



The Universal Hip Workshop

Stem Surgical Technique

Michael Kowaleski
DVM, DACVS, DECVS



Tufts
UNIVERSITY

Cummings School of
Veterinary Medicine



Notes



Objectives

- Illustrate stem technique
- Discuss intraoperative assessment
- Describe intraoperative adjustments

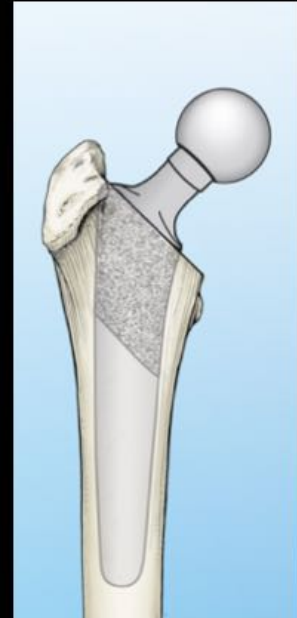
Notes



Stem Surgical Technique

Primary Objective: Initial Press-fit Stability (Friction)

- Canal fit (shape)
- Canal fill (85-90%)
- Cancellous and cortical bone quality
- Quality of canal preparation
- Interference fit
- Osteotomy level



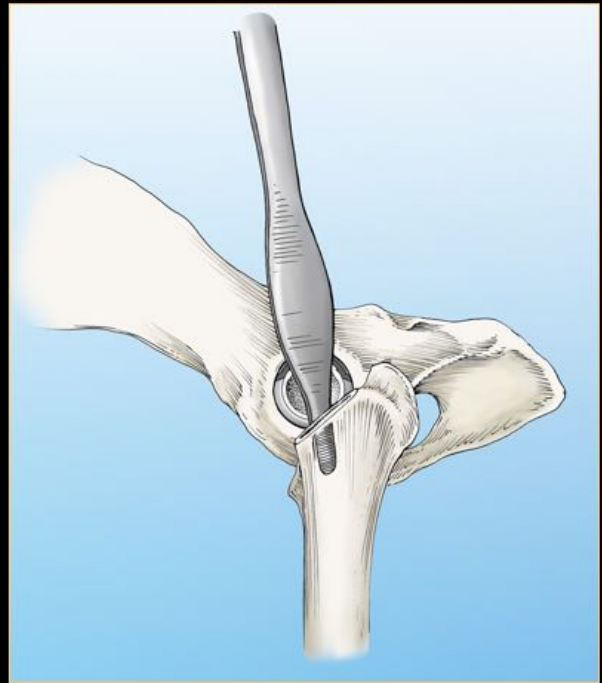
Notes



Stem Surgical Technique

Femoral Exposure

- 90° externally rotated
- Elevate with a blunt tip Hohmann retractor
- Must be able to align instruments axially in canal



Notes

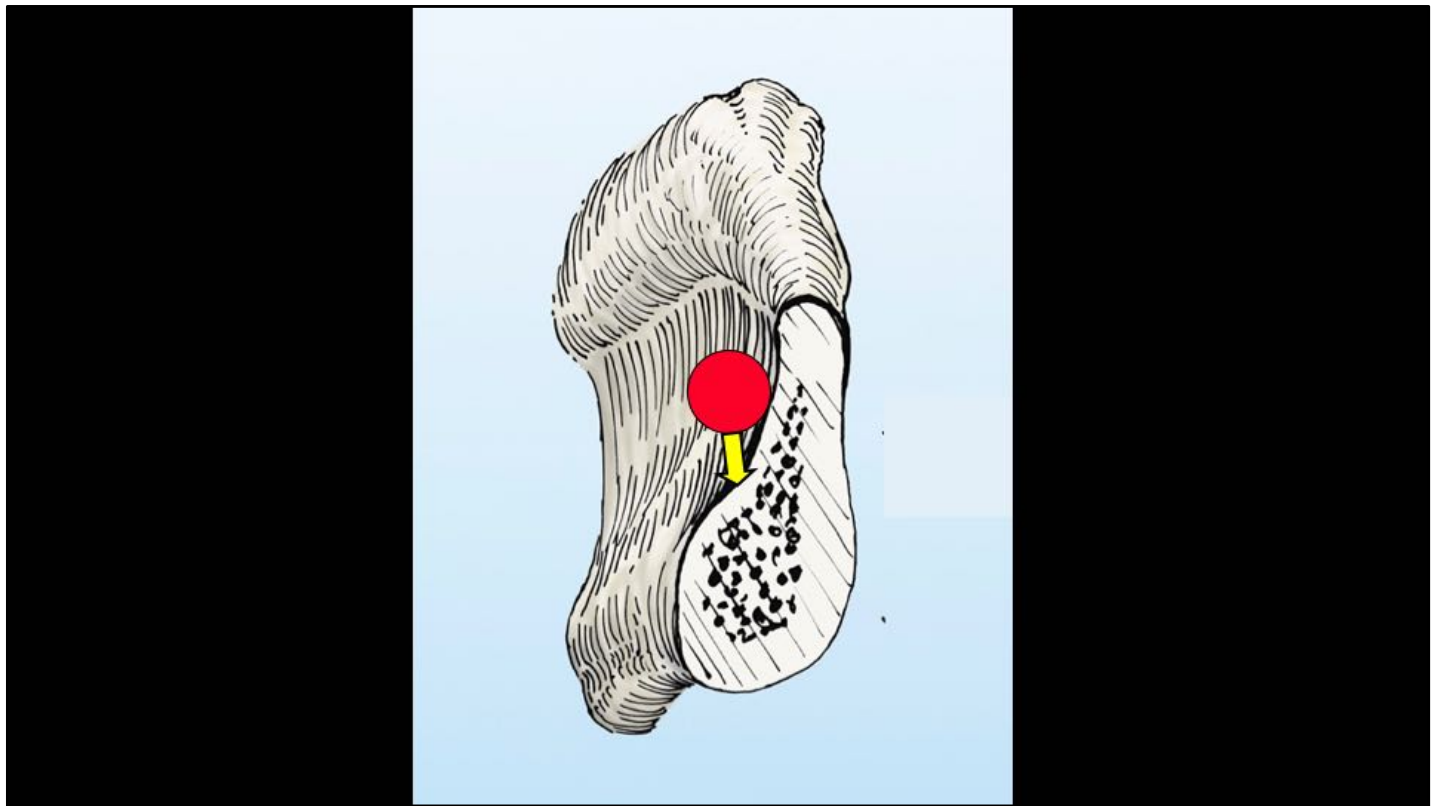
Stem Surgical Technique

Femoral Canal Entry

- Start with 3.2 mm pin
 - Like IM pin or interlocking nail for fracture repair
- Expand with 5mm drill bit
- Power ream with #5 reamer to remove caudal femoral neck (#2-3 Reamer)
- Rongeur wall away first?
- Sequential broaching, starting with #4
 - Peg tip- 3.2mm hole

