LE REVISIONI MULTIPLE IN CHIRURGIA PROTESICA D'ANCA

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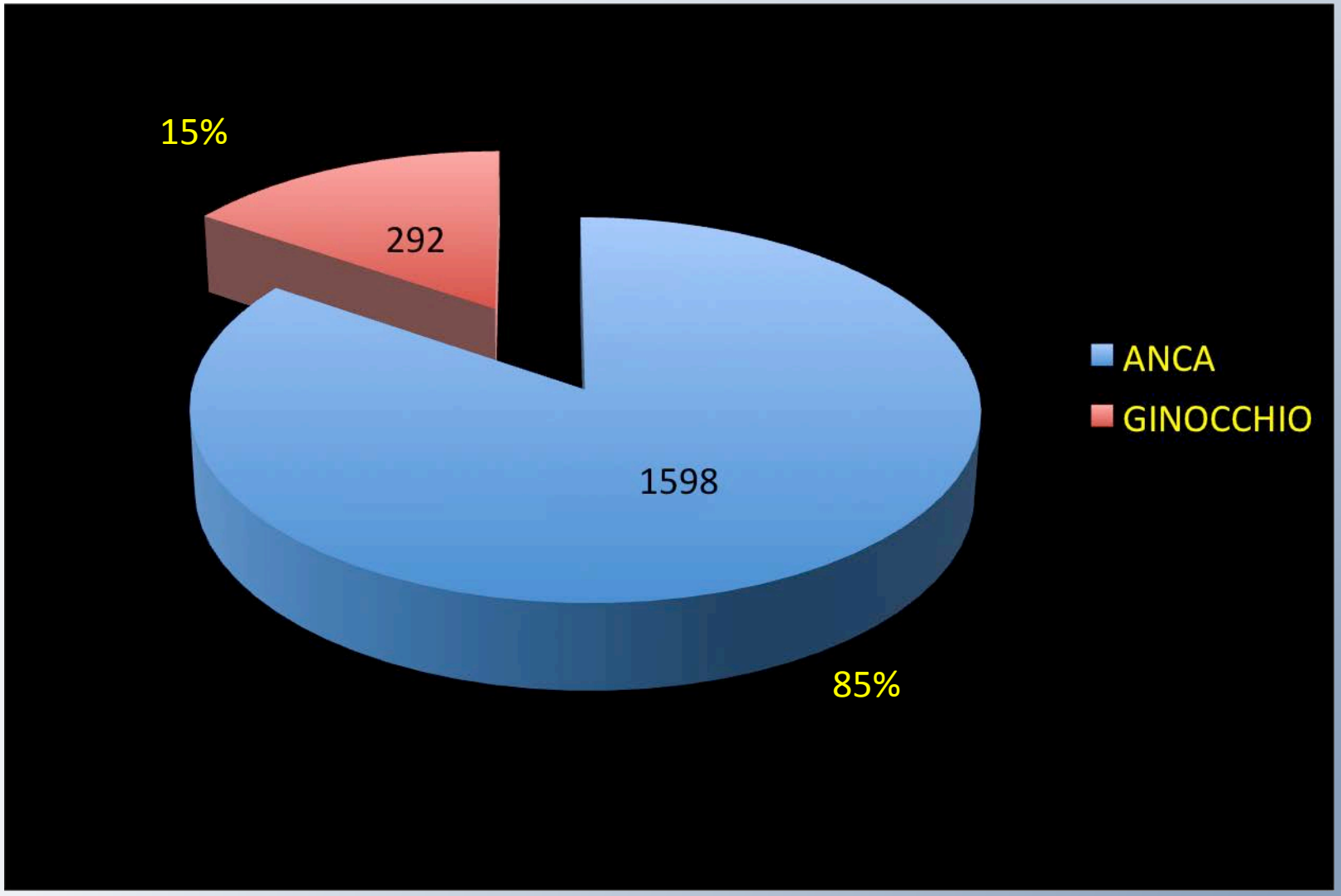
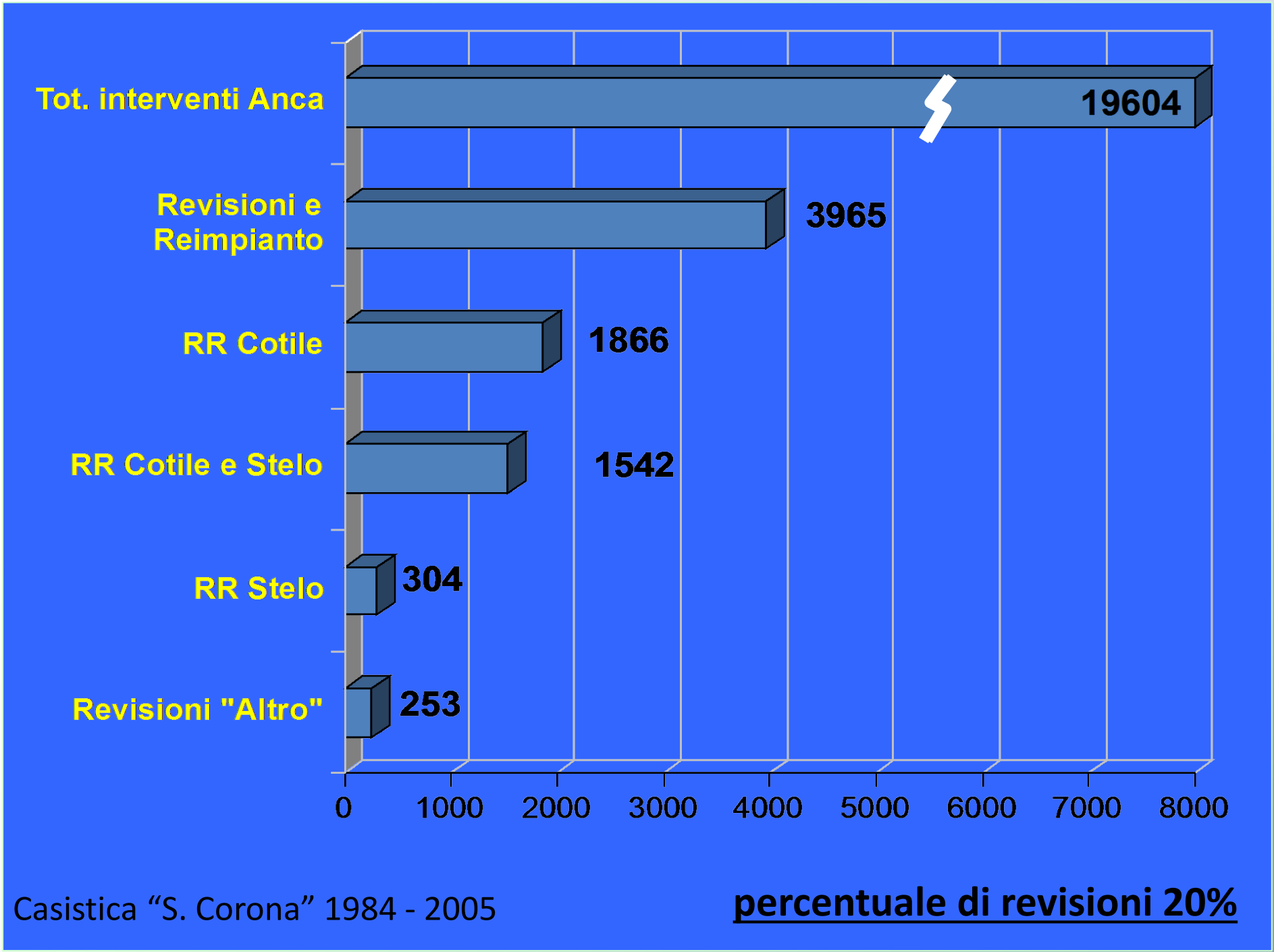
Nel mondo si impiantano
circa 2.000.000 di protesi all’anno

Casisitica ICH

2006 – 2012 1890 Reimpianti





Casistica “S. Corona” 1984 - 2005

percentuale di revisioni 20%

CAUSE DI REVISIONE

INFEZIONE (da escludere sempre)

OSTEOLISI PERIPROTESICA DA DETRITI

POLY
CEMENTO
METALLO
CERAMICA

SCOLLAMENTO CEMENTO (rottura da fatica)

MOBILIZZAZIONE MECCANICA

DISTRIBUZIONE SOLLECITAZIONI
RIMODELLAMENTO OSSEO

INSTABILITA'

FRATTURA PERIPROTESICA

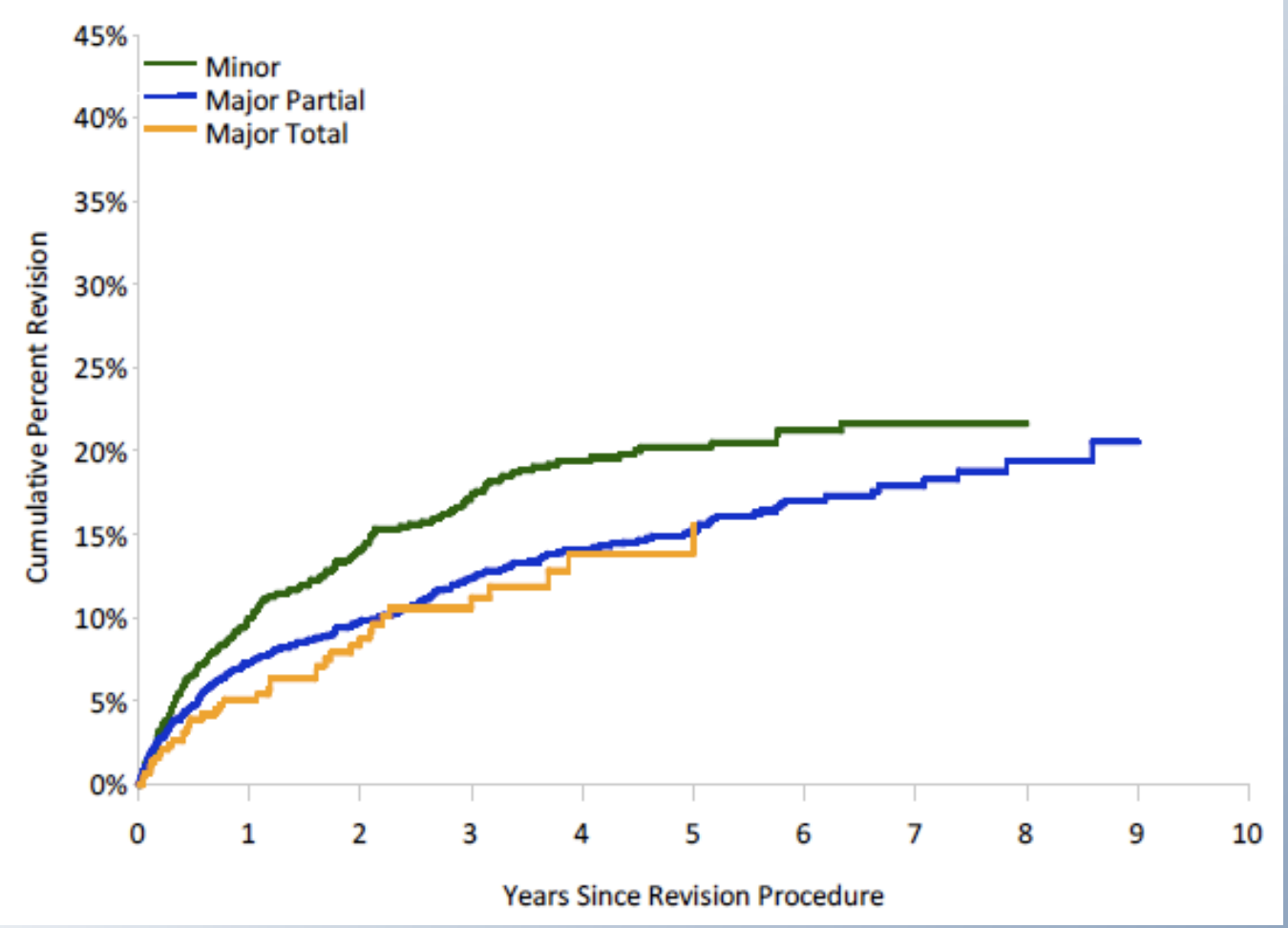
INTRAOPERATORIA
TRAUMATICA
DA OSTEOLISI
IN PTA SUPERFICIE

CALCIFICAZIONI / RIGIDITA'

ROTTURA DELLO STELO / DISACCOPPIAMENTO

STRESS SHIELDING

Cumulative Percent Re-revision of Known Primary Total Conventional Hip Replacement (Primary Diagnosis OA, excluding first revision for Infection)



AOA
AUSTRALIAN ORTHOPAEDIC ASSOCIATION

Number of revisions per diagnosis and number of previous revisions

primary THRs 1979-2011

Diagnosis at primary THR	0		1		2		> 2		Total	Prop.
Primary osteoarthritis	21,107	74.0%	3,552	70.1%	690	64.7%	201	60.9%	25,550	73.0%
Fracture	2,477	8.7%	408	8.1%	83	7.8%	17	5.2%	2,985	8.5%
Inflammatory arthritis	2,188	7.7%	475	9.4%	136	12.8%	45	13.6%	2,844	8.1%
Childhood disease	1,434	5.0%	368	7.3%	86	8.1%	38	11.5%	1,926	5.5%
Idiopathic femoral head necrosis	686	2.4%	131	2.6%	35	3.3%	9	2.7%	861	2.5%
Secondary arthritis after trauma	228	0.8%	69	1.4%	24	2.3%	18	5.5%	339	1.0%
Secundary osteoarthritis	233	0.8%	29	0.6%	4	0.4%	0	0.0%	266	0.8%
Tumour (malignancy)	108	0.4%	19	0.4%	3	0.3%	1	0.3%	131	0.4%
(missing)	58	0.2%	15	0.3%	5	0.5%	1	0.3%	79	0.2%
Total	28,519	100%	5,066	100%	1,066	100%	330	100%	34,981	100%

14% almeno 2 Revisioni

3% > di 2 Revisioni

Number of revisions per reason and number of previous revisions

primary THRs 1979-2011

Reason for revision	0		1		2		> 2		Total	Prop.
Aseptic loosening	20,489	71.8%	3,000	59.2%	542	50.8%	125	37.9%	24,156	69.1%
Dislocation	2,505	8.8%	756	14.9%	205	19.2%	95	28.8%	3,561	10.2%
Deep infection	2,309	8.1%	653	12.9%	175	16.4%	77	23.3%	3,214	9.2%
Fracture	1,956	6.9%	418	8.3%	87	8.2%	16	4.8%	2,477	7.1%
Technical error	639	2.2%	112	2.2%	29	2.7%	7	2.1%	787	2.2%
Implant fracture	420	1.5%	87	1.7%	19	1.8%	7	2.1%	533	1.5%
Pain only	108	0.4%	23	0.5%	5	0.5%	2	0.6%	138	0.4%
Miscellaneous	93	0.3%	16	0.3%	3	0.3%	1	0.3%	113	0.3%
Secondary infection	0	0.0%	1	0.0%	1	0.1%	0	0.0%	2	0.0%
Total	28,519	100%	5,066	100%	1,066	100%	330	100%	34,981	100%

Infezione e lussazione stessa percentuale di ri-revisioni (9-10% dei casi)

“errori tecnici” pecentuale del 2%

Number of revisions per year of revision and number of previous revisions

primary THRs 1979-2011

Year of revision	0		1		2		> 2		Total	Prop.
1979-2006	21,759	76.3%	3,633	71.7%	706	66.2%	198	60.0%	26,296	75.2%
2007	1,289	4.5%	266	5.3%	58	5.4%	21	6.4%	1,634	4.7%
2008	1,301	4.6%	256	5.1%	80	7.5%	27	8.2%	1,664	4.8%
2009	1,433	5.0%	305	6.0%	81	7.6%	23	7.0%	1,842	5.3%
2010	1,406	4.9%	312	6.2%	82	7.7%	31	9.4%	1,831	5.2%
2011	1,331	4.7%	294	5.8%	59	5.5%	30	9.1%	1,714	4.9%
Total	28,519	100%	5,066	100%	1,066	100%	330	100%	34,981	100%

TASSO DI SOPRAVVIVENZA DELL'IMPIANTO

76% DEGLI IMPIANTI VIENE REVISIONATO ENTRO 25 AA

"SOLO" 9% DEGLI IMPIANTI HA LA PRIMA REVISIONE DOPO 30 AA

Strategie chirurgiche nella ri-revisione di protesi di anca

- Analisi cause del fallimento (planning, analisi RX)

- **Biomeccanica!!**
- **Tipo di impianto**
- **Qualità della cementazione**
- **Qualità ossea**
- **Deficit osseo**
- **Attività muscolare**
- **Strumentari**

STRUMENTARIO

TECNICA SPECIFICA

STRUMENTARI SPECIALISTICI

SISTEMI PER ESTRAZIONE CEMENTO
- U.S.
- SEG-CES

PLACCHE, CAVI, FILI M.

SISTEMI DI RIMOZIONE COTILI
- EXPLANT

ESTRATTORI STELI
- MODULARI
- MONOBLOCCO

IMPIANTI PROTESICI DEDICATI

SPAZIATORI (PROTESI) CEMENTATI

PLACCHE / GABBIE /ANELLI

ACCOPPIAMENTI A DOPPIA MOBILITA' /RITENTIVI

AUGMENT
- TANTALIO

COTILI AD ELEVATO GRIP E INTEGRAZIONE
- TANTALIO
- TI-POR

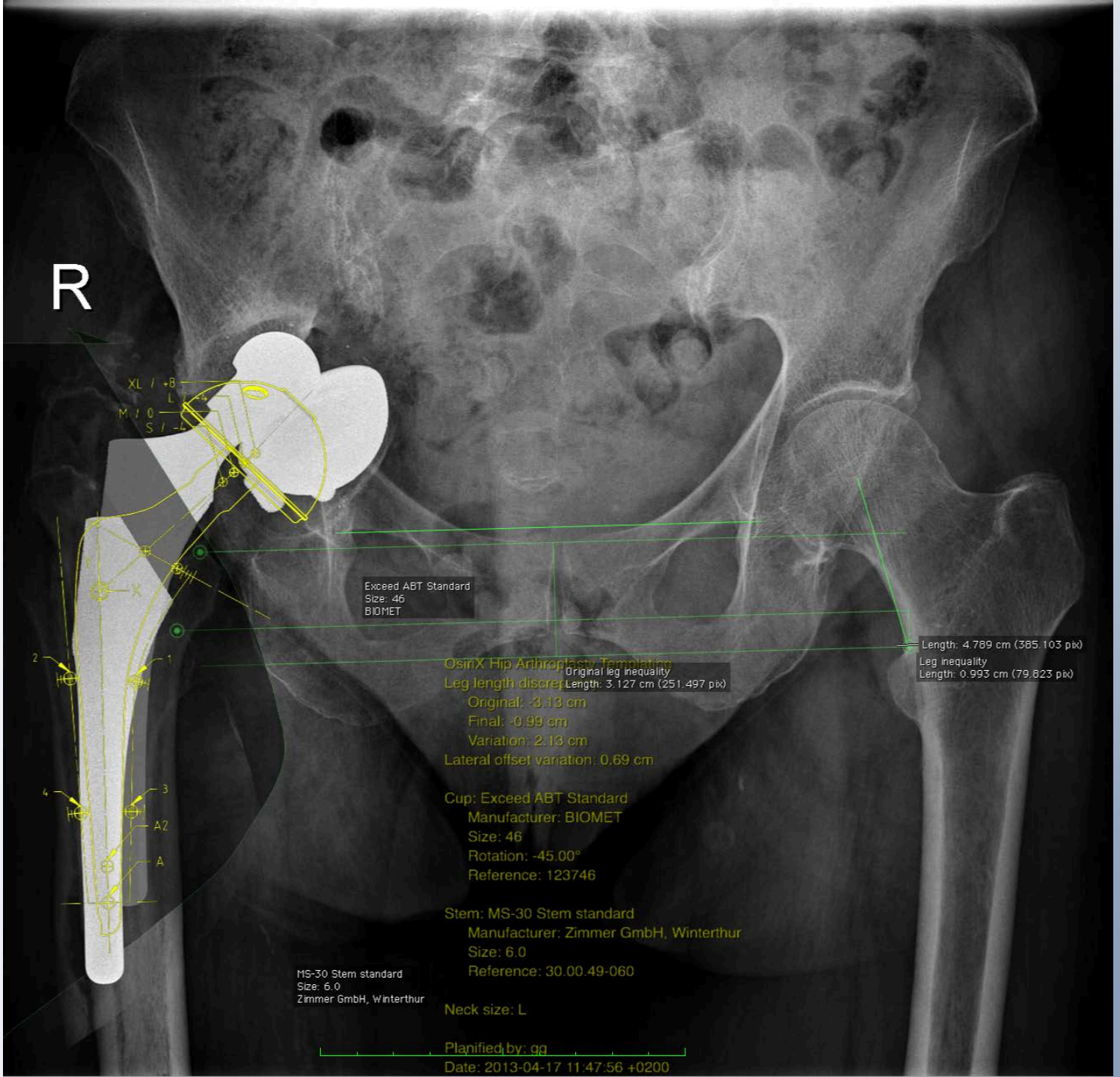
COTILI MODULARI

SOVRACOLLI MODULARI
- TITANIO POROSO

STELI LUNGHI
- MONOBLOCCO
- MODULARI

INNESTI OSSEI / SOSTITUTI SINTETICI / FATTORI DI CRESCITA


R
R


R
XL / +8
L
M / 0
S / -4
Exceed ABT Standard
Size: 46
BIOMET
Length: 4.789 cm (385.103 pix)
Leg inequality
Length: 0.993 cm (79.823 pix)
OsiriX Hip Arthroplasty Templating
Original leg inequality
Length: 3.127 cm (251.497 pix)
Leg length discrep
Original: -3.13 cm
Final: -0.99 cm
Variation: 2.13 cm
Lateral offset variation: 0.69 cm
Cup: Exceed ABT Standard
Manufacturer: BIOMET
Size: 46
Rotation: -45.00°
Reference: 123746
Stem: MS-30 Stem standard
Manufacturer: Zimmer GmbH, Winterthur
Size: 6.0
Reference: 30.00.49-060
MS-30 Stem standard
Size: 6.0
Zimmer GmbH, Winterthur
Neck size: L
Planified by: gg
Date: 2013-04-17 11:47:56 +0200
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DX


