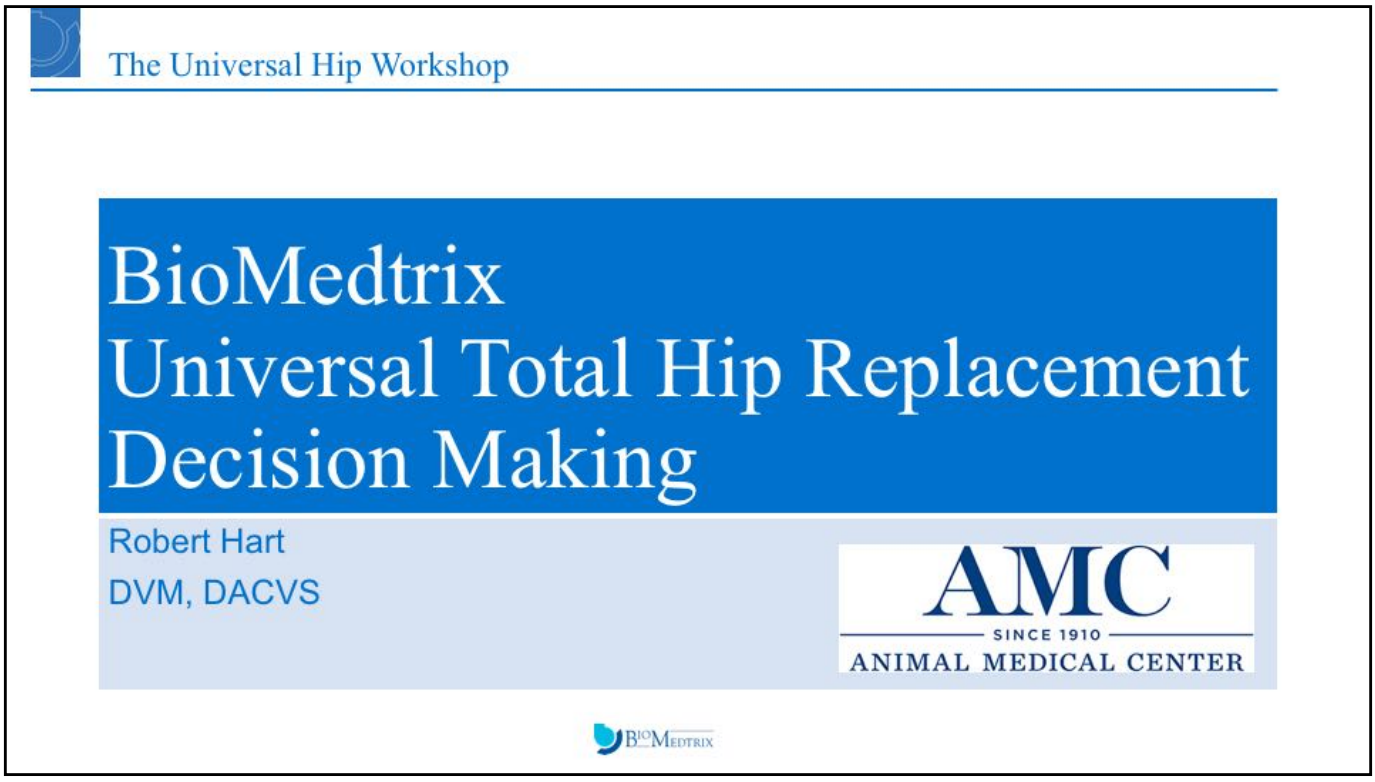
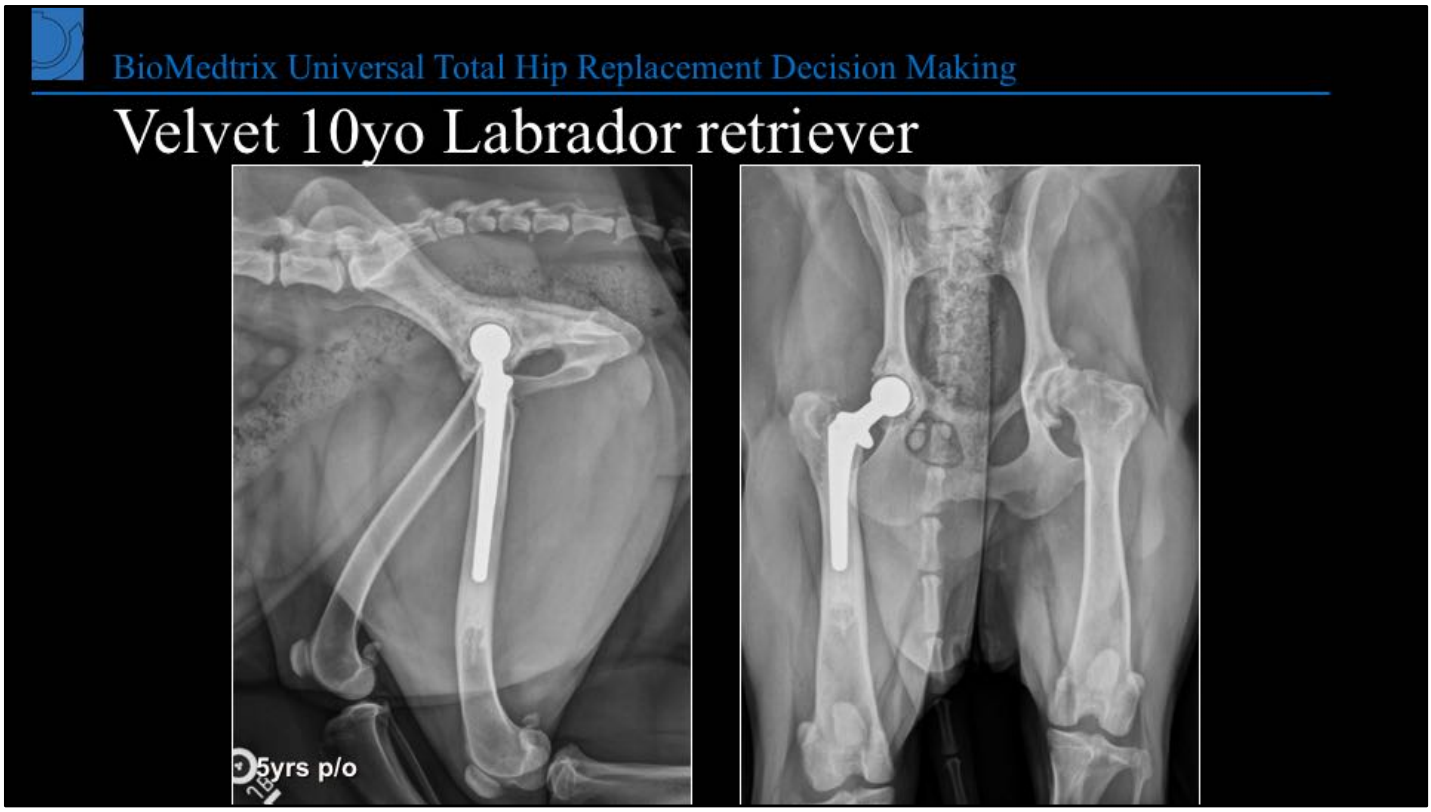

The Universal Hip Workshop
BioMedtrix
Universal Total Hip Replacement
Decision Making
Robert Hart
DVM, DACVS
AMC
SINCE 1910
ANIMAL MEDICAL CENTER
BioMedtrix

Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Velvet 10yo Labrador retriever
5yrs p/o

Notes

BioMedtrix Universal Total Hip Replacement Decision Making

BioMedtrix BFx THR

- Motivation. Potential for reduction in aseptic loosening, infection.
- Howmedica PCA
- Kyon®/Zurich cementless
- BioMedtrix BFx
- Innoplant Helica
- CoCr porous ingrowth femoral stem
- Ti press-fit PE cup
- 1 year of clinical use

BVOA 2005 BRITISH VETERINARY ORTHOPAEDIC ASSOCIATION

Notes

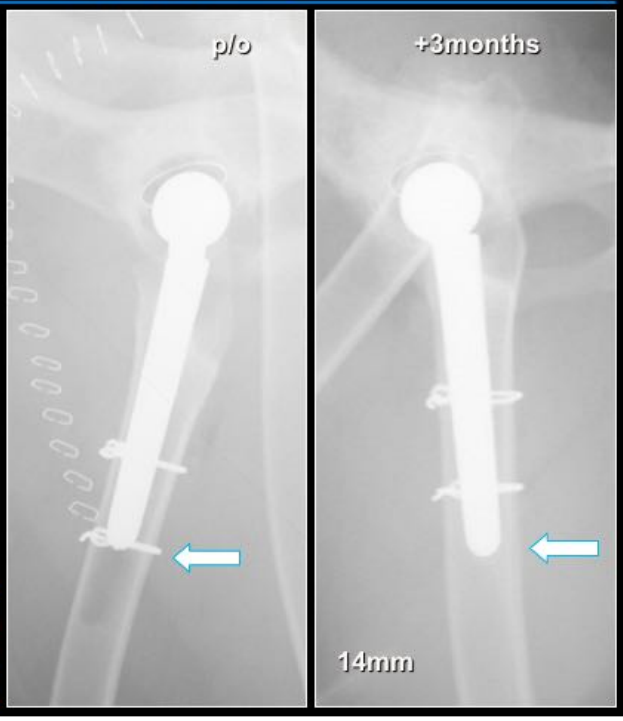
BioMedtrix Universal Total Hip Replacement Decision Making

BFx Complications

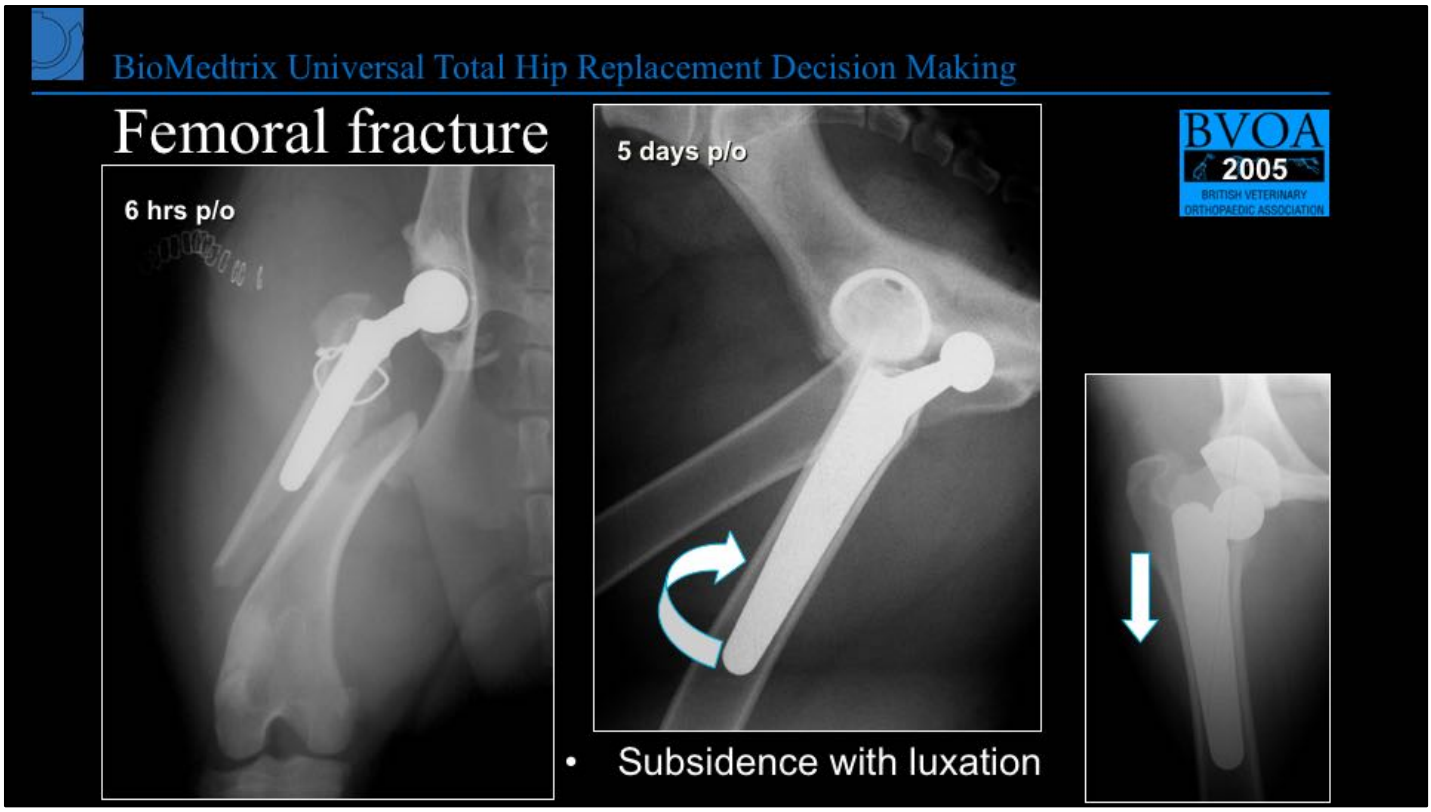
- 30 BFx THR
- ventral luxation 4
- dorsal luxation 2
- femoral fissure 5
- femur Fx 2
- stem loosening 1

- majority < 1week

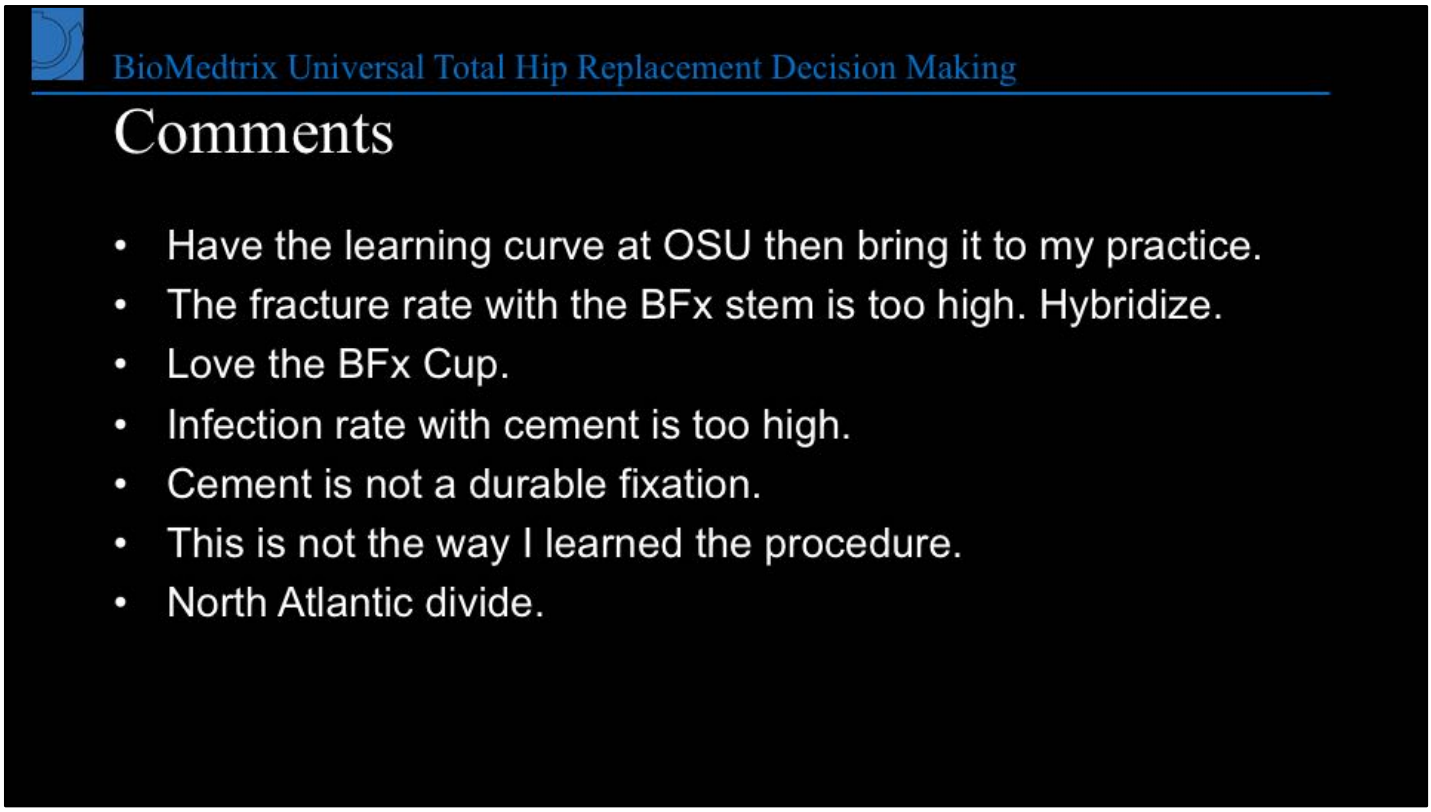
BVOA 2005 BRITISH VETERINARY ORTHOPAEDIC ASSOCIATION



Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Femoral fracture
6 hrs p/o
5 days p/o
BVOA
2005
BRITISH VETERINARY ORTHOPAEDIC ASSOCIATION
• Subsidence with luxation

Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Comments
• Have the learning curve at OSU then bring it to my practice.
• The fracture rate with the BFx stem is too high. Hybridize.
• Love the BFx Cup.
• Infection rate with cement is too high.
• Cement is not a durable fixation.
• This is not the way I learned the procedure.
• North Atlantic divide.

