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Removing Well Fixed Implants in THA

UCSF/ Hoag Arthroplasty for the Modern Surgeon Course 2025

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Disclosures

- CORIN- Consultant
- Smith & Nephew- Advisory Board

OUTLINE

- Principles
- Femoral Implant Removal
- Acetabular Component Removal
- Summary

PRINCIPLES

- Preoperative planning is critical
  - Prior op reports, templating (planned ETO), instrument/implant request
  - Cup removal- OD/ID, liners for explant; femoral heads for retained stem
  - Stem removal- proprietary extraction tool; liners for retained cup
- Minimize iatrogenic bone loss
  - Maximize success of reconstruction
- Patience, patience, patience
  - Yet know when you need to switch gears (e.g. ETO)

FEMUR

WORKFLOW

- Expose lateral shoulder of implant
- Expose proximal femur-implant interface circumferentially
- Flexible osteotomes
- Extraction device

Femoral Implants

- **Single wedge taper stems**
- Modular primary stems
- Dual wedged/ Triple tapered collared stem
- Fully HA compaction broach type stem
- Cemented stems
- Diaphyseal engaging stems

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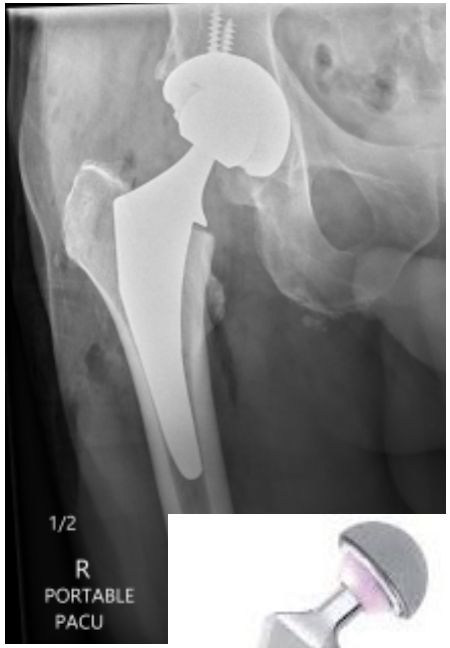

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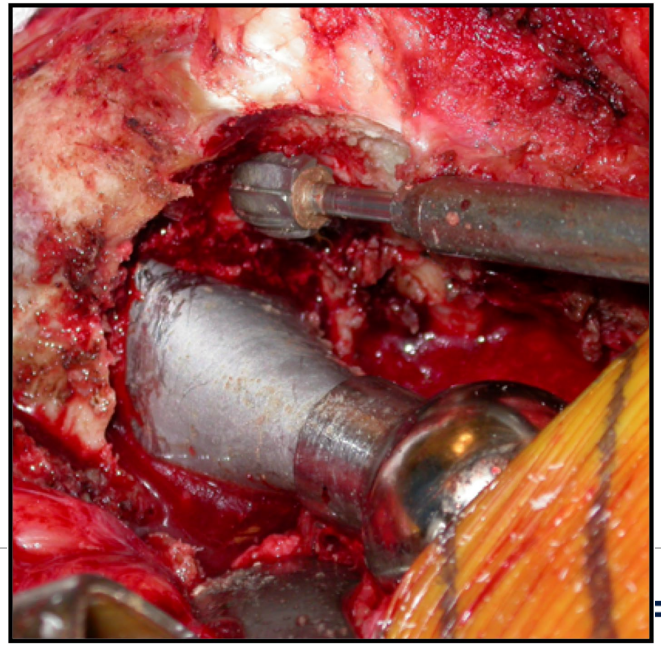
"Clearing the Shoulder"

- Do This In All Cases!
  - Especially varus remodeling, troch overgrowth, and long straight stems
- Allows access to lateral interface
  - Subsequent burring/ osteotomes
  - Extraction handle threads
- Facilitates revision stem reaming trajectory



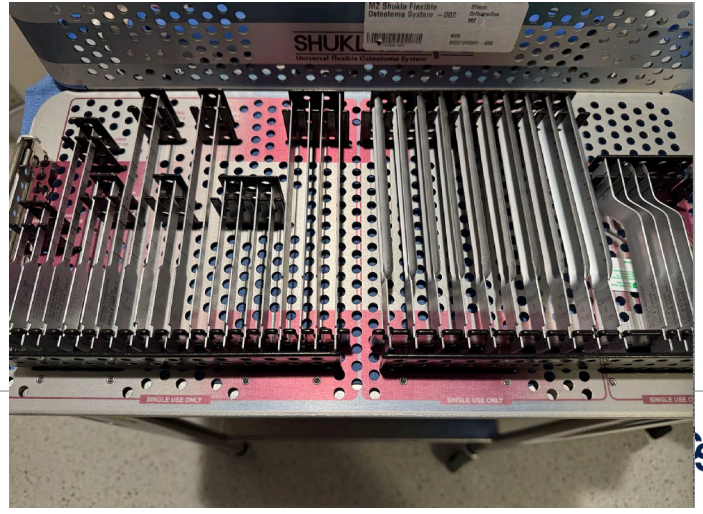
Exposing the Proximal Bone Implant Interface

- Pencil tipped burr circumferentially
  - Vs. double sided recip saw for A-P sides
- Creates safe bone-implant interface
- Helps avoid the osteotomes from skiving and creating perforations

- Tips
  - Be wary of lateral shoulder and angle
  - Irrigate & suction continuously
  - Don’t hesitate to remove some proximal bone

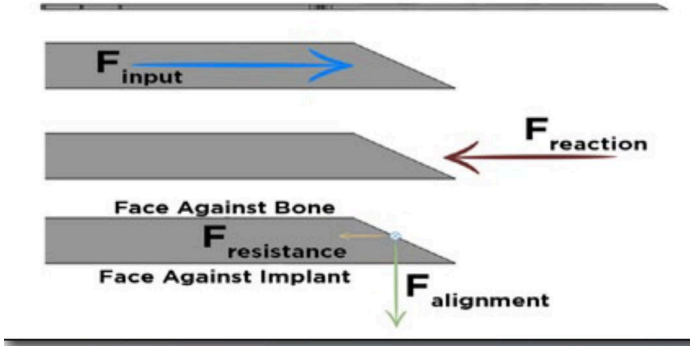
Flexible Osteotomes

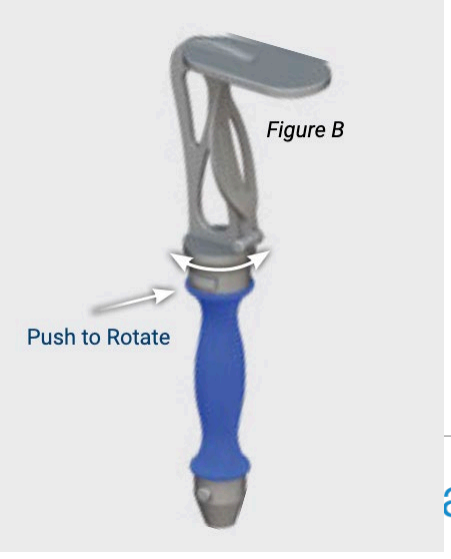
- A-P: Straight blades
- Laterally: Curved blade
- Medially: Reverse curve