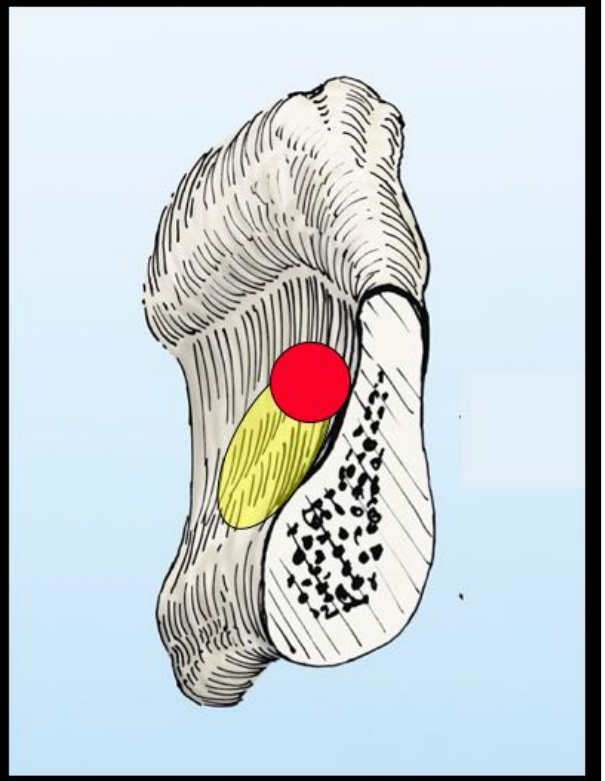


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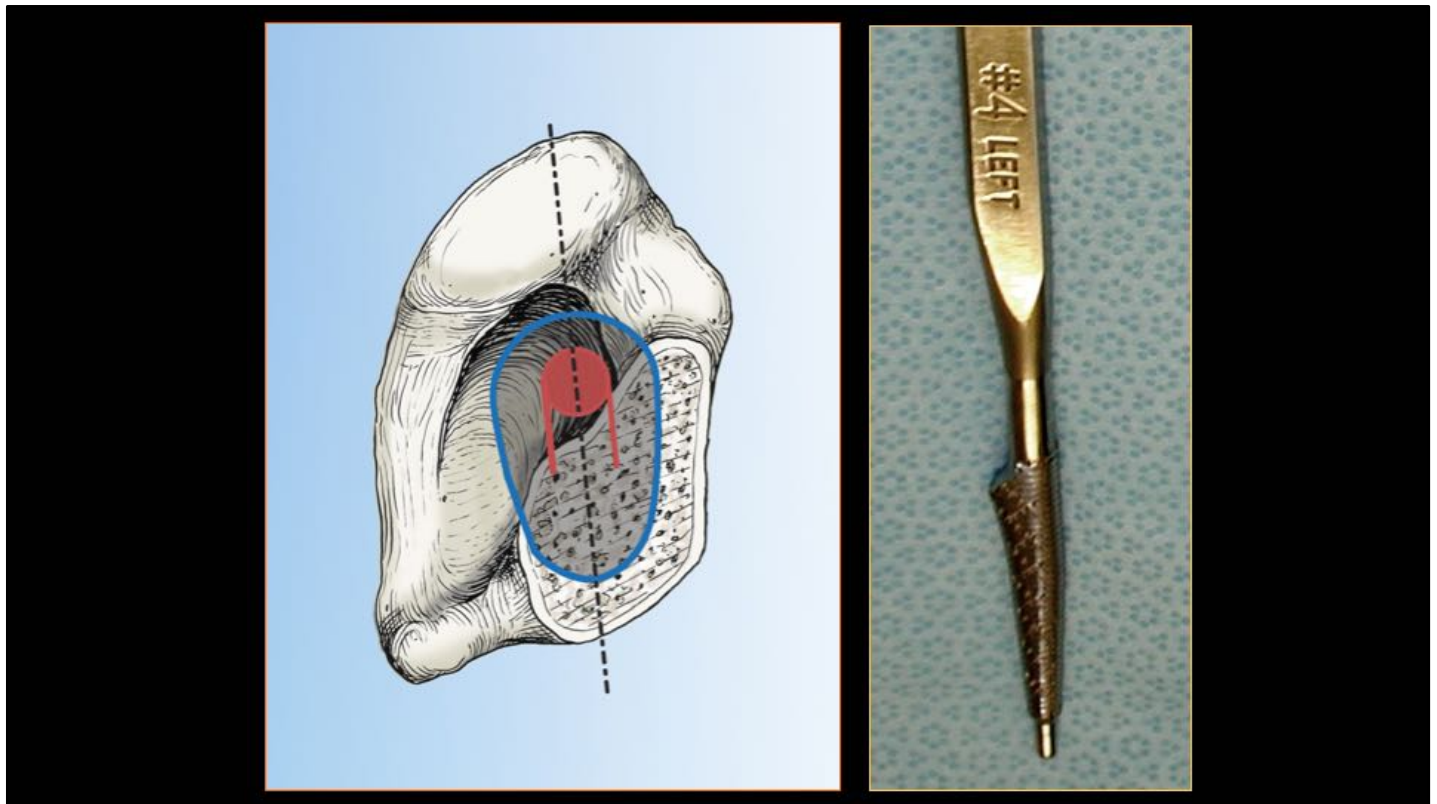