Notes

BioMedtrix Universal Total Hip Replacement Decision Making

The way ahead

BVOA 2005 BRITISH VETERINARY ORTHOPAEDIC ASSOCIATION

- define selection criteria for cementless THR
- improve radiographic templating (digital)
- improve instrumentation
- refine surgical technique
- elucidate failure mechanisms
- prospective analysis

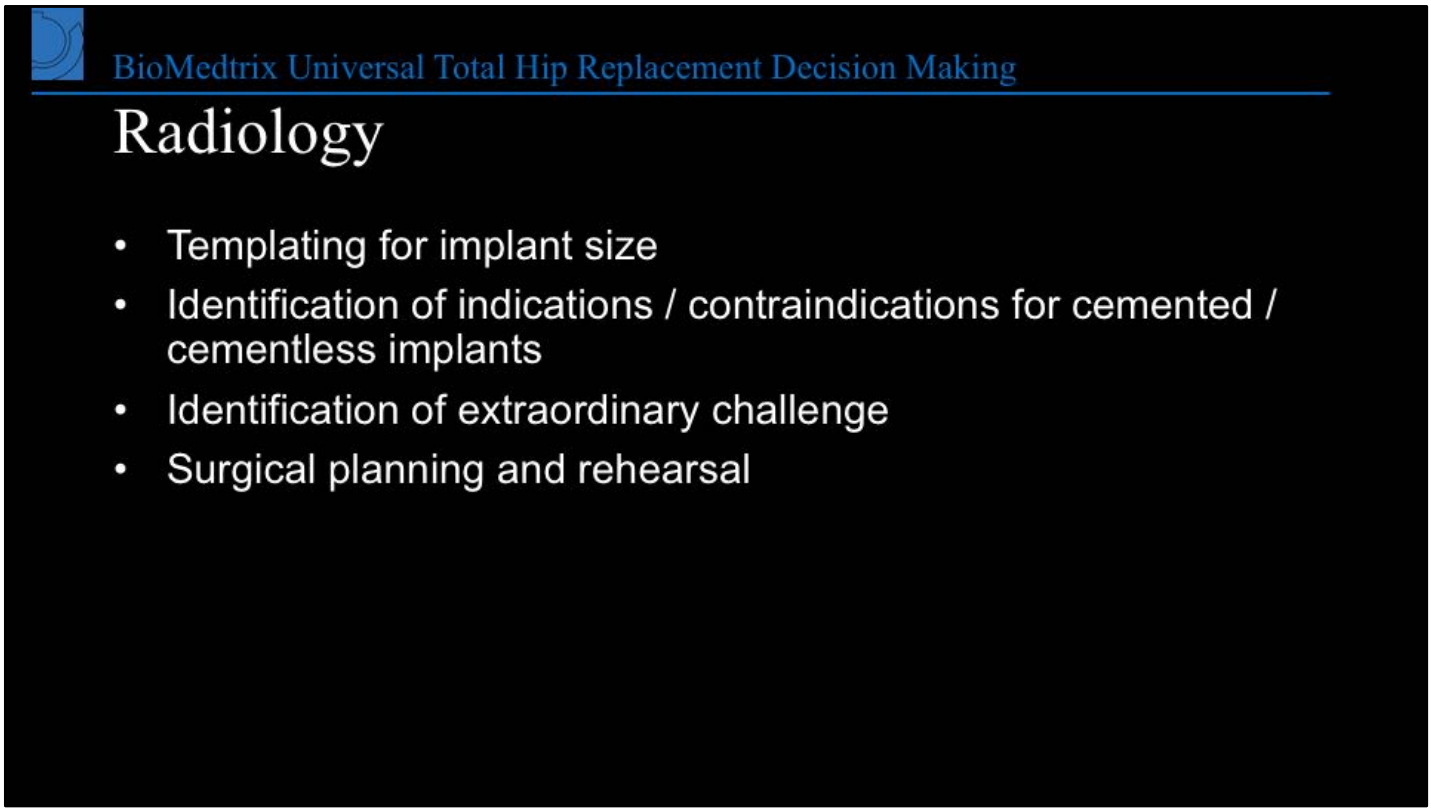
Notes

BioMedtrix Universal Total Hip Replacement Decision Making

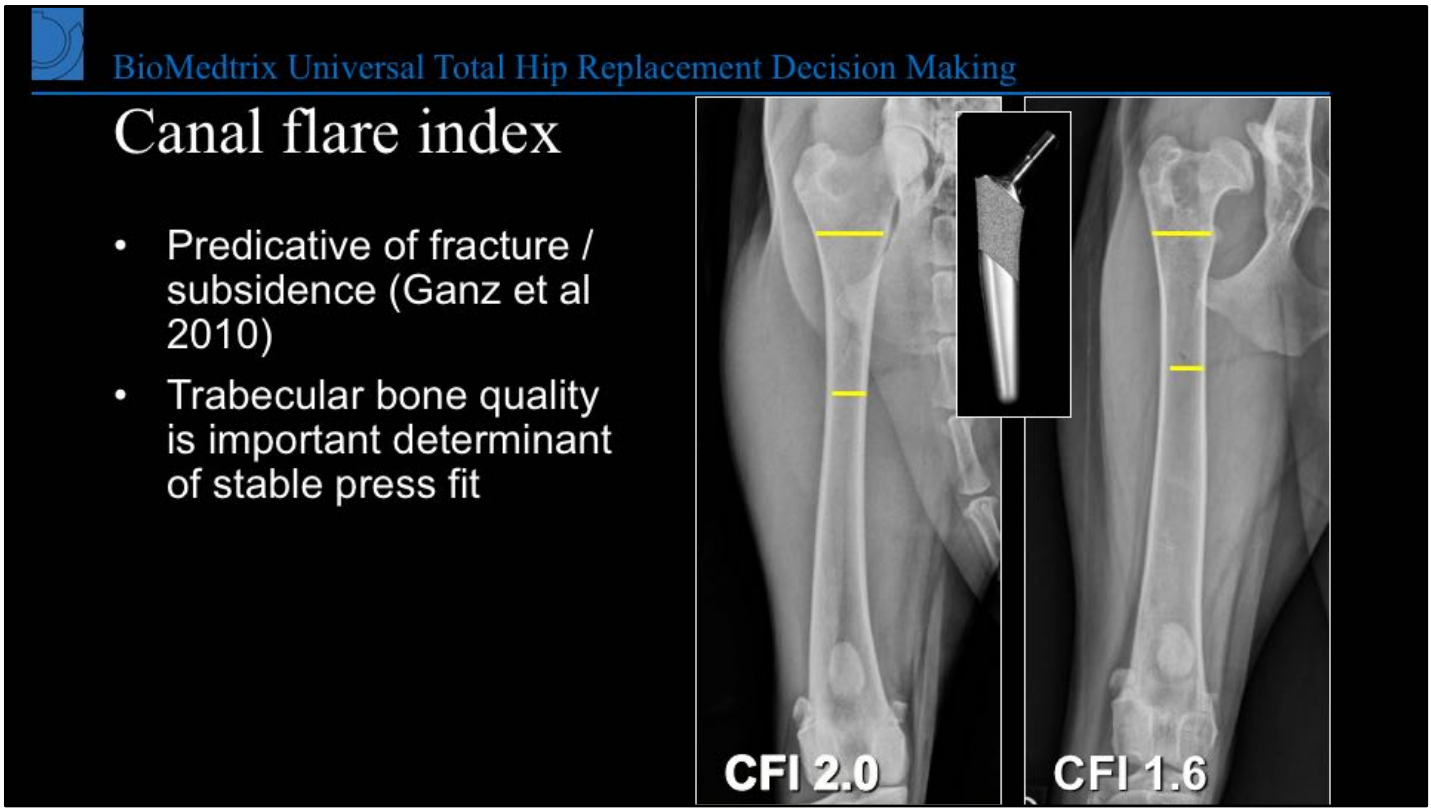
Radiography

- Template implant size
- Standard series
  - Lateral pelvis
  - VD pelvis (OFA)
  - Medio-lateral femur
  - Cranio-caudal femur

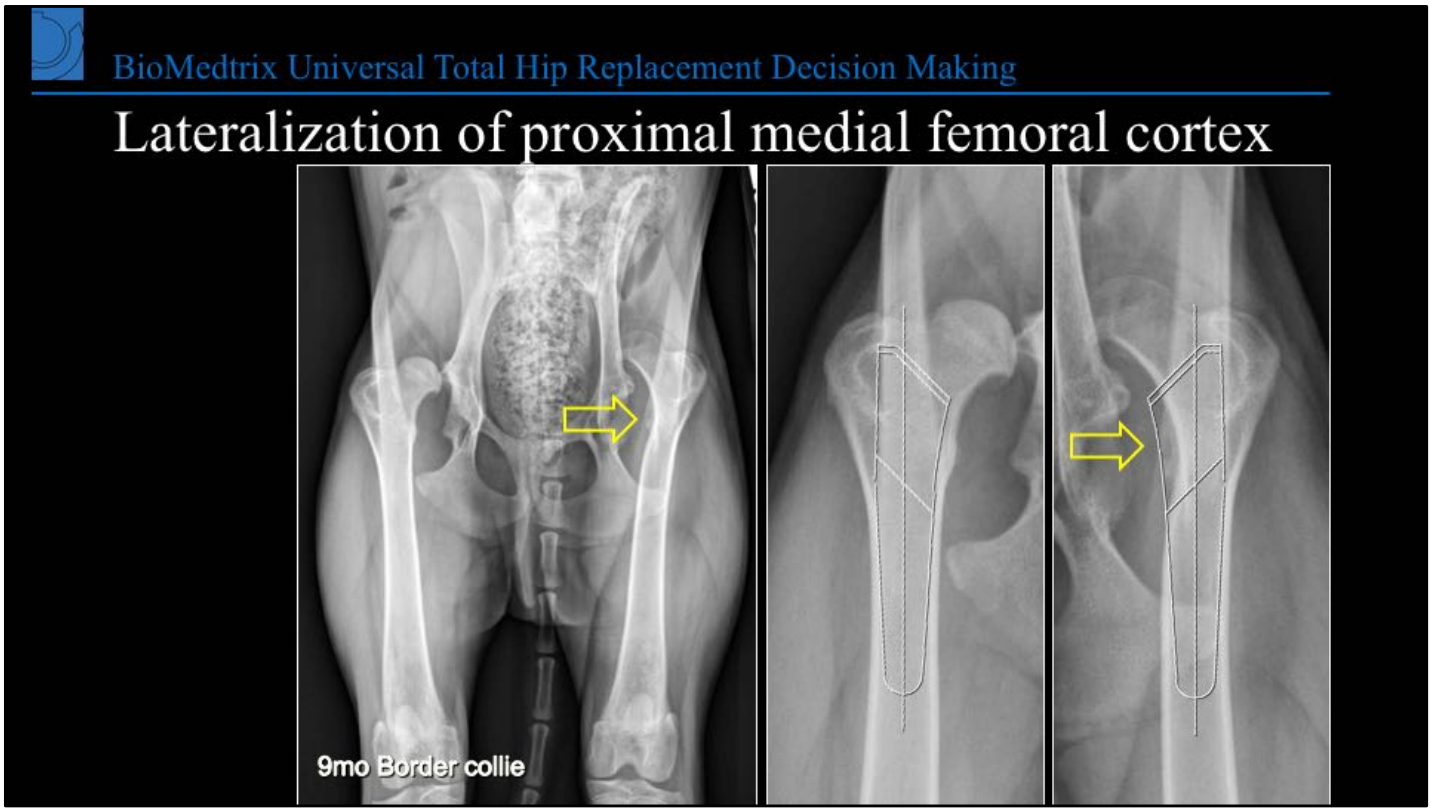
Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Radiology
• Templating for implant size
• Identification of indications / contraindications for cemented / cementless implants
• Identification of extraordinary challenge
• Surgical planning and rehearsal

