Rationale of Short "Neck Sparing" Stem Femoral Components

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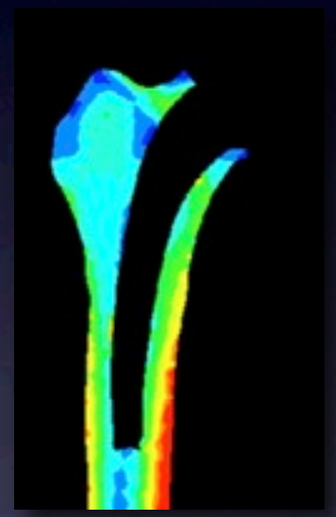
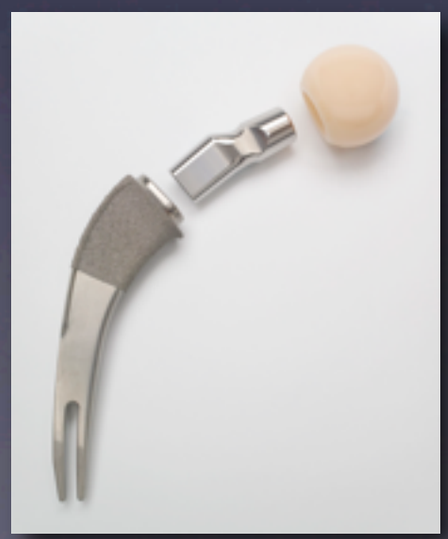
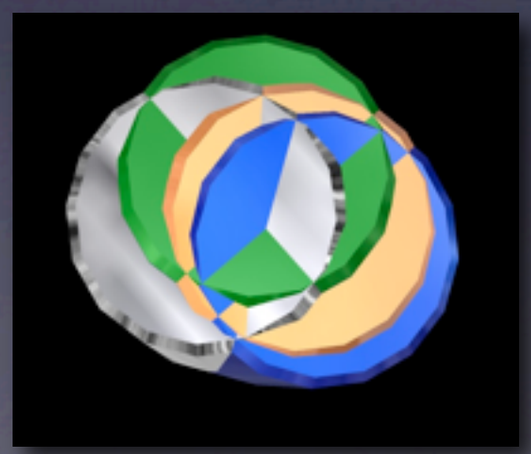






HARVARD MEDICAL SCHOOL

Cambridge, MA
Sept. 29, 2010

Disclosure

- In accordance with Professional guidelines the authors acknowledge:
- Presenting Author:

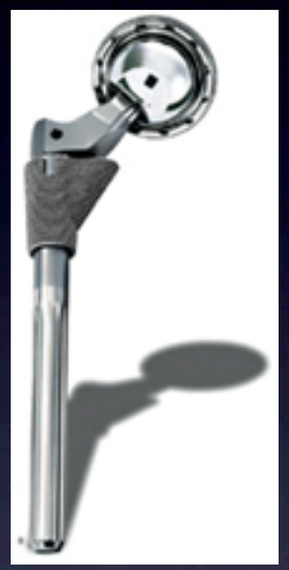
Consulting Agreement: Stryker Orthopaedics, Omnilife Science

& CDD, LLC

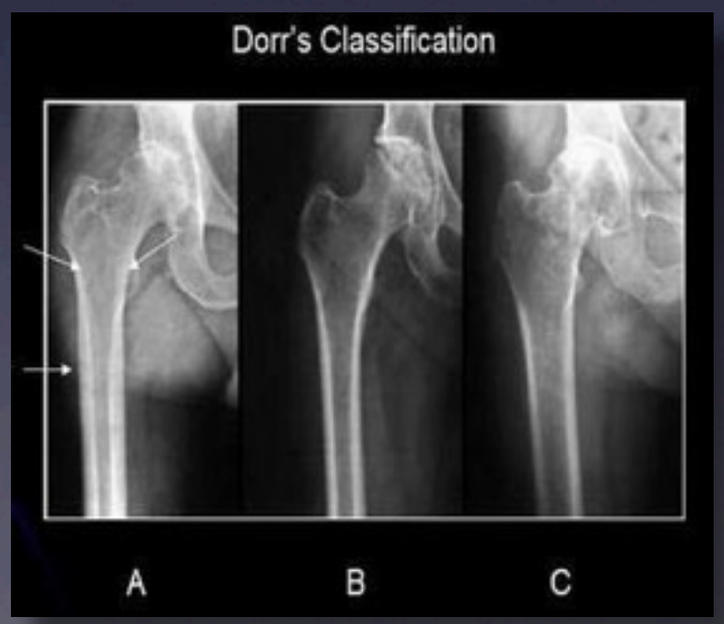
- Co-Author: Consultant and Stock interest in: Omnilife science, Member of CDD, LLC, & Global Orthopaedics

My Past Hip Stem Preference

1985



S-ROM



Type C bone

2005

Proximal Modular Designs

Apex Modular

K-2

2010

History of Short Stems

Bohlman 1939

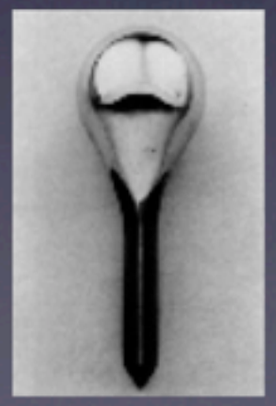
Bohlman 1940

Judet 1950

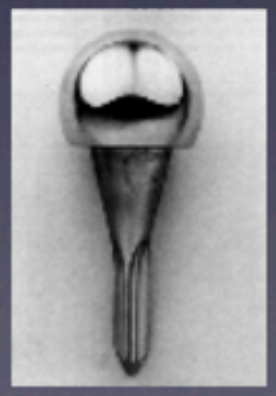
Vitallium Judet 1951

Judet grooved 1952

Ferciot 1953



J.E.M. Thompson 1950

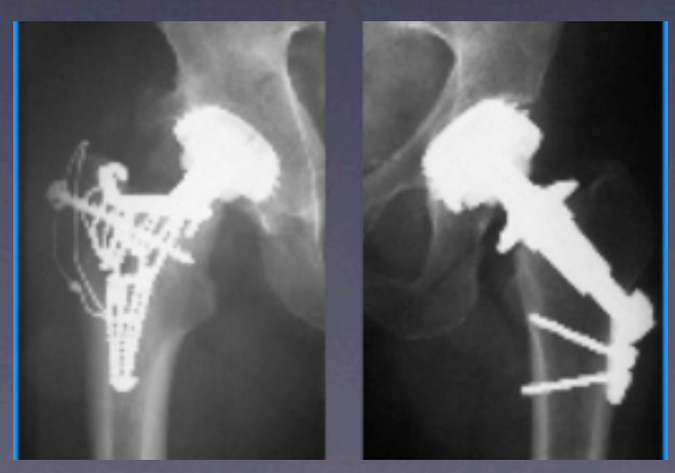


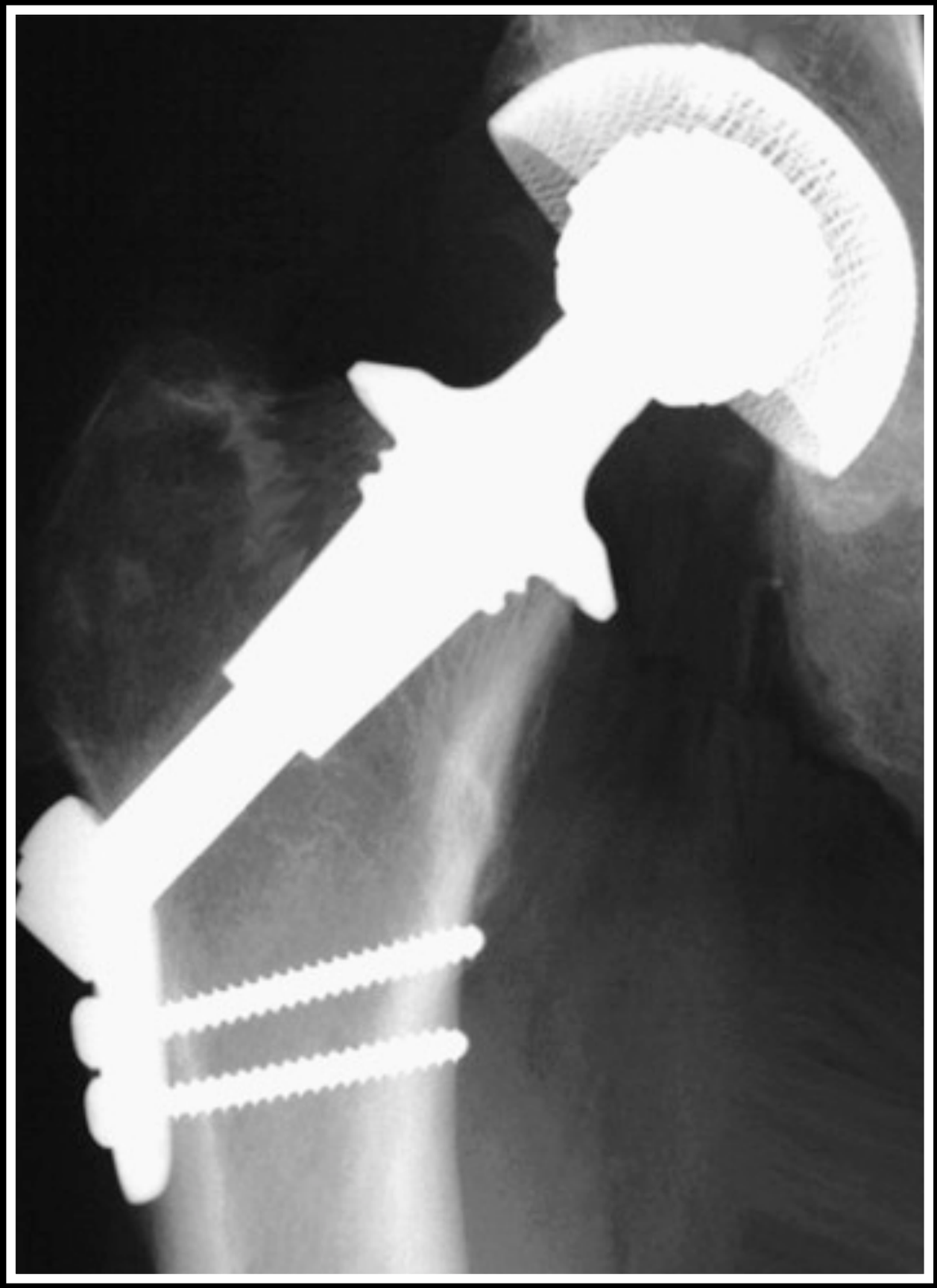
Vitallium Thompson 1951

Mid-Head Resection
New Trend

The Birmingham Mid-Head Resection both straight and curved stem designs

Modern Short Stems



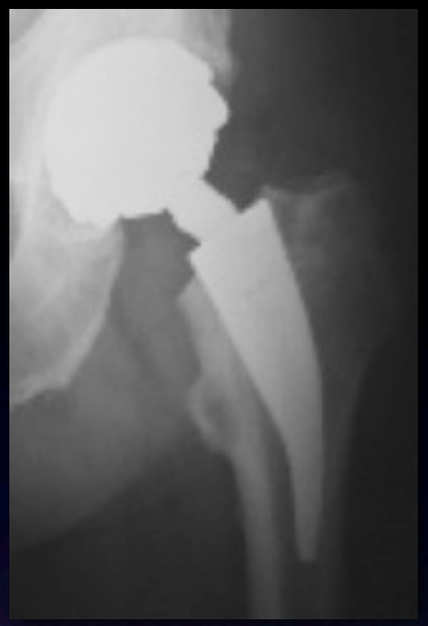


Source: Orthopaedics and Trauma 2009; 23:46-51 (DOI:10.1016/j.cuor.2008.08.005)

Mayo Type Stems

Mayo

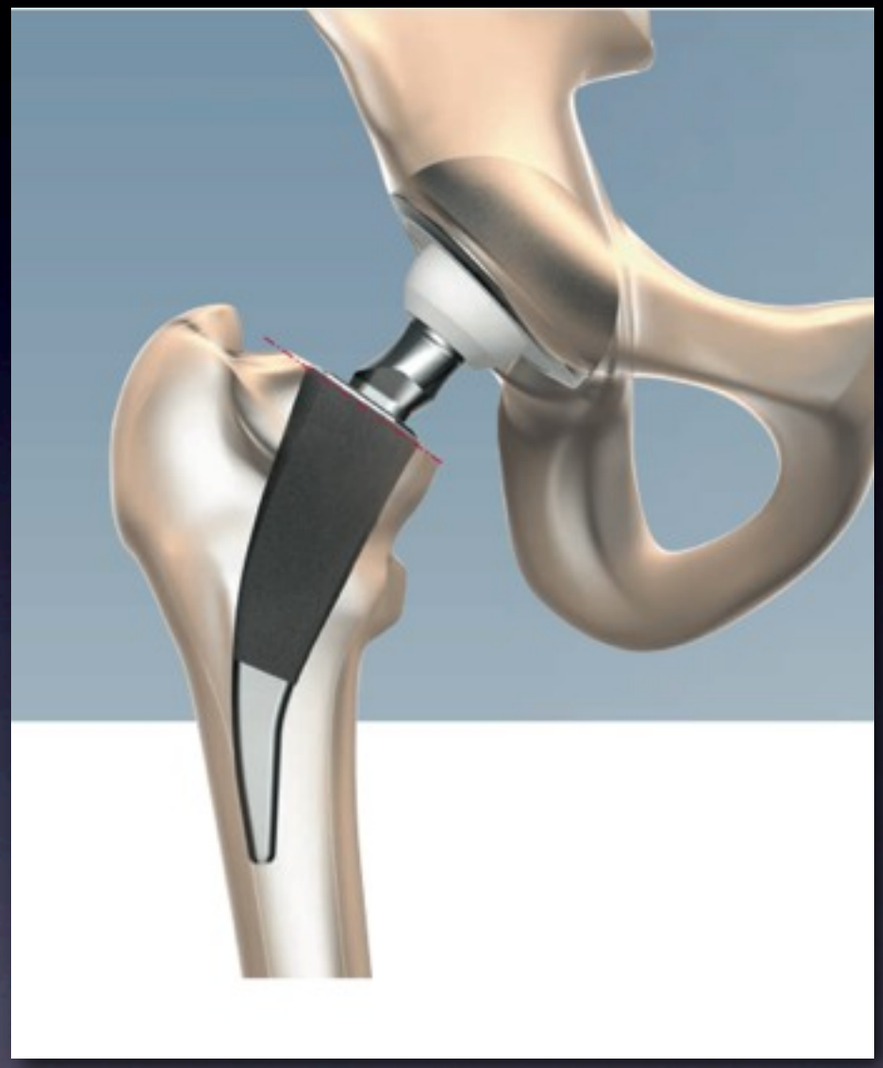
Metha



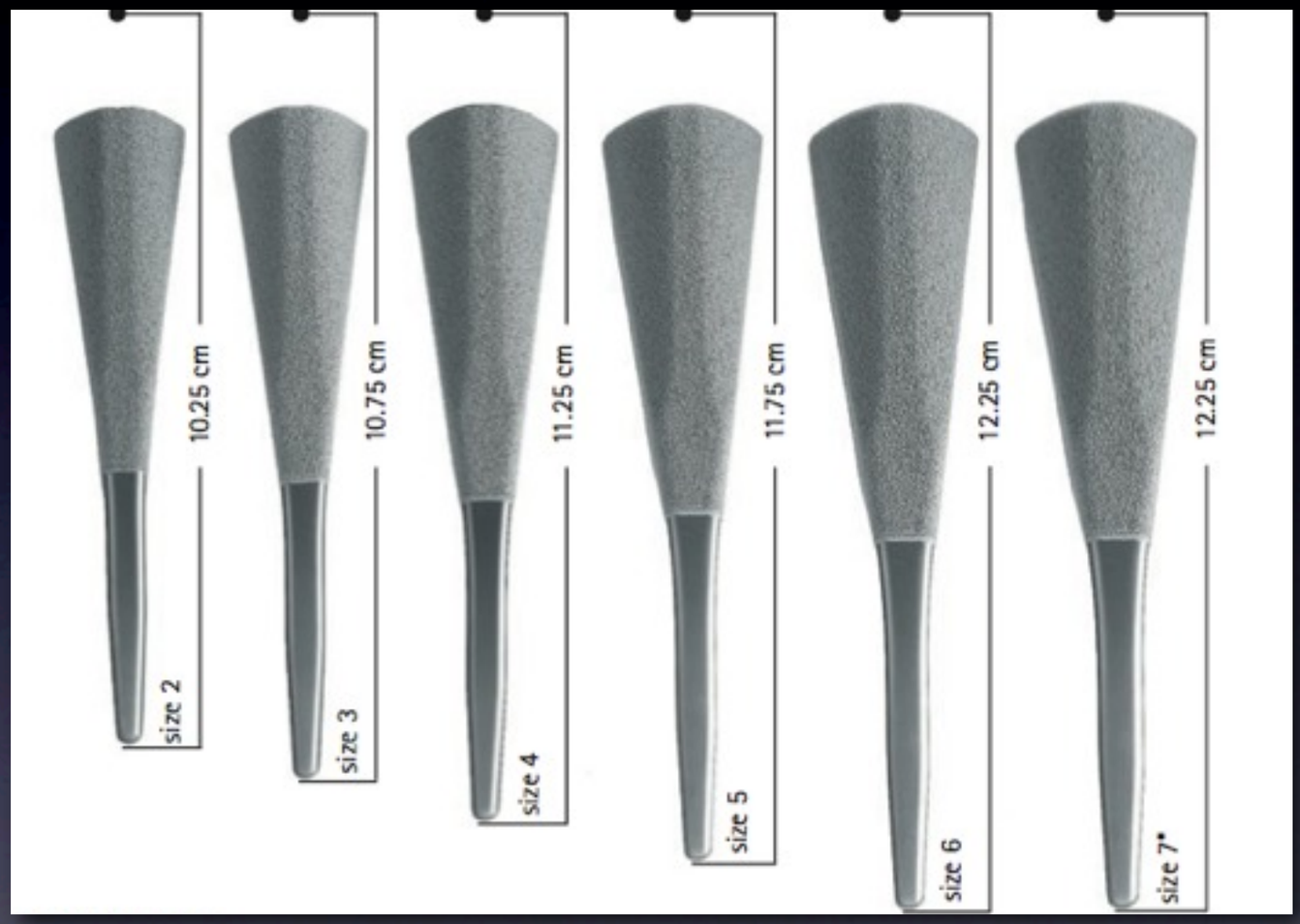
Eska

Three Point Fixation with Lateral Contact

Metha Stem



Note Modular Neck



Proximal Conical Shape
Distal lateral stem contact similar to
Mayo stem design

Microplasty Type Hip Stems

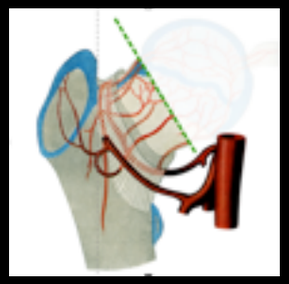
Distal crack & post-op stress shielding medial calcar