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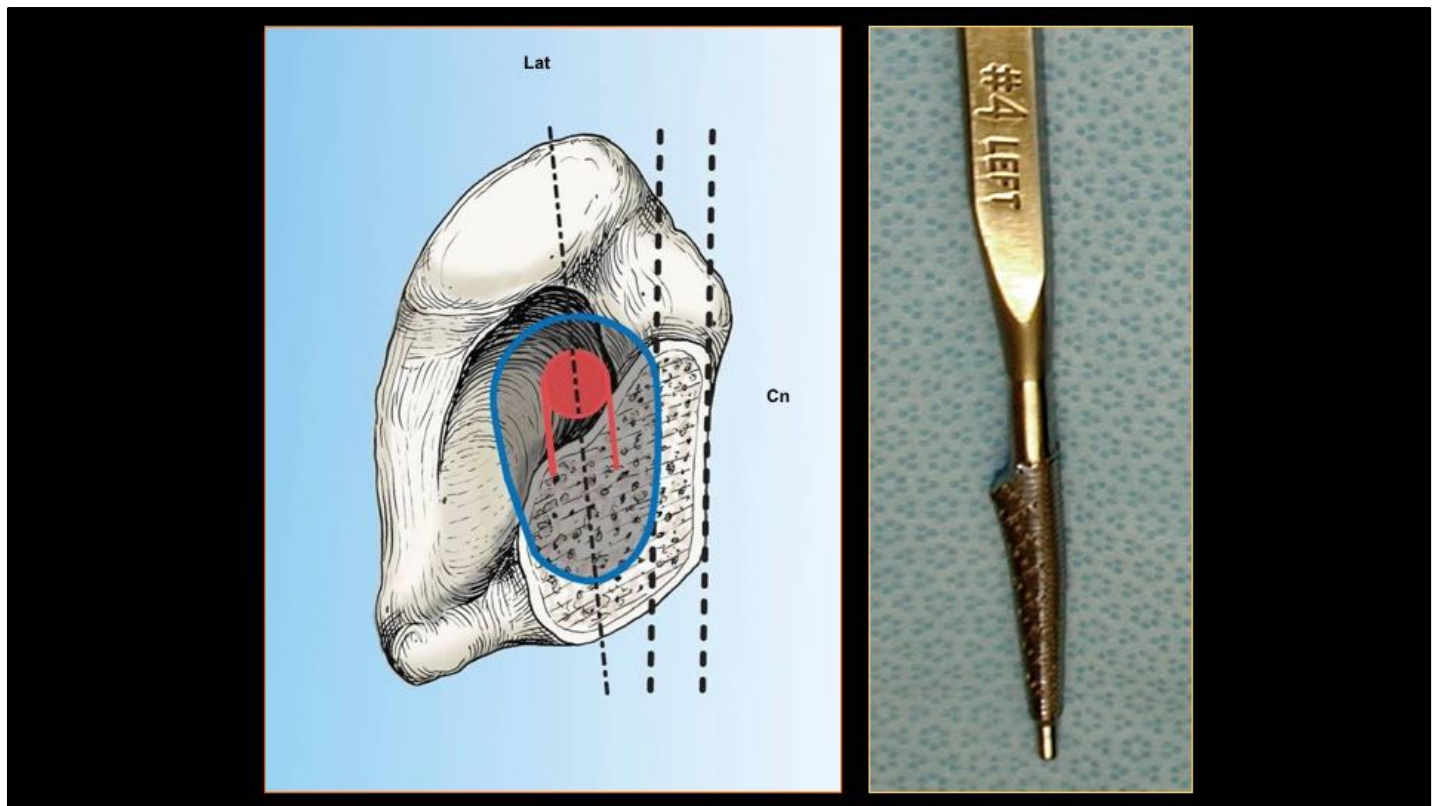
- Avoid broach malposition and or rotation



Notes



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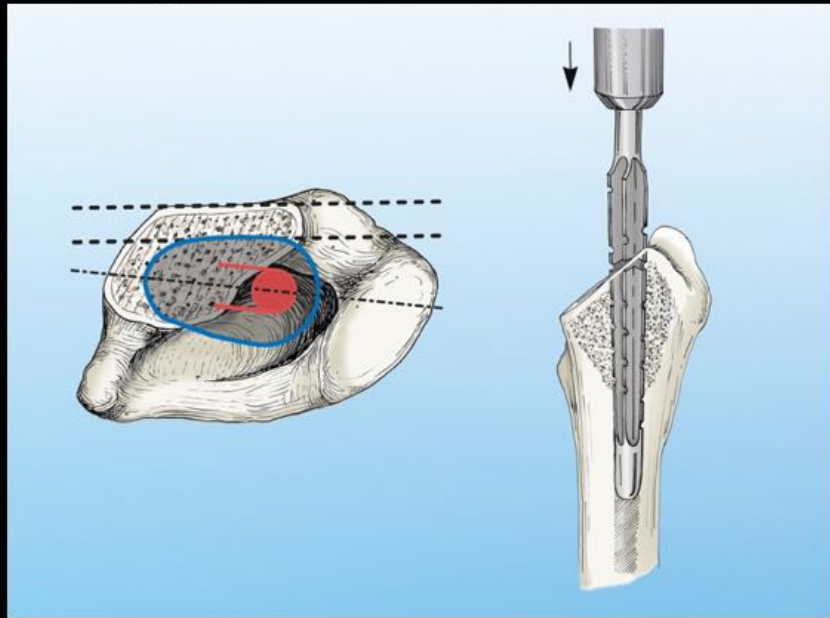


Notes

Stem Surgical Technique

Femoral Reaming

Side cutting reamer to remove caudal femoral neck bone. May help to rongeur wall away first.



Notes



Femoral Broaching

- Broach and mallet...



Notes



Stem Surgical Technique

Femoral Broaching

- Start small and increase incrementally
- Do not bend or torque the broach

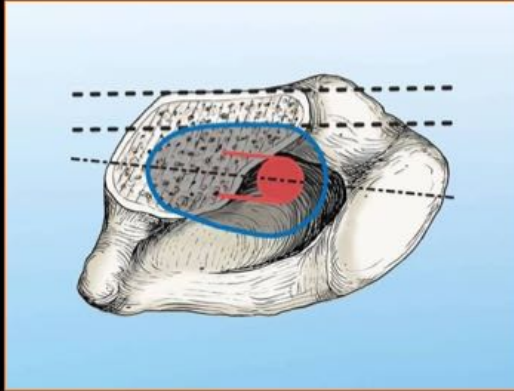


Notes

Stem Surgical Technique

Femoral Broaching

- Start in central axis
- Counter pressure on knee
- Maintain axial alignment



Notes



Stem Surgical Technique

Femoral Broaching

- Assess
 - Valgus / varus
 - orientation
 - Cranial / caudal orientation



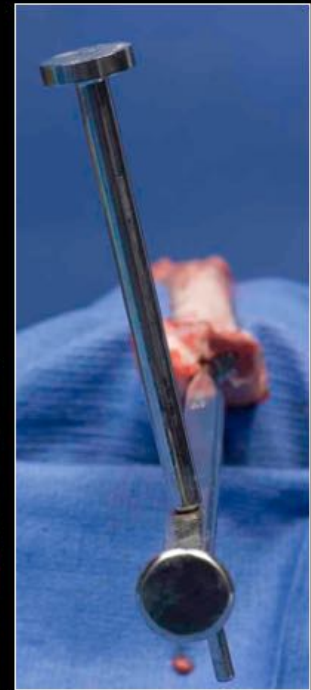
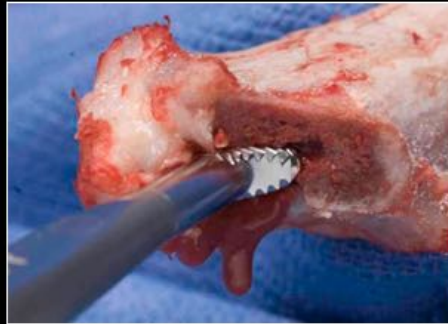
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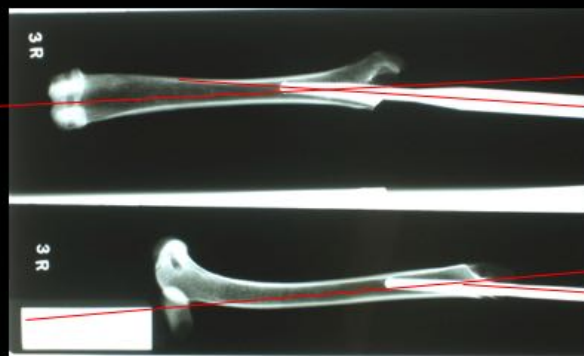
Stem Surgical Technique