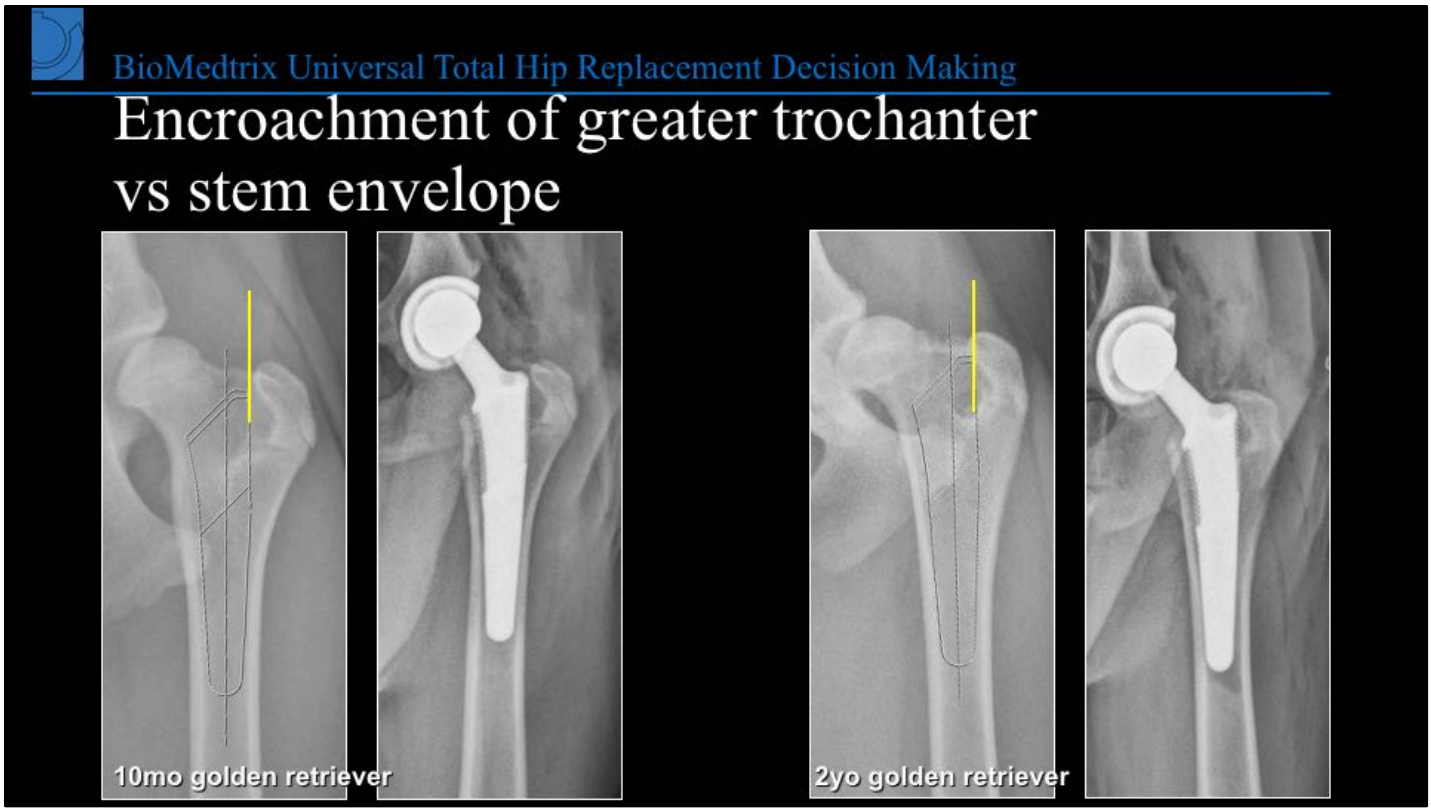
Notes



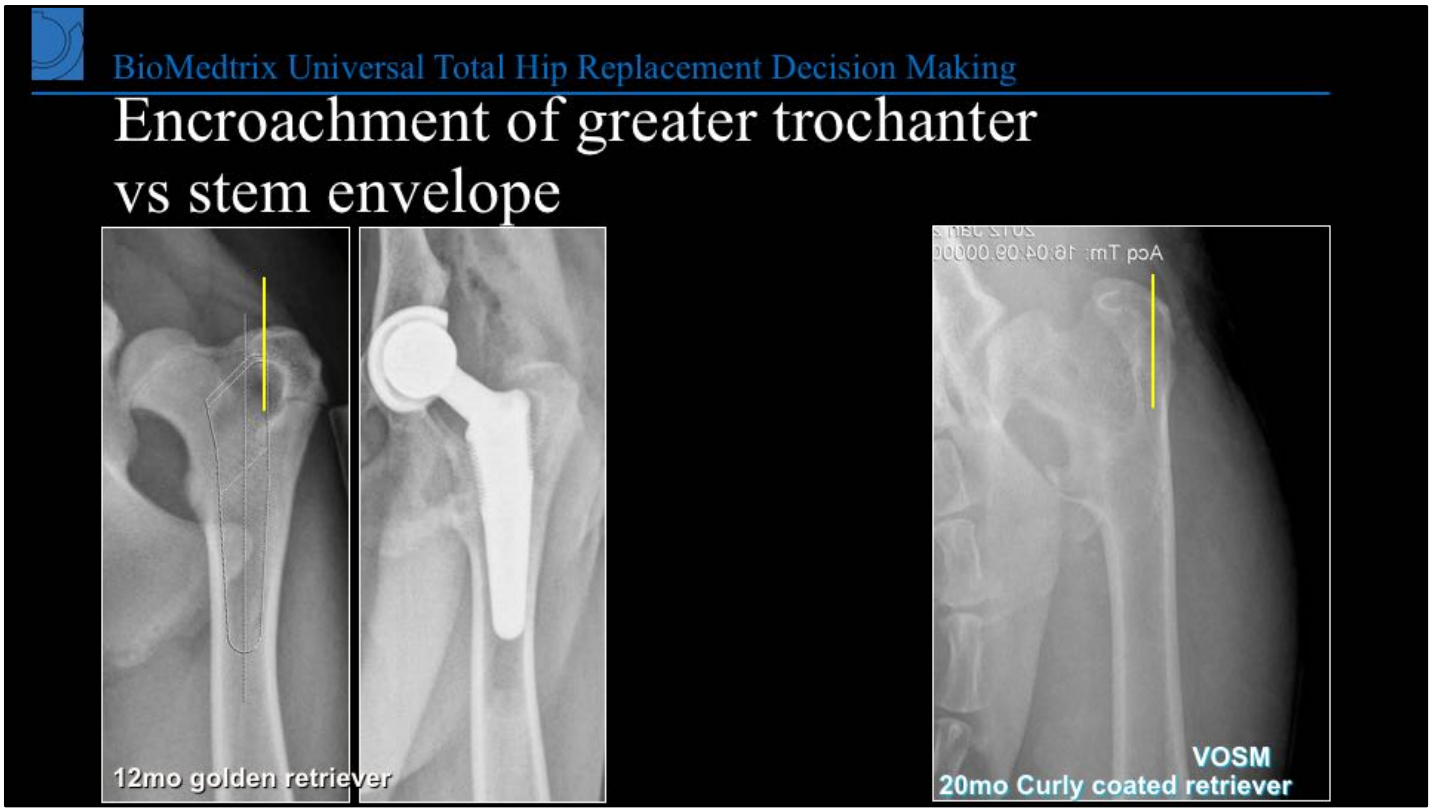
Notes Stove pipe conformation also has less cancellous bone. Consider lateral bolt or cemented femoral stem.



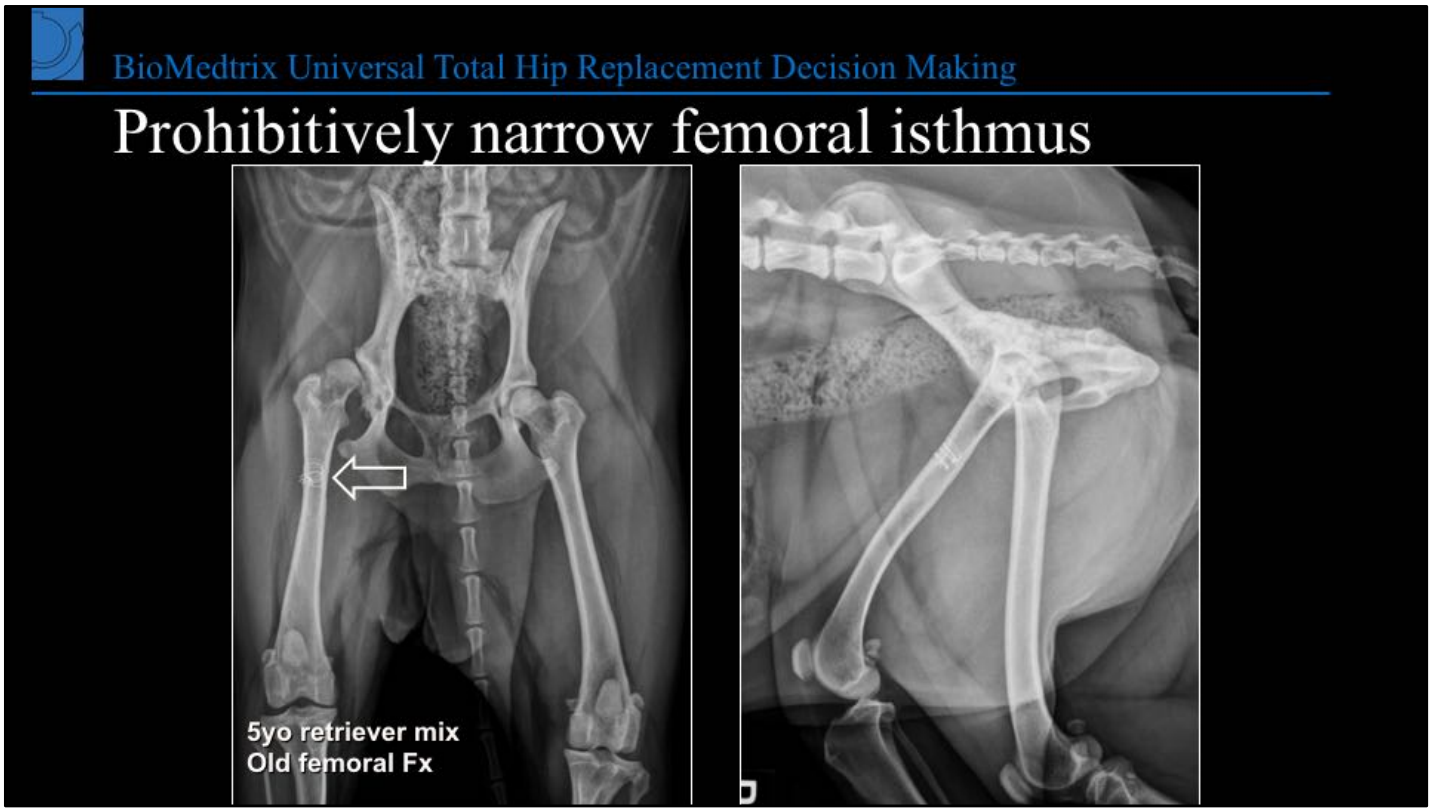
Notes Consider centerline for the luxoid femur bone


BioMedtrix Universal Total Hip Replacement Decision Making
Encroachment of greater trochanter vs stem envelope
10mo golden retriever
2yo golden retriever

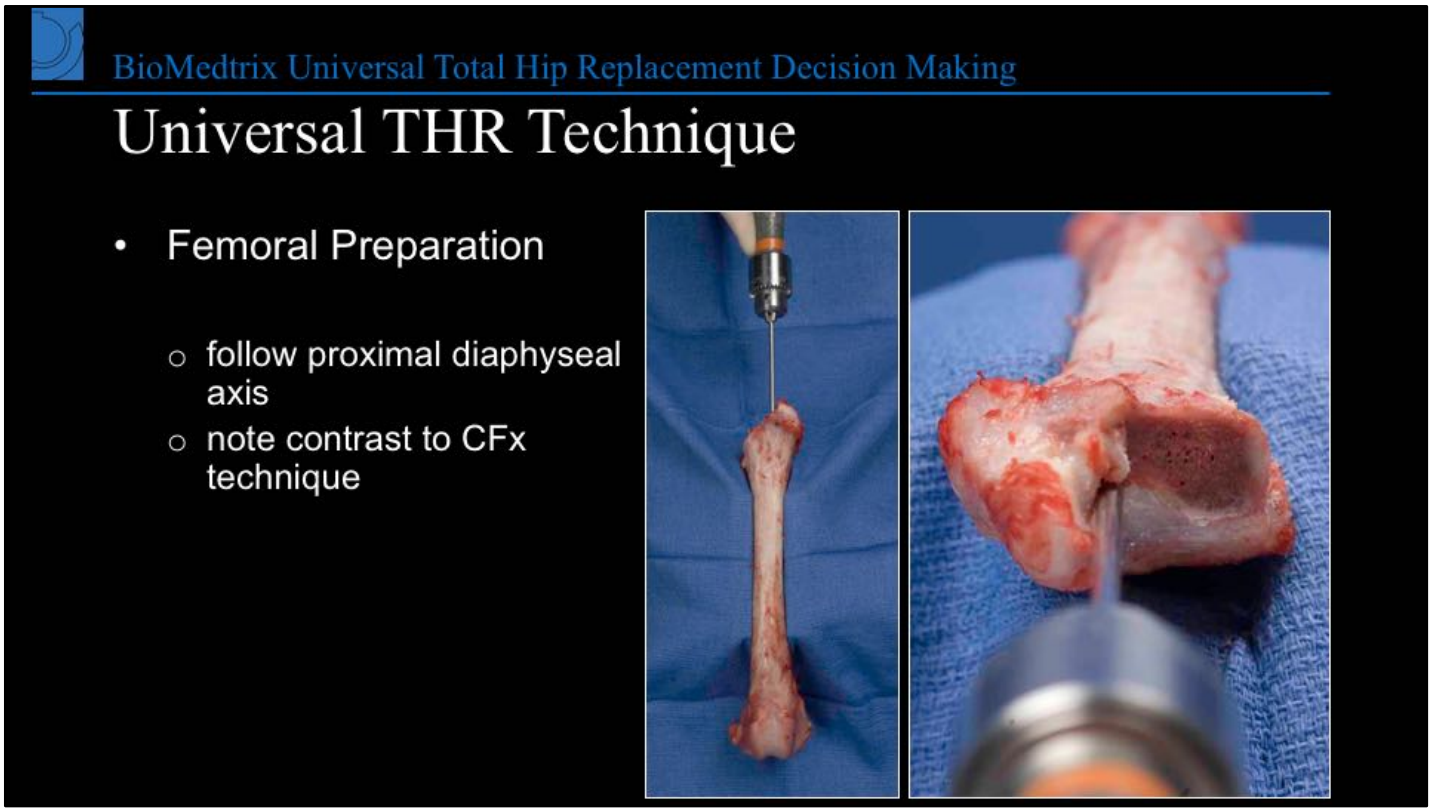
Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Encroachment of greater trochanter vs stem envelope
12mo golden retriever
VOSM
20mo Curly coated retriever

Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Prohibitively narrow femoral isthmus
5yo retriever mix
Old femoral Fx

Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Universal THR Technique
• Femoral Preparation
o follow proximal diaphyseal axis
o note contrast to CFx technique

Notes

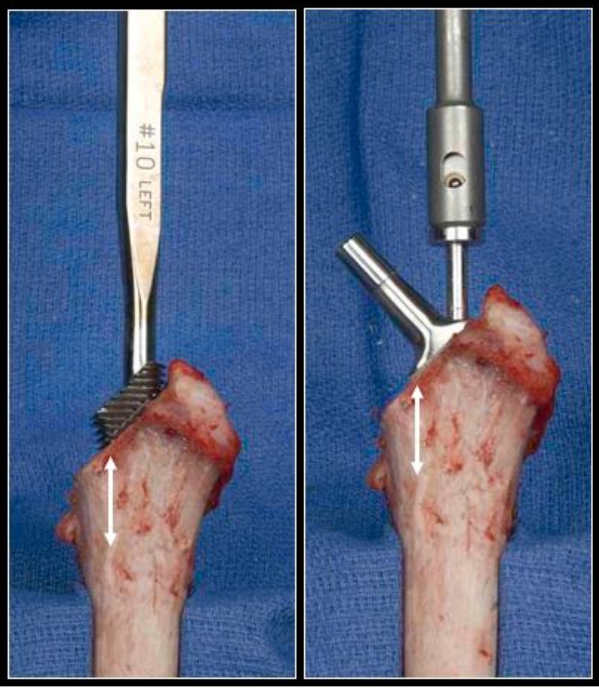
Notes

Notes

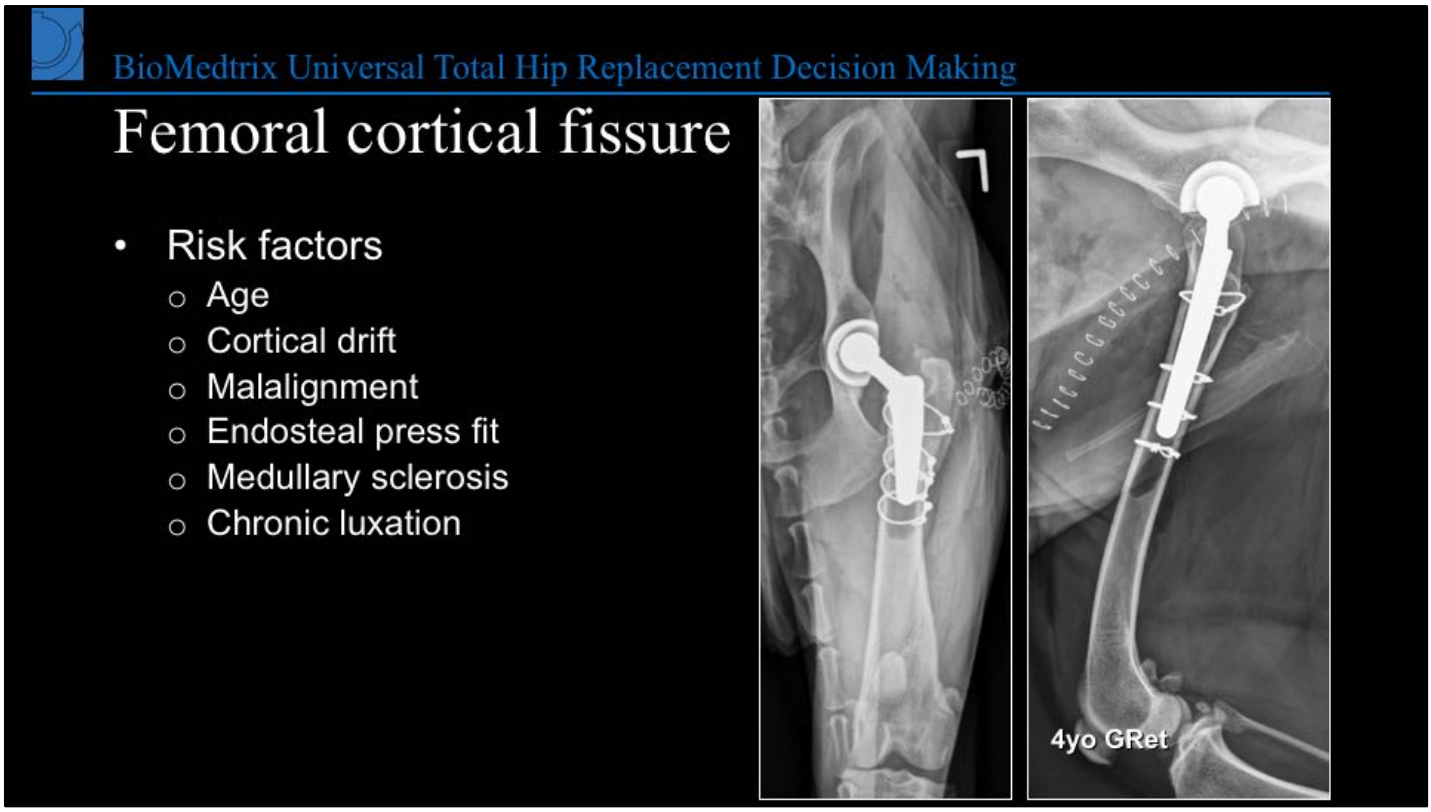
BioMedtrix Universal Total Hip Replacement Decision Making

Femoral cortical fissure

- craniomedial femur
- terminal broaching
- stem insertion



Notes



Notes The older dogs have more brittle bone and more prone to fissuring.

