THE LAMENESS EXAM

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Lameness Exam – Goals

- Consistent
- Thorough
- Isolation
- Repeatable
- Appropriate diagnostics
- Improve clinical skills

Signalment & History

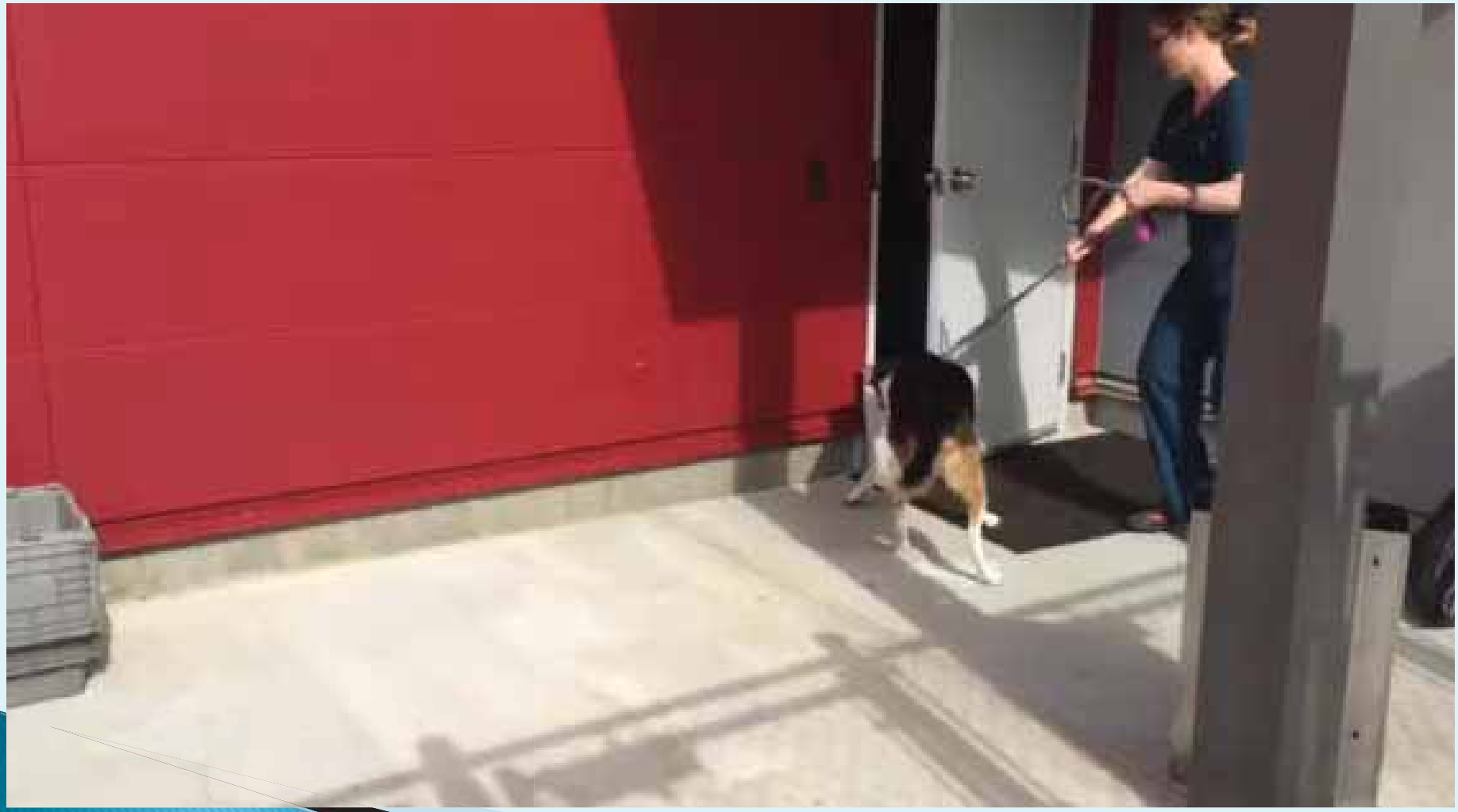
- Breed
- Age
  - Congenital vs. acquired injuries
- Qualification of lameness
  - Acute vs. chronic
    - Static vs. progressive
  - Persistent vs. intermittent
  - Exercise vs. rest
  - Mild -> non-weight bearing
    - “Tumor lame”

Physical Examination

- Complete examination
  - Systemic health
- Observe walking
  - Before exam

Gait Analysis

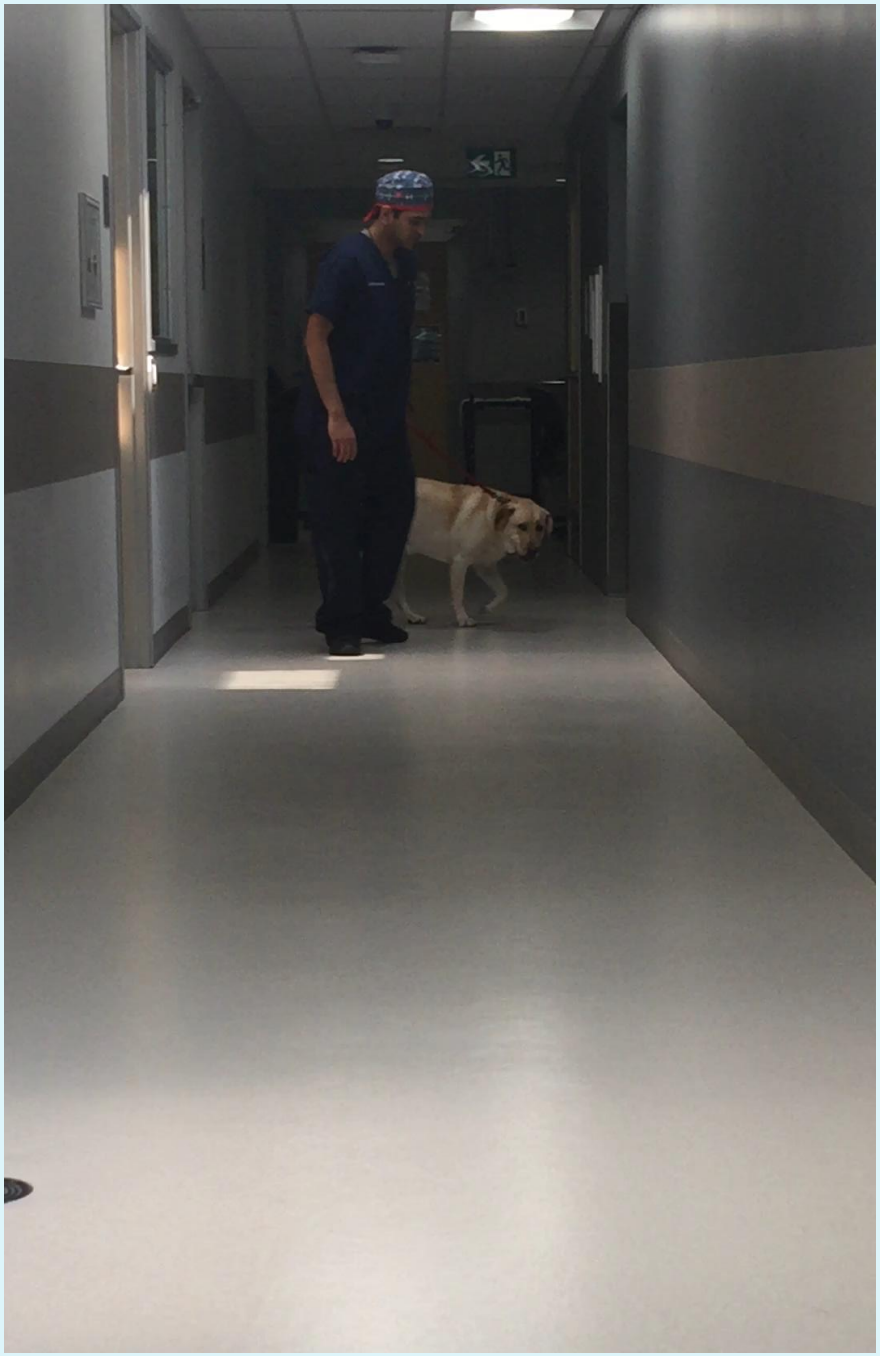
Gait Analysis



Gait Analysis

Physical Examination

- Complete examination
  - Systemic health
- Observe walking
  - Before exam
  - **Repeat afterwards**



Orthopedic Examination

- Both limbs simultaneously
  - Swelling
  - Asymmetry
  - Atrophy
  - Wounds/abrasions
- Neuro exam
  - Postural reflexes
  - Neck manipulation
  - Spinal
  - L-S palpation

Sound Leg

- What's normal
  - Exam
  - Reaction
- Standing or lateral
  - Comfort
- Start at the toes
  - Consistent
  - Thorough

Now….

- Move to problem leg
- Save painful manipulations for last
  - Easier
    - You
    - Patient
    - Owner
- Complete in entirety
- Repeat if necessary
  - Exercise
- **REPEAT!!**

Anatomy – Thoracic Limb

- Scapula
- Shoulder joint
- Humerus
- Elbow
- Antebrachium
- Carpus
- Digits

- Cervical Spine
- Axillary Region

Foot and Metacarpus

- Palpate each bone & joint
- Symmetry
  - Swelling
- Instability
- Crepitus

Foot and Metacarpus

- Nail beds
  - Infection
  - Neoplasia
  - Amputation??
- Laceration
  - SDF
  - DDF
  - Dropped foot
- FB

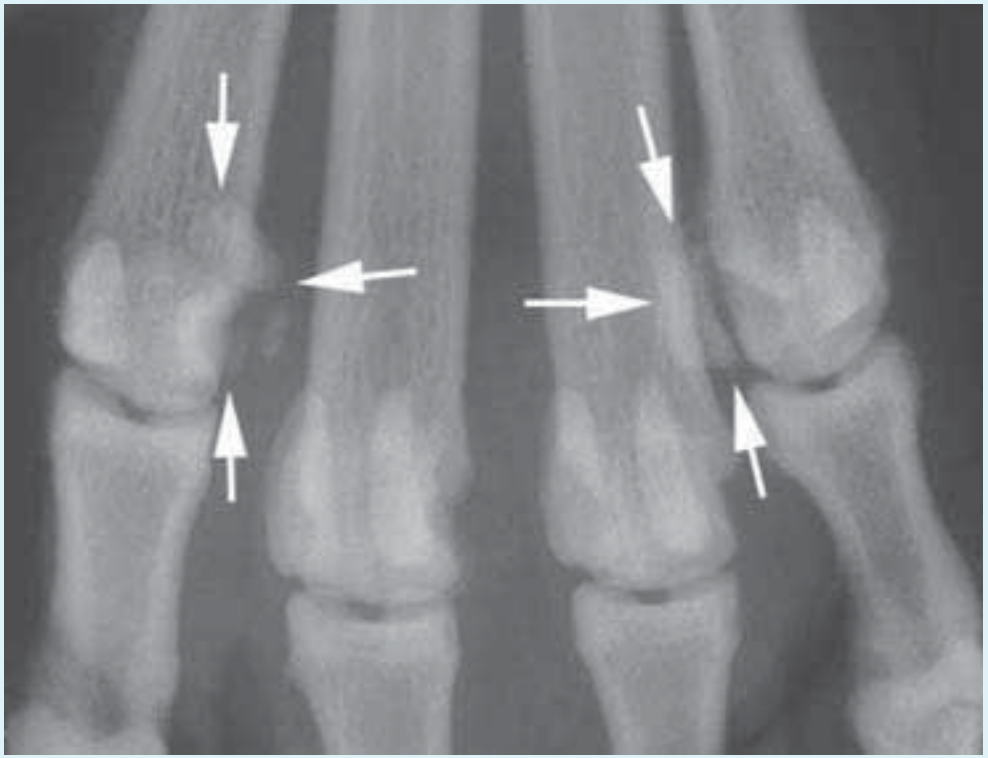
Foot and Metacarpus

Foot and Metacarpus

- Wart-like lesions
- Greyhounds *vs.* Non-Greyhound
  - weight bearing digits
  - inflammatory
  - papillomavirus
  - surgical excision?