Broach

- Incremental broaching
- Set version angle
- Use CFx stem impactor as guide
- #8 stem: broach to #8 hand broach
- Preserve cancellous envelop



Notes



Alignment Problems

- Varus Position
- Caudally Tipped
- Broach Undersized
- Wedged

Further Impaction in this Position



Cranial Fissure

Notes



Correcting Broach Misalignment

- The sooner the better
- Never force broach back into alignment

Notes



Correcting “Slight” Broach Misalignment

- Retract broach until it can be aligned
- Resume impaction holding broach aligned
 - Resist following old pathway
 - Use golfers grip- thumb on shaft

Notes



Stem Surgical Technique

Finishing file

- Finishing file or small
- broach for selective removal of lateral bone
- Reference trochanter on radiographs
- Care with obturator insertion



Notes



Correcting “Severe” Broach Misalignment

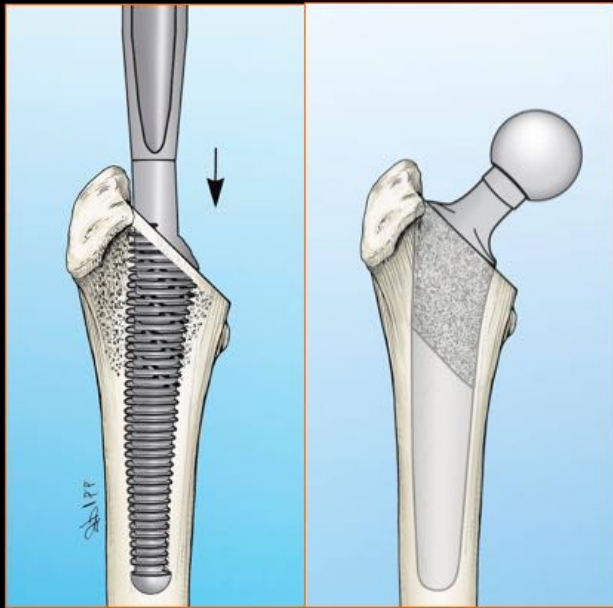
- Extract broach
- Use smaller broach as a rasp
- Focus bone removal lateral and caudal
- Don’t violate envelope
- A little goes a long way. 1-2 seconds at a time!!

Notes

Stem Surgical Technique

Femoral Broaching

- Feel, sound, sight
- Broach = Trial
- Identify ridge of vastus origin (landmark broaching depth)
- Broach level matches stem level



Notes



Stem Surgical Technique

Femoral Broaching: When the Going Gets Tough or Stops

- Extract broach
 - Clean, reinsert, impact and repeat
 - Small 1-2 mm gains
- Extract broach
 - Insert smaller size and rasp
 - Focus bone removal lateral & caudal
 - Caution, especially if final broach

Notes



Accurate Bone Preparation: Press-fit Stability

- If NOT, less implant-bone contact or friction
- Less initial stability
 - Stem subsidence
 - Stem retroversion
 - Cup dislodged
 - Failure of in-growth

Notes

Stem Surgical Technique

Broach

- Broach is trial stem



Notes



Accurate Bone Preparation: Cabinetry

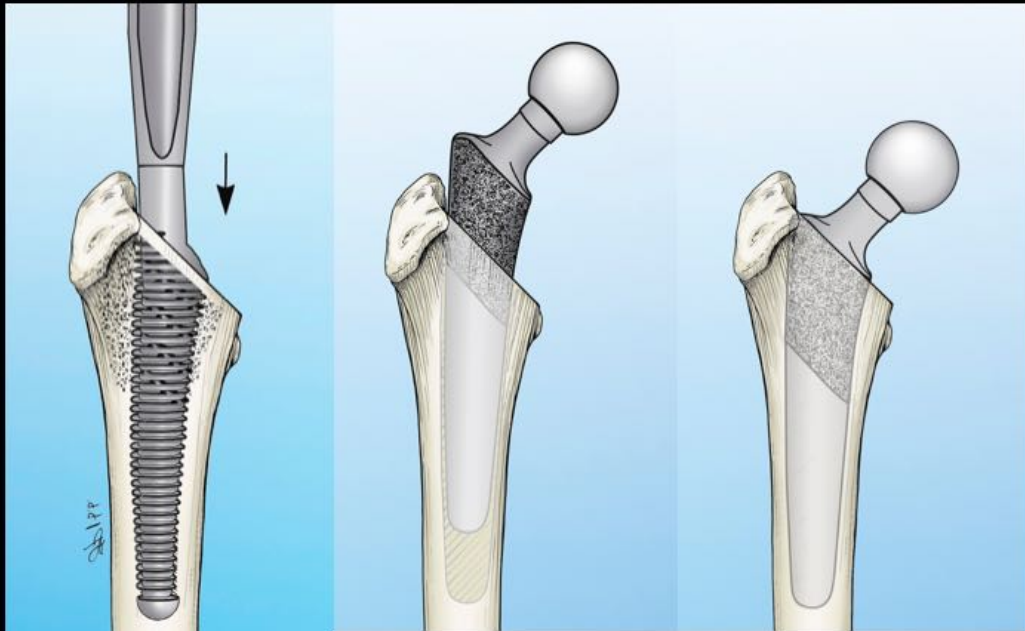
- Close tolerances
 - ~ 1mm
- Prepared bone bed **MUST**
 - Match implant shape
 - Not violate envelope
 - Be oriented the way you want your implants
 - Preparation instruments: Trial implants

Notes



Stem Surgical Technique

Bone Preparation: Achieve Press-fit Stability



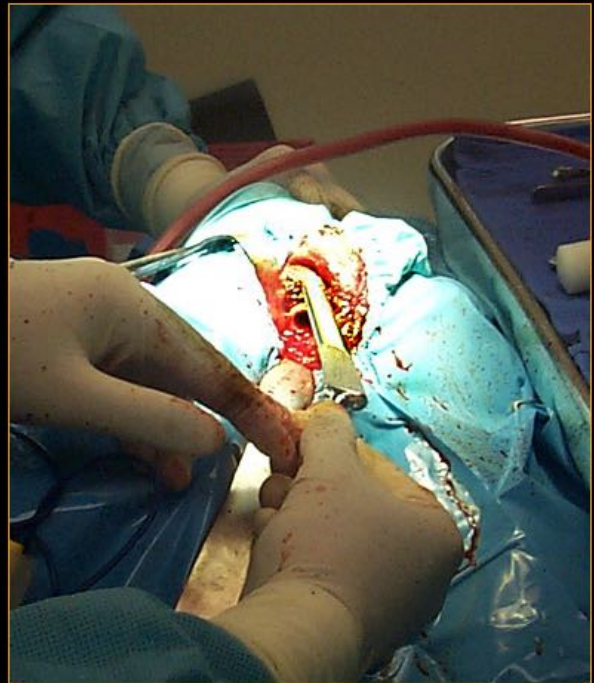
Notes



Stem Surgical Technique

Stem Implantation

- Insert by hand axially
- Handle by neck
 - Never touch beads or stem shaft
- Assess remaining drive distance



