetét
- nagy fejátmérő (36-40 mm)
- **dual-mobility vápa**

- +/- lágyrész rekonstrukció

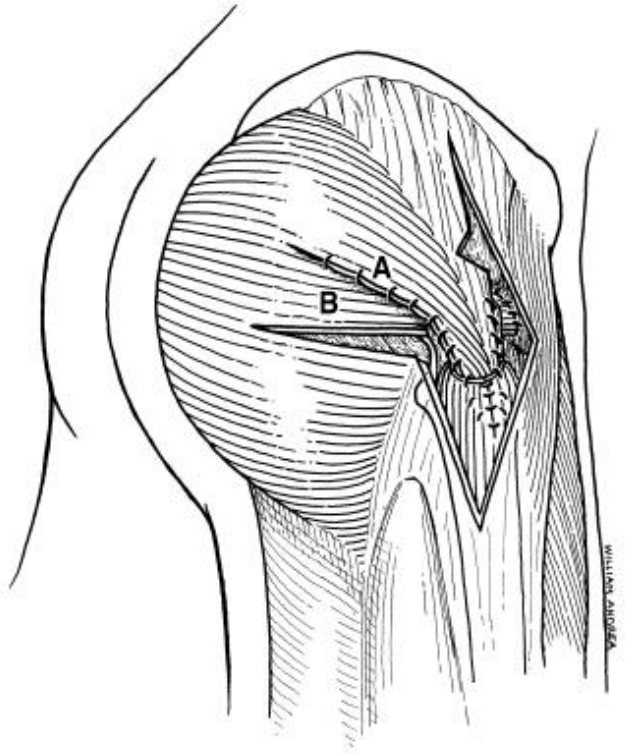


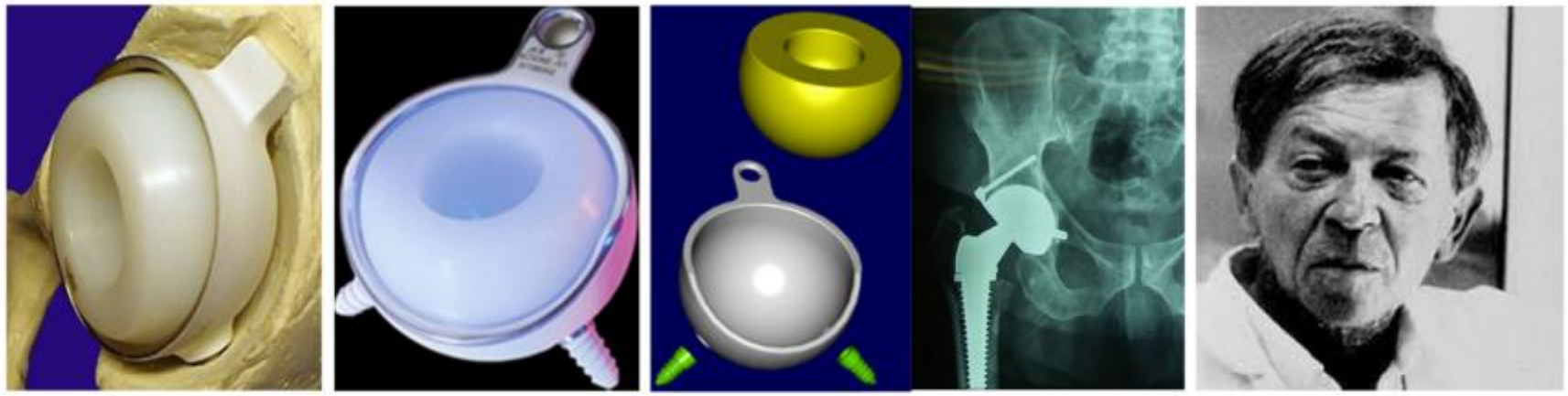
Fig. 10 The posterior edge of the anterior gluteus maximus flap (A) is sutured to the posterior gluteus maximus flap (B), which passes under it.

Whiteside LA.
Surgical technique: Transfer of the anterior portion of the gluteus maximus muscle for abductor deficiency of the hip.
Clin Orthop Relat Res. 2012 Feb;470(2):503-10.

- Gilles Bousquet ortopéd sebész & André Rambert mérnök ötlete nyomán (1970-es évek, Saint Étienne)
- Low friction arthroplasty és MacKee-Farrar MoM nagy fej ötletének a házasítása
- 1979 – Dual Mobiliy Concept

Caton JH, Ferreira A.
Dual-mobility cup: a new French revolution.
Int Orthop. 2017 Mar;41(3):433-437.