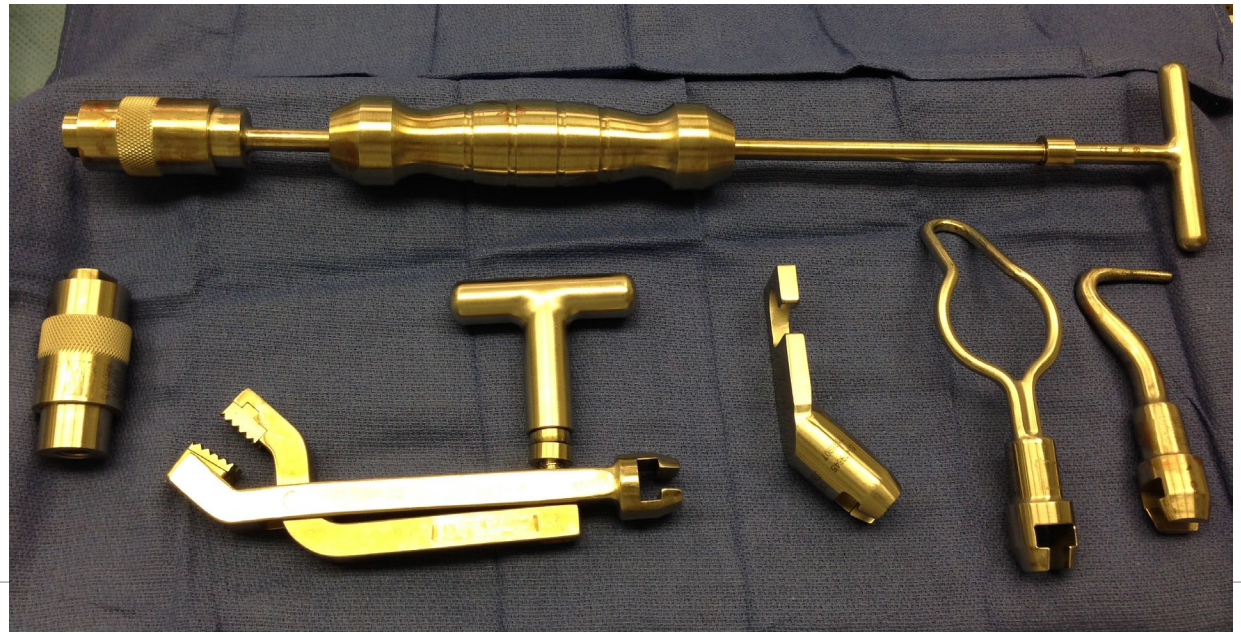
Flexible Osteotomes

- Tip-
  - Measure blade vs length of stem fixation surface
  - Ensure bevel side of blade adjacent to implant, and strike plate ergonomically placed for retrograde mallet blows





Universal Femoral Extraction Set



Systems 5 & 6 of 15

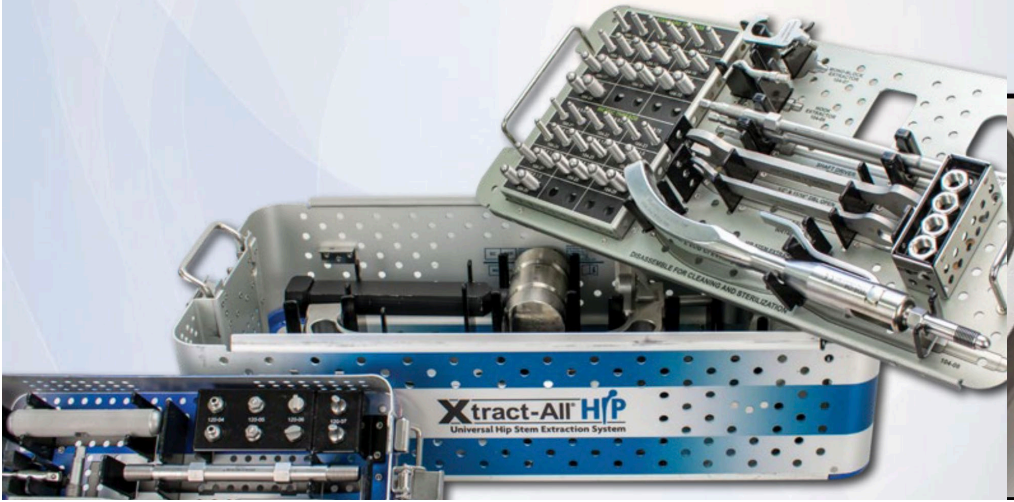
SHUKLA HIP

Universal Hip Implant Extraction Solution

and

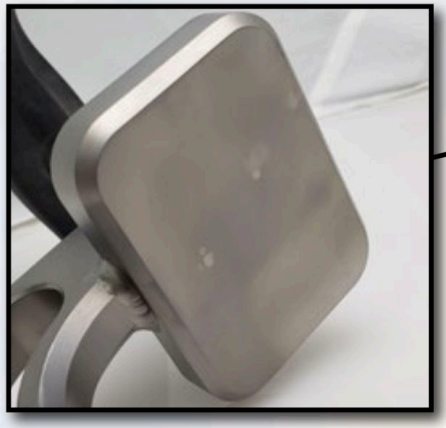
MOD SHUKLA HIP

Universal Hip Implant Extraction Solution



STRIKE PLATE FRAME

e applies crucial extraction force in-line with the
Harmonics help break up bone ingrowth, making
helping reduce the risk of fractures.



The wide strike plate allows surgeons to hit with a large degree of accuracy, reducing the chance of mishits.

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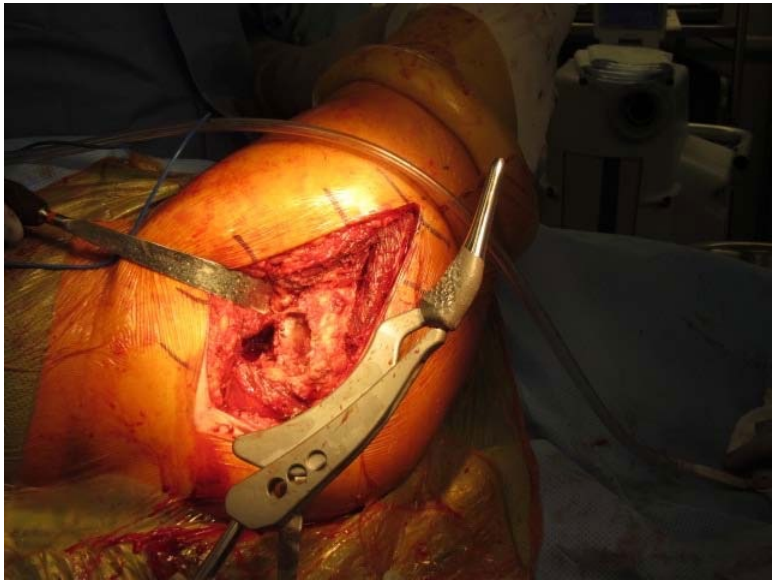
Taking out Modular Neck Stems