TRI·LOCK®

BONE PRESERVATION STEM

Standard neck resection
with shorter stem length

Proximal Filling with Loading of Lateral Calcar

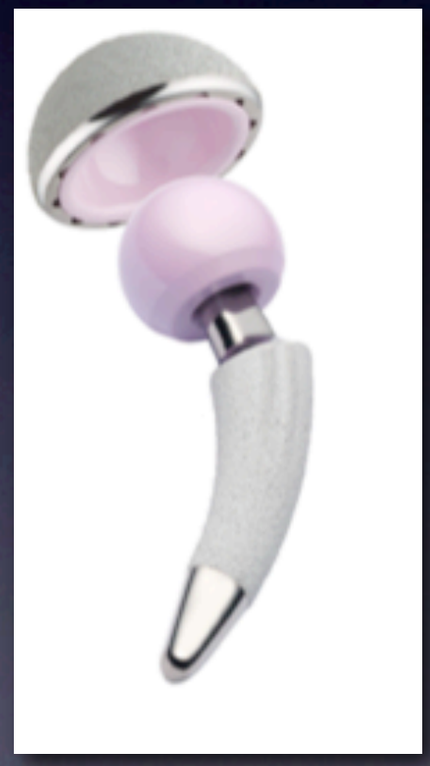


Short Curved Neck Sparing Stems

Pipino CLS™ Stem

ARC™ & MSA™ Stems

licensed TSI™ technology patents pending

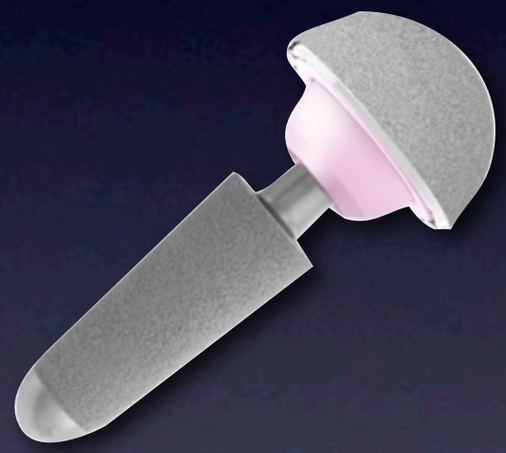


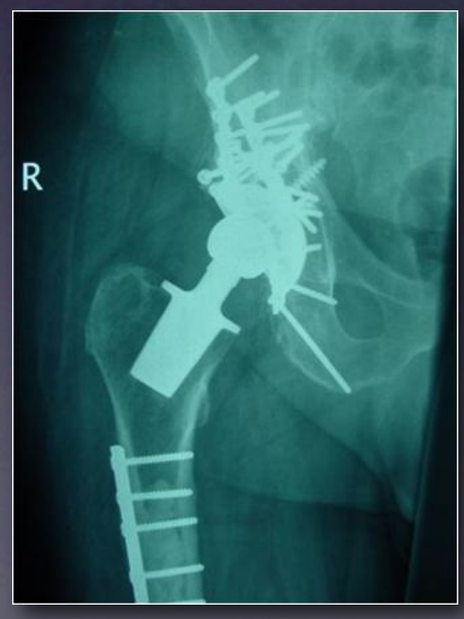
Corin stem

Neck Plugs

Stemless THA

Is this the next generation?

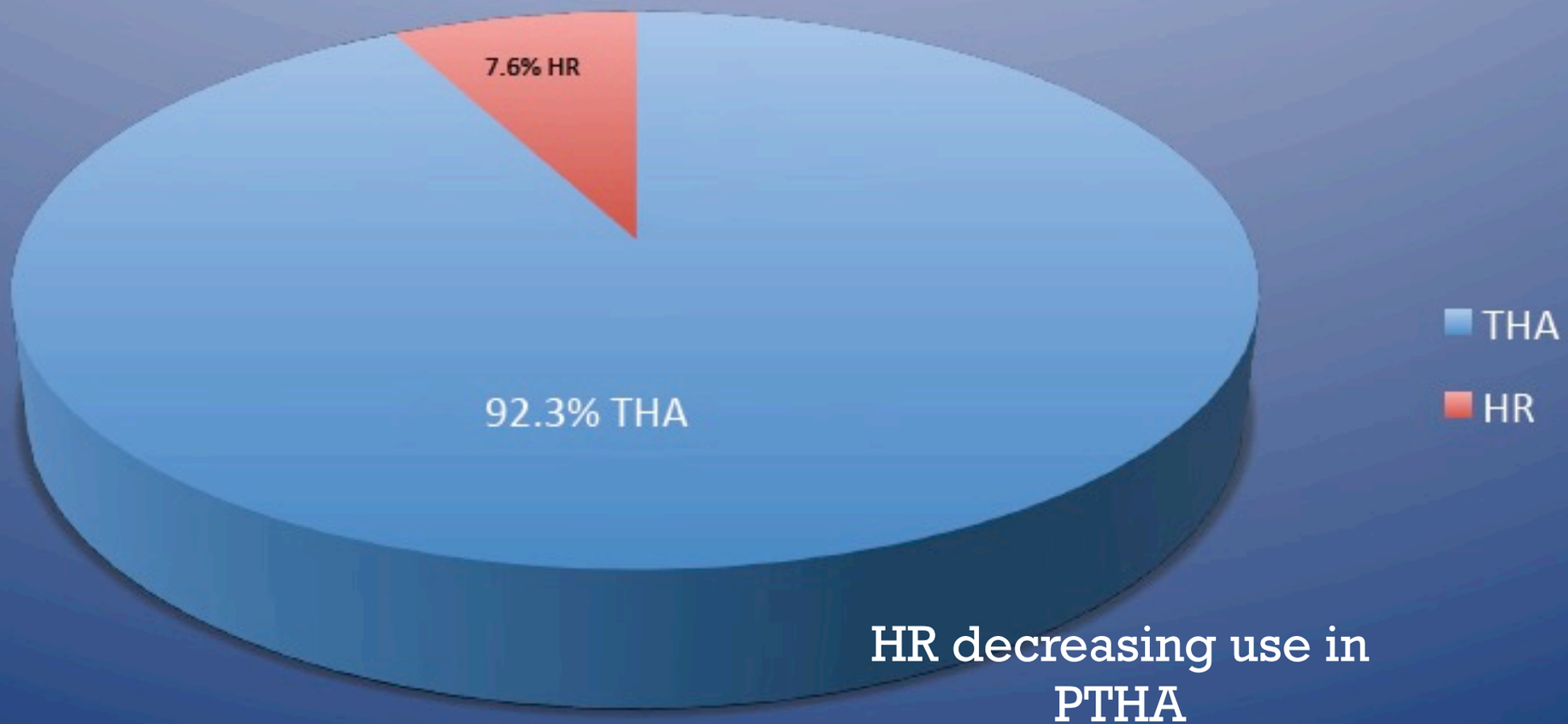




Short Stem Goals

- Initial Stability
- Restore Joint Biomechanics
- Long term Survival
- Decrease Adverse Bone Remodeling
- Facilitate Soft Tissue Sparing Approaches
- Minimize Bone Loss in Cases of Revision
- Decrease Physiologic Insult / Improve Rehabilitation
- Burn no Bridges

All THA
2008 Australian Registry



HR decreasing use in
PTHA
8.9% 2005
8.2% 2006
7.6% 2008

My Head Resurfacing Experience

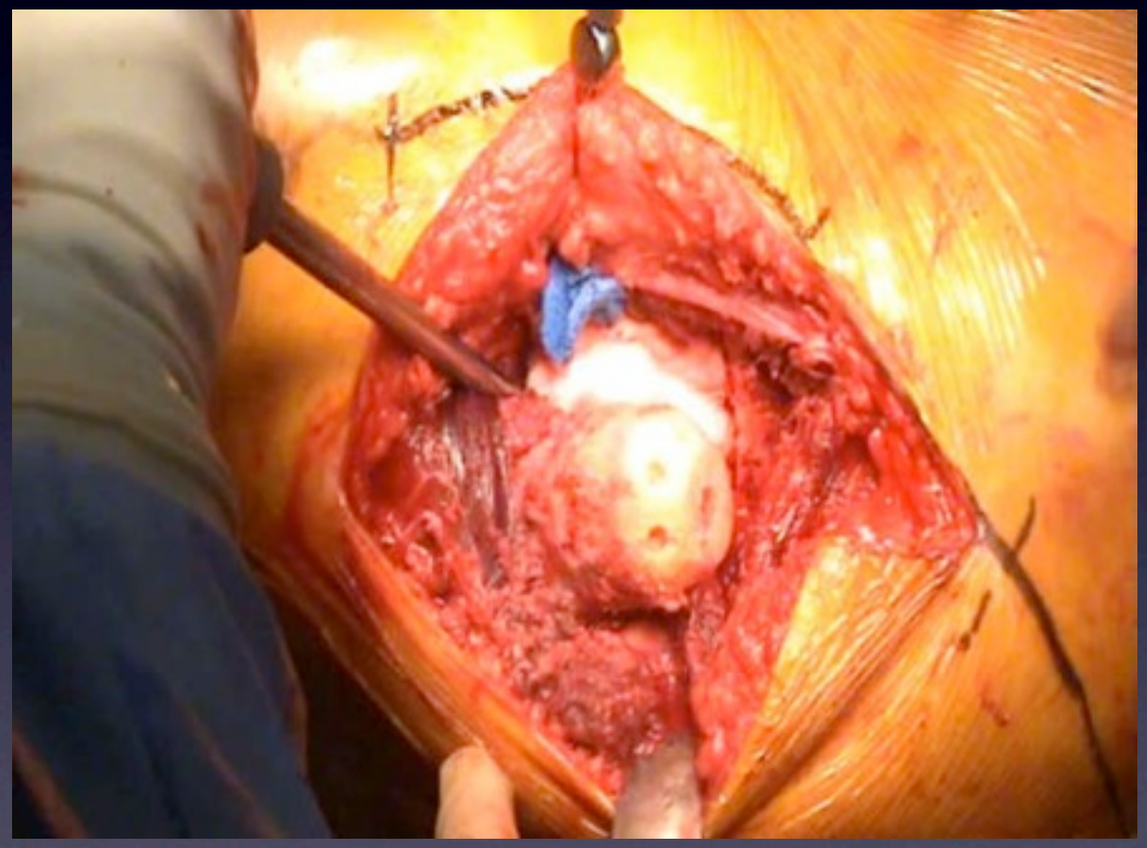
Art Steffee

Hip Resurfacing

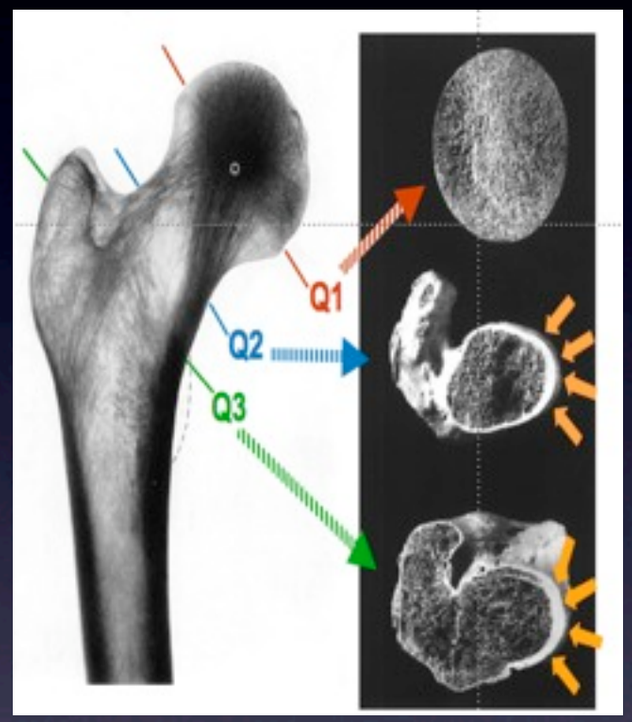
- Steep Learning Curve
- Limited Indications
- Risk of Fracture
- Late Remodeling and Aseptic Loosening
- Limited to MOM Bearings
- Extensive Soft Tissue Dissection
- ? Conservative

Preserve Soft & Hard Tissue

John Keggi will demonstrate the anterior surgical approach after lunch.



Why Save the Neck?



Freeman 1986

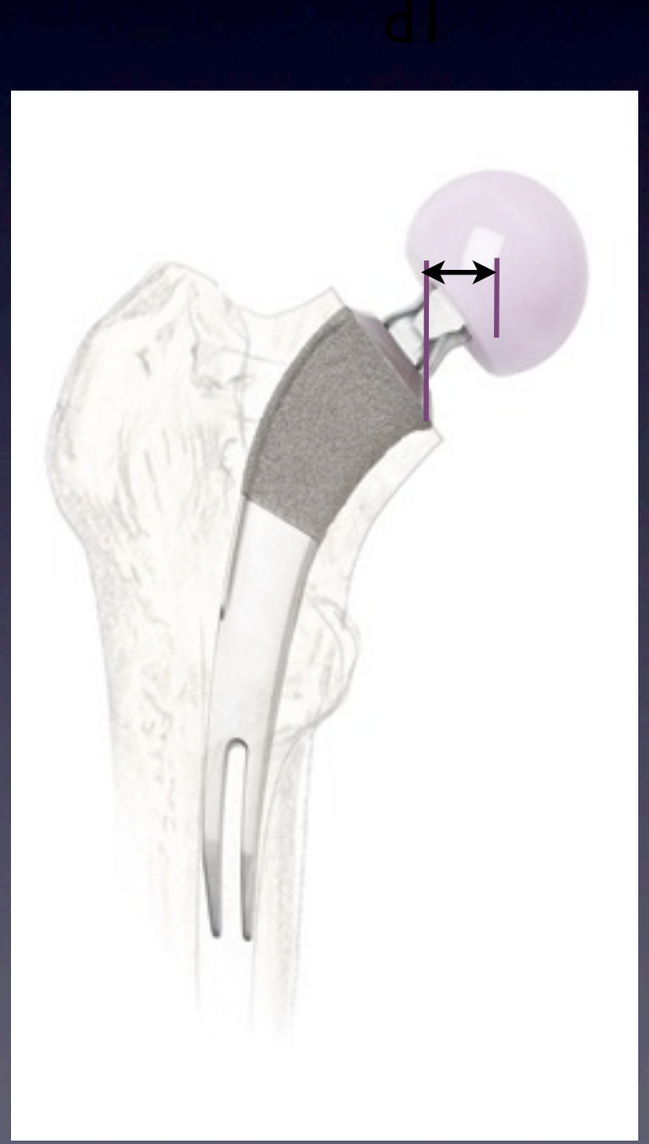
Whiteside Biomechanical Advantages

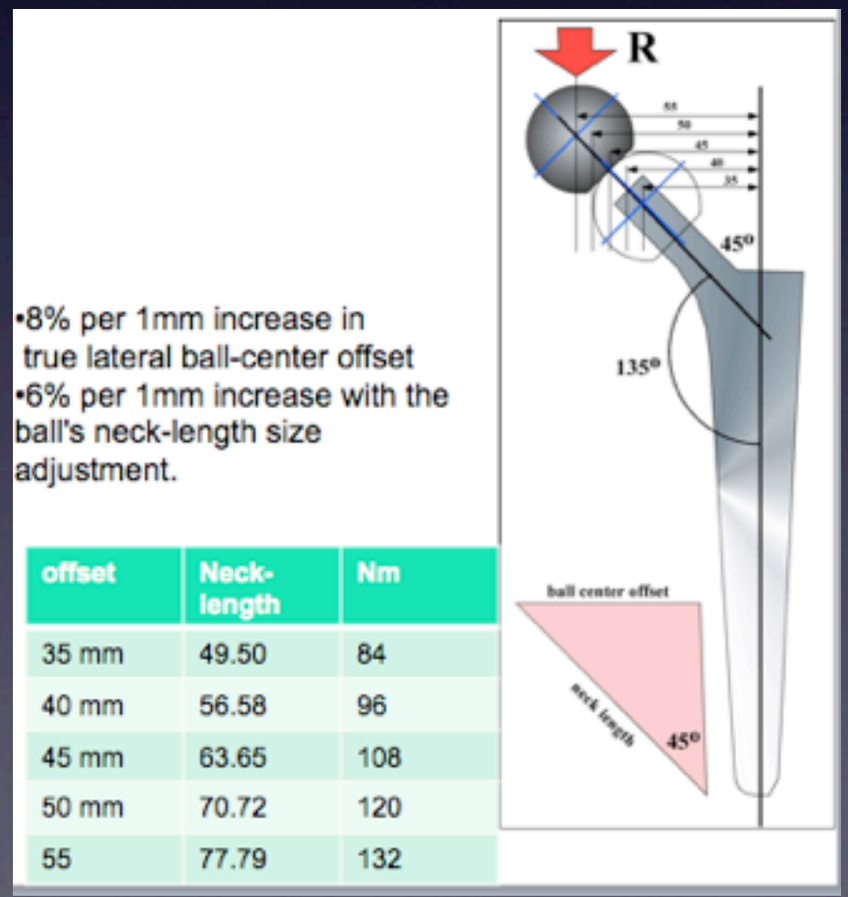
Pipino Preserving blood supply

Torsional loads : A/P resultant force

Neck resection generates significant torsional moment at the stem/bone interface Freeman

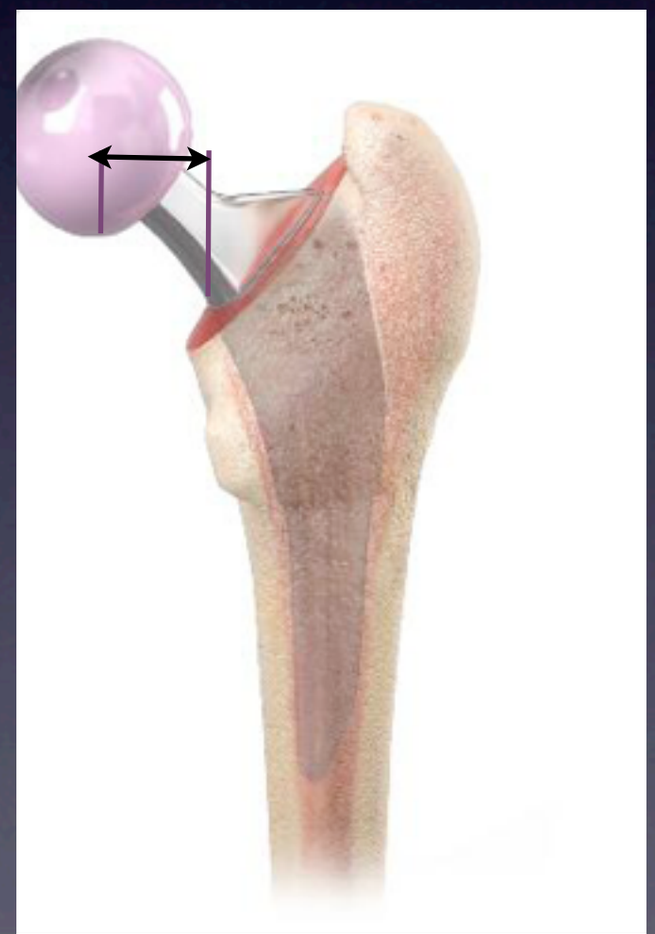
Saving the neck reduces bending and torsional forces





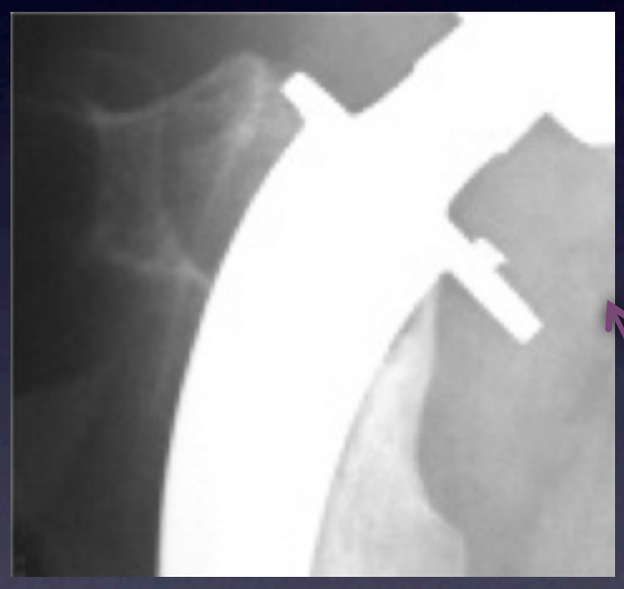
- 8% per 1mm increase in true lateral ball-center offset
- 6% per 1mm increase with the ball's neck-length size adjustment.