Initial results, published by Bousquet et al. in 1986, showed satisfactory midterm results and a **low dislocation rate of 2.8%** in 112 THA revisions



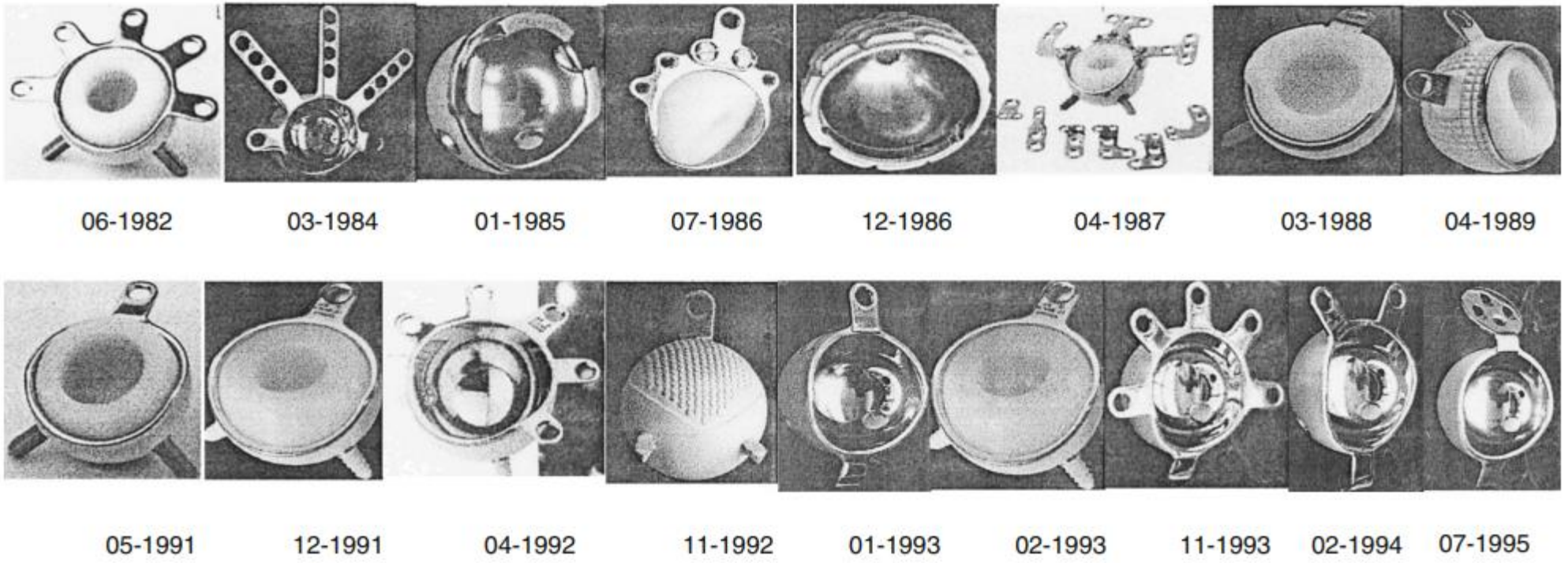
a b c

Fig. 6 1977: first THA with DM created by G. Bousquet, A. Rambert and J. Rieu called NOVAE®. (**a**) At first, it is sealed on the left and is called a "tripod"; (**b**) in February 1979, the cup is cementless and coated with alumina and called NOVAE® (**c**) Gilles BOUSQUET

Bousquet G, Argenson C, Godeneche JL, Cisterne JP, Gazielly DF, Girardin P, Debiesse JL. Reprises après descellement aseptique des arthroplasties totales de hanche cimentées par la prothèse sans ciment de Bousquet. A propos de 136 observations [Recovery after aseptic loosening of cemented total hip arthroplasties with Bousquet's cementless prosthesis. Apropos of 136 cases]. Rev Chir Orthop Reparatrice Appar Mot. 1986;72 Suppl 2:70-4. French.

The rationale for using a dual-mobility cup is based on this basic principle:

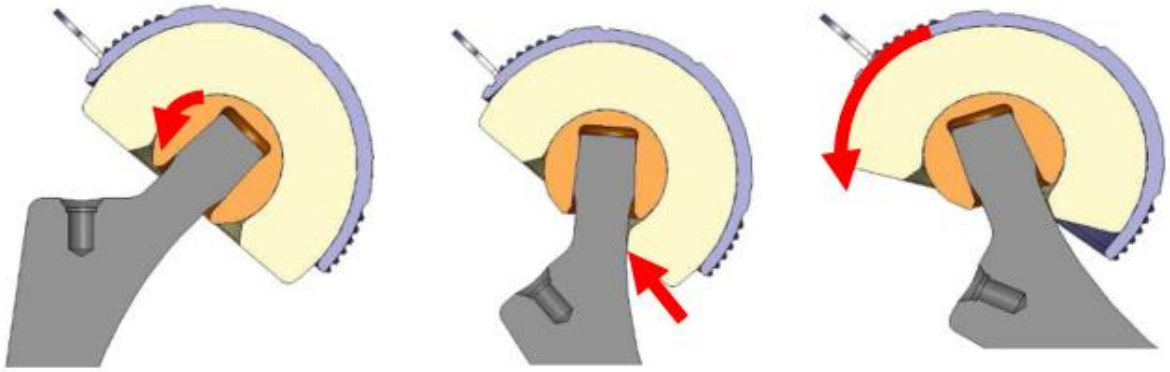
„A **small head articulates against a large-diameter polyethylene liner**, where it is free to move until the femoral neck and liner come into contact; a **second articulation** between the polyethylene and metal bearing provides a head size and ROM close to the native anatomy, resulting in greater joint stability”



Noyer D, Caton JH.
Once upon a time.... Dual mobility: history.
Int Orthop. 2017 Mar;41(3):611-618.

Dual mobility vápa előnyei

- Irodalmi adatok: kitűnő eredmények
- Alacsony komplikációs ráta
- Megnöveli a „jump distance-t”
- Csökkenti az impingement lehetőségét



Unter Ecker N, Kocaoğlu H, Zahar A, Haasper C, Gehrke T, Citak M.
What Is the Dislocation and Revision Rate of Dual-mobility Cups Used in Complex Revision THAs?
Clin Orthop Relat Res. 2021 Feb 1;479(2):280-285.

Indikációs terület

- primer TEP **glutealis insufficienciánál**
- TEP **combnyaktörésnél**
- **posttraumás** csípő protetizálása
- TEP beültetés **complience hiánya** esetén
- primer TEP vagy revízió **hátsó feltárásból**
- **neurológiai betegség** miatti luxációs veszély csökkentése primer TEP esetén
- **többszörös luxáció** miatt végzett revízió (vápa- és fejcsere)
- nagy **csontveszteséggel** járó revízió esetén
- **lágyrész elégtelenséggel** járó revíziók
- **tumorsebészet** (PFR)
- **szeptikus revízió**, reimplantáció

Avantage Reload Cementless Shell

Avantage 3P Cementless Shell

Avantage Cemented Shell

DUAL MOBILITY

PROVIDING STABILITY AND HIGH RANGE OF MOTION
WITHOUT THE NEED TO CONSTRAIN THE HEAD

Reduced Wear
Smaller diameter heads, like the inner head in this construct, have been clinically proven to lead to lower rates of wear [11]

Dislocation Resistance
Large diameter heads, like the polyethylene bearing in this construct, have been clinically shown to increase jump height which makes it more difficult for the head to dislocate [4, 14, 15]

Seating and Alignment
Hard bearing inserter ring helps ensure the CoCr liner is aligned properly during implantation to help limit micro-motion

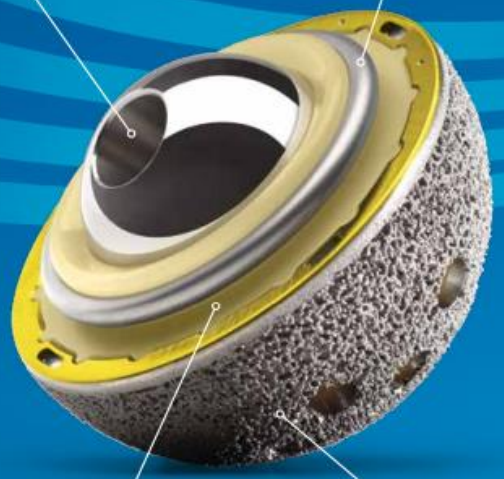
Stability
Optimized 40mm bearing to 50mm shell ratio with option to convert to a constrained liner if needed

FREEDOM CONSTRAINED

DESIGNED TO COUNTER THE DISTRACTIVE FORCES
THAT CAN LEAD TO RECURRENT HIP DISLOCATION

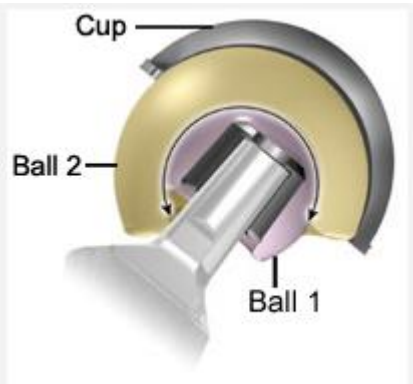
Simplified Reduction
Circumferential flats on Freedom heads allow for in-vivo reduction and pre-assembled Freedom® liners and rings

