



The Universal Hip Workshop

Cup Surgical Technique

Jonathan Dyce

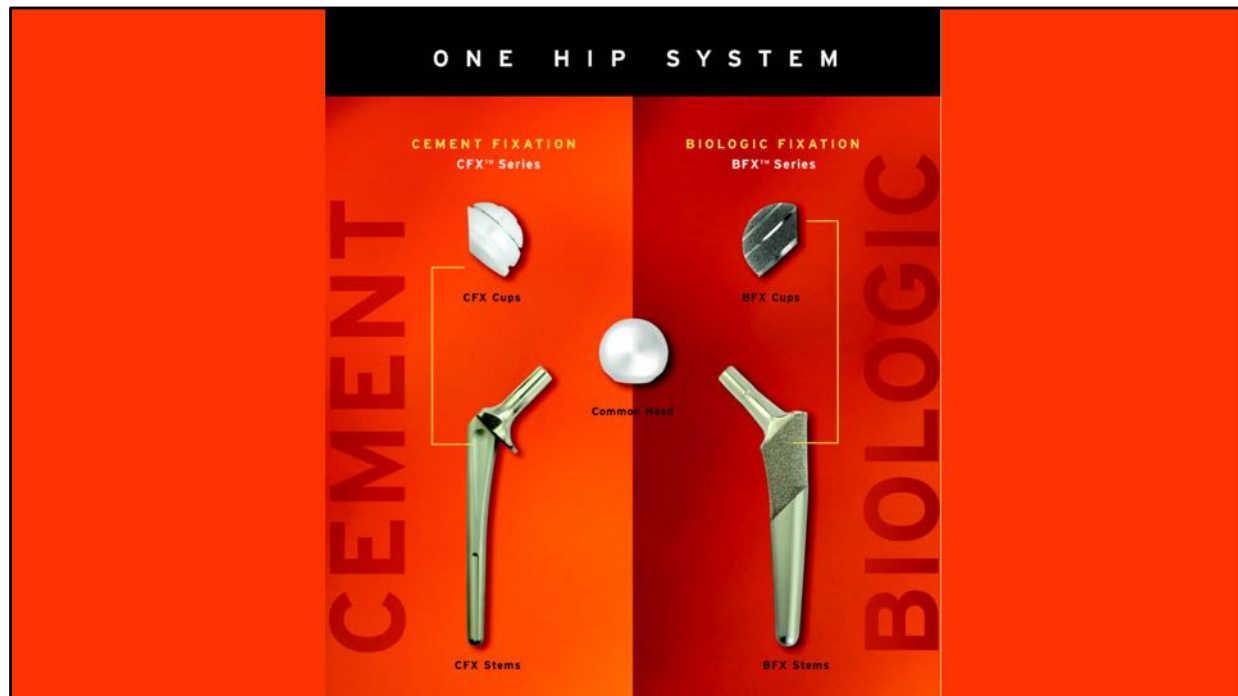
MA, VetMB, MRCVS, DSAO, DACVS



COLLEGE OF
VETERINARY MEDICINE



Notes



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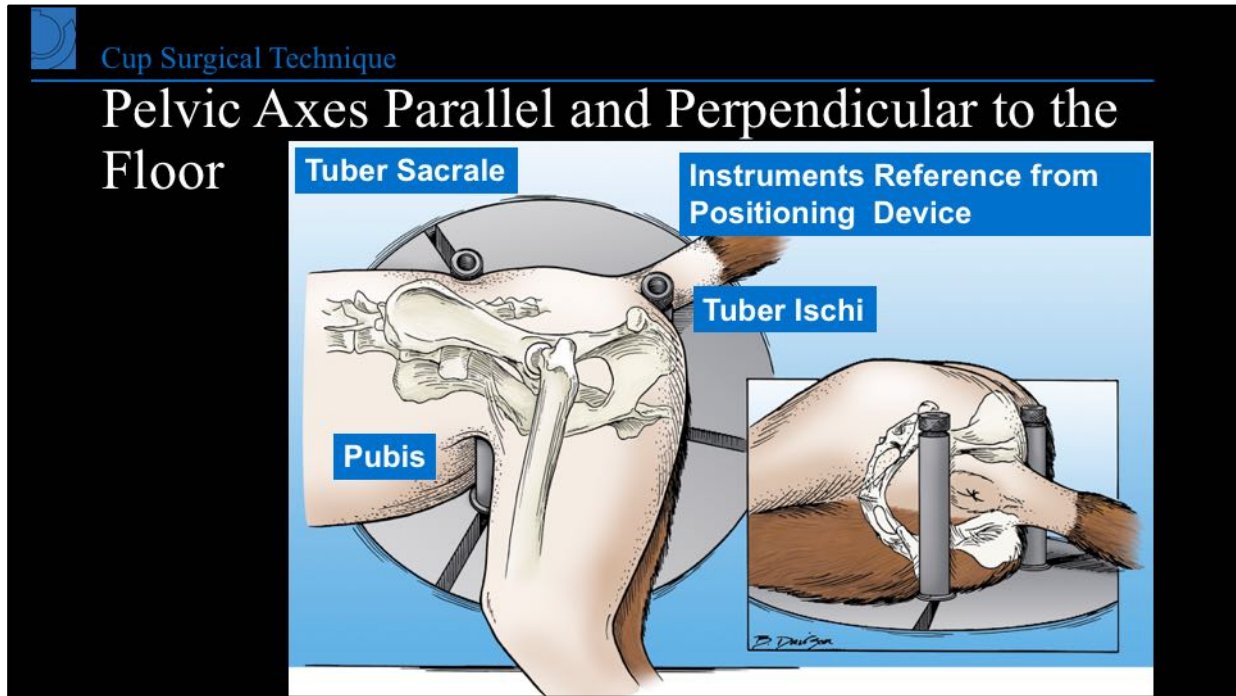


Cup Surgical Technique

Overview: Acetabular Preparation

- Templating
- Patient positioning
- Surgical exposure
- Reaming to achieve press-fit
- Cup insertion
- Cup alignment and adjustment

Notes



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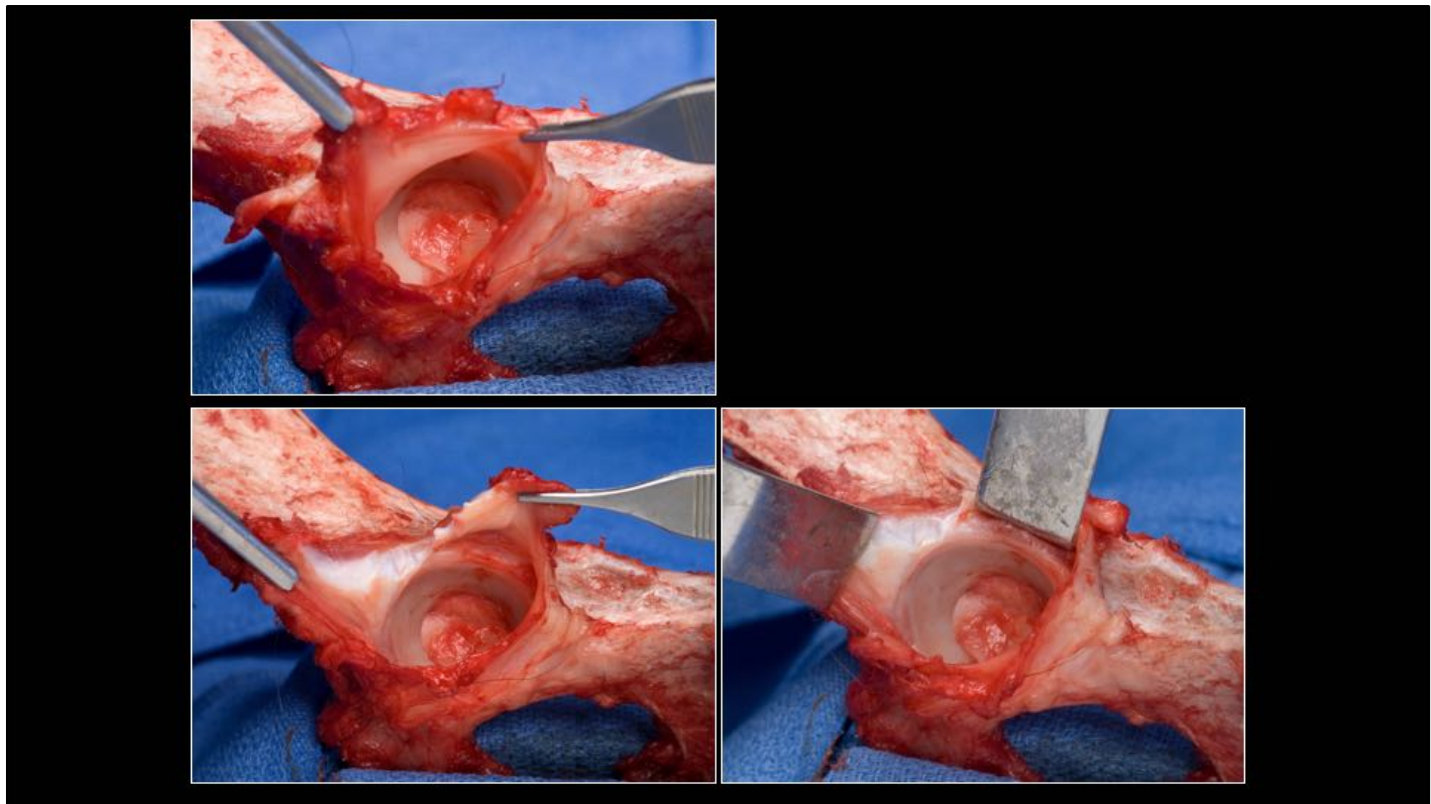


Cup Surgical Technique

Surgical Approach

- Cranio-lateral Approach
- Must develop adequate exposure
- Locate reliable references or landmarks

Notes



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Cup Surgical Technique

Acetabular Bone Preparation & Press-fit Enhanced: Two Stage Reaming Process

- Depth: Starter Reamer
 - Odd numbered sizes
- Diameter: Finishing Reamer
 - Even numbered sizes

Notes



Cup Surgical Technique

Reaming

- Starter reamer: cheese grater
 - Undersized 1mm smaller than the finishing reamer
 - Remove cartilage and sclerotic bone
 - Create depth
 - Ream to appropriate depth (cranial and caudal bone columns; often to medial wall)

Notes



Eccentric reaming

- Commonly caudal



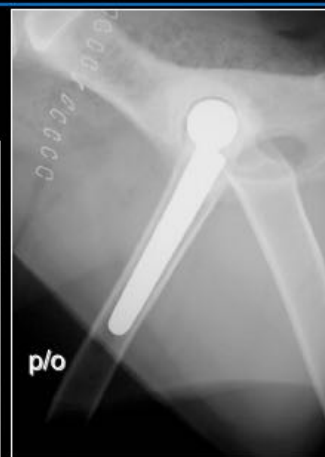
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Cup Surgical Technique

Eccentric reaming

14mo Dobermann



**Loss of
press fit**

Notes



Cup Surgical Technique

Eccentric reaming

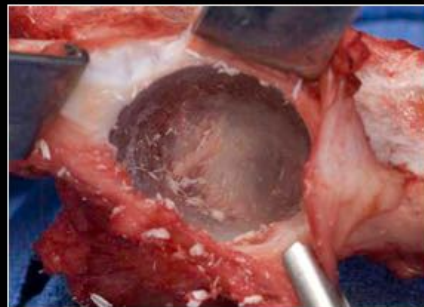
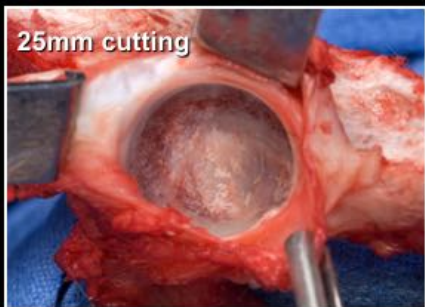


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Cup Surgical Technique

Concentric reaming



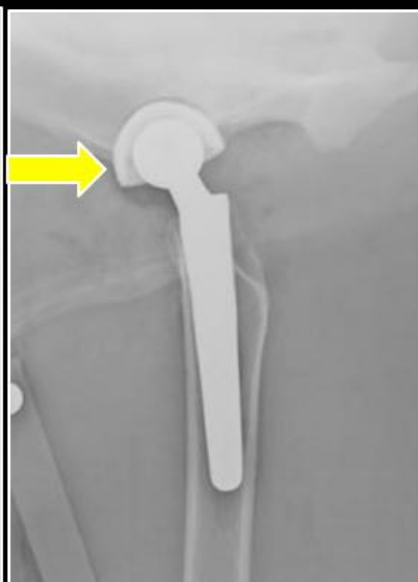
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Cup Surgical Technique

Failure to translate dorsally

- Non - dysplastic



Notes



- Dorsal subchondral bone
- Selective reaming dorsally
- Confirm seating with trial cup

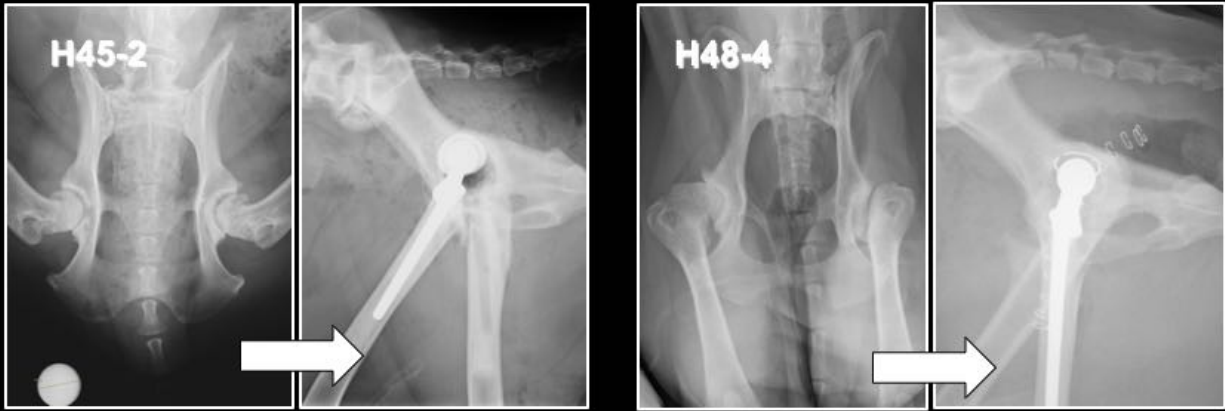
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Cup Surgical Technique