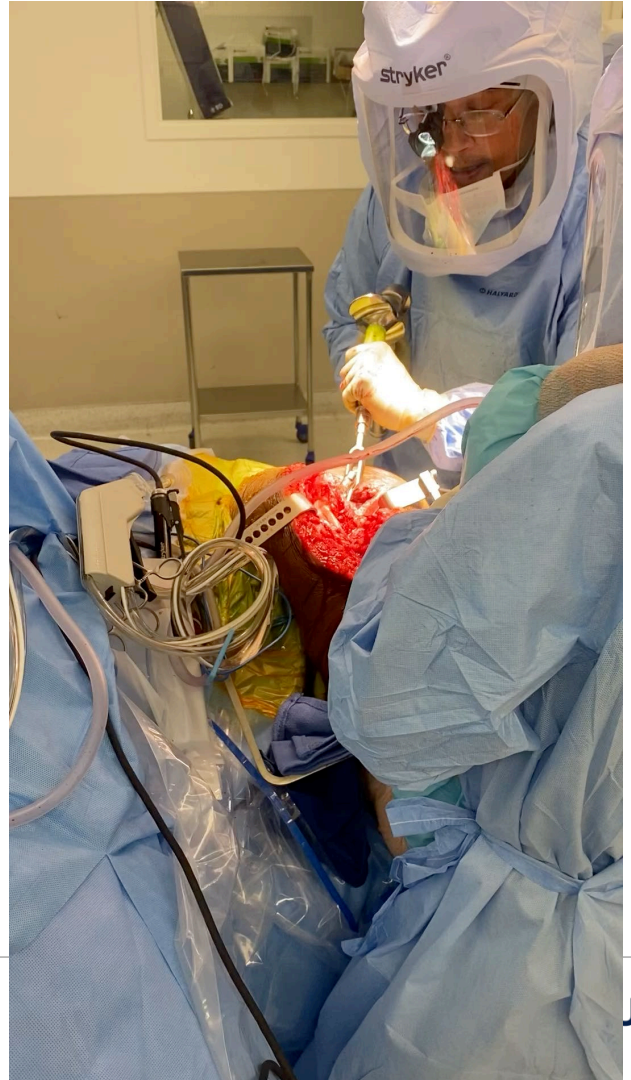
Gotta Collar?? No Problem

- Burr collar w/ metal cutting tip
- Resect some calcar to give yourself space

Exodus

Revision Hip System
for Femoral Stem Removal

Surgical Technique



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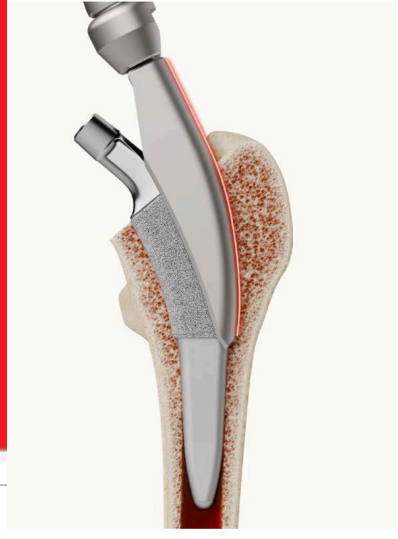
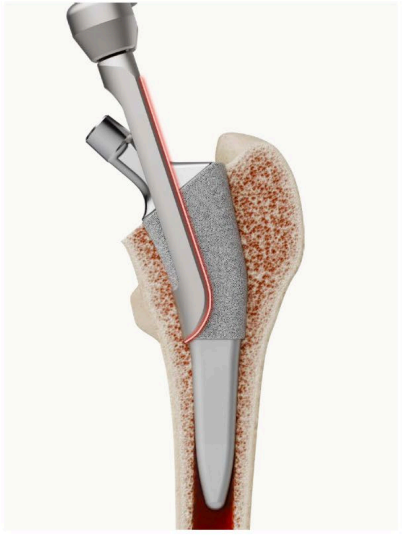
WATSON EXTRACTION SYSTEM™

A Novel Surgical Instrument Set for the Extraction of Well-Fixed Cementless Stems in Revision Total Hip Arthroplasty



Curved lateral blades (CLAT)

Straight lateral blades (SLAT)



Straight medial blades (SMED)

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18
19
WATSON
REF 17118A


WATSON


WATSON
Blade Length 84 mm
REF 14018A

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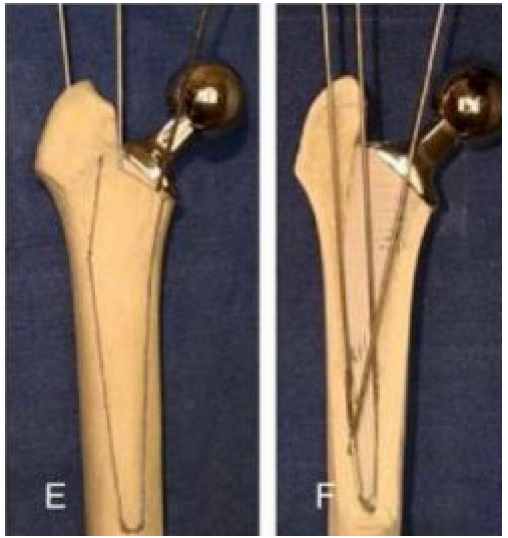
R

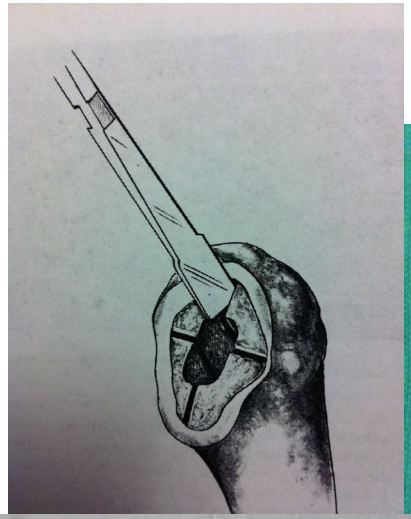
Fully HA Coated Compaction Broaching Stem

- Additionally described techniques
  - Smooth K wires under fluoro
  - Hitting distal before proximal
- Tip
  - Be careful of perforations
  - Low threshold for ETO



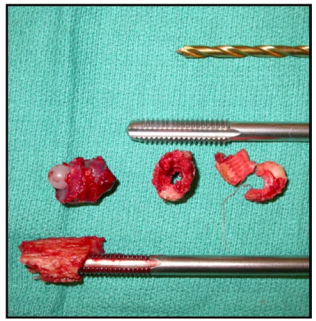
Cemented Stems

- Stems are smooth so relatively easy to tamp out
  - May need to just remove the most proximal cement
- Left with a cement mantle to remove
  - Moreland set +/- burr
  - Work circumferentially w/ radial splits
- Tip
  - Scrutinize your XRs to understand cement mantle
  - Clear proximal before going distal