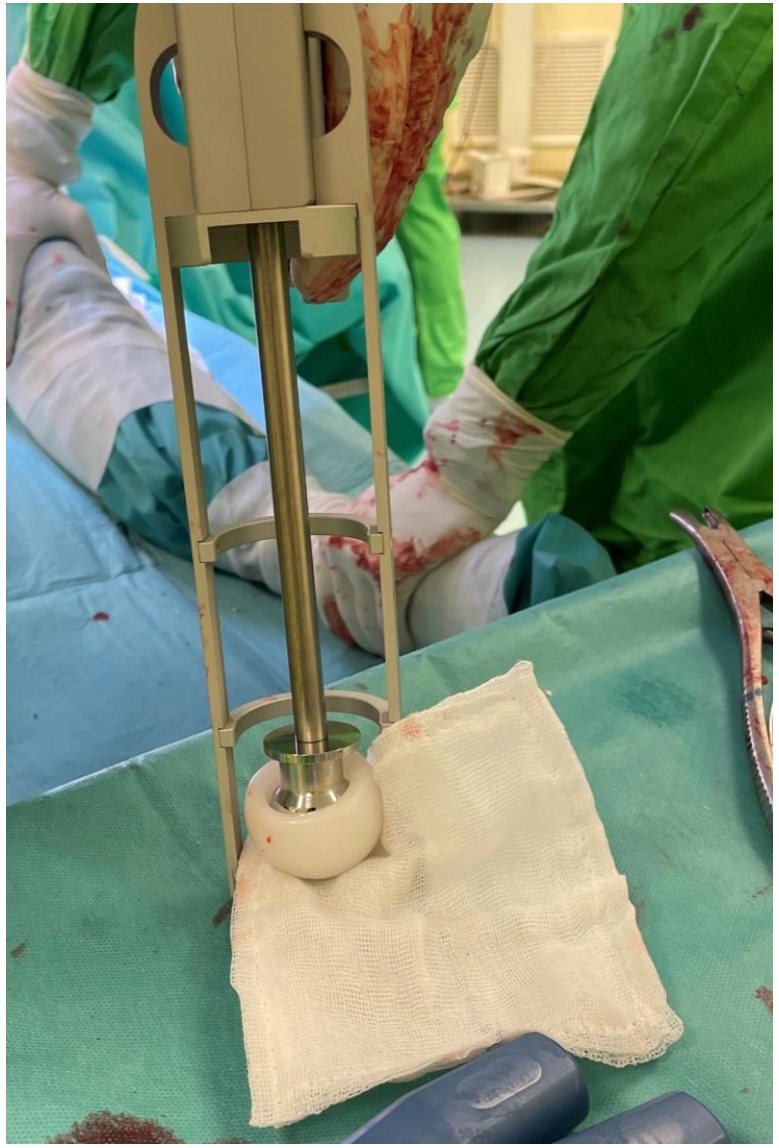
Enhanced Constraint
Preassembled constraining ring increases resistance to lever-out forces without need to assemble in-vivo