Excessive dorsal translation

- dysplastic – arthritic hip
- saucerization



Notes



Cup Surgical Technique

Chip

7yo MN German short haired pointer 22kg



Notes



Cup Surgical Technique

ESUVTH



Notes



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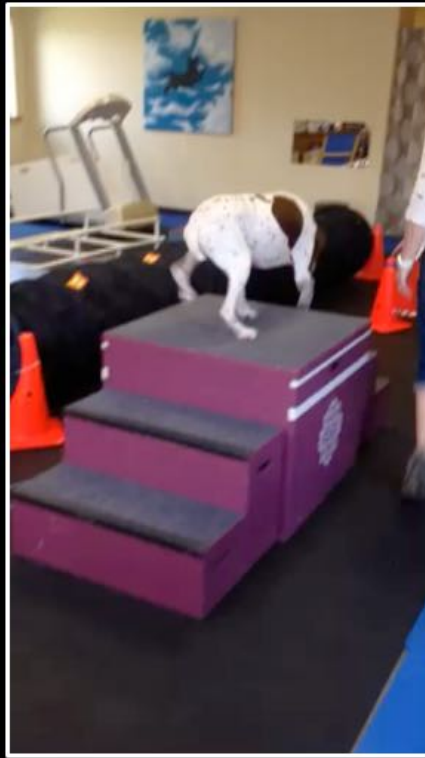


- **Magnitude of dorsal rim loss to maintain stability?**
- **Cranial to caudal press fit compromised.**

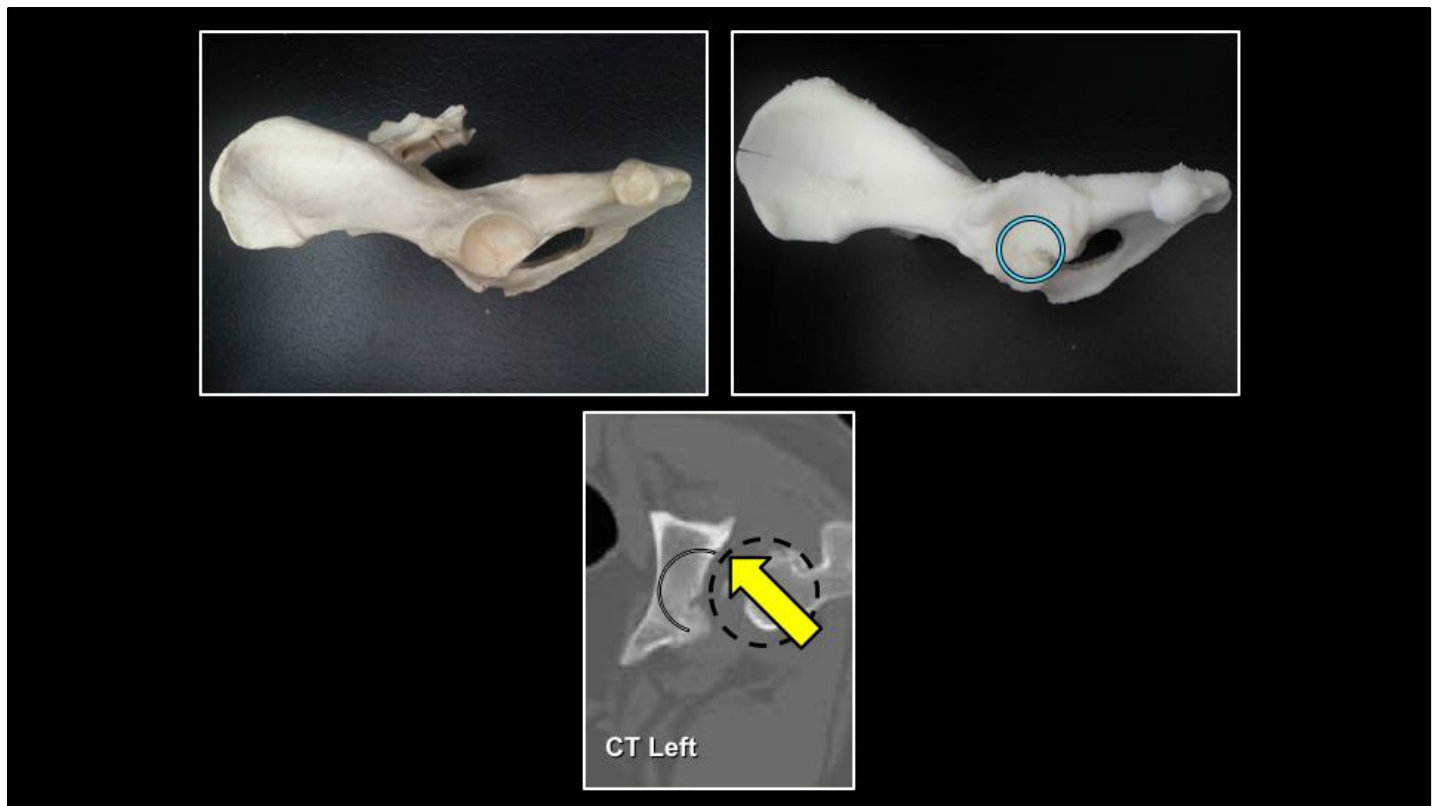


Notes

**12 weeks
post right
THR explant**



Notes



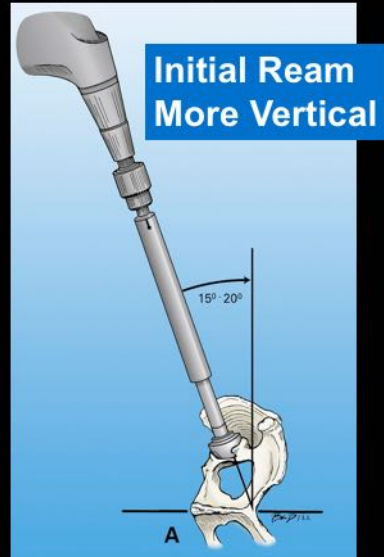
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Cup Surgical Technique

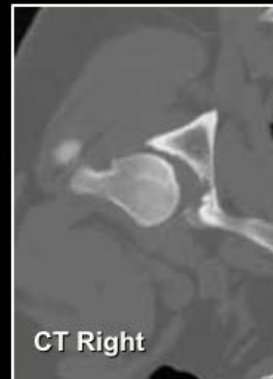
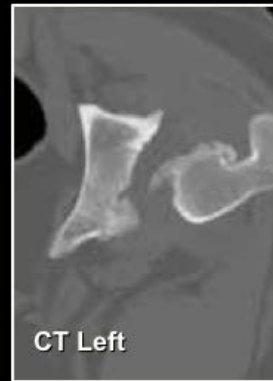
Center Reamer Over “True Acetabulum”

- Start at 15- 20° angle off vertical
 - Reduces dorsal migration
- Use incremental reaming 21,23,25 etc
 - Don't invade final envelope

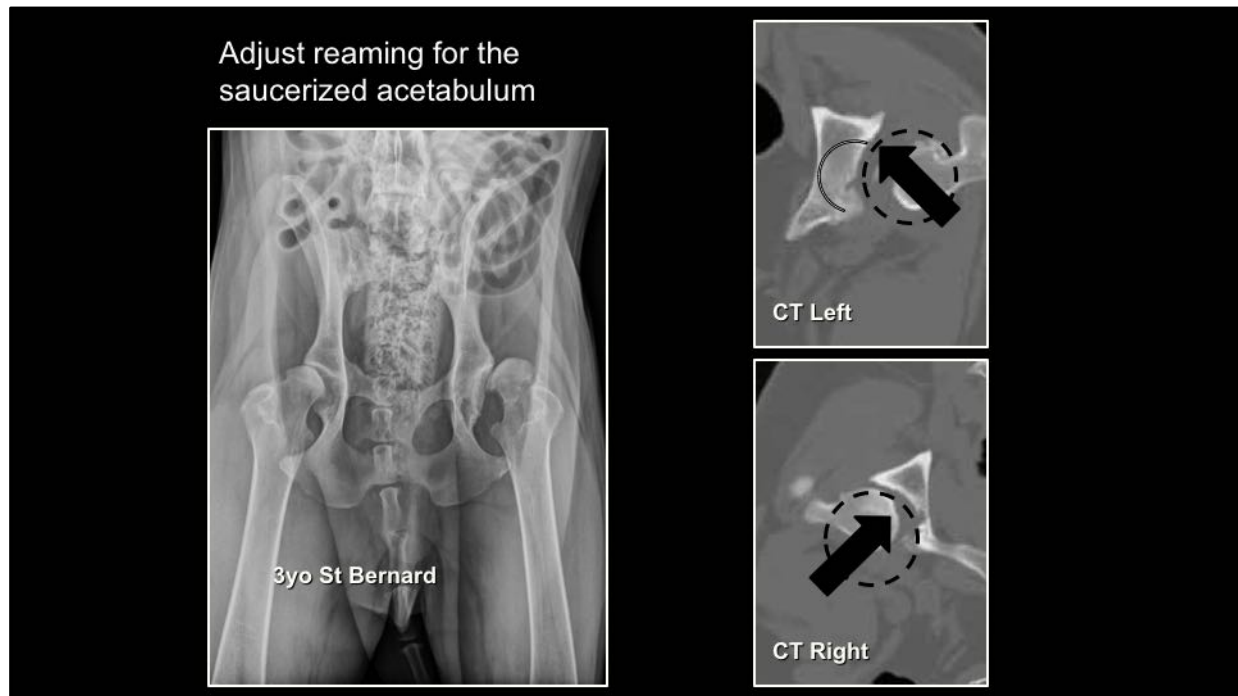


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Adjust reaming for the
saucerized acetabulum

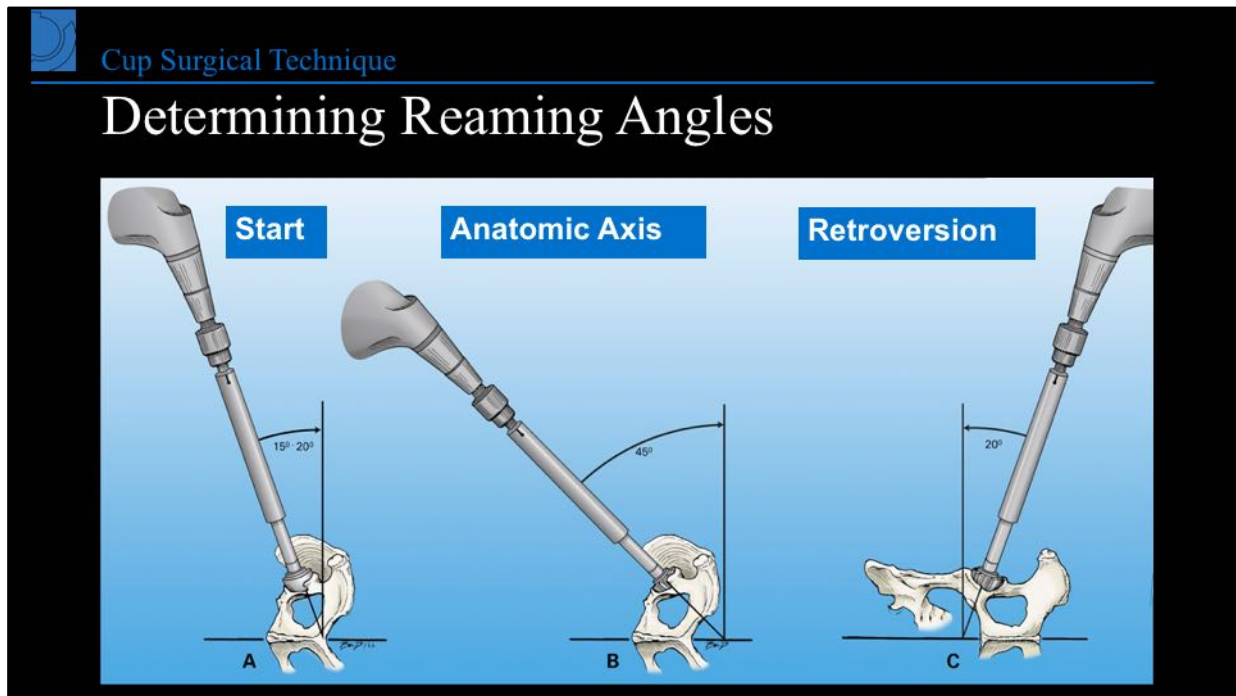


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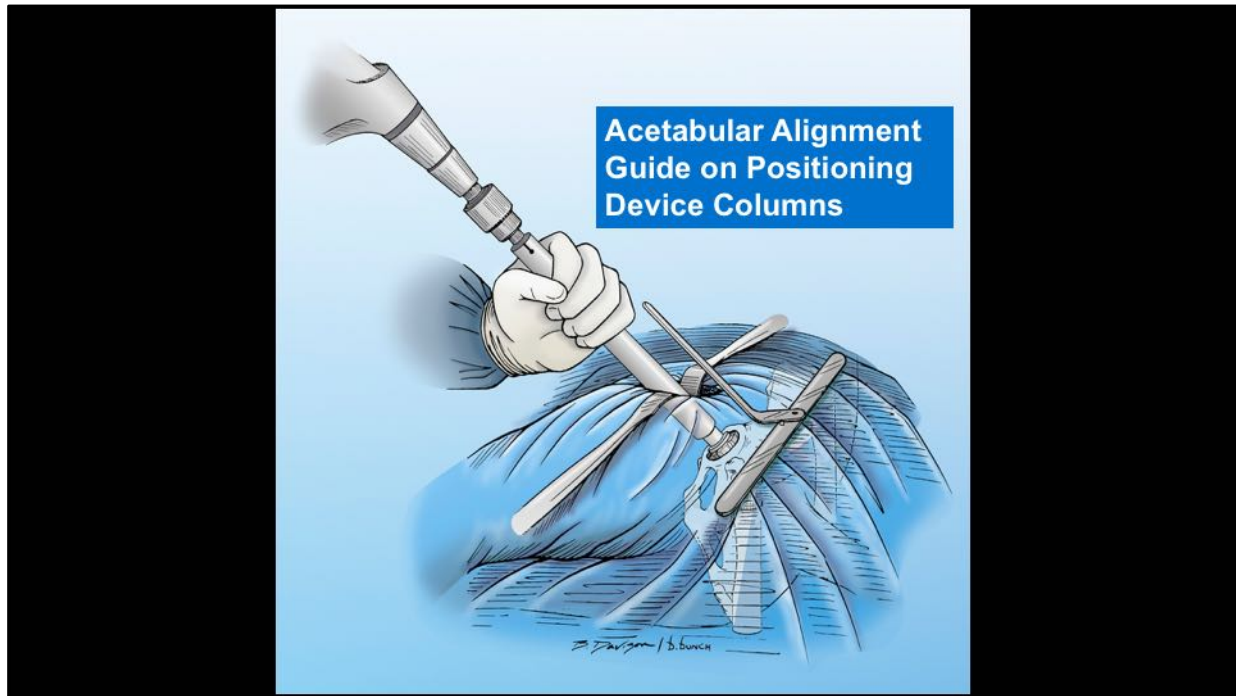