ERNARDI, SILVANO
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0/09/2011
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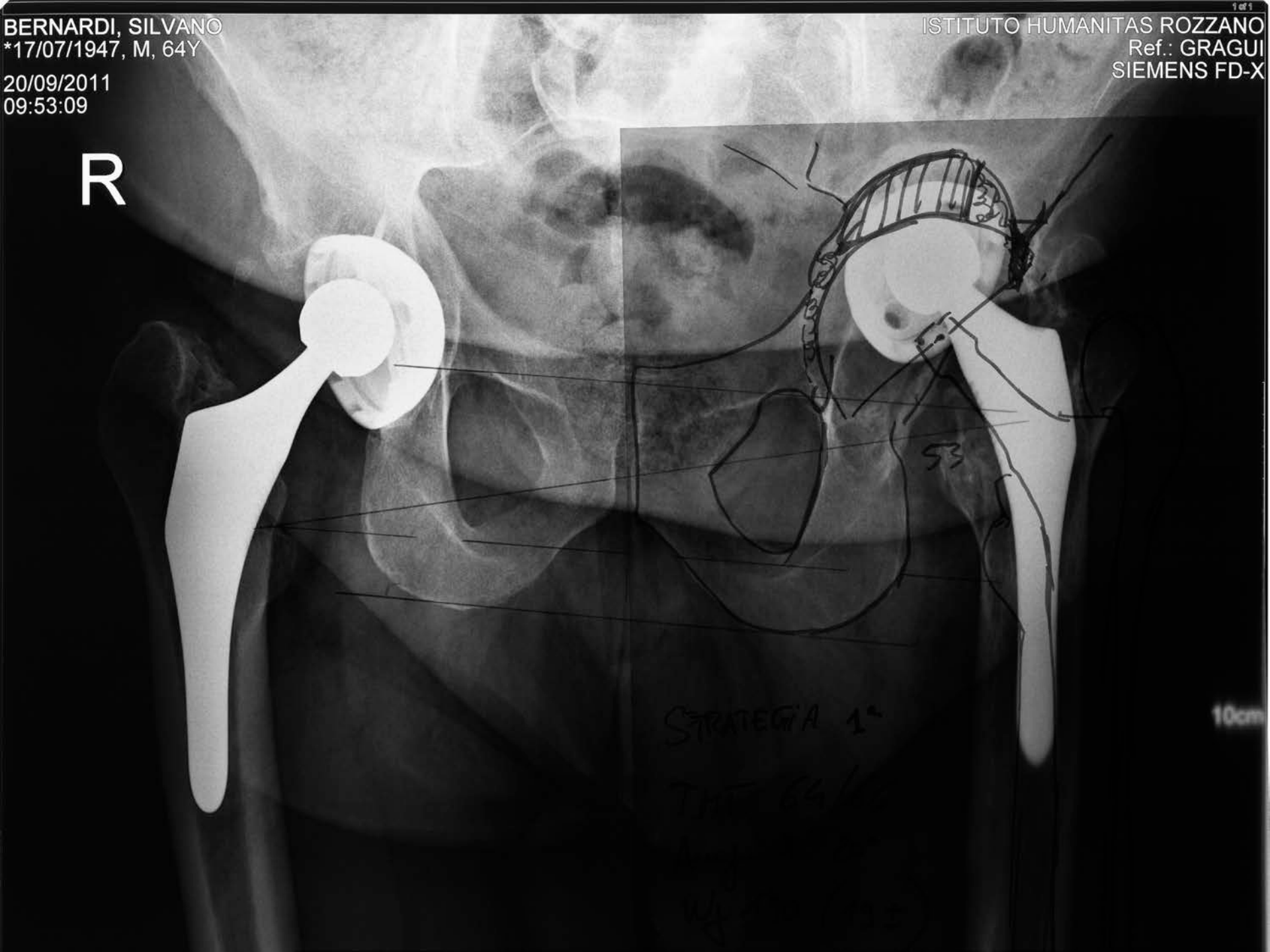
ISTITUTO HUMANITAS ROZZANO
Ref.: GRAGUI
SIEMENS FD-X
10cm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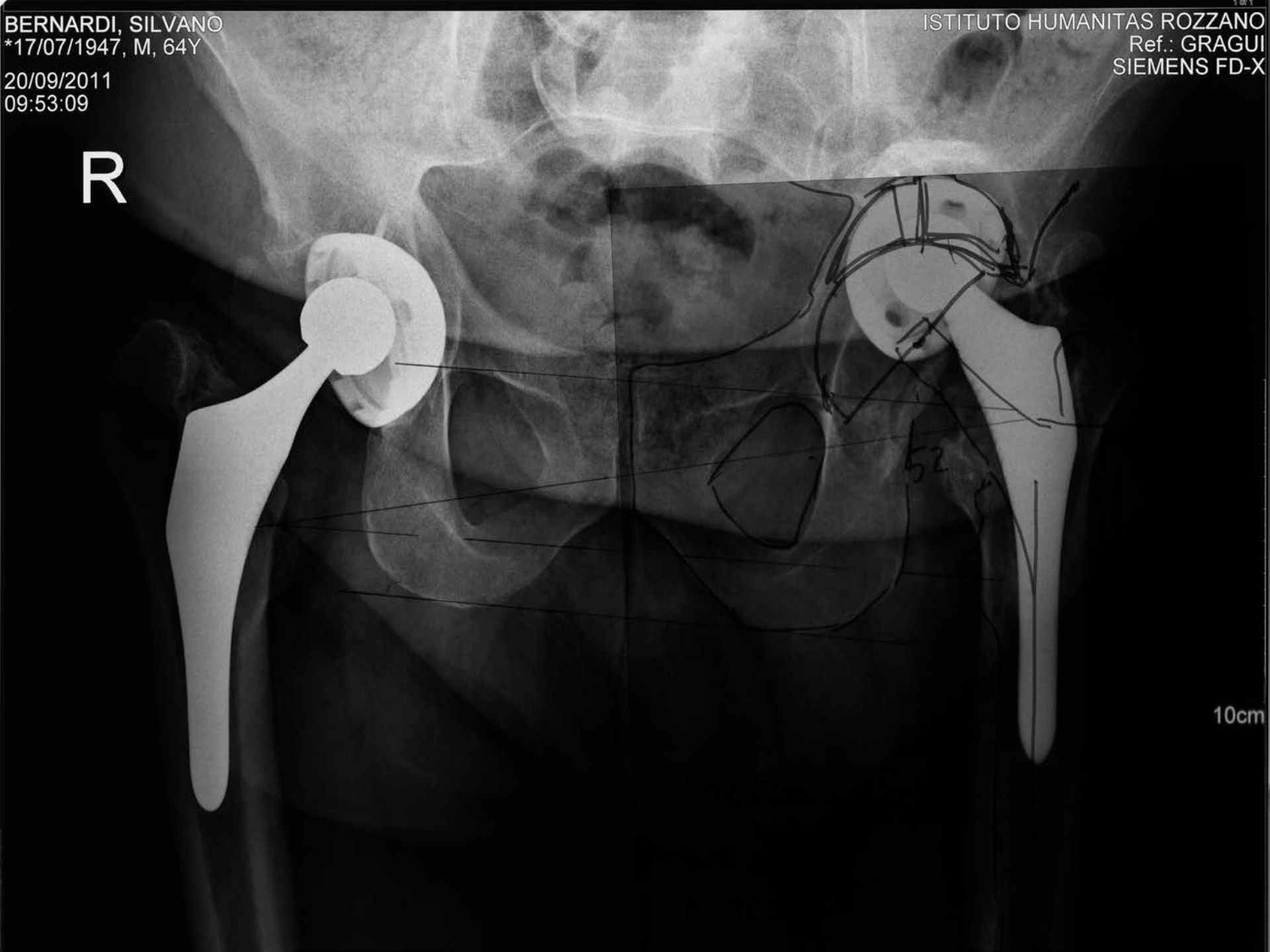
53
STRATEGIA 1°
10cm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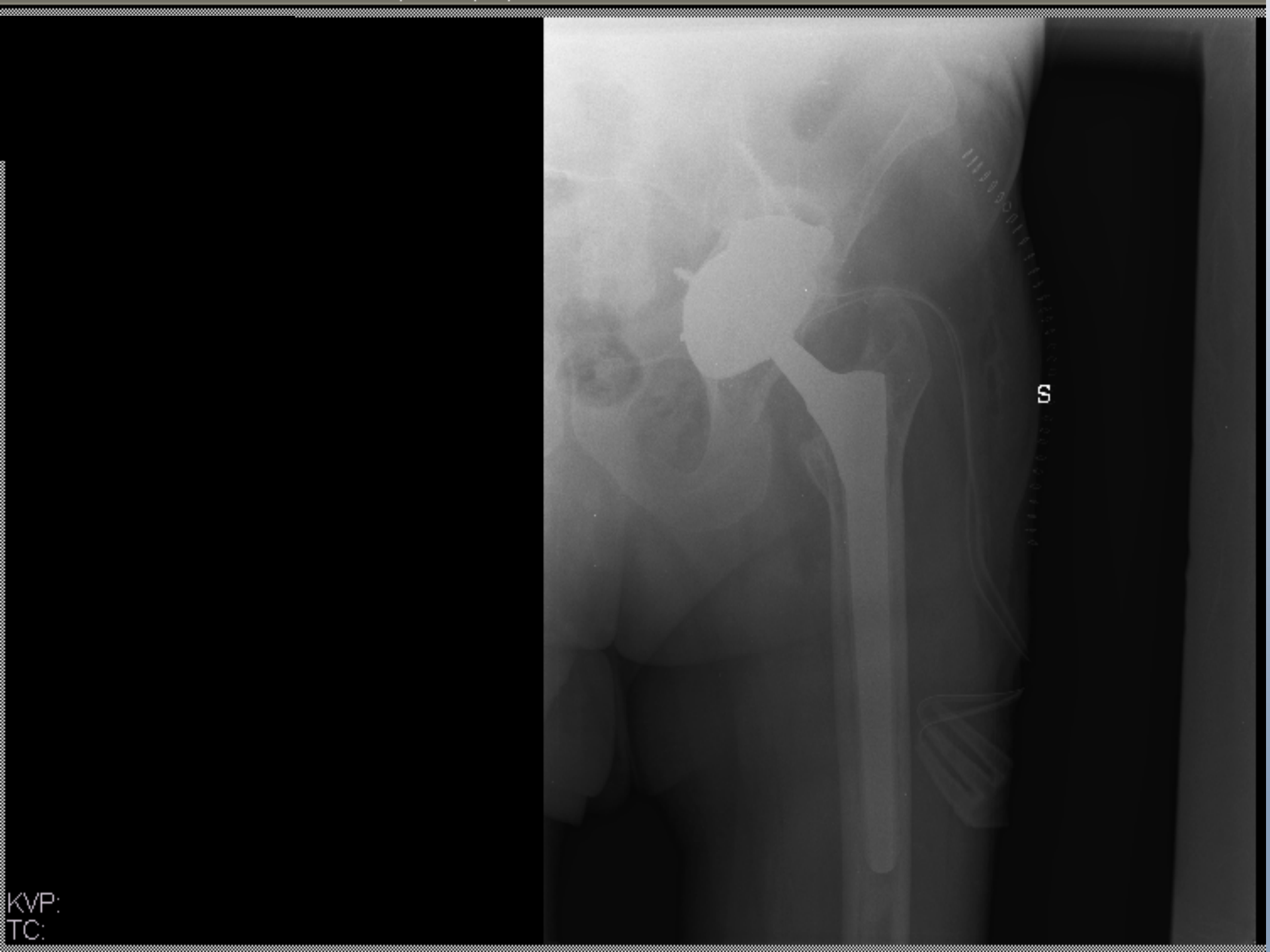
52
10cm


S
KVP:
TC:


*21/08/1961, M, 50Y
30/08/2011
11:35:36
ISTITUTO HUMANITAS ROZZANO
Ref.: GRAGUI
SIEMENS FD-X
R
10cm


DUMA, MIHAI
*21/08/1961, M, 50Y
30/08/2011
11:35:36
ISTITUTO HUMANITAS ROZZANO
Ref.: GRAGUI
SIEMENS FD-X
R
10cm

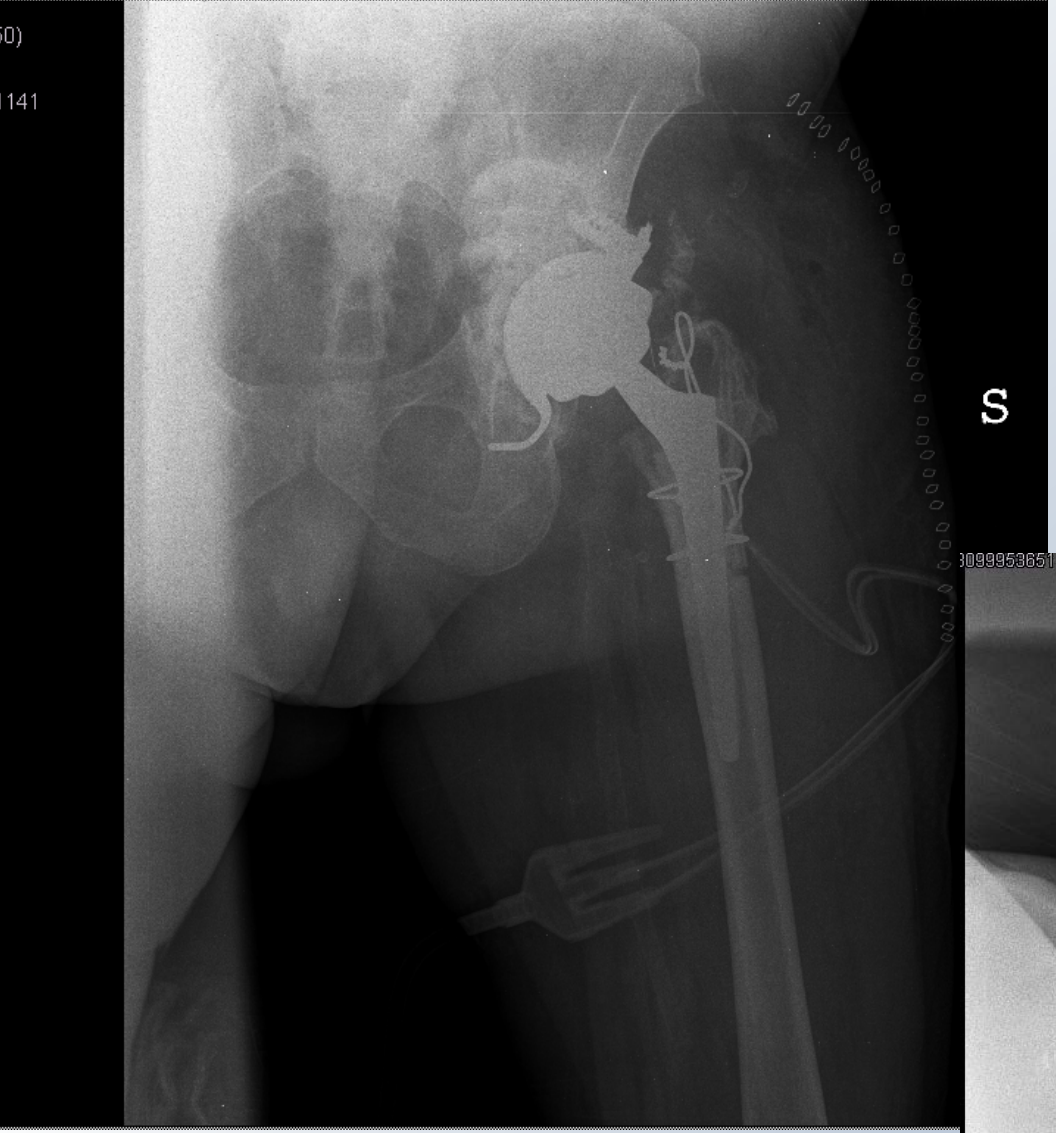

DUMA, MIHAI
*21/08/1961, M, 50Y
30/08/2011
11:35:36
ISTITUTO HUMANITAS ROZZANO
Ref.: GRAGUI
SIEMENS FD-X
R
10cm

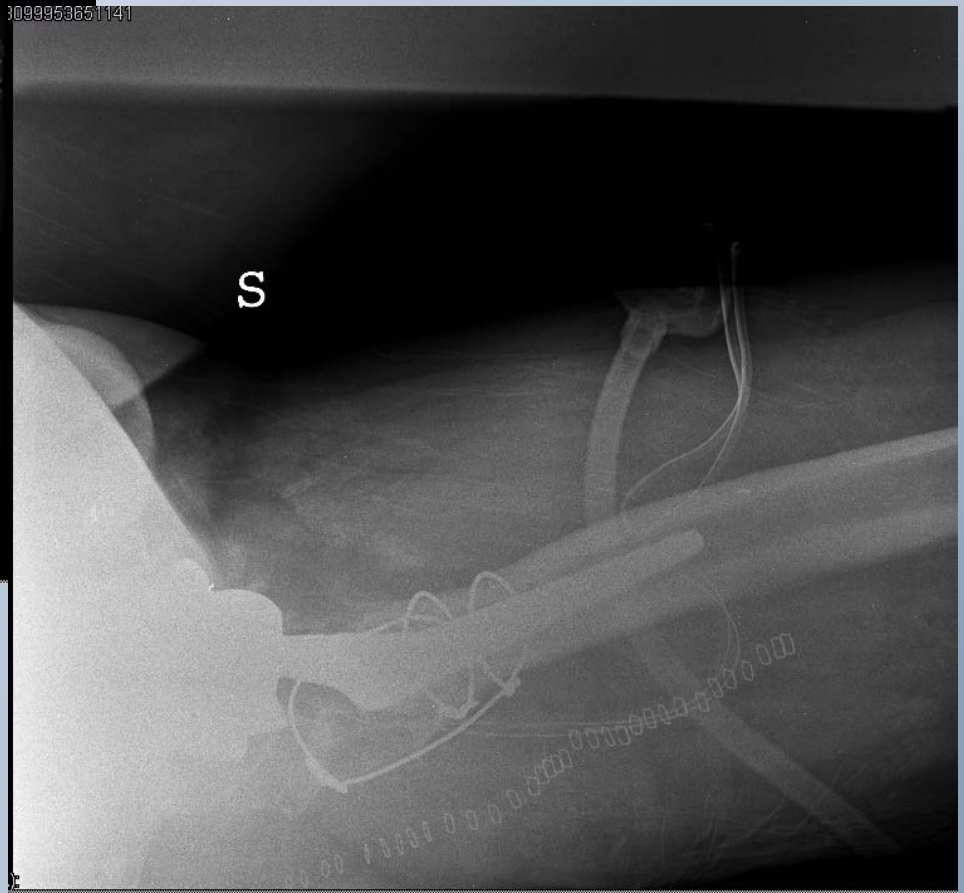

DUMA, MIHAI
*21/08/1961, M, 50Y
30/08/2011
11:35:36
ISTITUTO HUMANITAS ROZZAN
Ref.: GRAG
SIEMENS FD
R
10c

D. M.

Rx post-op

28/09/2011





Strategie chirurgiche nella ri-revisione di protesi di anca

Cotile: modularità – non modularità (augments vs bilobati, jumbo)

tipo di supporto (graft osseo vs TMT) [Paprosky – Sporer]

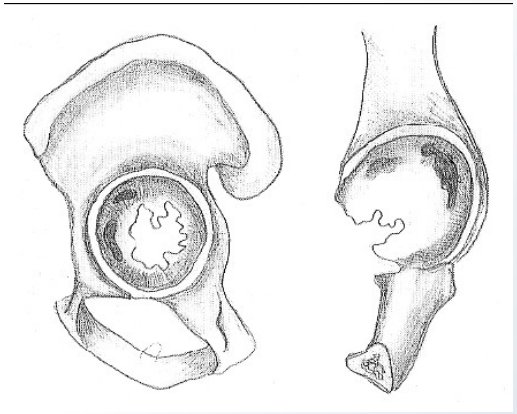
evoluzione design e materiali (TMT vs gabbia)

sistemi ritentivi

Deficit ossei acetabolari criteri classificativi : GIR

PAPROSKY

Cotile: modularità – non modularità (augments vs bilobati, jumbo)

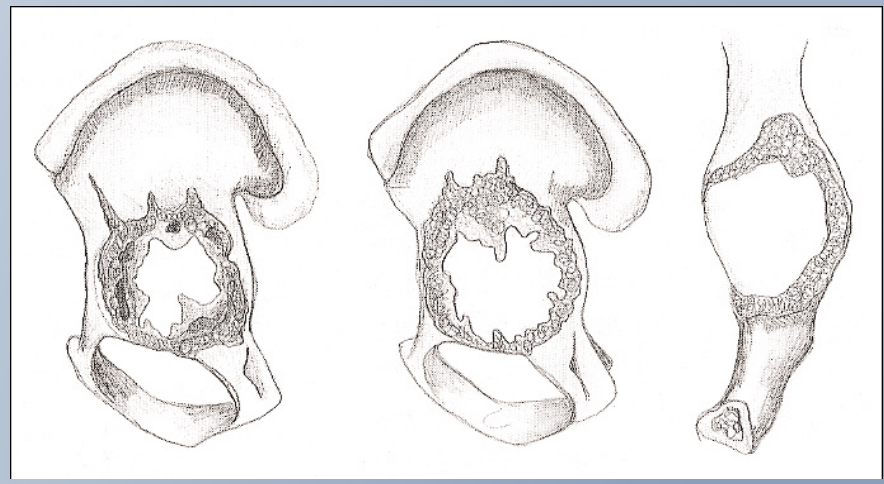


GIR 3

Grado 3: Mobilizzazione con
- esteso allargamento della cavità acetabolare;
- perdita multipla delle pareti acetabolari, e, spesso, del fondo.