Notes



Stem Surgical Technique

Drive Distance

- One third of the beaded portion of the stem
- Long drive distance is associated with fissure
- Ream again
- Assess interference point



Notes



Stem Surgical Technique

Stem Implantation: Drive Distance

- Following hand insertion
 - One-quarter bead length minimum
 - Two-thirds to one-half
 - bead length maximum



Notes



Stem Implantation: Drive Distance

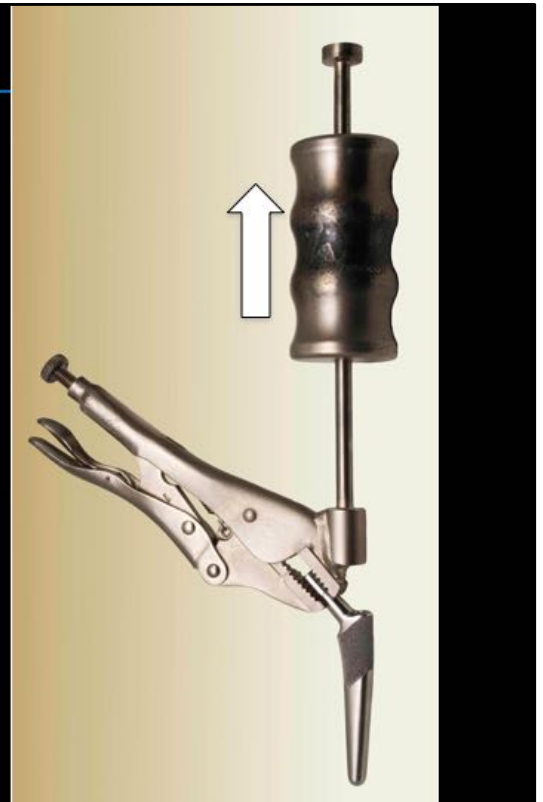
- If > two-thirds to one-half bead length
 - Do not impact stem
 - Cautiously expand preparation
 - Next size broach: advance 1-2 teeth
 - Remove and reinsert stem
 - Reassess drive distance

Notes



Stem Surgical Technique

Stem Extractor

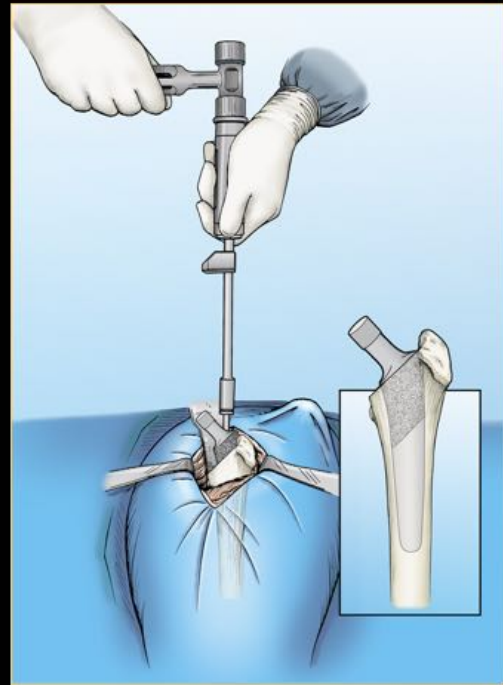


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Stem Surgical Technique

Stem Implantation

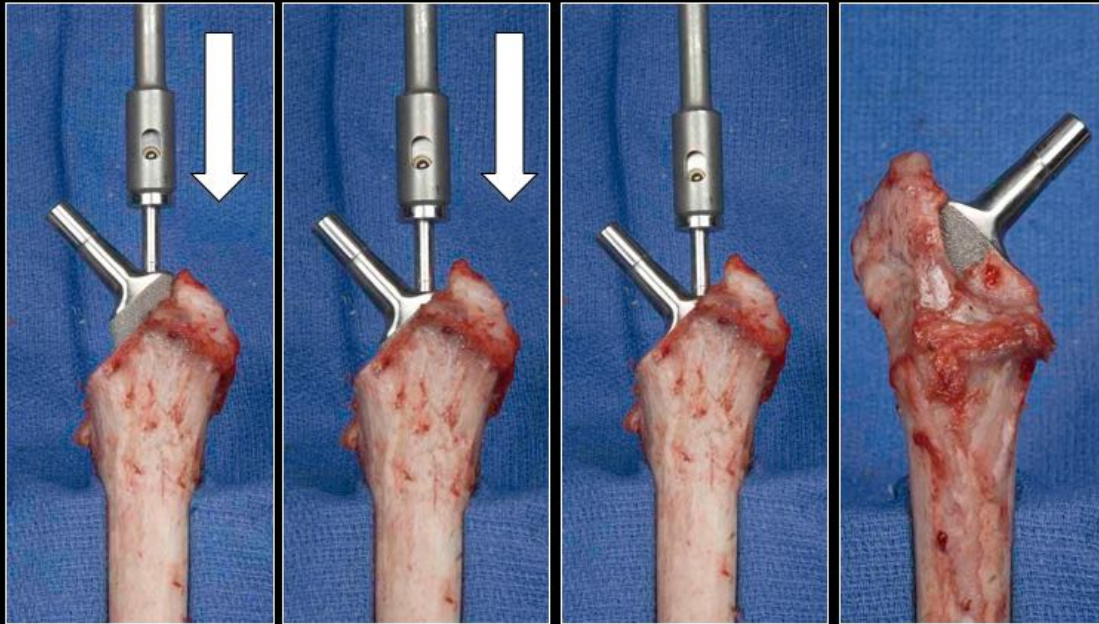
- Even tapping
- Identify ridge of Vastus origin
- Impaction based on resistance felt
- Generally impact to level of broaching +/- 1-3 mm