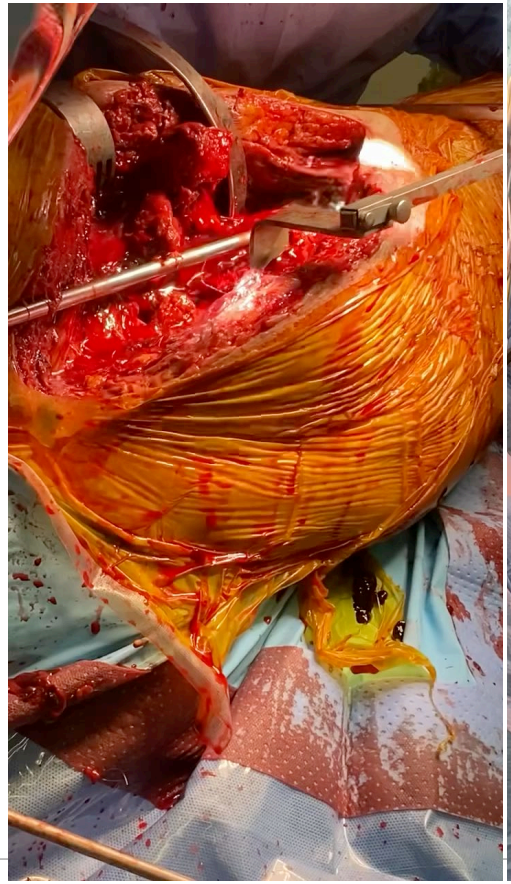


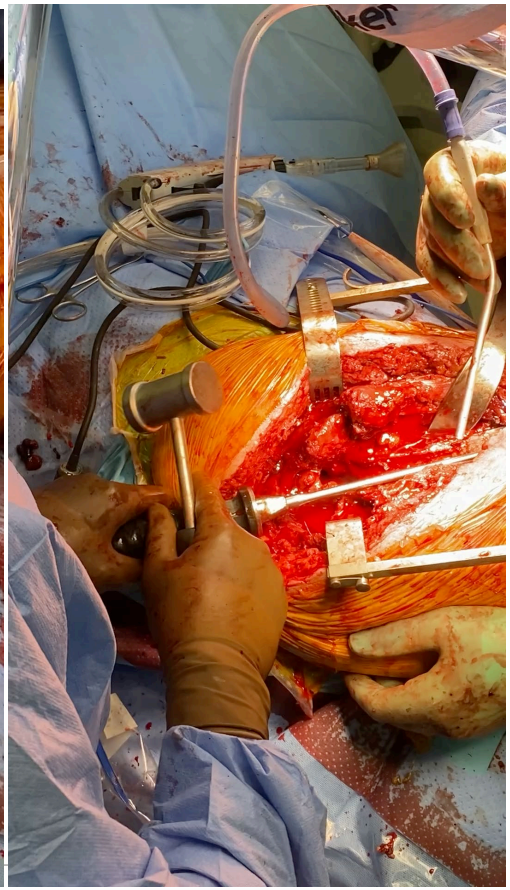
Distal Cement Plug/Mantle

- Strategy depends on quantity and quality of distal cement mantle
  - Drill & Tap vs back hoe
  - Ultrasonic device (Oscar, Ultradrive)
  - ETO



- Tip
  - Imperative to get all cement out before reaming for rev stem





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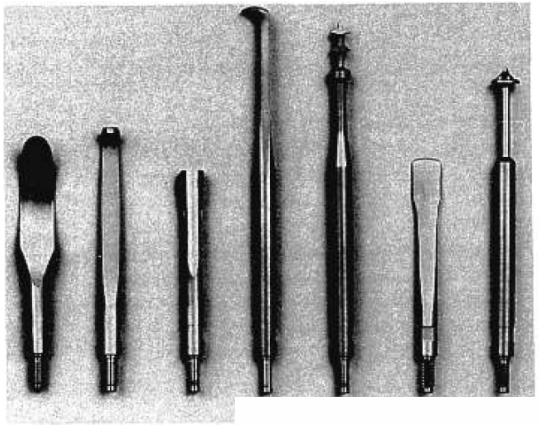
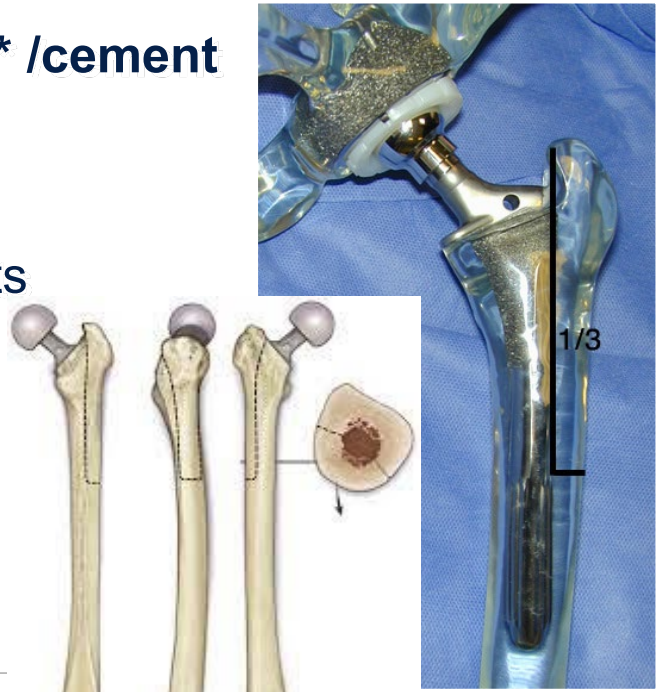


- Tip
  - Imperative to get all cement out before reaming for revision stem

Extended Trochanteric Osteotomy- Indications

- **Removal of well-fixed femoral components* /cement**
- Improving acetabular exposure
- Facilitating implantation of revision components
- Correcting deformity (varus remodeling)
- Tip-
  - *Episiotomy may suffice



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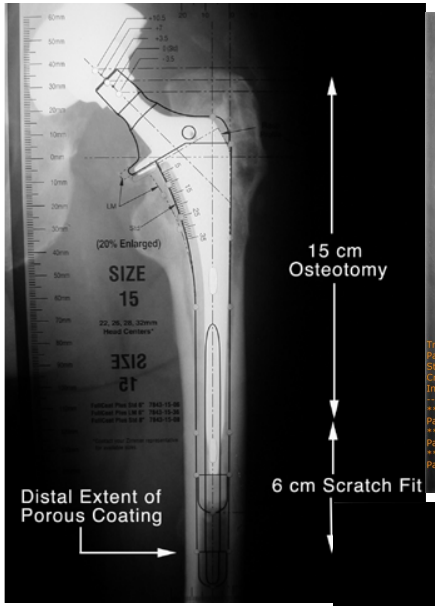
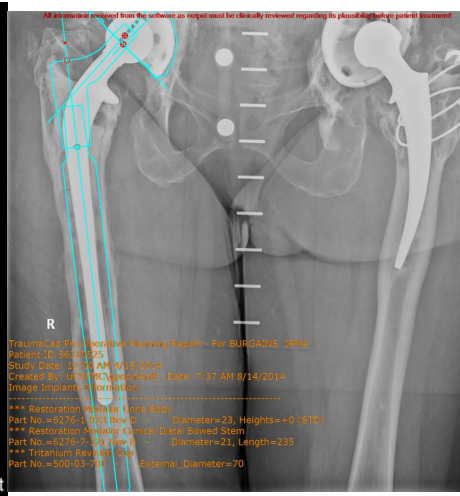
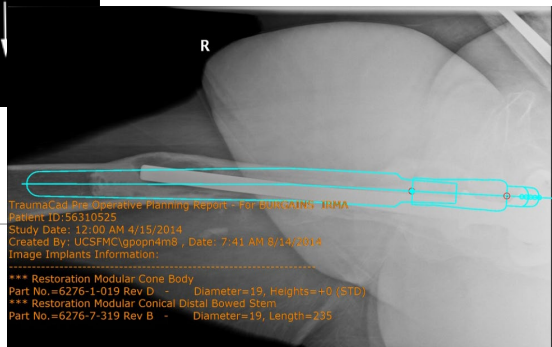
Extended Trochanteric Osteotomy- Planning

- Long enough to successfully get components out
- Short enough to keep an intact tube
- Allow for at least 4cm of scratch fit distal to ETO
- Tip-
  - Make sure you get full length femur films to template
  - Measure twice (ruler & fluoro) and cut once