Impiego di innesti ossei (massivi o morcellizzati) ben impattati, anelli di rinforzo con cotili cementati od impiego di cotili oblunghi, lobati, o con stelo femo

GIR 4

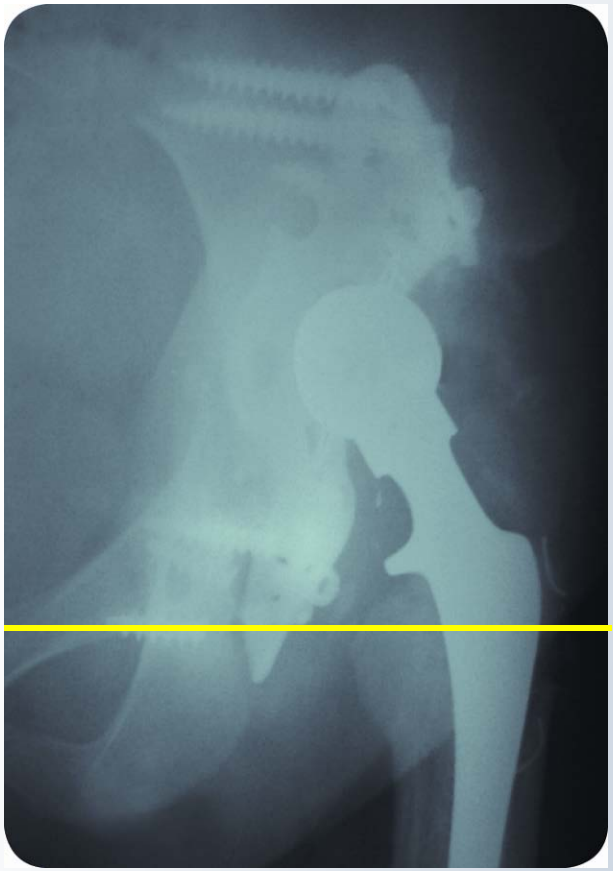


Grado 4: Grave mobilizzazione e migrazione della componente cotiloidea, perdita ossea massiva.

Ripristino del *bone-stock* mediante l'impiego di estesi innesti massivi con anelli metallici di rinforzo o coppe con stelo iliaco

PAPROSKY CLASSIFICATION

Type IIIA Extensive Segmental Defect -



Type IIIA Extensive Segmental Defect

Kohler's Line: Intact

Tear Drop: Minimal lysis

Ischial Lysis: Mild

Vertical Migration: Severe, >3cm

Type IIIB Contained Medial Defect -

Type IIIB Medial Defect

Kohler's Line: Violated

Tear Drop: Violated, significant lysis

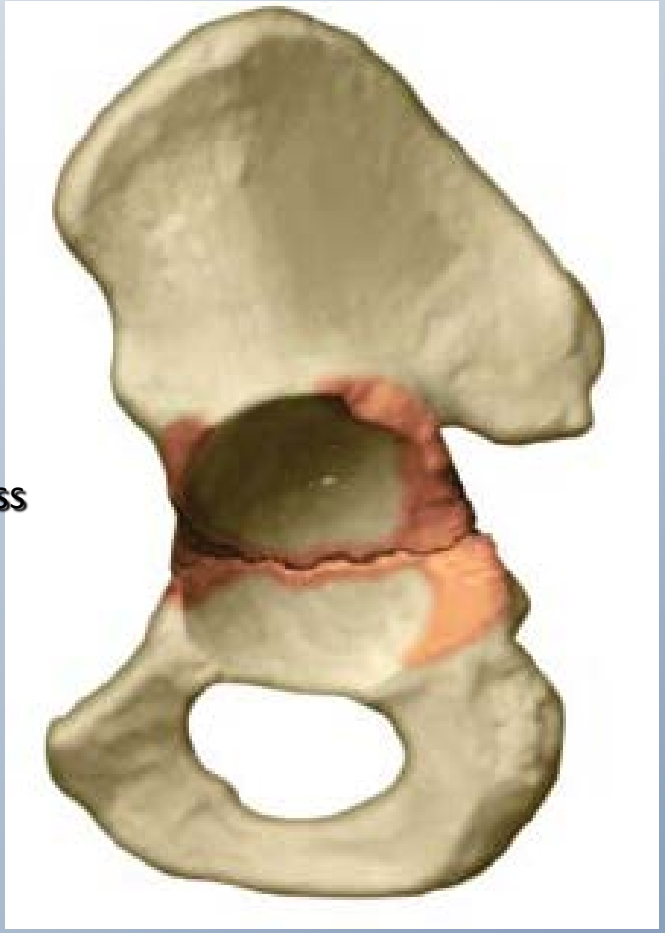
Ischial Lysis: Severe

Vertical Migration: Severe, >3cm

Pelvic Discontinuity -

Pelvic Discontinuity

Superior aspect of pelvis is separated from the inferior aspect as a result of bone loss or an acetabular fracture.

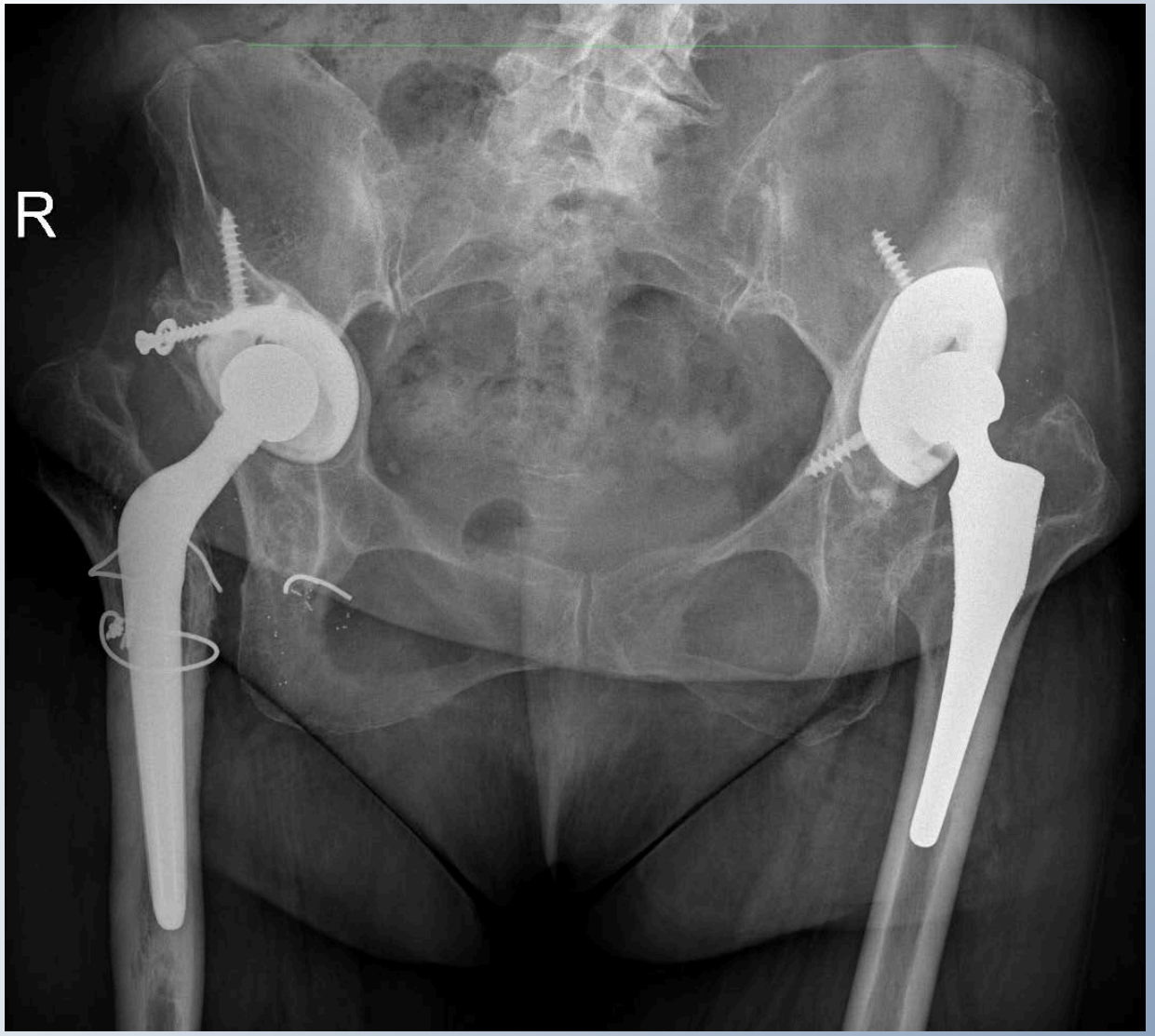


Strategie chirurgiche nella ri-revisione di protesi di anca

Cotile: **modularità – non modularità** **(augments vs bilobati, jumbo)**

PAZ 62 AA

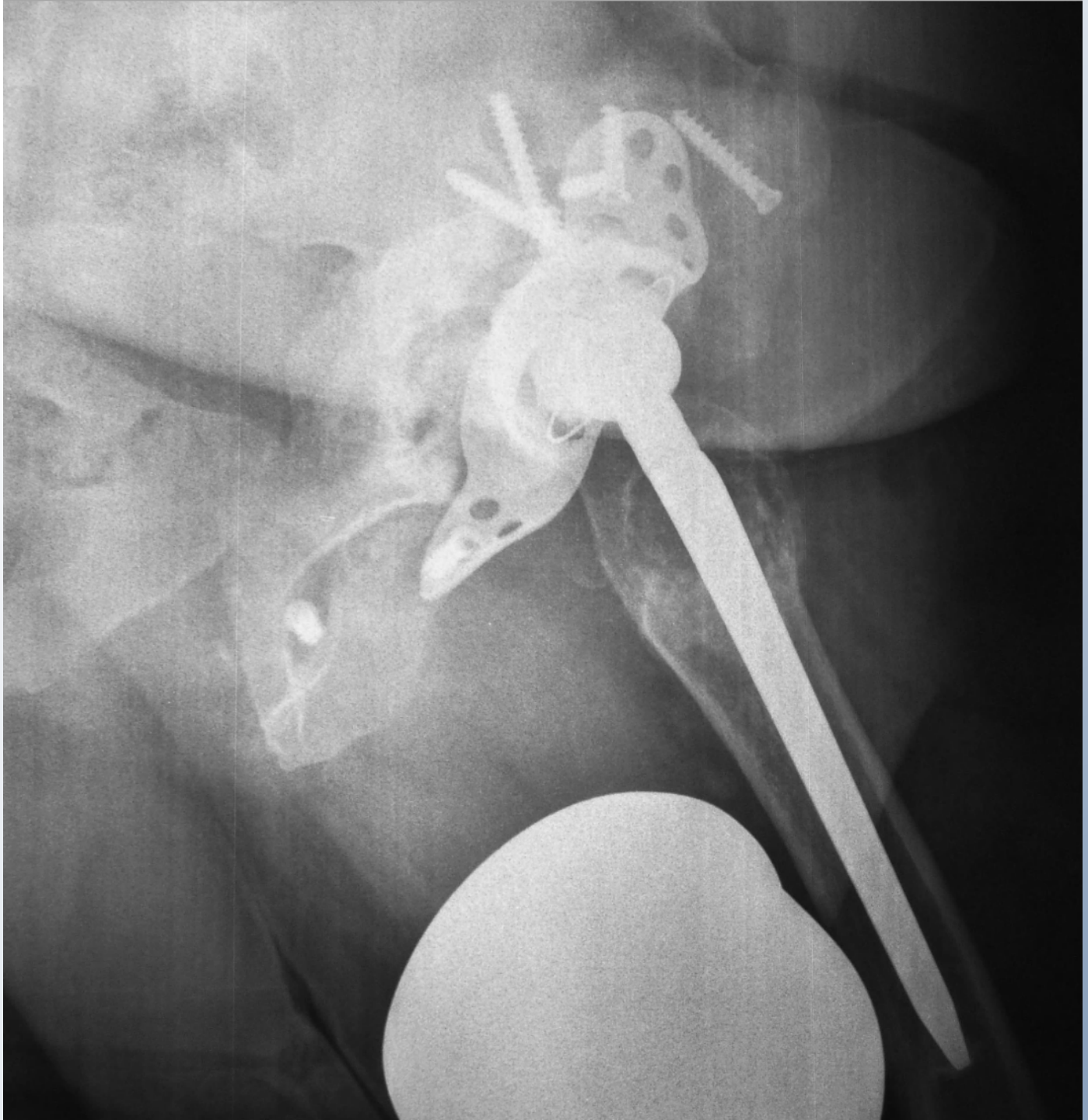
3° REVISIONE



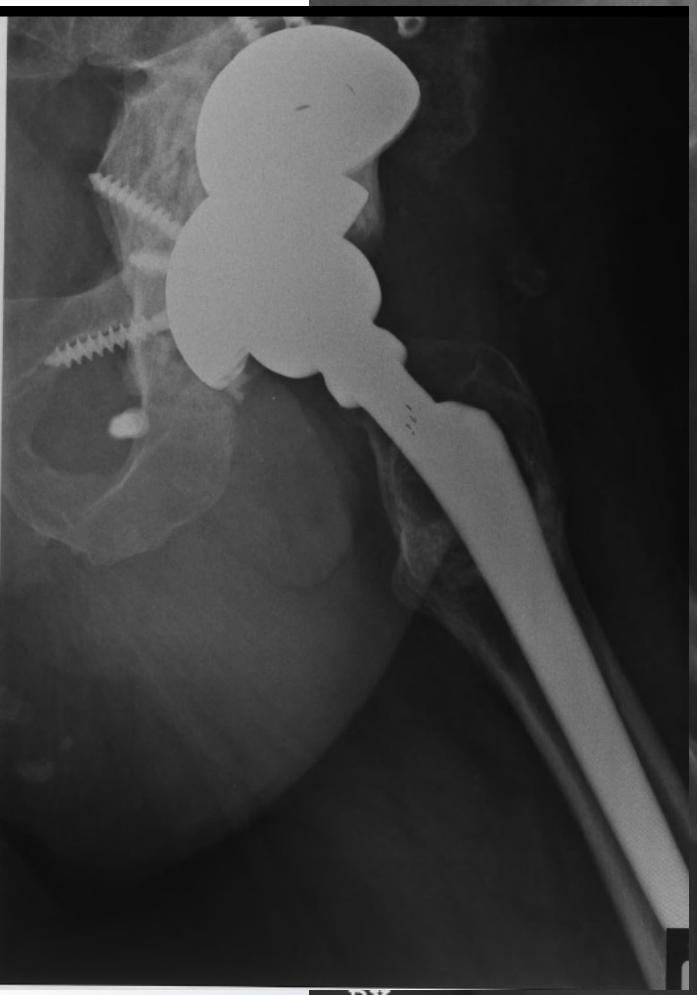

D

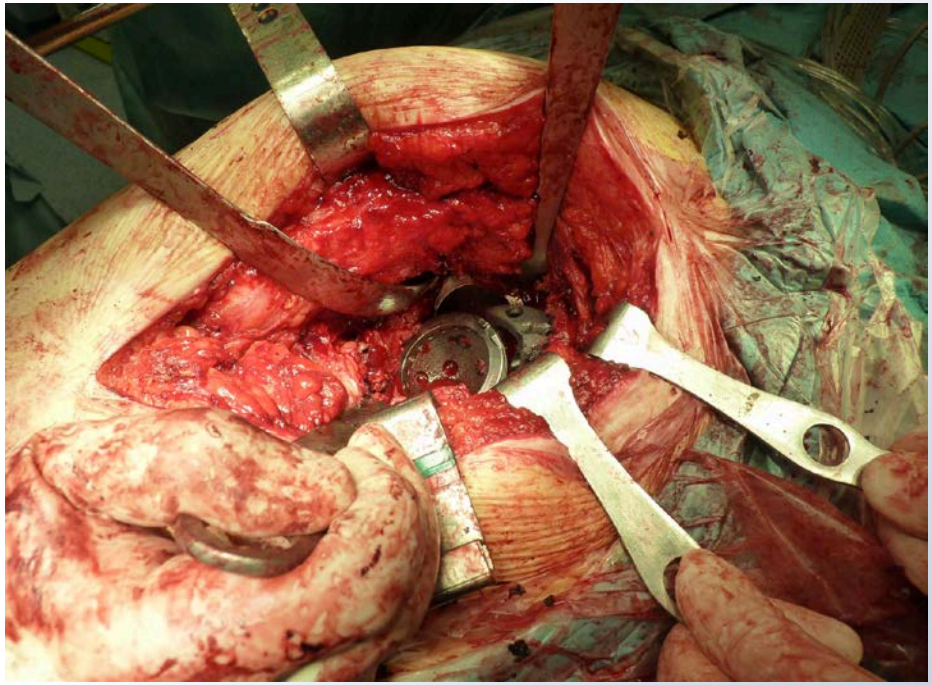
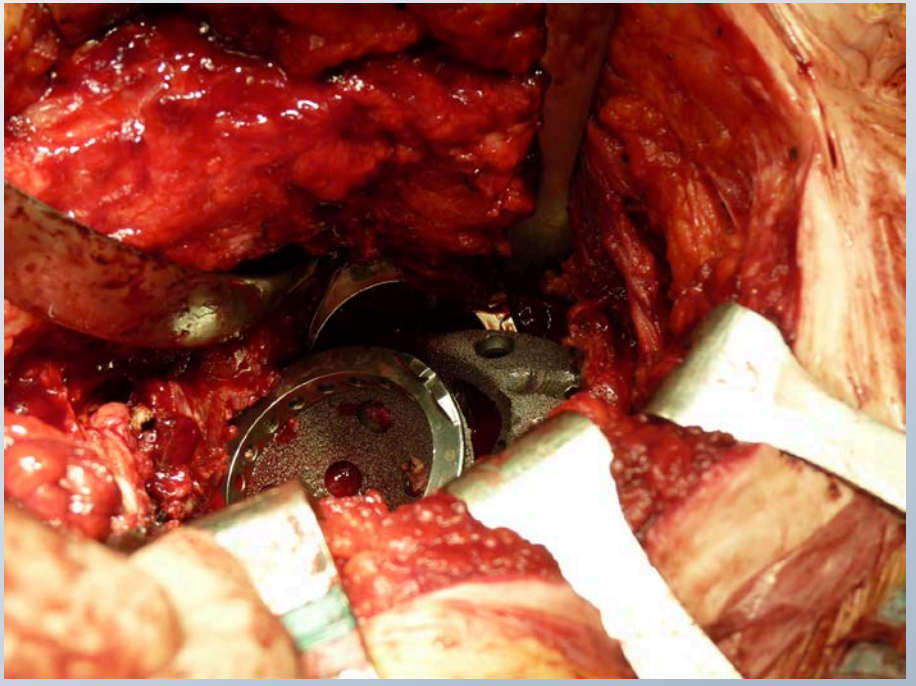
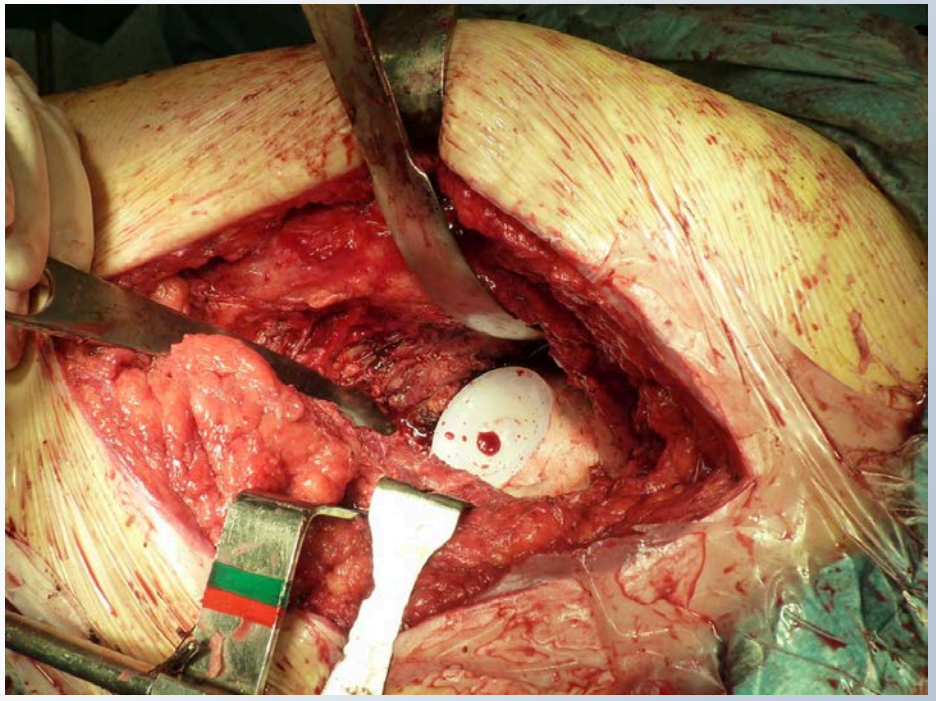
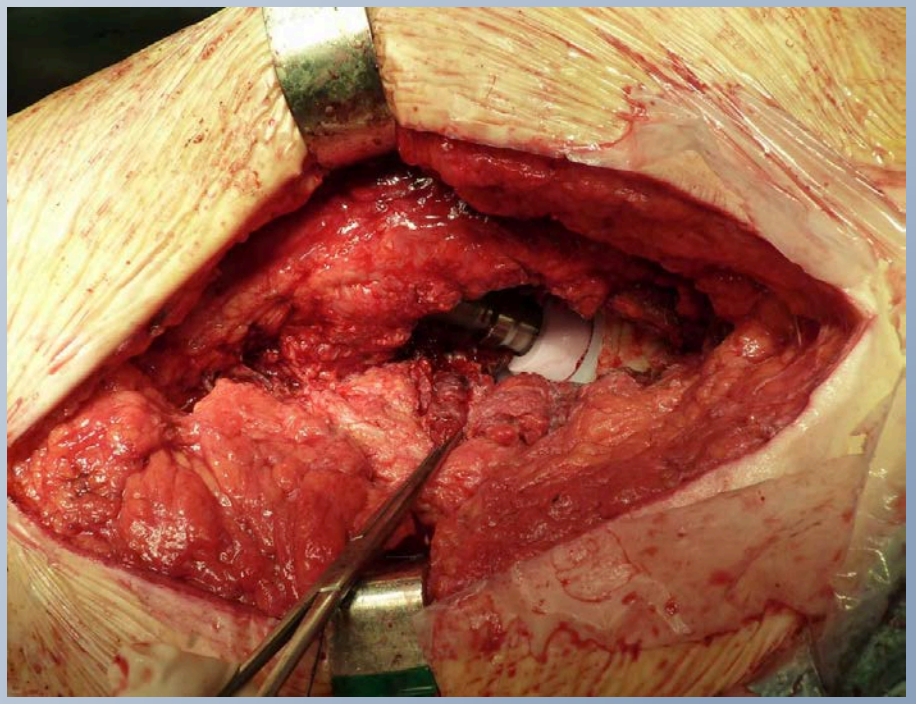
Cotile: **evoluzione design e materiali (TMT vs gabbia)**