Preserve DAR

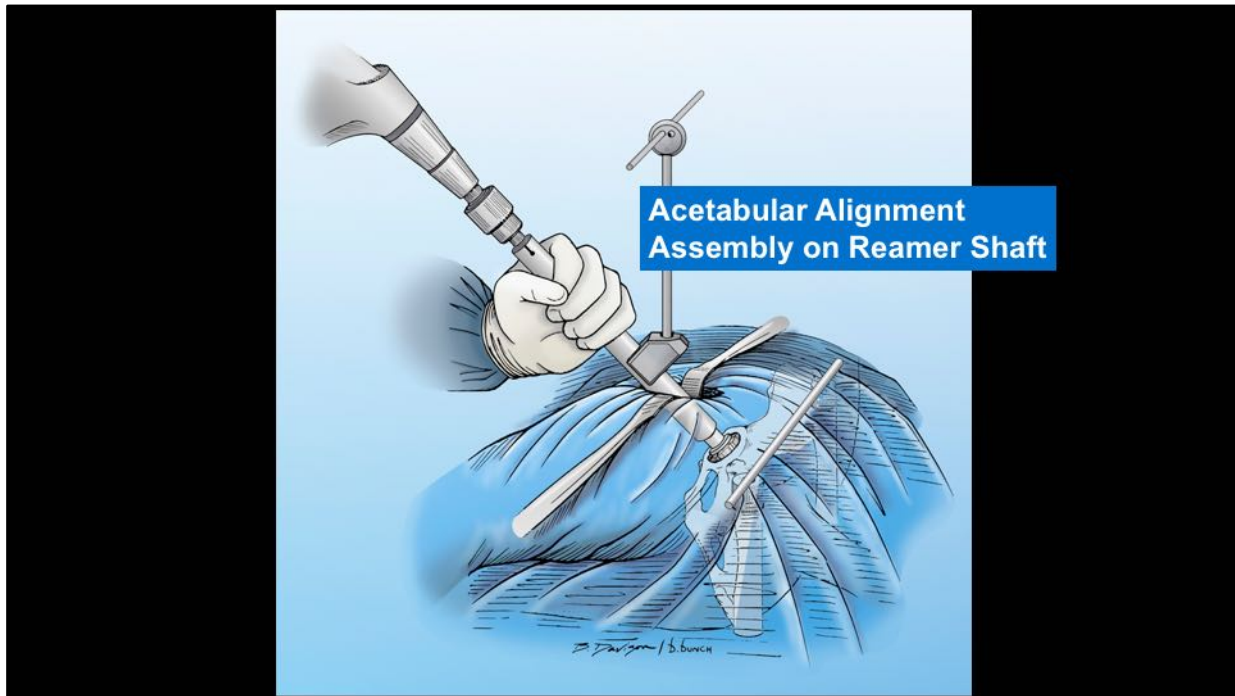
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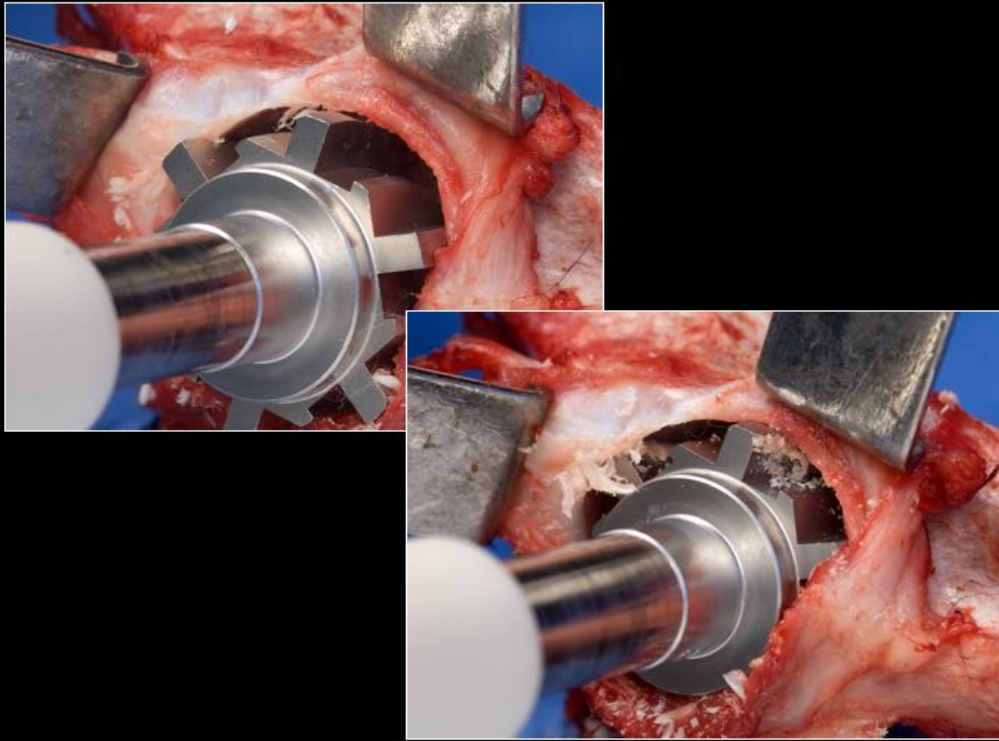


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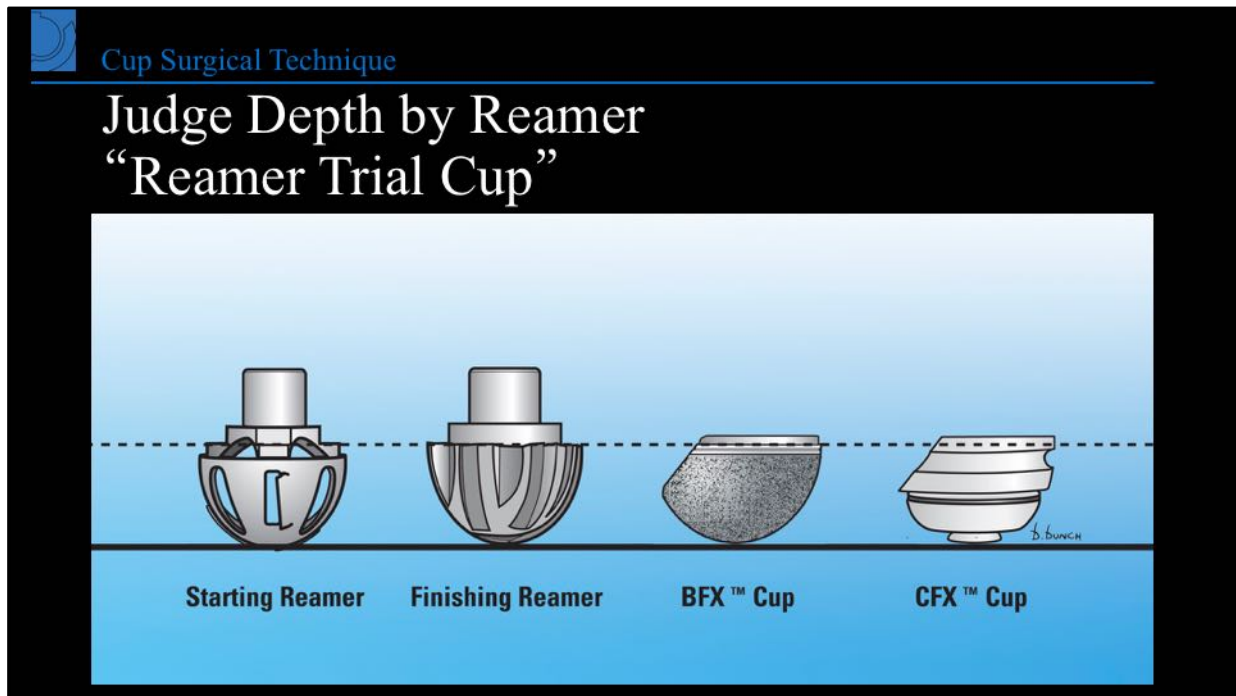
Reaming

- Finishing reamer
 - To establish the diameter & create press-fit
 - Finishing reamers only cut on the sides
 - Same size as final BFX cup size
 - 1mm larger than CFX cup (cement mantle)

Notes



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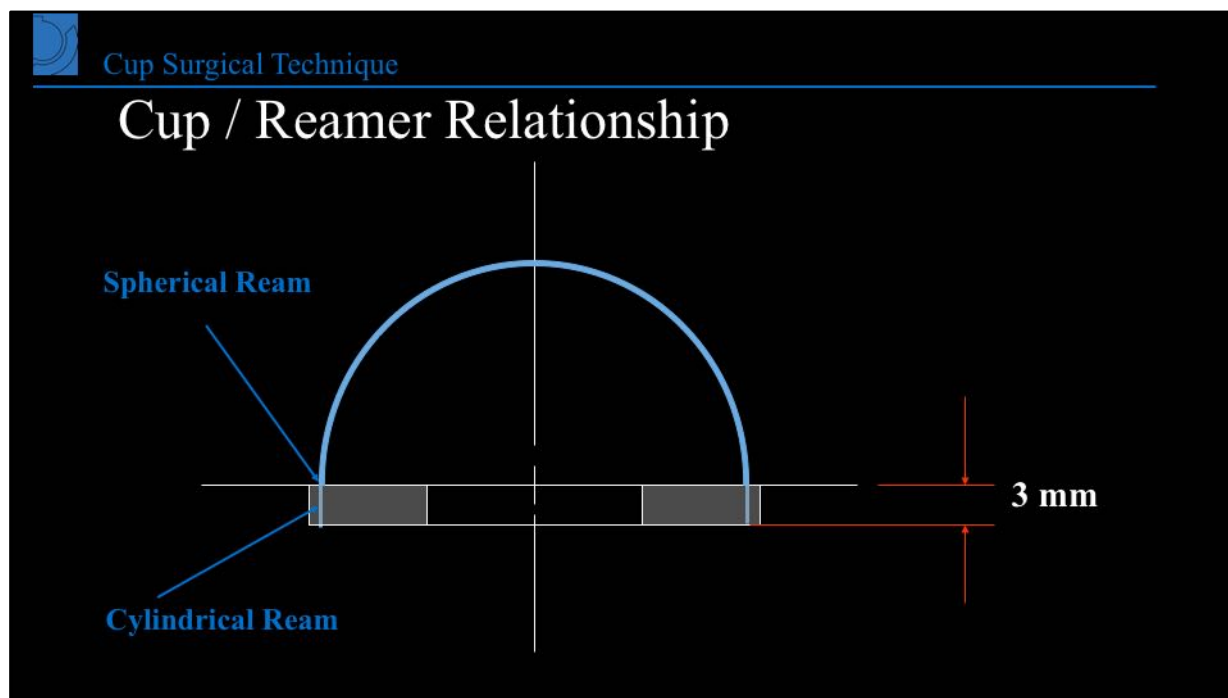