Notes



Impaction



Notes



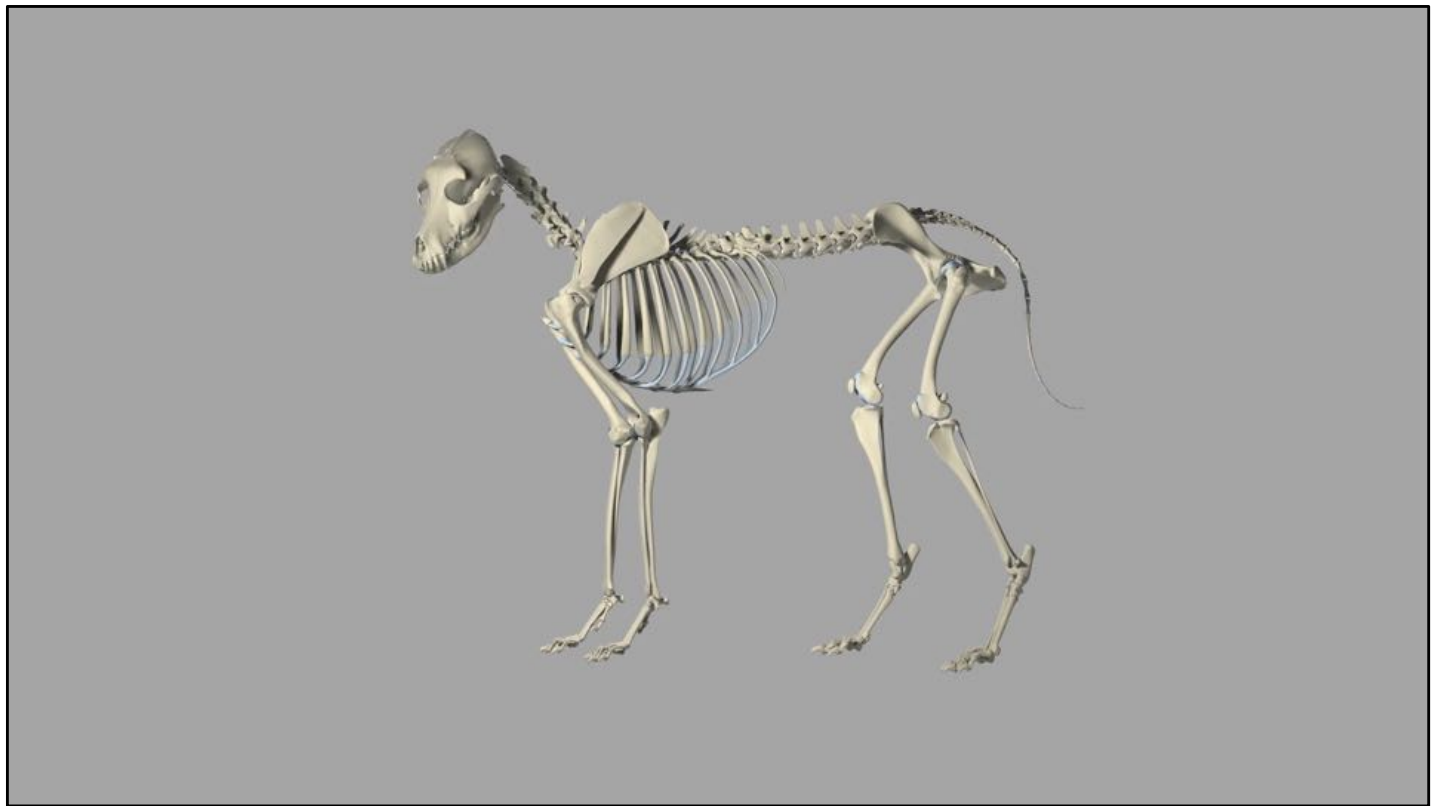
Stem Surgical Technique

Stem Implantation

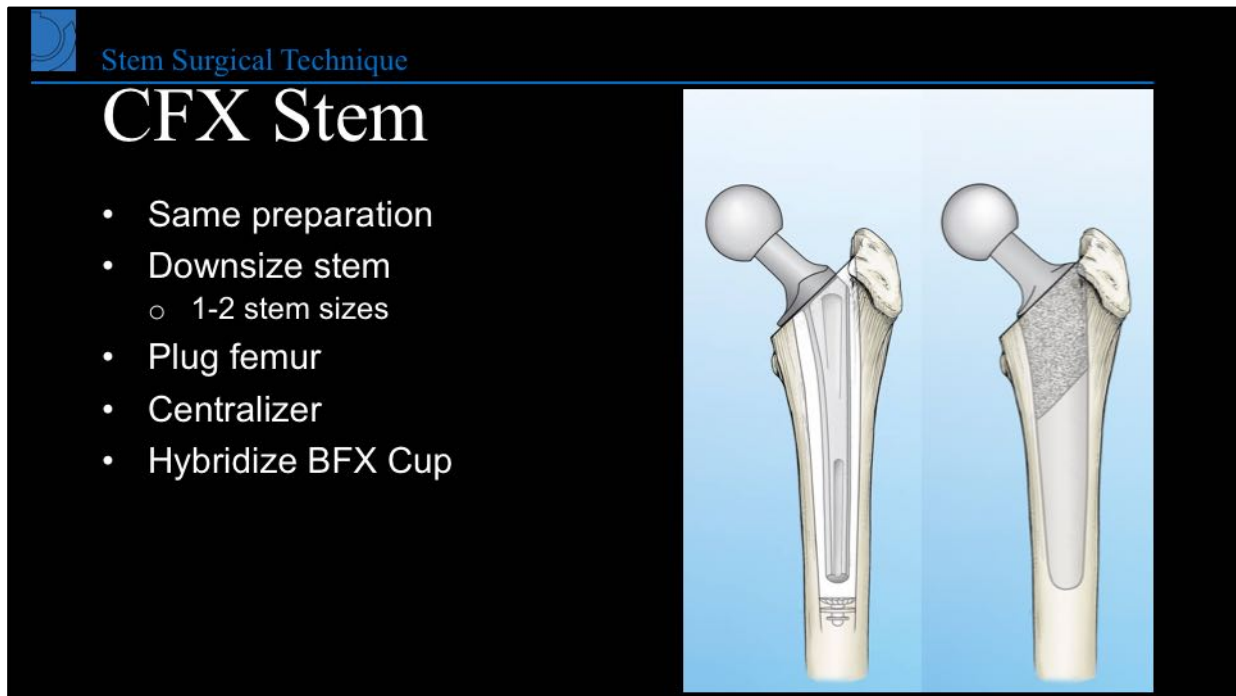
- Even tapping
- Identify ridge of Vastus origin
- Impaction based on resistance felt
- Generally impact to level of broaching
+/- 1-3 mm



Notes



Notes



Redue this illustration to match the others you have done, using bone in previous figure but with cement mantle and Cemented CFX implant. Can use the template in Figure 10 as a shape guide. Also need to show a cement restrictor in canal. Chris to send photo.

Notes



Stem Surgical Technique

Centralizer

- PMMA
- Spacer/offset
- Supplied sterile
- Dab of cement on stem tip
- Apply centralizer
- Insert