3° REVISIONE



“SOLUZIONE DEDICATA ……”



Fallimento cotile a presa
Iliaca e ischiatica


DX

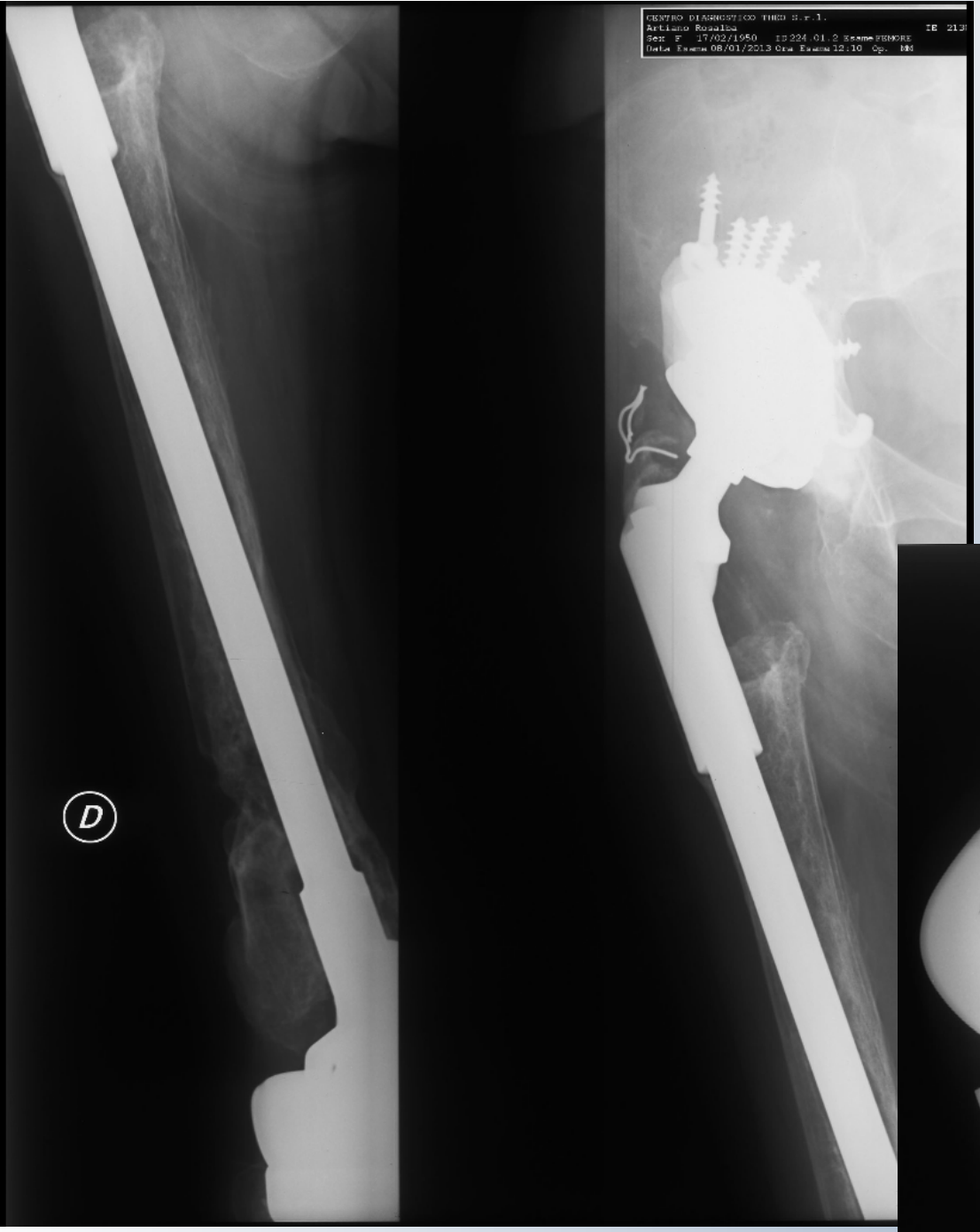

R

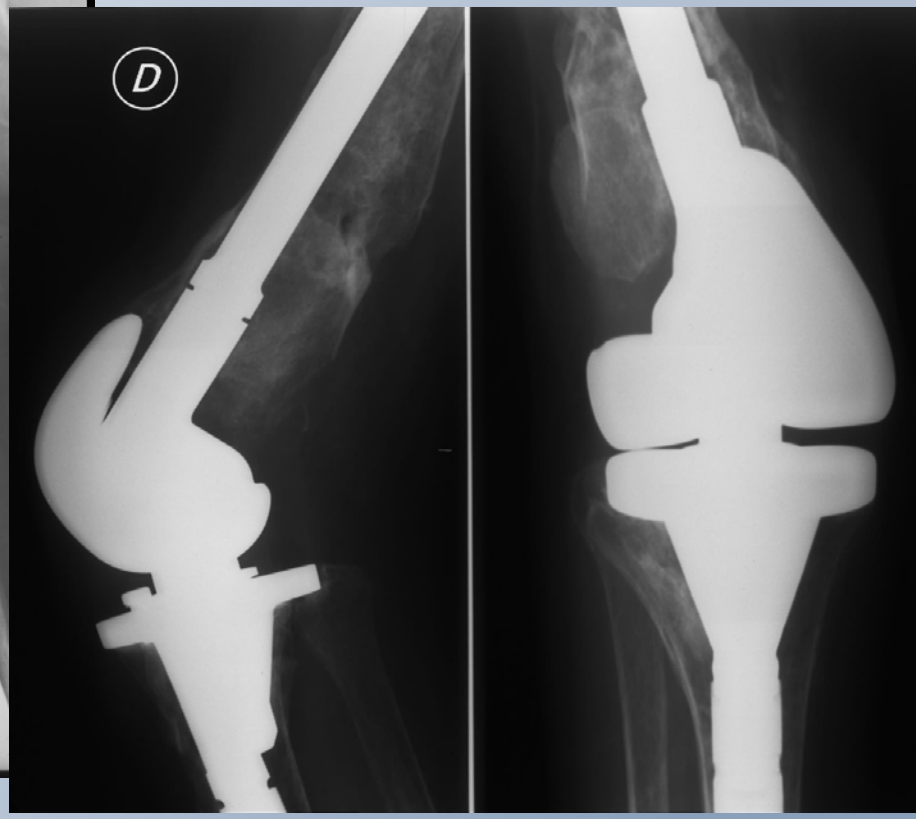
Non sempre la Gabbia fallisce!!

SEMBRA TUTTO RIUSCITO MA……..

MODULARITA’ SU MODULARITA’ !!!!!!

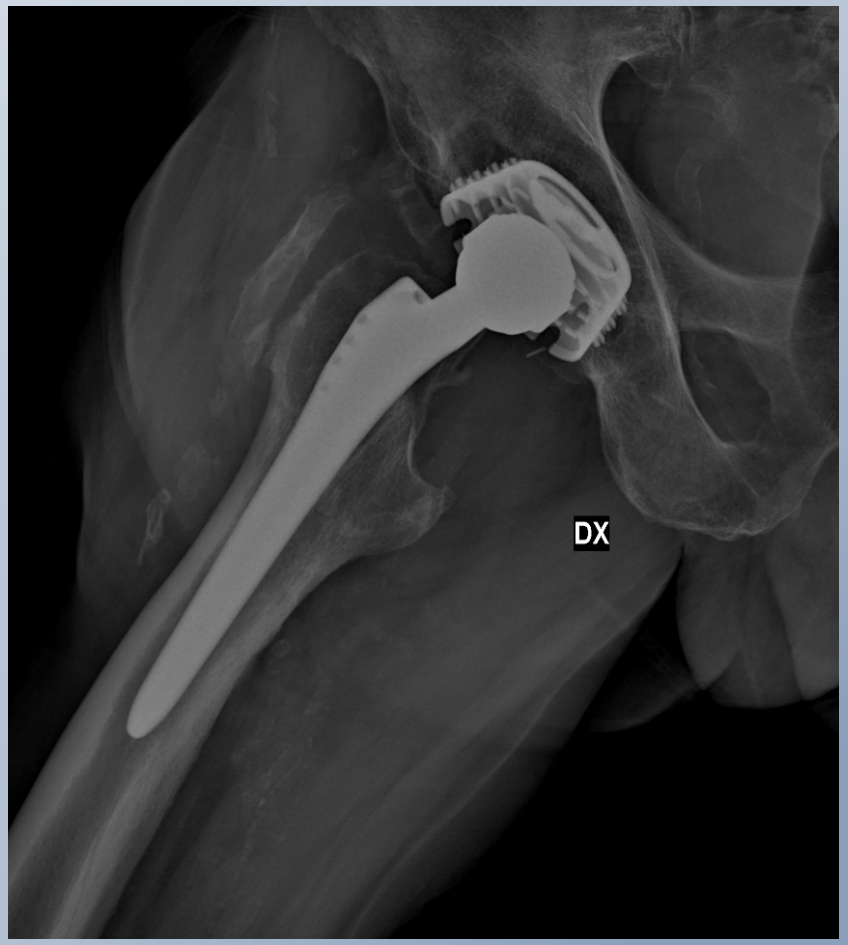
SISTEMA TOTAL FEMUR





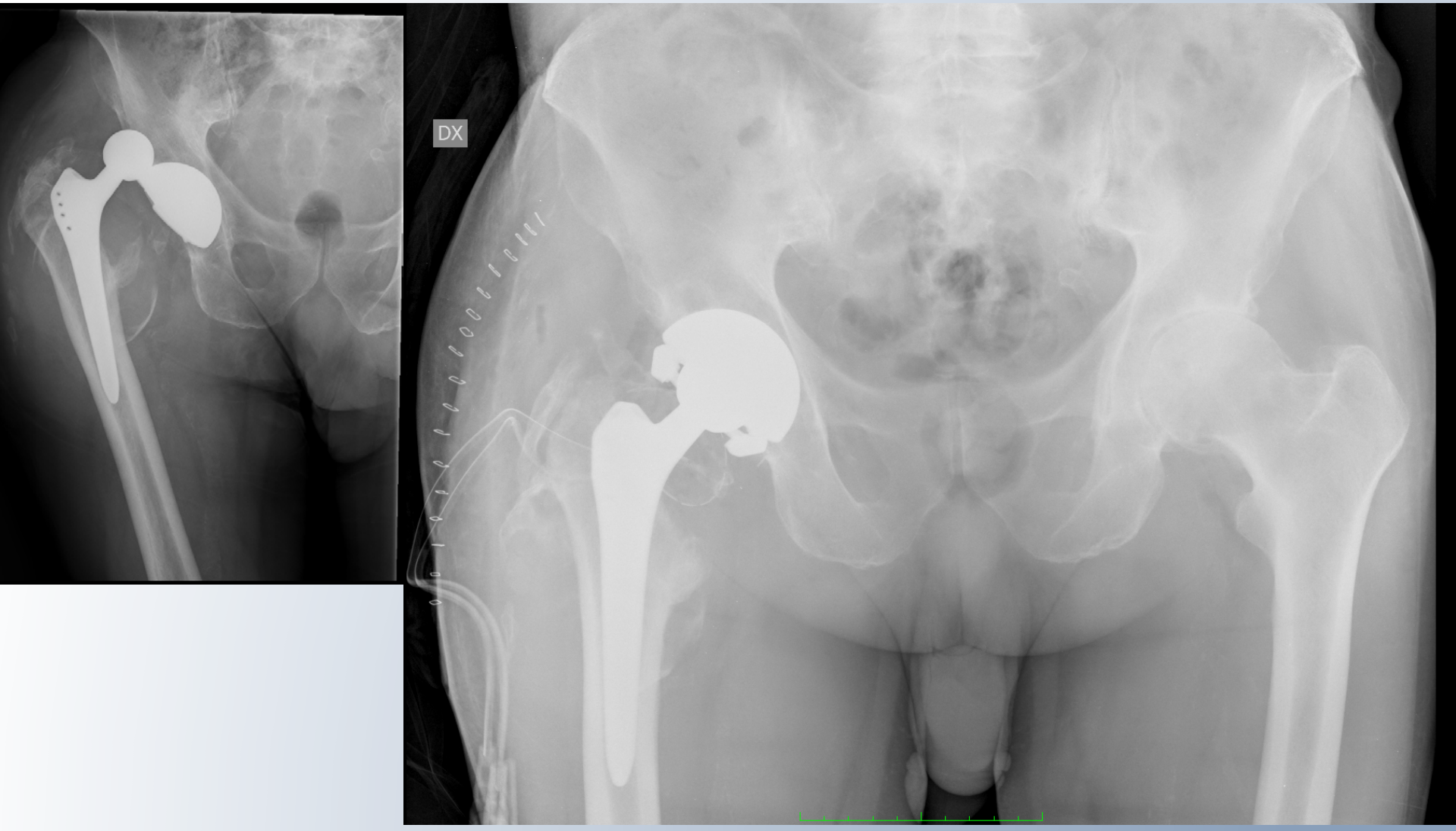
Sistemi Ritentivi

PAZ DI 77 AA DOLORE MOBILIZZAZIONE COTILE.