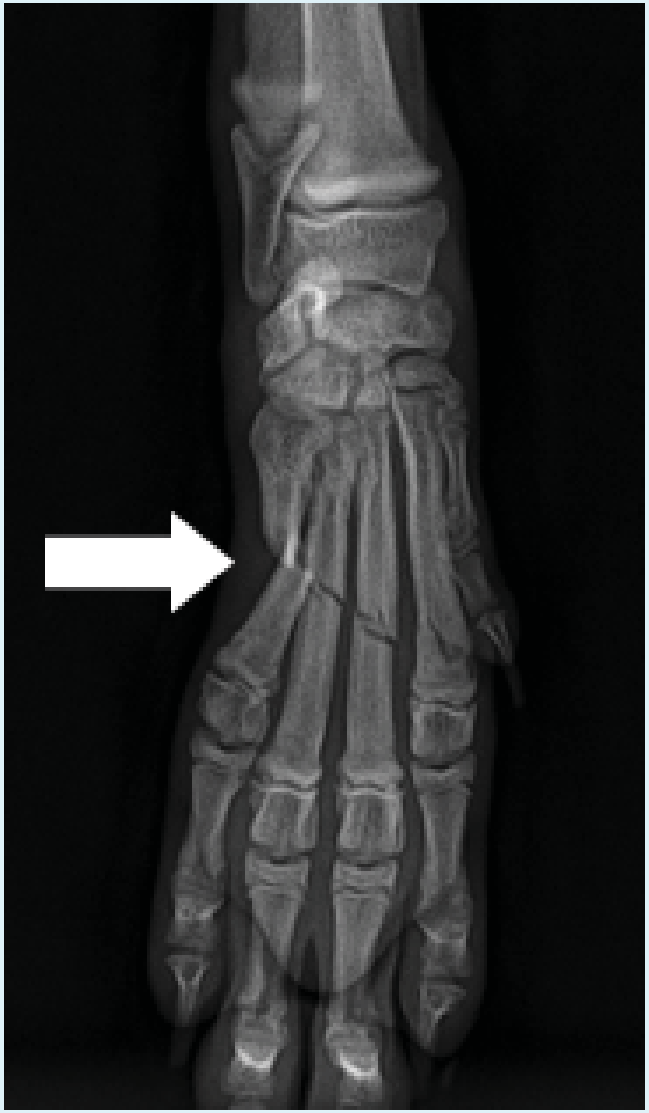
Foot and Metacarpus

- Sesamoid injuries
  - Rottweiller
  - #2 and #7

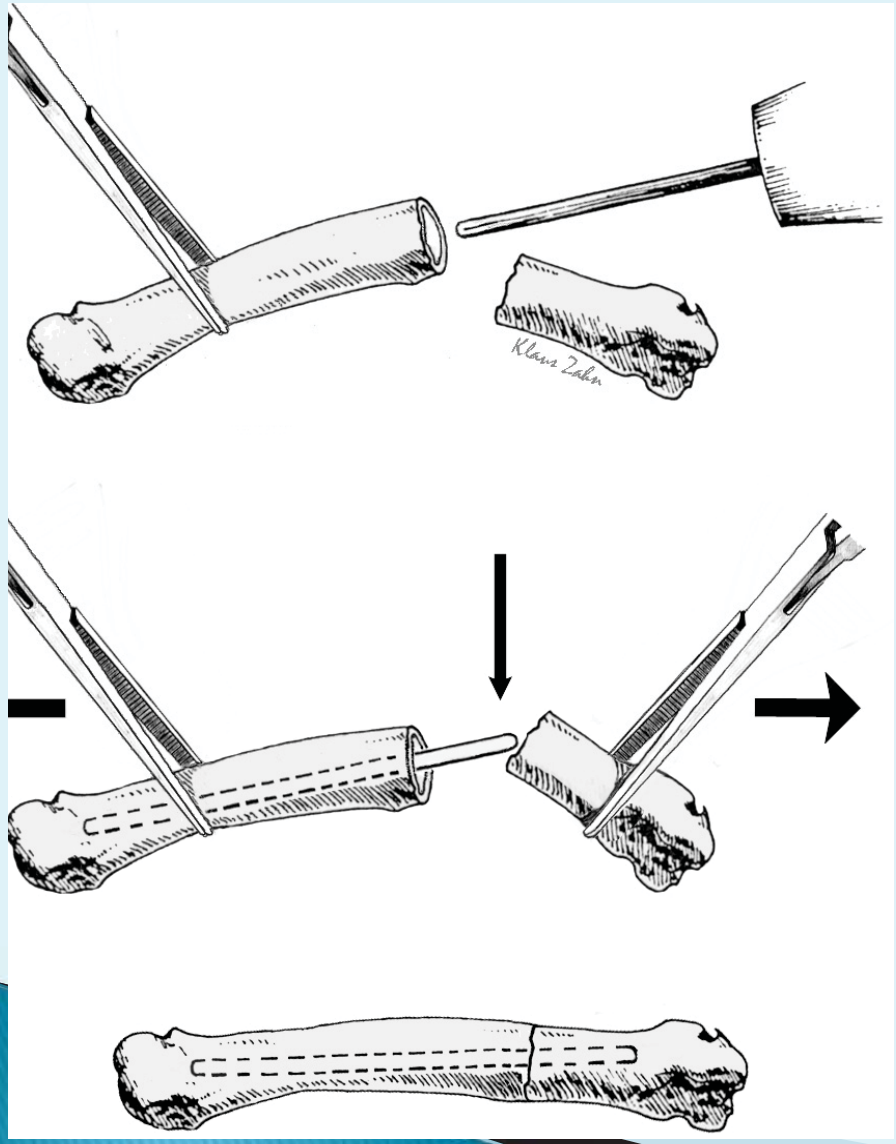


Foot and Metacarpus

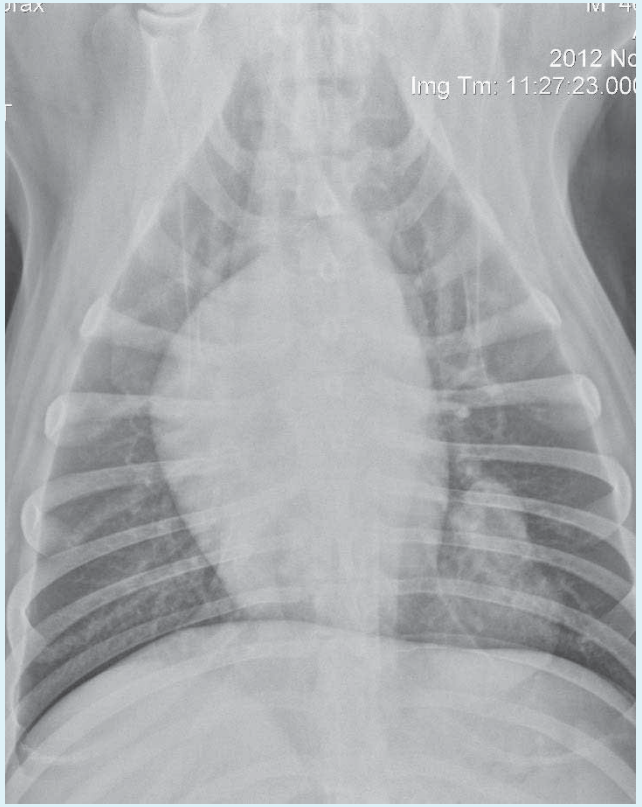
- Surgical vs Conservative?
  - Fractures or luxations
  - >2
  - #3 and #4



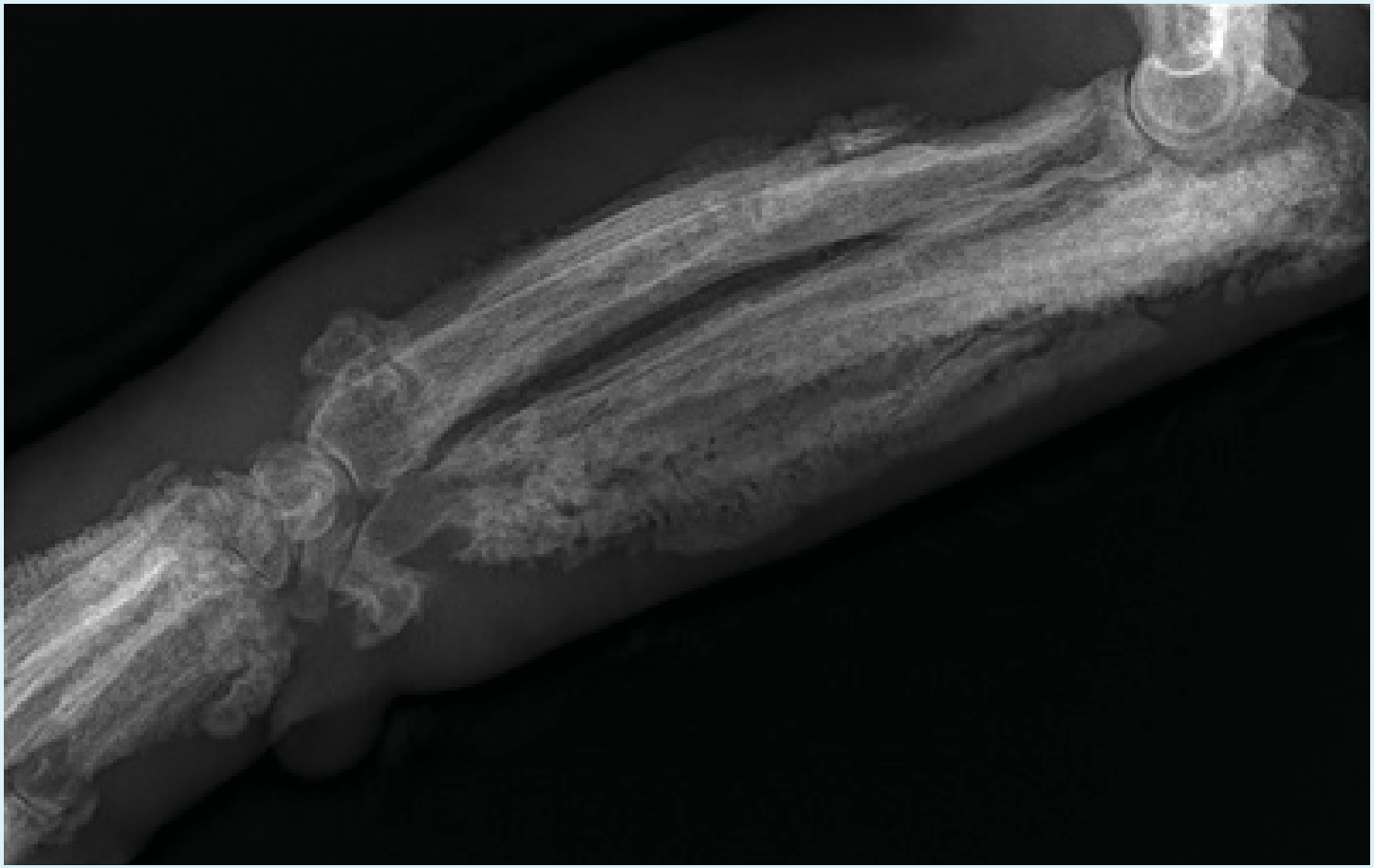
Foot and Metacarpus



Foot and Metatarsus



Foot and Metacarpus

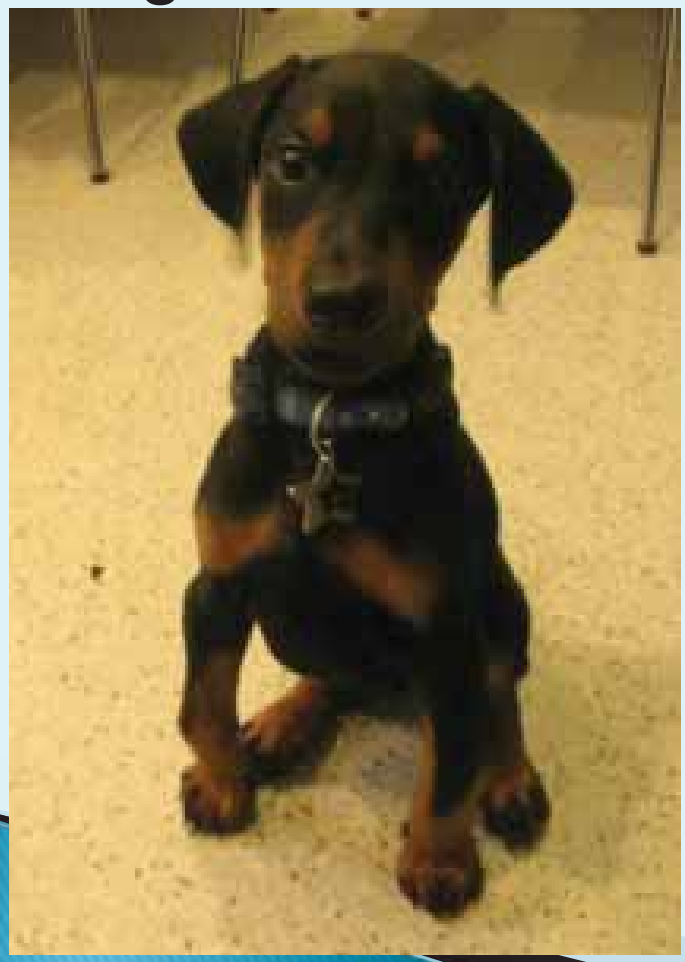


Carpus

- Range of motion
- Crepitus
- Effusion/thickening
  - Dorsal joint surfaces
- Stability
  - Flexion & extension
  - Collaterals
  - Palmar fibrocartilage