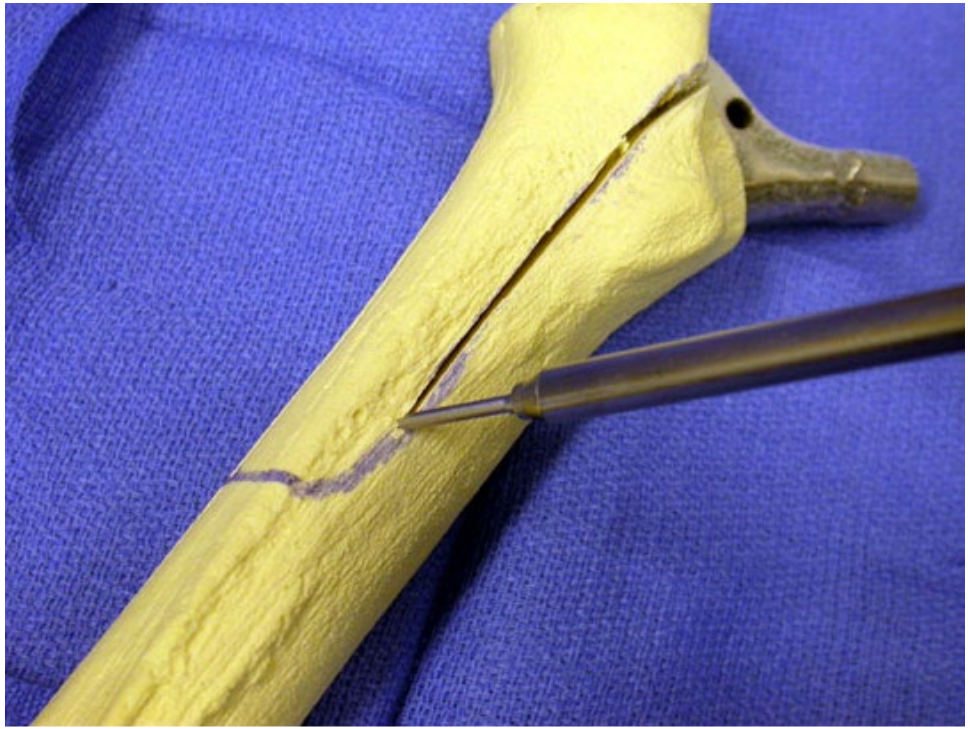






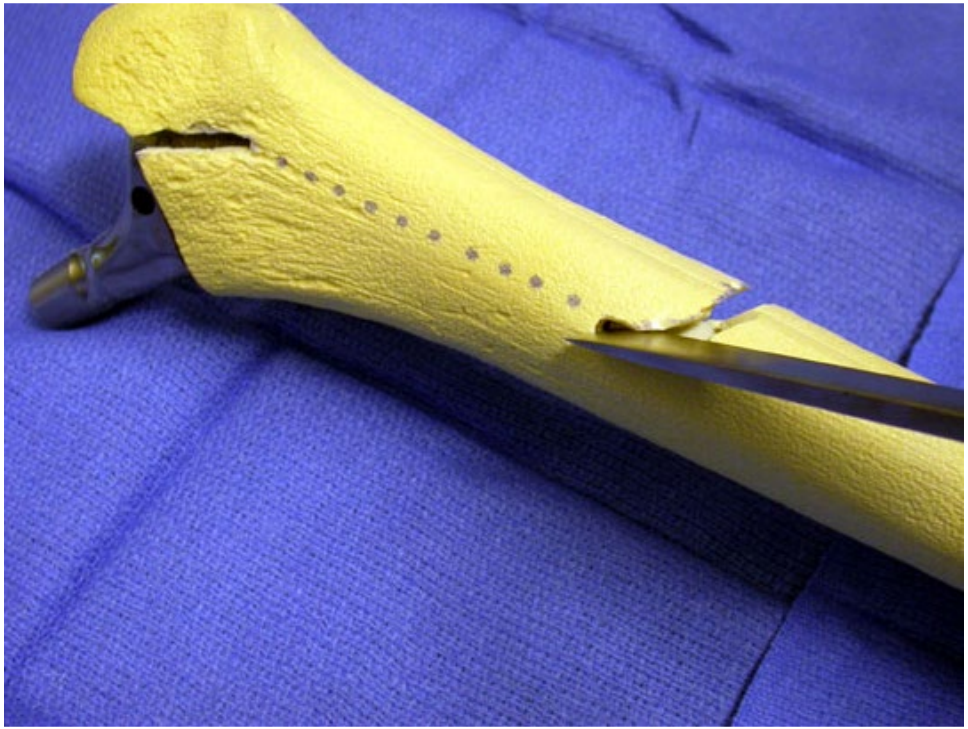
Extended Trochanteric Osteotomy

- Distal limb rounded with burr



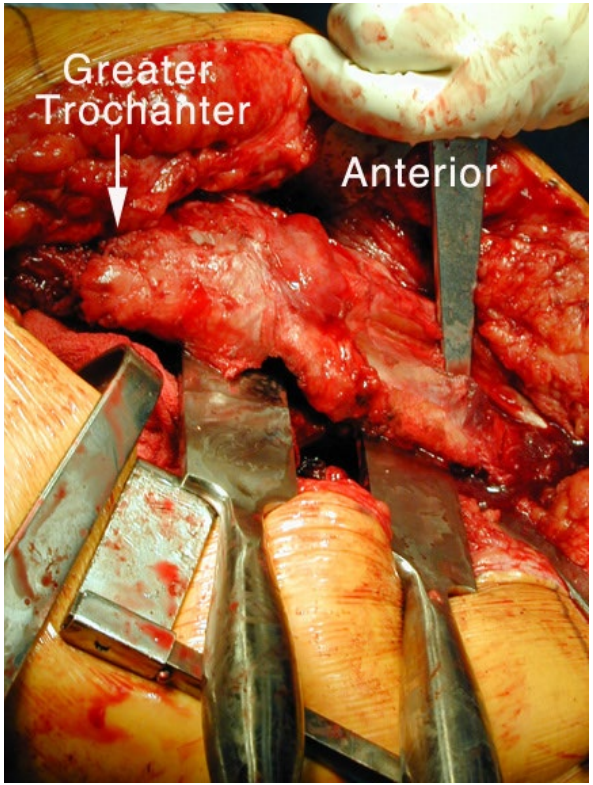
Extended Trochanteric Osteotomy

- Start the back side with an osteotome



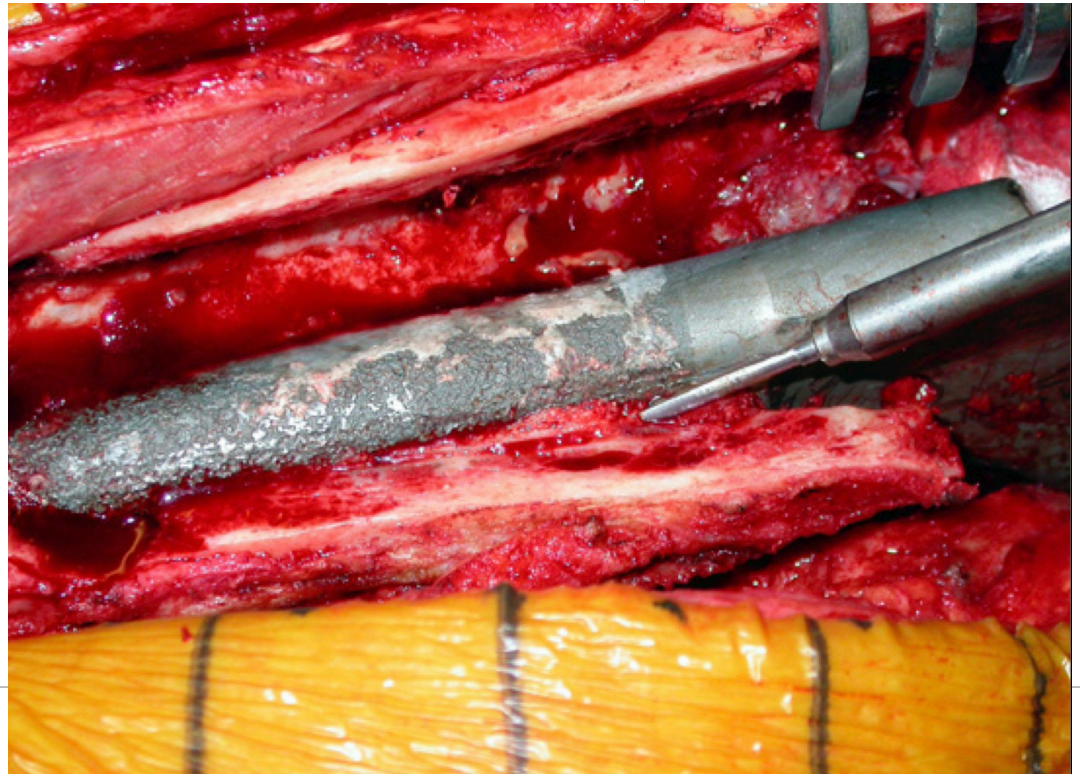
Extended Trochanteric Osteotomy

- *Lever open with multiple wide osteotomes*



Extended Trochanteric Osteotomy

- The finished product…

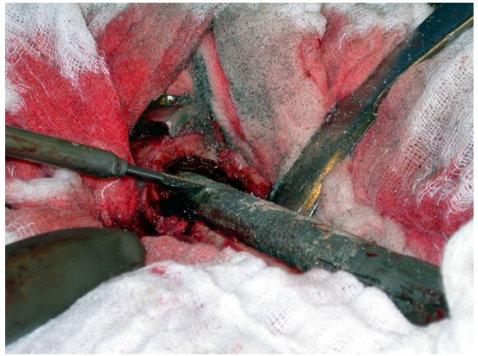


Extended Trochanteric Osteotomy

- Gigli saw medially

Cylindrical Diaphyseal Engaging Stems

- Cut stem at proximal aspect of cylindrical stem
- Trephine distal fragment



Conical Splined Revision Stem

- ETO
- Cannot use trephines because of tapered distal geometry
- Helpful instruments
  - Pencil tip burr
  - Curved flexible osteotomes
  - Smooth Steinman pins for splines