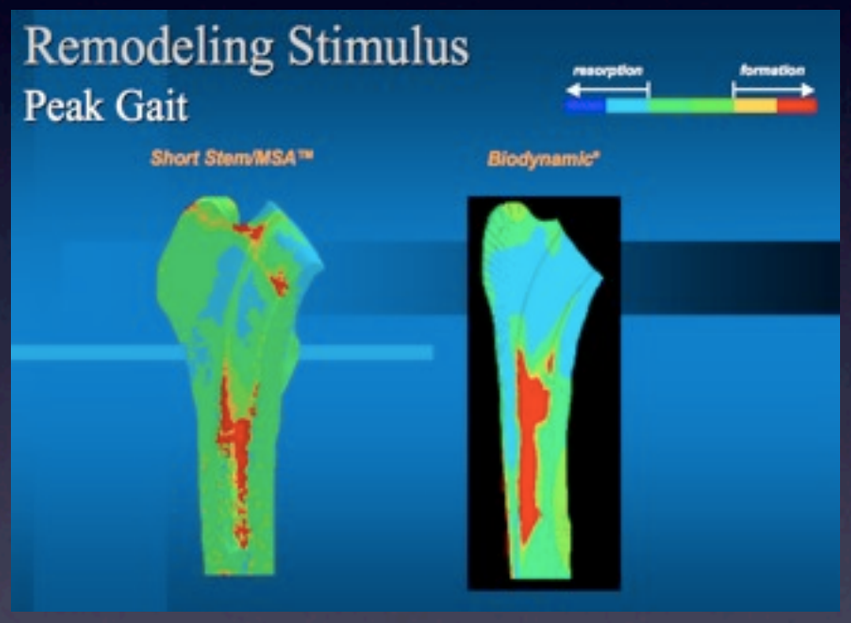
offset	Neck-length	Nm
35 mm	49.50	84
40 mm	56.58	96
45 mm	63.65	108
50 mm	70.72	120
55	77.79	132



Pipino current stem design CFP™ evolved from his Biodynamic experience.

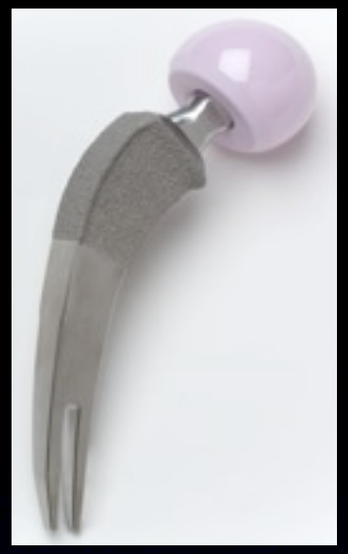
- He has experienced improved results over the CrCo material, but still encounters some stress shielding





Conical Flare
Prox load transfer

- FEA modeling of the MSA/ARC (conical flare) stem has demonstrated better bone loading patters compared to the Biodynamic™ design
- The CFP stem is the current bench mark in clinical/surgical results for short curved neck-sparing stems



Design Process

- Load the Neck- F.E.A., Conical Taper, Ti stem
- Determine Curve-Mueller, Thompson, Pipino
- Distal Stem Features - Sagital Slot, Lateral angle
- Modularity-CrCo neck, 8° and 12° varus/valgus, 12°anteversion
- Simplicity-5 sizes
- Choice of Bearing and Cup Options
- Instrumentation Compatible with Modern Approaches

Saves Bone
compared to standard M/L taper stem design

Design Process

- Cadaver Studies
- In Vivo studies with instruments and trials
- 5 custom cases in Australia
- U.S. Approval-510K April 2010
- Manufacturer's Limited Release

Tissue Sparing

Acetabular Considerations

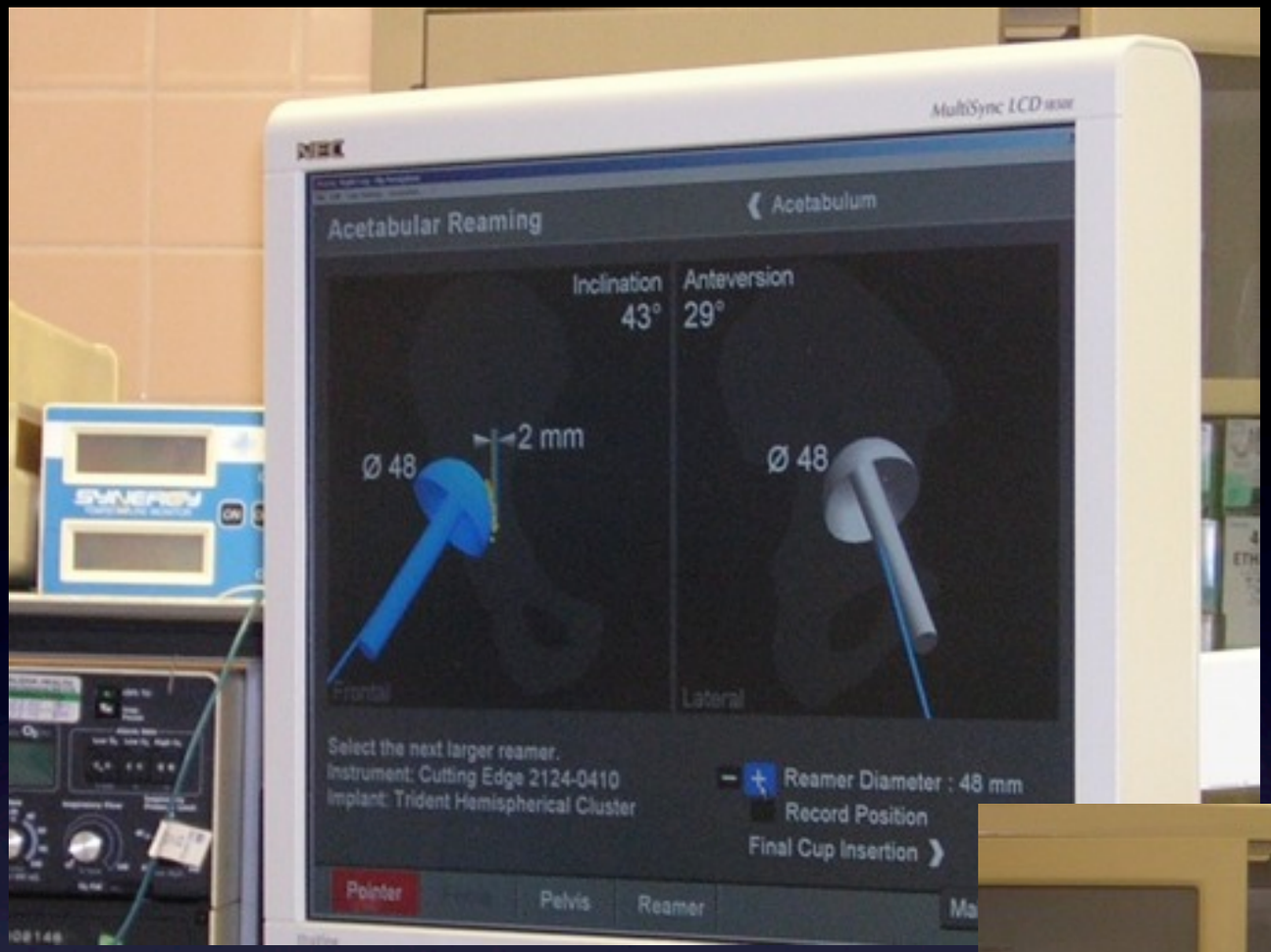
In an effort to increase stability....

Do not compromise the Acetabulum

Do not over-ream to accommodate the next larger head

Large head diameter is no substitute for proper acetabular placement

Small women represent a challenge

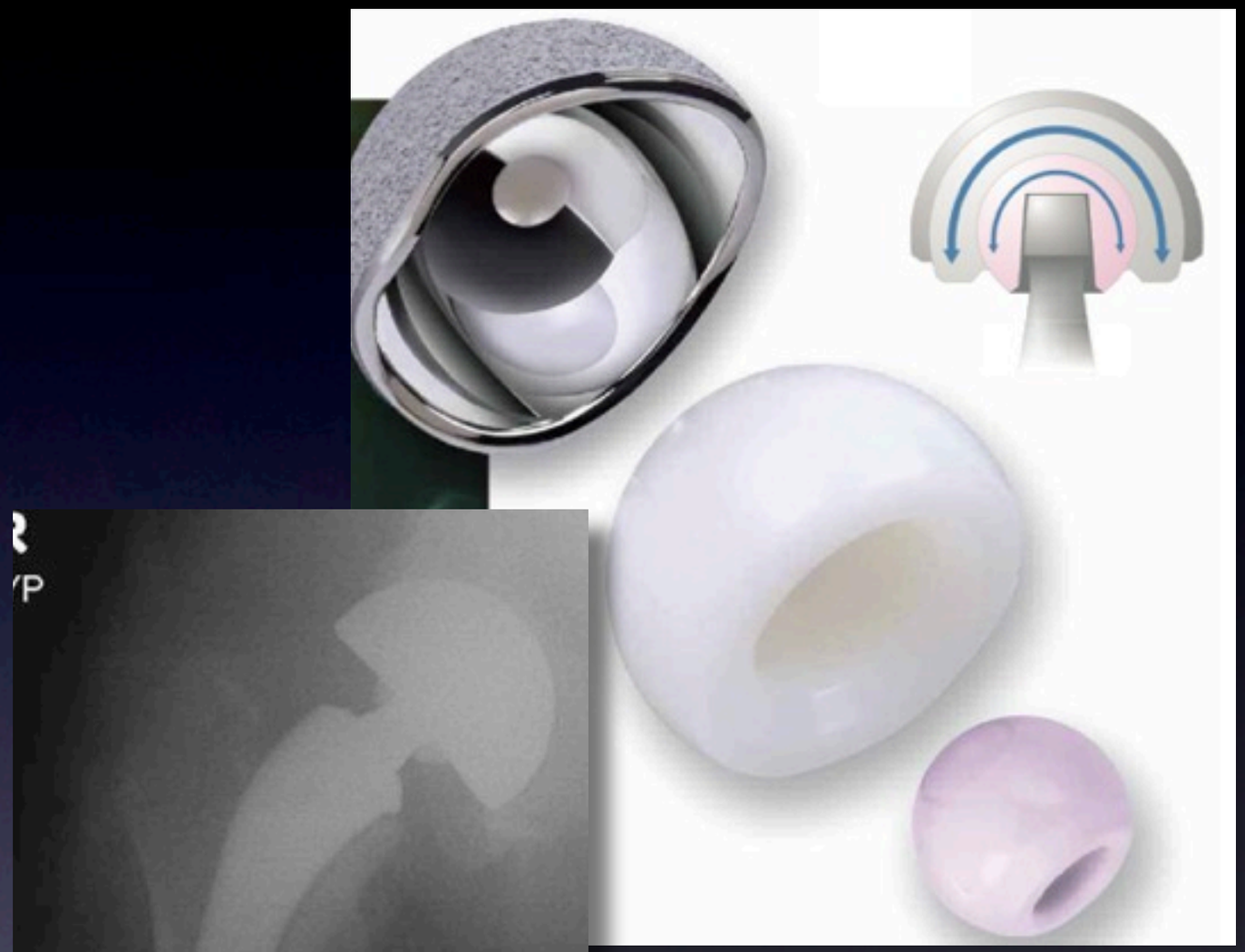

MultiSync LCD
Acetabular Reaming
Acetabulum
Inclination
43°
Anteversion
29°
Ø 48
2 mm
Ø 48
Frontal
Lateral
Select the next larger reamer.
Instrument: Cutting Edge 2124-0410
Implant: Trident Hemispherical Cluster
Reamer Diameter : 48 mm
Record Position
Final Cup Insertion
Pointer
Pelvis
Reamer


Final Reduction
Lengthening
6 mm
Lateralization
3 mm
65° Flexion
25° Adduction
27° Int. Rot.
11 mm Lift-Off
Max. Flexion and Int. Rot.
Press SELECT to record current leg position.
Femur
Pelvis

Metal on Metal

another relative "contraindication"