Lateral drift, caudal drift of broaching

If a fissure is noted, place one cerclage above the lesser trochanter, then every centimeter until 1 cm distal to the fissure line.

BioMedtrix Universal Total Hip Replacement Decision Making

Stem subsidence

- Transition from press fit to osseointegration
  - 4 weeks
- Clinical significance
  - none
  - catastrophic failure

Notes

- subsidence and retroversion
- subluxation
- be attentive to early postoperative lameness

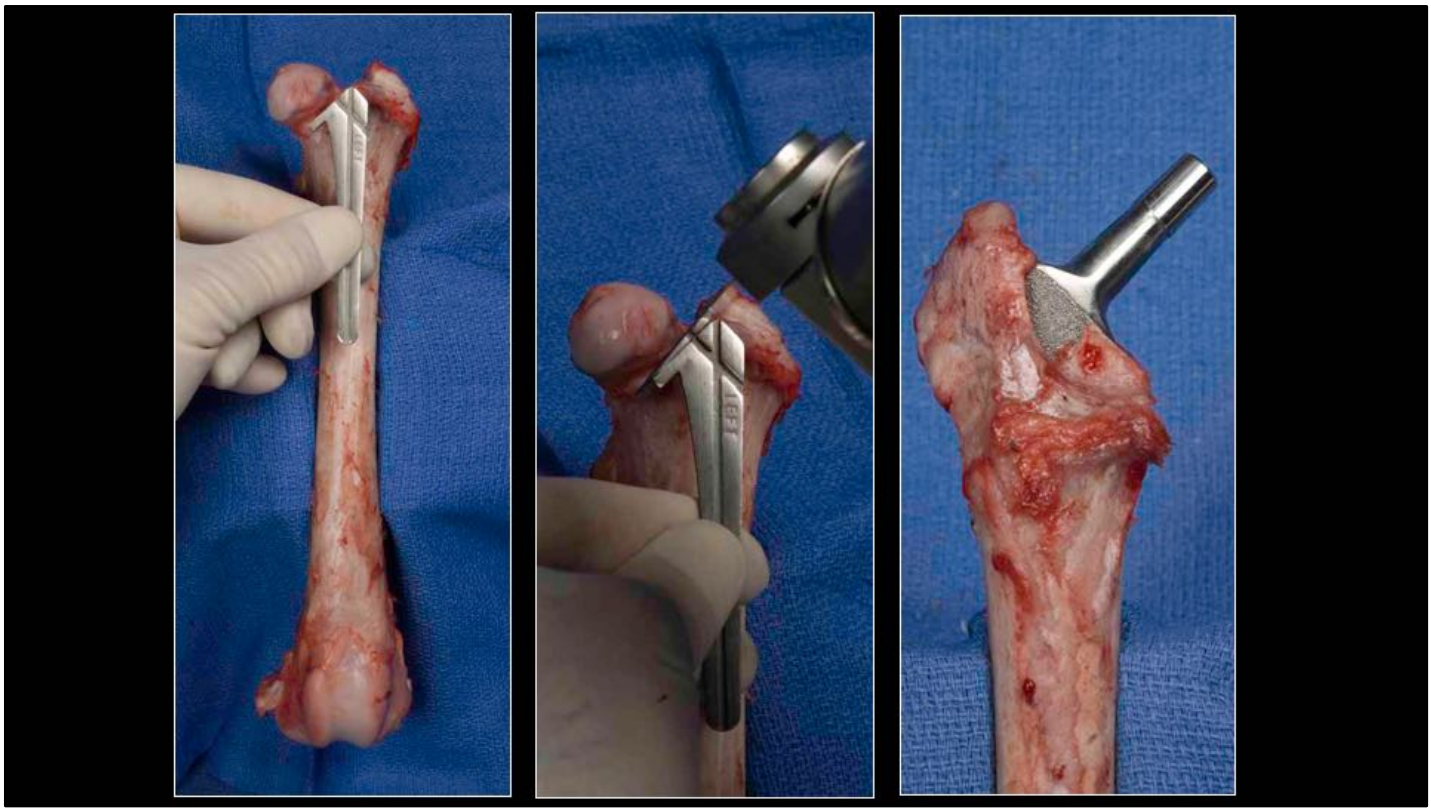
Notes Treat this complication within the first 2 weeks after surgery.

BioMedtrix Universal Total Hip Replacement Decision Making

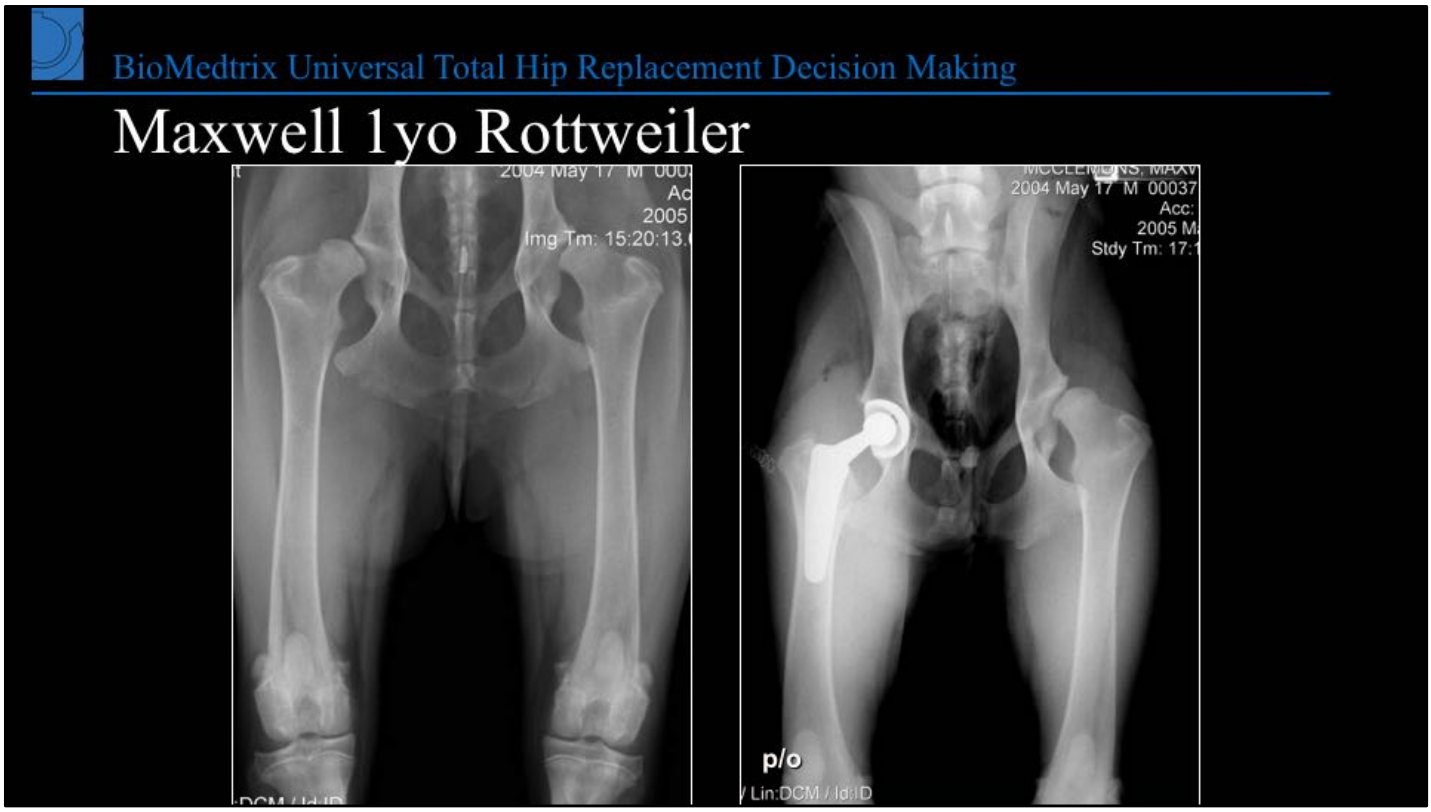
Stem subsidence

- Risk factors
  - Trabecular bone quality
    - Age
    - Breed (size)
  - Femoral conformation
    - Stove pipe vs tapered
  - Femoral preparation
    - Osteotomy level
    - Canal fill
  - Postoperative activity

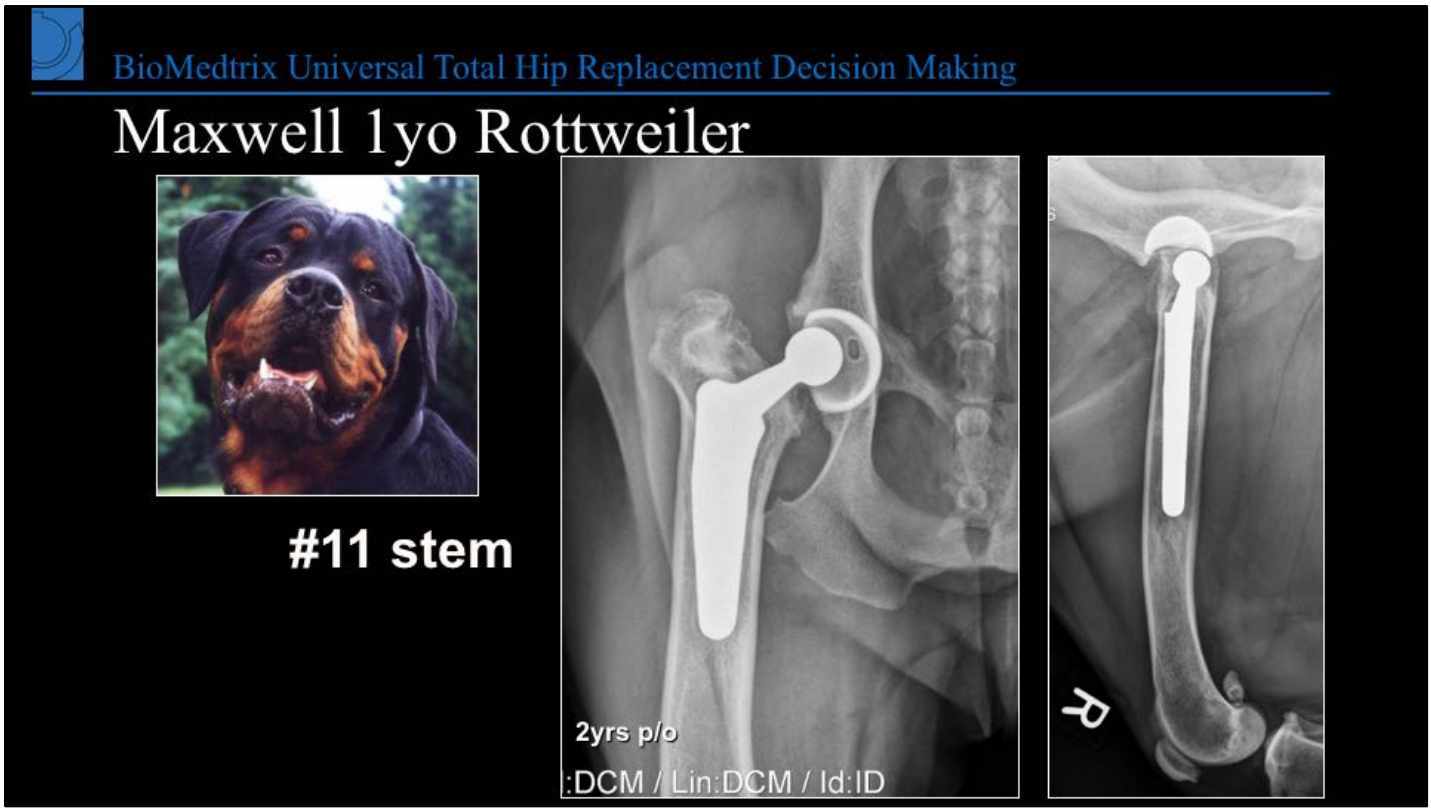
Notes If the femoral cut is too low, then there is less trabecular bone and greater risk for subsidence.



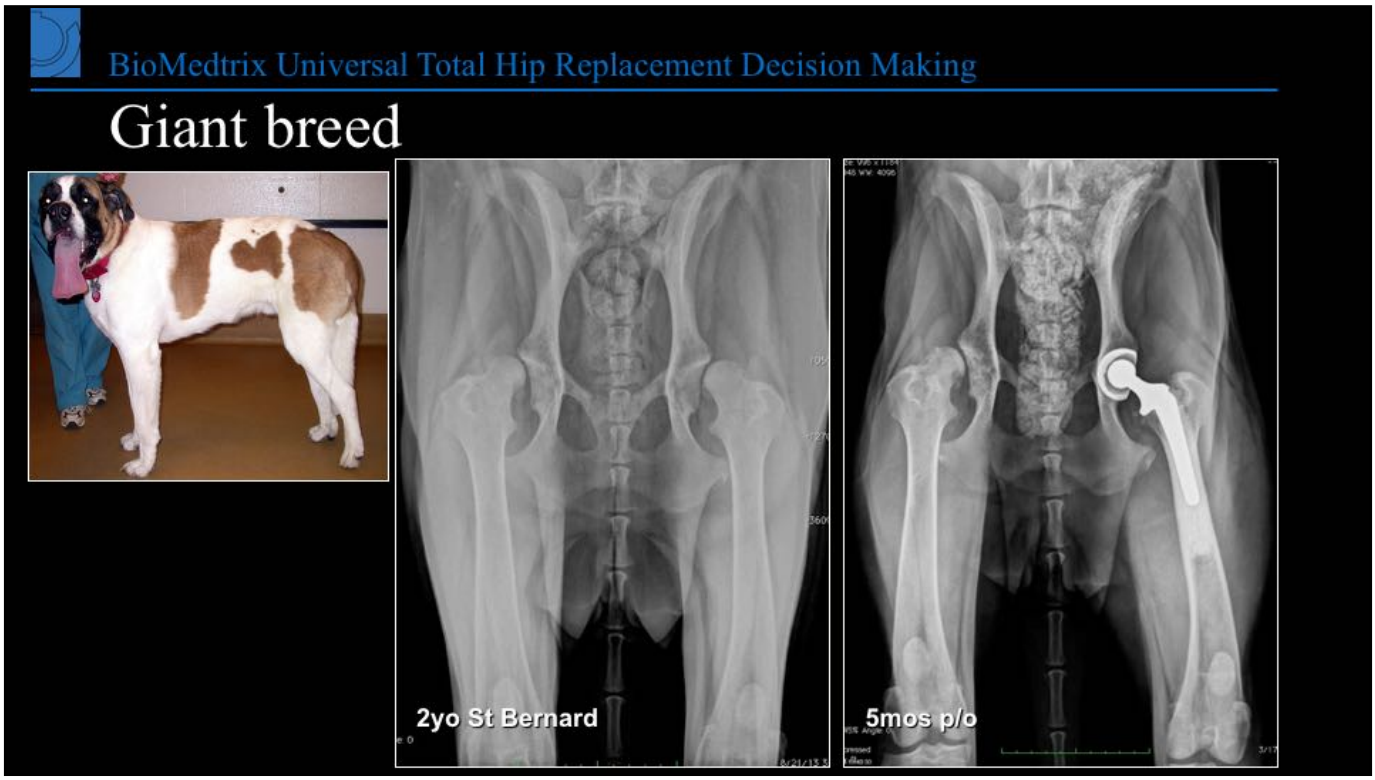
Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Maxwell 1yo Rottweiler
2004 May 17 M 00037
Acc:
2005
Img Tm: 15:20:13
2004 May 17 M 00037
Acc:
Stdy Tm:
p/o