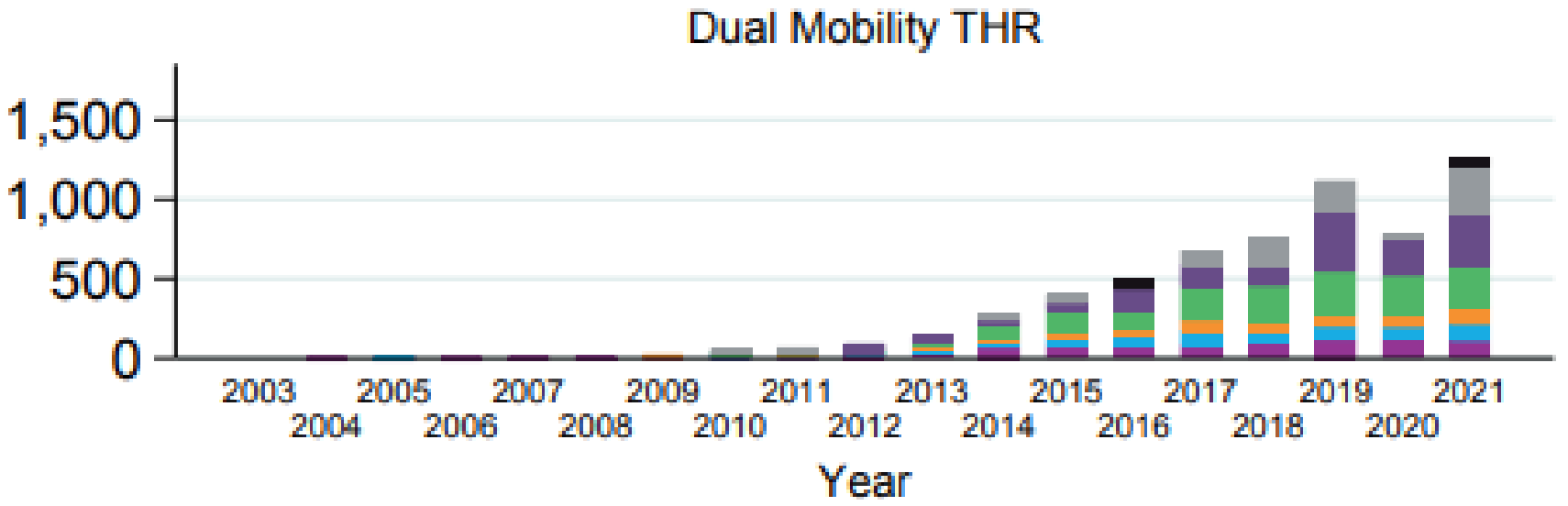


Reduced Risk of Impingement and Instability
Increased ranges of motion, as found in the Freedom constrained liner at 114 degrees, have been clinically shown to reduce the risk of impingement and instability [12]

Stability
Interchangeability between all G7 components allows surgeons to customize stability to the patient's needs


Cup
Ball 2
Ball 1





N=Procedures per year and by type, summed over elective and acute replacements

1≤N≤2 3≤N≤4 5≤N≤6 7≤N≤12 13≤N≤24 25≤N≤48 49≤N≤96 97≤N≤192 ≥193

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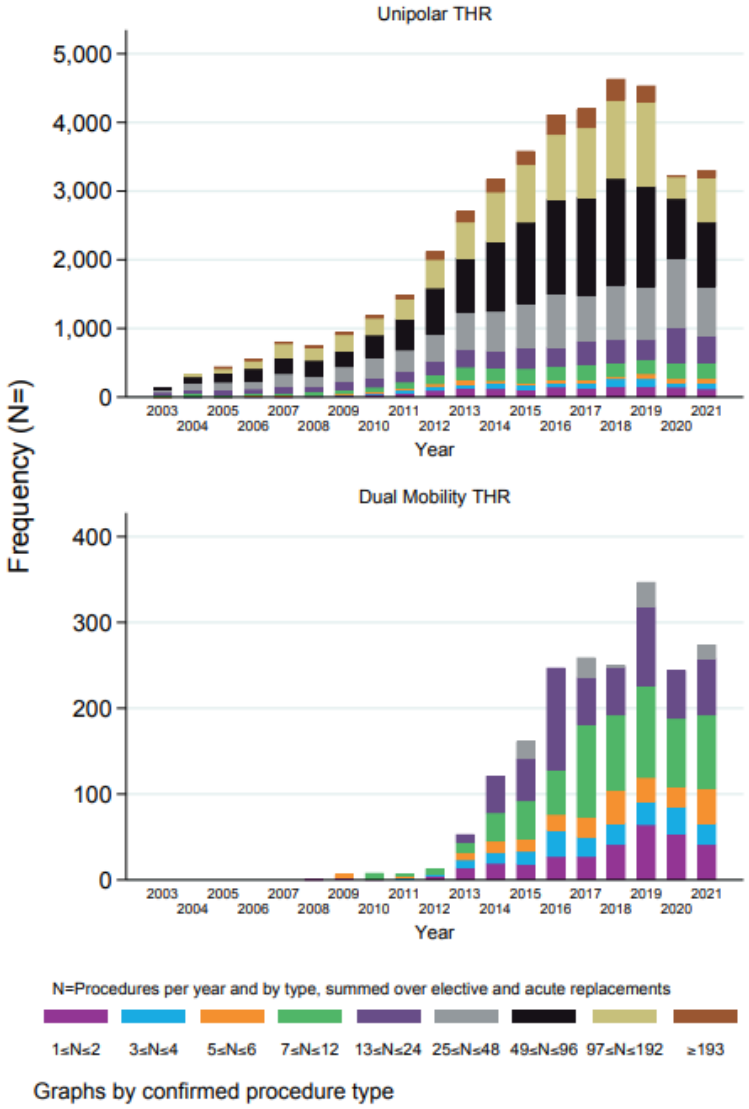
Figure 3.H1 (c) Frequency of primary hip replacements within acute trauma cases stratified by procedure type, bars stacked by volume per consultant per year.