Cup Surgical Technique

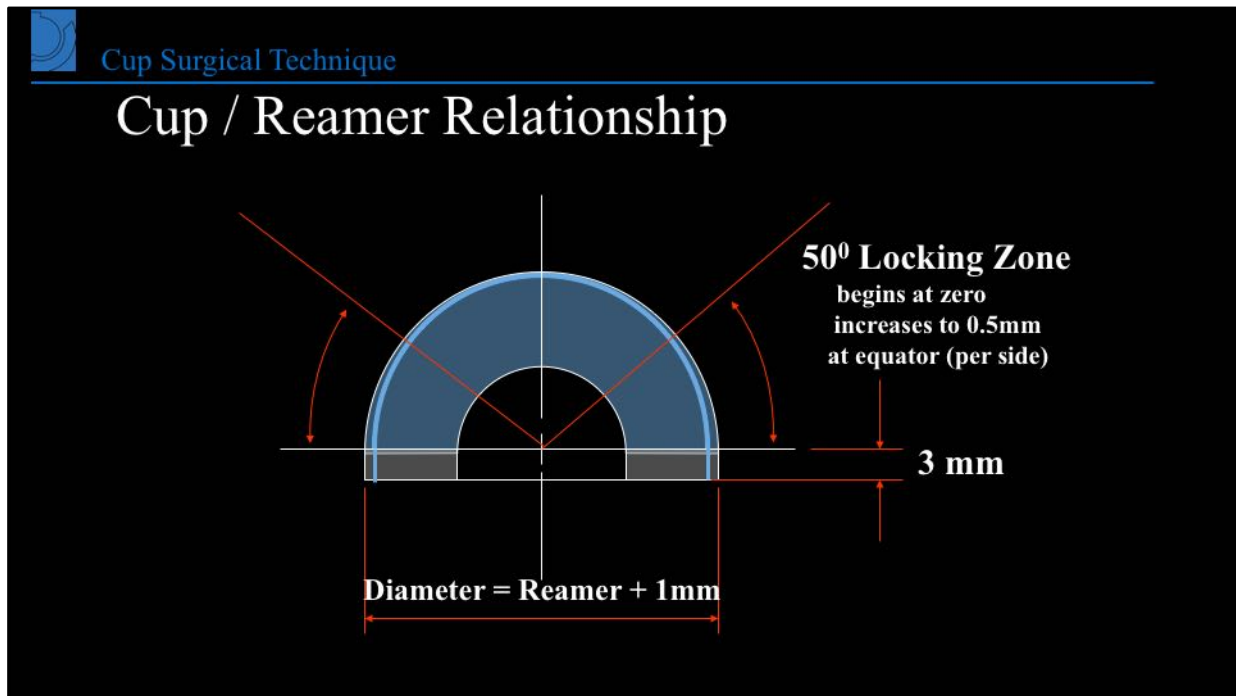
General Principles

- The BFX cup is NOT spherical (last 3mm cylindrical)
- Therefore
- Orientation of reaming defines the orientation of the cup
- All reaming should be aligned
 - One exception: very initial reaming

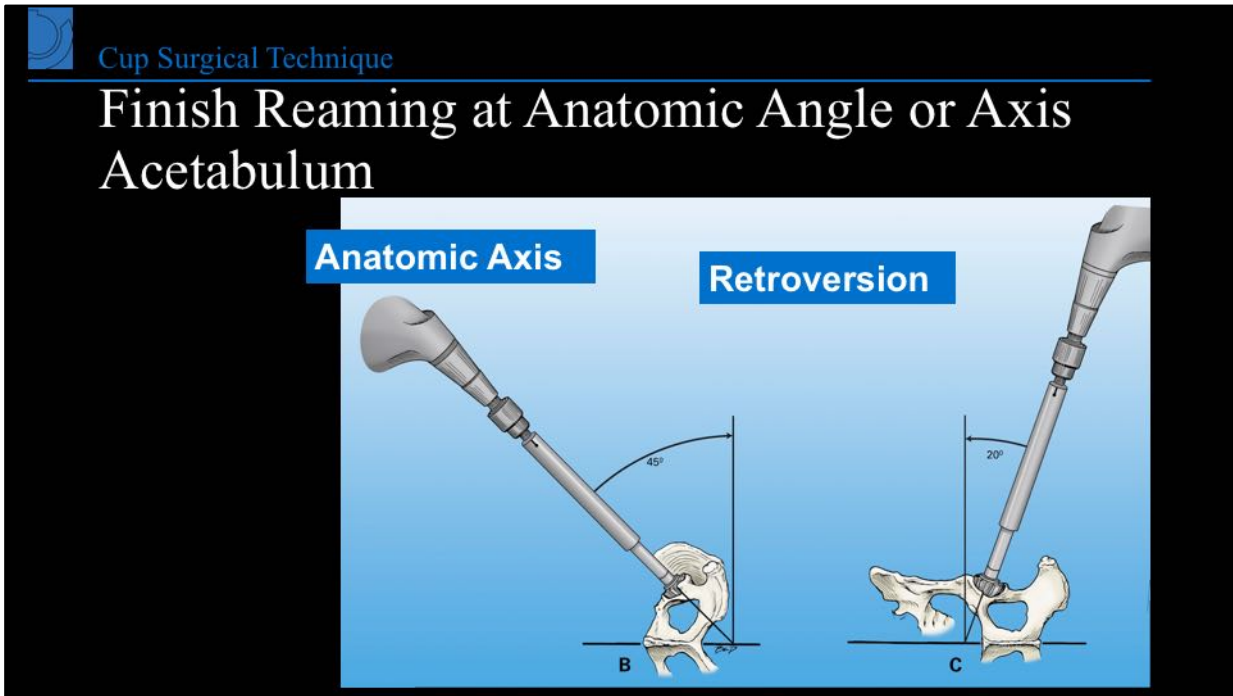
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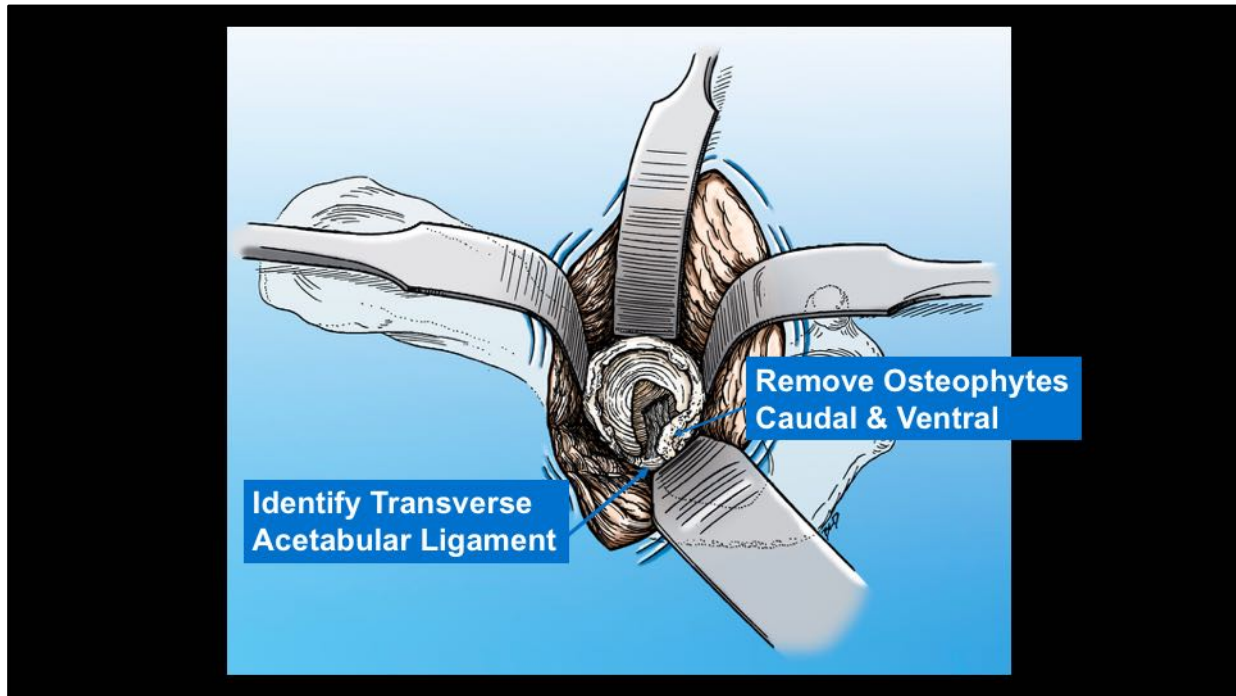


Cup Surgical Technique

Before cup insertion

- Place plastic trial cup to
- assess acetabular boundaries
- Remove ventral osteophytes
- Remove or retract ventral joint capsule
 - Can be pulled in
- Keep cup oriented ventrally on initial insertion

Notes



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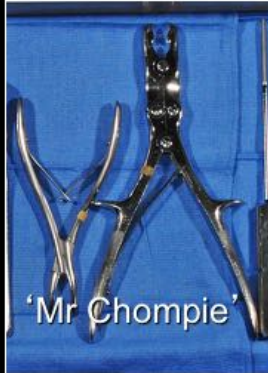
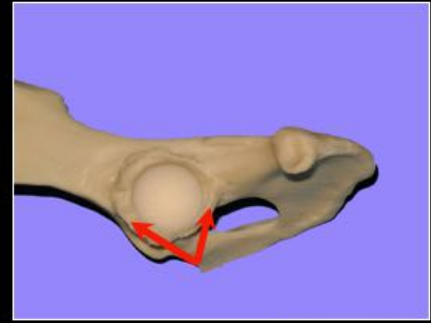


Notes

Cup Surgical Technique

Remove ventral osteophytes

- Bone in this region will interfere
- with cup positioning



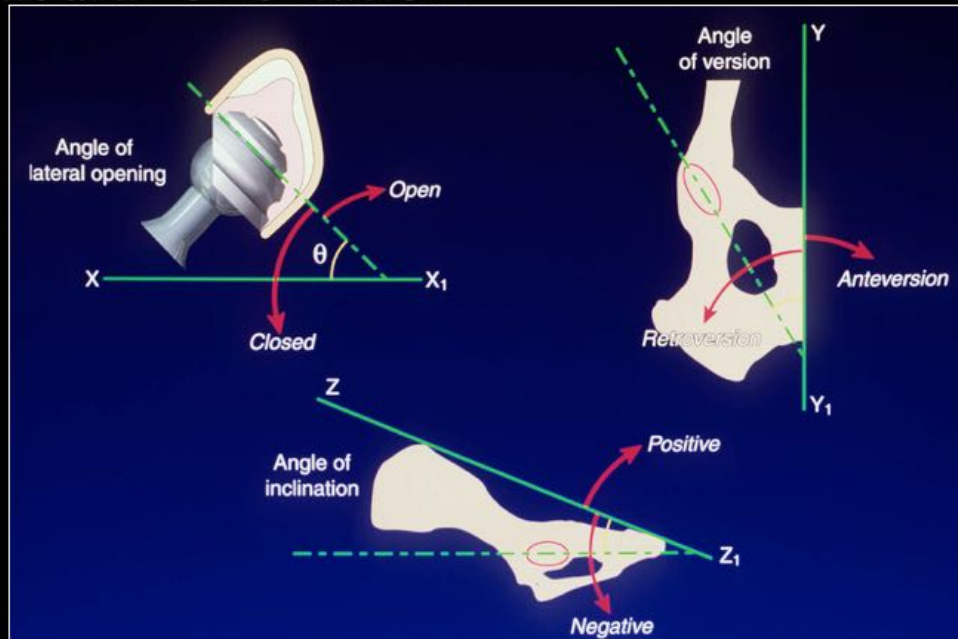
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Cup Surgical Technique

Acetabular orientation

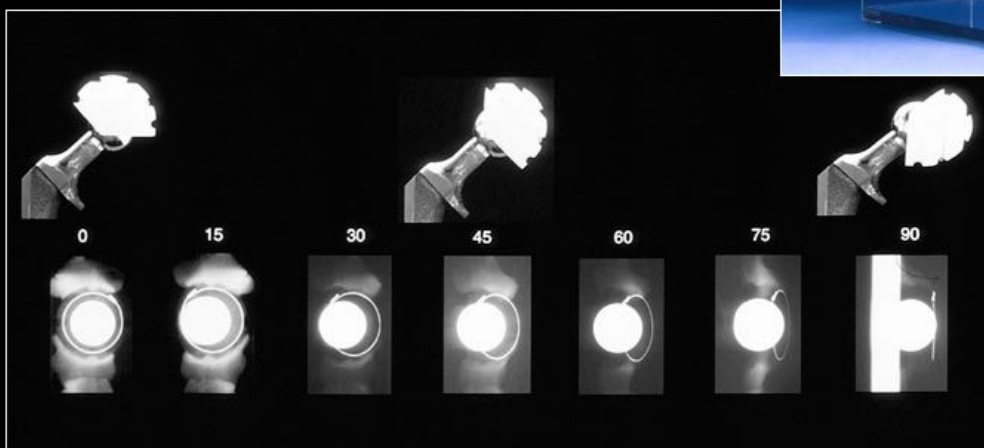


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Cup Surgical Technique

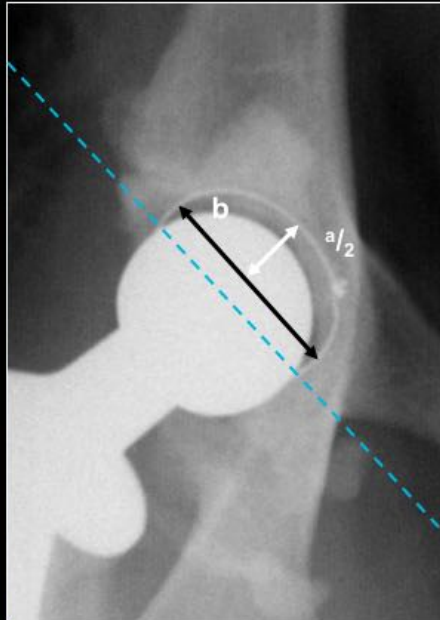
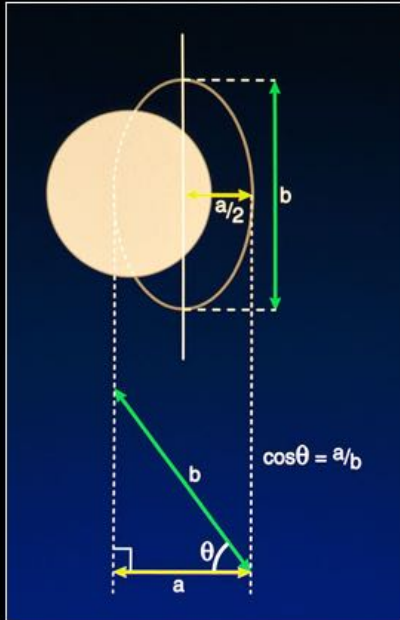
Angle of lateral opening (CFx)



Notes

Cup Surgical Technique

Angle of lateral opening (CFx)



- $a/2 = 12\text{mm}$
- $b = 34\text{mm}$
- $\cos\theta = 24/34$
- $\theta = 45^\circ$