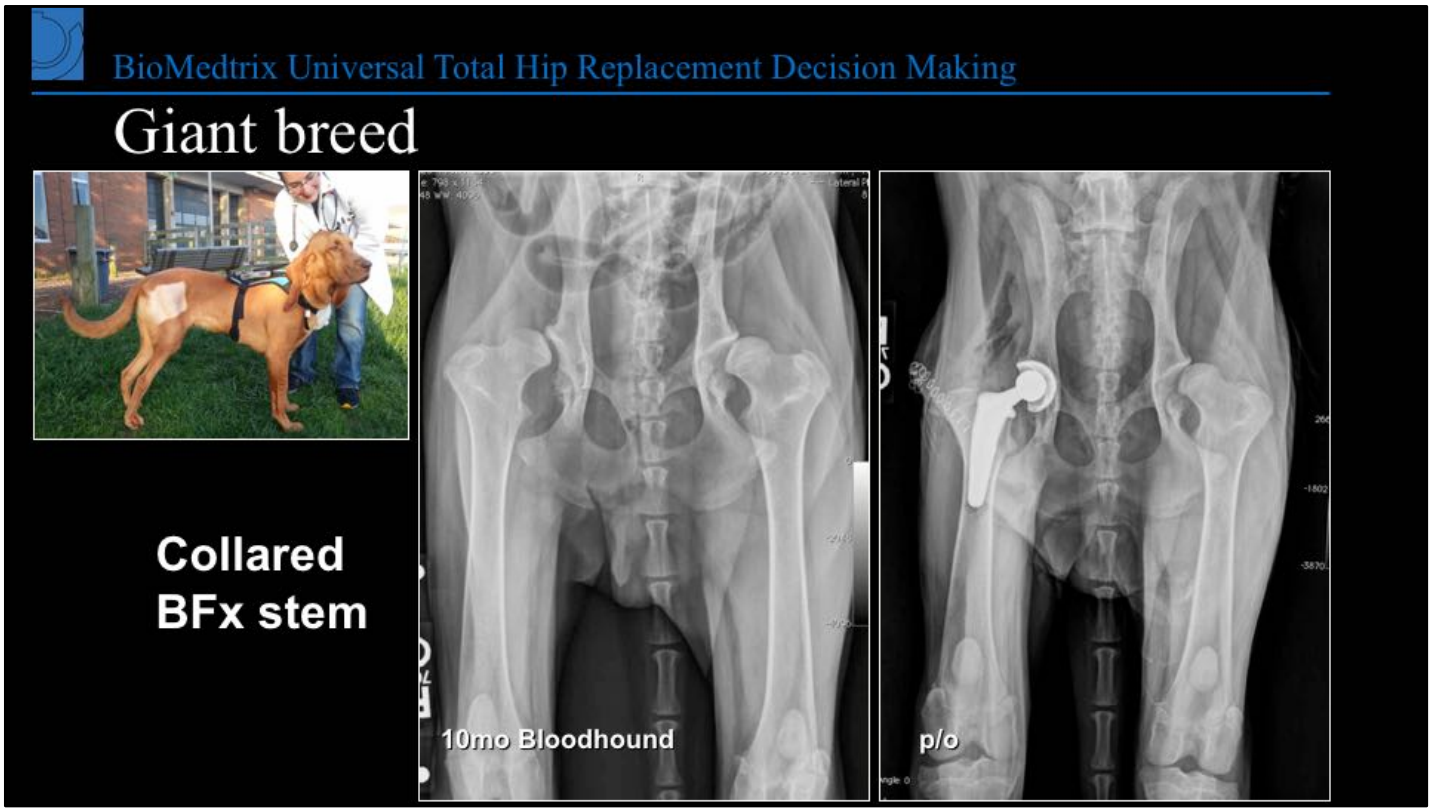
Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Maxwell 1yo Rottweiler
#11 stem
2yrs p/o
:DCM / Lin:DCM / Id:ID
R

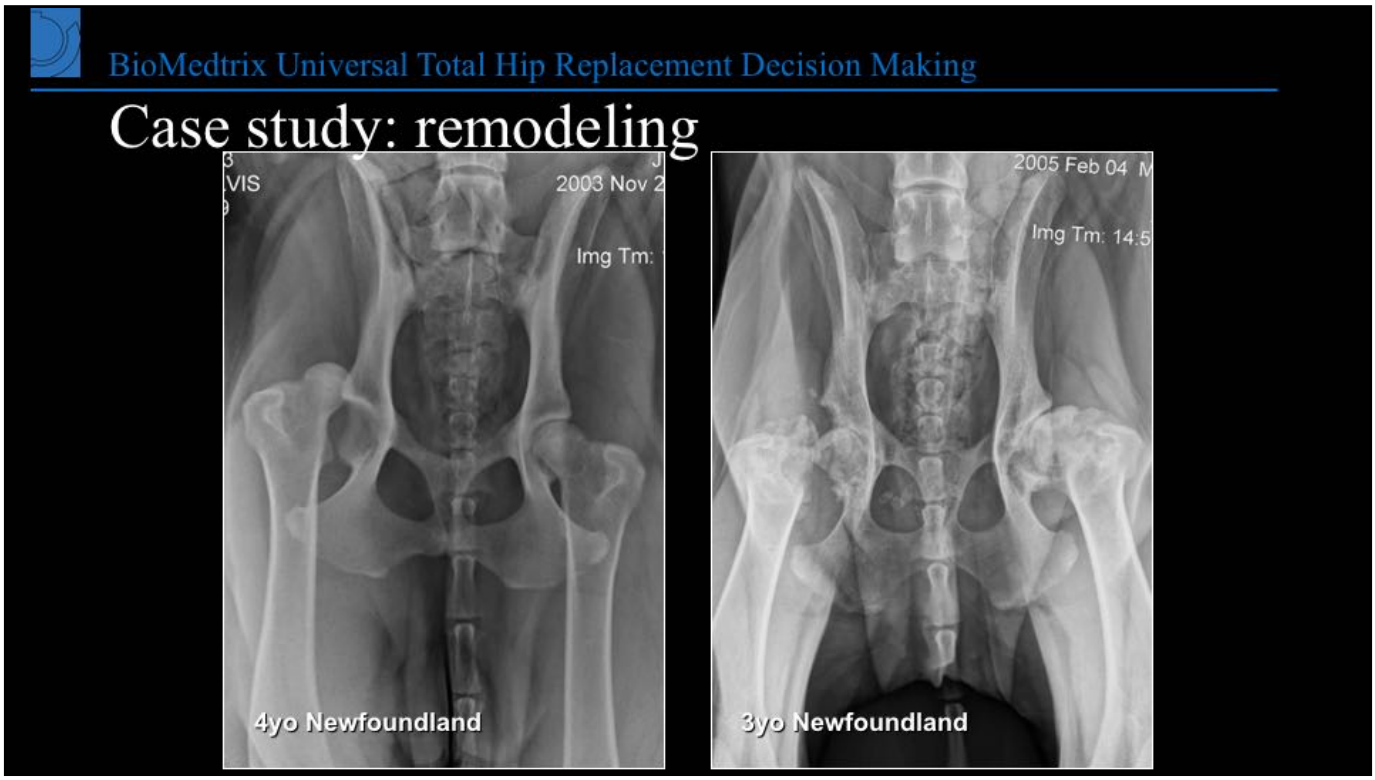
Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Giant breed
2yo St Bernard
5mos p/o

Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Giant breed
Collared
BFx stem
10mo Bloodhound
p/o

Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Case study: remodeling
2003 Nov 2
Img Tm:
4yo Newfoundland
2005 Feb 04
Img Tm: 14:5
3yo Newfoundland

Notes

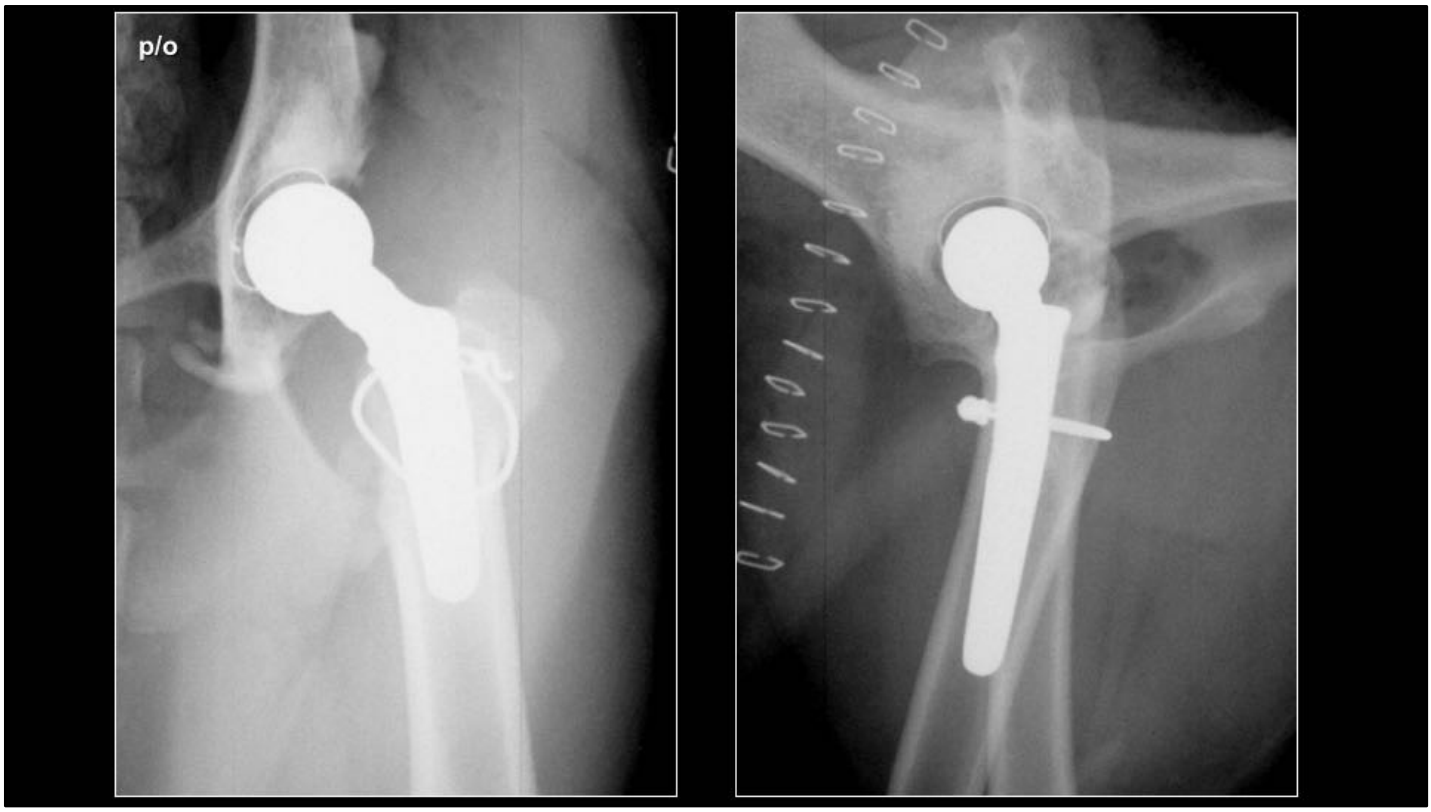
Notes

BioMedtrix Universal Total Hip Replacement Decision Making

Femoral fracture

- Early postoperative complication
- Risk factors
  - Femoral fissure
  - Stem misalignment
  - Narrow femoral isthmus
  - Challenging reduction

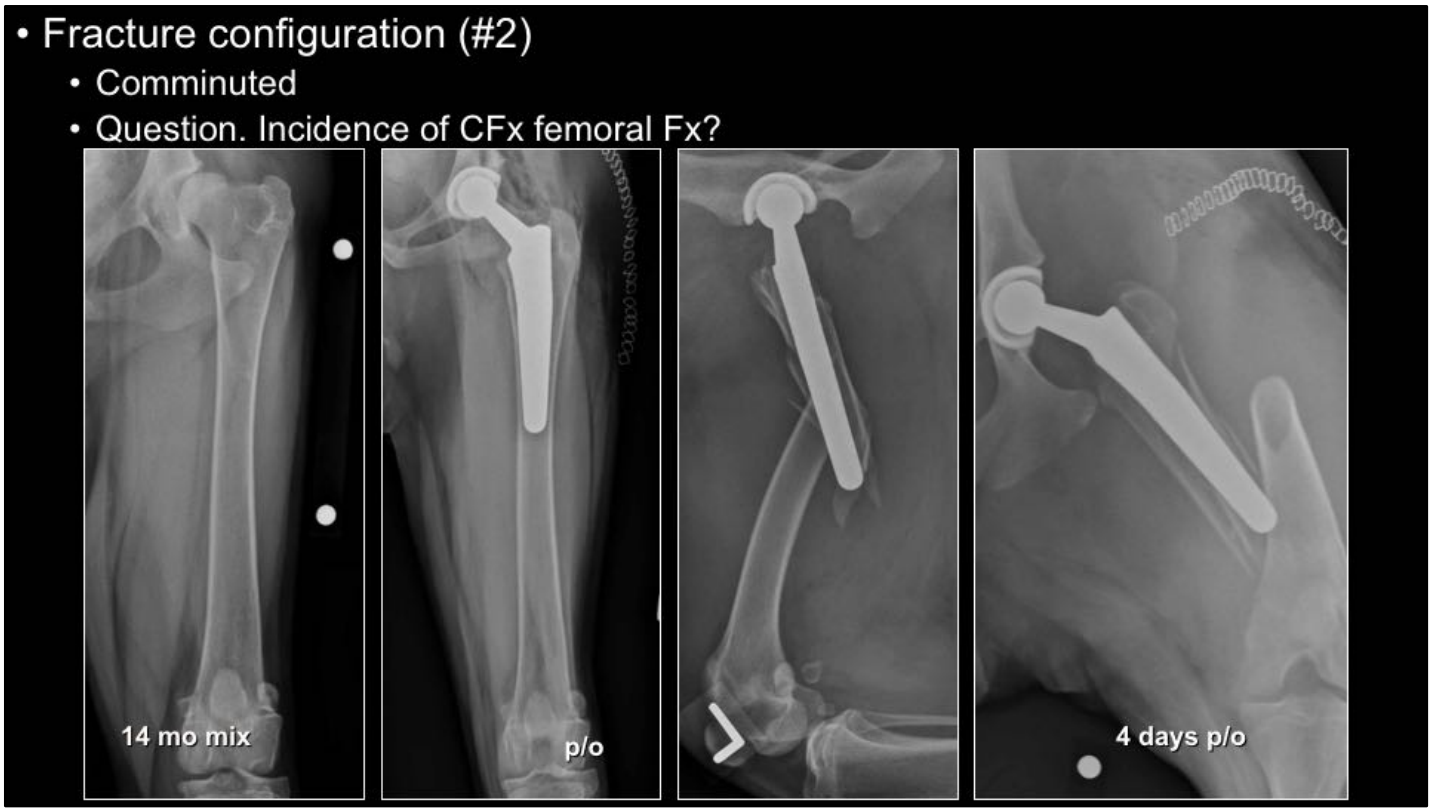
Notes Sclerotic bone with the bone is more brittle and greater risk for fracture



Notes

- Fracture configuration (#1)
  - spiral / oblique

Notes



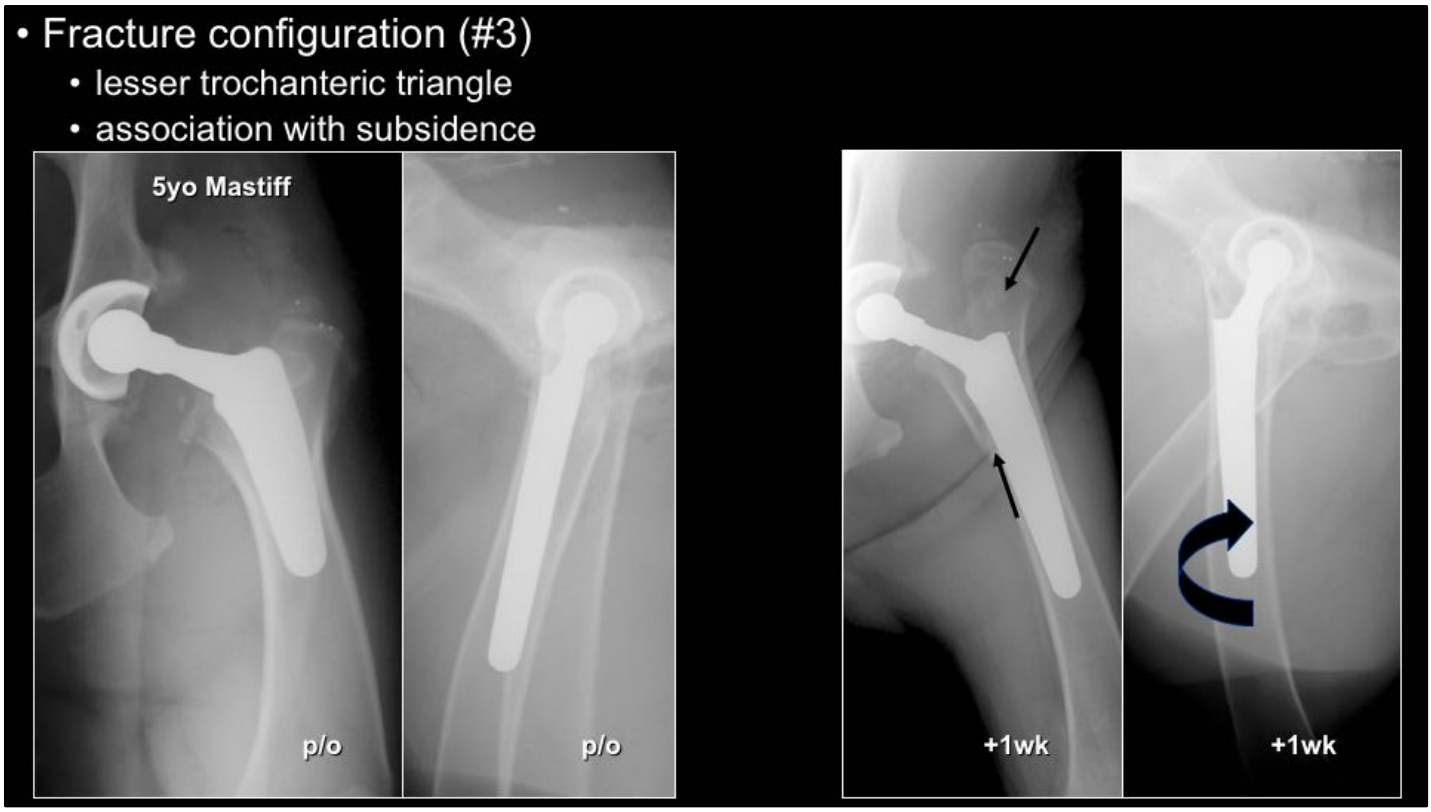
Notes Long neck length is greater moment arm and increases fracture risk.