HAP vs. DM-TEP

„dual mobility bearings include reduced risk of early revision due to dislocation”

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Komplikációs lehetőségek

- Luxáció → fedett repozíció lehetséges
- Fokozott PE kopás
- Aszeptikus lazulás
- Intraprotetikus luxáció: kis fej elhagyja a nagy PE fejet
- Fej-kónusz disszociáció: kis fej elválik a protézis kónusztól

„…this study demonstrates that dual-mobility acetabular components ***decrease the risk of post-operative instability*** *also in high-risk patients, both in primary and revision hip arthroplasties…”*

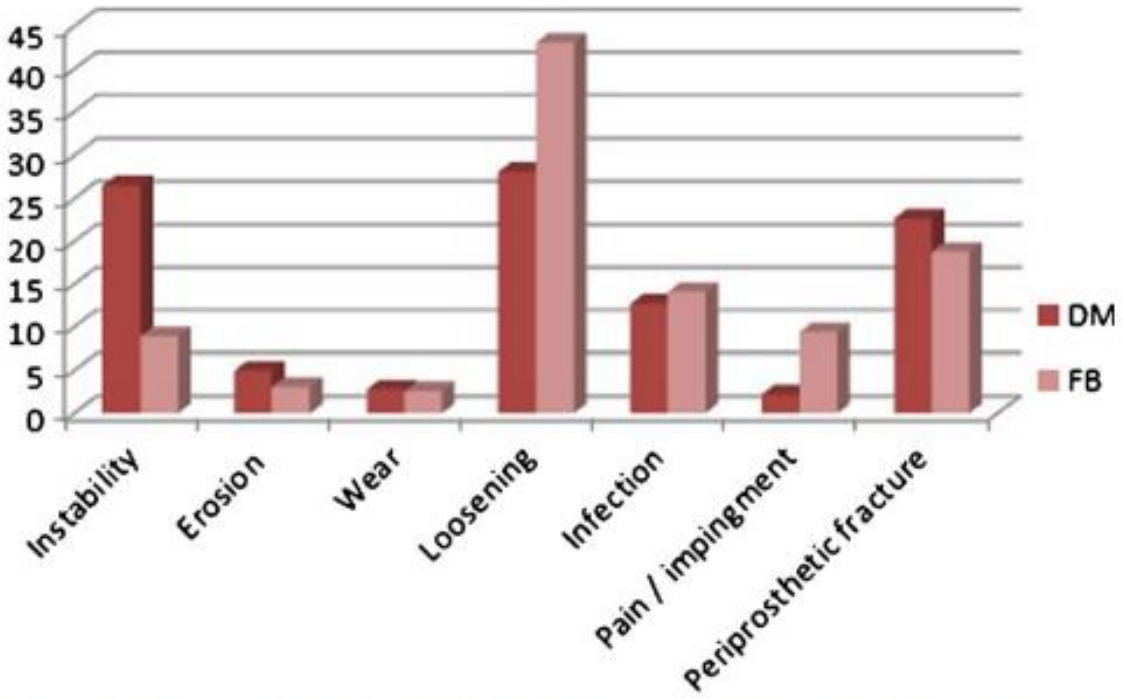


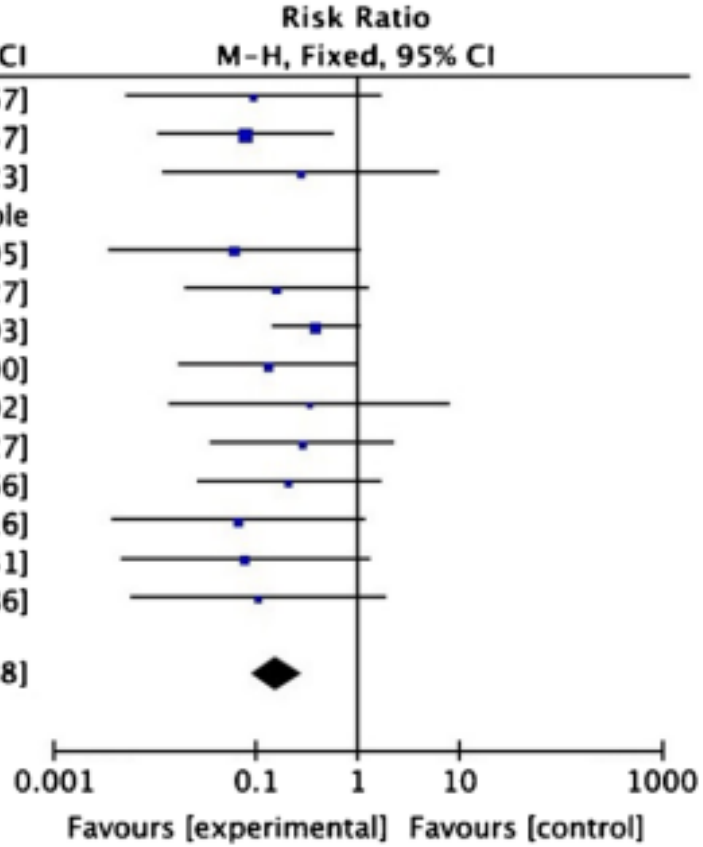
Fig. 3 Causes for revision arthroplasties for dual-mobility cups and fixed bearing implants

Romagnoli M, Grassi A, Costa GG, Lazaro LE, Lo Presti M, Zaffagnini S.
The efficacy of dual-mobility cup in preventing dislocation after total hip arthroplasty: a systematic review and meta-analysis of comparative studies.
Int Orthop. 2019 May;43(5):1071-1082.