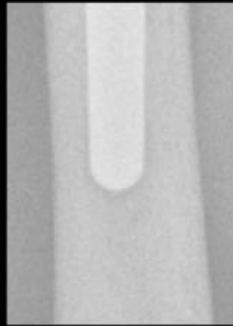


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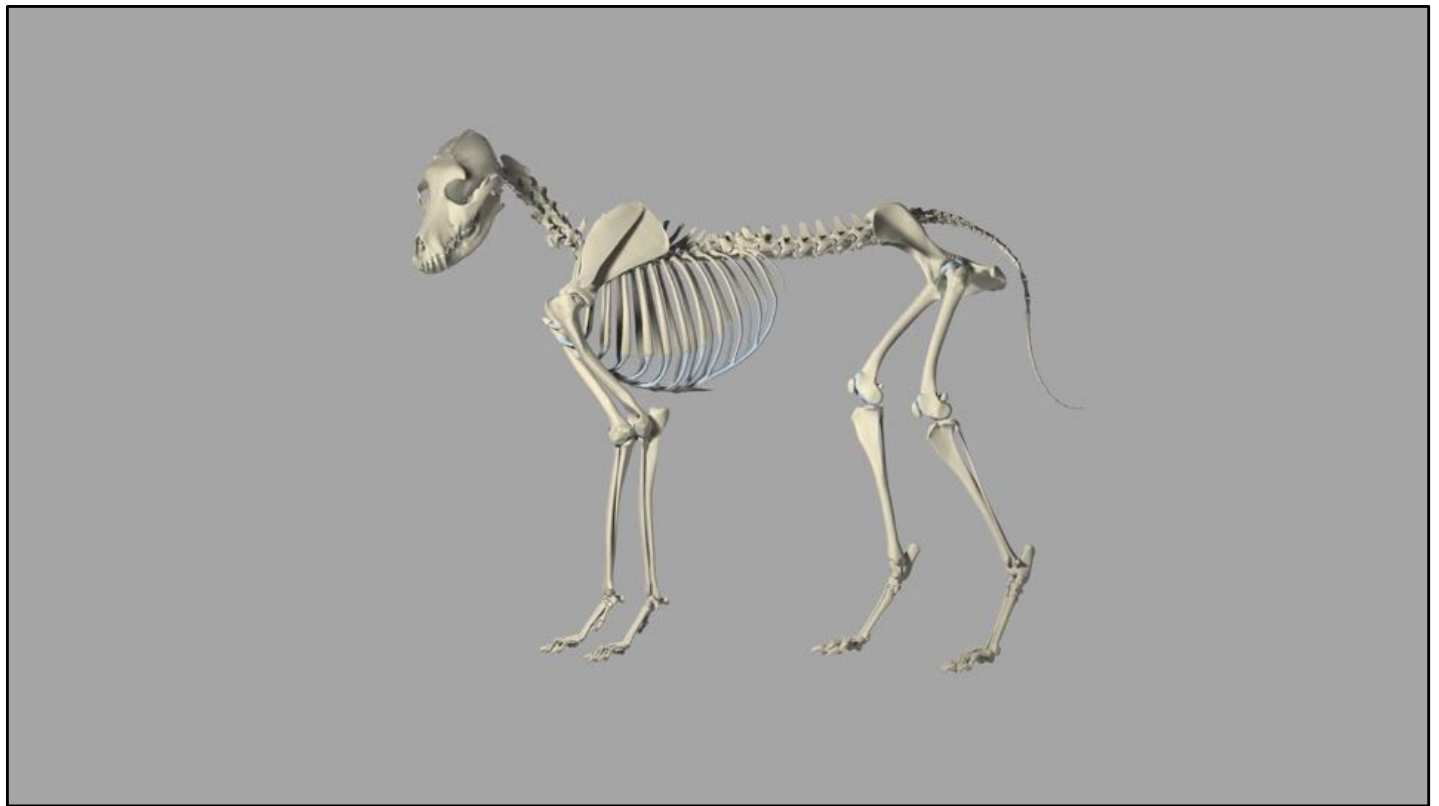


Stem Surgical Technique

Centralizer



Notes



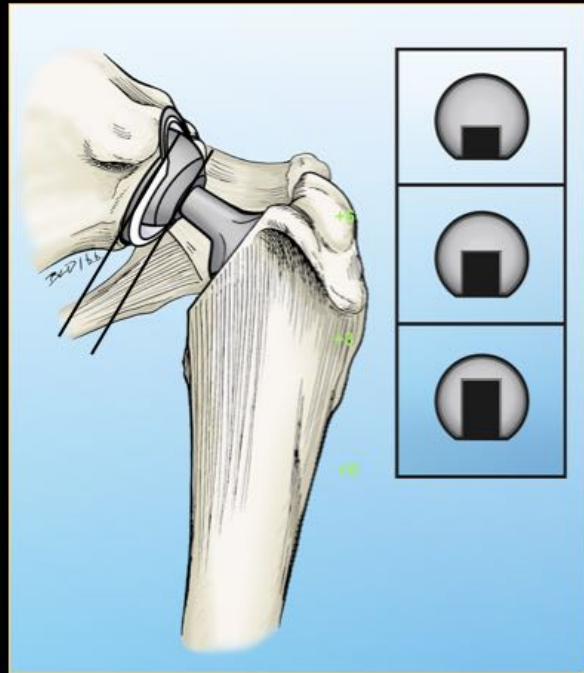
Notes



Stem Surgical Technique

Trial Reduction

- Use trial head
- Assess tightness
- Assess cup orientation
- Assess joint ROM
- Gentle dislocation of trial head (Lewen clamp)

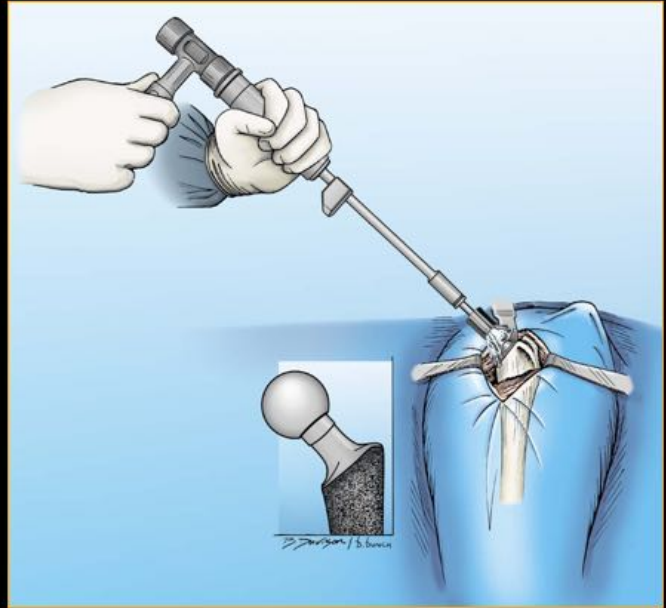


Notes

Stem Surgical Technique

Head Impaction

- Handle head with care
- Clean & dry trunion
- Gently tap the head (gauze)
- Never touch with metal