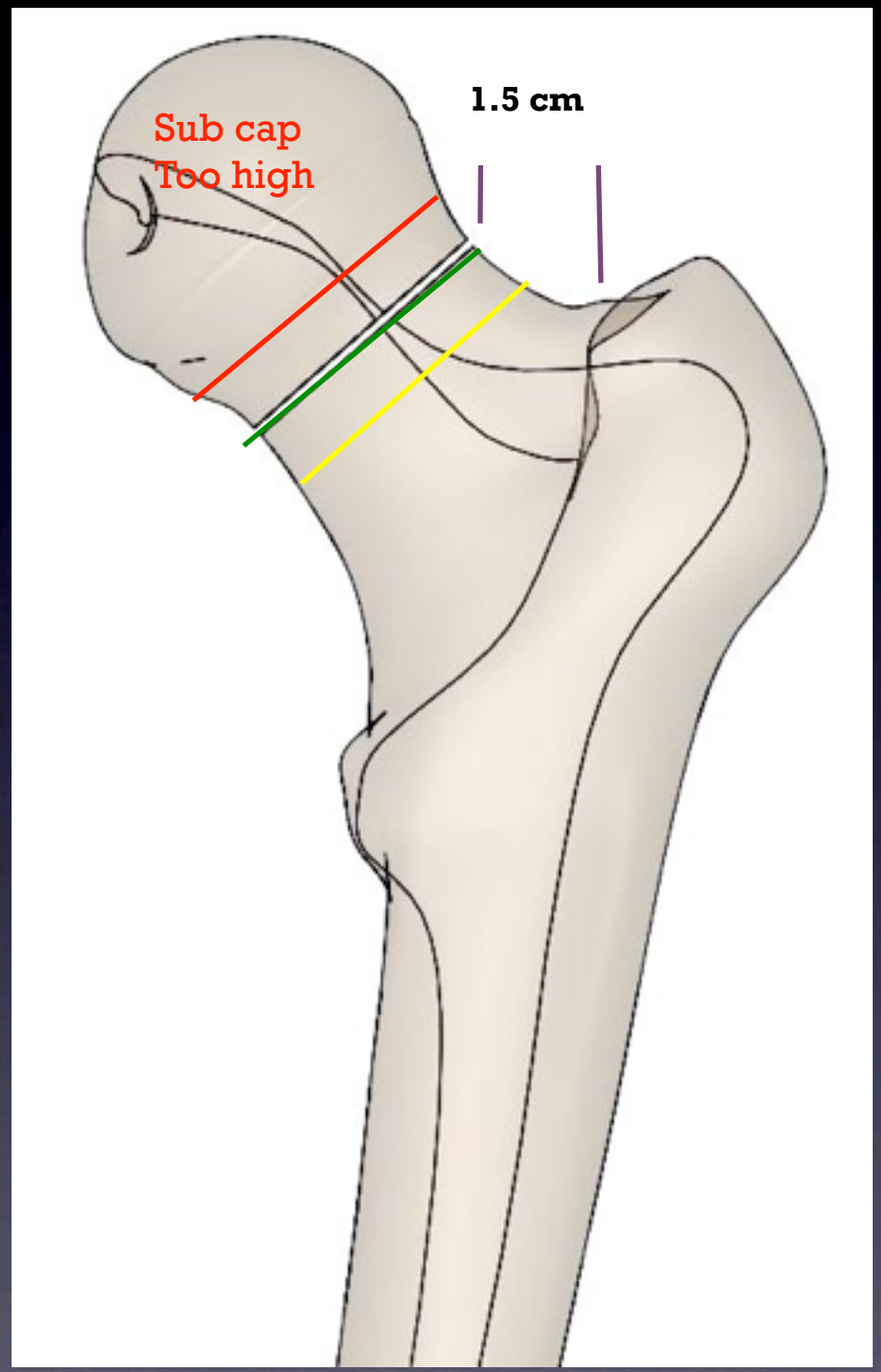
Dual Mobility Cups



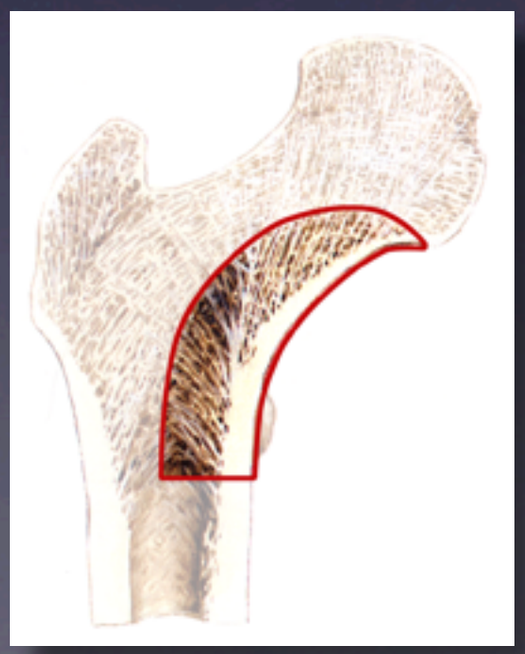
Surgical Technique

Level of Neck Resection

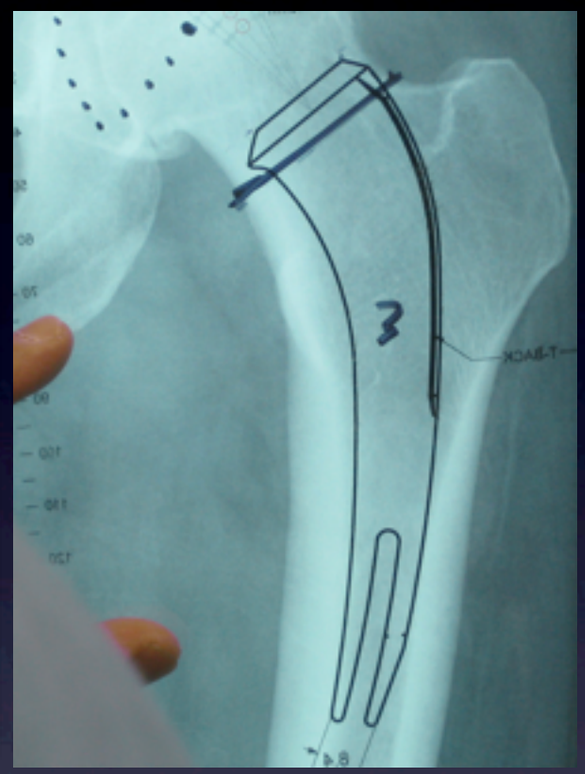
Angle of Neck Resection 50°



Rasping the Medial curve



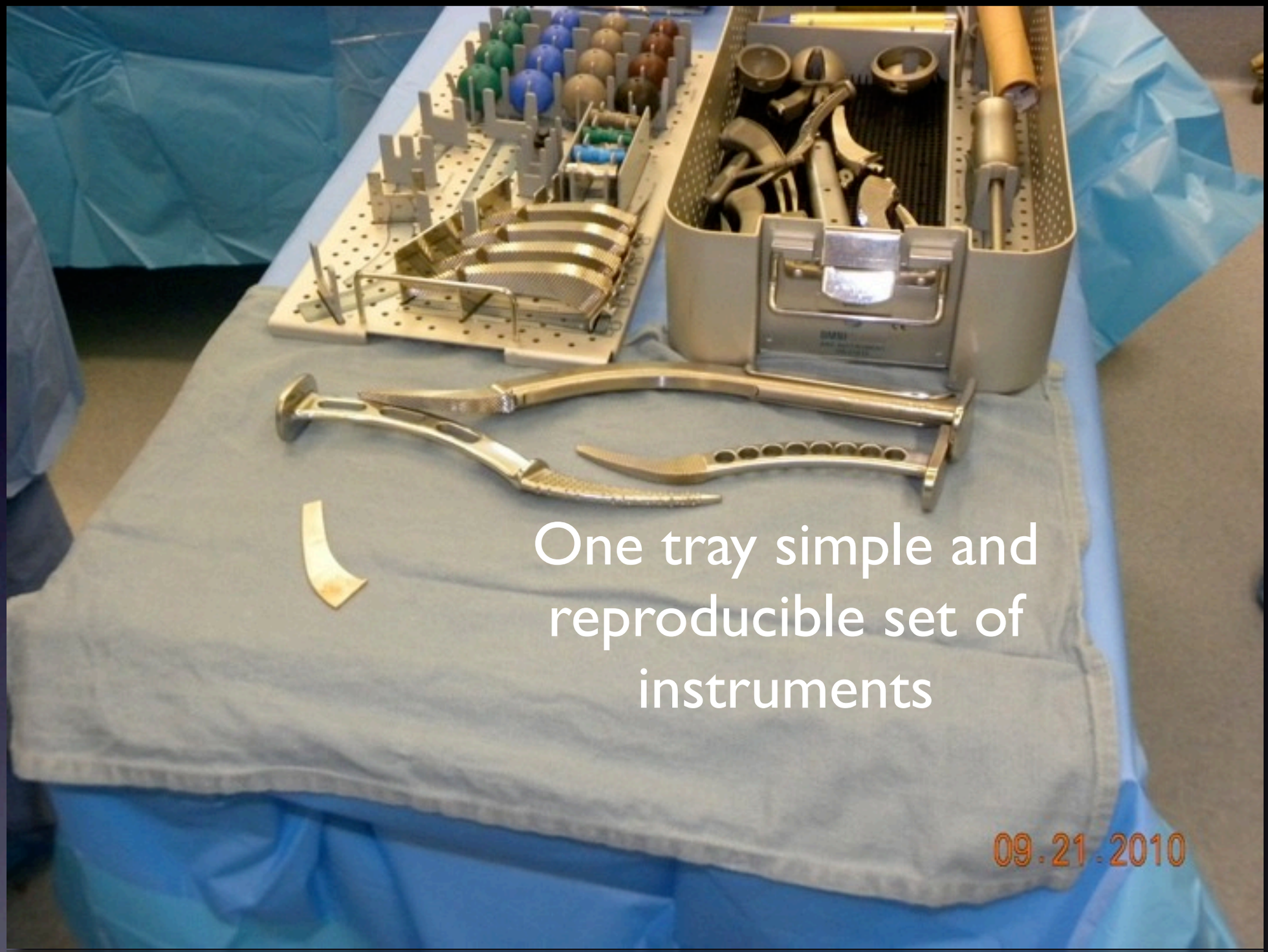
Templating



AP helps determine neck level of resection
Lateral helps determine stem size

You don't template like a conventional stem. This would be too tight. The distal stem is a pilot. A size #2 will ensure proper seating of the conical flair.

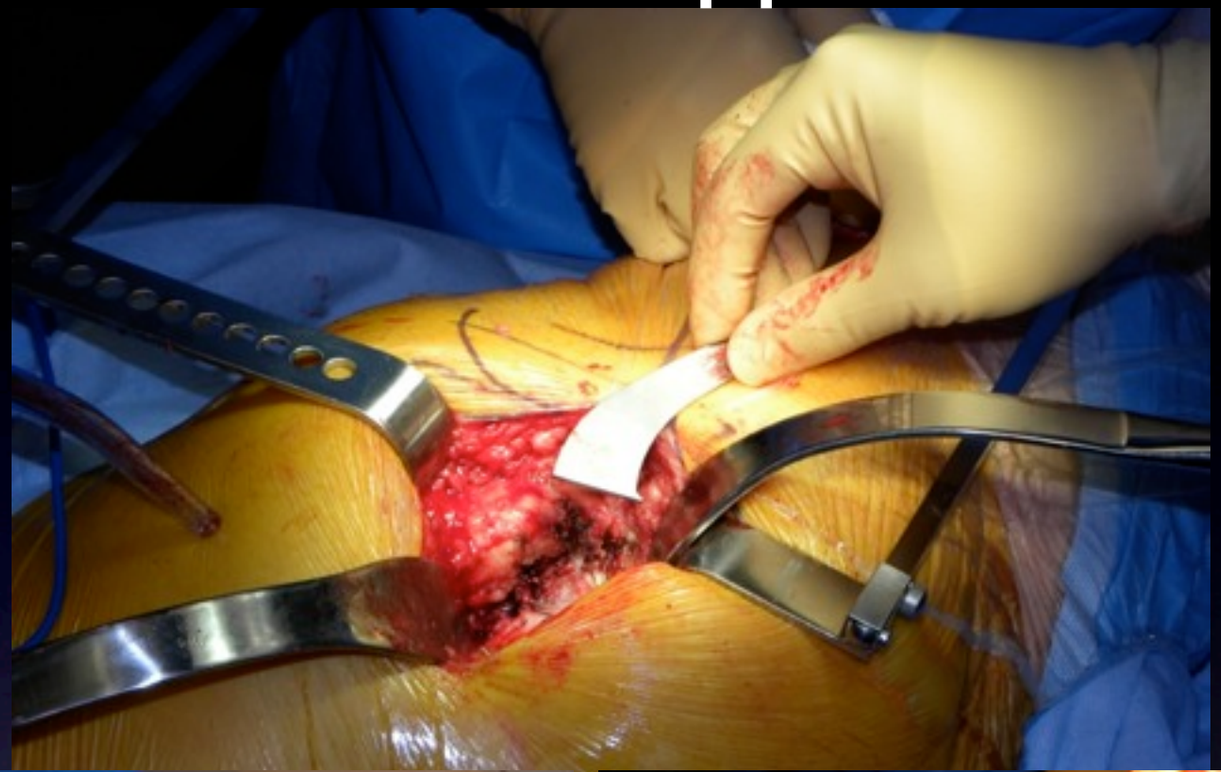
(Ideally AP film should be in Internal Rotation)