- Tip
  - Remove proximal body if modular
  - Have proprietary extraction device for distal stem

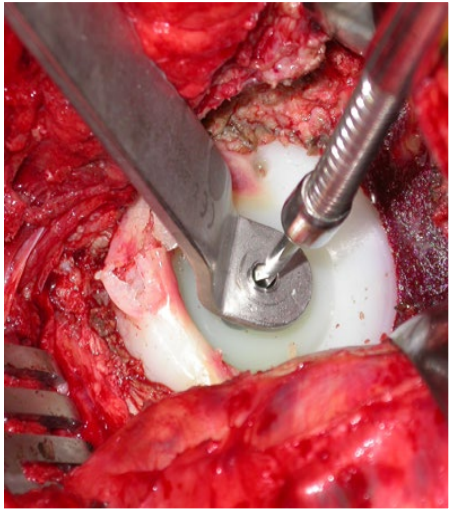
One stage Exchange

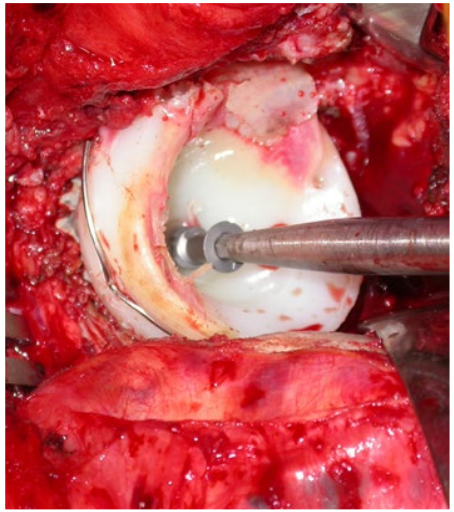
ACETABULUM

WORKFLOW

- Expose the acetabular component circumferentially
- Remove liner
- Remove screws
- Explant system

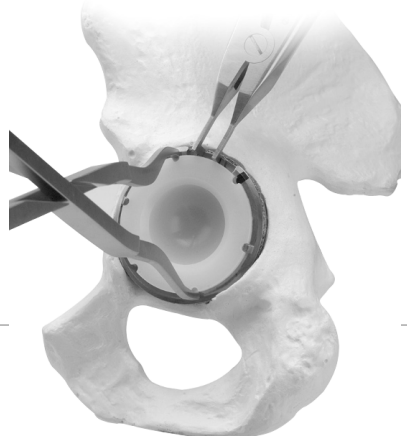
PE Liner Removal





- Good ole' osteotome at rim
- Fancy drill/ screw

- Tip-
  - Know idiosyncratic liner locking mechanism
  - Try not to destroy liner as can be used for explant



Zimmer Trilogy

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Metal or Ceramic Liner Removal

- Proprietary extraction device
- Bone tamp on rim of cup
  - Creates vibration
- Suction cup

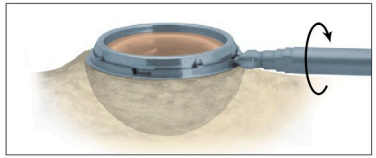
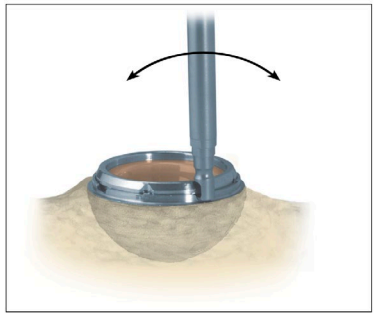
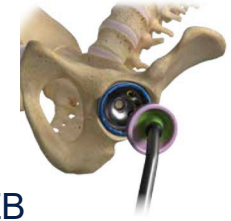