Dear Jon,
Performed BFX implantation on a 1 year old Golden 10 days ago and was largely happy with the results except….
12 mo Golden
4days p/o

Notes

- Fissure propagated from stem tip
- Narrow femoral isthmus

Notes


• Fracture configuration (#3)
• lesser trochanteric triangle
• association with subsidence
5yo Mastiff
p/o
p/o
+1wk
+1wk

Notes

Notes If you cannot reduce the native hip, then move forward with FHO.

Notes

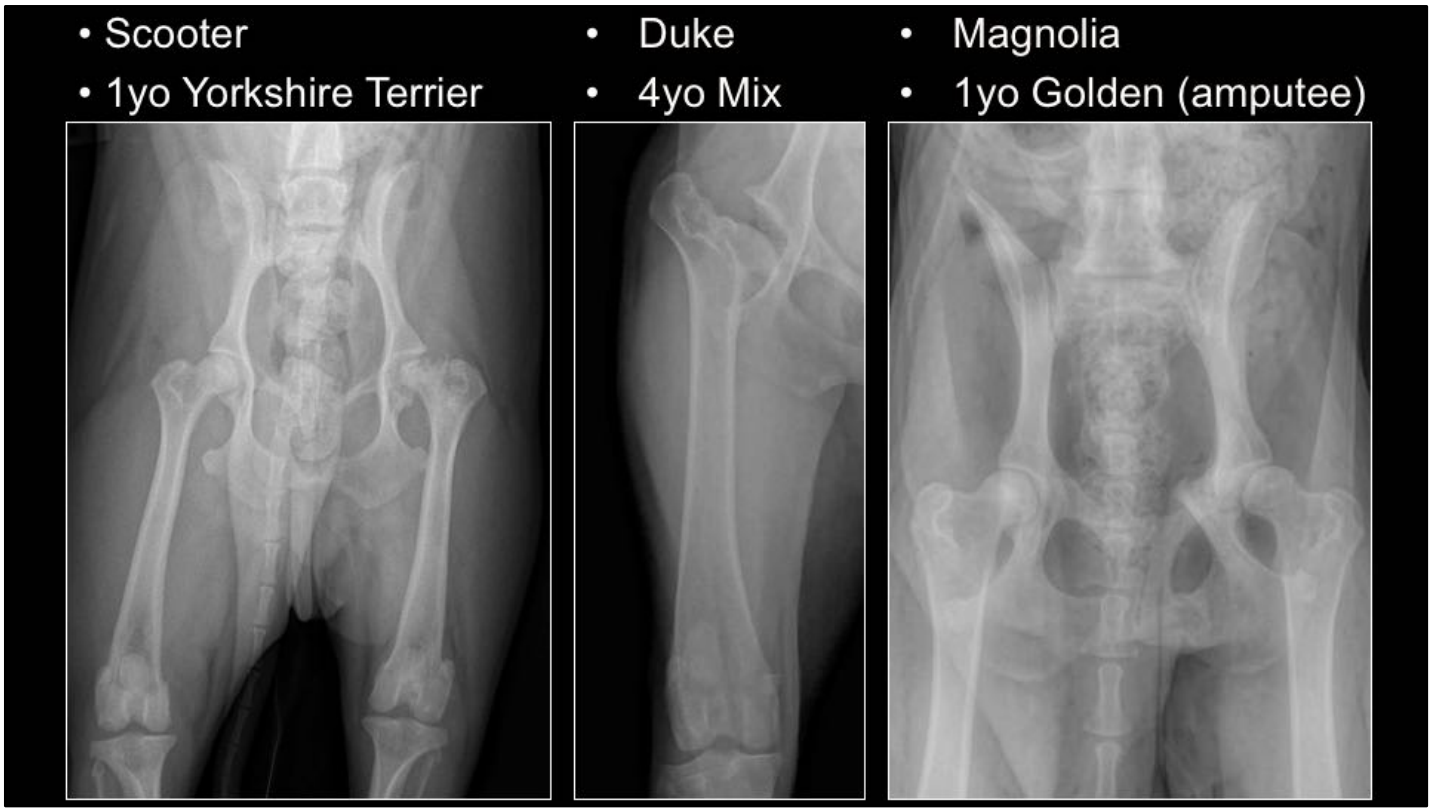

BioMedtrix Universal Total Hip Replacement Decision Making
Pick your battles
Journey

Notes

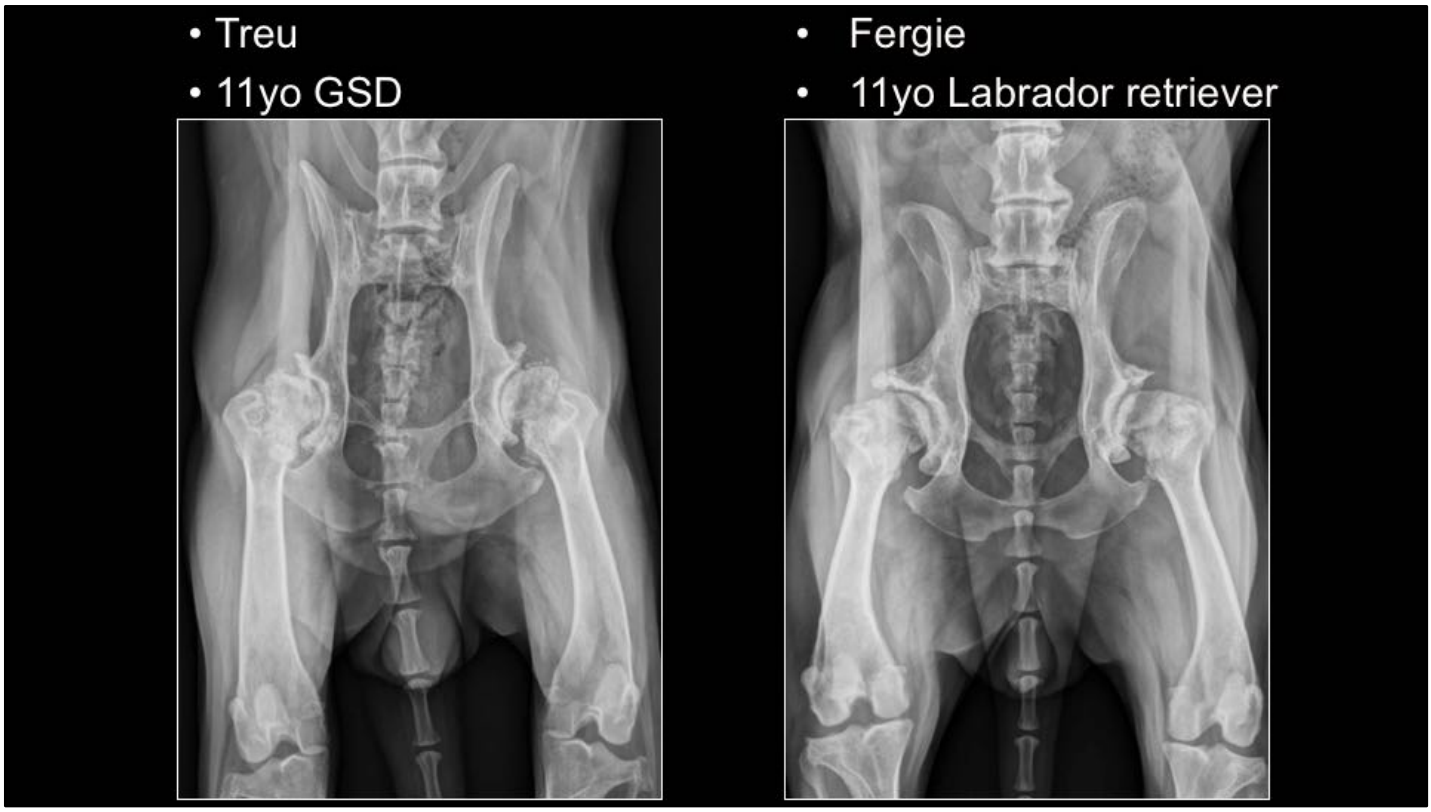
- Mona
- 1yo St Bernard

- Winston
- 4yo St Bernard

Notes


• Scooter
• 1yo Yorkshire Terrier
• Duke
• 4yo Mix
• Magnolia
• 1yo Golden (amputee)

Notes



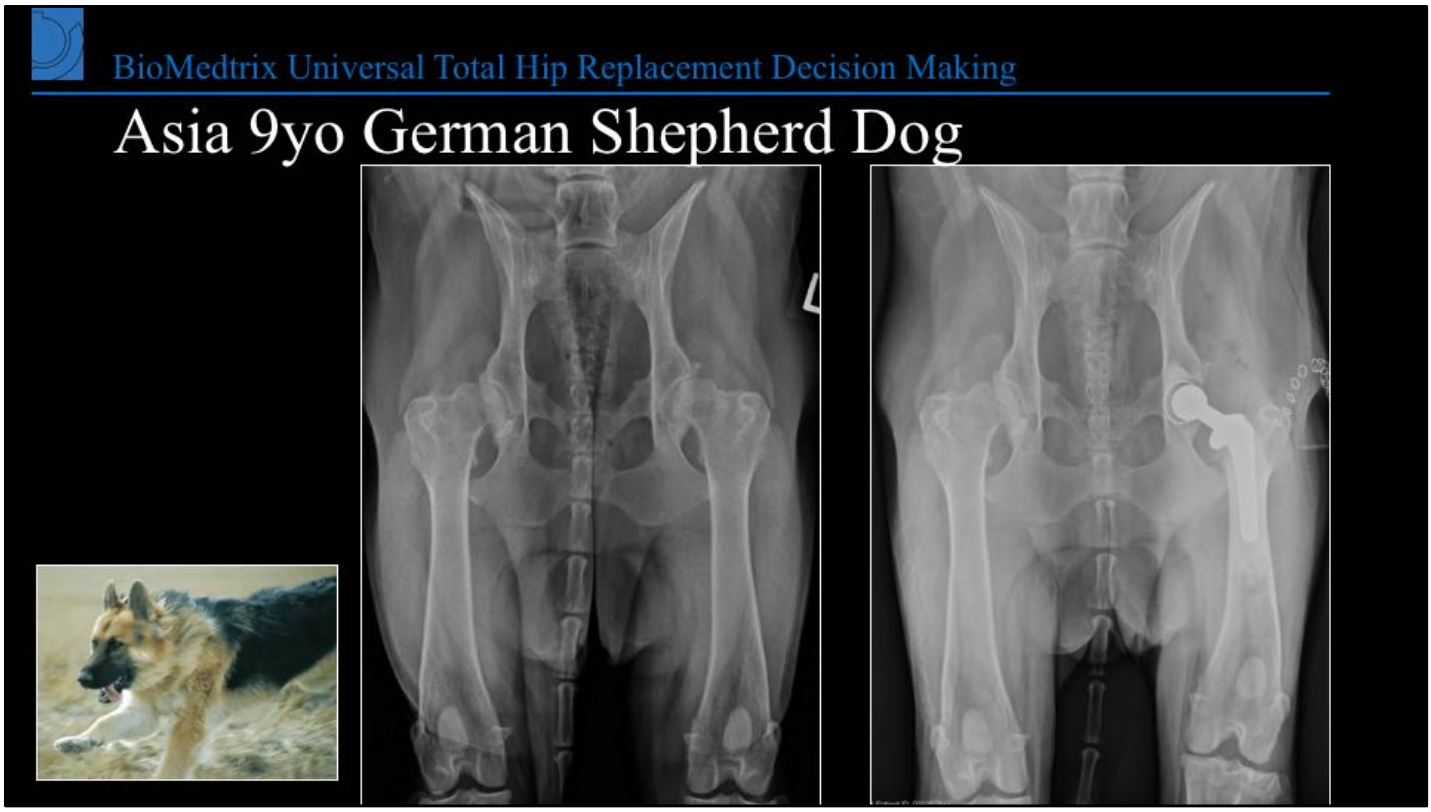
Notes

BioMedtrix Universal Total Hip Replacement Decision Making

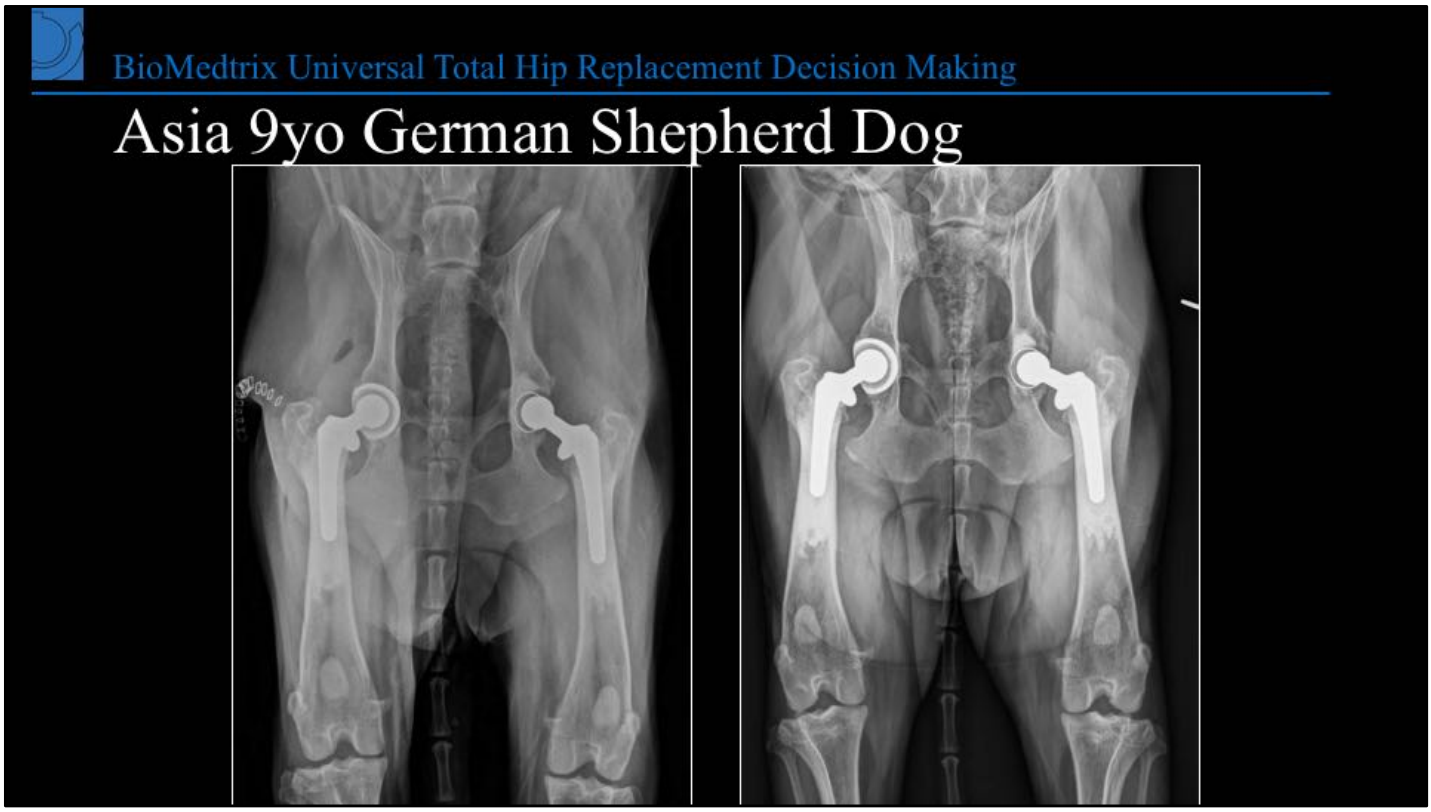
German Shepherd Dog

- Stove pipe femur
- Cortical thickness
- Cancellous bone quality
- Femoral diameter vs neck length
- Periarticular fibrosis