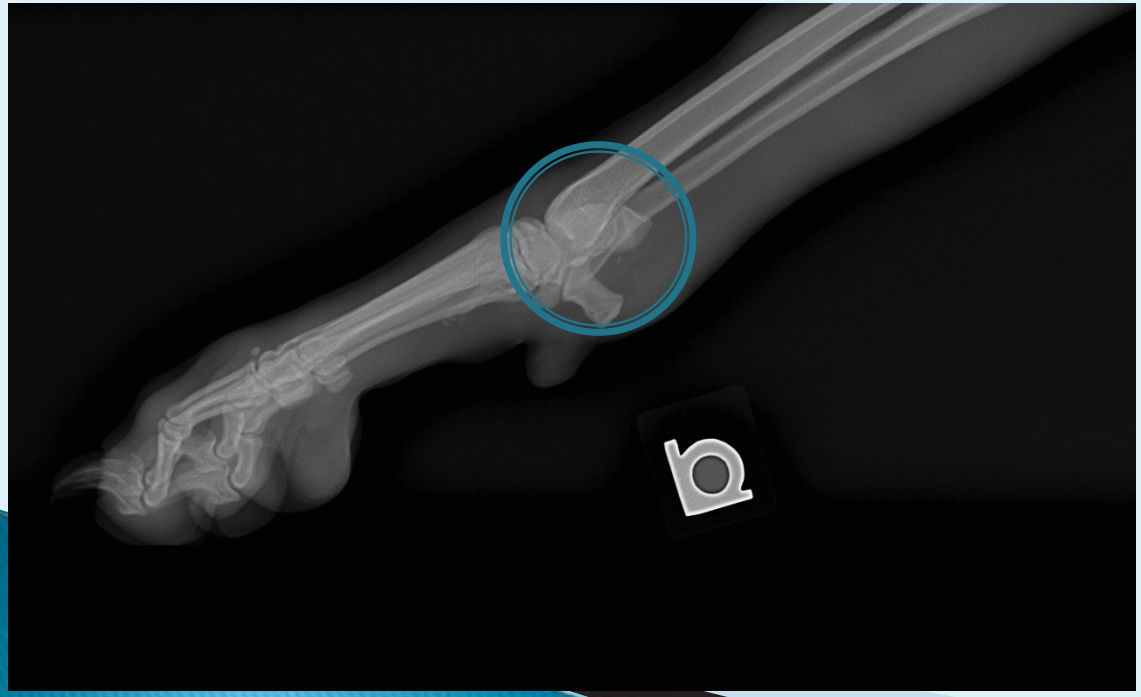
Carpus

- IMPA, monoarthropathies
- **Congenital**



Carpus

- Congenital
- **Trauma**
  - **Fractures**
  - **Ligament injuries**



Carpus

- Hyperextension injuries
  - Stress radiography
  - Splints?
  - Surgery?

Carpus

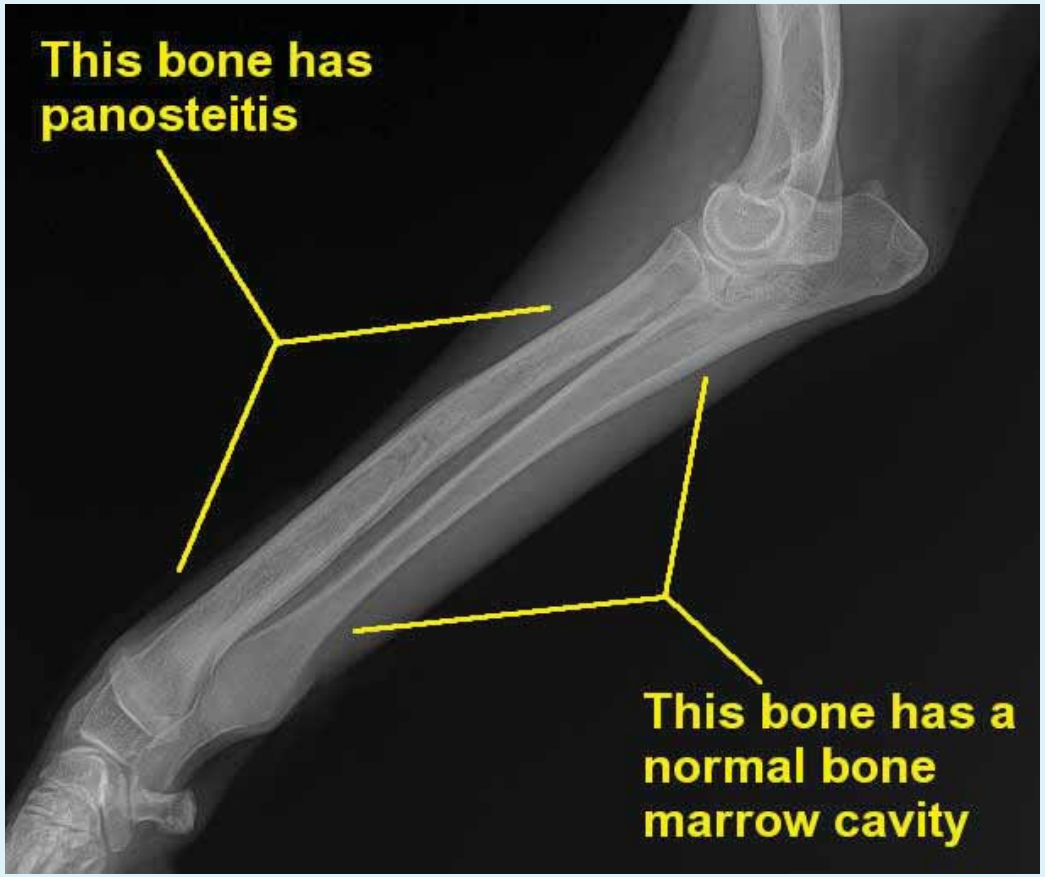
Carpus

Antebrachium

- Swelling
- Discomfort
- Symmetry
- Ddx
  - Panosteitis
  - RUIN
  - Masses – lipoma
  - Fractures

Antebrachium

- Symmetry
  - Swelling and discomfort
- Trauma
  - Fractures
  - Toy breeds
- **Panosteitis**

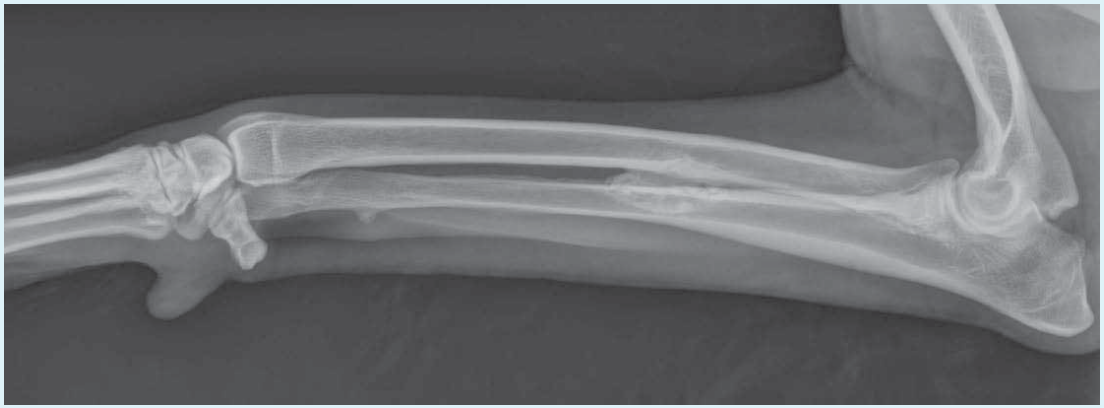


Radioulnar Ischemic Necrosis (RUIN)

- Traumatic lameness
- Pain on palpation
- Localized R/U lesion
- Etiology
  - Unknown
  - Secondary to IO ligament tears and necrosis?