Study or Subgroup	Dual Mobility Events	Total	Fixed Bearing Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Bouchet et al. 2011	0	105	5	108	6.0%	0.09 [0.01, 1.67]
Caton et al. 2014	1	105	26	215	19.0%	0.08 [0.01, 0.57]
Chalmers et al. 2017	0	16	1	13	1.8%	0.27 [0.01, 6.23]
D'Apuzzo et al. 2014	0	78	0	78		Not estimable
Epinette et al. 2015	0	143	7	130	8.7%	0.06 [0.00, 1.05]
Gonzales et al. 2017	1	150	7	166	7.4%	0.16 [0.02, 1.27]
Hernigou et al. 2016	5	85	13	85	14.5%	0.38 [0.14, 1.03]
Hernigou et al. 2017	1	35	7	32	8.1%	0.13 [0.02, 1.00]
Homma et al. 2016	0	60	1	60	1.7%	0.33 [0.01, 8.02]
Jauregui et al. 2016	1	60	7	120	5.2%	0.29 [0.04, 2.27]
Perrin et al. 2017	1	24	5	25	5.4%	0.21 [0.03, 1.66]
Rowan et al. 2017	0	136	7	136	8.3%	0.07 [0.00, 1.16]
Tarasevicius et al. 2013	0	42	8	56	8.1%	0.08 [0.00, 1.31]
Tarasevisius et al. 2010	0	58	5	67	5.7%	0.10 [0.01, 1.86]
Total (95% CI)		1097		1291	100.0%	0.16 [0.09, 0.28]
Total events	10		99			

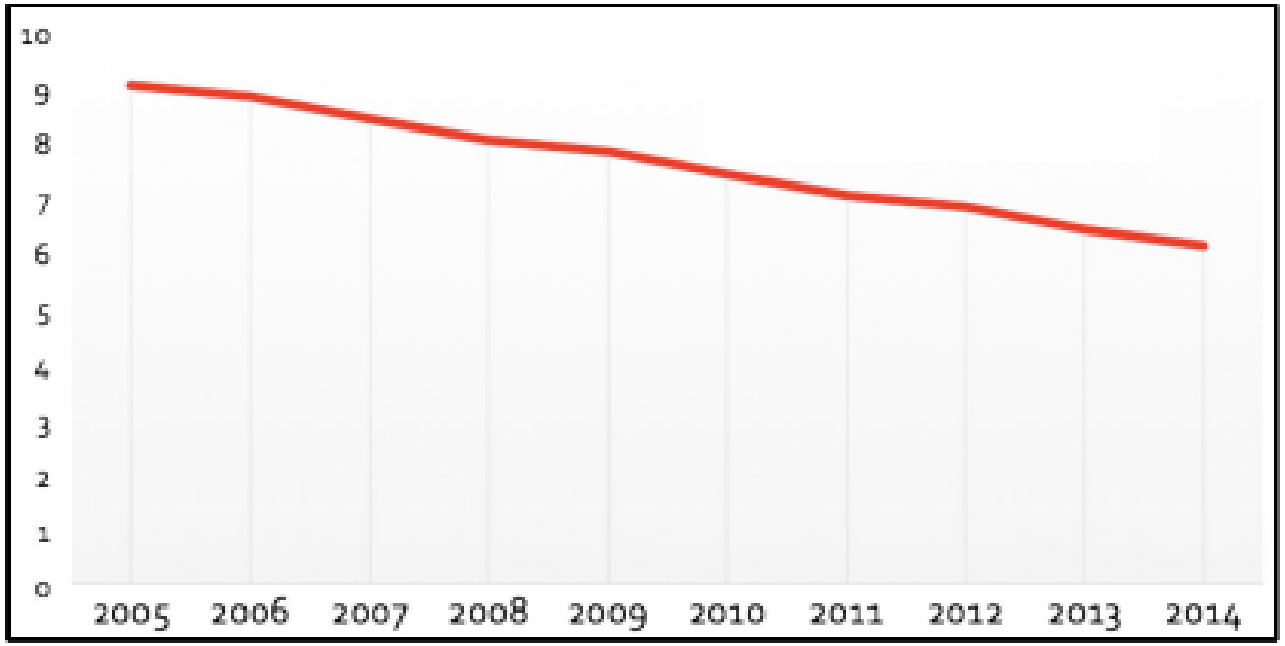
Heterogeneity: $Chi^2 = 5.56$, $df = 12$ ($P = 0.94$); $I^2 = 0\%$