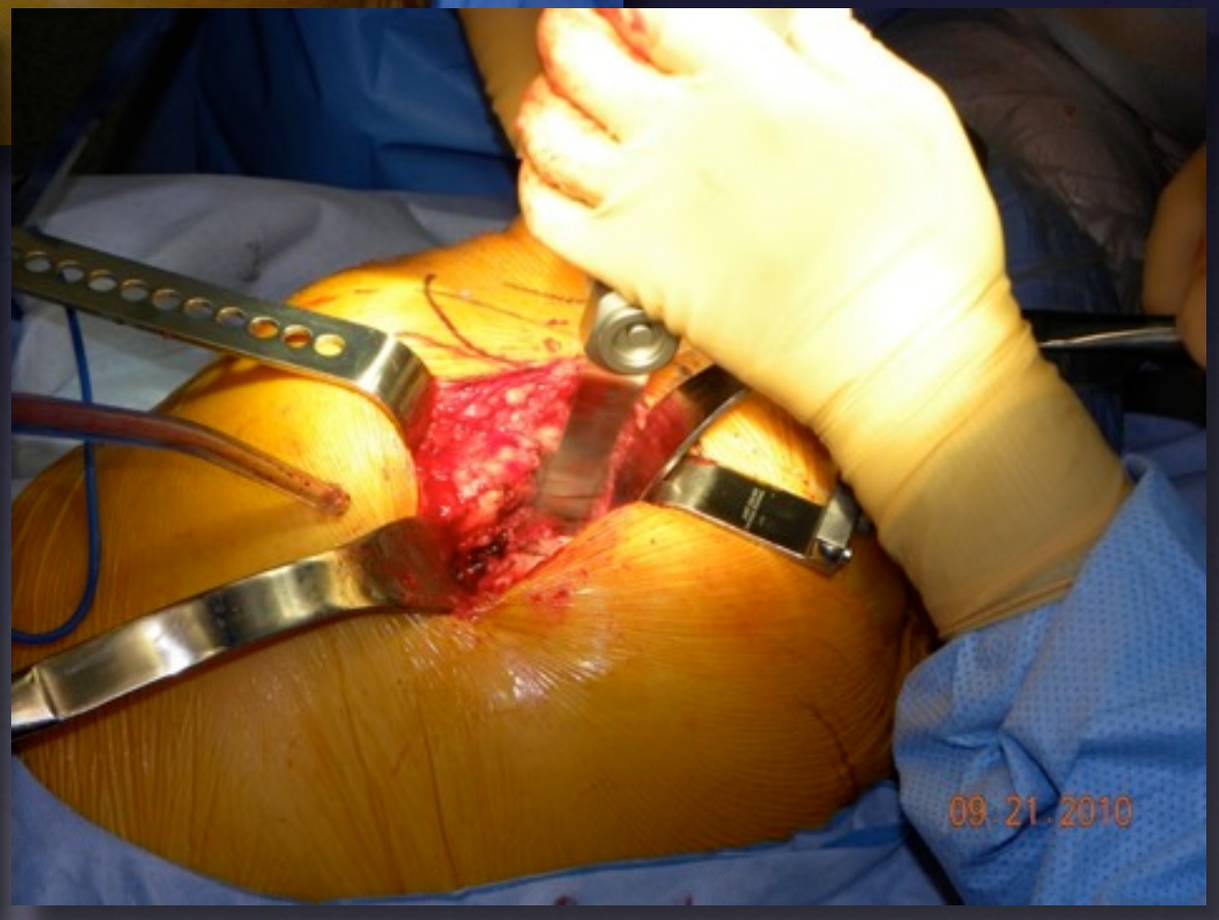


One tray simple and reproducible set of instruments

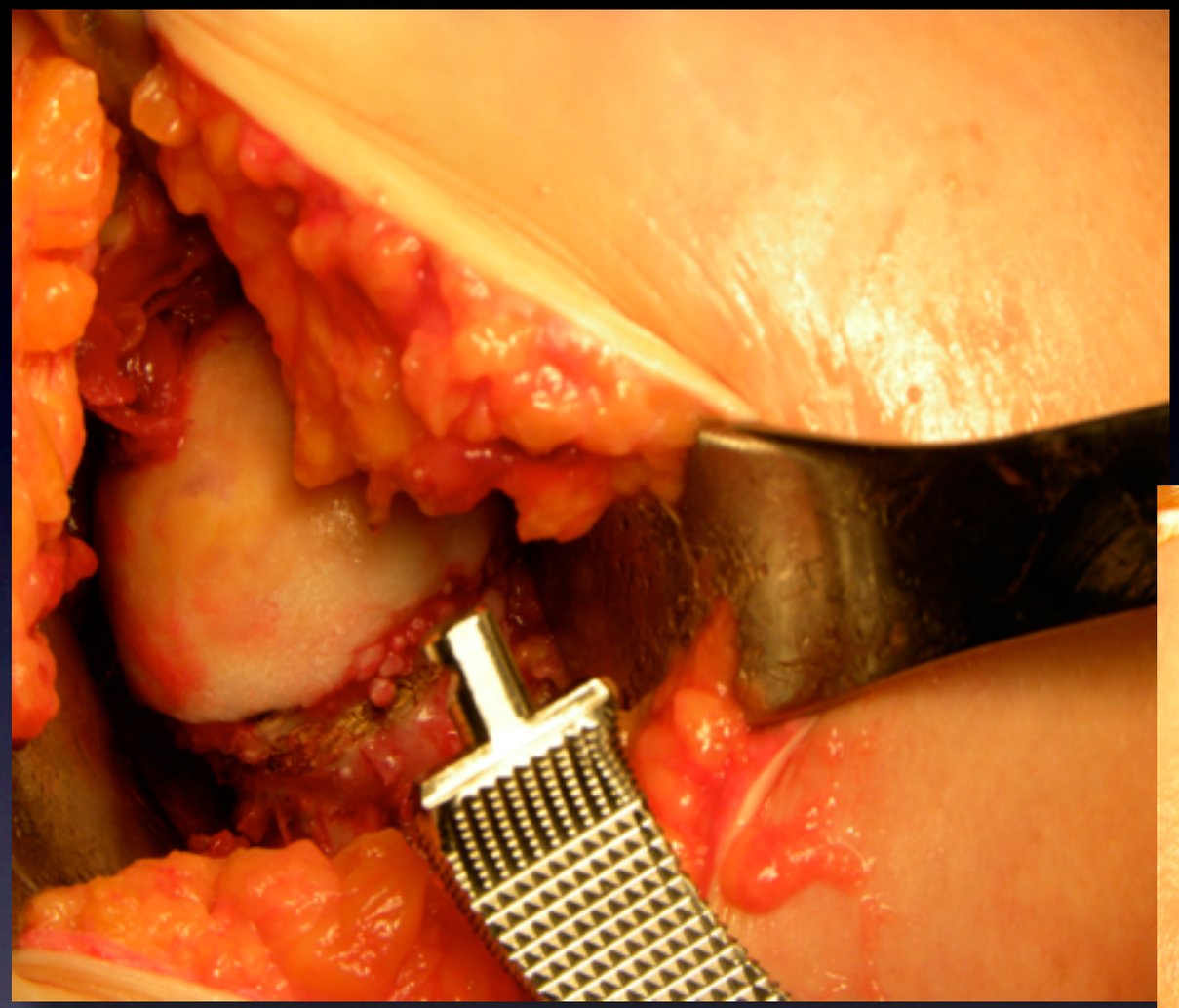
Surgical Technique

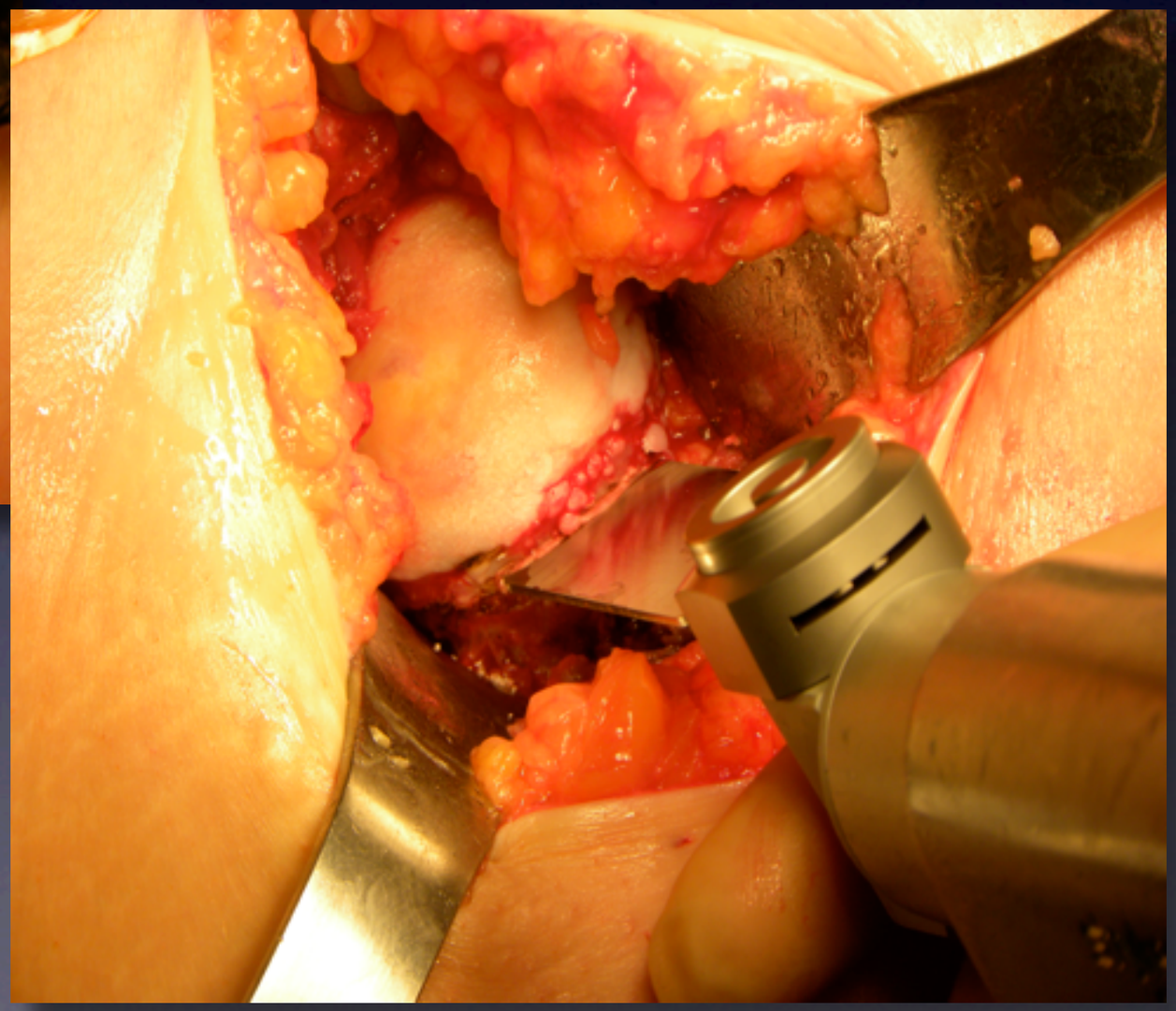
Posterior Approach

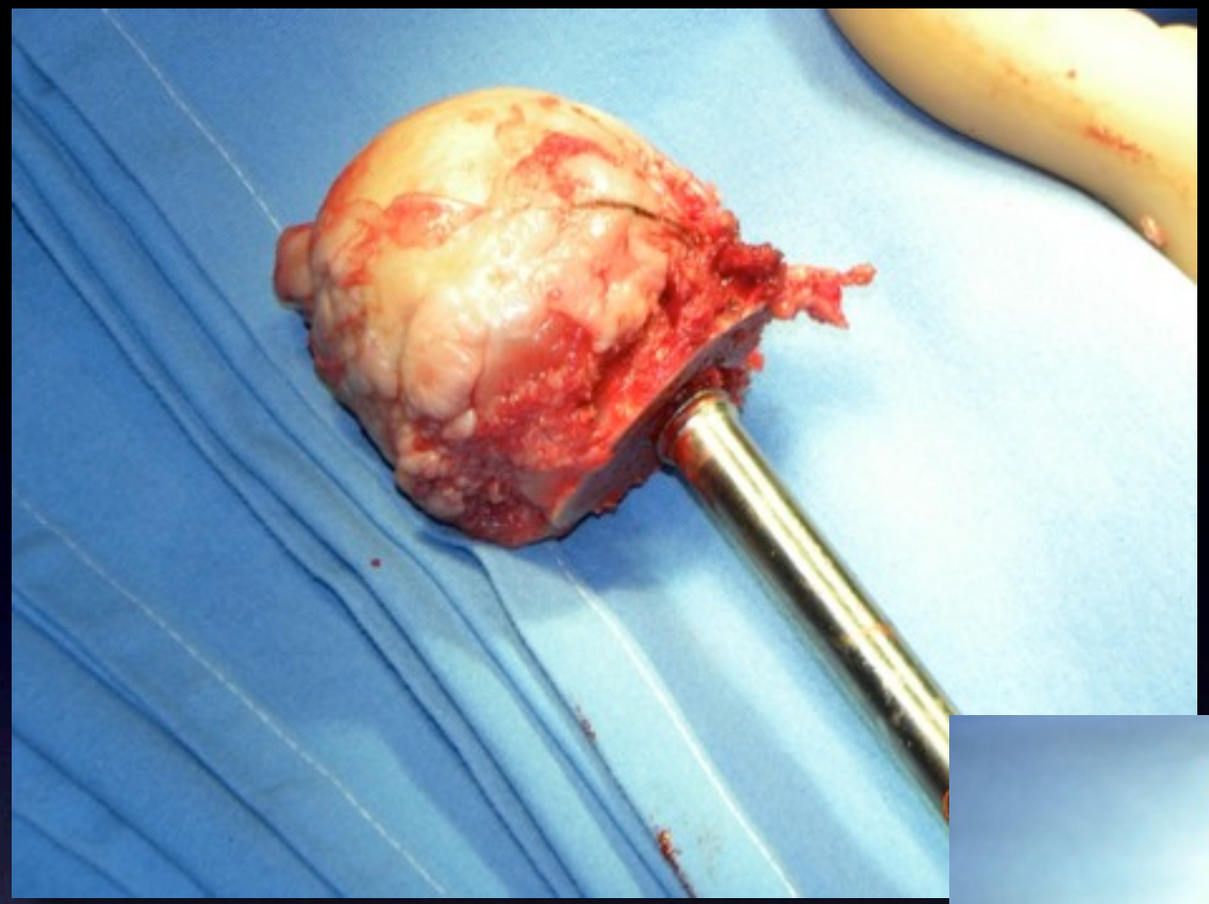




Anterior Approach





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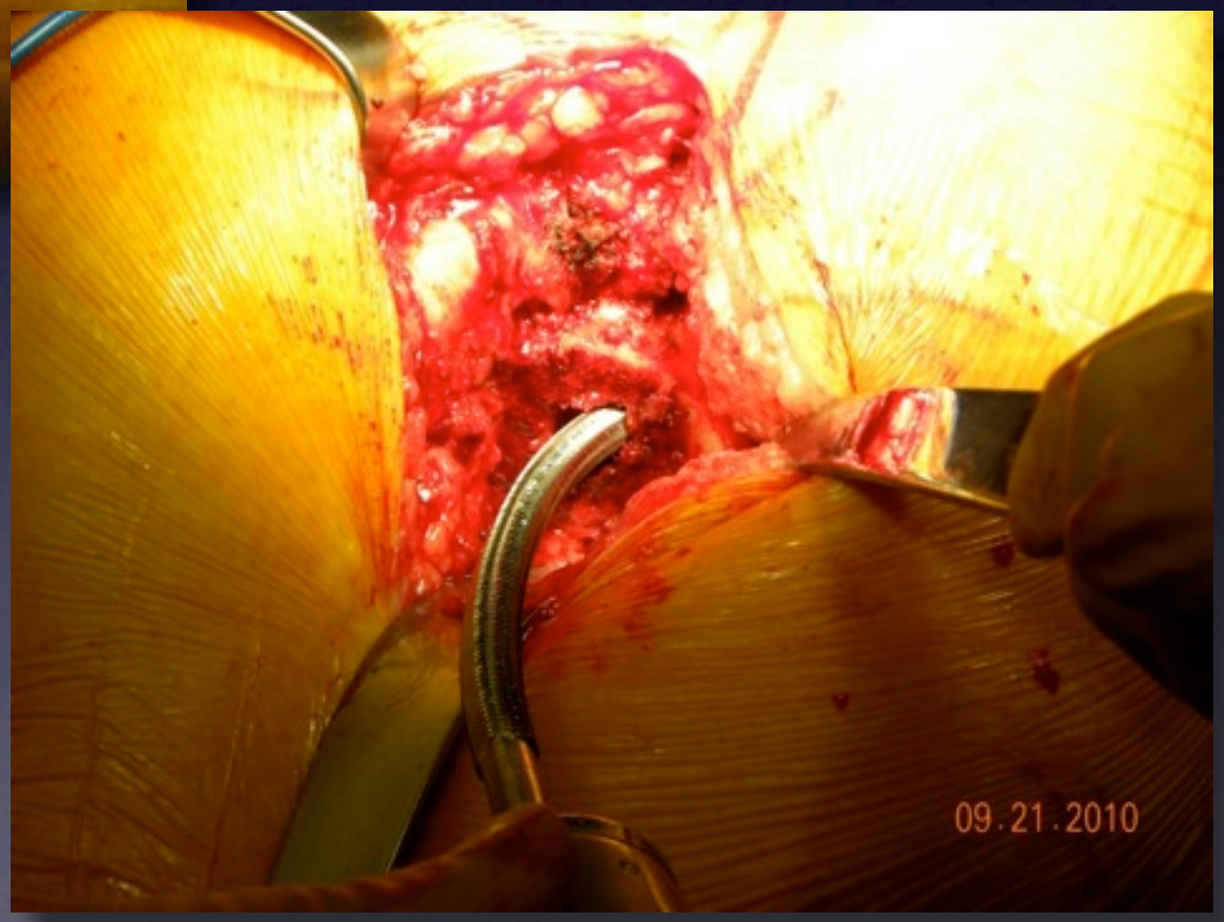
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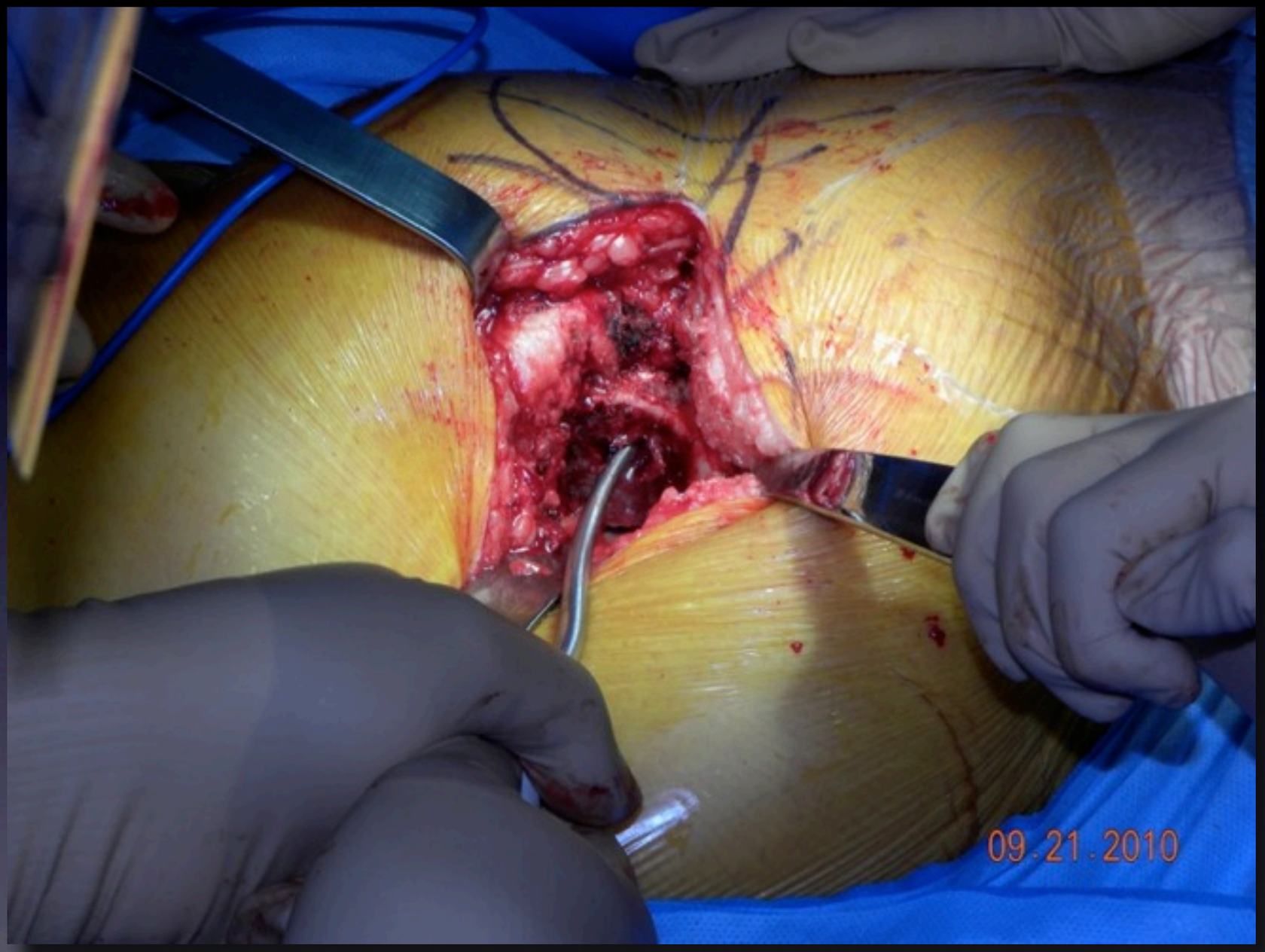
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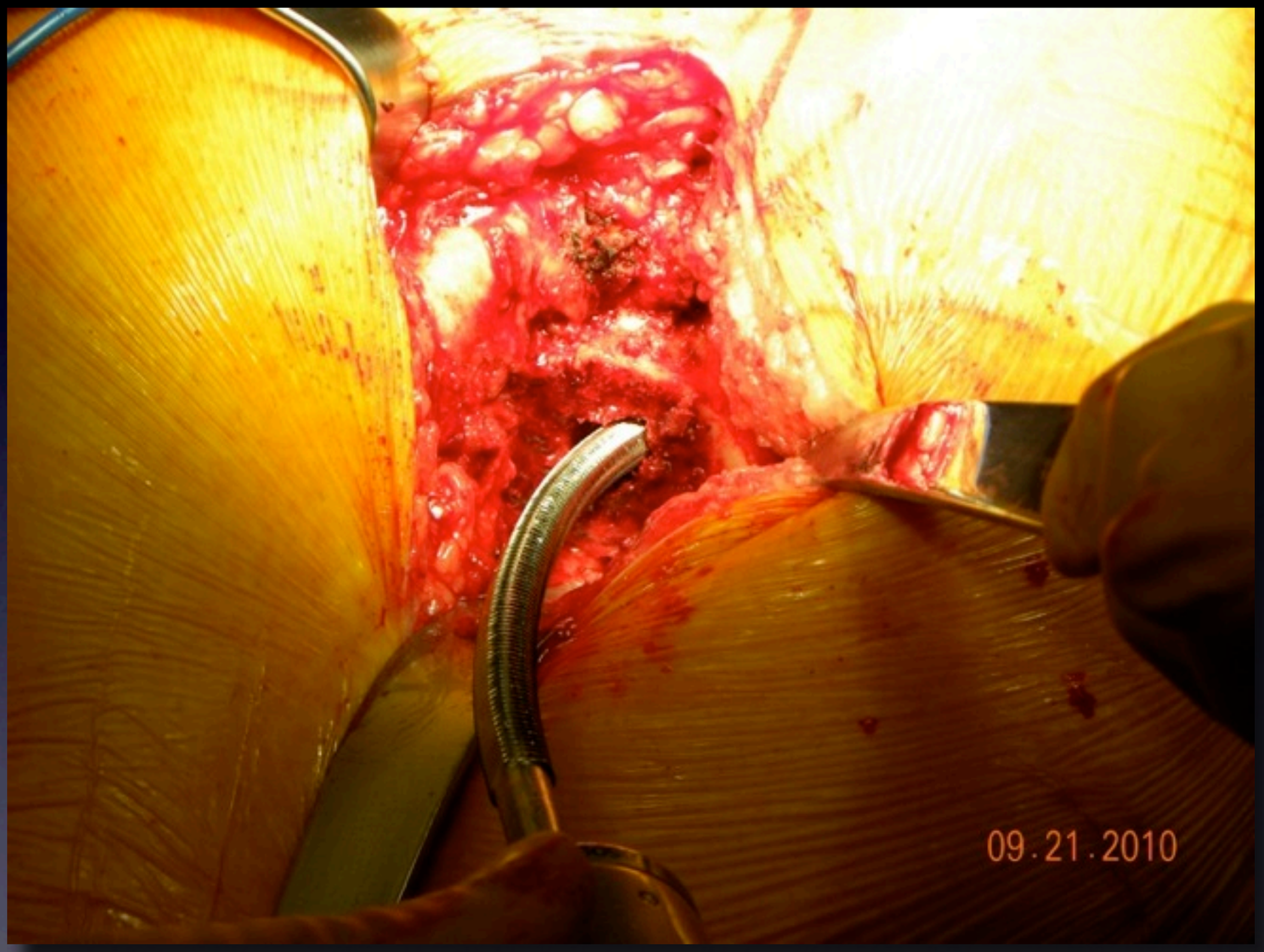