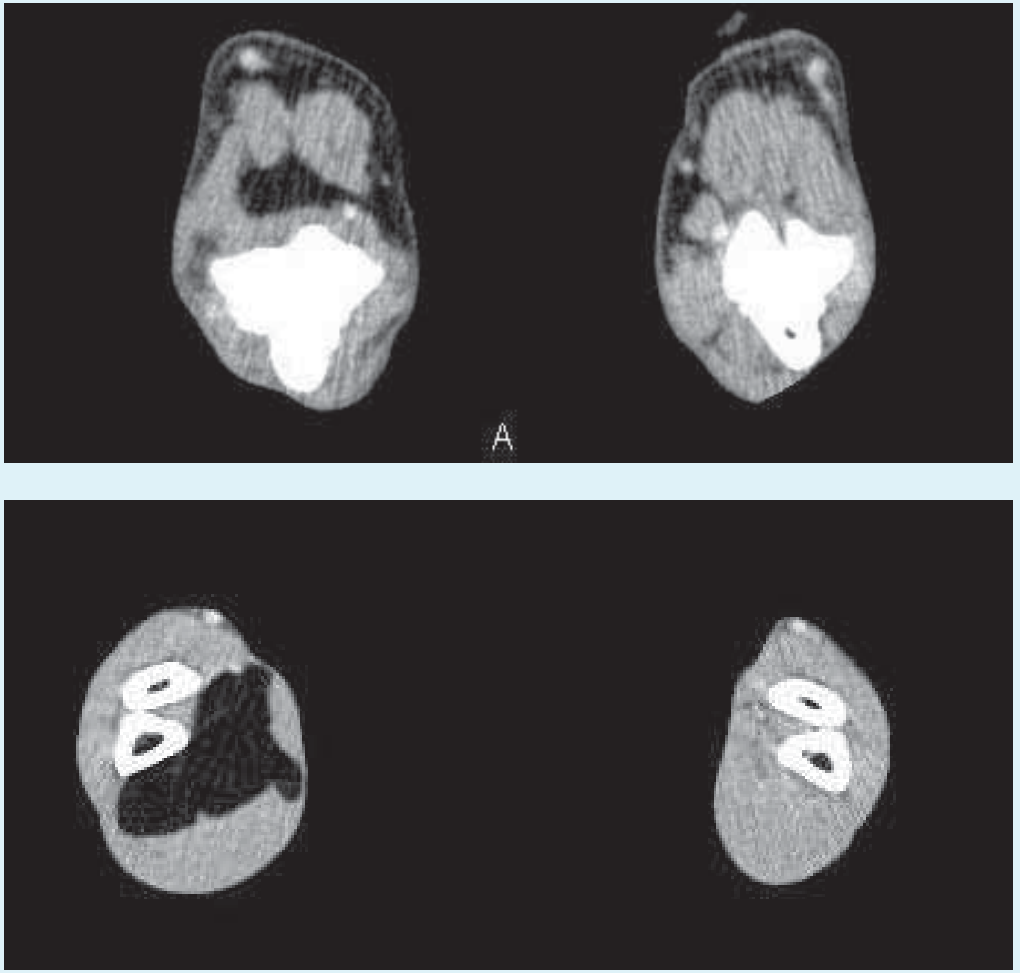
RUIN

- Radiographs
  - Cortical osteolysis
  - Enthesiophytosis
- CT scan



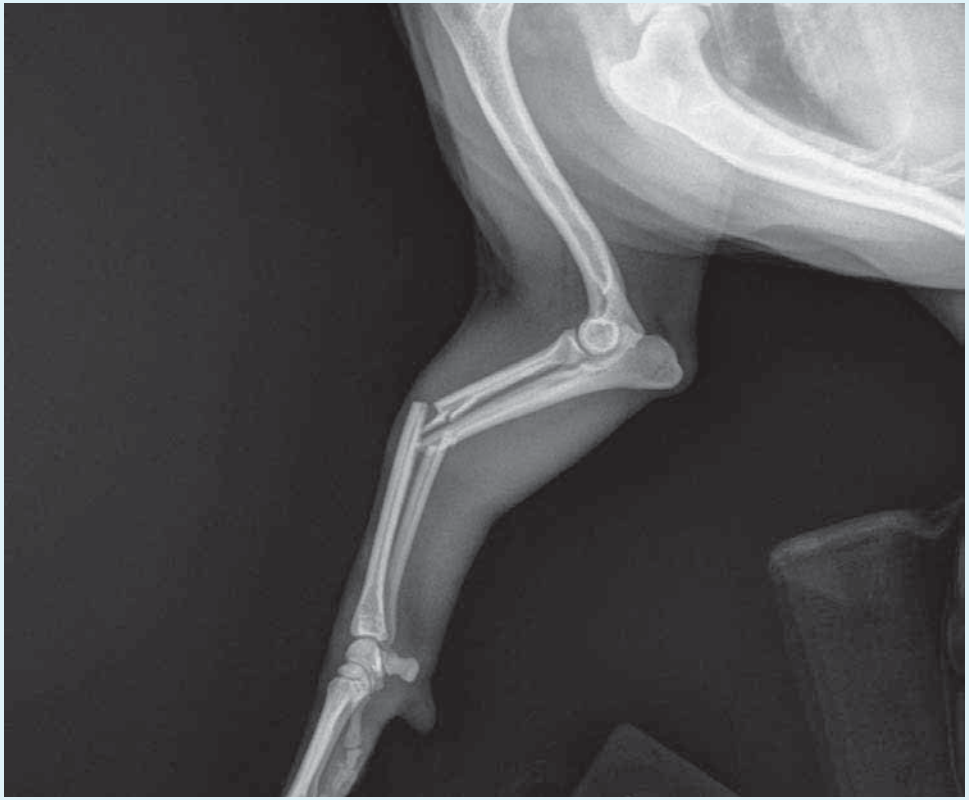
IM Lipoma

- Unusual
- Supinator
- Radiographs
  - Normal
- CT scan



Antebrachium

- Symmetry
  - Swelling and discomfort
- Trauma
  - Fractures
  - Toy breeds



Antebrachium

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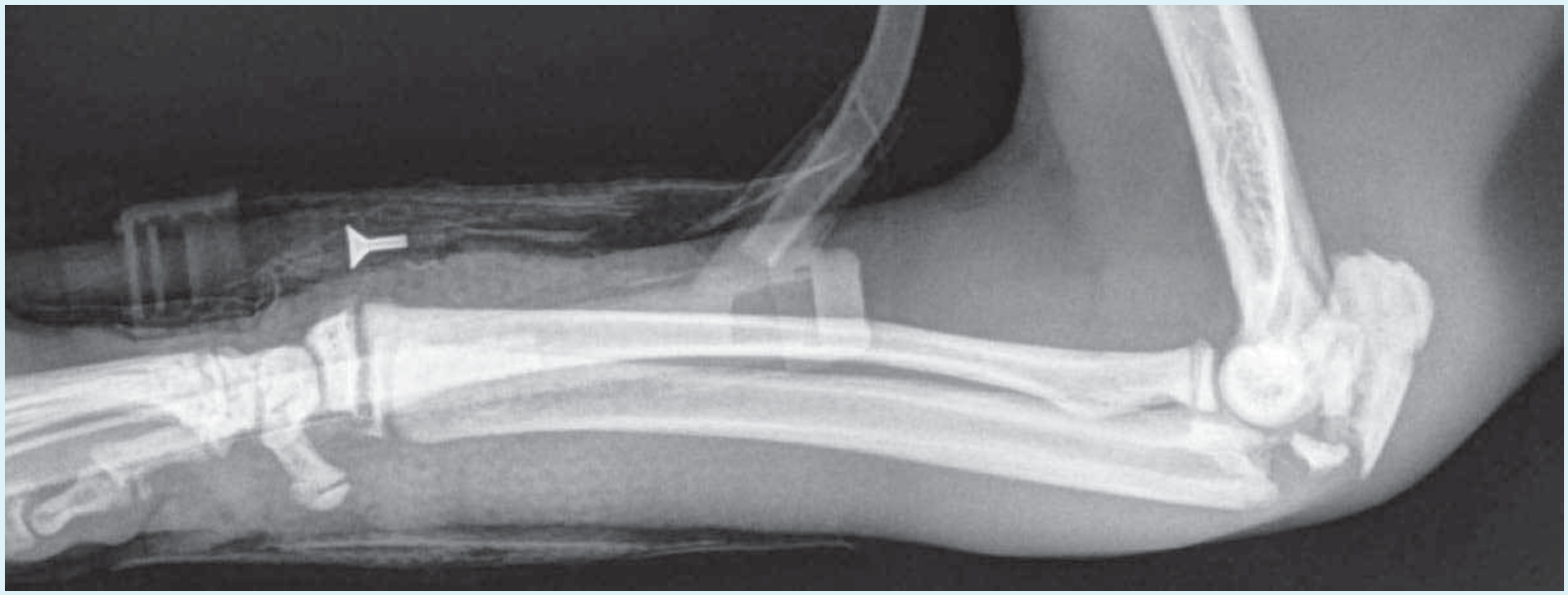
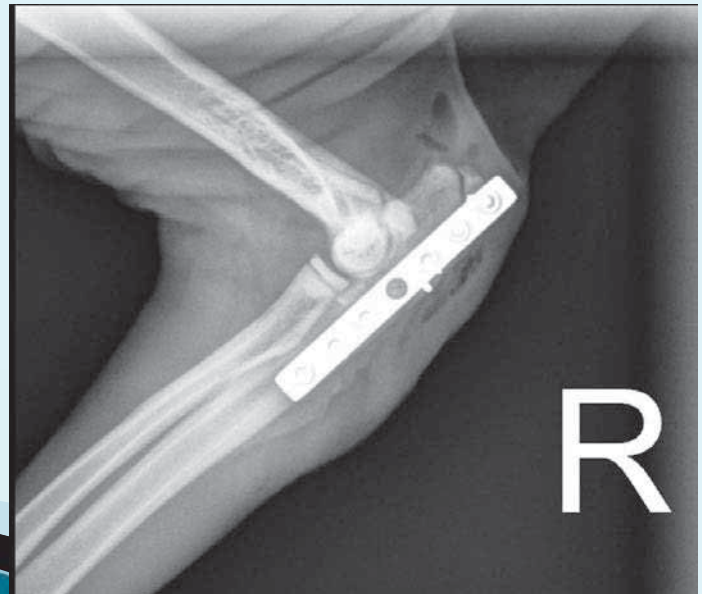




Antebrachium – Toy Breeds

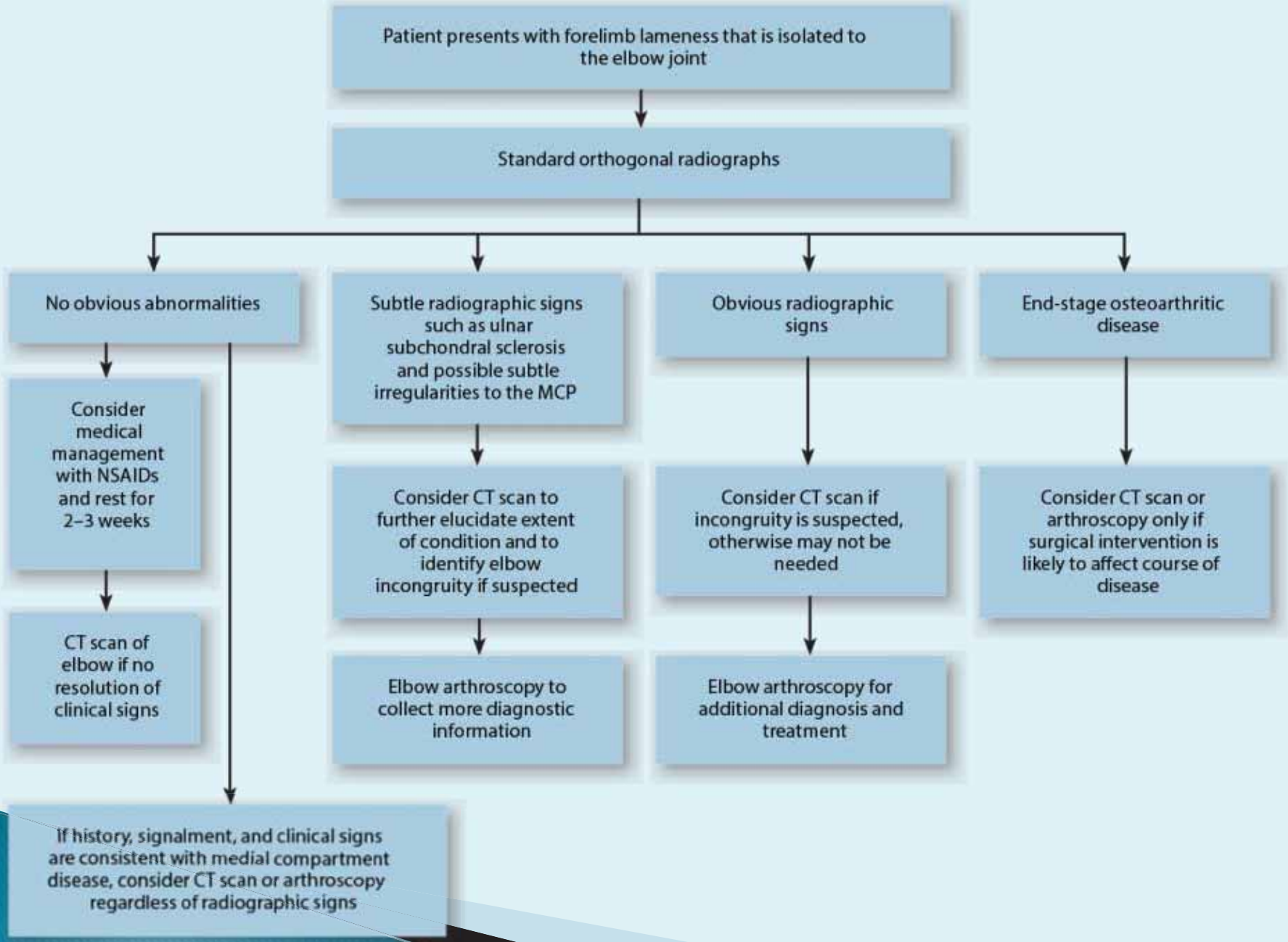
- Distal diaphyseal - 95%
- Morphologic difference in bone
- Decreased vascular density
- Tx?
  - External coaptation?
    - Malalignment/malunion
    - >80%
  - ESF
  - ORIF
    - Osteopenia
    - Stress protection
    - Dynamization

Elbow

- Most commonly affected joint
- Close attention
  - Effusion
  - ROM
  - Thickening
- Palpate MCP for pain
- Often non-specific