Notes



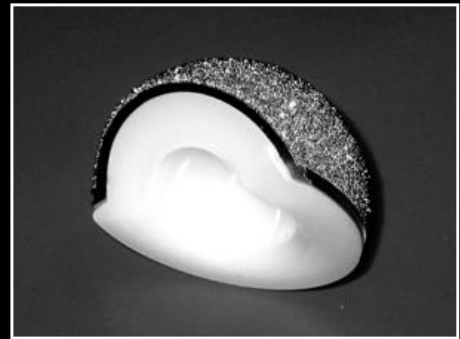
Cup Surgical Technique

Angle of lateral opening (BFx)



- $\cos \theta = 17 \div 24$

- $\theta = 45^\circ$

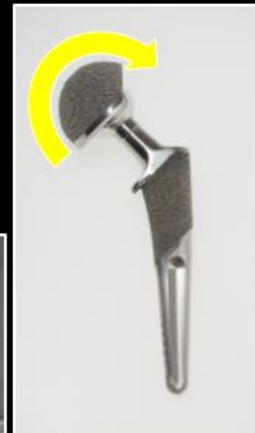


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Cup Surgical Technique

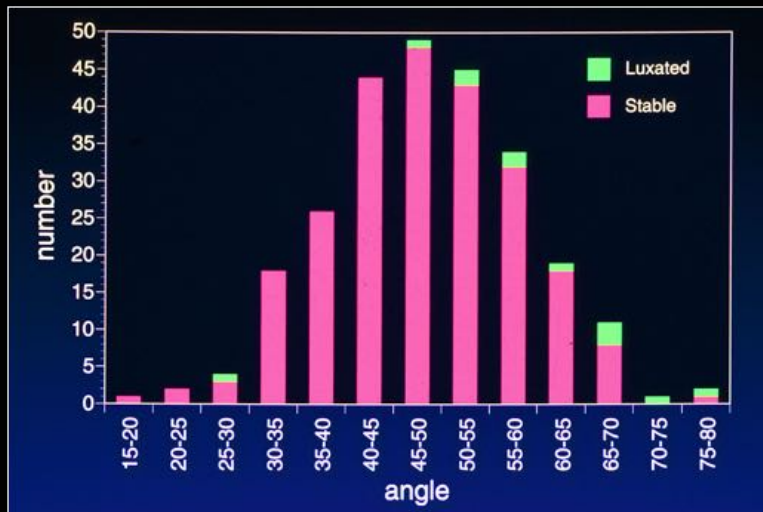
Angle of lateral opening (BFx)



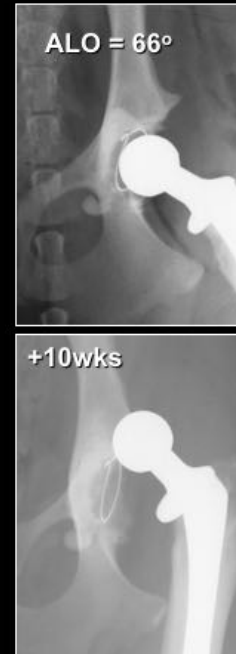
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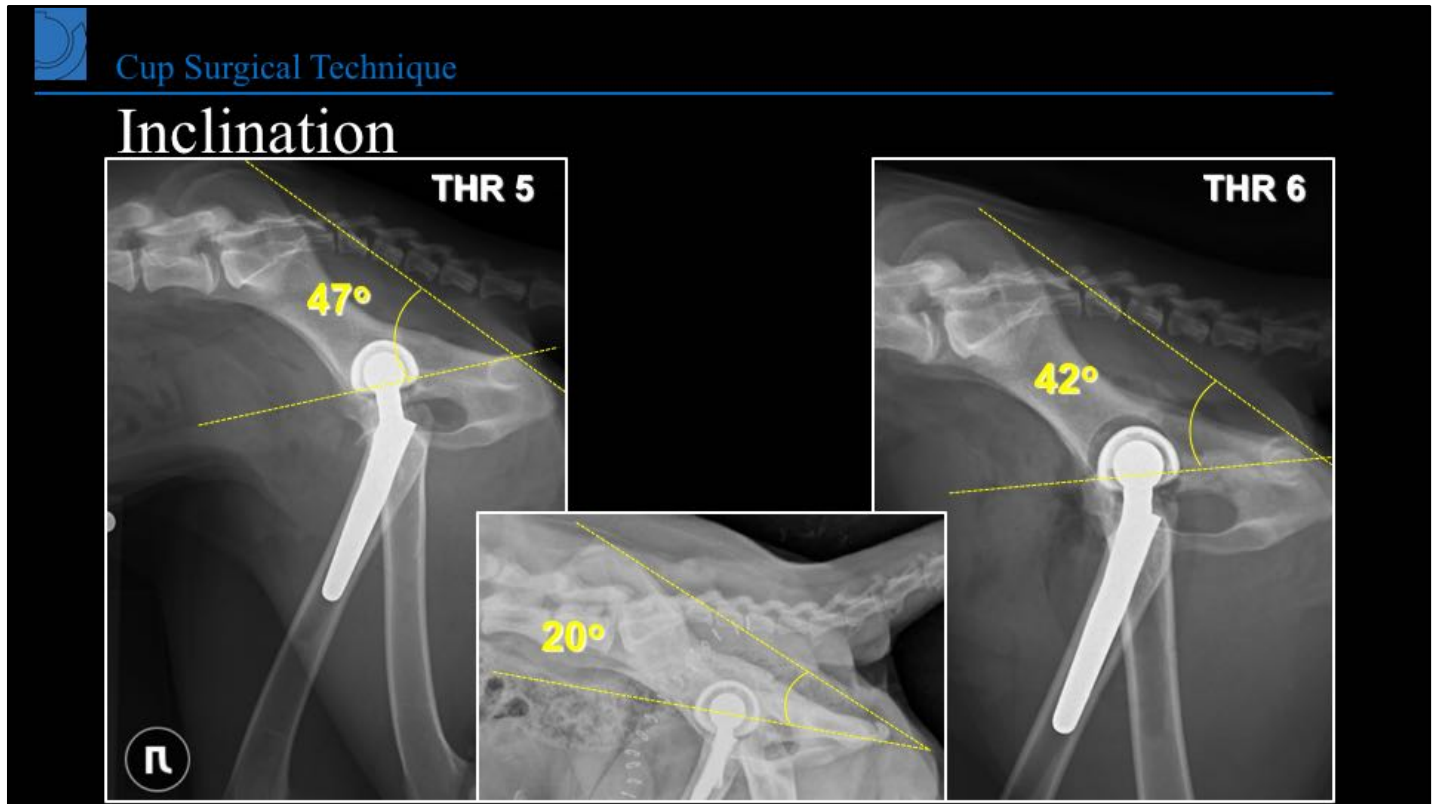
Dorsal luxation (CFx)



ALO > 60°
risk of luxation increases 8x



Notes



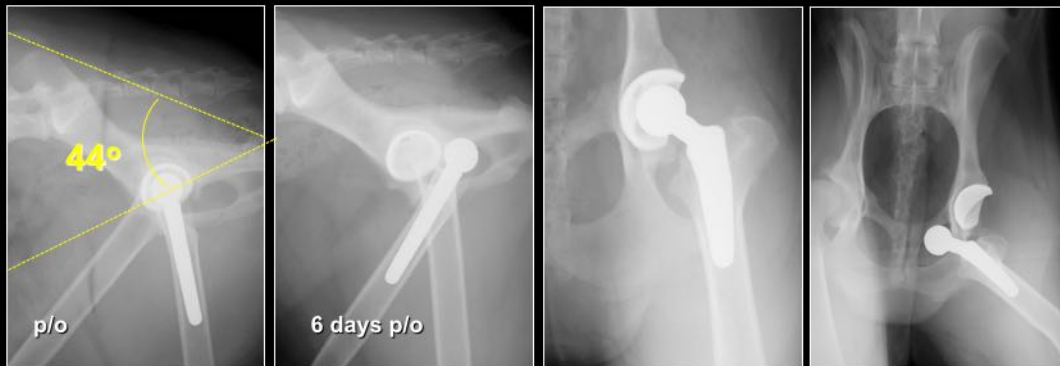
Good

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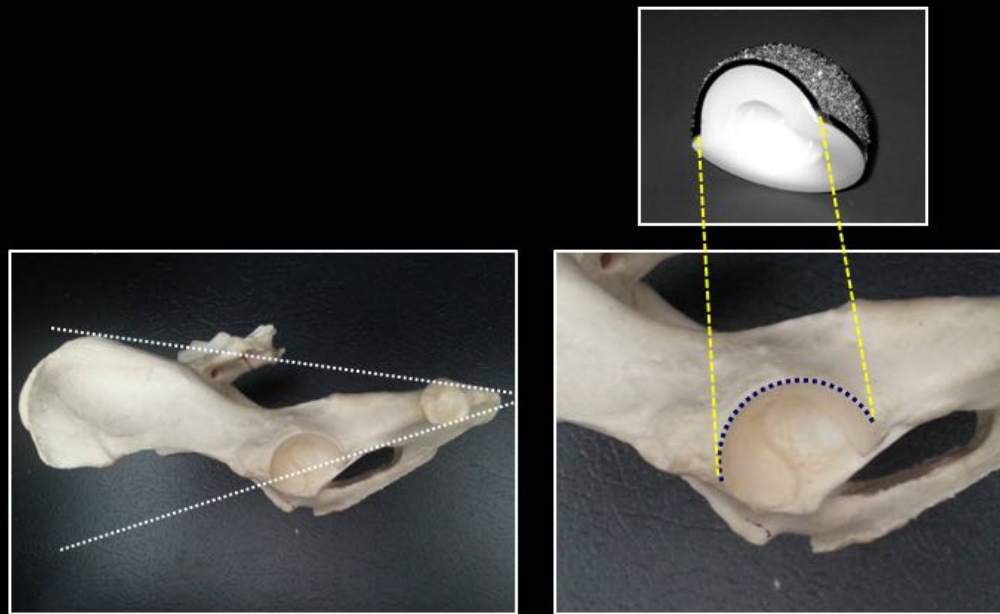


Cup Surgical Technique

Angle of inclination



Notes



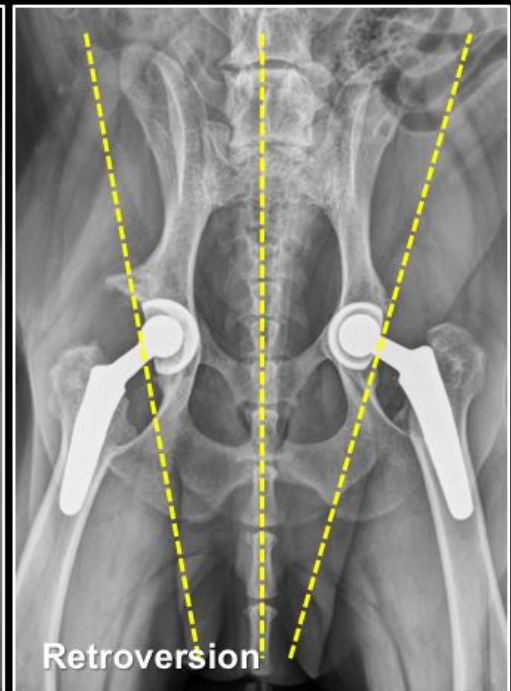
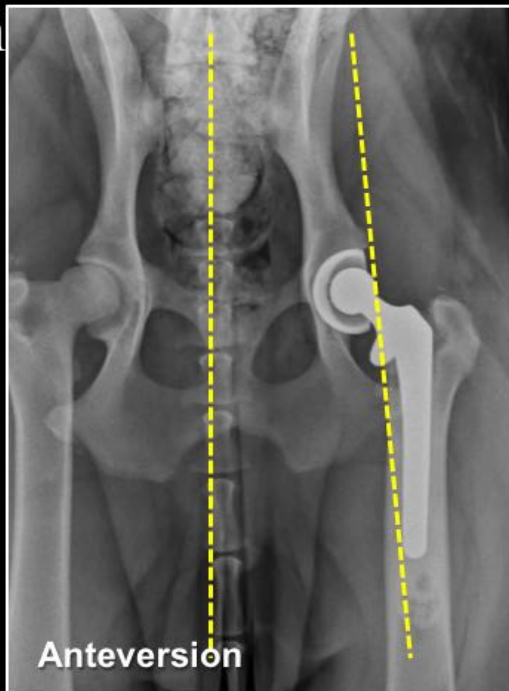
Reference local anatomy

Notes



Cup Surgical Technique

Version



Notes



Cup Surgical Technique

Version

- Coefficient of friction



Notes



Medial wall perforation



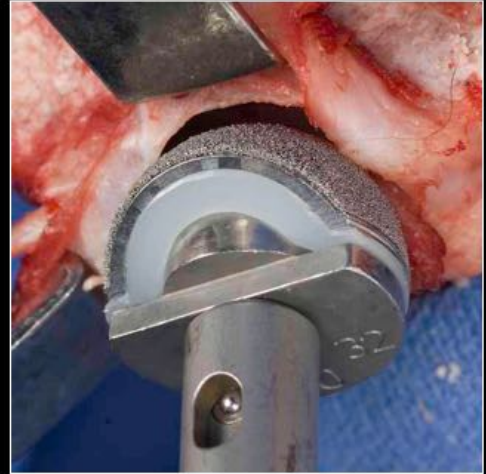
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Cup Surgical Technique

Depth of impaction

- Check for seating of finishing reamer
- Soft tissue interposition
- Failure to debride ventral osteophyte
- Non-coaxial insertion of cup