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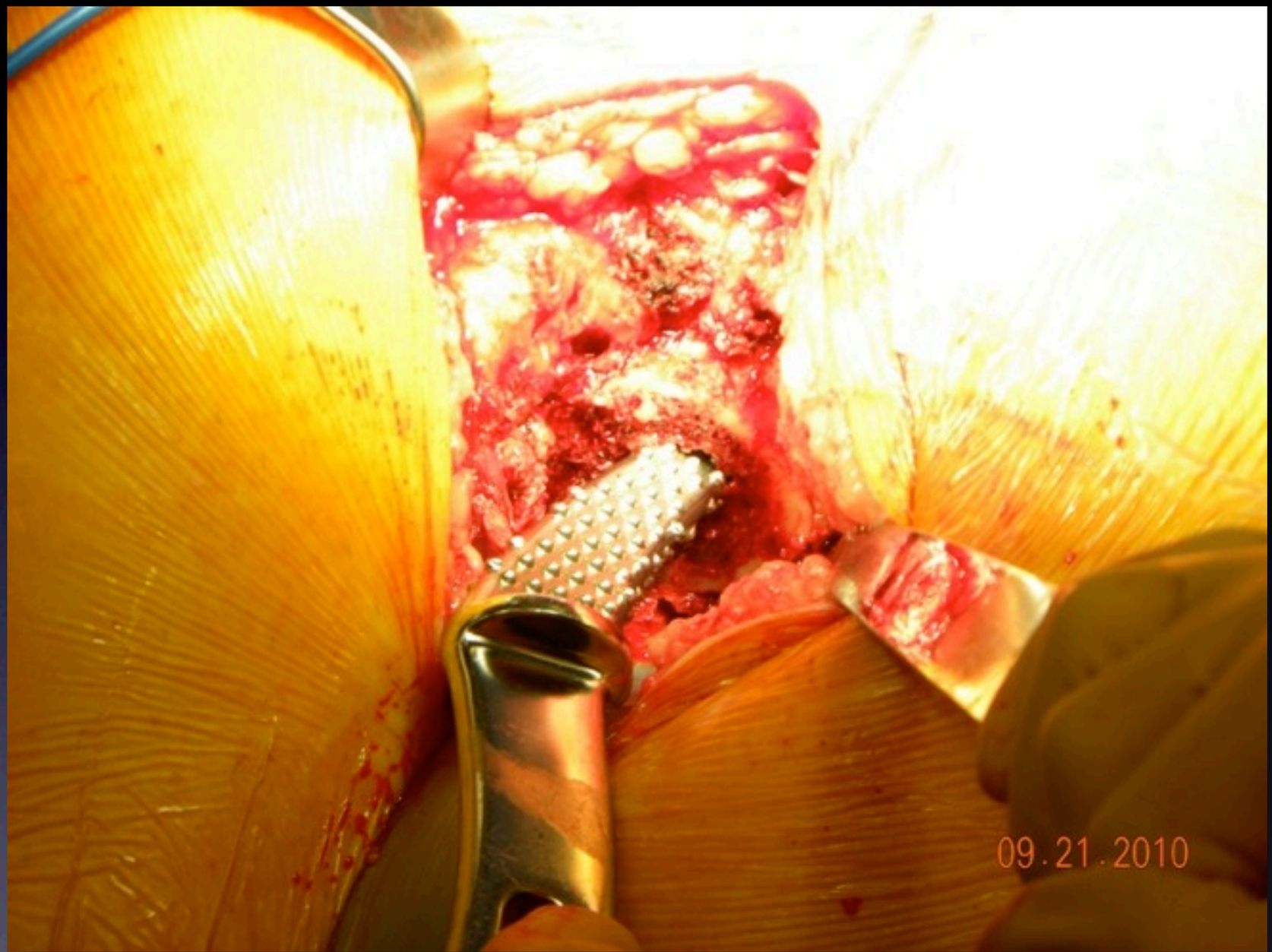
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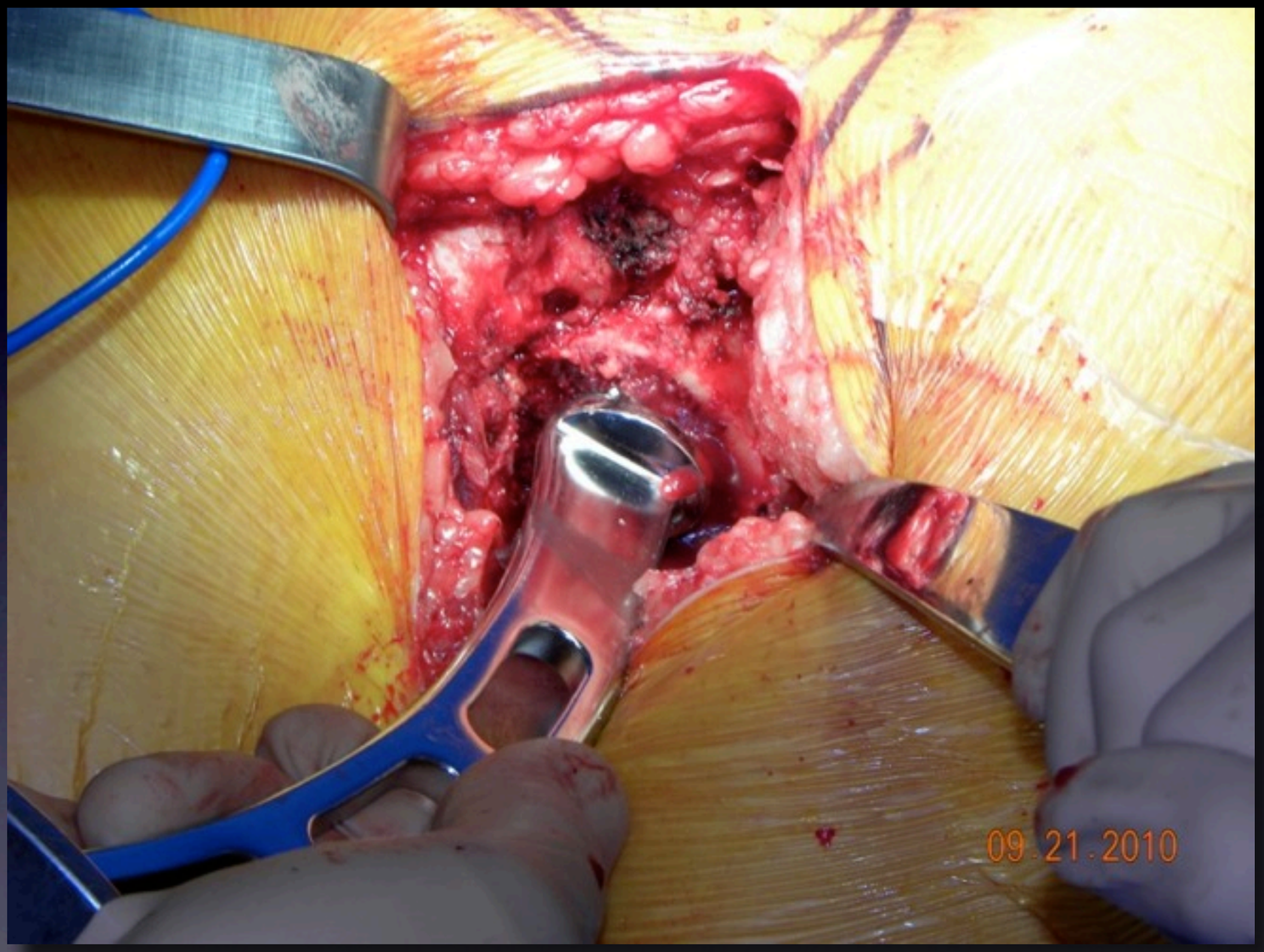
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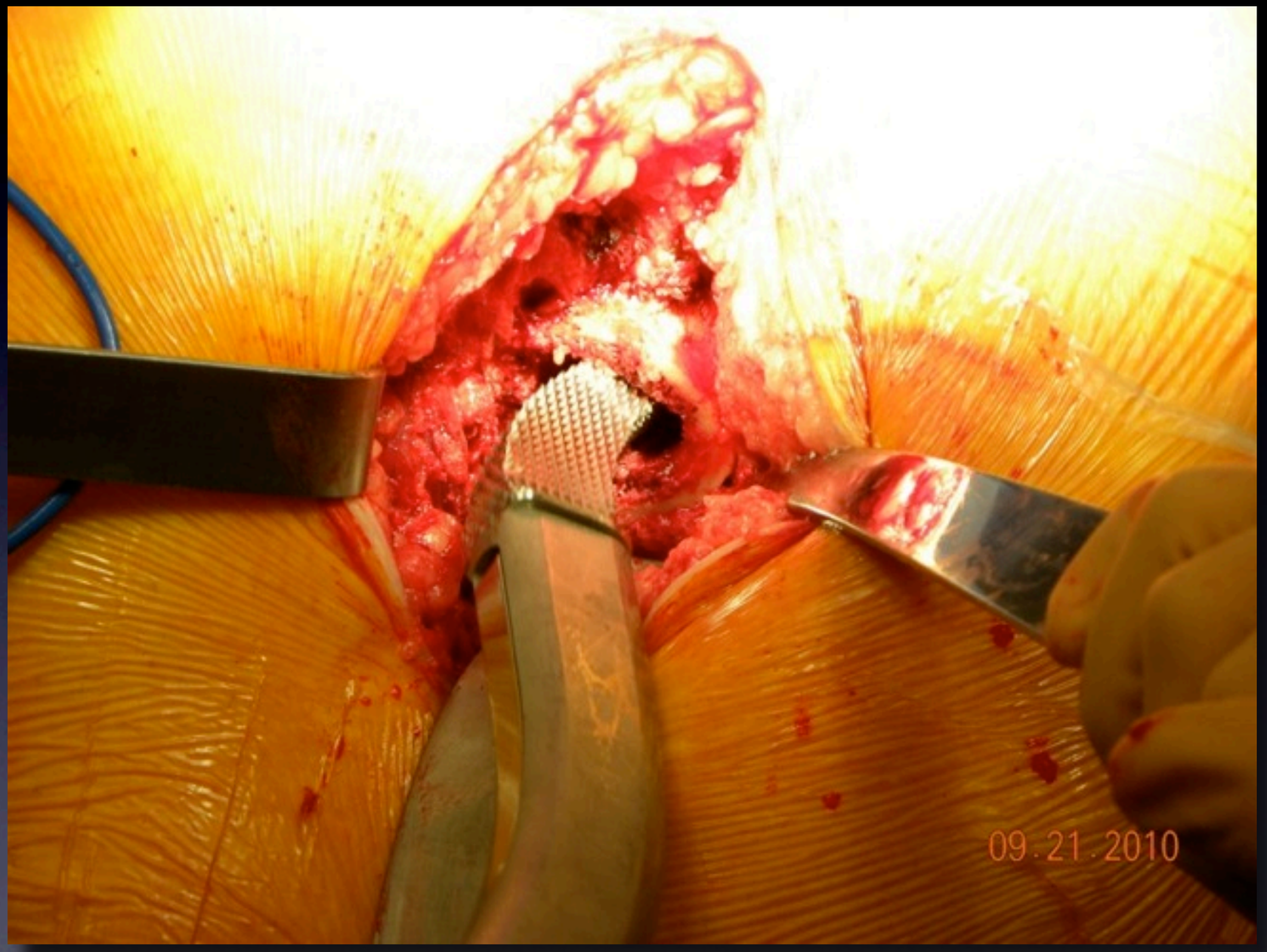
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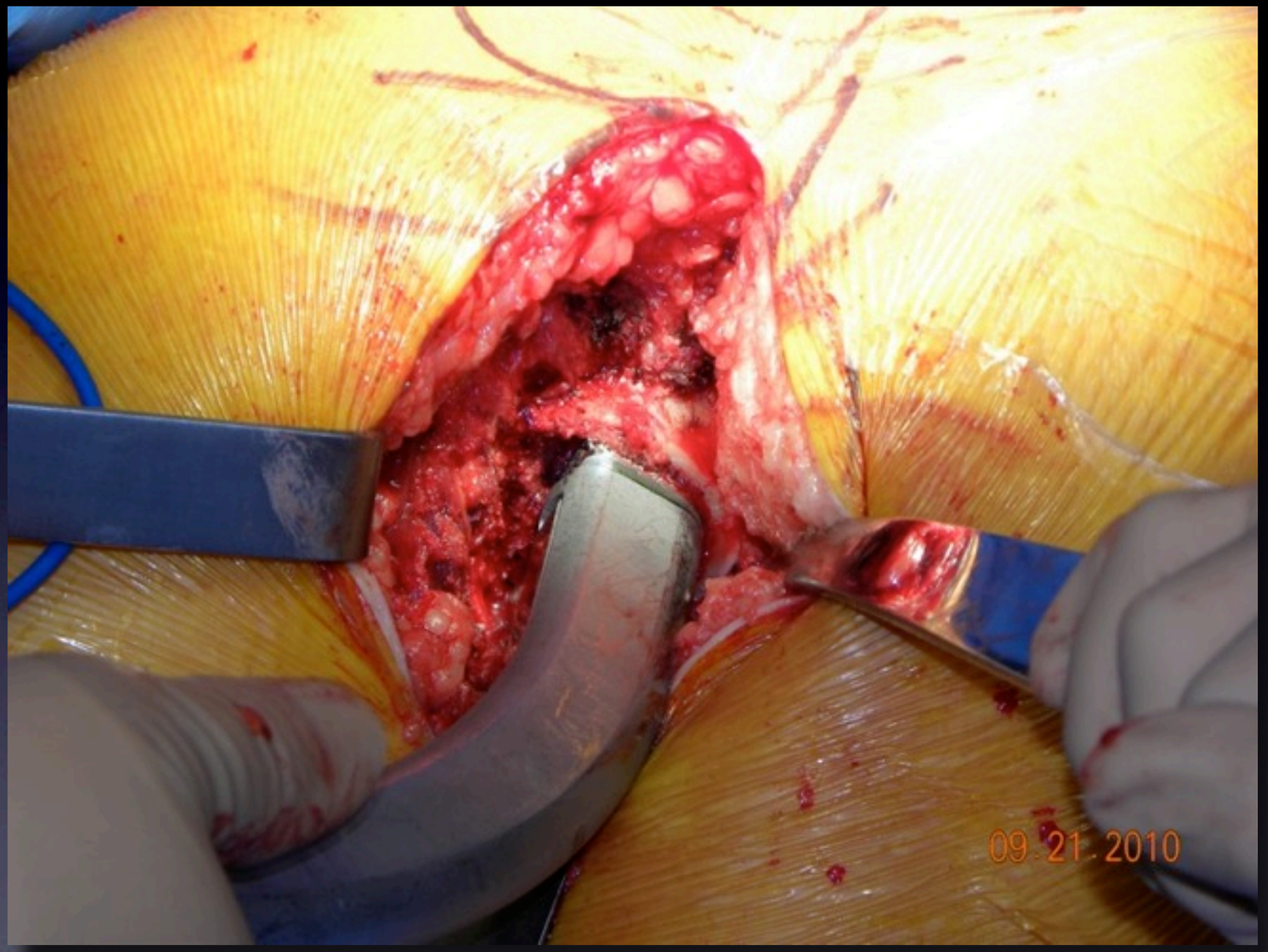
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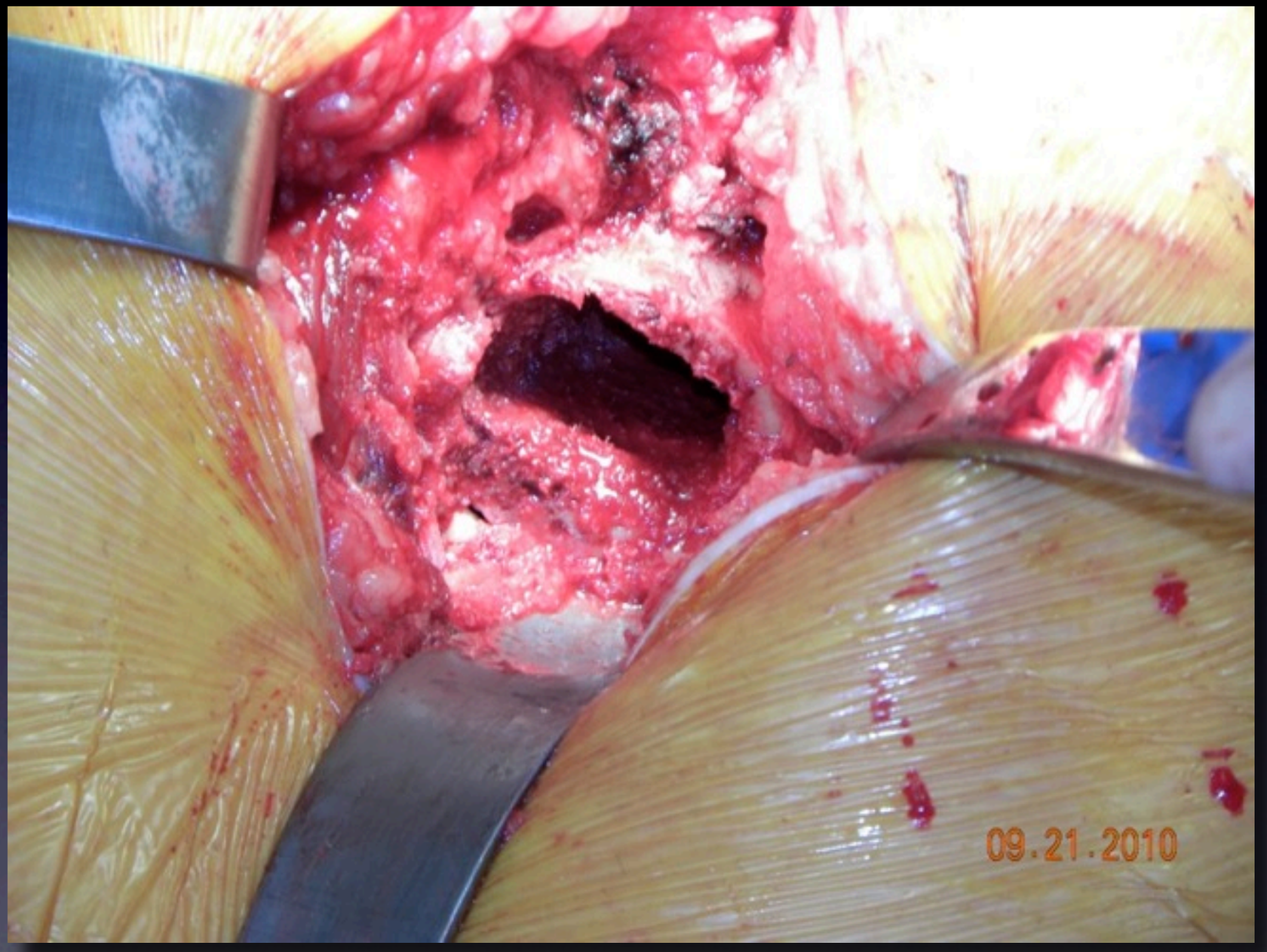
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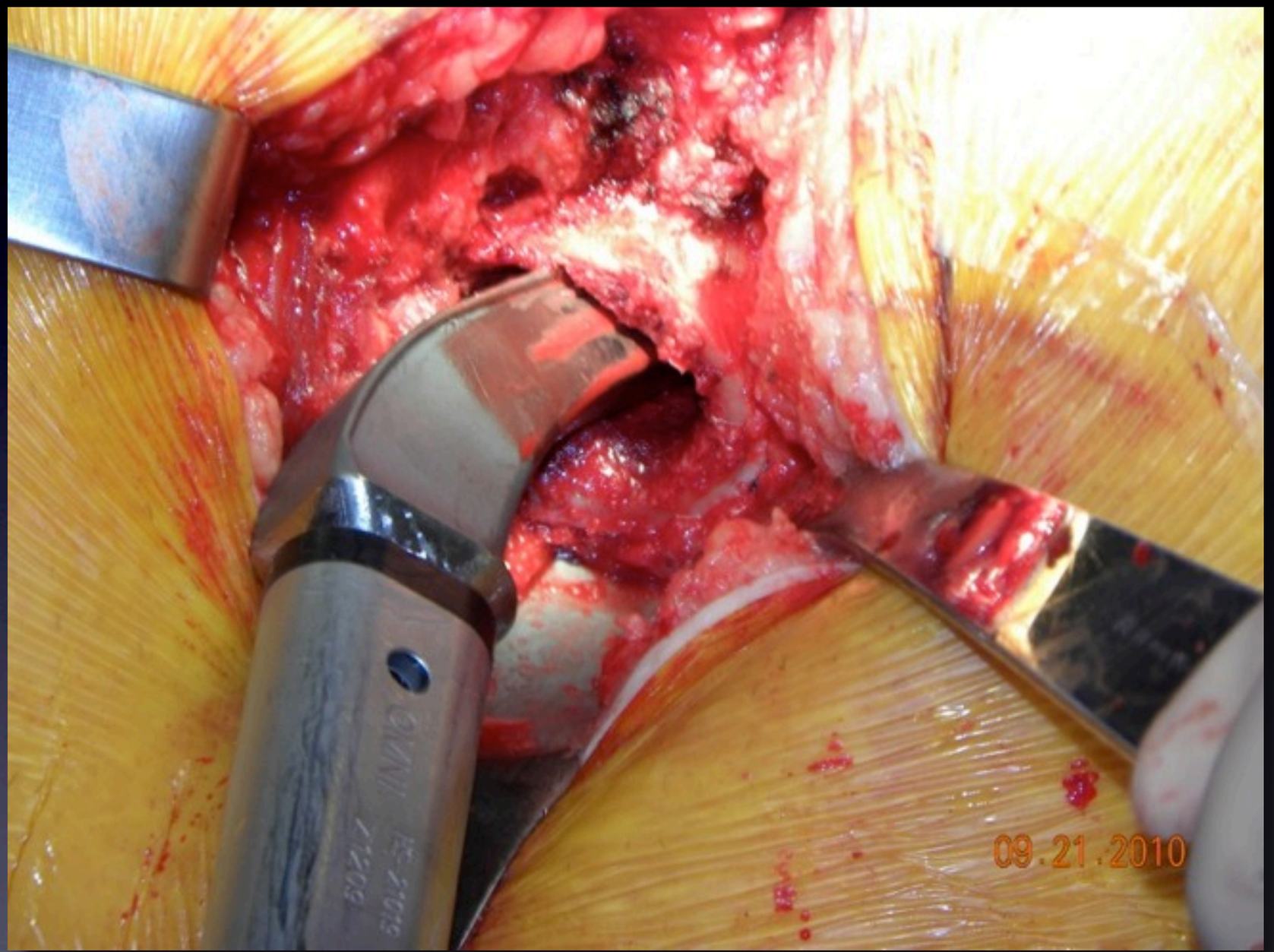
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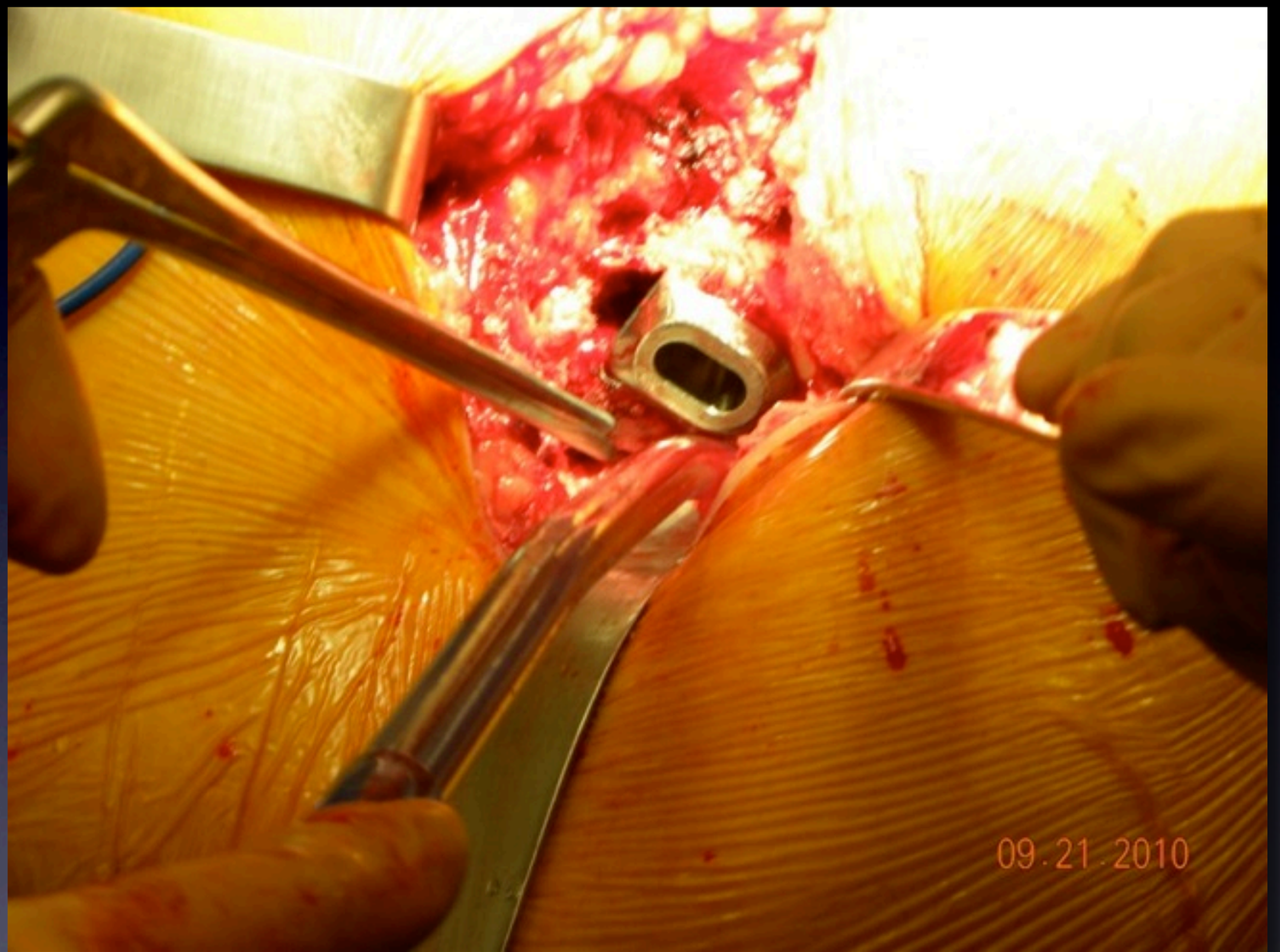