Figure 18



Stryker



ZB

Smith Nephew

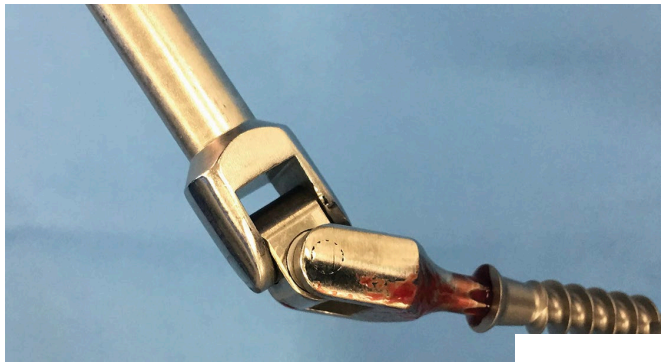
Figure 47
Alternative Bearing Extractor

Figure 48
Placement of Alternative Bearing Extractor

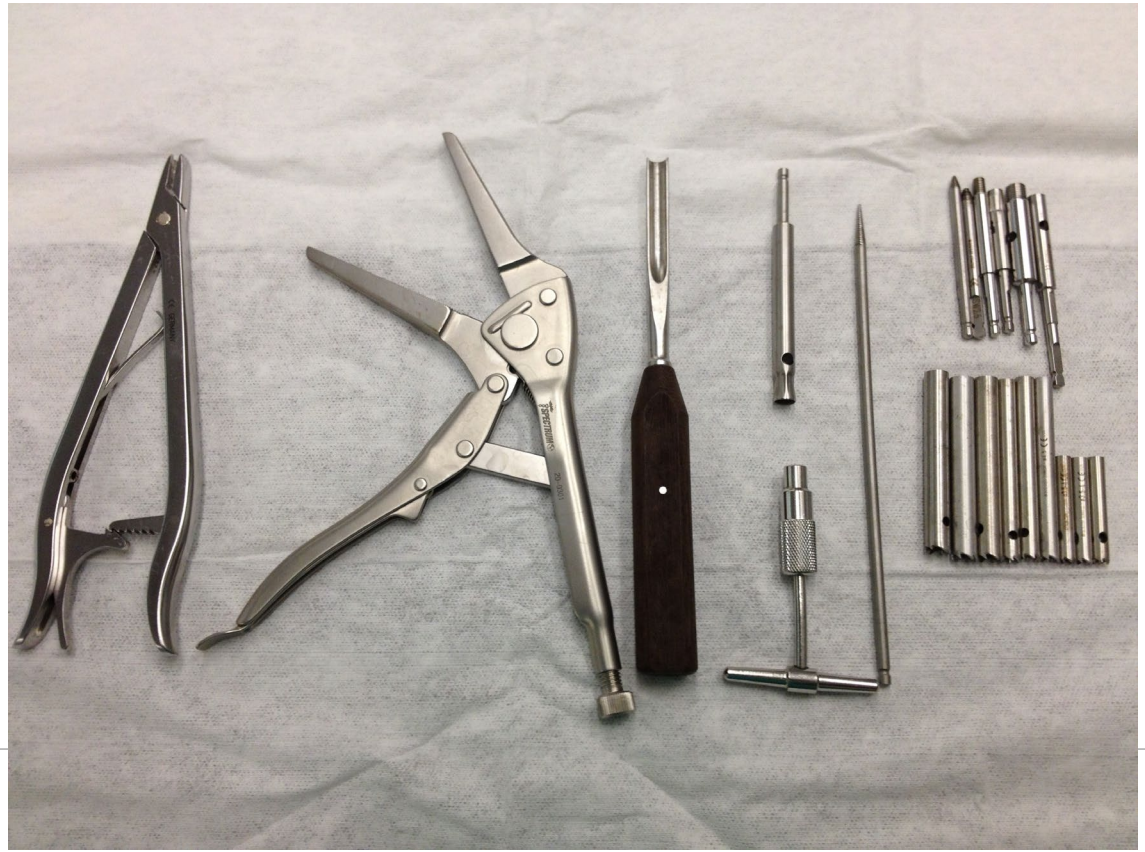
Depuy

Removing Screws

- Know how many you need to go after
- Know screw head
  - Hex- Most systems
  - Star- Stryker Trident 1 pre-2018
  - Cruciform- Depuy SROM cup
- Stripped screw head?
  - Metal cutting burr the head
- Broken screw shaft?
  - Take proximal out through cup; trephine remainder later



Broken Screw Removal Set



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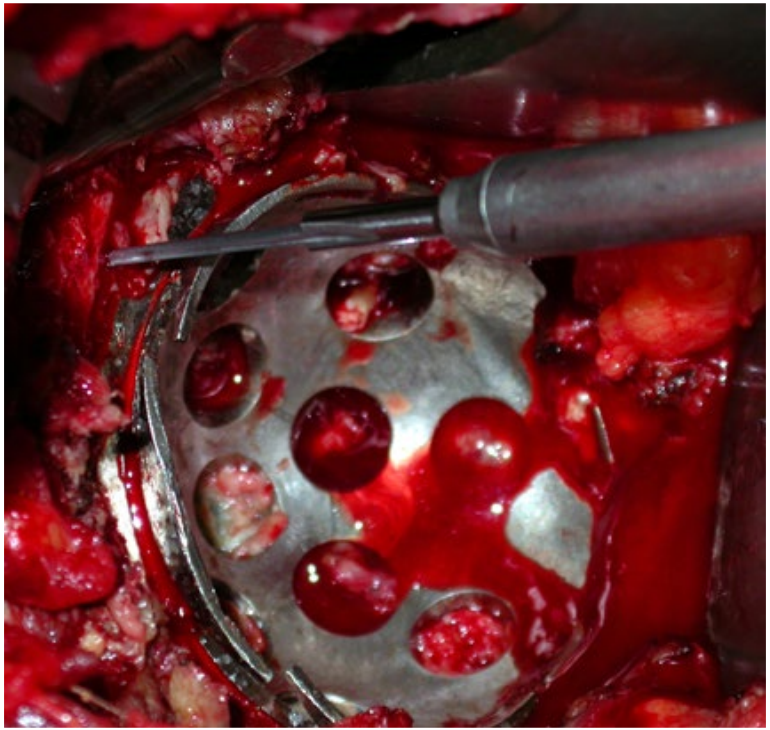
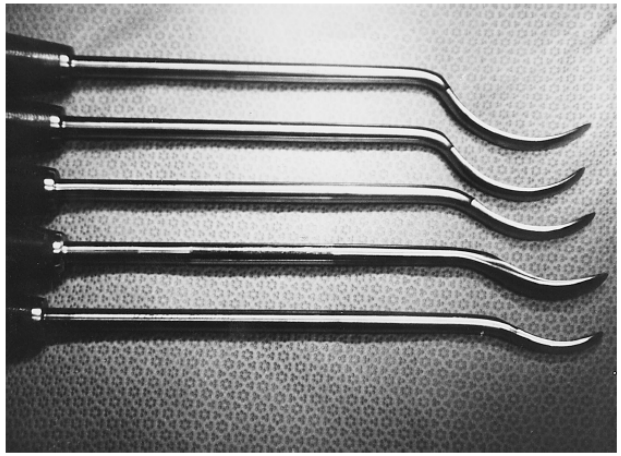
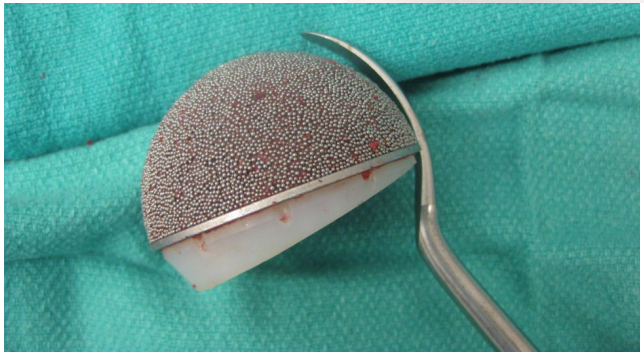
Exposing Bone Implant Interface