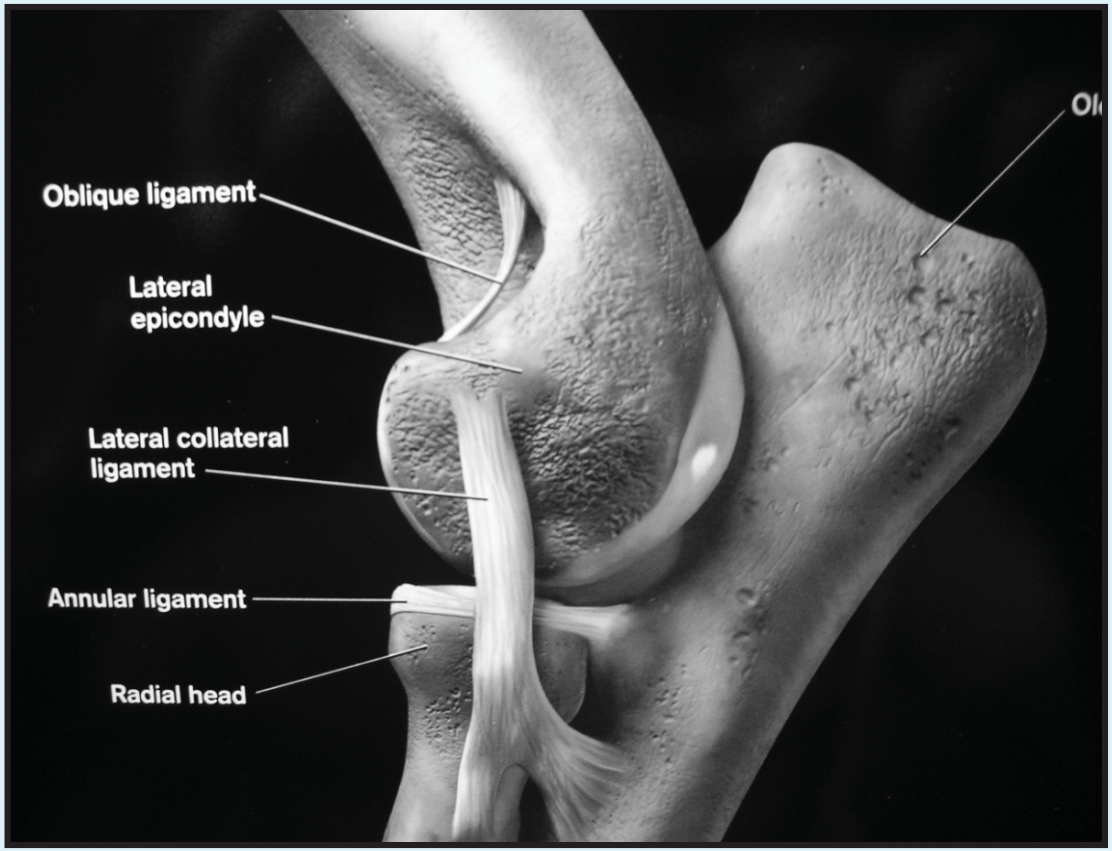
Indirect Palpation

Diagnosis of Medial Compartment Disease in the Dog



Elbow

- Radiographic diagnosis
  - Advance imaging
  - Arthroscopy
- Trauma
  - Fx/luxation
- **UAP**
- **FCP**
- **OCD**
- **UME**
- **Incongruency**

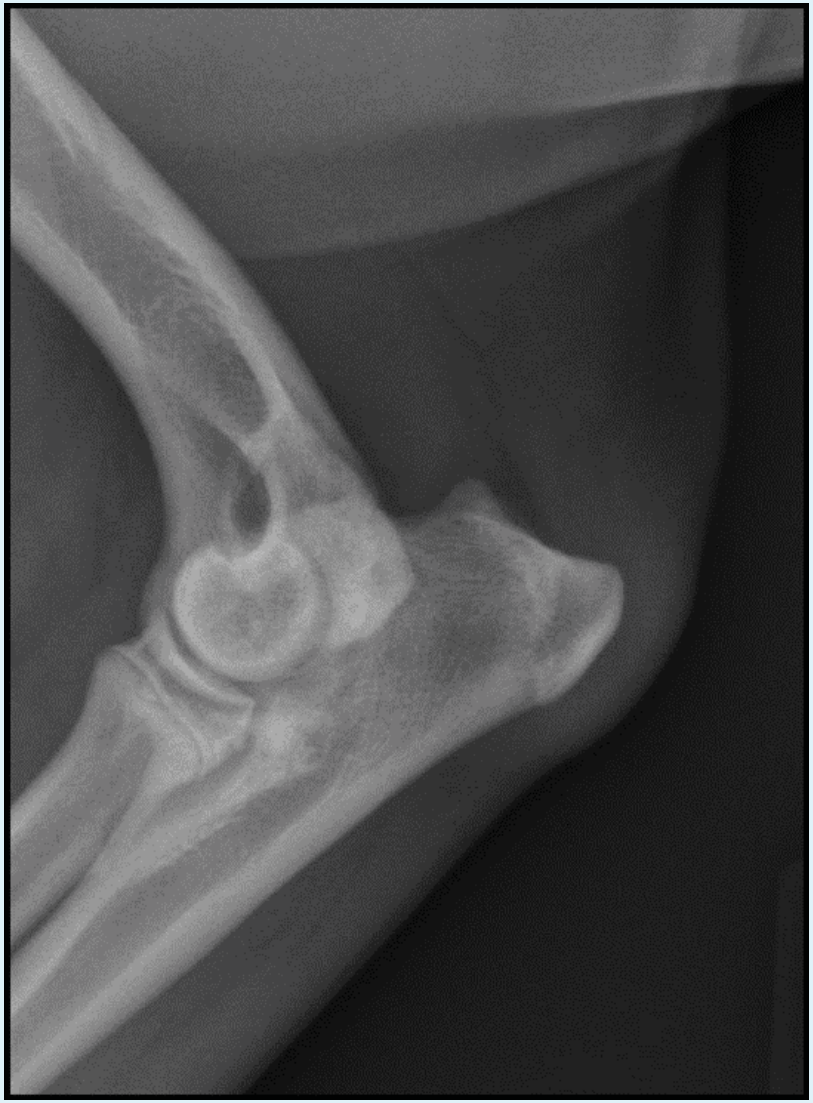


Normal or Abnormal?

Normal or Abnormal?

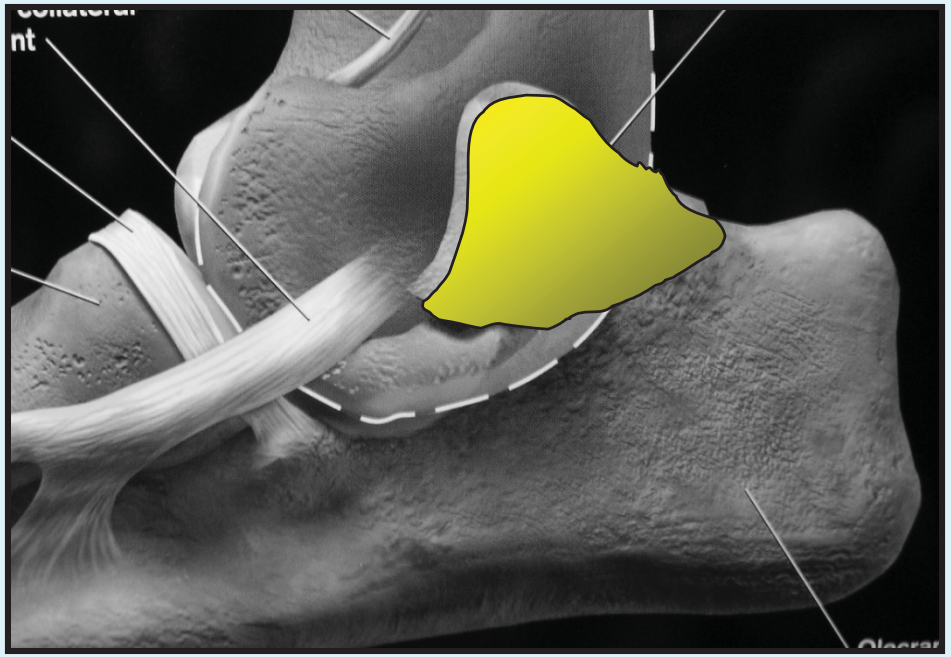
Normal

Abnormal



Ununited Anconeal Process

- Normal fusion at 4-5 months of age
- Form of OCD?
- Incongruency?
  - Bassets/chondrodystrophic breeds
- 6-12 months
- Hyperflexed lateral
- Concurrent disease
- Surgery
  - Reattachment
  - Excision