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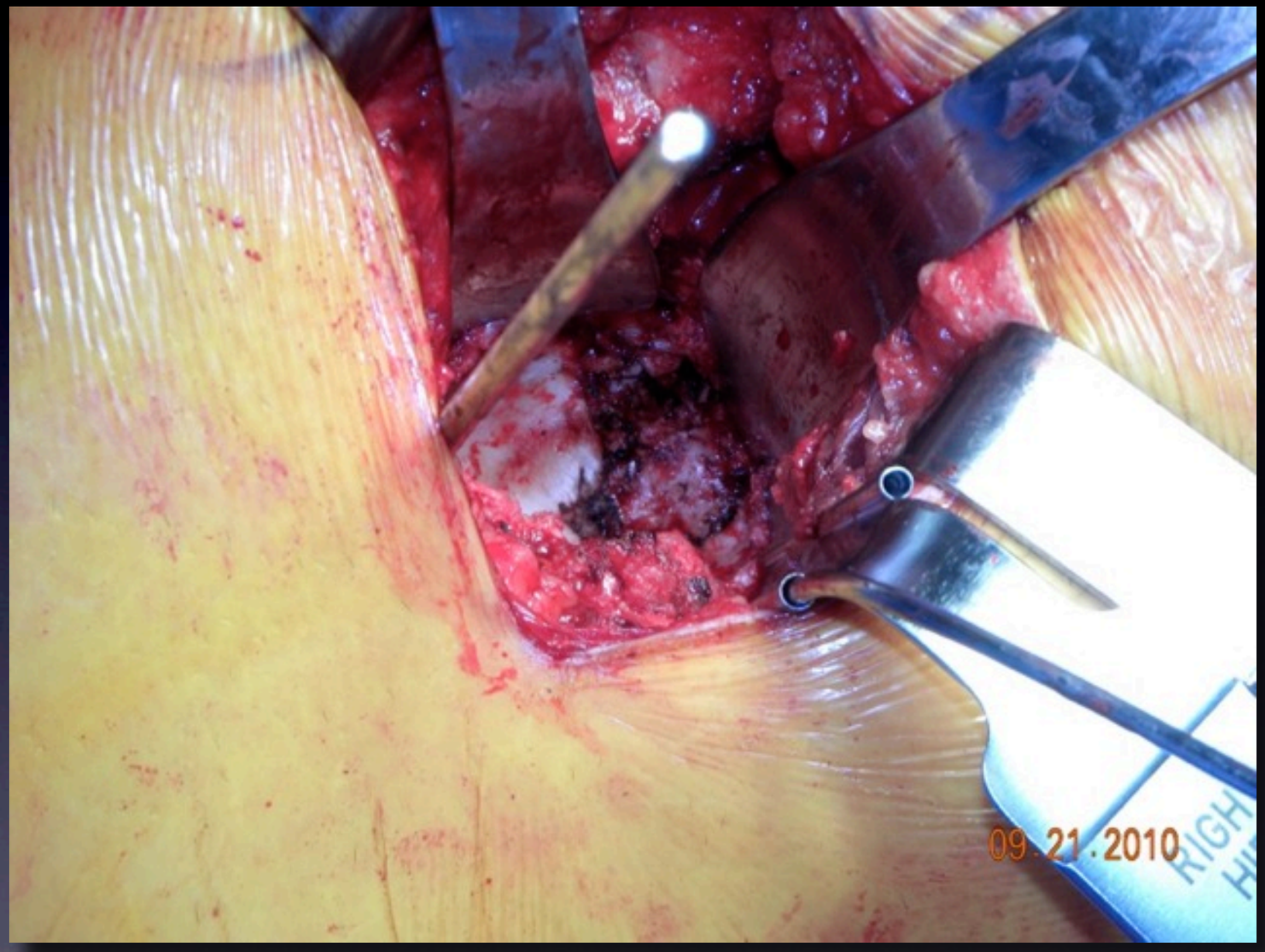
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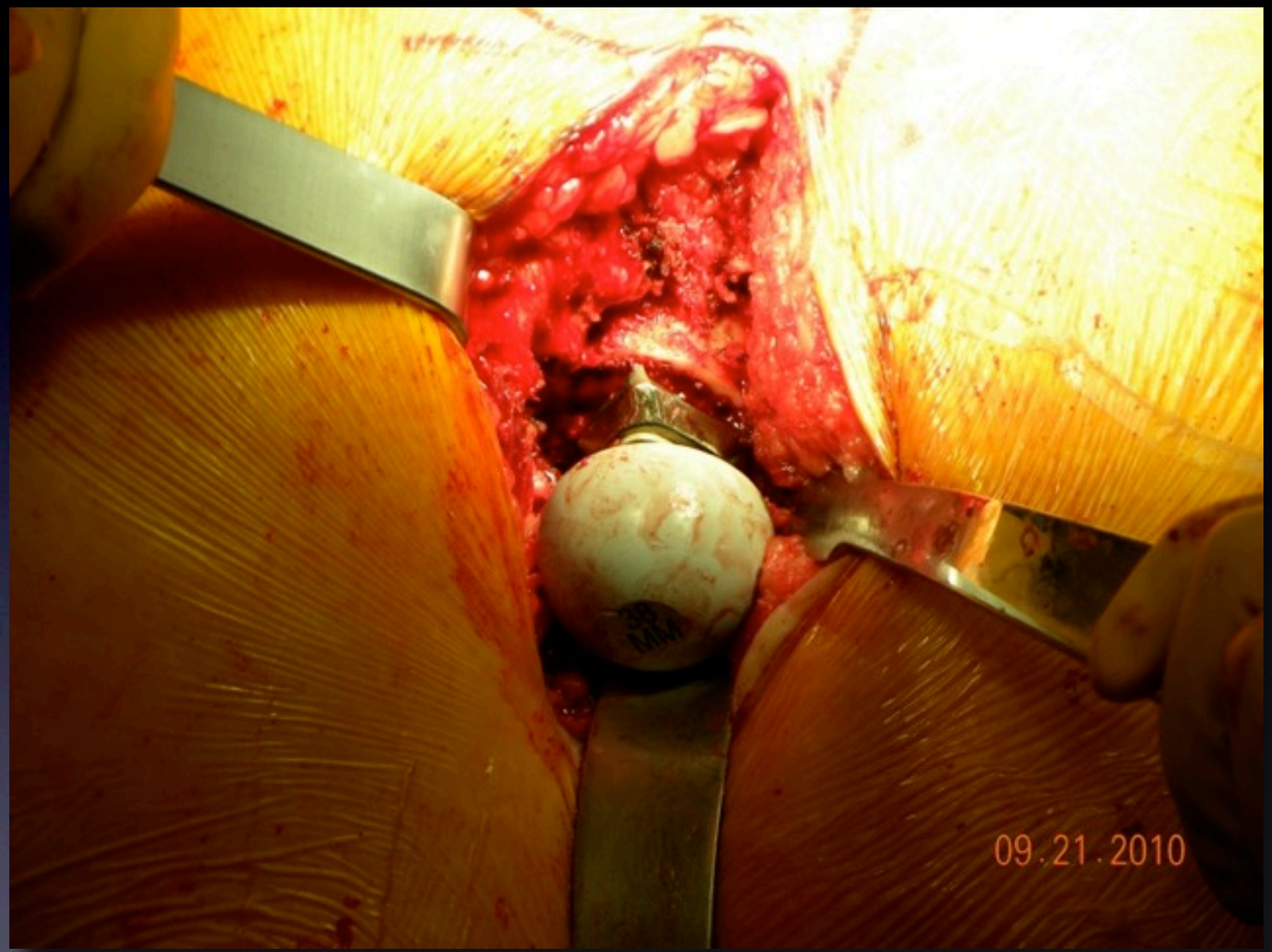
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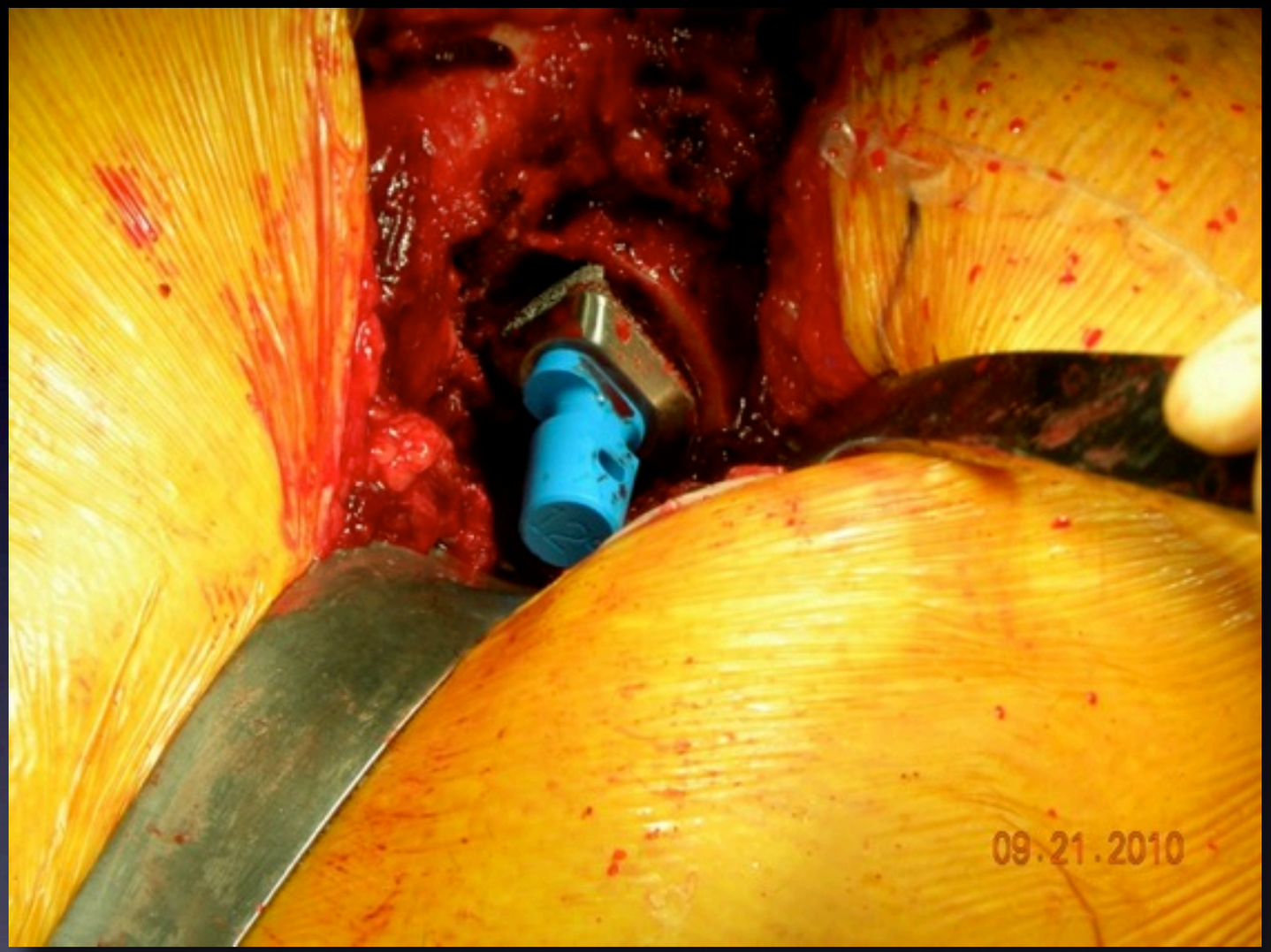
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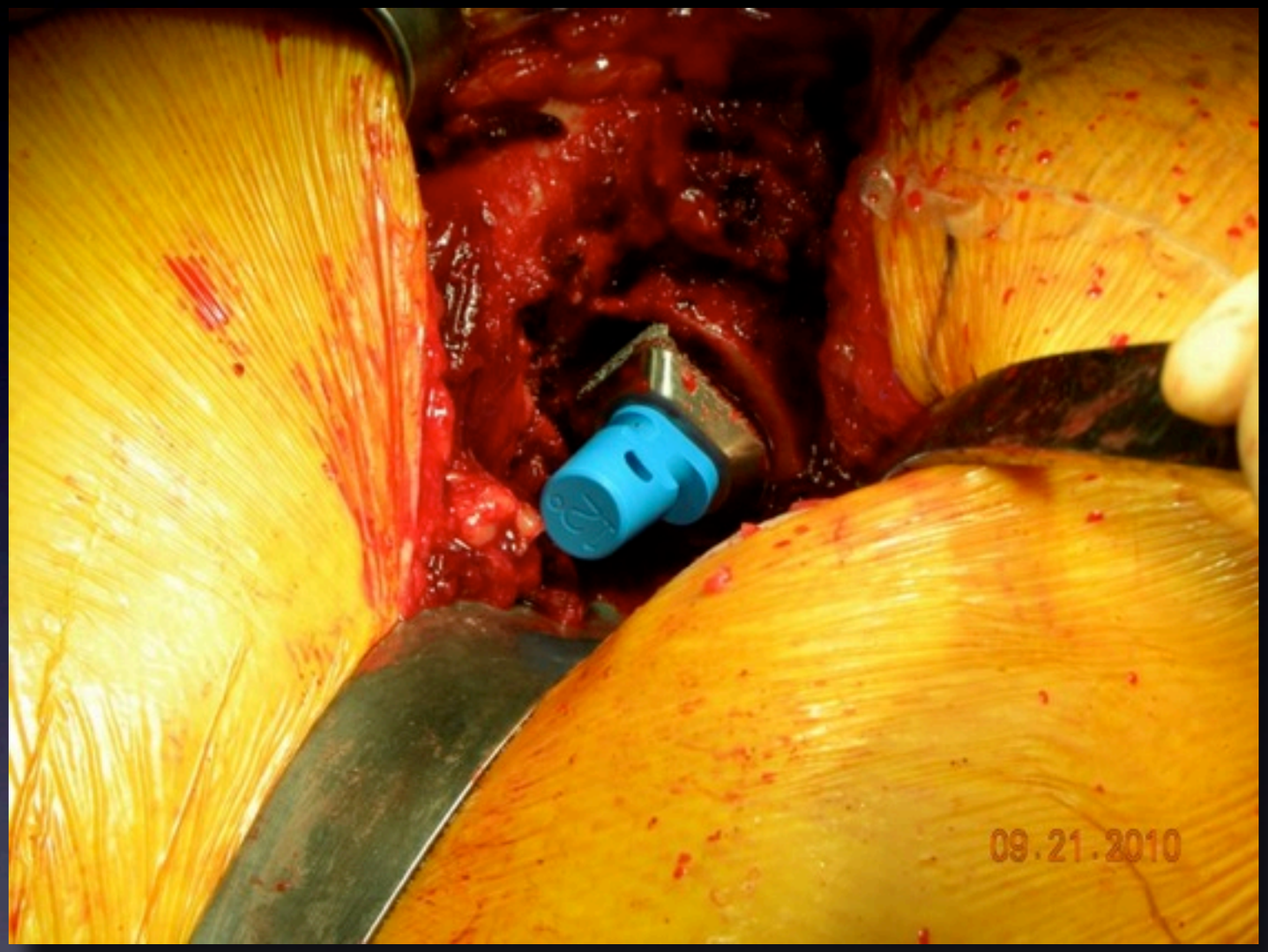
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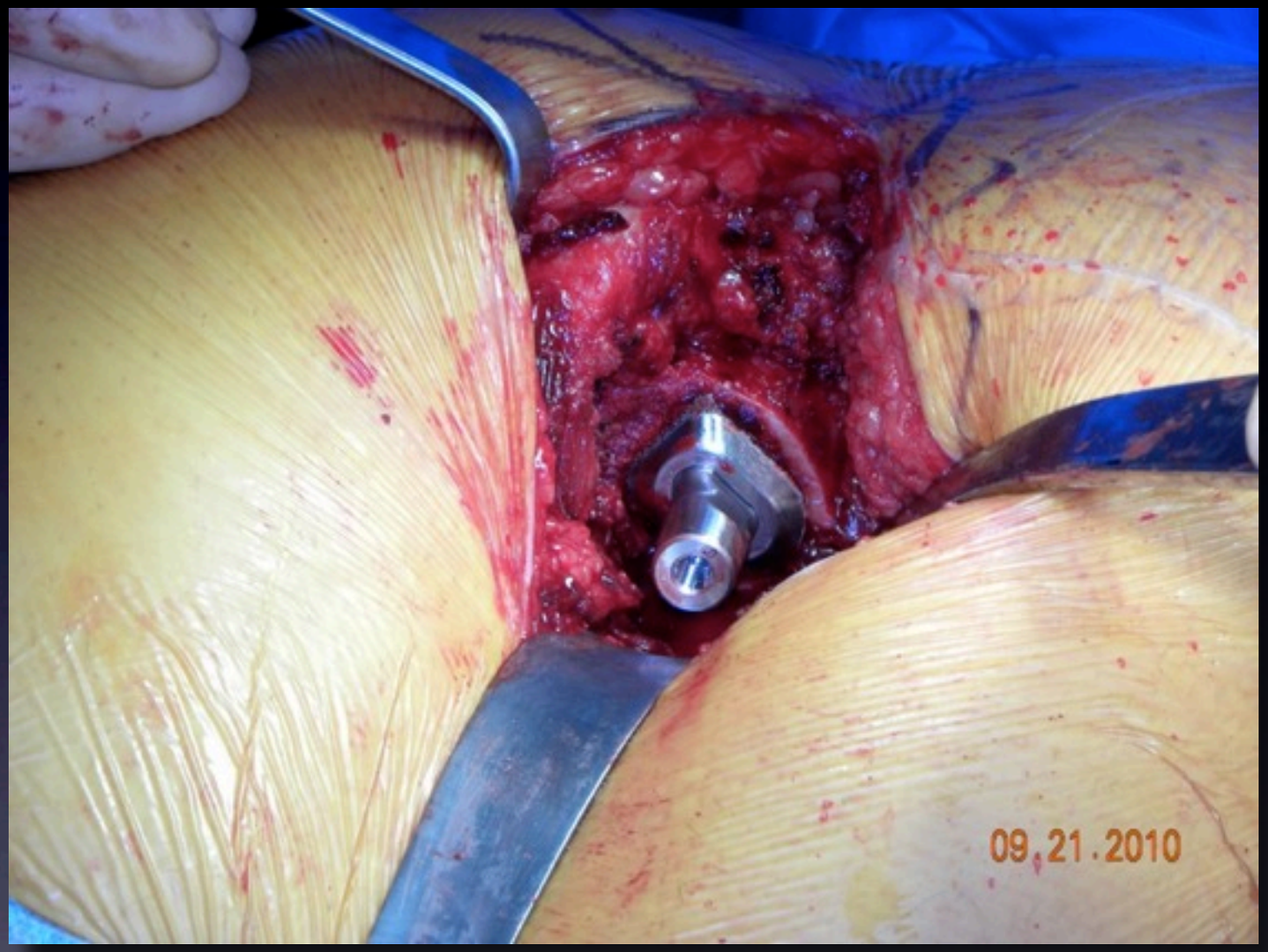
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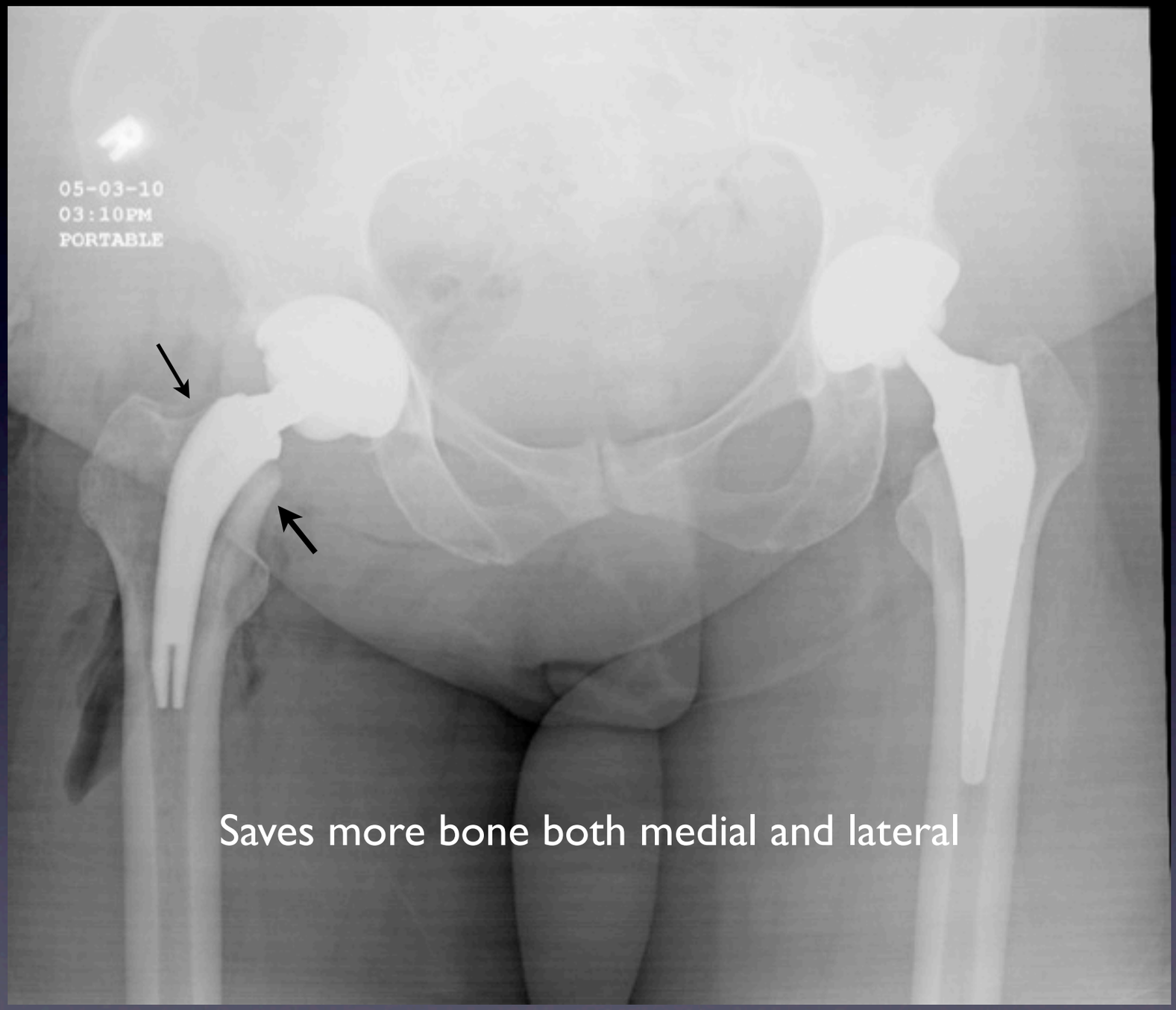
06.29.2010