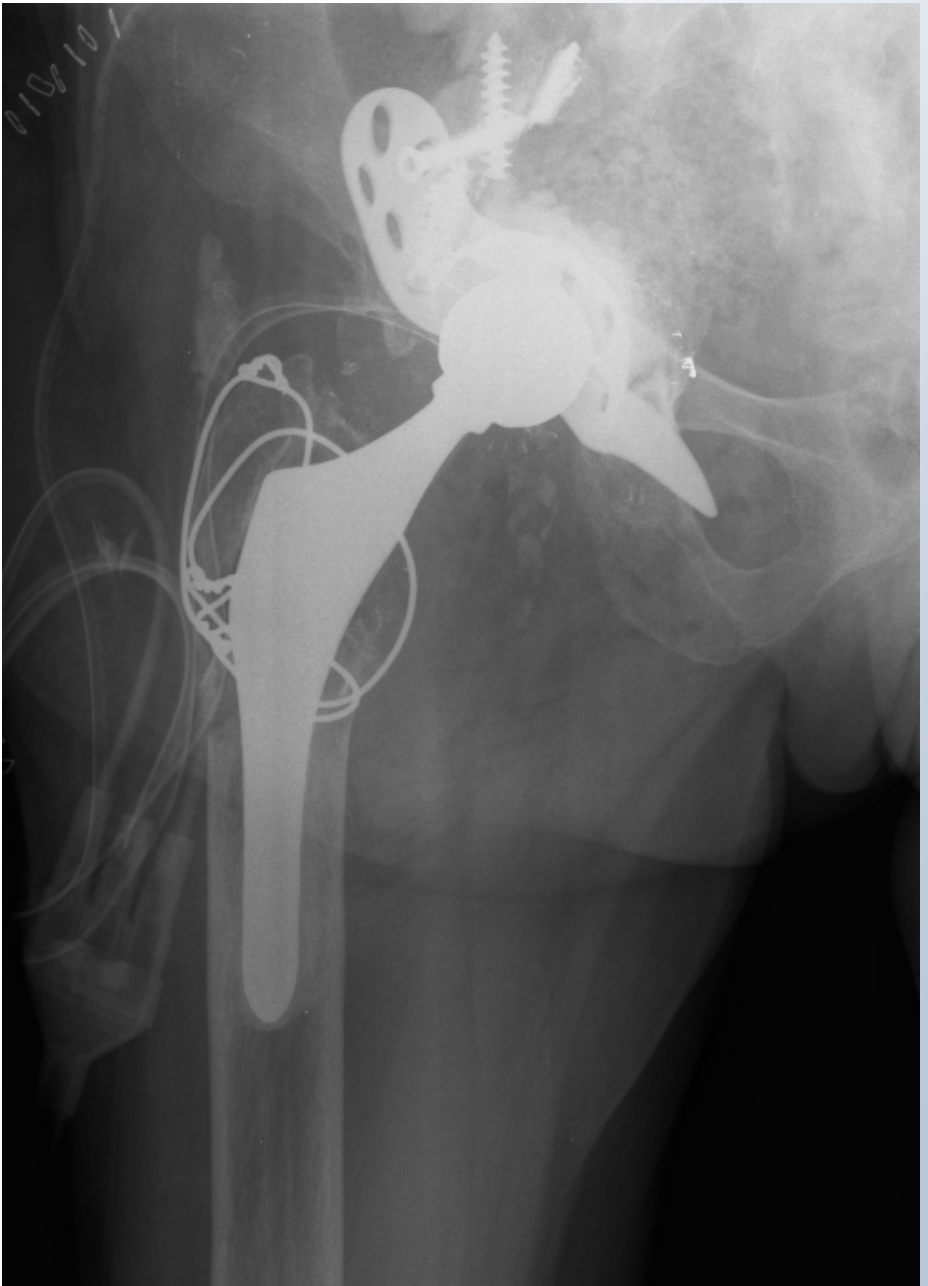


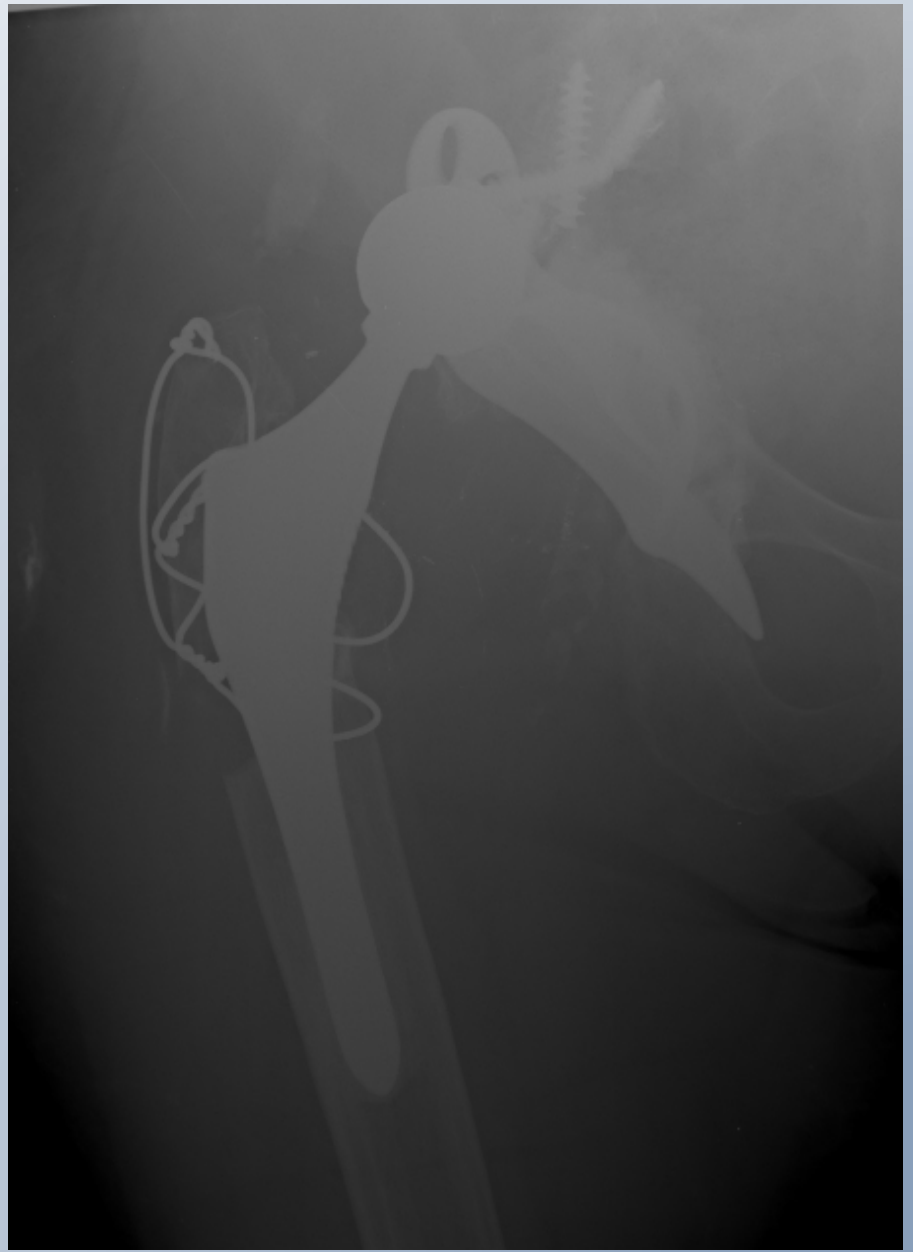

DX

Sistemi Ritentivi



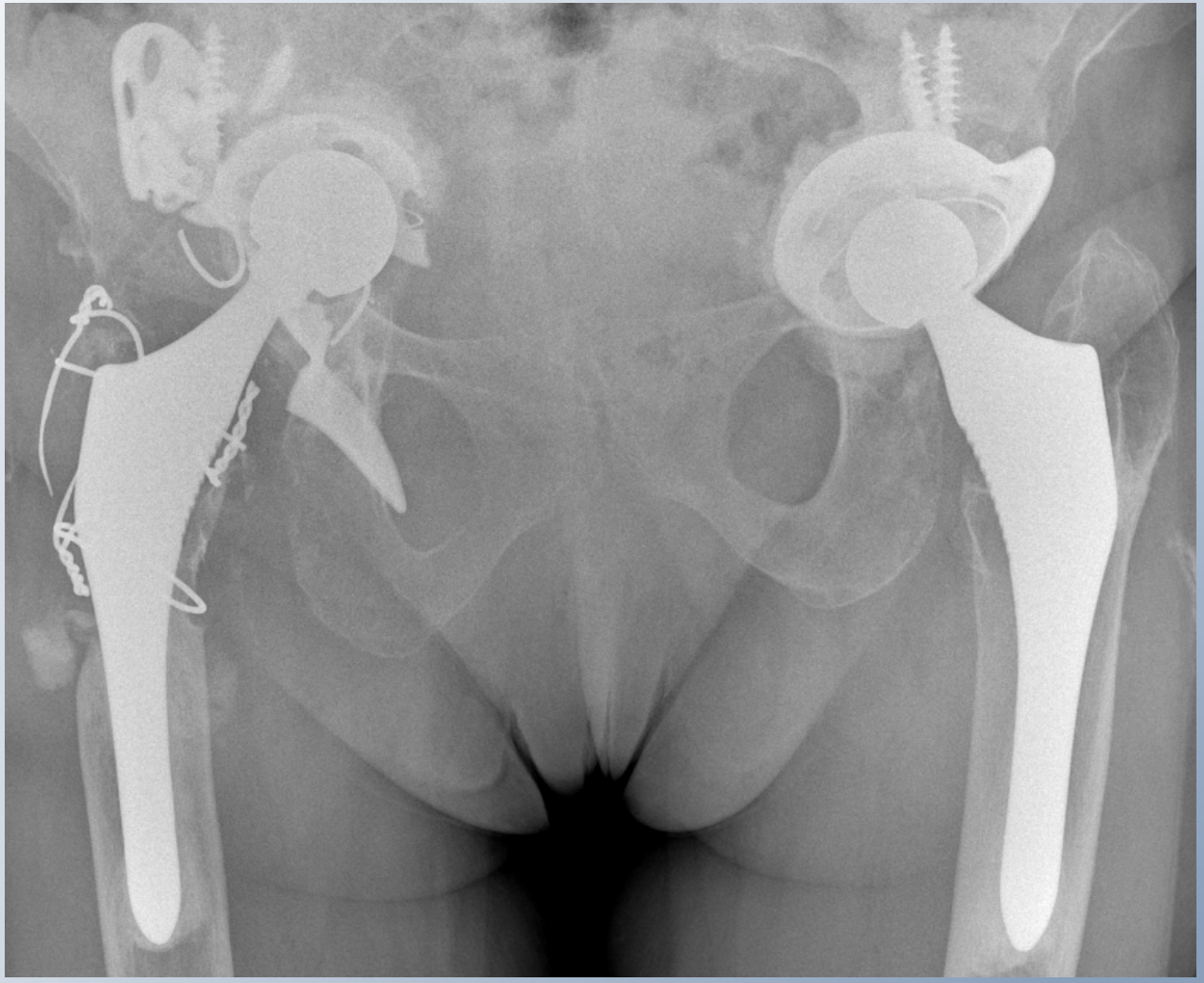
2° REVISIONE

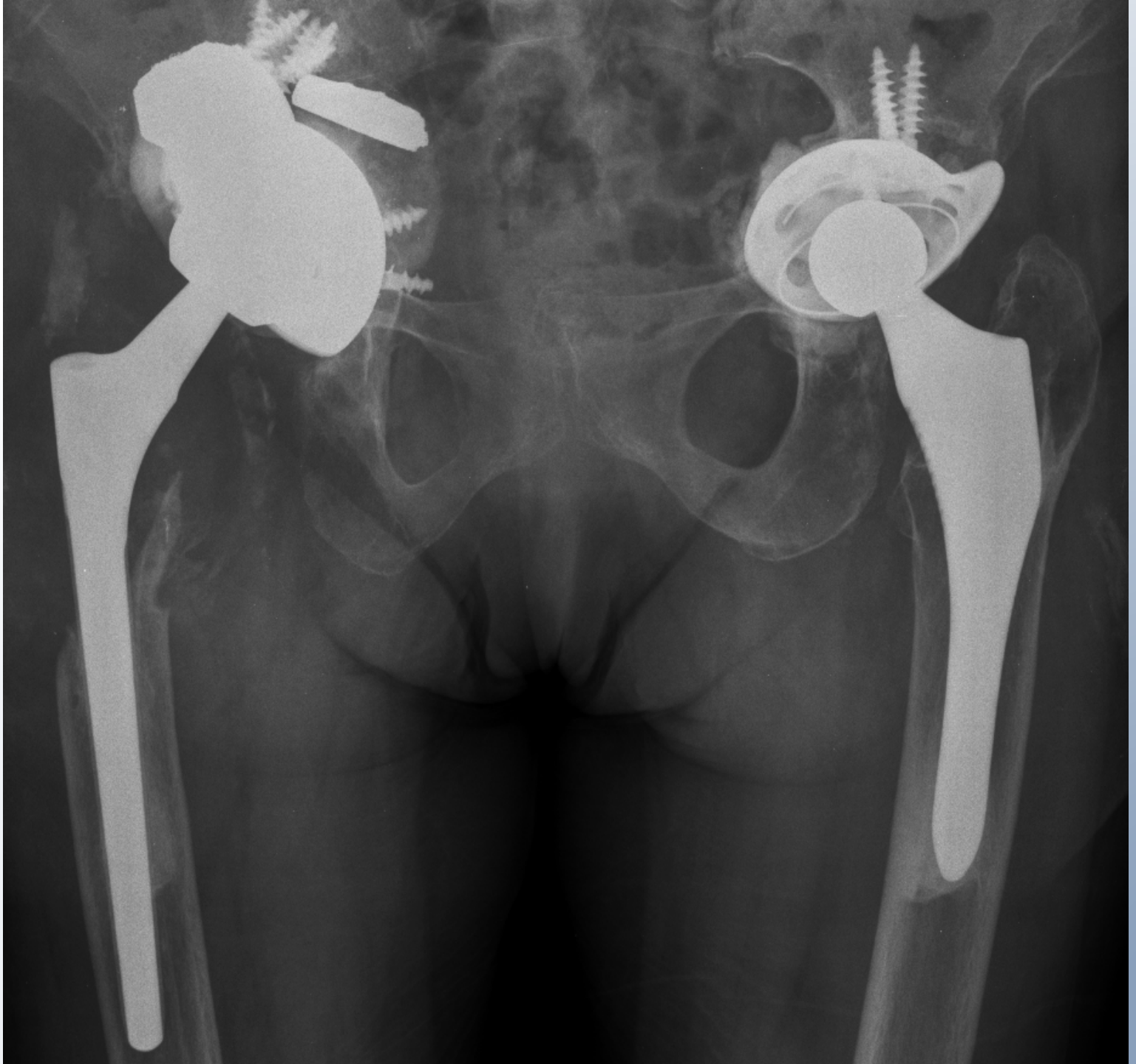


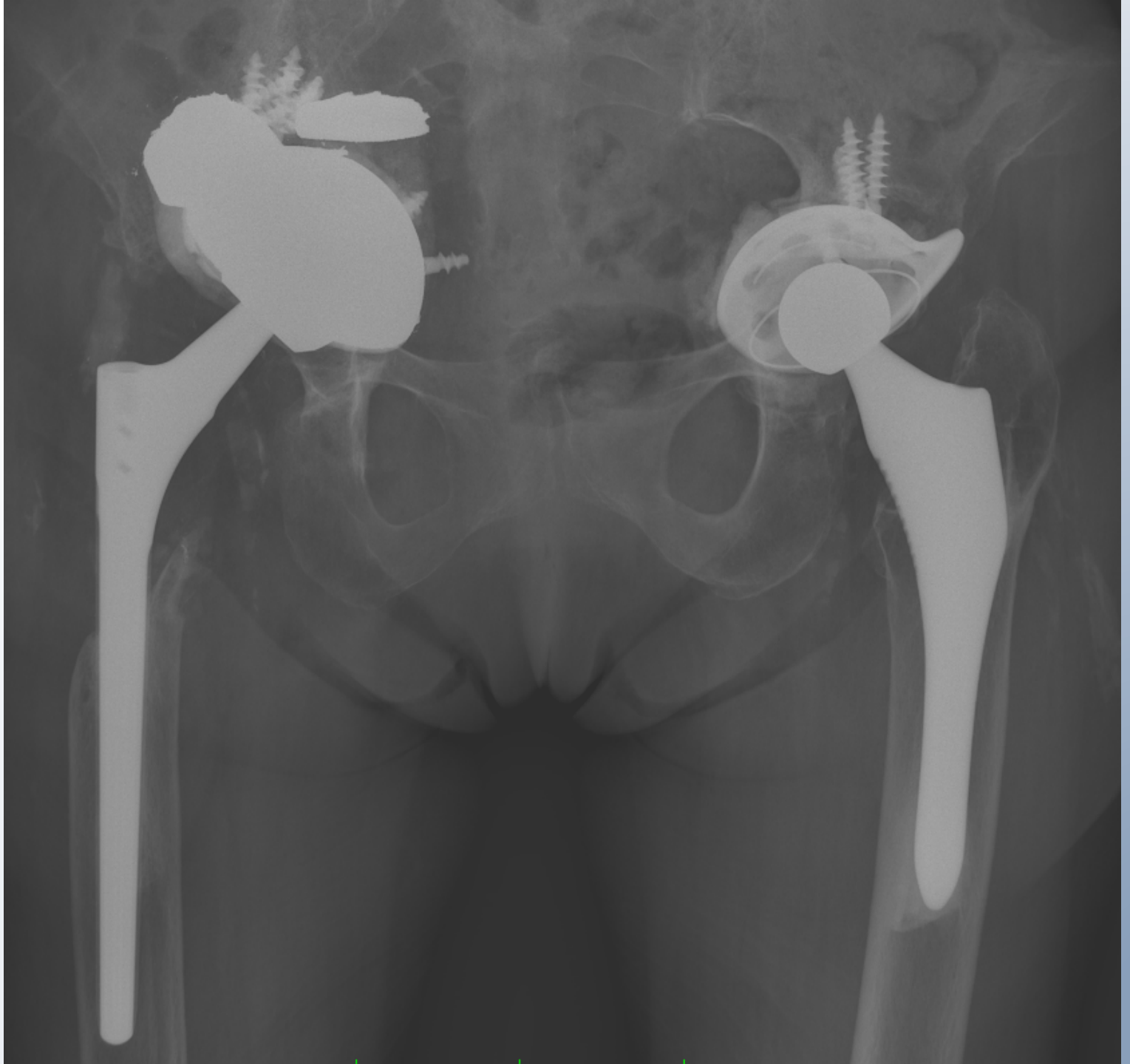


RIDUZIONE

RILUSSAZIONE CON TRAUMA DOPO 7 MESI



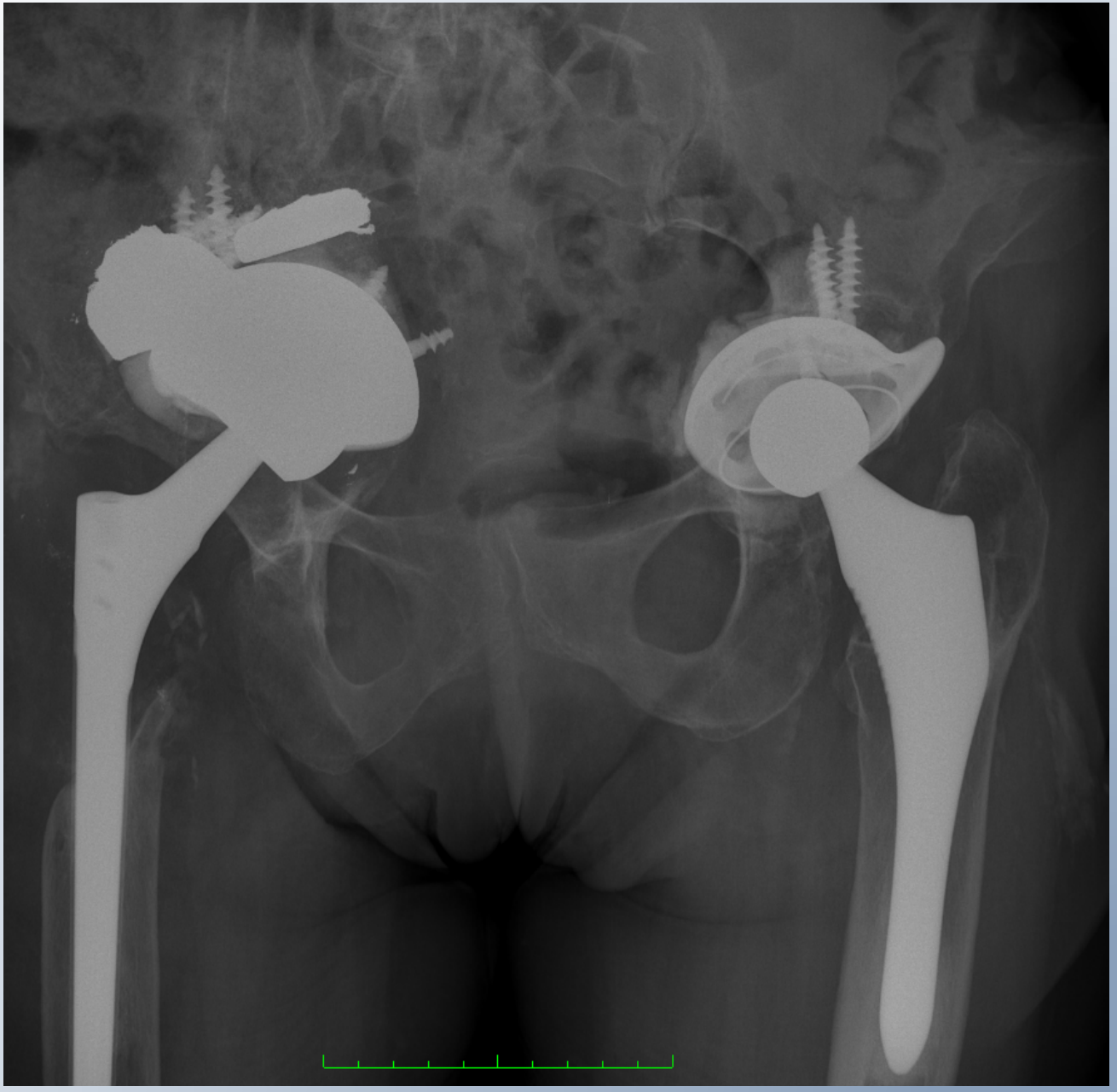




E ORA CHE FARE??

Sistema T MARS ?

Cotile PROTOTYPING ?



-**Ri Revisioni Stelo:** **modularità vs monoblocco**

cemento vs non cemento

Obiettivo Principale

- **Sollievo dal Dolore**
- **Stabilità immediata e prolungata nel tempo**

La cementazione
sembrerebbe rappresentare una scorciatoia
per ottenere questi risultati ma ....

Gustillo e Pasternak

Clinical Orthopaedics and Related Research

INCIDENZA DI FALLIMENTI NELLE REVISIONI CEMENTATE

Riferimenti Bibliografici	N° CasI	F.U. (Anni)	% Fallimenti
Dandy et Theodorus	83	> 2	60 %
Pellicci et al.	110	5 - 12,5	29 %
Kavanagh et Fitzgerald	45	3	24 %
Kavanagh et al.	194	2 - 10	18 %
Amstuz et al.	66	1 - 9	9 %

Aspetti tecnico - chirurgici
Reimpianto artroprotesi d'anca

Due scuole di pensiero:
CEMENTO vs NON CEMENTO

A favore del cemento:

- stabilità primaria e facilità di impianto
- uso di cemento antibiotato
- costo contenuto dell'impianto
- riempimento del difetto osseo con cemento

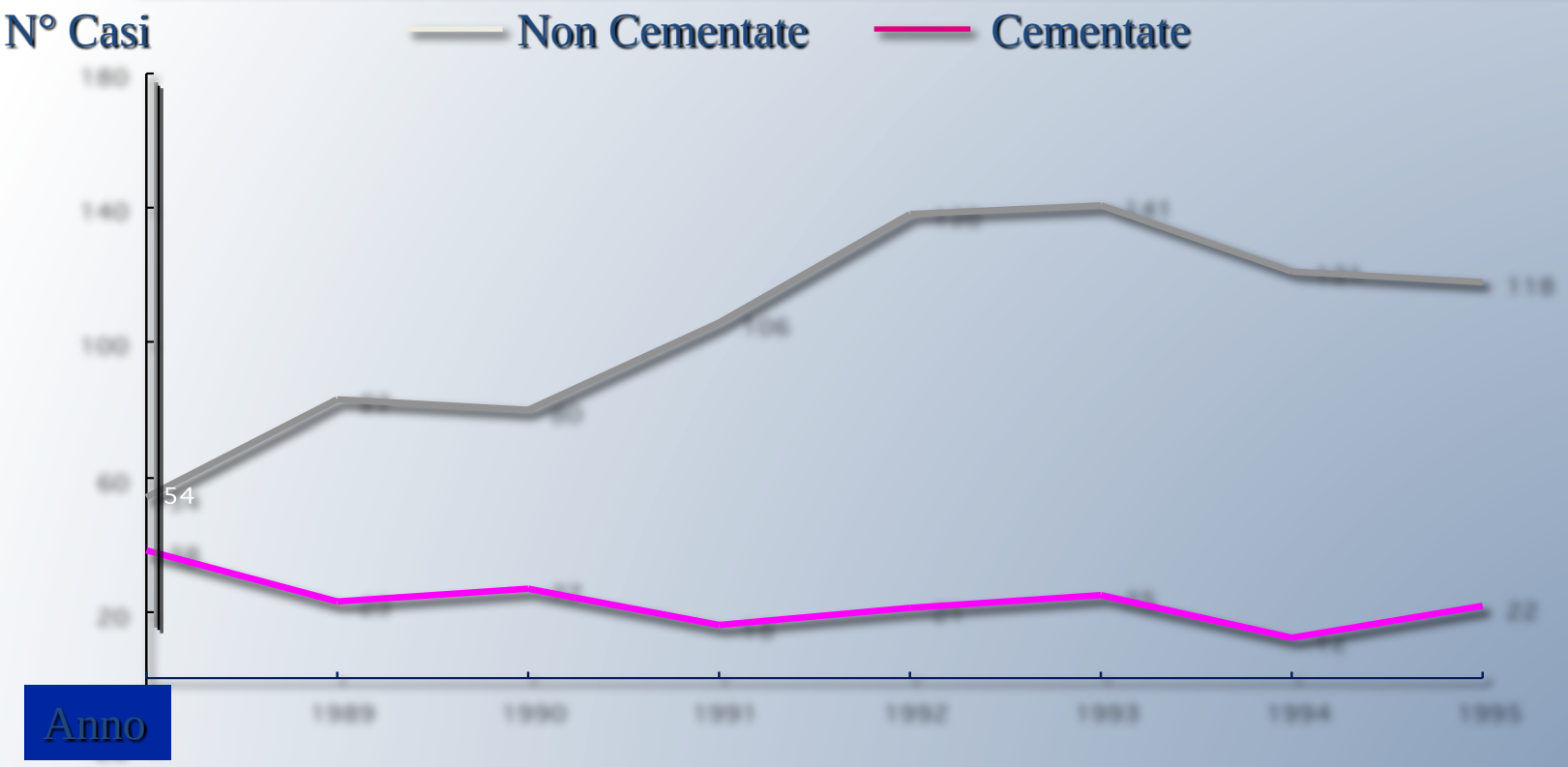
A favore del non cemento:

- stabilità dell'impianto a medio e lungo termine
- capacità osteoinduttive dei materiali (es. titanio e tantalio) che conducono ad osteointegrazione e neoapposizione ossea
- rivitalizzazione dei tessuti dell'ospite cruentati

REVISIONI DI STELO

Rapporto

CEMENTO - NON CEMENTO



“Filosofia” delle Revisioni

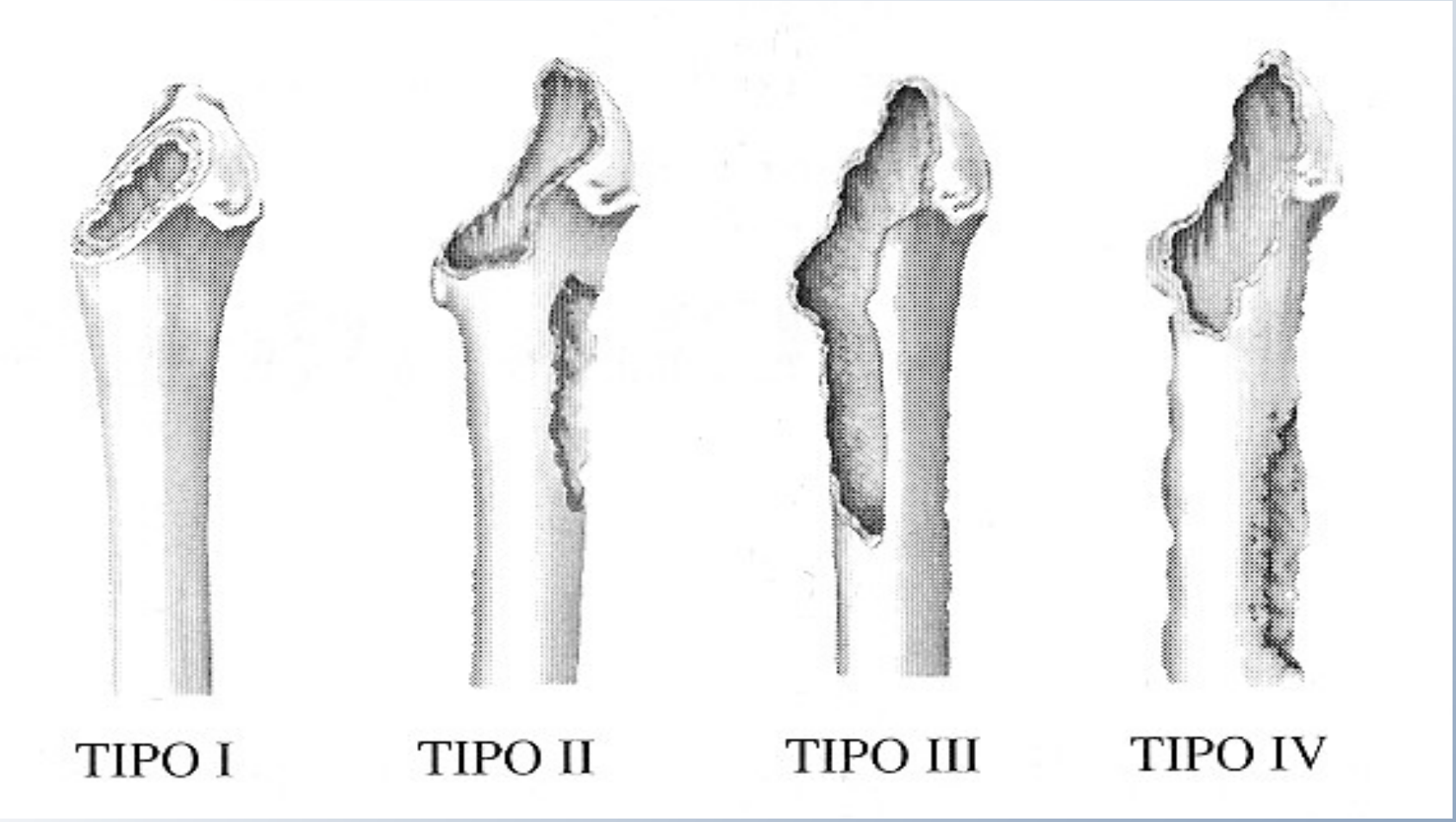
- STELO NON CEMENTATO
  - - Ancoraggio Diafisario (min. 7 cm.) il piu’ prossimale possibile
  - - Forma Conica
  - - Elasticità “Biocompatibile”
  - - Materiali Osteofilici
  -
- NO TRAPIANTI MASSIVI CON FUNZIONE DI SOSTEGNO MECCANICO
- MINIME INDICAZIONI ALL’IMPIEGO DI COMPONENTI CEMENTATE

Classificazione dei Difetti Ossei Femorali

- La classificazione del difetto di Bone-Stock è fondamentale per l'analisi critica dei risultati delle differenti casistiche.