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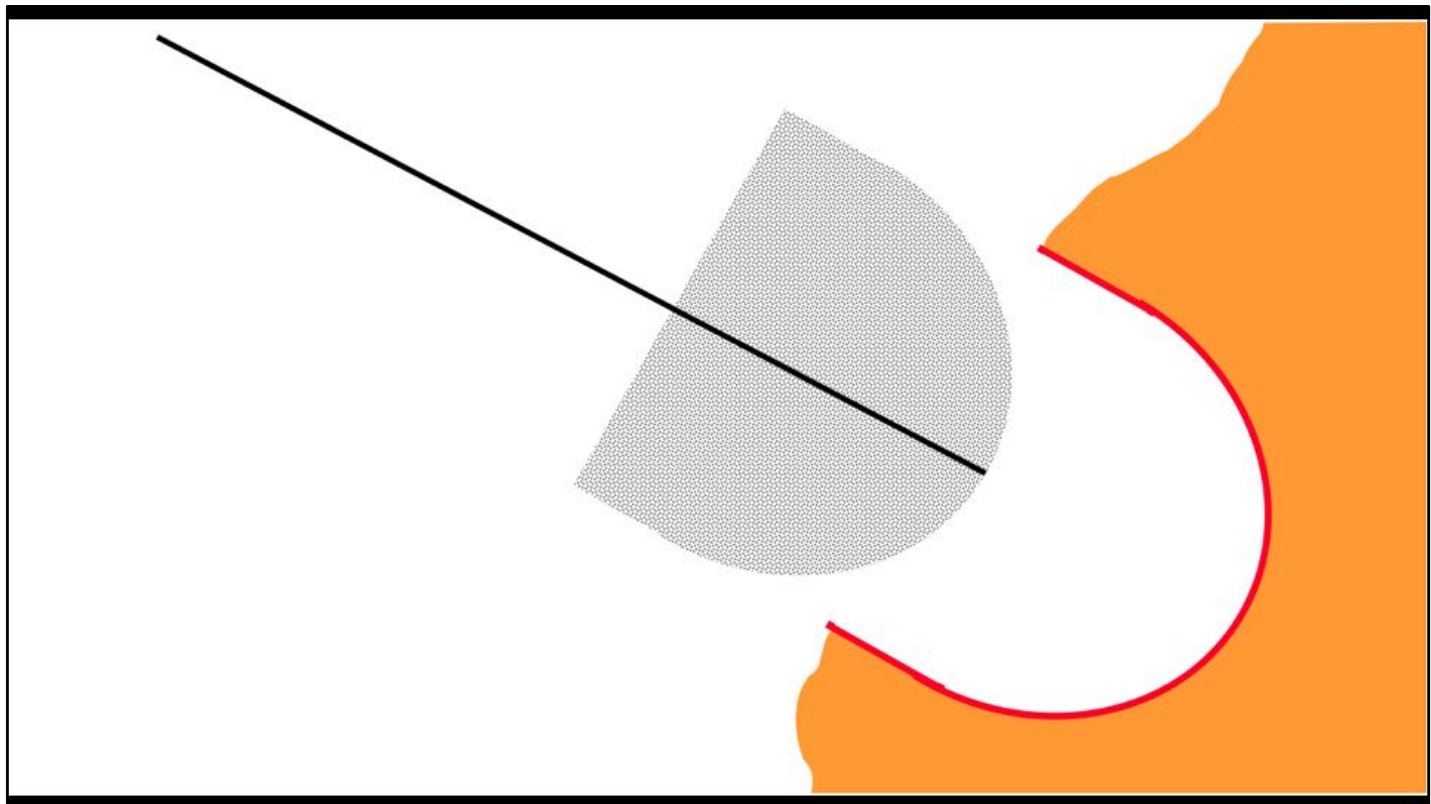


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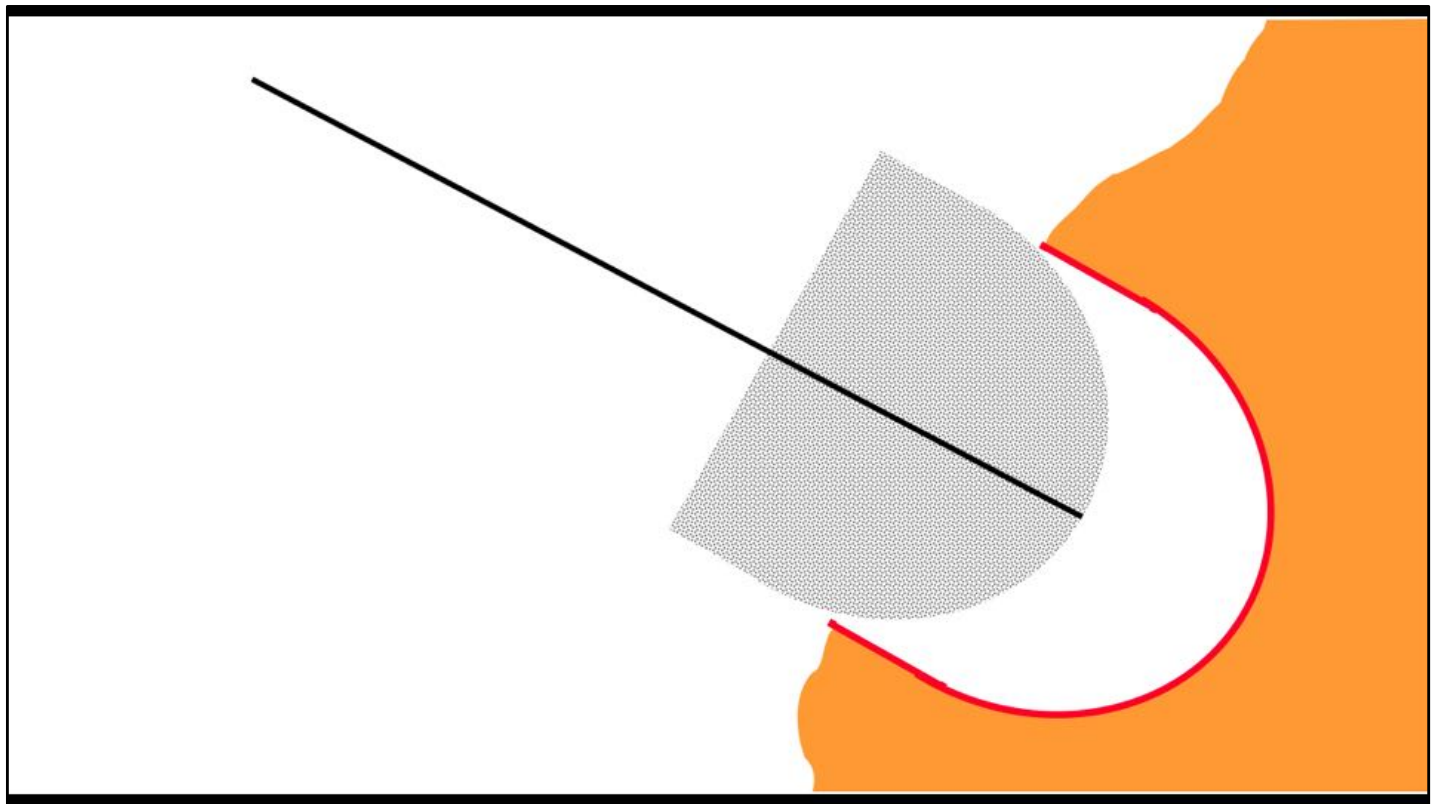
Cup Insertion: General Principles

- Cup fit and cup stability will be better if cup is inserted exactly along the reamed axis

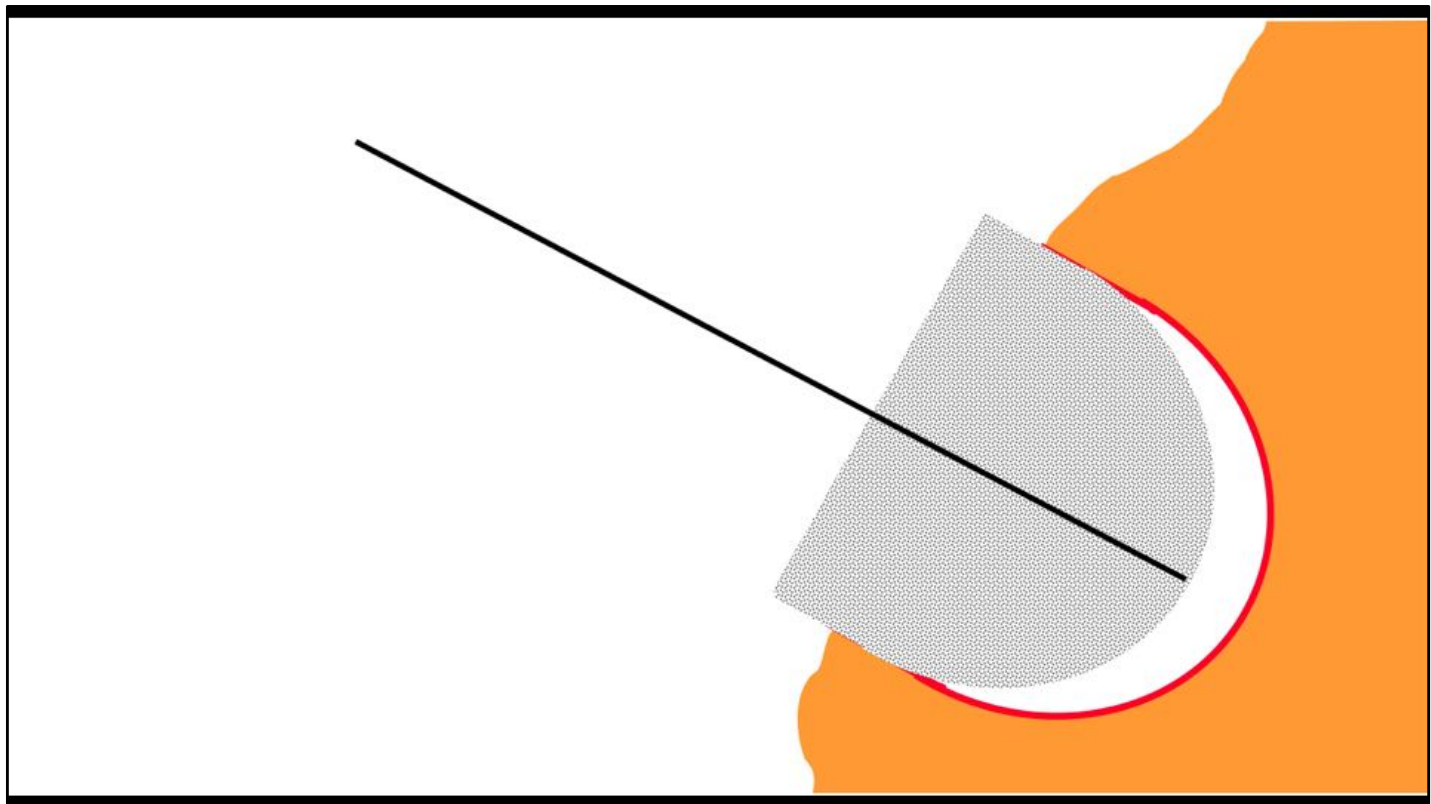
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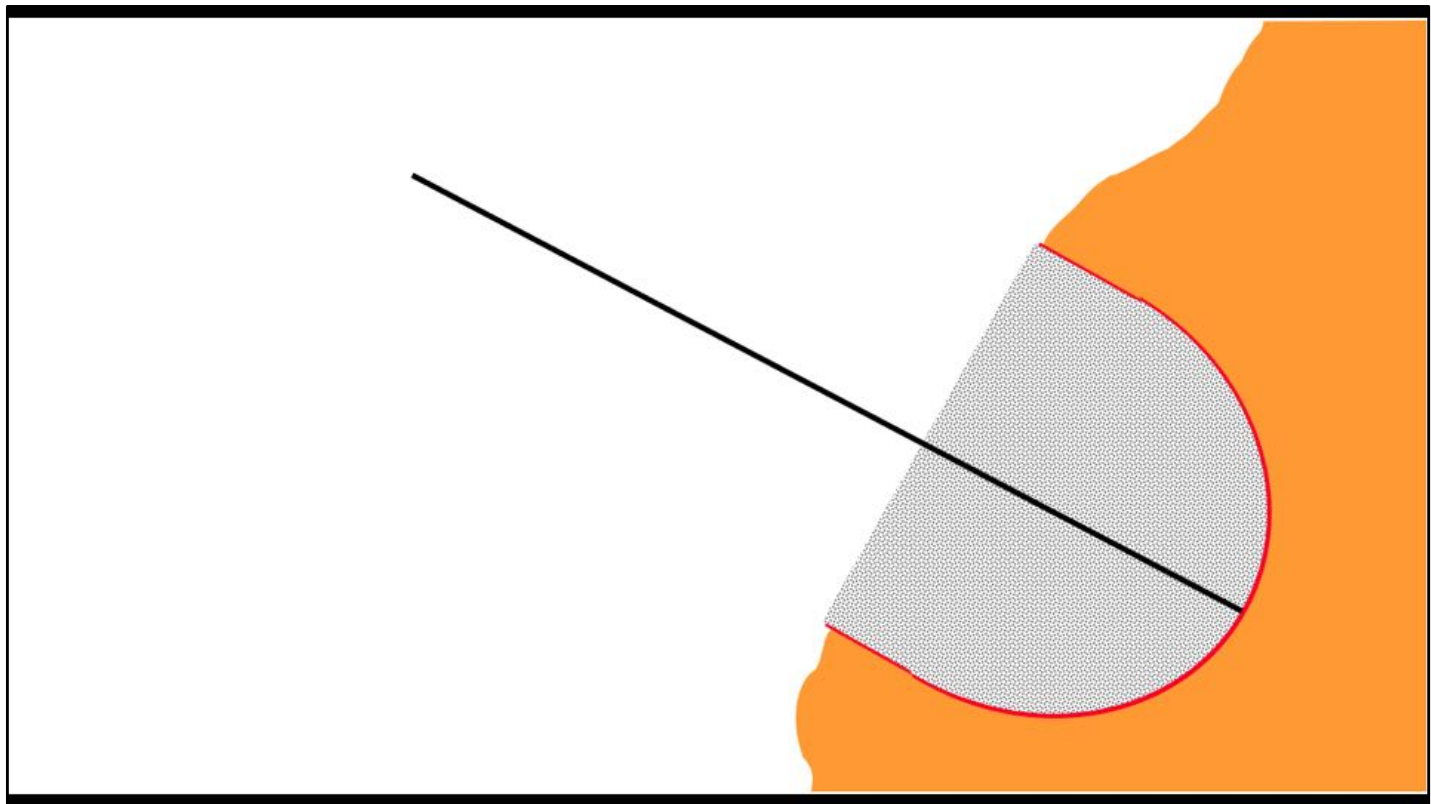
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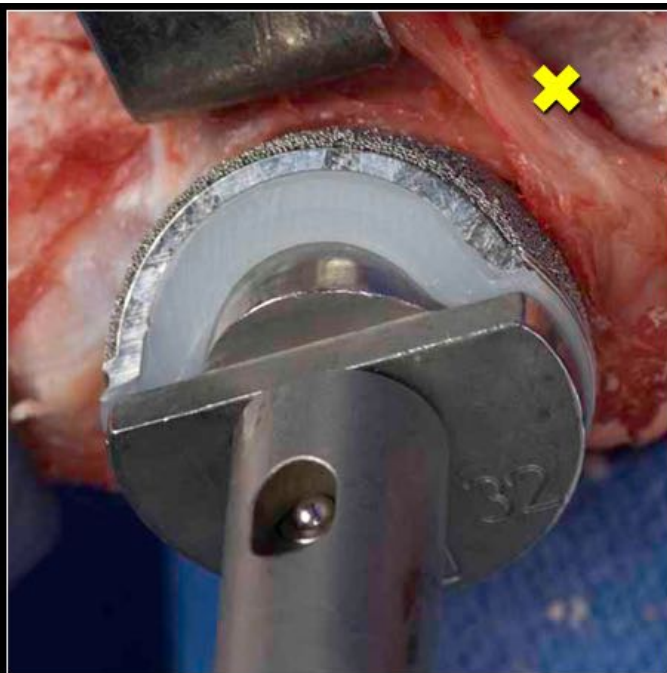
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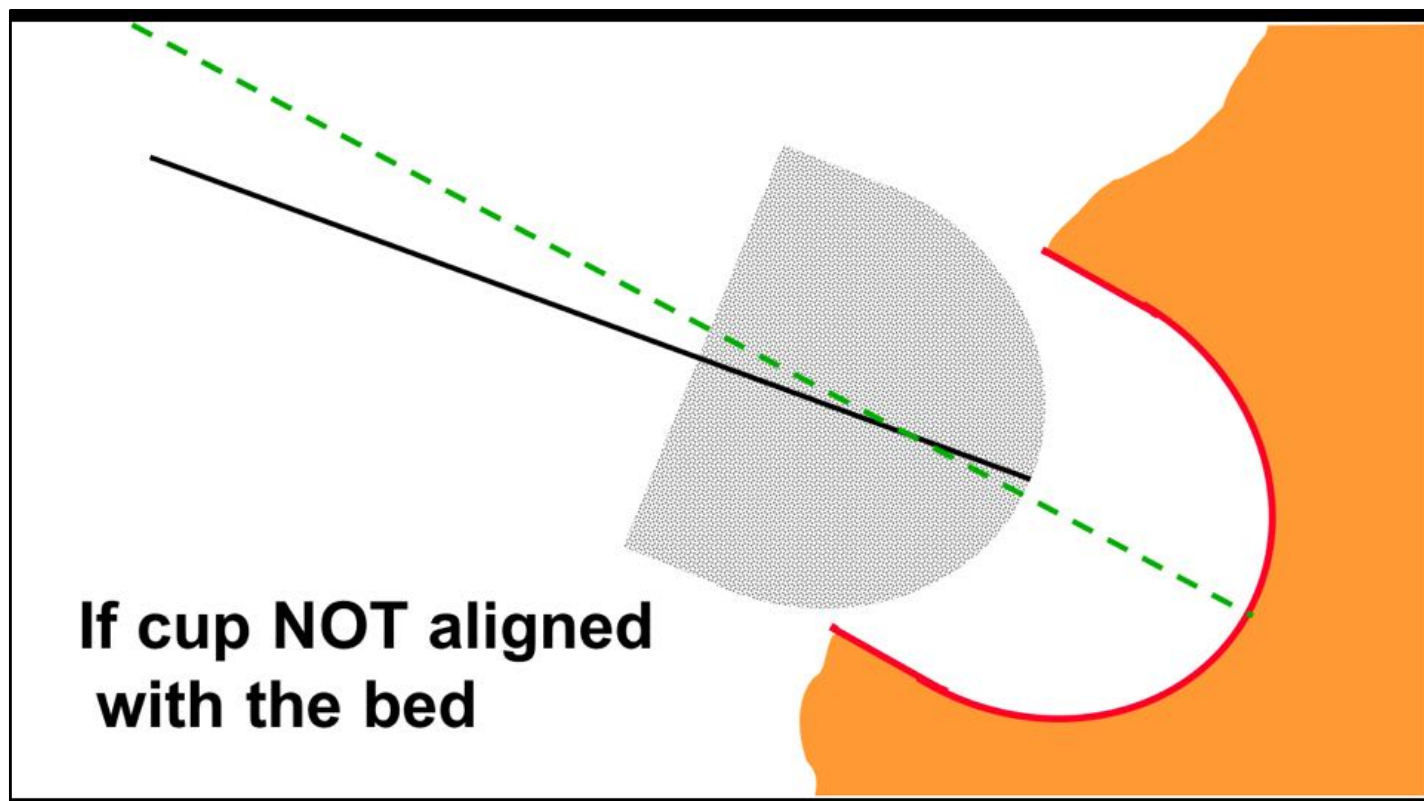