Test for overall effect: $Z = 6.34$ ($P < 0.00001$)



Romagnoli M, Grassi A, Costa GG, Lazaro LE, Lo Presti M, Zaffagnini S.
The efficacy of dual-mobility cup in preventing dislocation after total hip arthroplasty: a systematic review and meta-analysis of comparative studies.
Int Orthop. 2019 May;43(5):1071-1082.

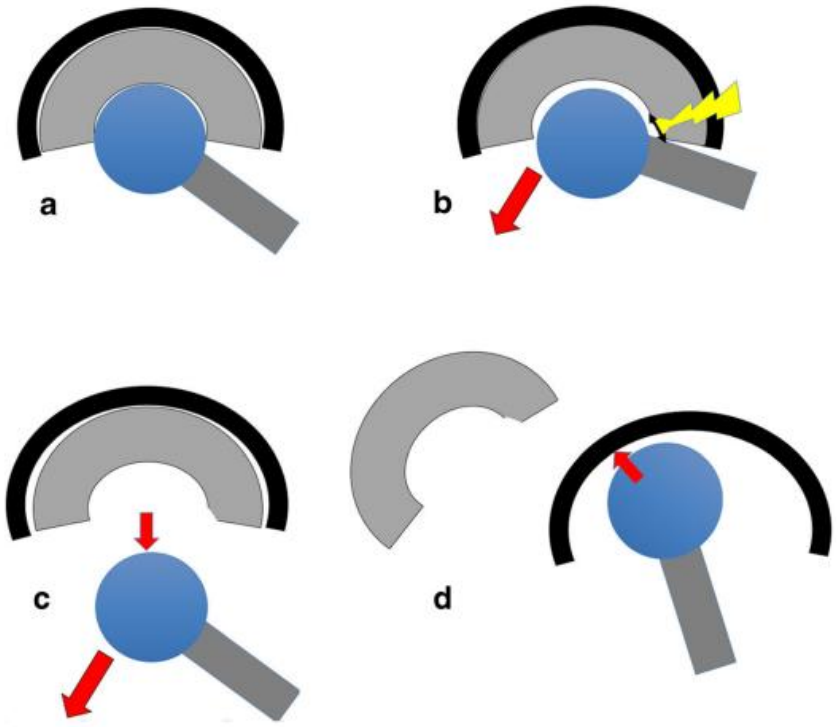
Fig. 3 Evolution of dislocation rate after THA in France from 2005 to 2014 (French NHS Data - CNAM TS – Courtesy J Caton)



Batailler C, Fary C, Verdier R, Aslanian T, Caton J, Lustig S.
The evolution of outcomes and indications for the dual-mobility cup: a systematic review.
Int Orthop. 2017 Mar;41(3):645-659.

Bubble sign

„Accelerated PE wear can occur on its inner or outer surface”



Hernigou P, Dubory A, Potage D, Roubineau F, Flouzat Lachaniette CH. Dual-mobility arthroplasty failure: a rationale review of causes and technical considerations for revision. Int Orthop. 2017 Mar;41(3):481-490.

Luxáció DM után? – hogy lehet ez???

*„due to this salvage indication and some indications in which the **dual-mobility cup is not implanted anatomically**, recurrent dislocation remains possible after implantation of a dual-mobility arthroplasty and is **paradoxically the most frequent complication** following dual-mobility arthroplasty in the short-term follow-up”*

Hernigou P, Dubory A, Potage D, Roubineau F, Flouzat Lachaniette CH. Dual-mobility arthroplasty failure: a rationale review of causes and technical considerations for revision. Int Orthop. 2017 Mar;41(3):481-490.

Luxáció DM után – mit lehet tenni?

„Revision with a constrained liner: It is important to recognise that if the previous dual-mobility arthroplasty did not ensure hip stability, the probability that a new dual-mobility arthroplasty will prevent dislocation after conversion surgery is low, particularly if muscle abnormalities are present on CT scan. In this situation of dislocation in the larger mobility, our preference is to ***use a constrained liner****, particularly when* ***muscle insufficiency*** *is observed”*

Hernigou P, Dubory A, Potage D, Roubineau F, Flouzat Lachaniette CH.
Dual-mobility arthroplasty failure: a rationale review of causes and technical considerations for revision.
Int Orthop. 2017 Mar;41(3):481-490.

Köszönöm a figyelmet

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