- La classificazione basata sul Bone-Stock Residuo permette di correlare la tecnica chirurgica al quadro anatomo-patologico.

Mallory 1988



Grado 1: allargamento del canale femorale senza interruzione della parere
Grado 2: allargamento del canale e modesti difetti della parete
Grado 3: perdita corticale importante metafisaria.
Grado 4: estesa perdita corticale prossimale con scomparsa di osso metafisario

CLASSIFICATION
(acc. to functional bone stock)
and TREATMENT

STAGE 1

good bone quality

none or minimal bone defect

proximal localization

economic removal

Standard prosthesis

CLASSIFICATION
(acc. to functional bone stock)
and TREATMENT

STAGE 2

poor bone quality

medium or extensive defect cavitary or segmental

localization no more than 150 mm. from the top of the greater trochanter

not easy removal limited induced defect

mid stem rev. prosthesis

CLASSIFICATION
(acc. to functional bone stock)
and TREATMENT

STAGE 3

poor bone quality

very large defect cavitary et/or segmental

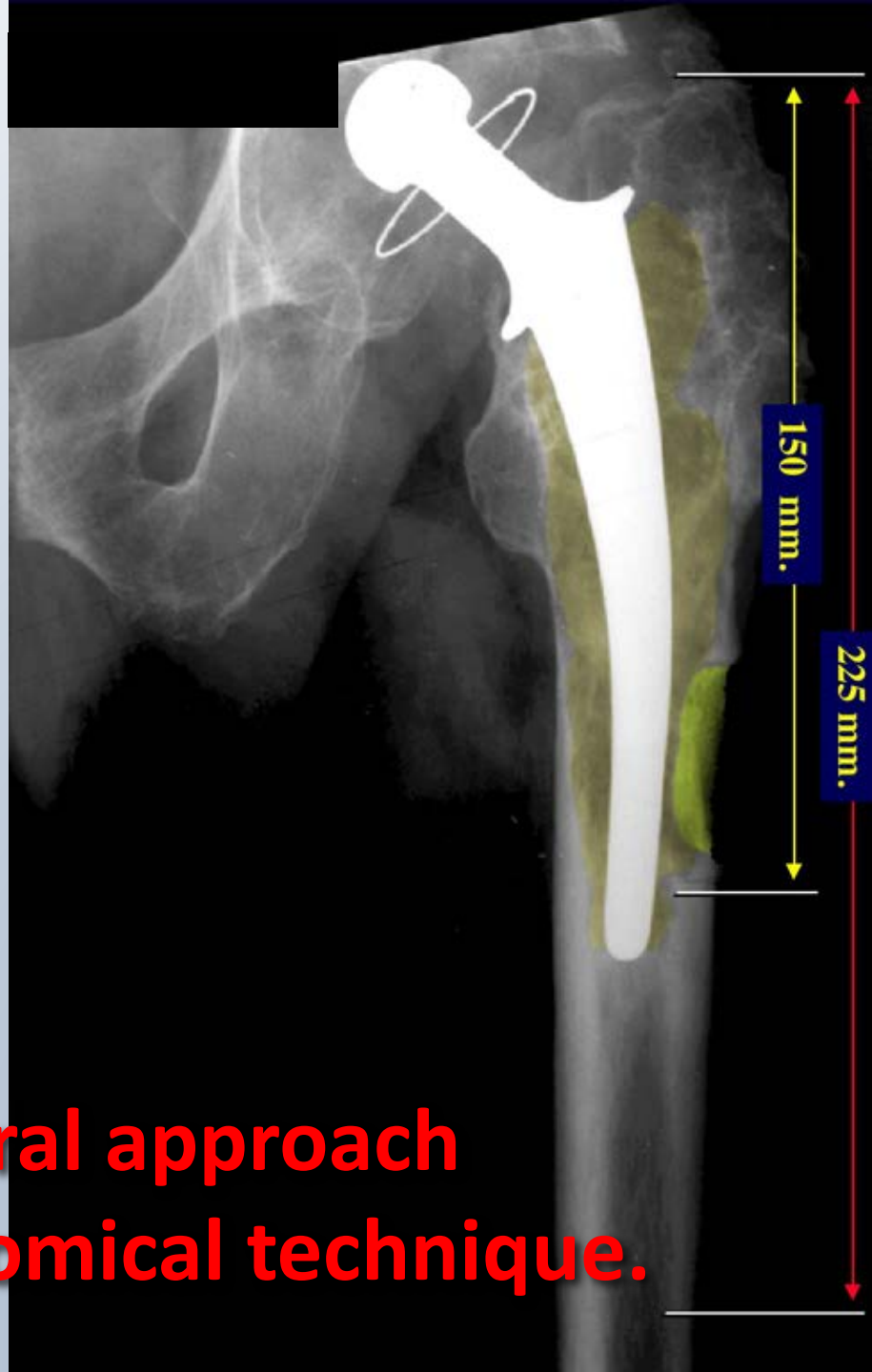
localization more than 150 mm from the apex of the greater trochanter

difficult, destructive removal

long stem rev. prosthesis

Pianificare la Rimozione

- Valutazione d'insieme
- Preservazione ossea
- Integrità Anatomica



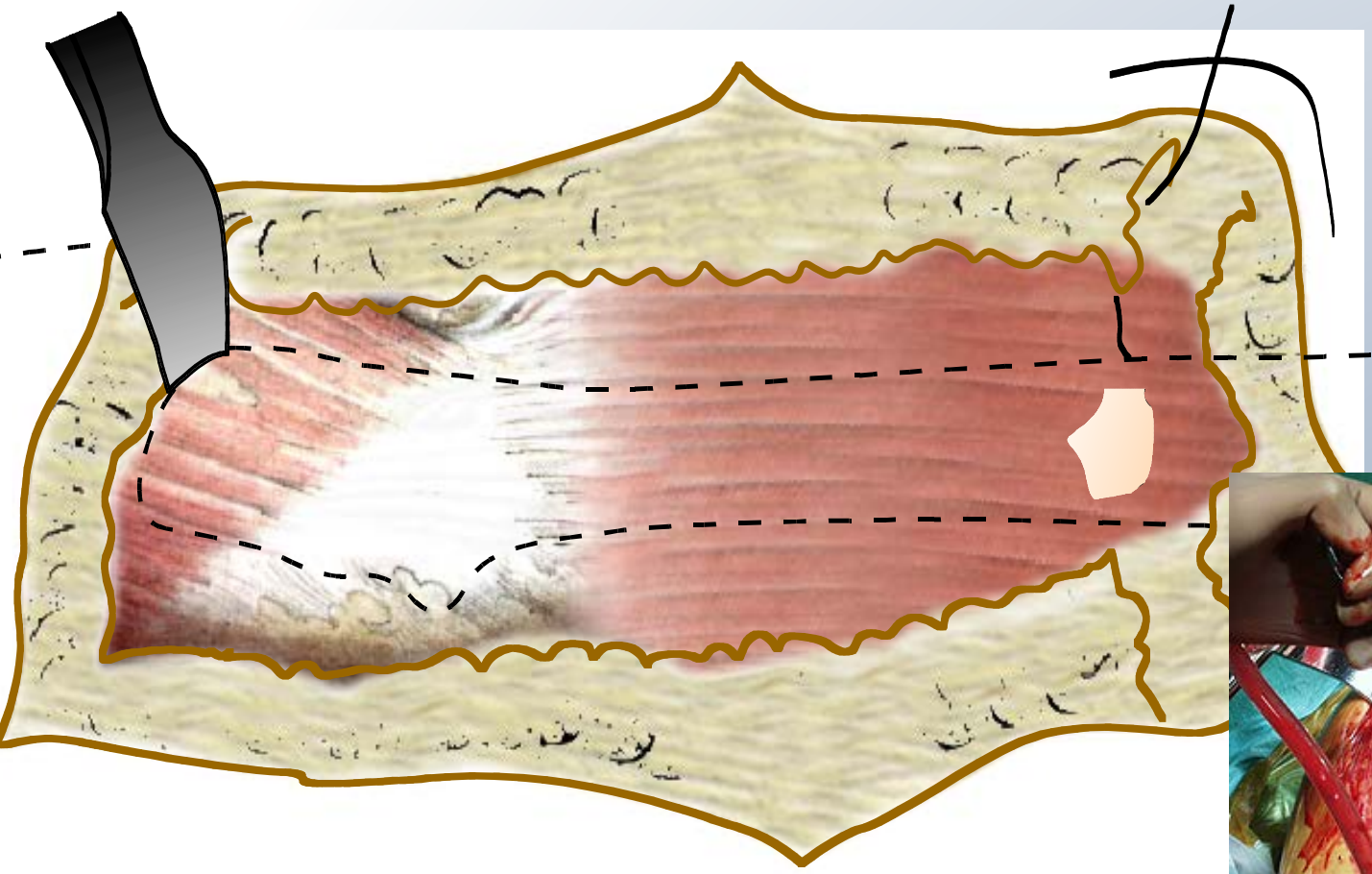
... sometimes transfemoral approach results in the most economical technique.

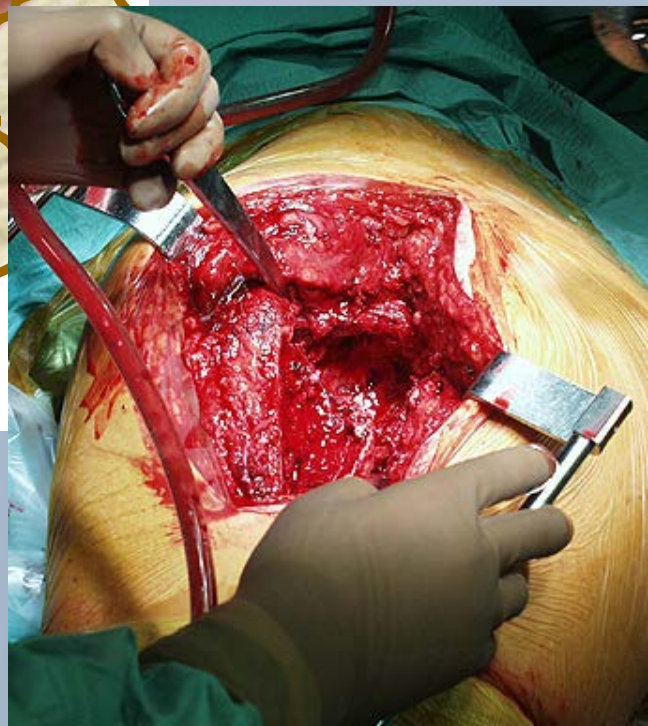
Tecniche Chirurgiche

- Via Postero-laterale **52%**
- Via Post-lat. + finestra distale **15%**
- Via Post-lat. + finestra ampia **18%**
- Via Transfemorale **11%**
- Altre **4%**

chirurgica

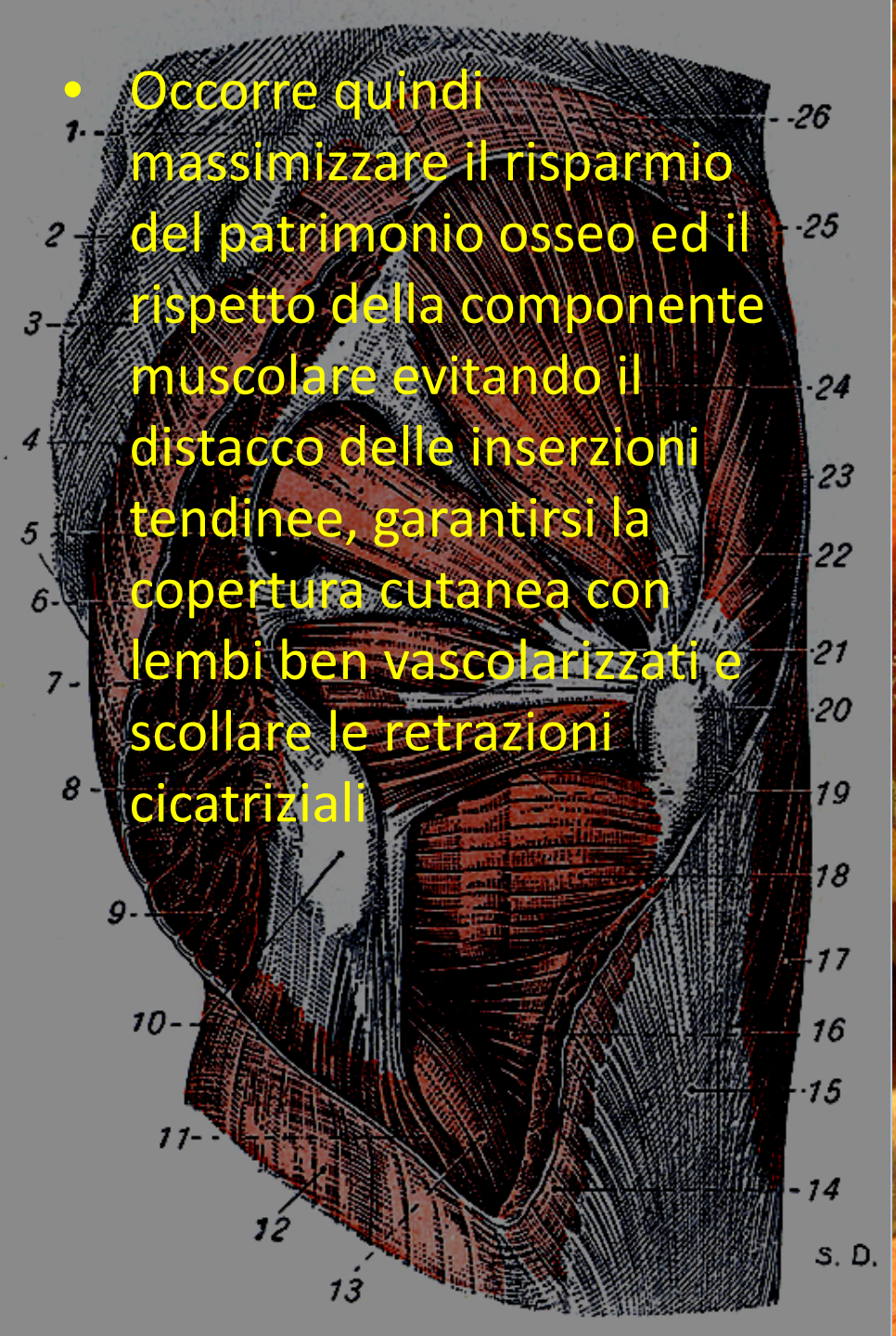
postero-laterale





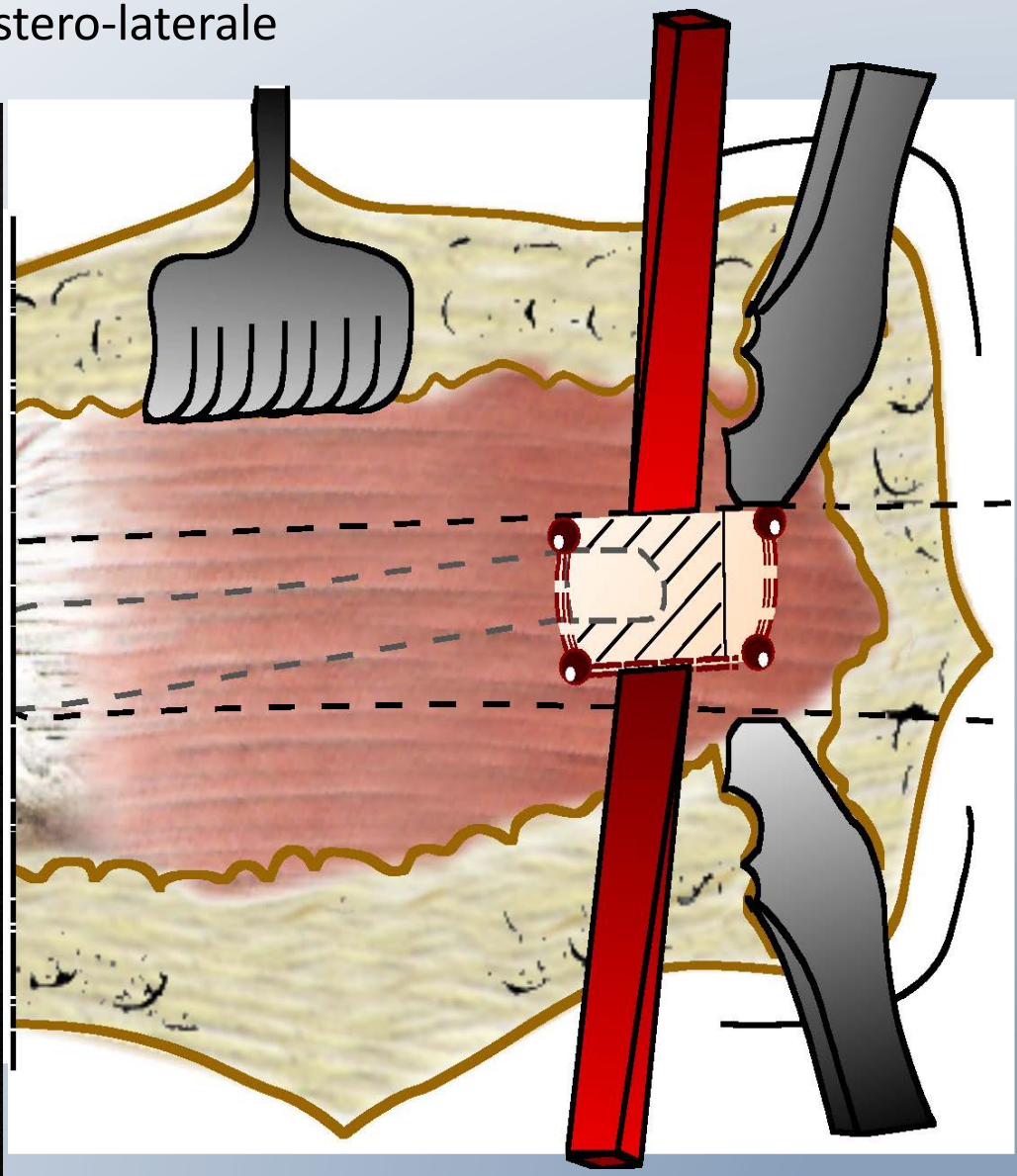
Via transfemorale

- Occorre quindi massimizzare il risparmio del patrimonio osseo ed il rispetto della componente muscolare evitando il distacco delle inserzioni tendinee, garantirsi la copertura cutanea con lembi ben vascolarizzati e scollare le retrazioni cicatriziali