Saturday, January 8, 2011

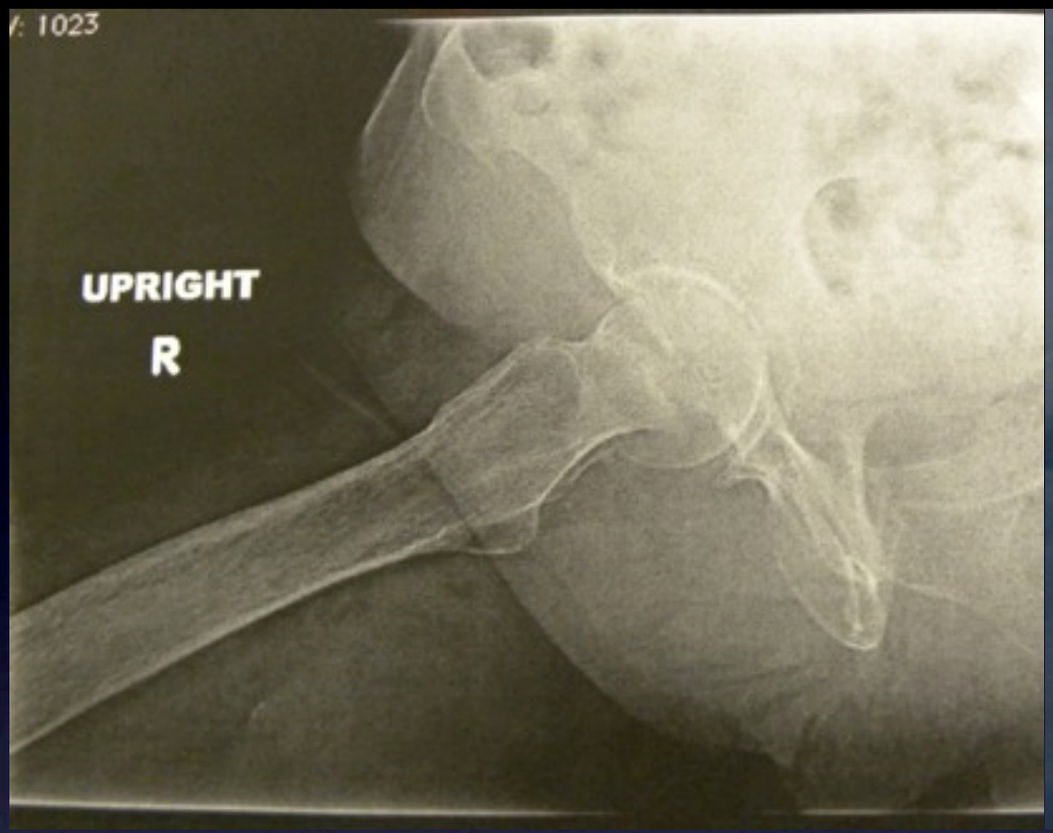
Saturday, January 8, 2011


R

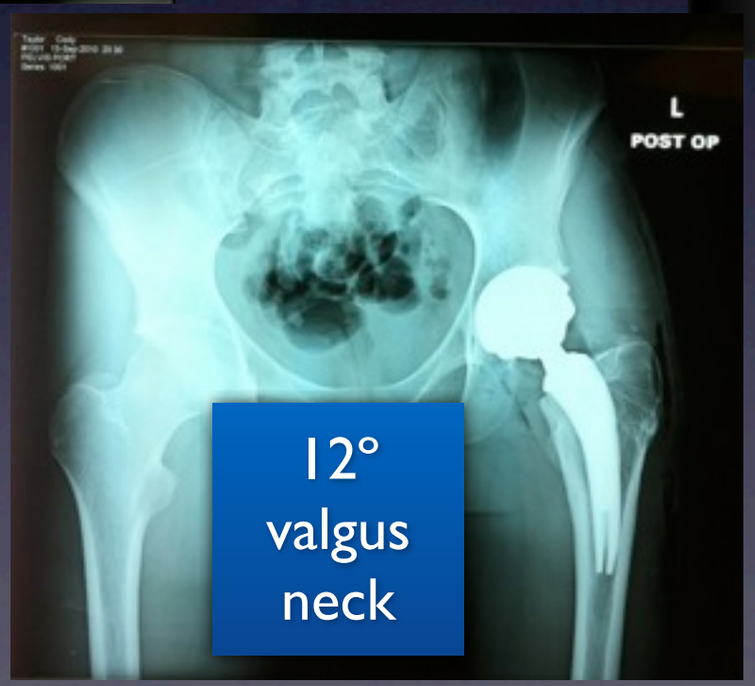

05-03-10
03:10PM
PORTABLE



Saves more bone both medial and lateral


: 1023
UPRIGHT
R

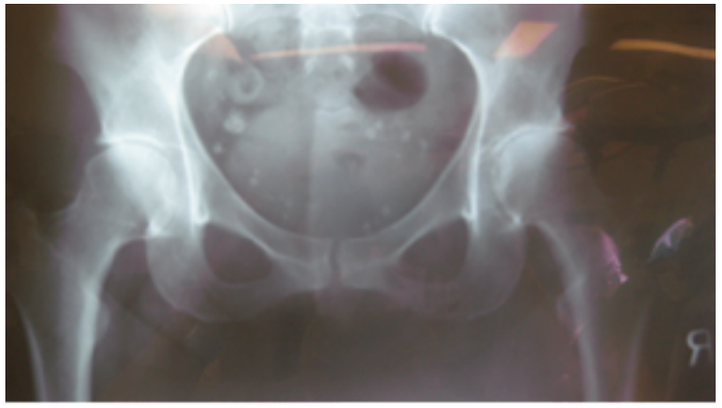

06 29 2010



12°
valgus
neck

17 yr. old
youngest to-date McPherson

First stem

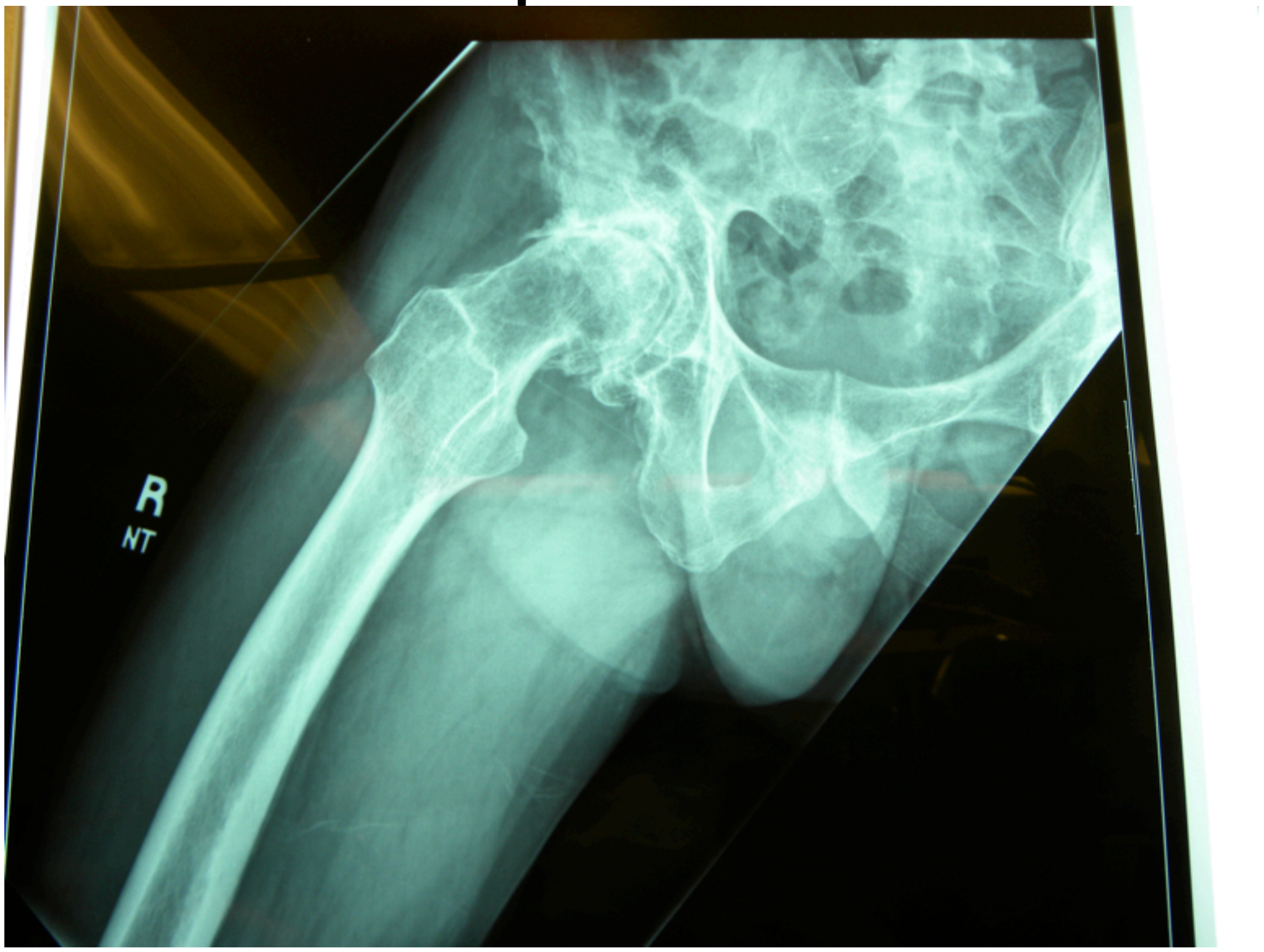


Gail Rather

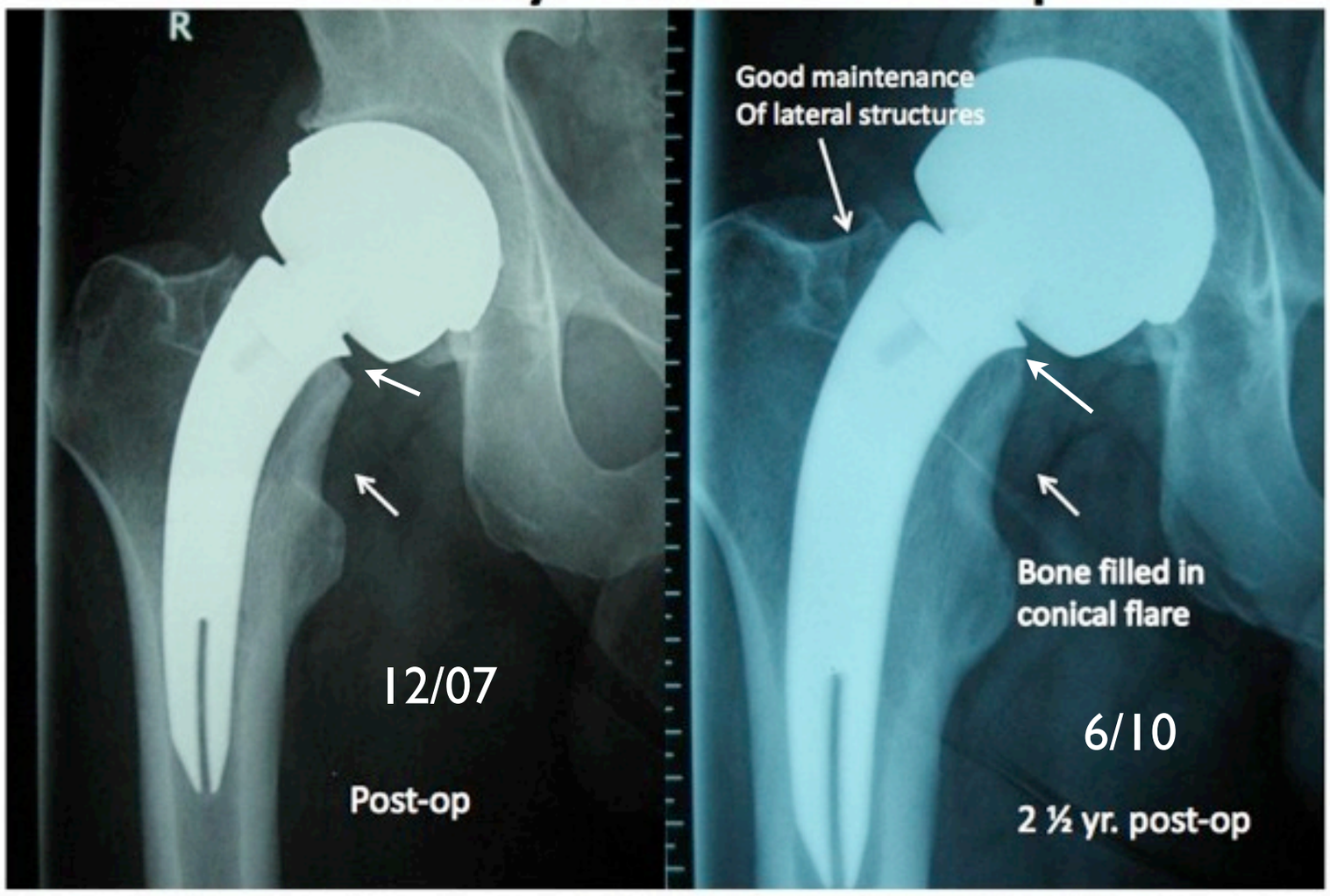
Sub cap A?P


C: 2551.5, W: 3087.0
4/22/2010, 11:24:58 AM
JAGO, PAUL A
R
4/22/2010, 11:25:34 AM

Sub cap lateral



2 ½ year follow up



No distal reactive lines no sign of distal load transfer. Good medial curve contact slight rounding of medial neck and appearance of bone filling in gap at conical flare.