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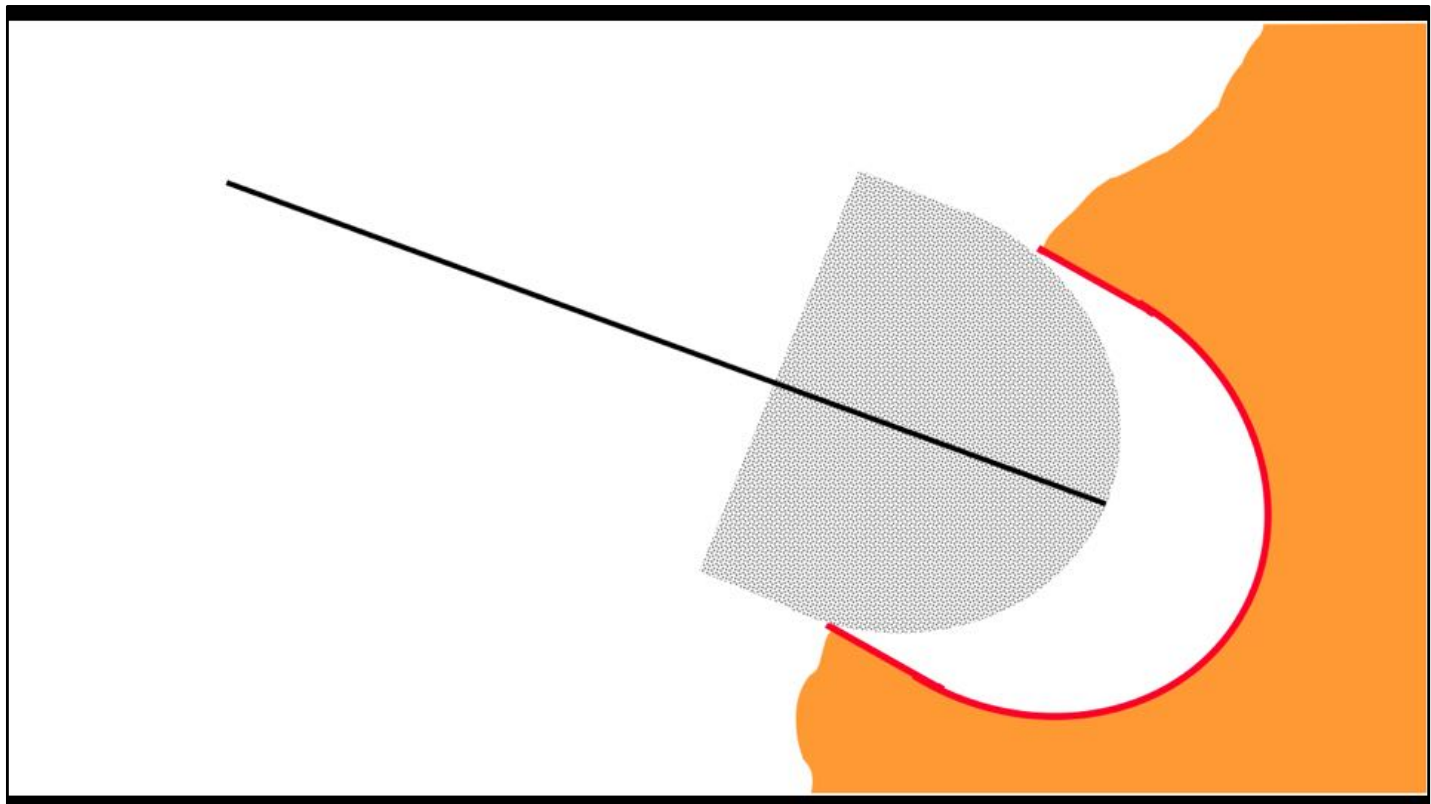


- 45o angle of impaction
- introduce cup with dorsal stand-off

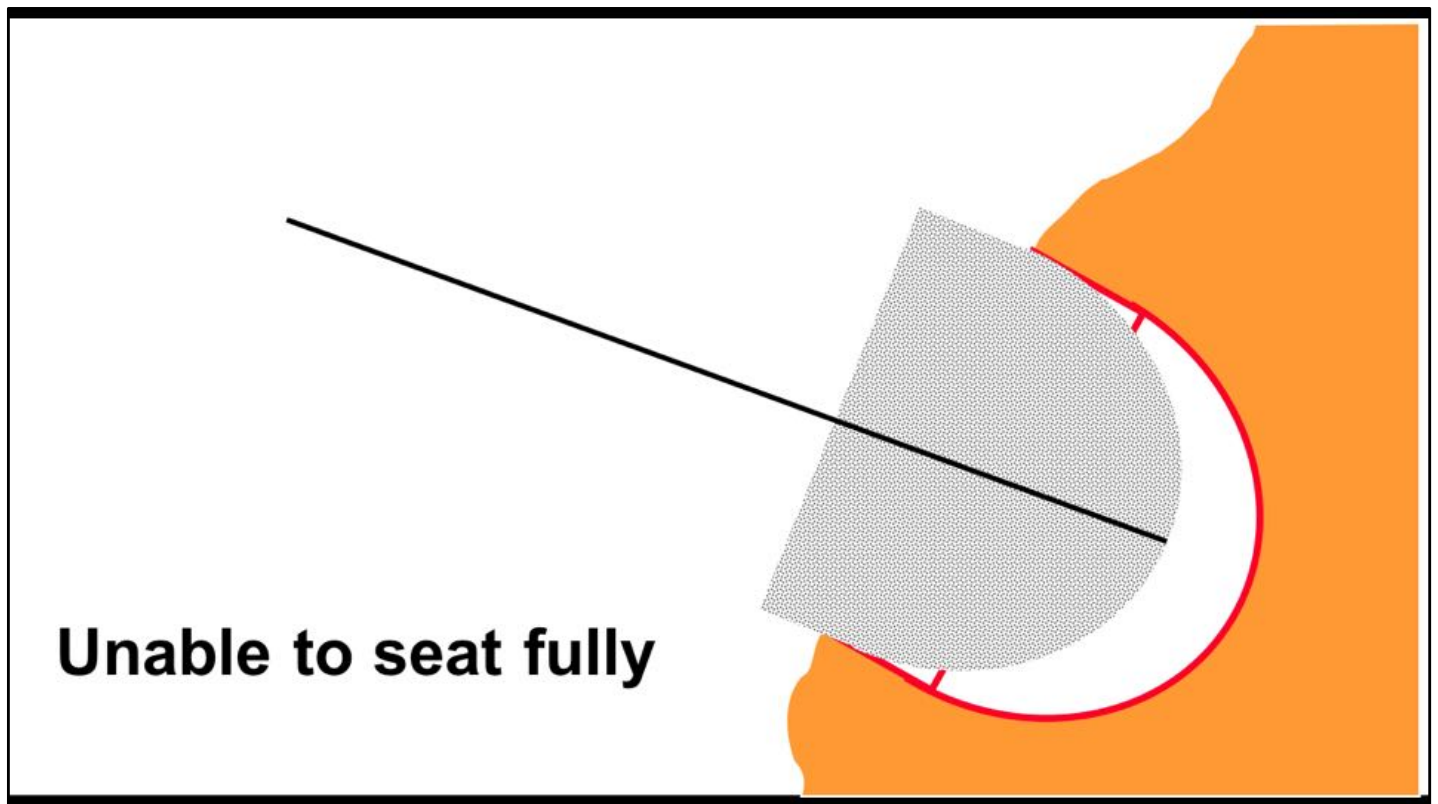
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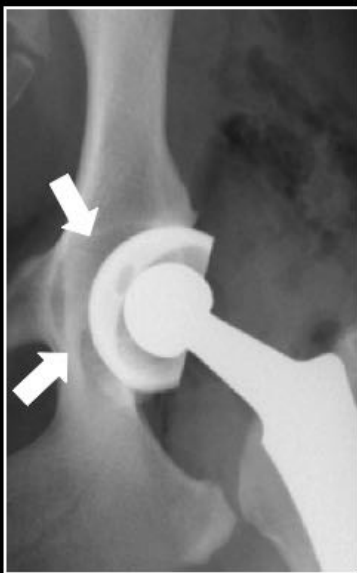
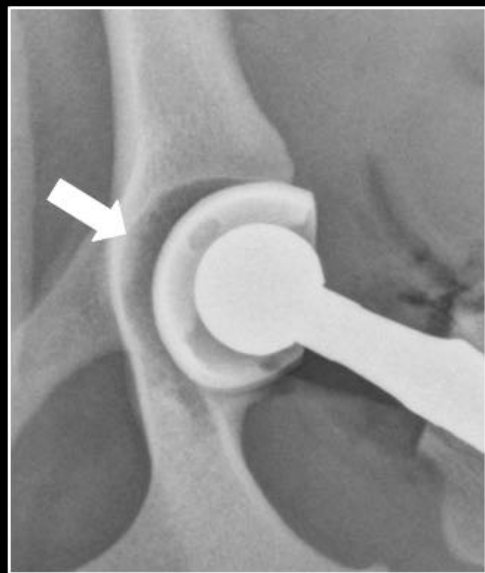
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Incomplete insertion