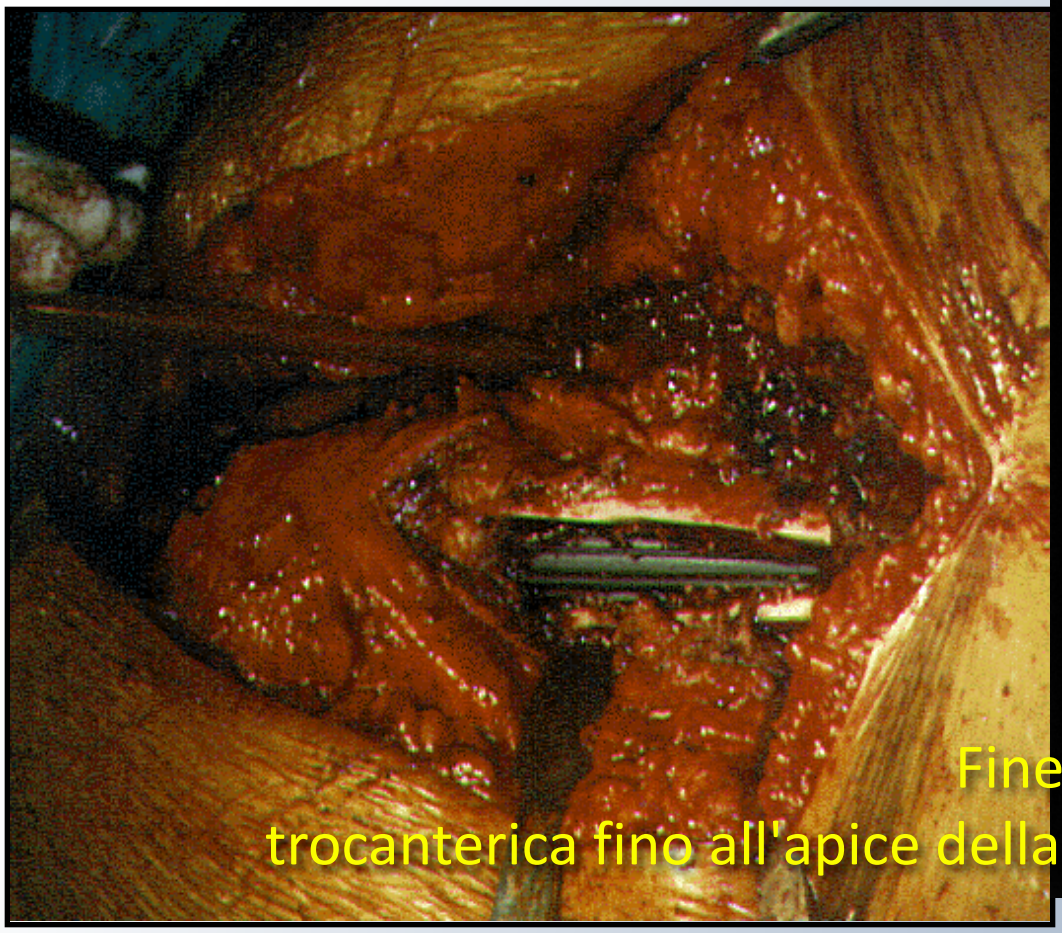
Tecnica Chirurgica

Via postero-laterale



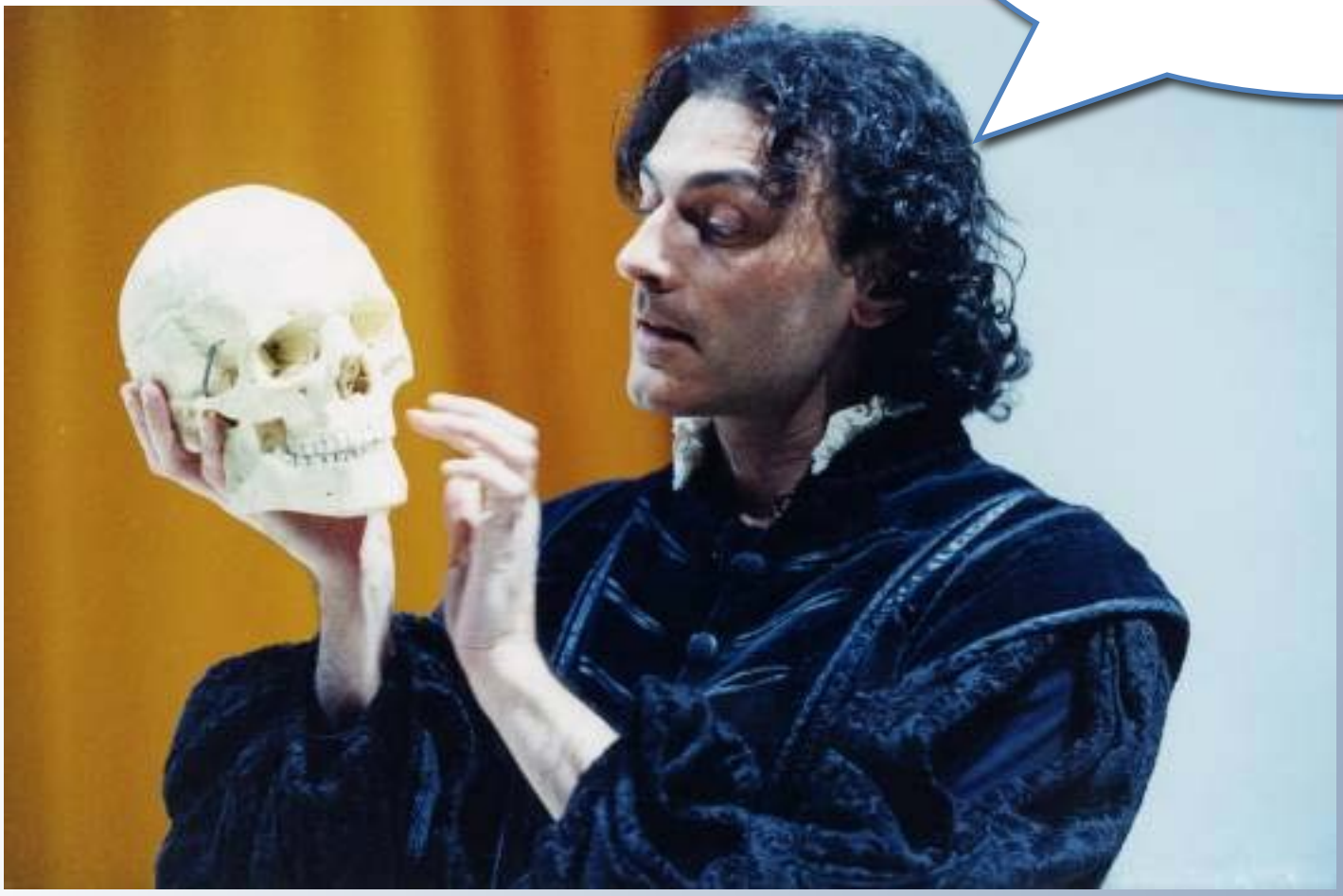
Tecnica Chirurgica

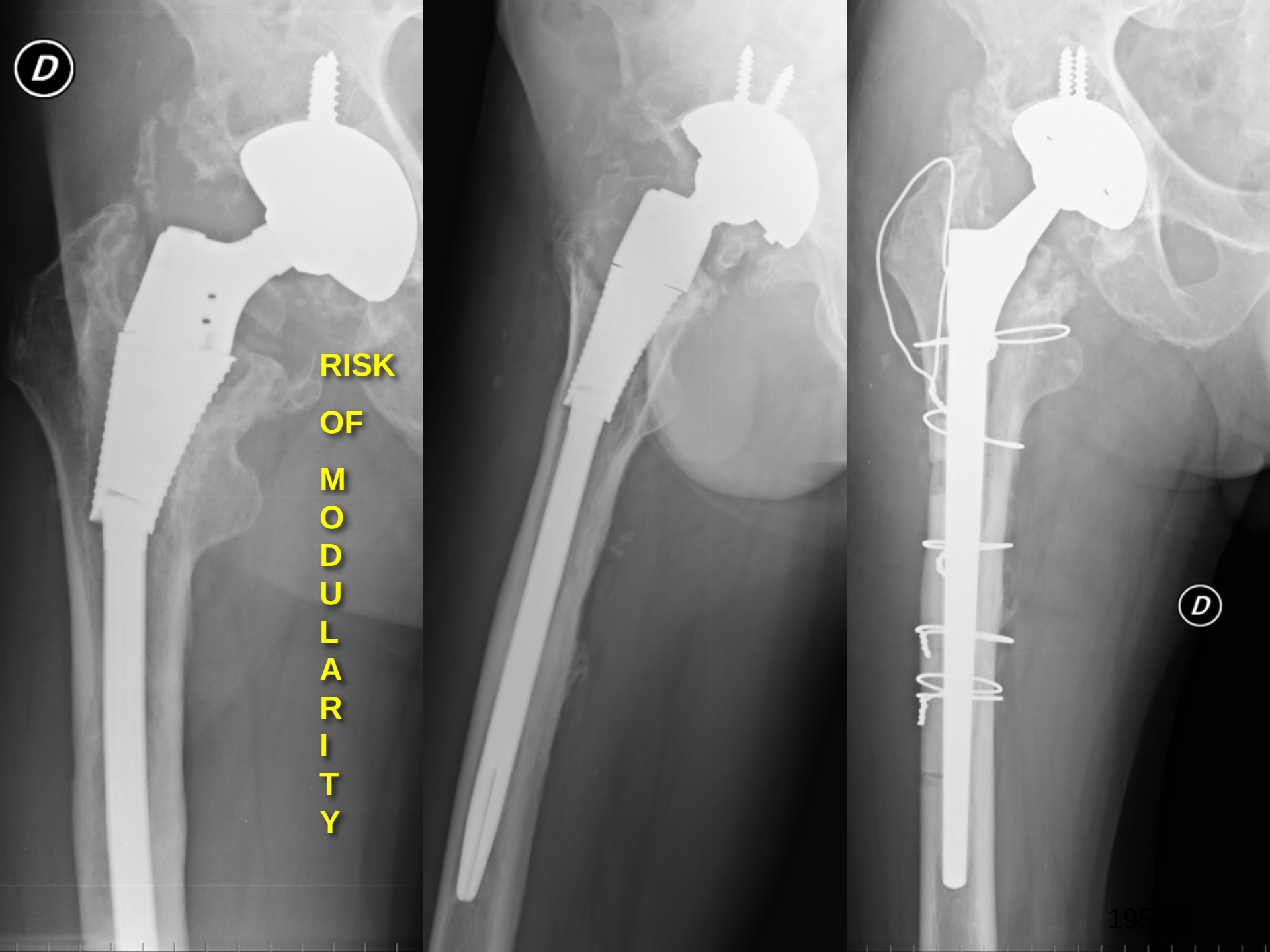
Via postero-laterale



Finestra ampia dalla regione sub-trocanterica fino all'apice della protesi o del cemento

REVISIONE STELO

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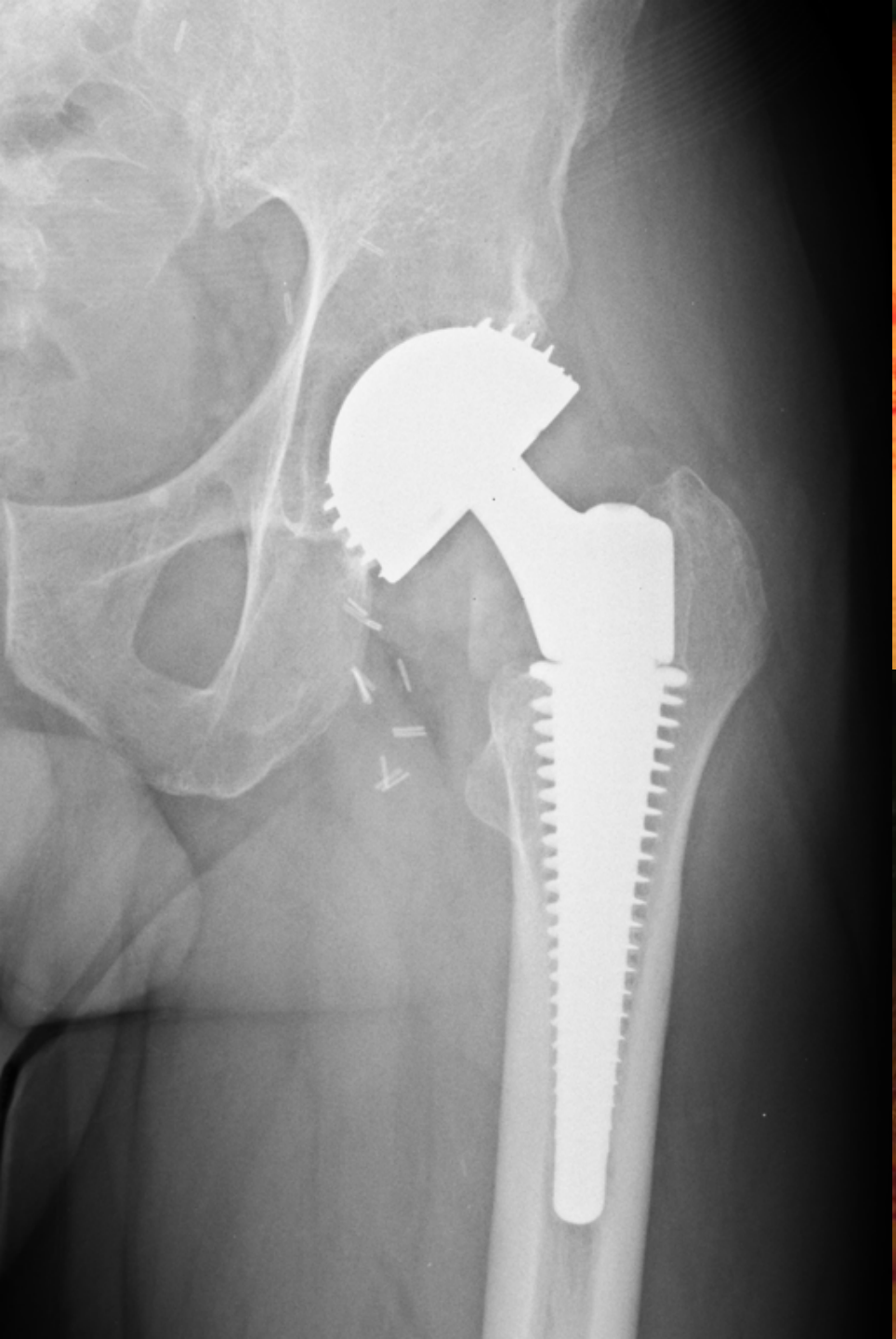

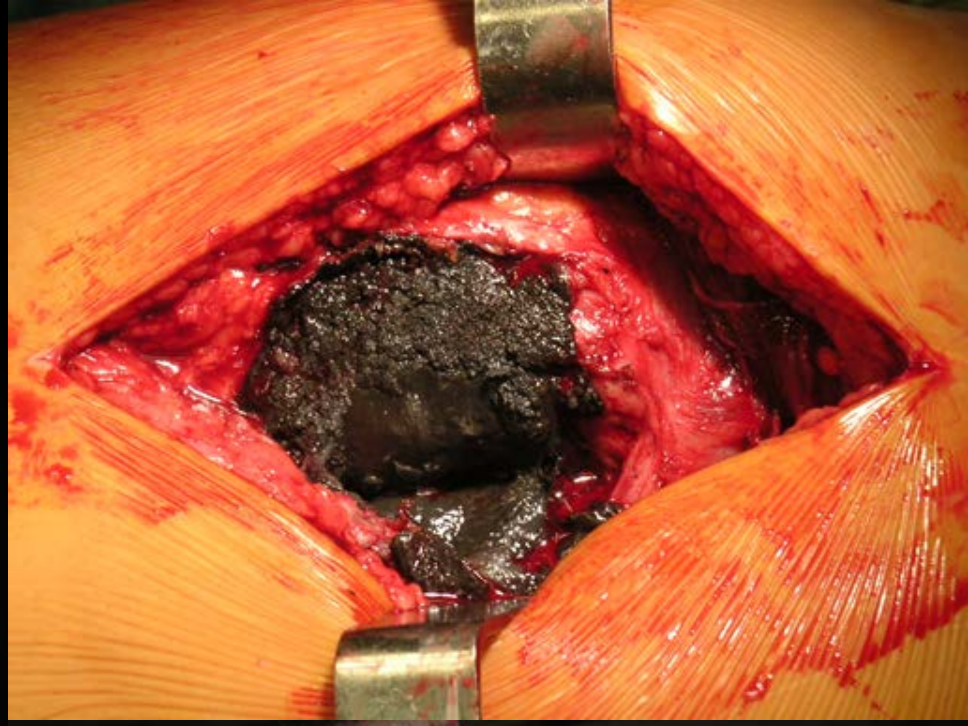

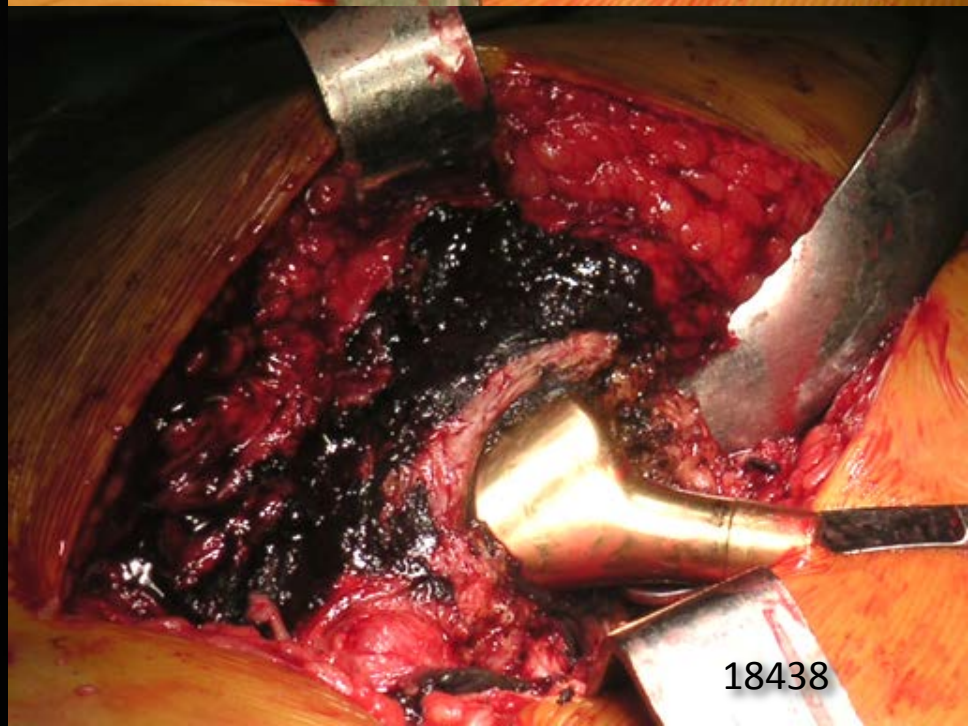

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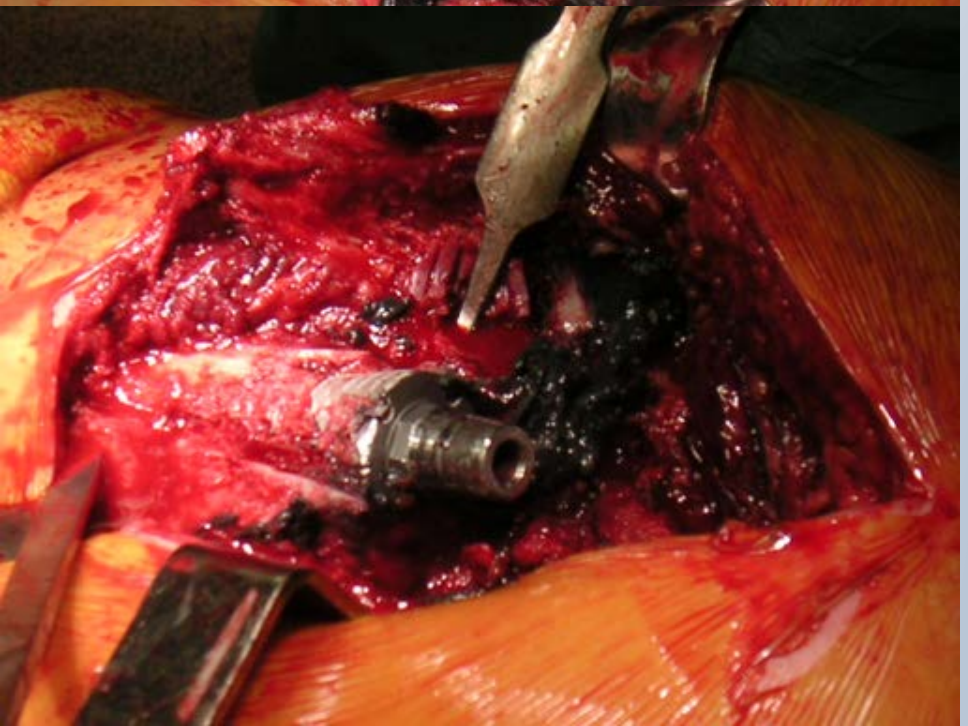

RISK

OF

MODULARITY

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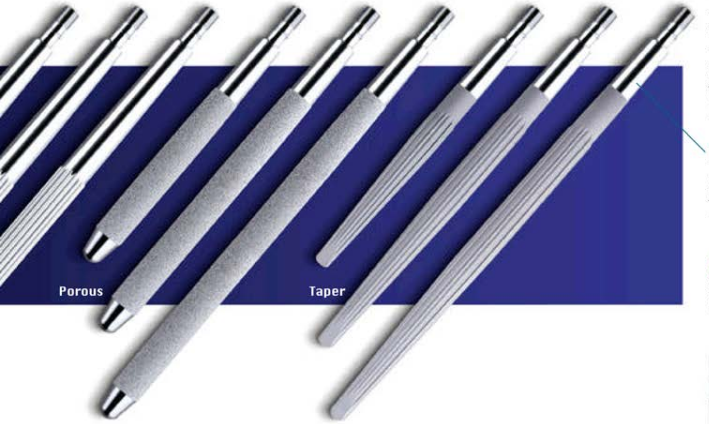
Spline Stem Options
The polished Tivanium® Ti-6Al-4V Alloy Spline Stems have positive-cutting splines along the length of the implant. The splines are designed to help achieve rotational stability, while maintaining insertional ease.

Porous Stem Options
The Porous Stems are coated with plasma-sprayed Tivanium Alloy to allow for biological fixation.

Taper Stem Options
The corundumized, splined Taper Stem is designed to provide distal fixation that transmits axial, torsional, and bending loads to the adjacent bone.



Taper Lock and Compression Nut
The mid-stem junction uses a Morse-type taper connection to assure locking of the body and stem components. The Compression Nut, torqued to 15N-m (130 in.-lbs.), provides additional security. The features of the Compression Nut* are designed to allow for settling of the mid-stem junction without the nut becoming loose or backing out.

* U.S. Patent Pending

Ti-Nidium Surface
The Ti-Nidium® Surface Hardening Process** helps protect against wear at the modular taper junction of the implant.

** U.S. Patents 5,192,323; 5,326,362

Leg Length
Graduated body heights in 10mm increments allow for intraoperative flexibility in adjusting leg length.

Offset
Extended offset body options provide for increased offset without changing the component neck angle or length.

Revision Instrumentation
ZMR Instrumentation is simple, precise, and designed with femoral revision surgery in mind. The ZMR Taper and Porous Hip Systems have distinctive instrumentation.

Restoration™ DPM independently combines proven philosophies for immediate axial and torsional stability, plus proximal loading for metaphyseal restoration.

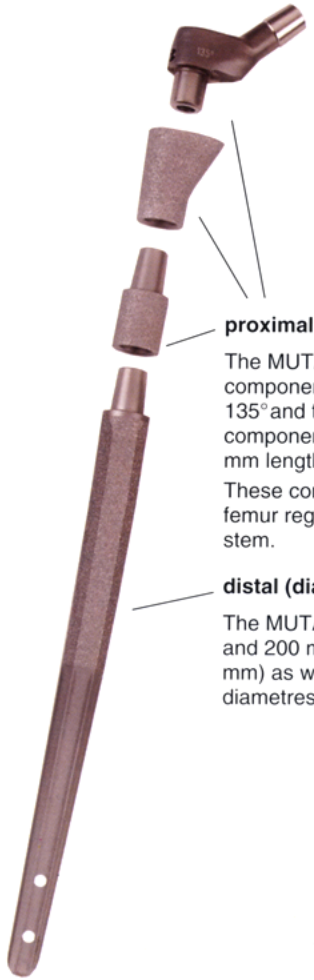
The implant is a modular, cementless, titanium (Ti6Al4V) revision system designed specifically to address the complex circumstances of Paprosky Type I, Type II and most Type III revision surgeries*. The distal design locks firmly into the femur whilst a hydroxyapatite coated sleeve fills proximally.