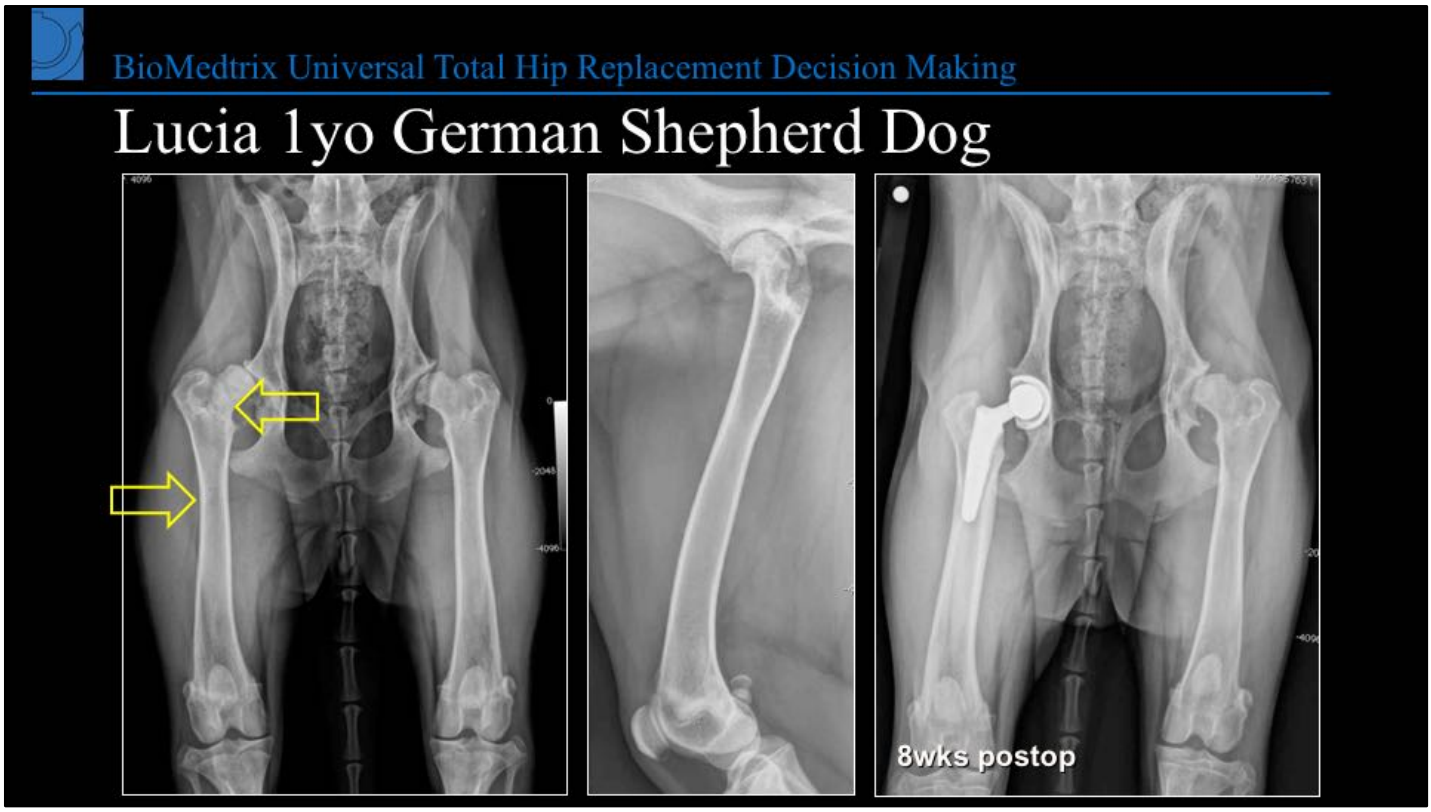
Notes



Notes Some of the German shep have shorter neck length as you see here. Also have capsular fibrosis which makes it difficult to reduce.


BioMedtrix Universal Total Hip Replacement Decision Making
Asia 9yo German Shepherd Dog

Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Lucia 1yo German Shepherd Dog
8wks postop

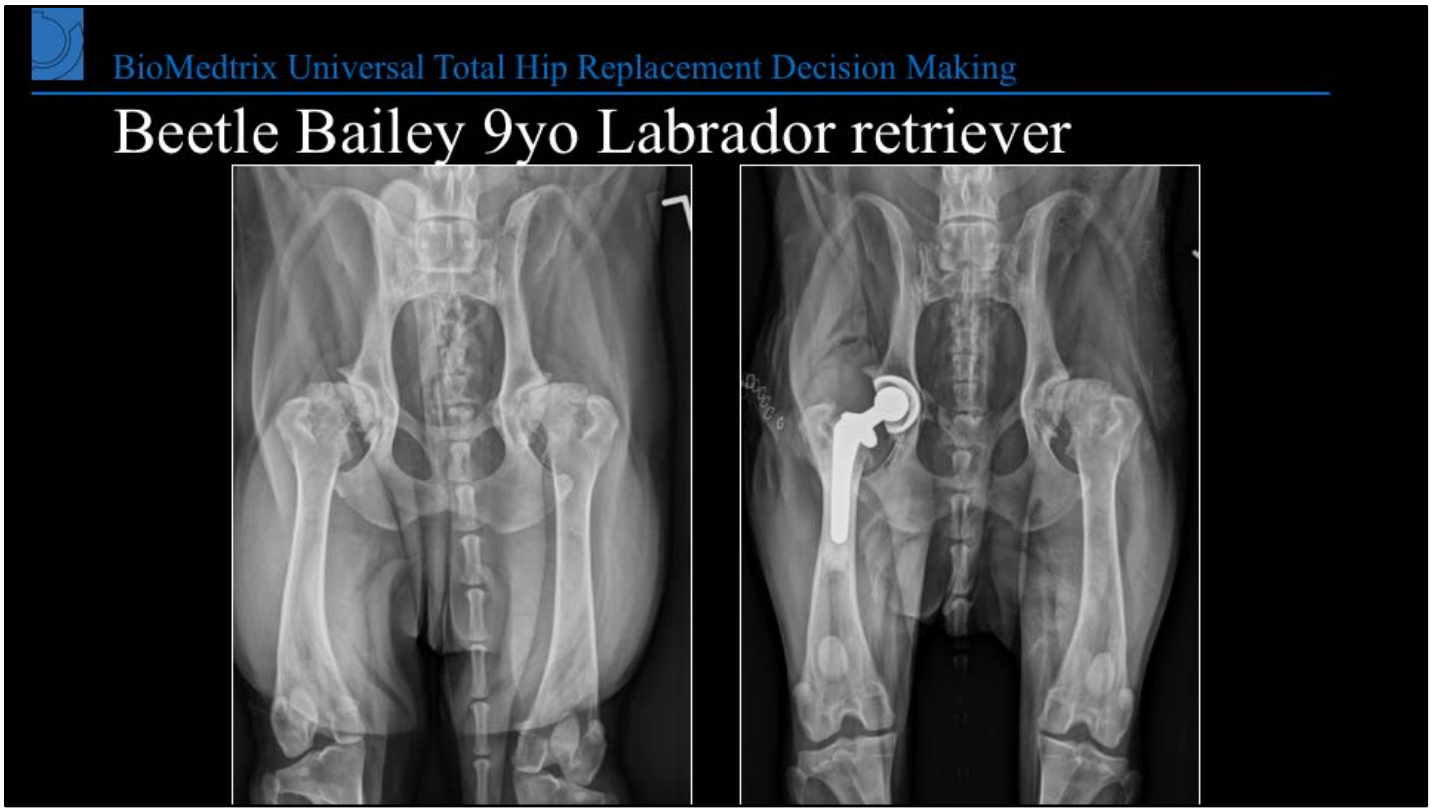
Notes

BioMedtrix Universal Total Hip Replacement Decision Making

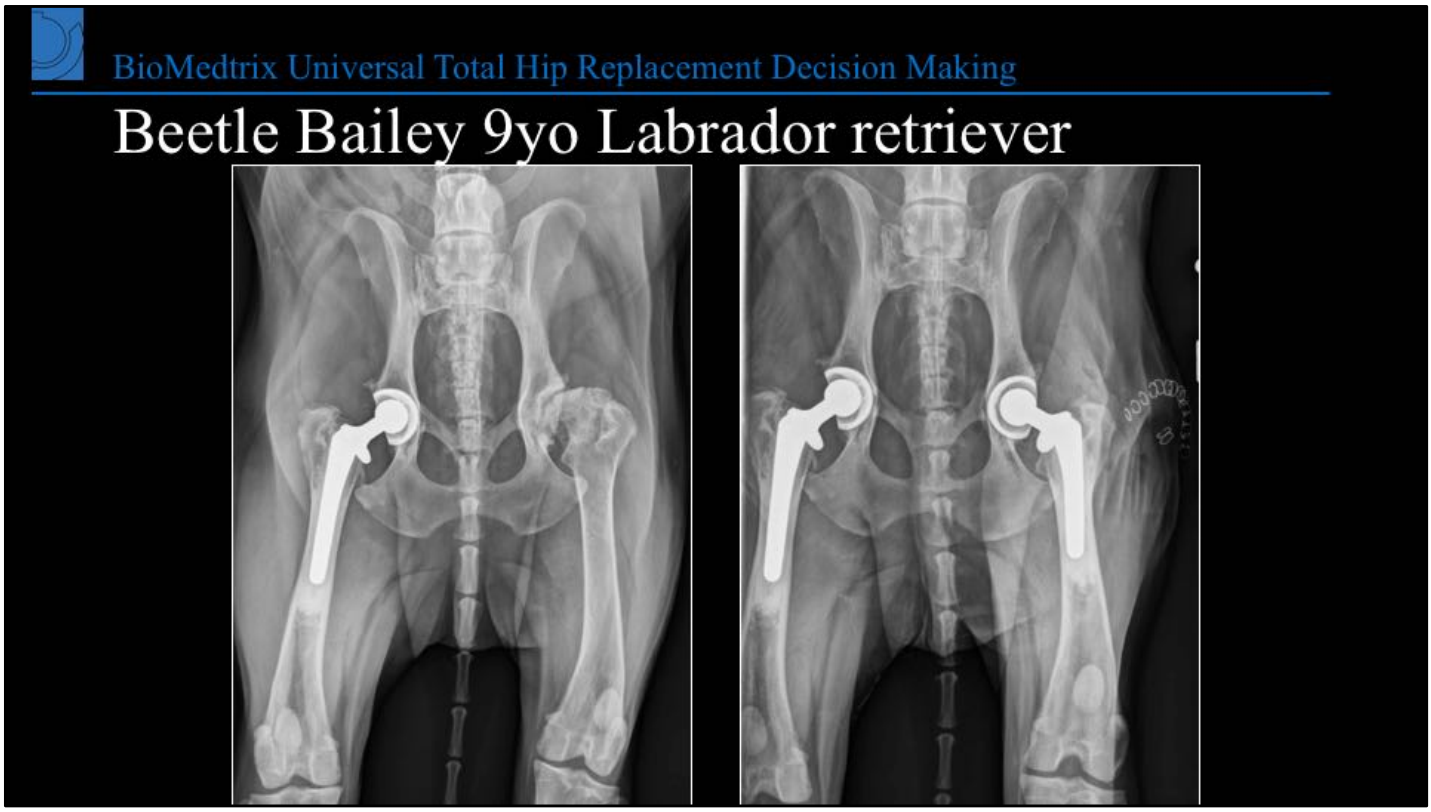
Age

- Appositional remodeling
- Cortical thickness
- Cortical compliance
- Cancellous bone quality
- Endosteal press fit
- Femoral diameter vs neck length
- Periarticular fibrosis

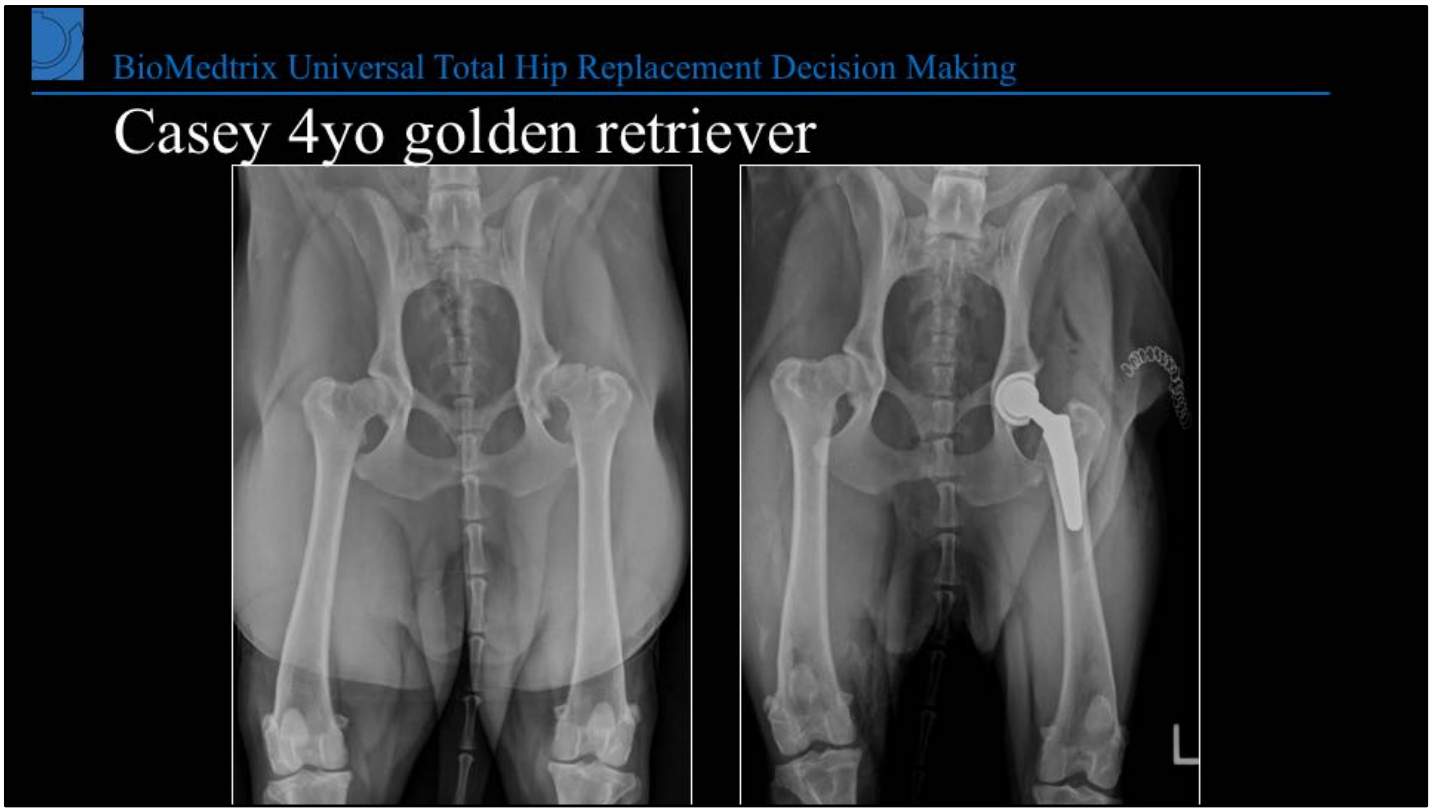
Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Beetle Bailey 9yo Labrador retriever