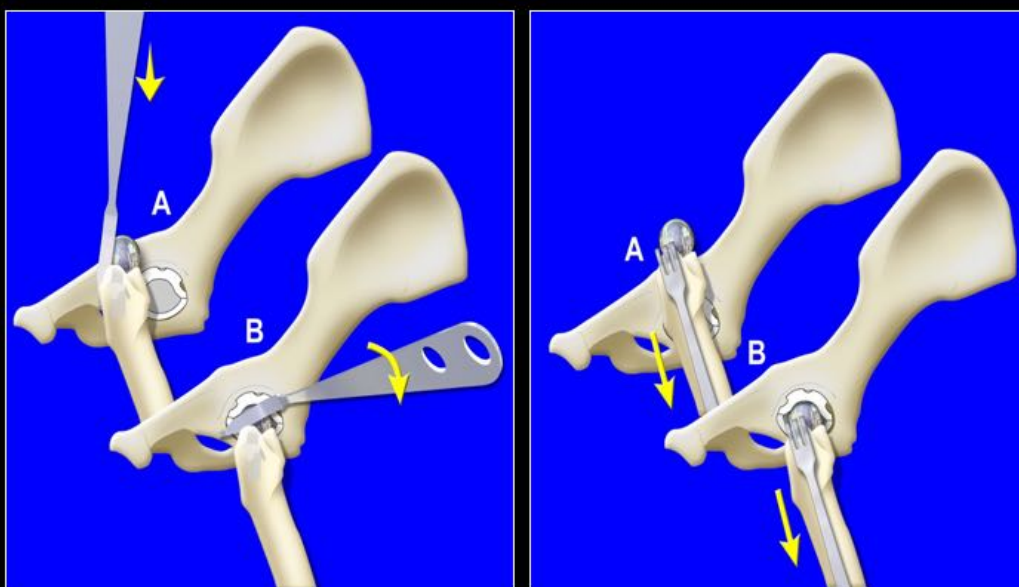


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Stem Surgical Technique

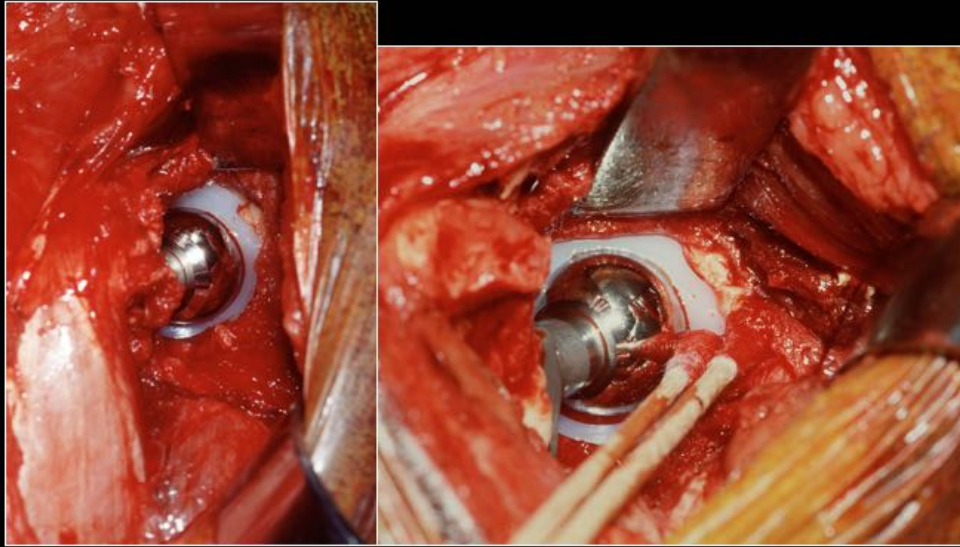
Reduction



Notes



Culture



Notes



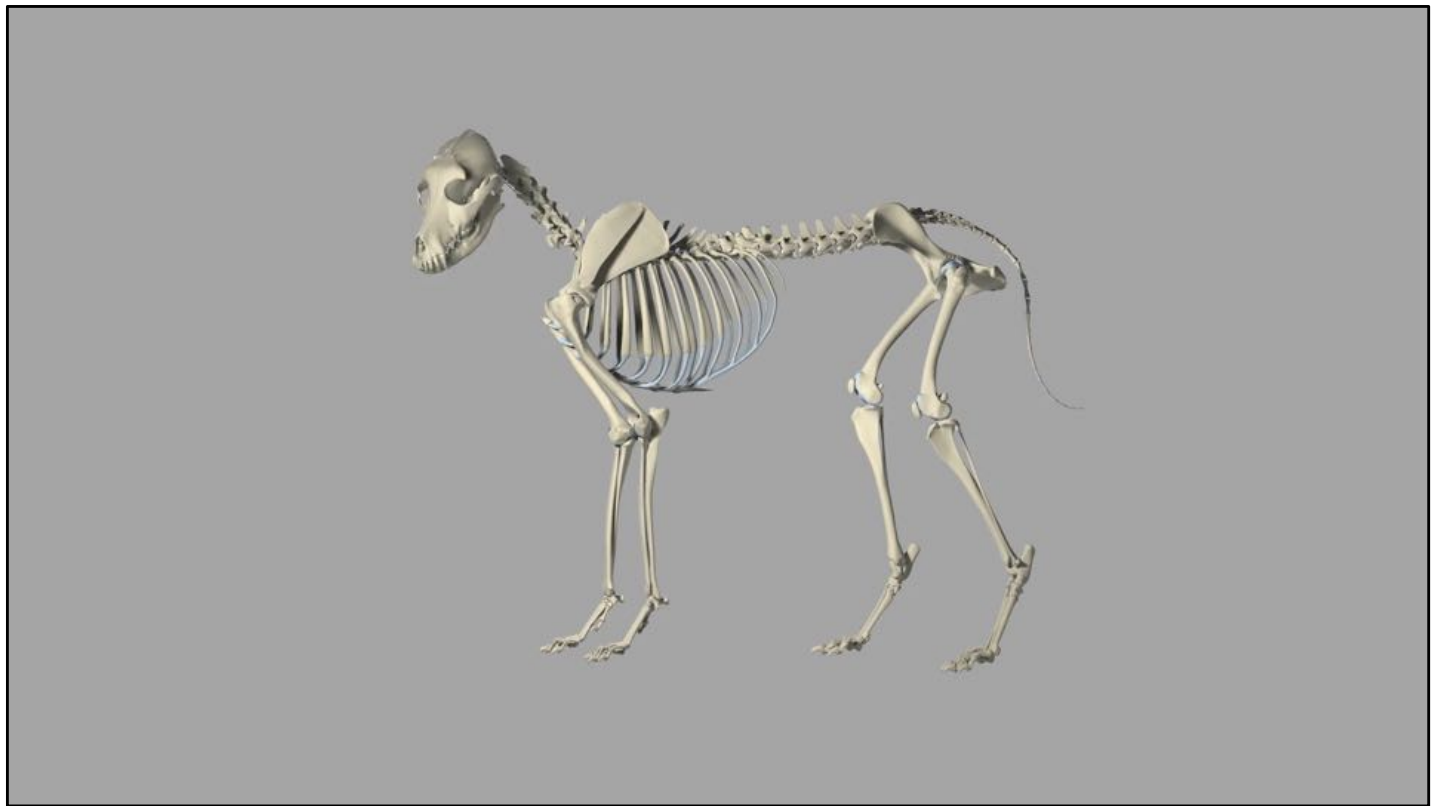
Stem Surgical Technique

Closure

- joint capsule
- deep gluteal
- vastus
- superficial fascia
- s/c
- skin



Notes



Notes



Summary

- Exposure and alignment essential
- Constant assessment of alignment
- Make necessary intraoperative adjustments

Notes



The Universal Hip Workshop

Break



INNOVATION • EDUCATION • SUPPORT

Notes