- A sand-blasted, fluted conical distal stem with a long clinical history designed to provide immediate axial and torsional stability.
- Proximal sleeve designed to load the partially or totally resorped proximal metaphysis.
- HA coated proximal sleeve in combination with morselised bone grafts can rebuild the proximal femur.
- Small, medium and large sleeve options adapt to remaining proximal metaphysis.
- Ceramic options (Zirconia or Alumina) with V40™ head taper.
- Adjust leg length and offset with different V40™ heads.
- Short straight, and long curved (left and right) stem options.
- Simple instrument system for accurate and reproducable implantation.
- Uses femoral head centre and provides visual depth references for accurate joint centre restoration, even when proximal landmarks may be unavailable.

A sand-blasted, fluted conical distal stem with a long clinical history designed to provide immediate axial and torsional stability.

Characteristics

- different CCD angles
- anatomically shaped stems
- microporous surface
- high primary stability because of distal anchorage
- modularity
- correction of the antetorsion in steps of 5° after implantation
- simple surgical technique



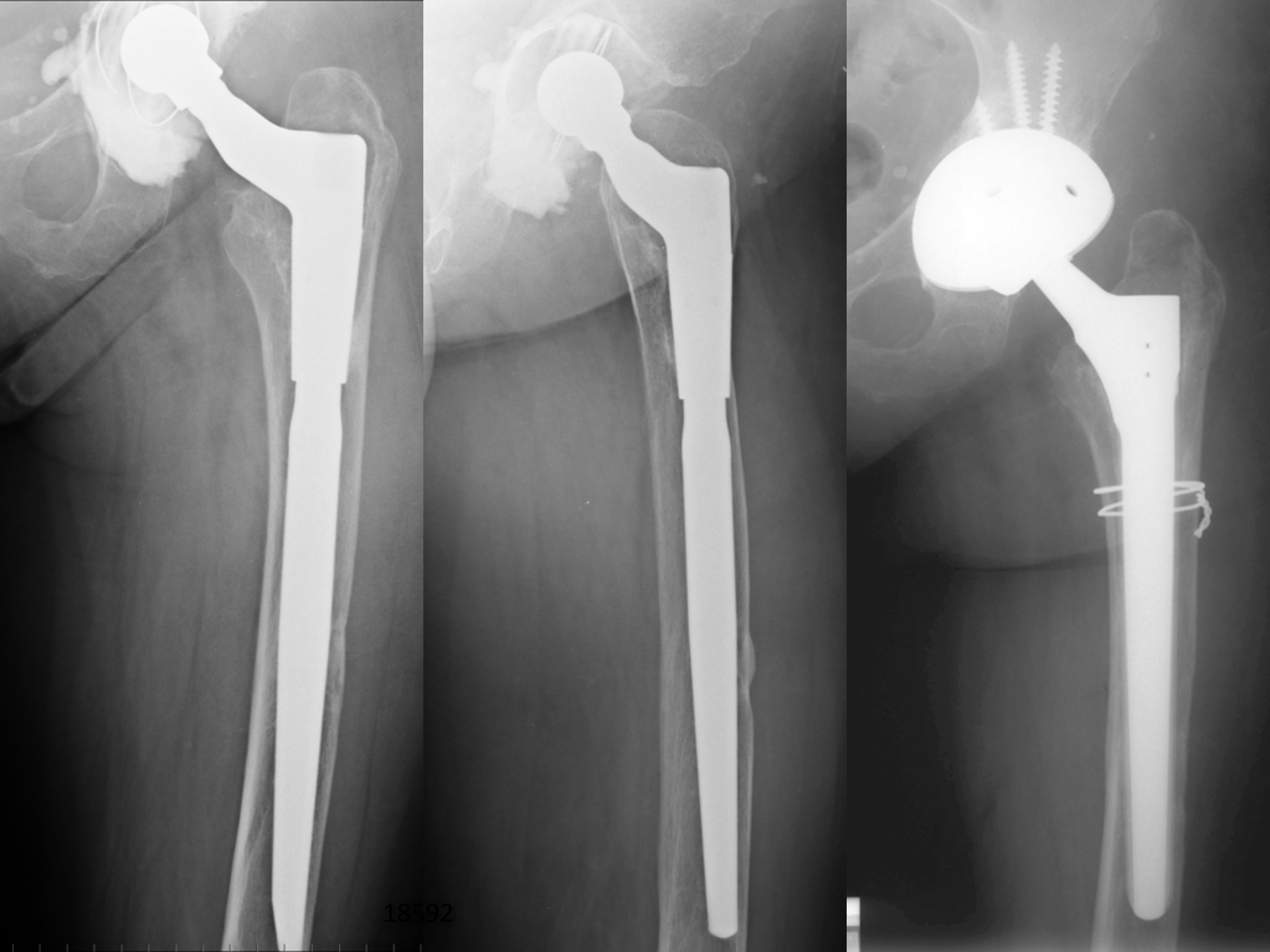
proximal (metaphyseal) components

The MUTARS® RS respectively includes two proximal components of 32 or 42 mm length with CCD angles of 127° or 135° and taper 12/14mm. Besides there are two metap hyseal components, 40 and 50 mm as well as one extension piece of 25 mm length.

These components facilitate the optimal filling of the proximal femur region without modification of the position of the diaphyseal stem.

distal (diaphyseal) components

The MUTARS® RS includes eleven stems in three lengths – 150 and 200 mm with respectively four diametres (14, 16, 18 and 20 mm) as well as 250 mm with distal locking holes in the three diametres 16, 18 and 20 mm.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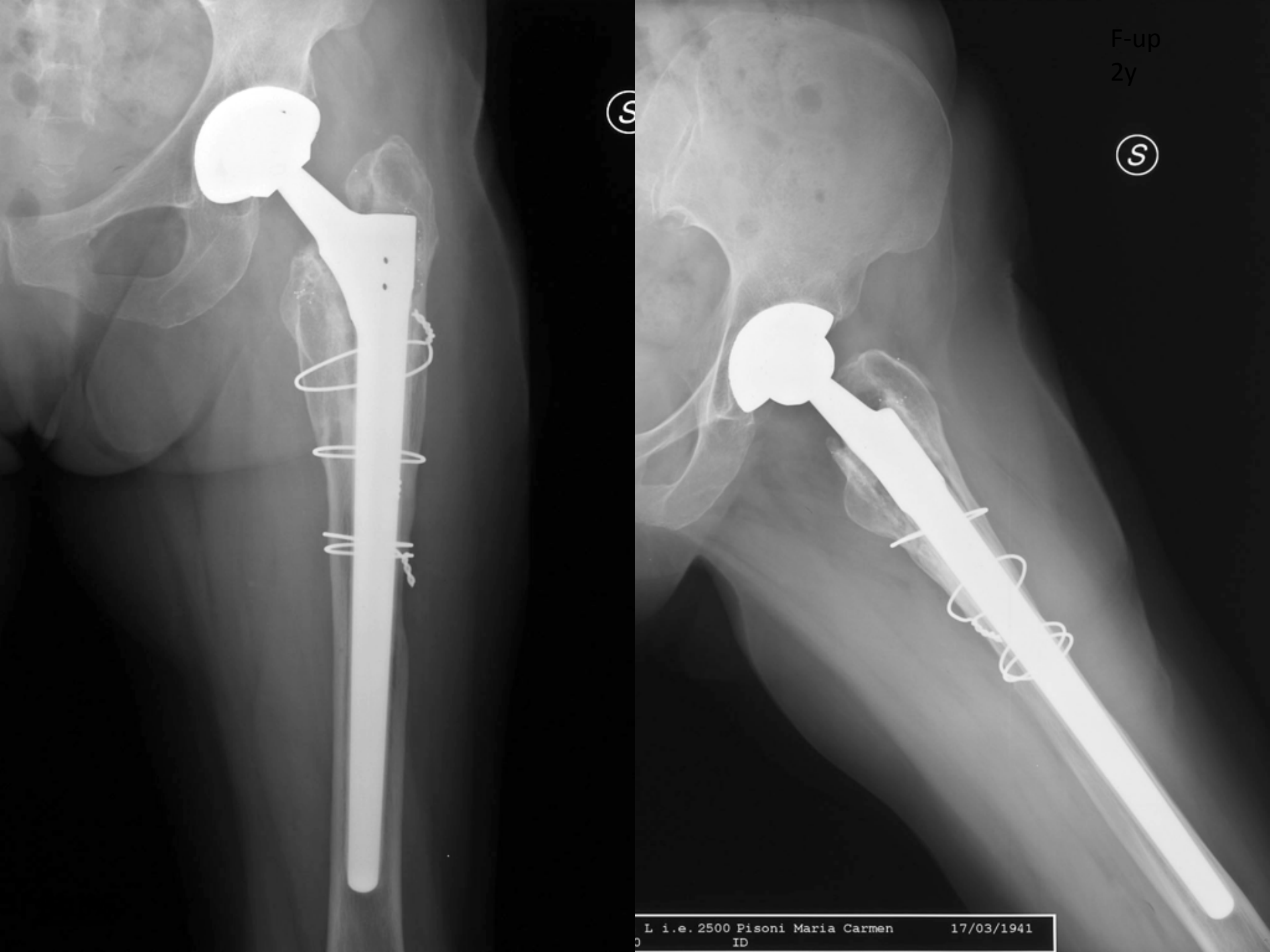
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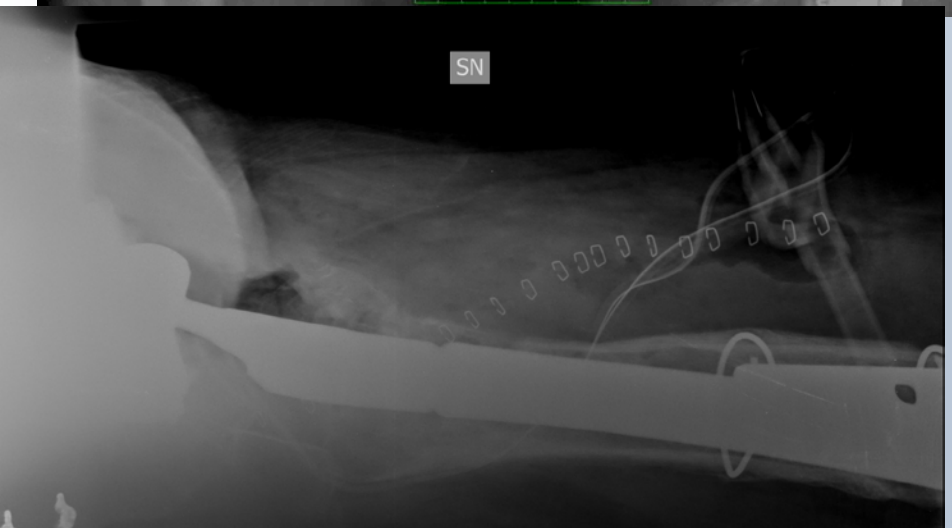
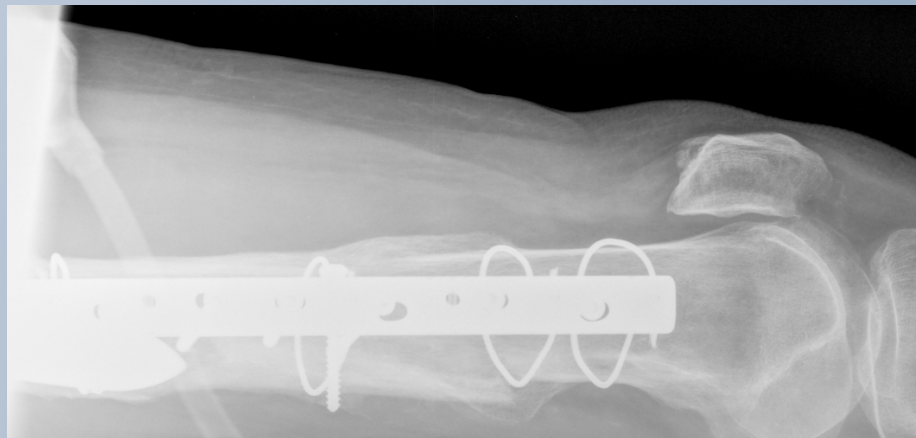
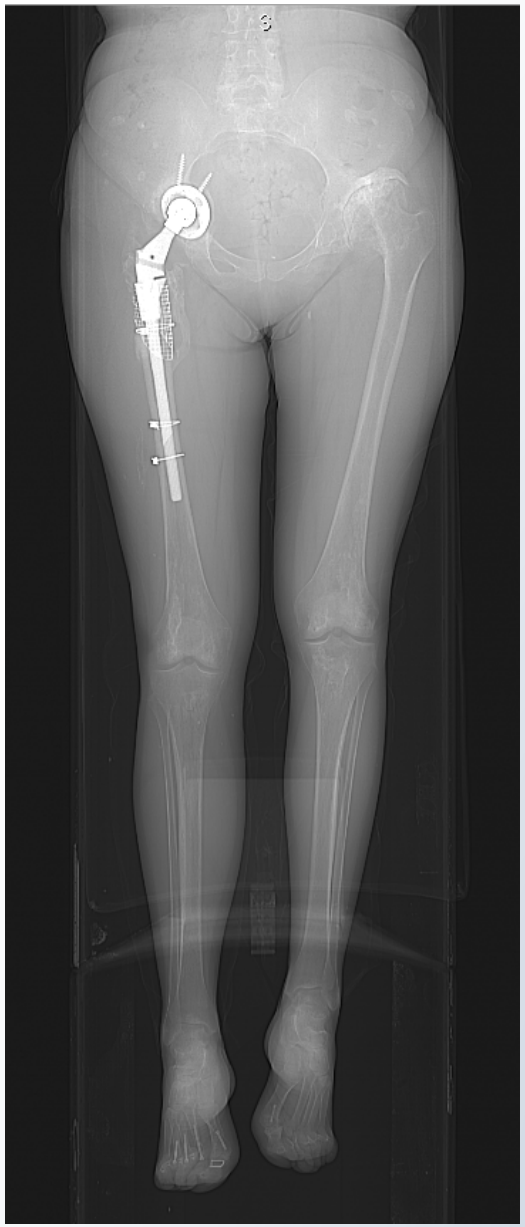
MA LO STELO MODULARE PUO' SERVIRE !!





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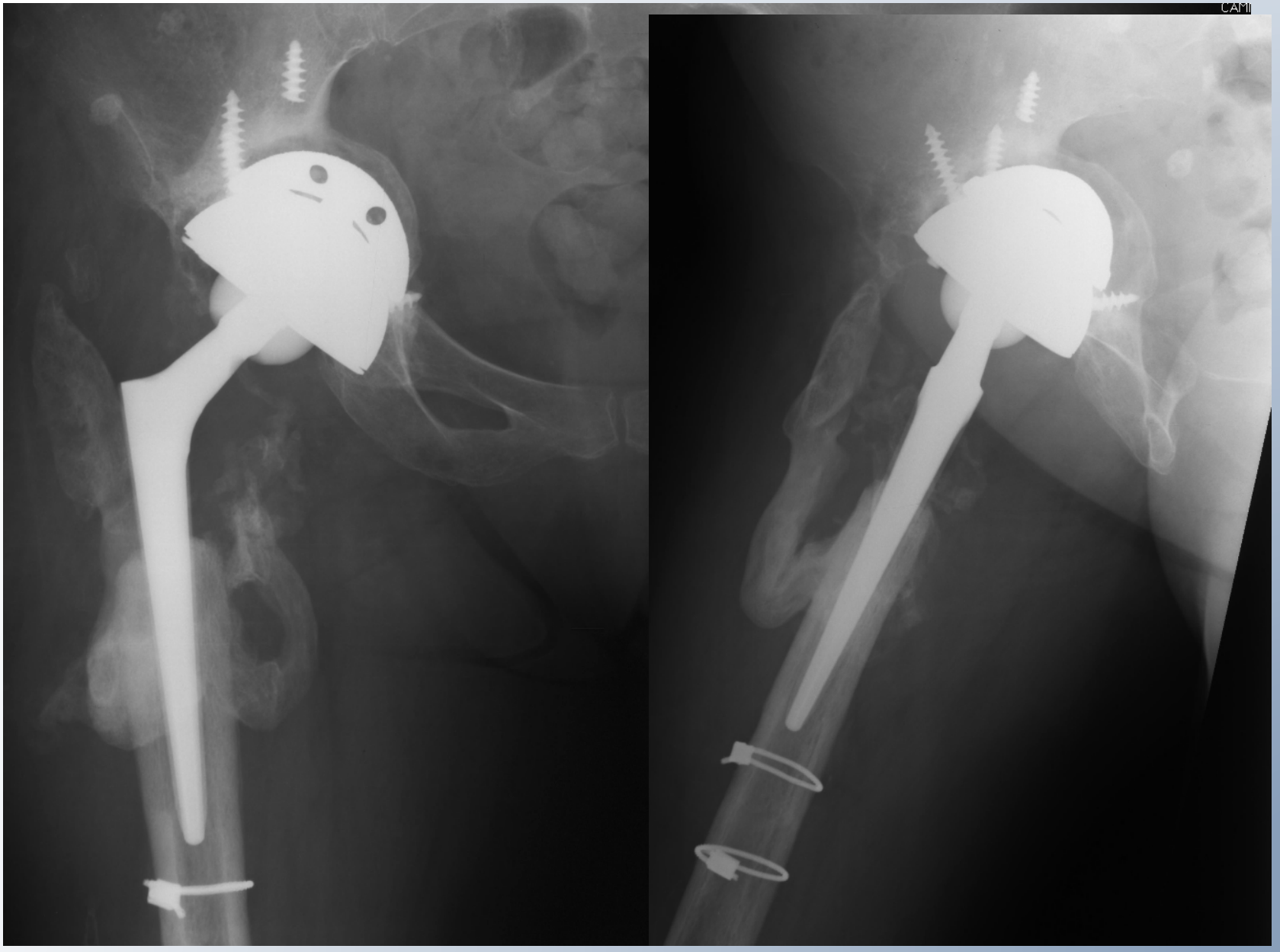
ANCORAGGIO PIU' PROSSIMALE POSSIBILE ANCHE QUESTA E' MODULARITA'!!!!!!!!



Take home message

Risparmio osseo dove possibile

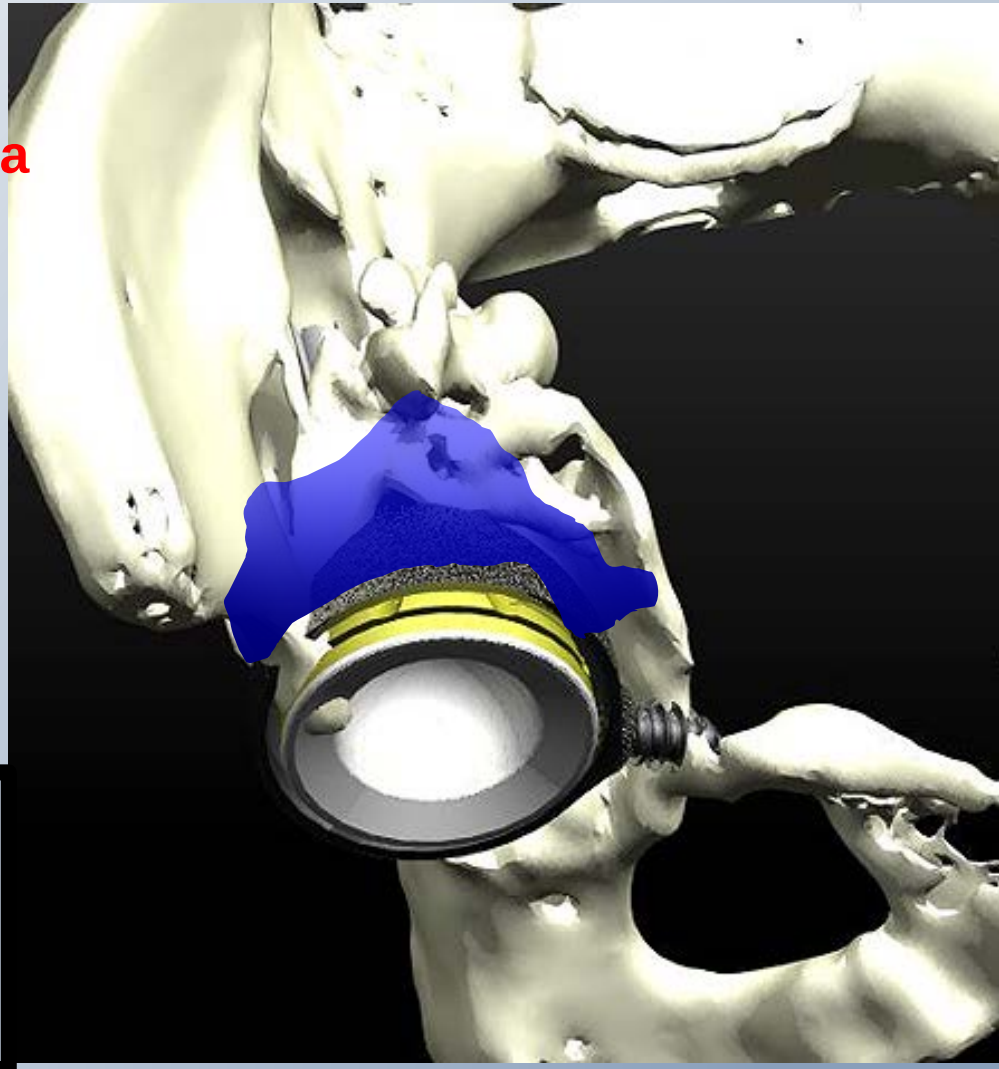
Revisione precoce

Ricostruzione biologica e meccanica

Chirurgia complessa da pianificare

Strumenti personale dedicato

Esperienza dell'operatore



LA MODULARITA' E' NELLA TESTA

DEL CHIRURGO !

Grazie

per la vostra
cortese attenzione

Livio Sciutto

FOUNDATION

e-mail: info@fondazione.it