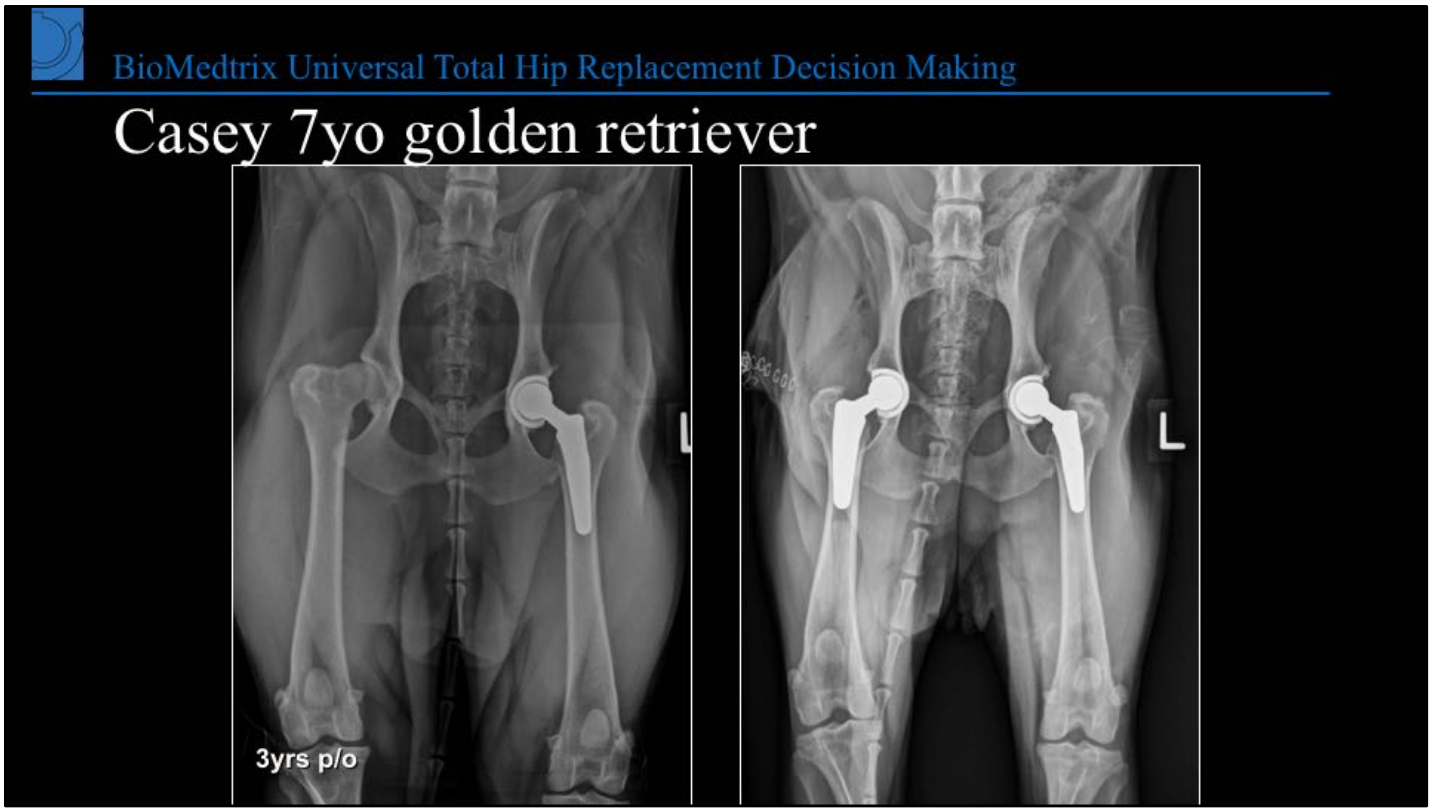
Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Beetle Bailey 9yo Labrador retriever

Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Casey 4yo golden retriever
L

Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Casey 7yo golden retriever
L
3yrs p/o
L

Notes

BioMedtrix Universal Total Hip Replacement Decision Making

Contraindications for BFx stem

- Age
- Femoral conformation
- Cancellous bone quality
- Cortical thickness and quality
- Size
- Prohibitive templating
- Postoperative compliance

Notes

BioMedtrix Universal Total Hip Replacement Decision Making

TOTAL HIP SCORE
A Pozzi, J Dyce

- Assessment of technical degree of difficulty of THR
- Guidance for the selection of BFx, CFx, or other THR system

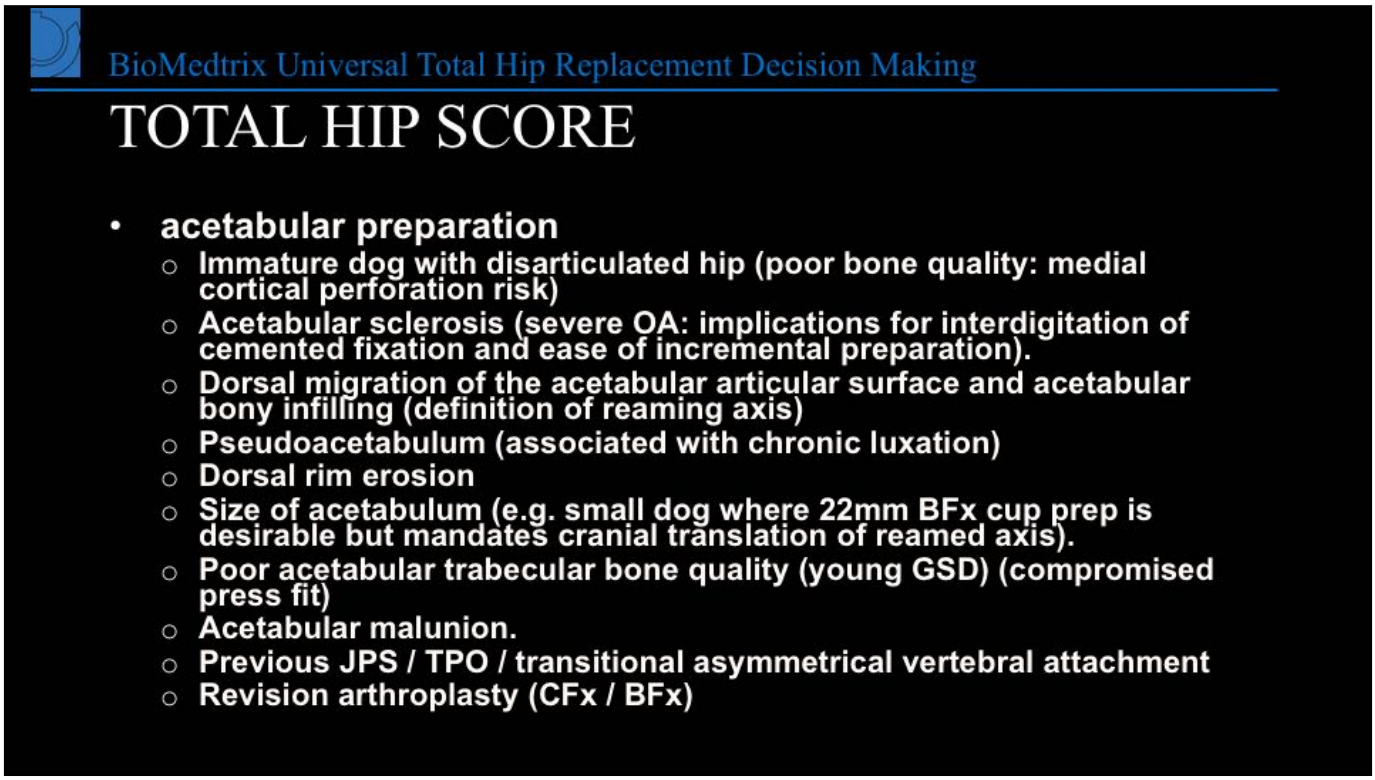
Notes

BioMedtrix Universal Total Hip Replacement Decision Making

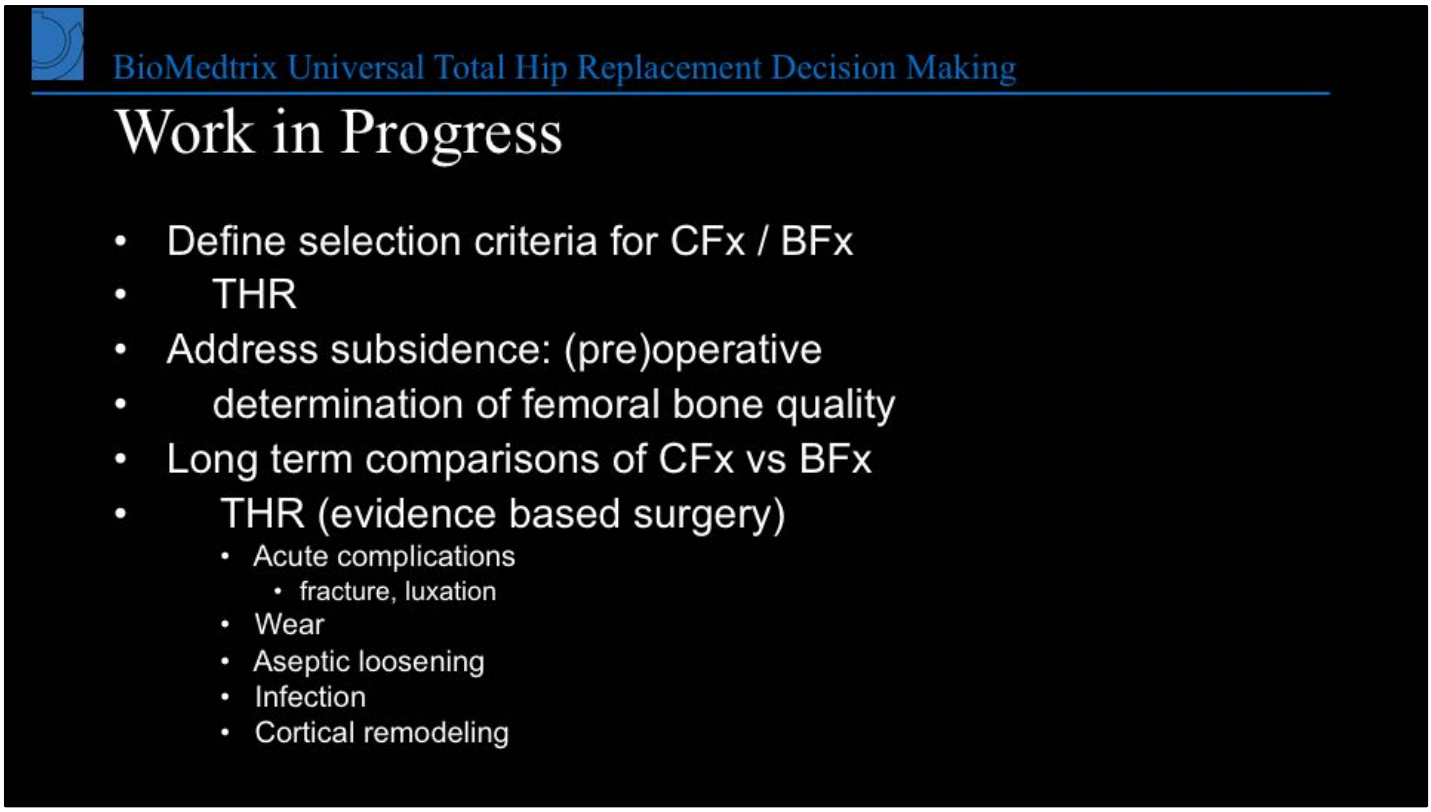
TOTAL HIP SCORE
A Pozzi, J Dyce

- acetabular exposure
- femoral presentation
- acetabular preparation
- femoral preparation
- reduction
- closure

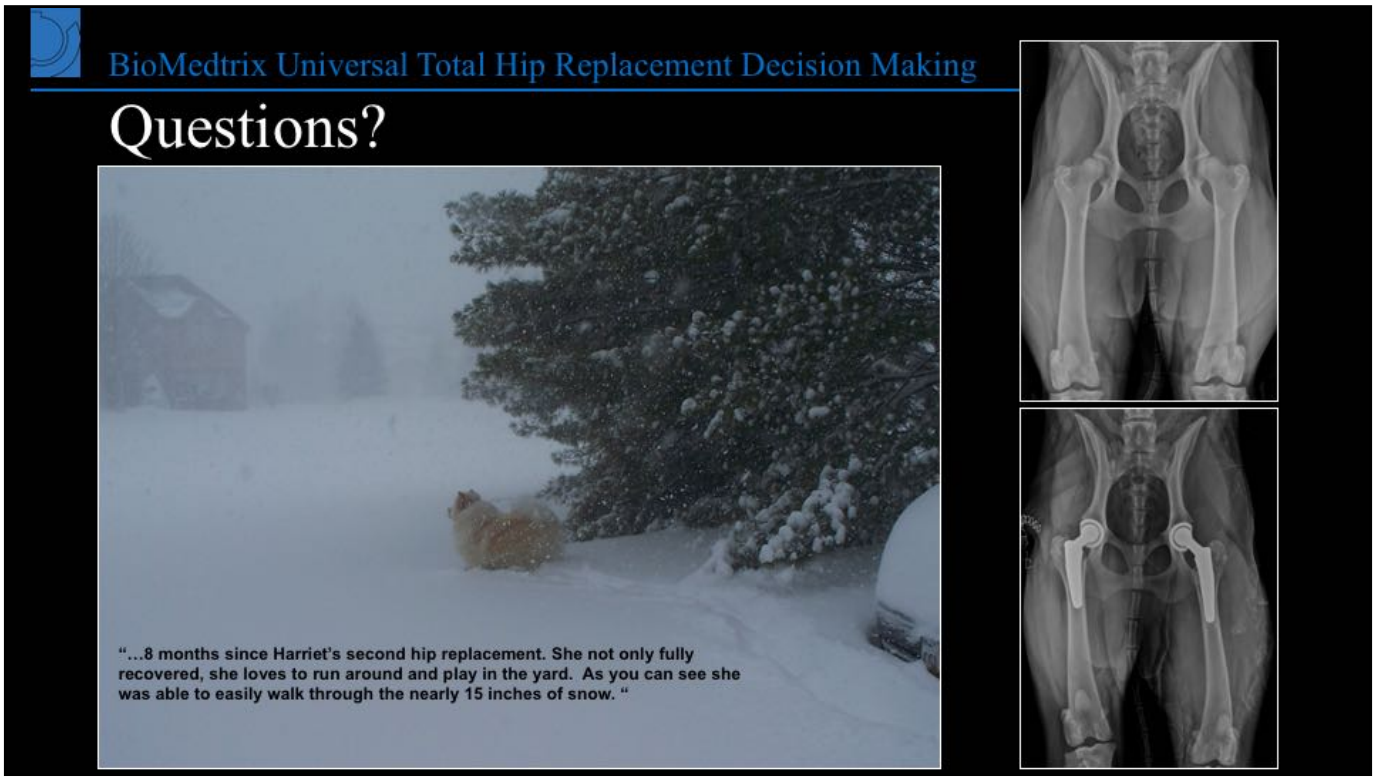
Notes


BioMedtrix Universal Total Hip Replacement Decision Making
TOTAL HIP SCORE
• acetabular preparation
o Immature dog with disarticulated hip (poor bone quality: medial cortical perforation risk)
o Acetabular sclerosis (severe OA: implications for interdigitation of cemented fixation and ease of incremental preparation).
o Dorsal migration of the acetabular articular surface and acetabular bony infilling (definition of reaming axis)
o Pseudoacetabulum (associated with chronic luxation)
o Dorsal rim erosion
o Size of acetabulum (e.g. small dog where 22mm BFx cup prep is desirable but mandates cranial translation of reamed axis).
o Poor acetabular trabecular bone quality (young GSD) (compromised press fit)
o Acetabular malunion.
o Previous JPS / TPO / transitional asymmetrical vertebral attachment
o Revision arthroplasty (CFx / BFx)

Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Work in Progress
Define selection criteria for CFx / BFx
THR
Address subsidence: (pre)operative
determination of femoral bone quality
Long term comparisons of CFx vs BFx
THR (evidence based surgery)
Acute complications
fracture, luxation
Wear
Aseptic loosening
Infection
Cortical remodeling

Notes


BioMedtrix Universal Total Hip Replacement Decision Making
Questions?
"…8 months since Harriet's second hip replacement. She not only fully recovered, she loves to run around and play in the yard. As you can see she was able to easily walk through the nearly 15 inches of snow. "

Notes