Acetabular Gouges

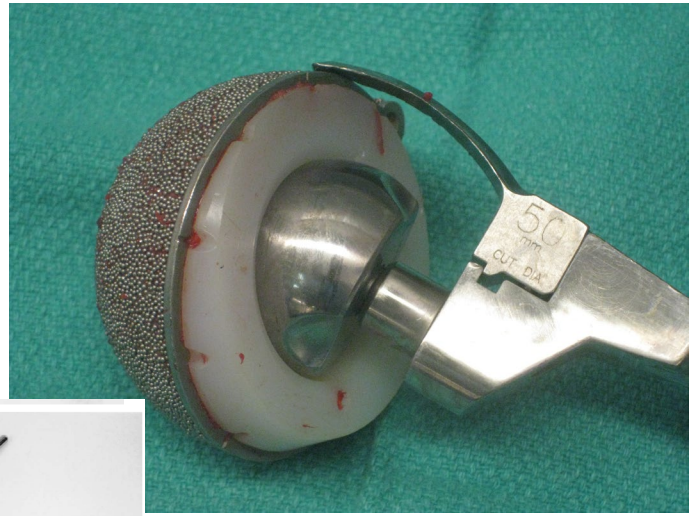


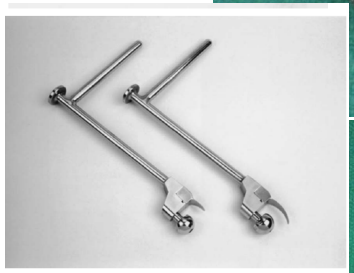


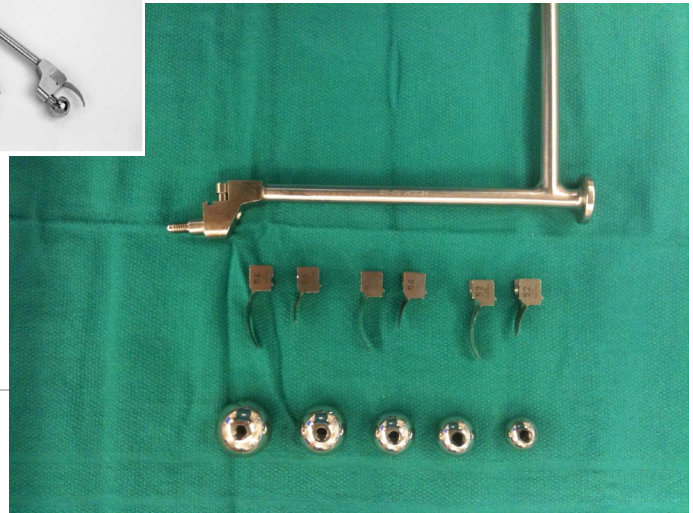
Old school technique- sometimes helpful for non-hemispheric cups, and those w/ spikes

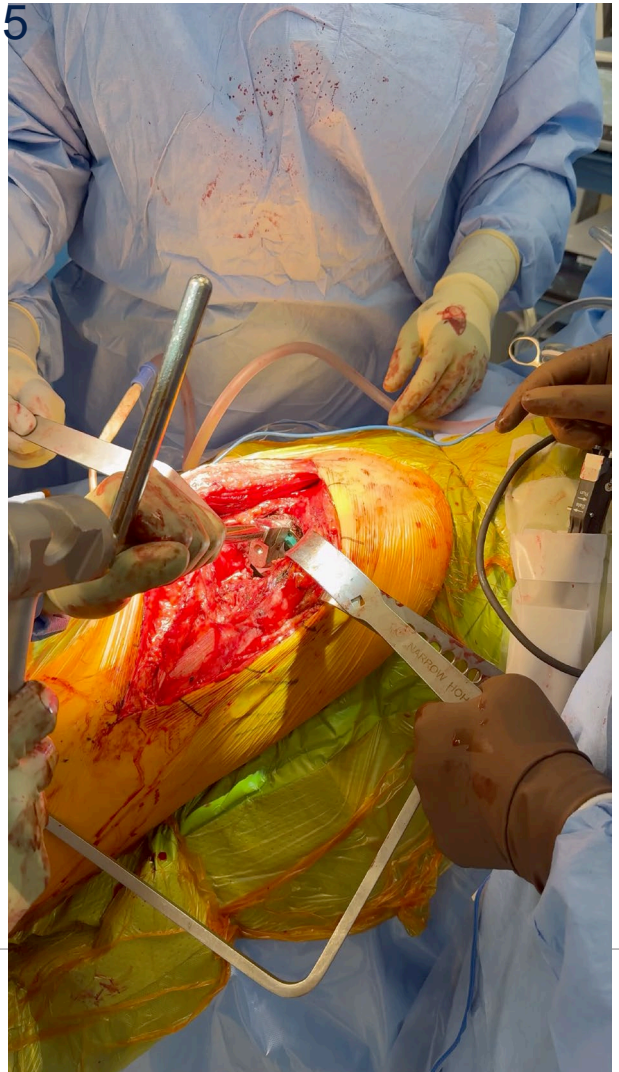
Explant Cup Out System

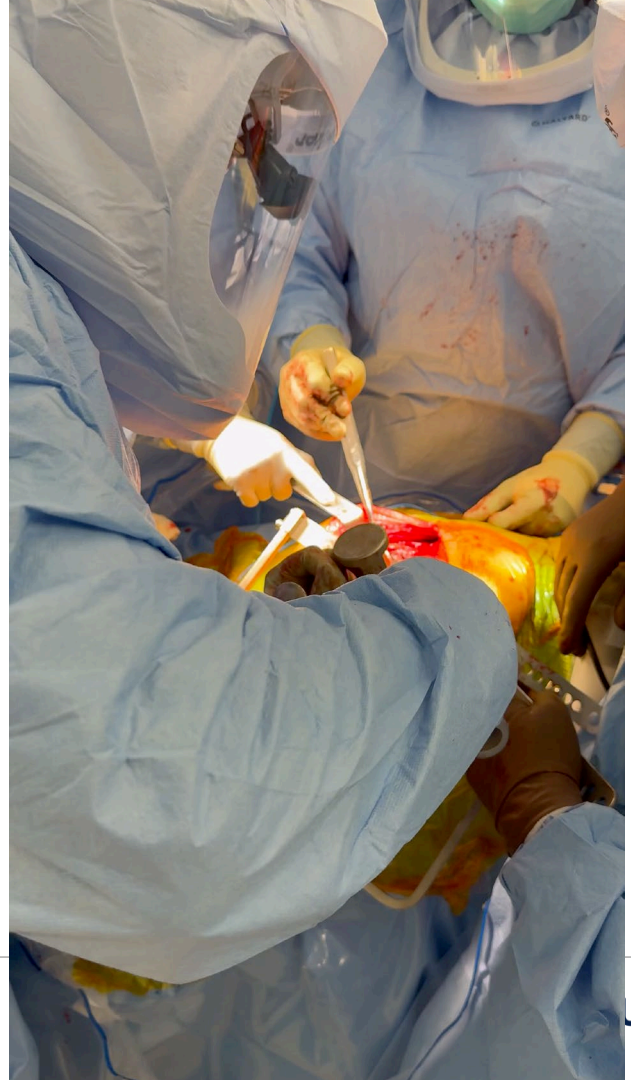
- Need to know cup OD/ID
  - If you don't have prior Op Report…
    - Preop: Set ratio of actual/measured head/cup on XR
    - Intra-op: Many cups have info inscribed on rim
- Short/ Long blades
- Work the cup systematically
  - Think "clock face", start at 12 o'clock
- Tip-
  - Have scrub tech organized ahead of time
  - Careful around the femoral retractor
  - Evaluate your preop Xray for challenges





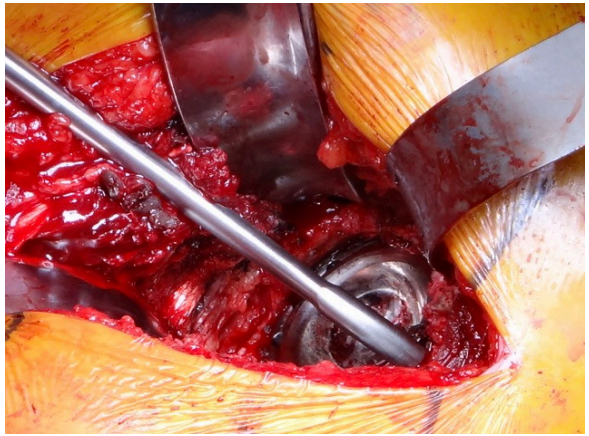






Large Monoblock MOM Cups

- Standard Explant system heads only go to 36mm
- Though you can use gouges
- Better yet- Use either trial bipolar heads or DM heads



UCSF Health

Automatic Acetabular Extractors

Depuy Kincise2

Brasseler EZX

Stryker EZout

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SUMMARY

- Removing well fixed components can be exhausting and time consuming
- Preop planning is critical
- Numerous instruments now available
- Nothing takes place of proper technique