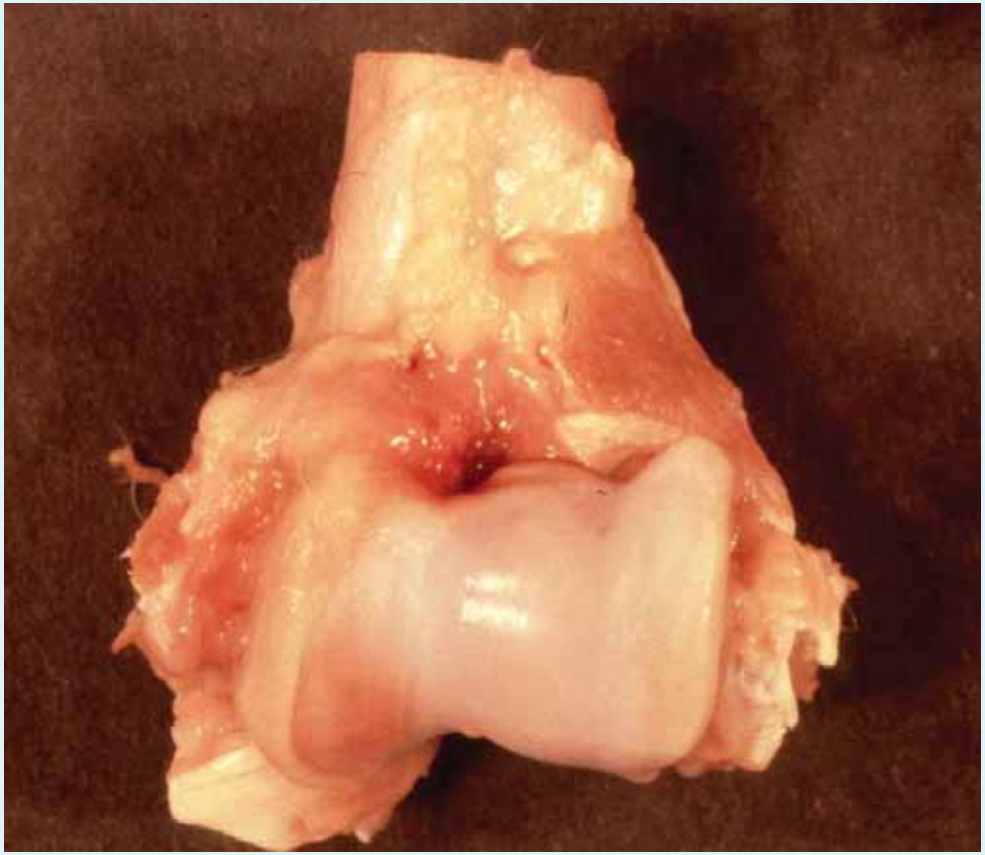


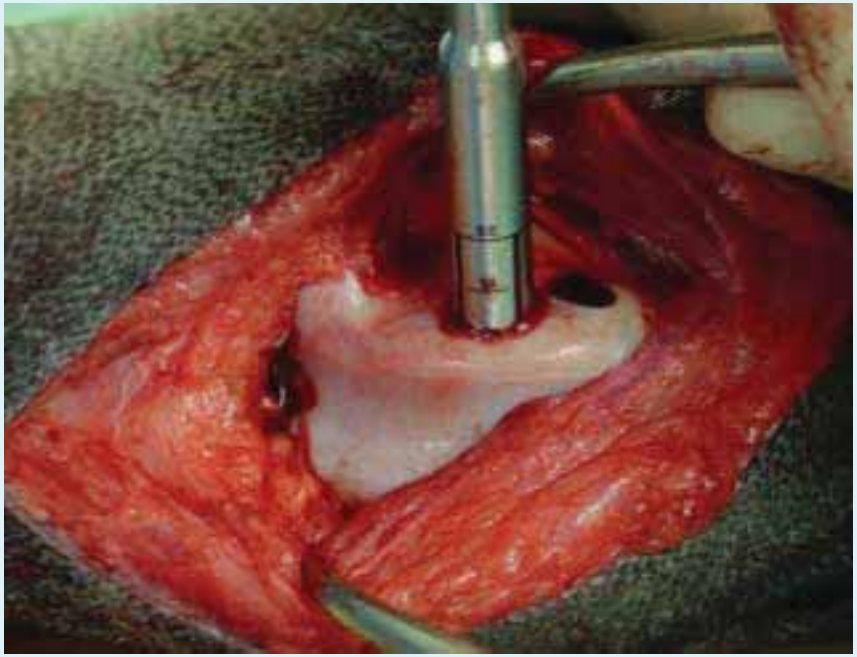
Ununited Medial Epicondyle

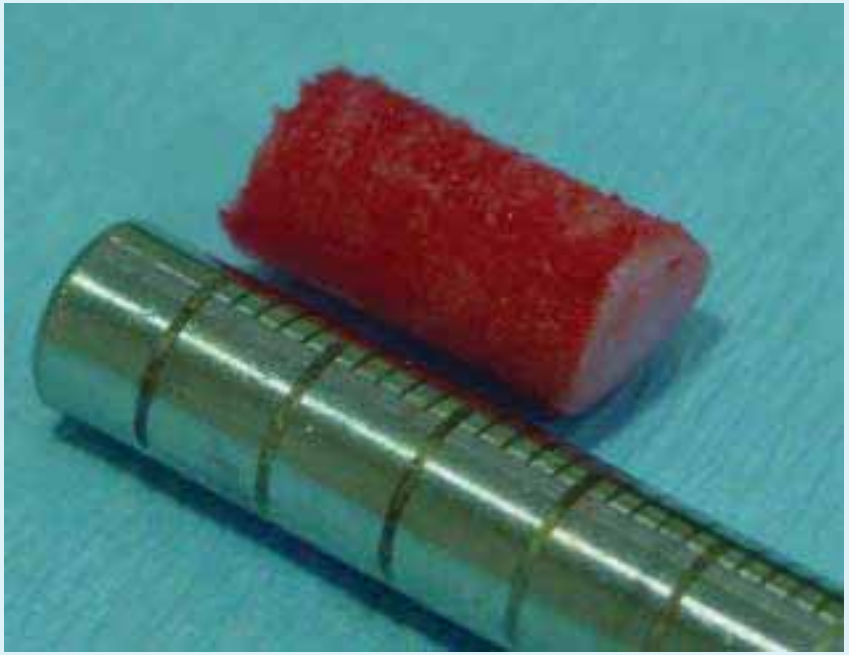
- Labrador Retrievers, GSD, Lg Breed dogs
- Ossification of flexor tendons
  - OCD related lesion?
- Often incidental findings
  - Bilateral condition
- R/O concurrent dz
- Excision
- Fixation

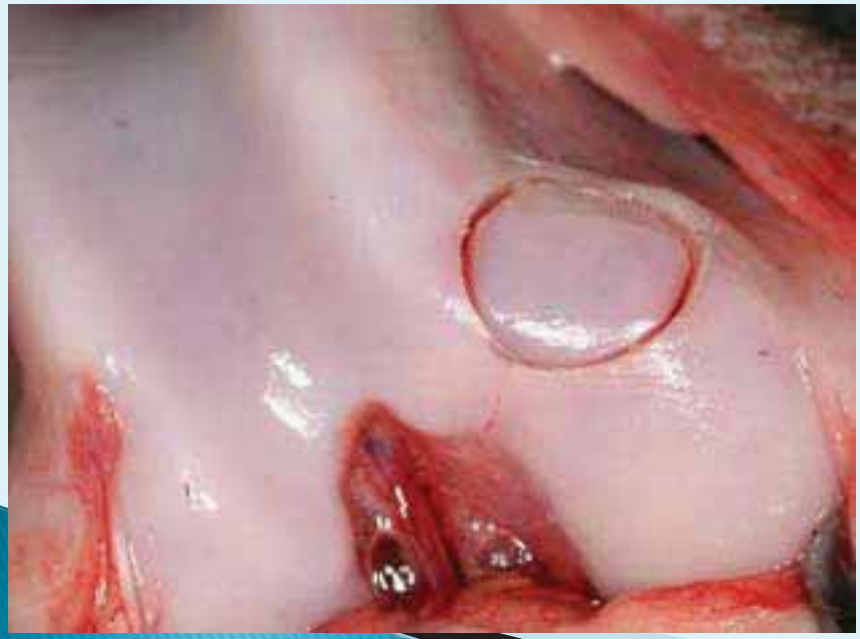
Osteochondrosis Dessicans

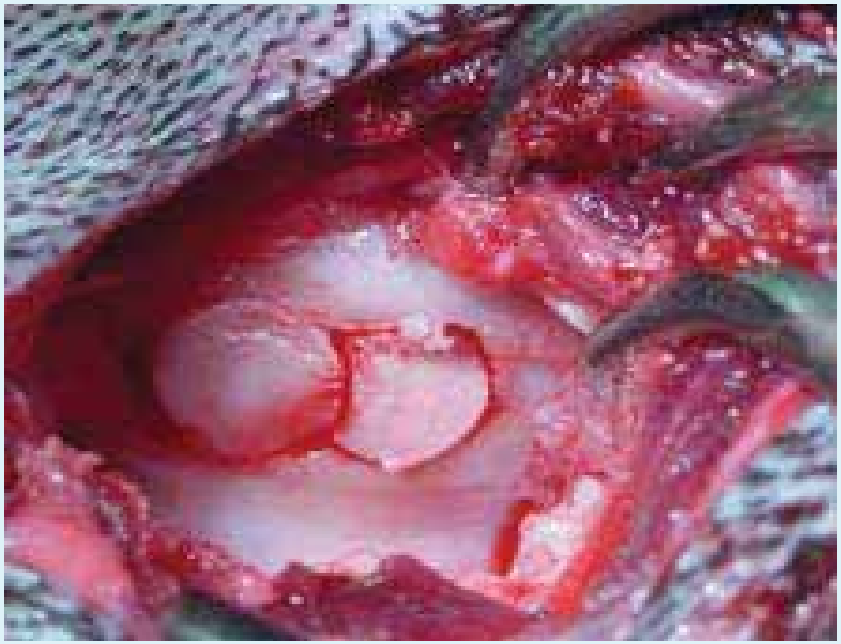
- Endochondral ossification
- Lg breed dogs
  - 5-7 months
- Radiographs
- Arthroscopy
  - FCP
  - Kissing lesion
- OATS
- SynaCart





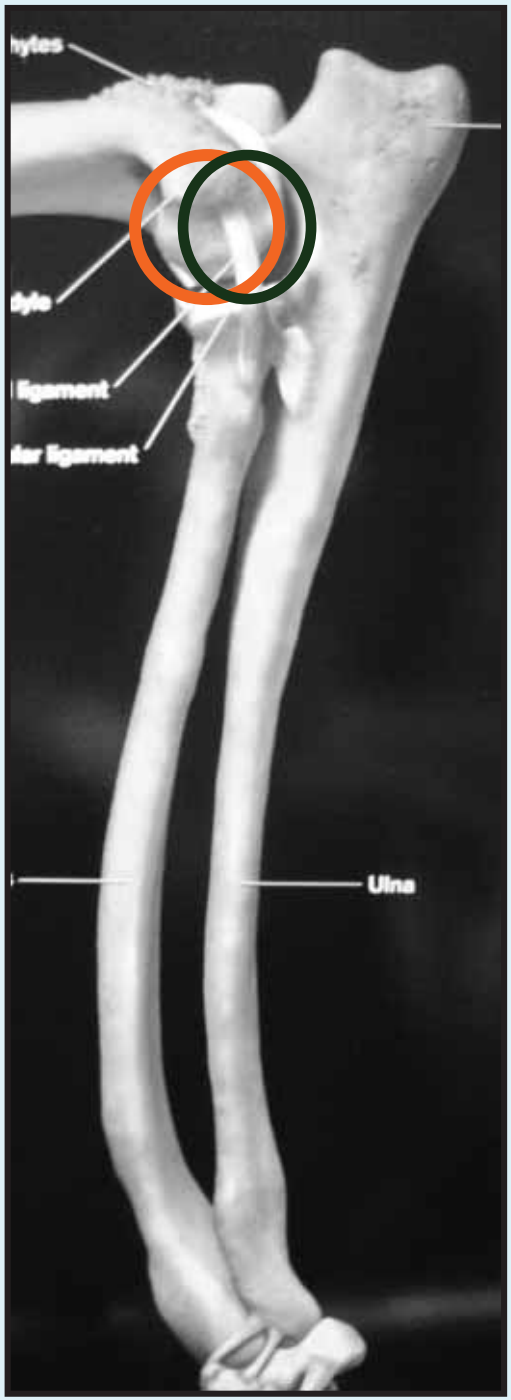


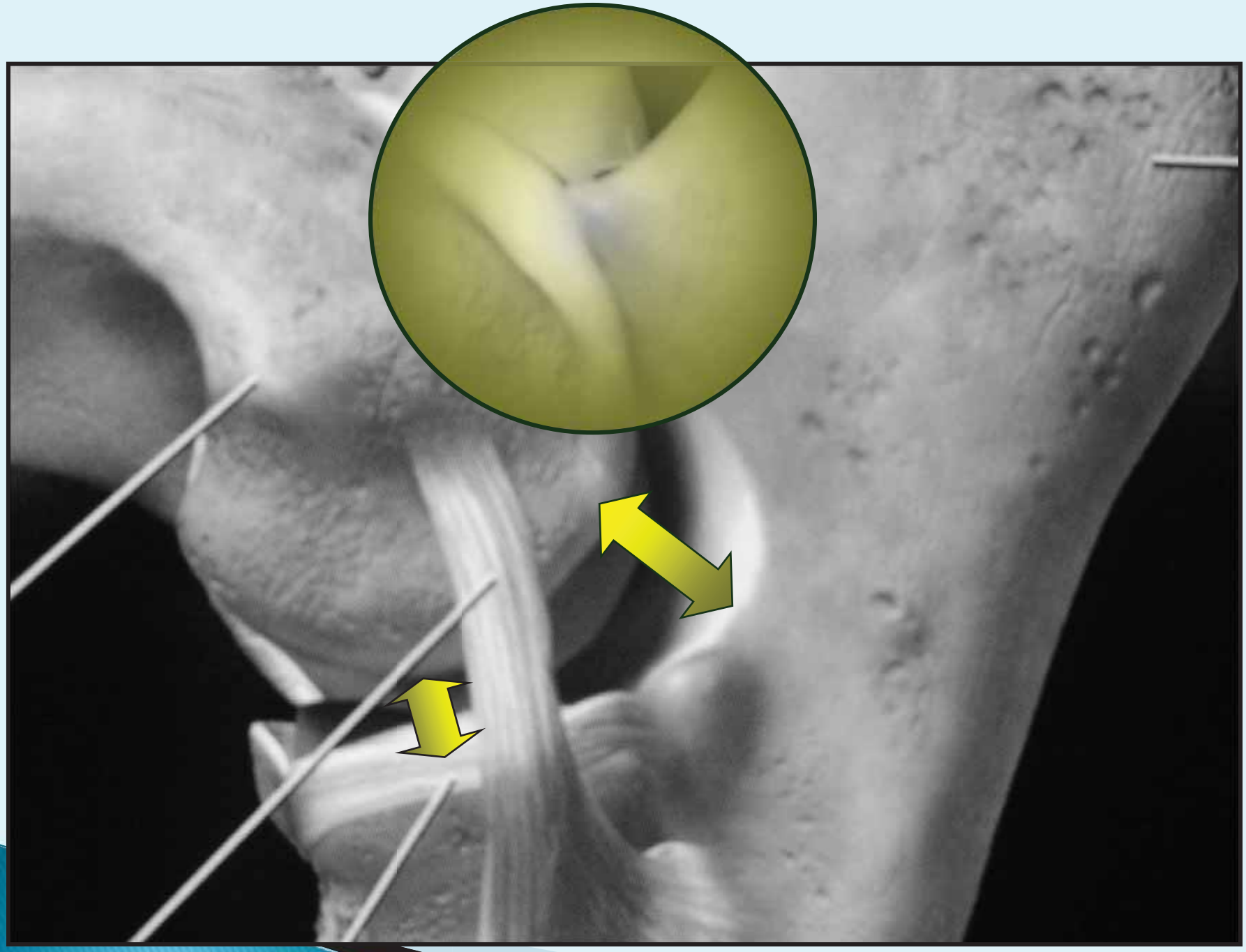




Elbow Incongruency

- Asynchronous growth
  - Radius
  - Ulna
    - Distal growth plate
- Traumatic
- Chondrodystrophy
- Carpal deviation