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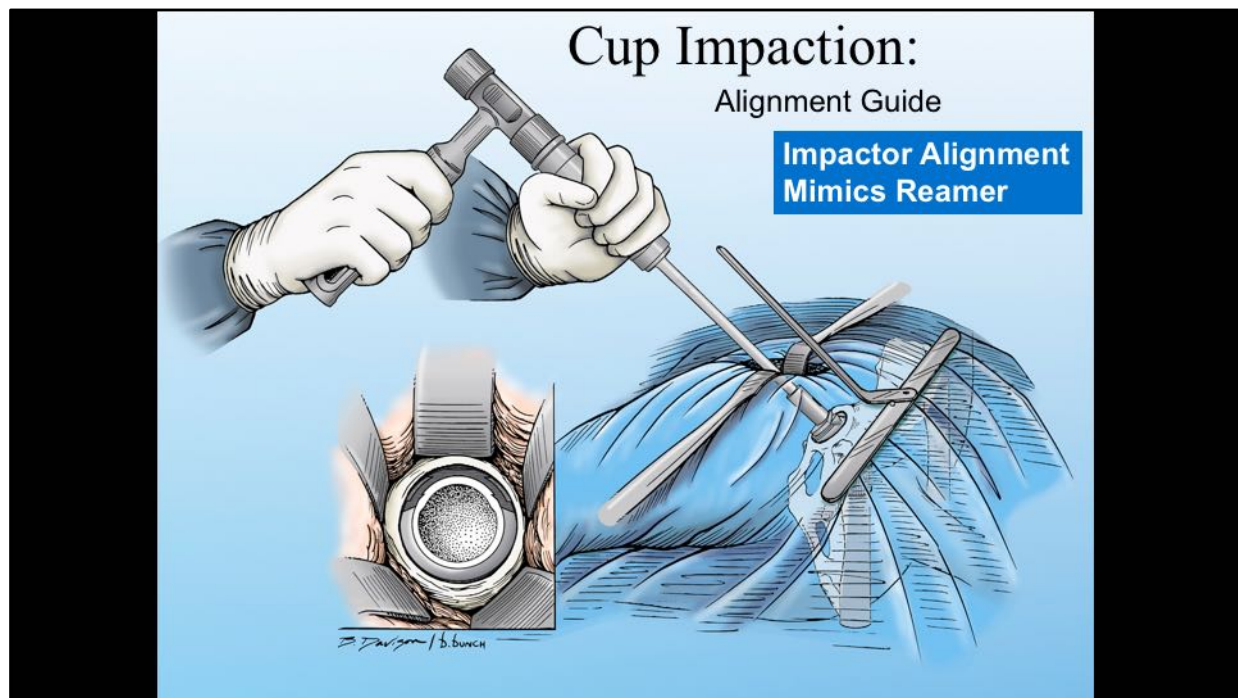


Cup Surgical Technique

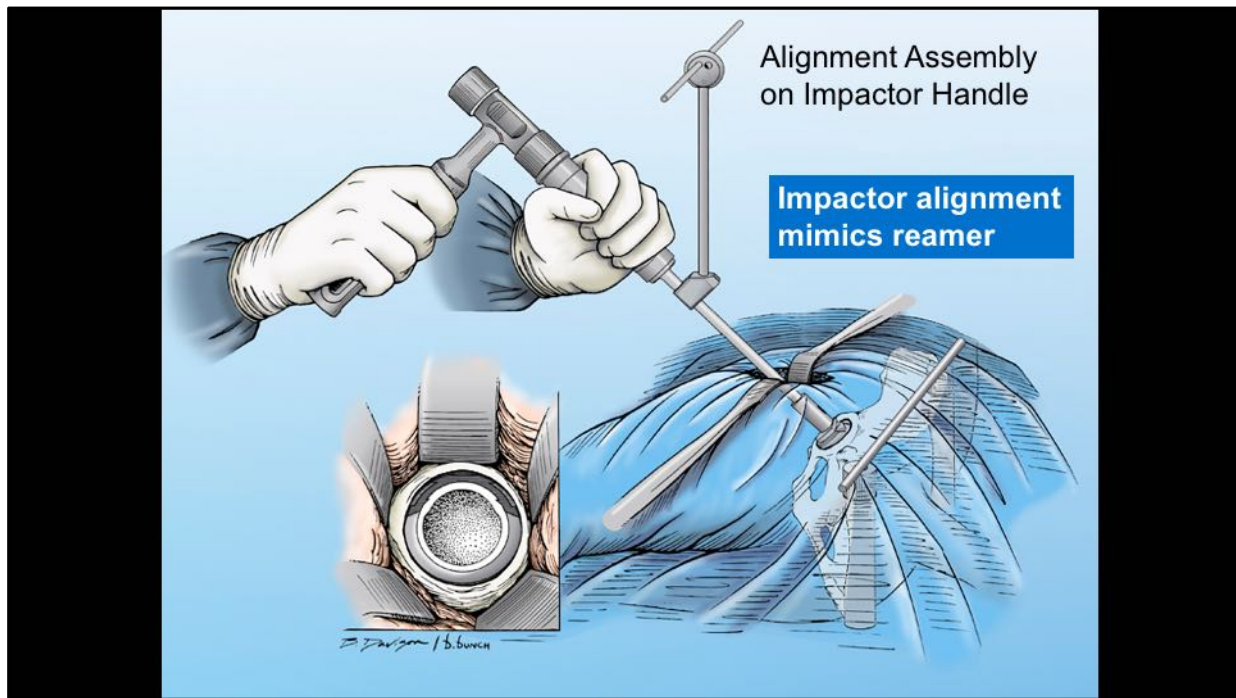
Cup Alignment and Impaction

- Acetabular Alignment Guide
- Acetabular Alignment Assembly

Notes



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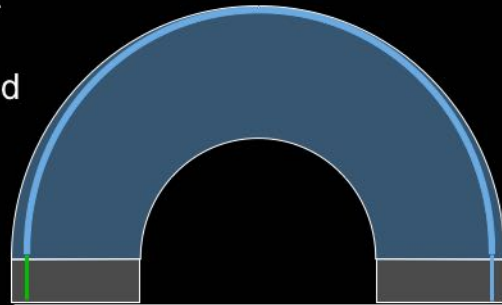
Notes



Cup Surgical Technique

Altering Cup Alignment

- Must be done early
- Push in & 1 - 2 taps
 - Assess prior to final 3-4 mm
- Eccentric impactor head to shift alignment
- Once seated, not easily adjusted



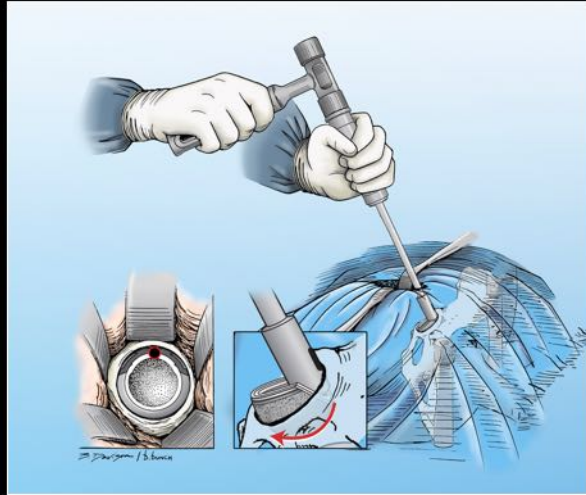
Notes



Cup Surgical Technique

Cup Removal

- Unable to reposition cup
- Impactor handle or
version alignment rod
- Impact at 12 o'clock
- Swivel out of bed



Notes



Cup Surgical Technique

CFX Cup

- Exact same reaming procedure and instruments
 - Starter reamer / finishing reamer
 - Same trial cup
 - Create keyholes dorsally
 - Cement a CFX cup one size smaller than finishing reamer
 - Insert with same impactor handle

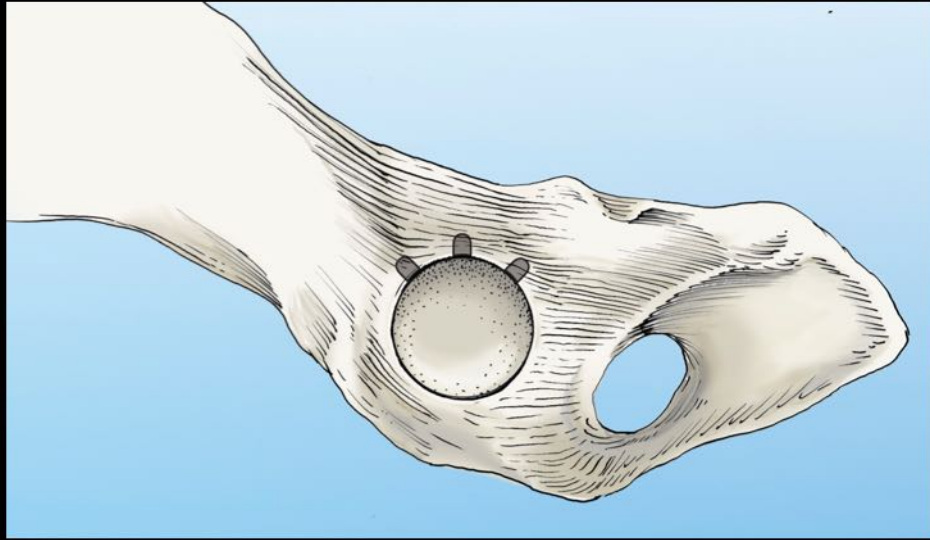


Notes



Cup Surgical Technique

CFX Cup

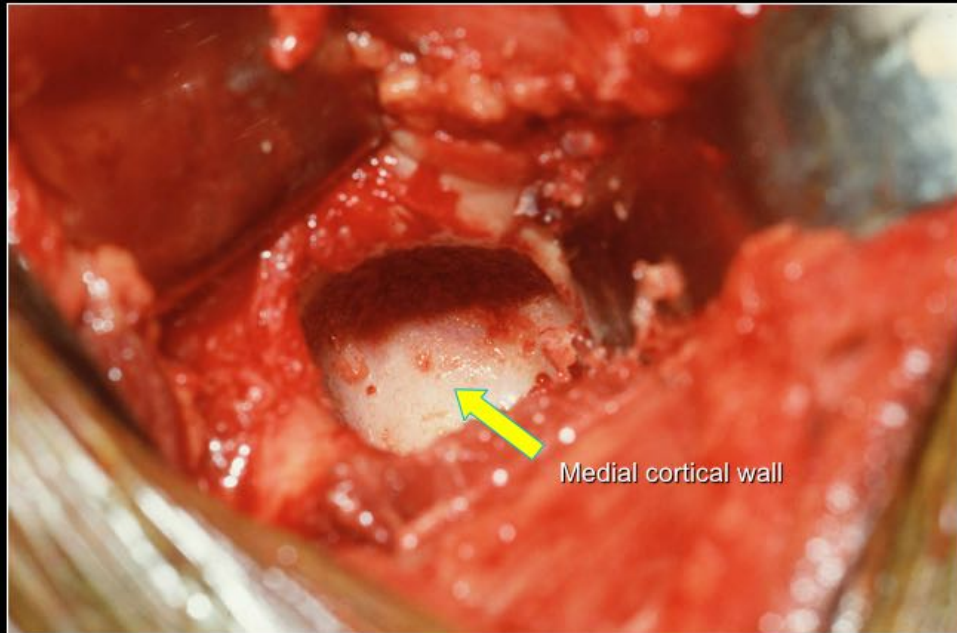


Notes



Cup Surgical Technique

Ream the acetabulum

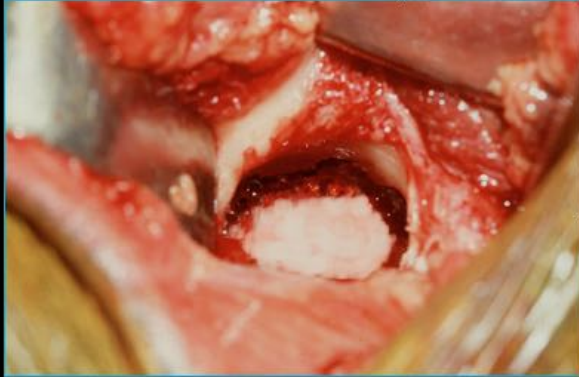


Notes



Cup Surgical Technique

Cemented cup



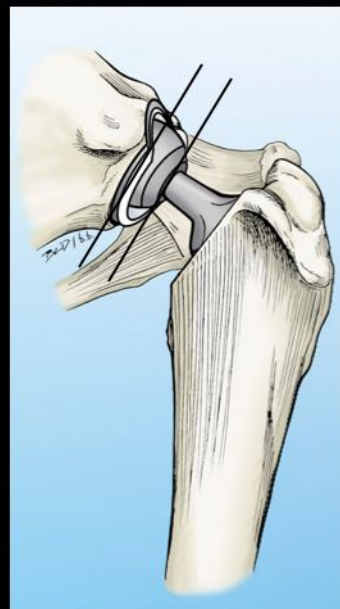
Notes



Cup Surgical Technique

Final Cup Position

- During trial reduction
- Limb normal position
- Head & cup parallel planes



Notes



Cup Surgical Technique

Thank you for your attention
Questions?



Skylar & Ruff

Notes



The Universal Hip Workshop

Cadaver Bones Lab: Acetabular Preparation



INNOVATION • EDUCATION • SUPPORT

Notes