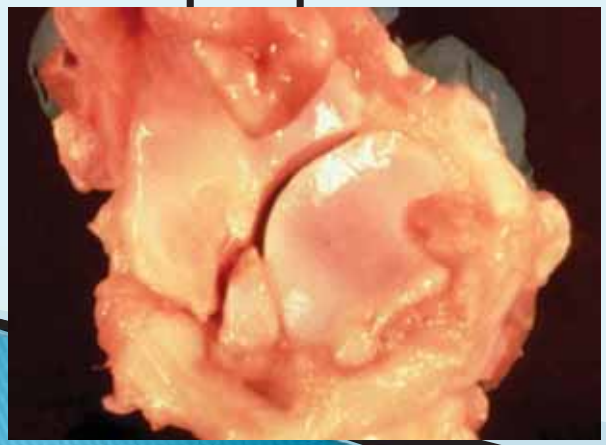


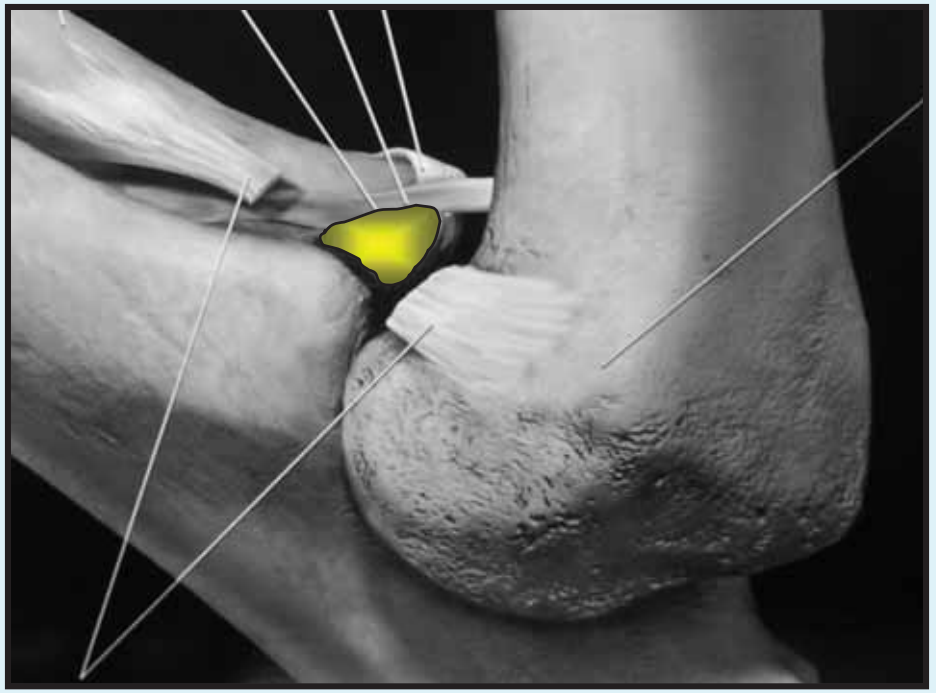


Tx – Ulnar Ostectomy

Fragmented Medial Coronoid

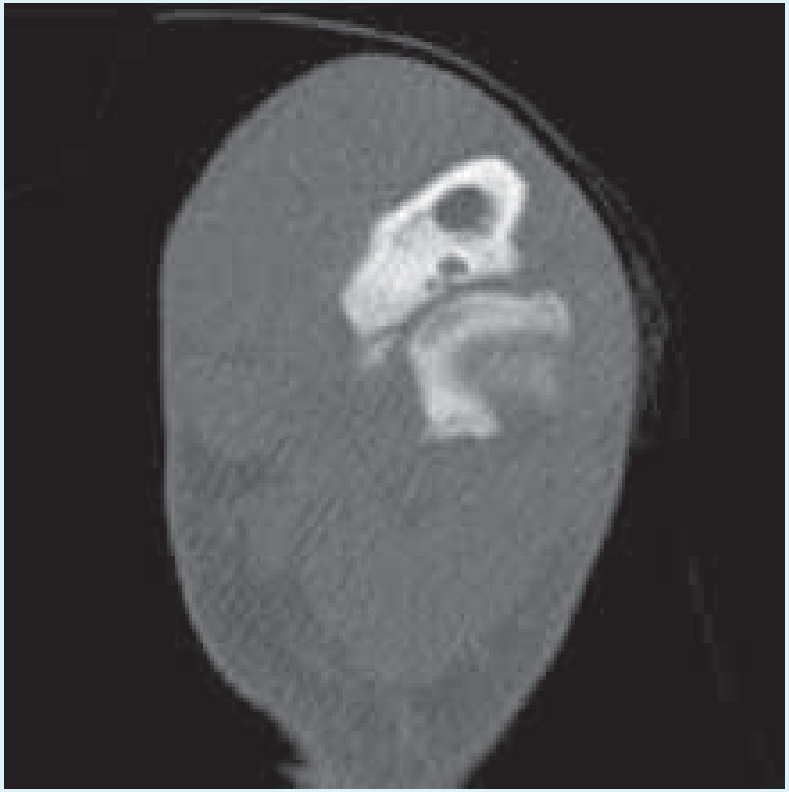
- Endochondral ossification vs. incongruency
- Lg. Breed dogs
  - 5-7 months
  - Older?
- Decreased ROM
- Direct palpation
- Indirect palpation





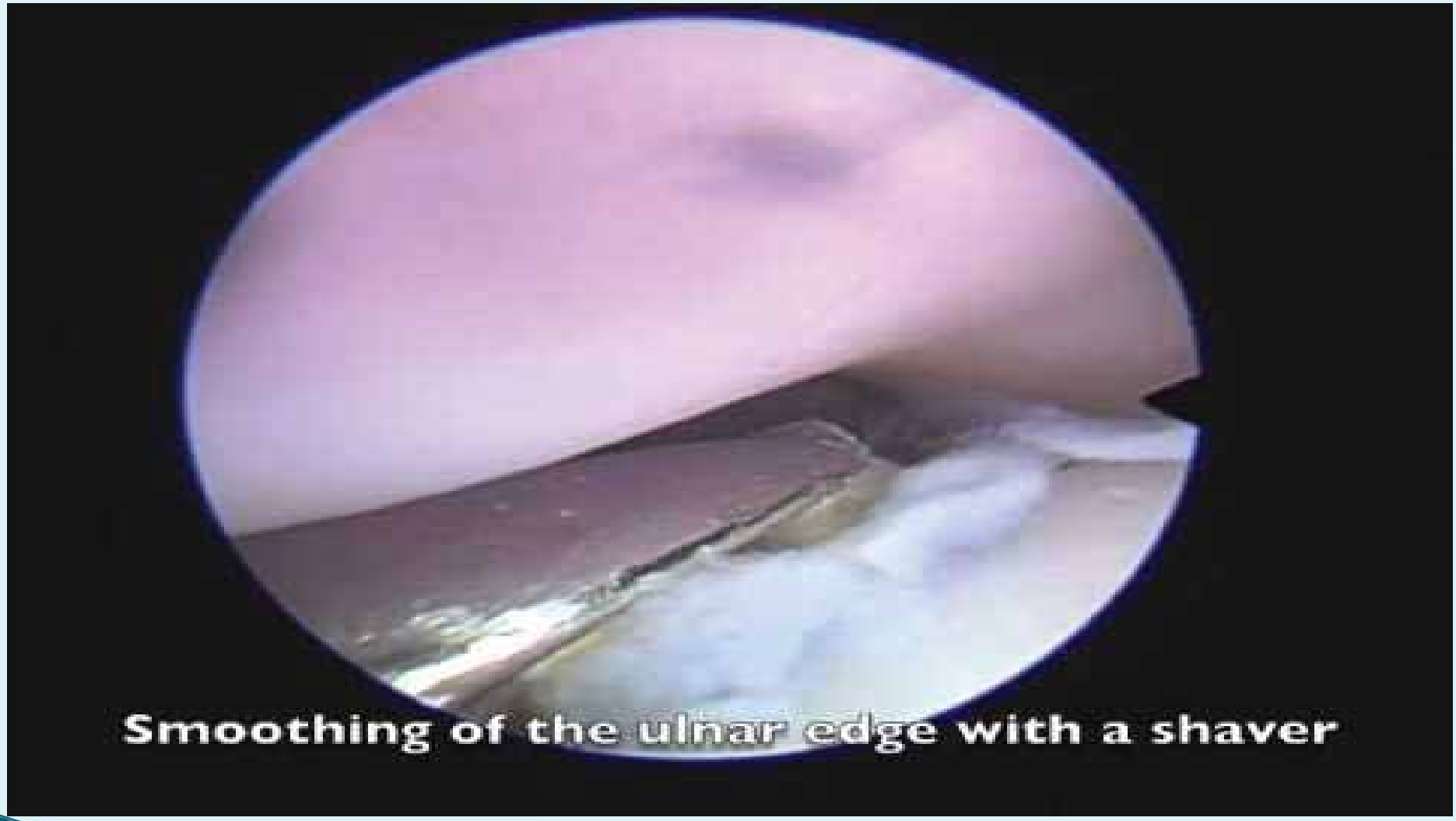
Fragmented Medial Coronoid

- Diagnosis
  - Radiographs
  - Arthroscopy
  - CT Scan



Fragmented Medial Coronoid

- Treatment Options
  - Arthroscopic removal
  - Subtotal coronoidectomy
  - SHO
  - Total Elbow Replacement
  - Conservative?

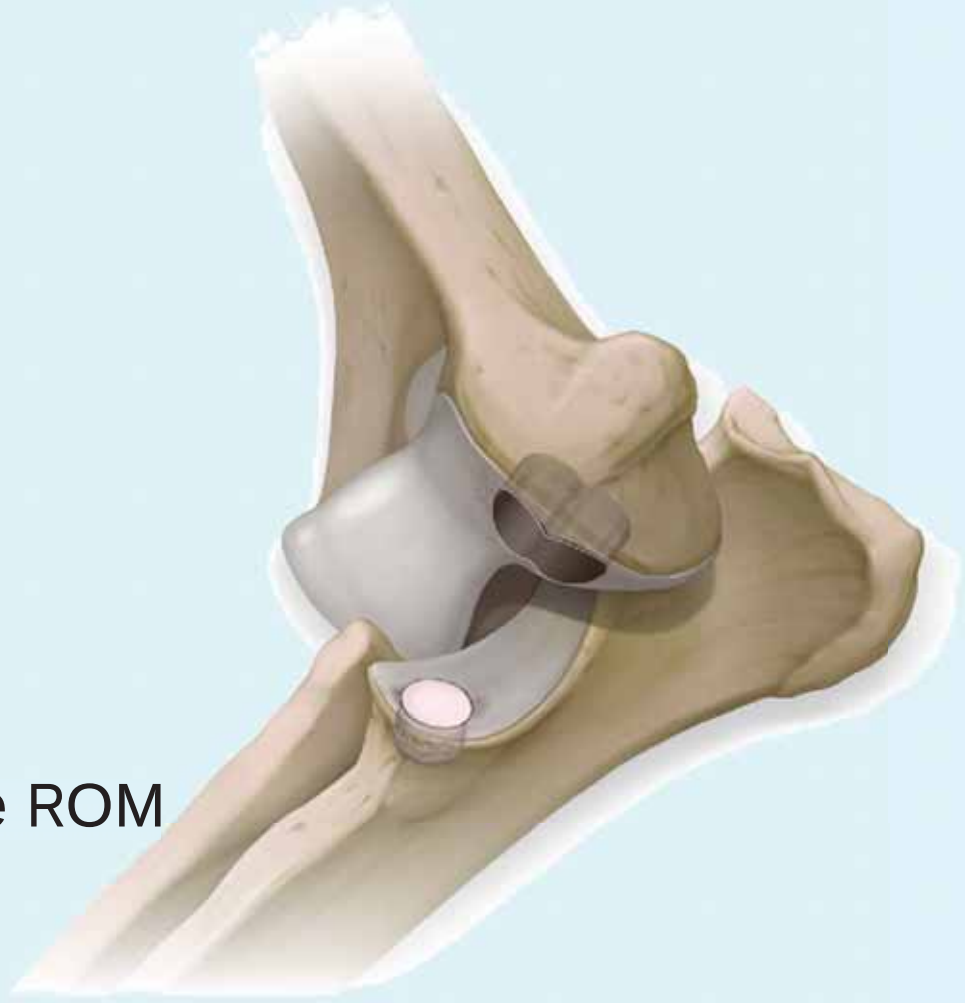

Smoothing of the ulnar edge with a shaver

Advanced Elbow OA

- Tate Total Elbow
- Canine Unicompartmental Elbow Resurfacing (CUE)

CUE

- Primary goal
  - Remove pain
  - Restore **full** function
    - High performance dogs
- Principles
  - Bone sparing
  - No luxation
  - Cementless
  - Maintains stabilizers
  - Contact through stance ROM



CUE

- Implants
  - Cobalt-chrome
  - Titanium bone in growth (BioSync)
  - Limits loosening

CUE – Patients

- Medial Compartment Disease
  - Cartilage loss/OA
  - Humeral condyle
  - Medial coronoid
- Clinical signs – lameness, pain
- “Failed” tx – many attempts
  - Arthroscopy done
  - Joint injections
  - Medical management exhausted

CUE – Outcomes

- First 100 cases
  - 91% full or acceptable
  - 9% unacceptable
  - Lameness grades improved
  - Force mat weight distribution
    - Improved to ~28-29%
  - 6 months PO!!
- Performance dogs
  - 90% returned to function (~65/75)

CUE – Complications

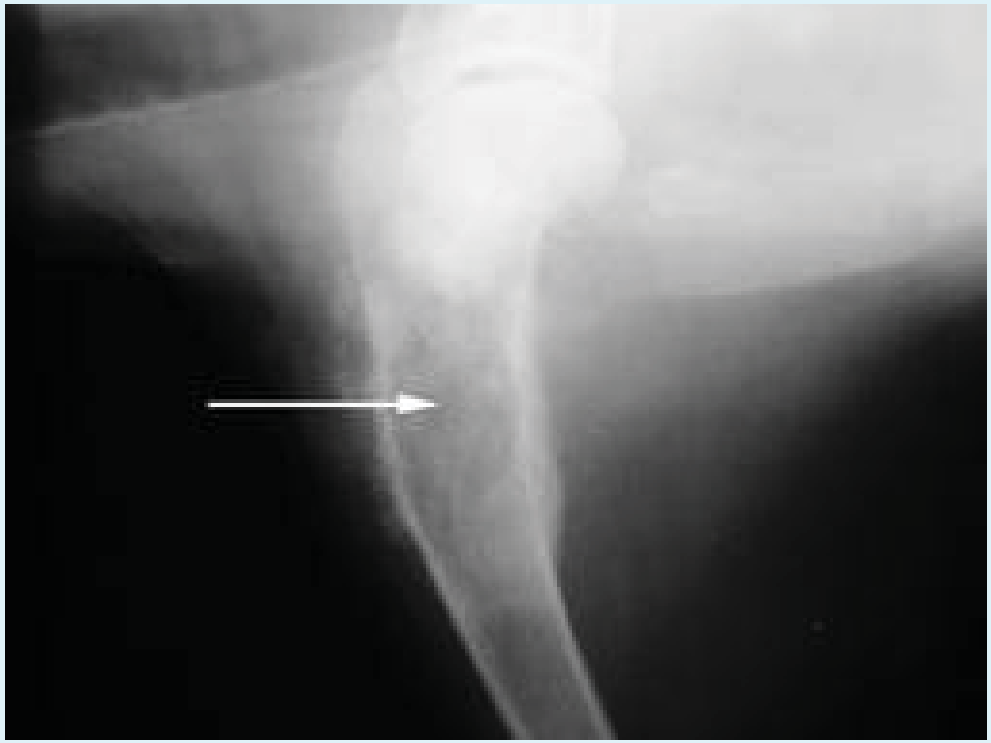
- Complications
  - 61% none
  - 27% minor
  - 11% major
    - Implant malpositioning: technical error
    - Infection: extra-articular
    - Medial epicondylar avulsion
  - 1% catastrophic

Conservative Tx

- Diet
- NSAIDS
- Chondroprotectants?
  - Oral Glucosamine
  - Adequan
- IA therapy
- Stem cell?
- Pain?

Humerus

- Careful palpation
  - Asymmetry
  - Atrophy
- Pain/swelling
- Fractures
  - Condylar
  - Puppies
  - Adult dogs??
- Neoplasia – Hx!!

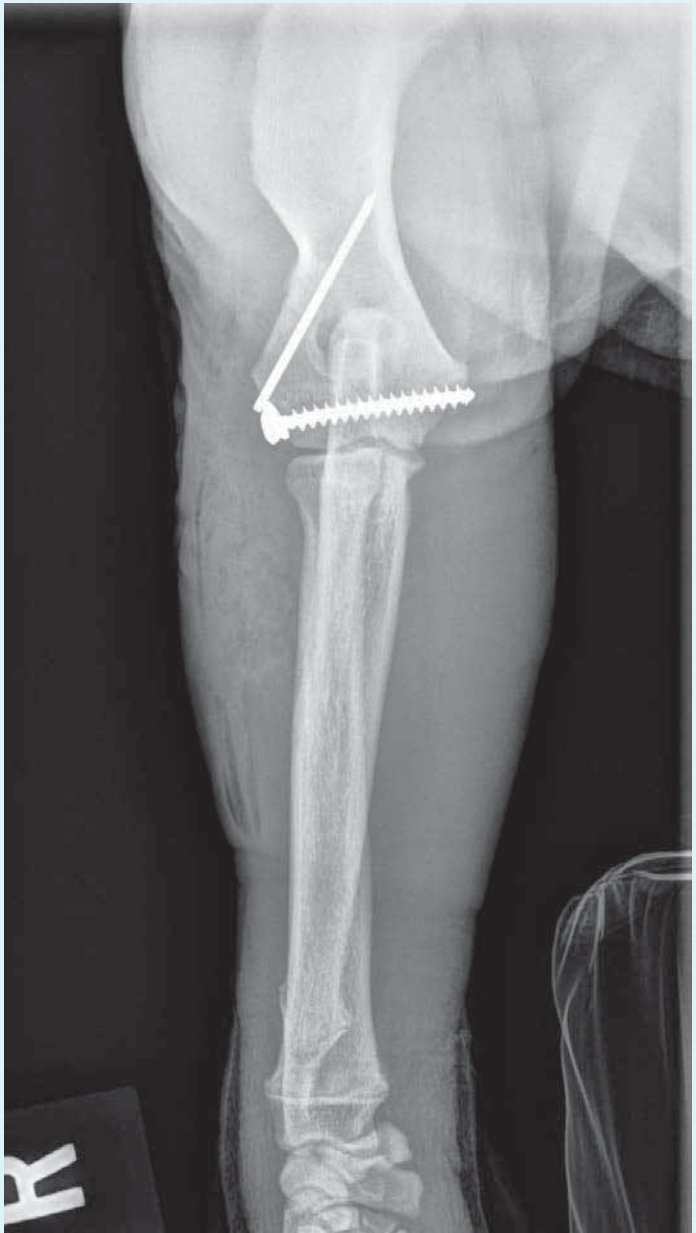


Condylar Fractures

- Trauma – low energy
- S-H Type IV
- Peak 4 months
  - French Bulldog
- Spaniels
- Radiographs
  - Cr-Ca

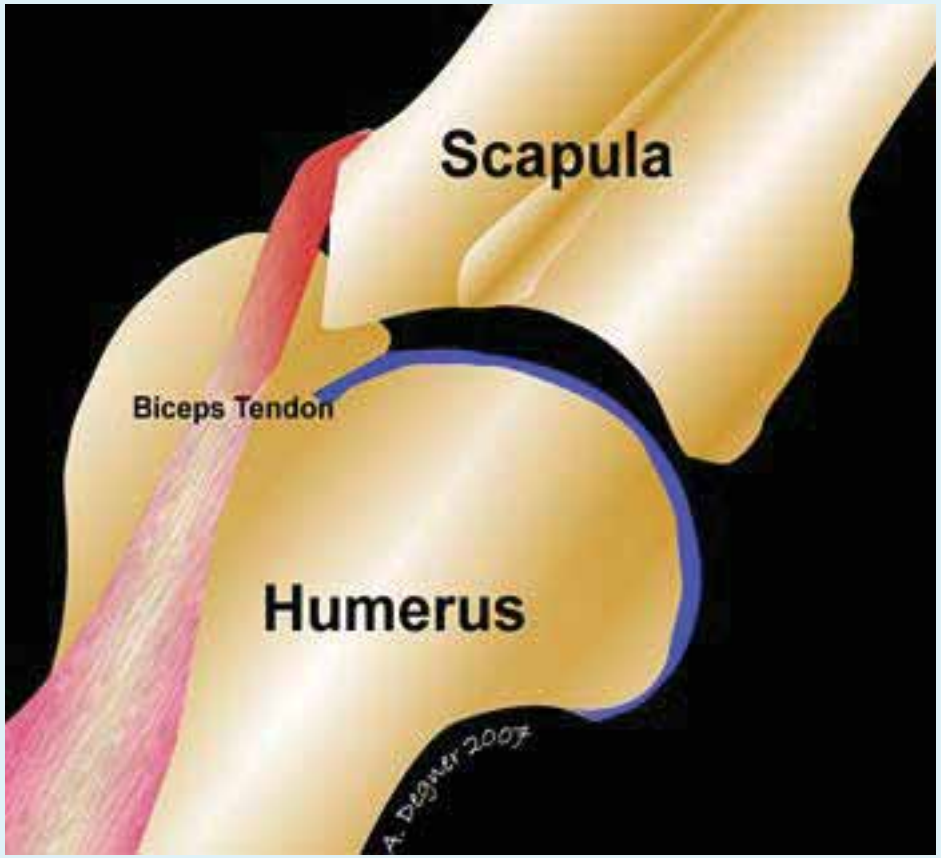
Condylar Fractures

- ORIF
- Closed – fluoroscopy
- Joint congruity



Shoulder Joint

- Atrophy
- Full range of motion
  - Resistance
  - Discomfort
  - Crepitus
- Biceps tendon
  - Flexion
  - Insertional palpation
- Instability



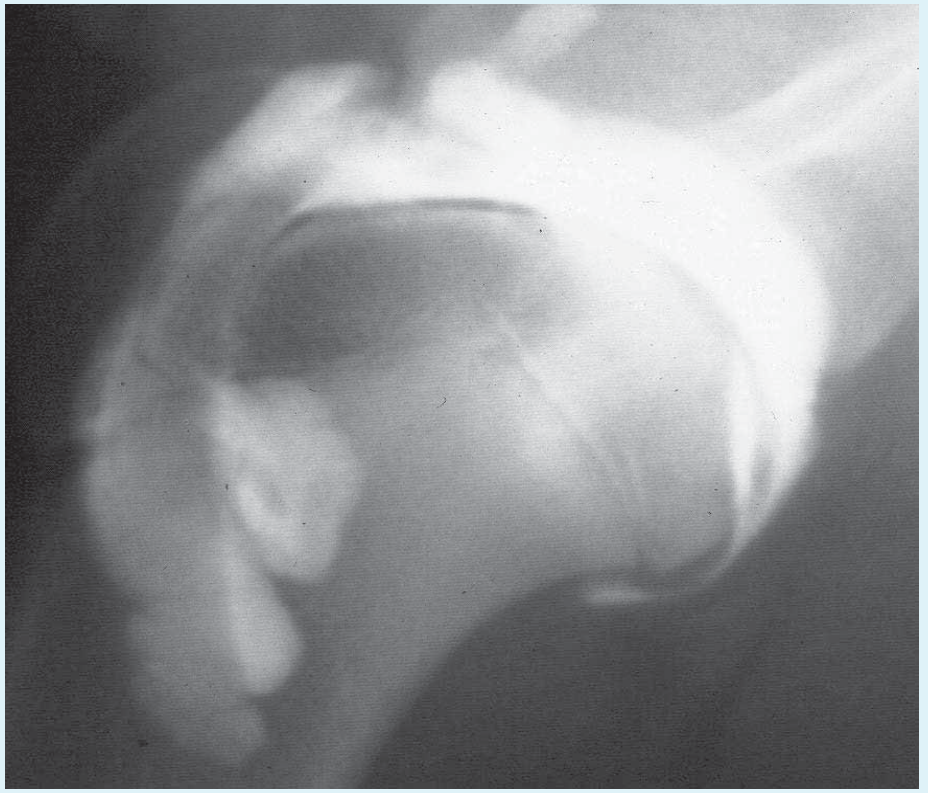
Shoulder Joint

- OCD
- Bicipital tenosysnovitis
- Trauma
  - Luxations
  - Medial *vs.* Lateral
- Neoplasia

Radiographs

Shoulder Joint

- OCD

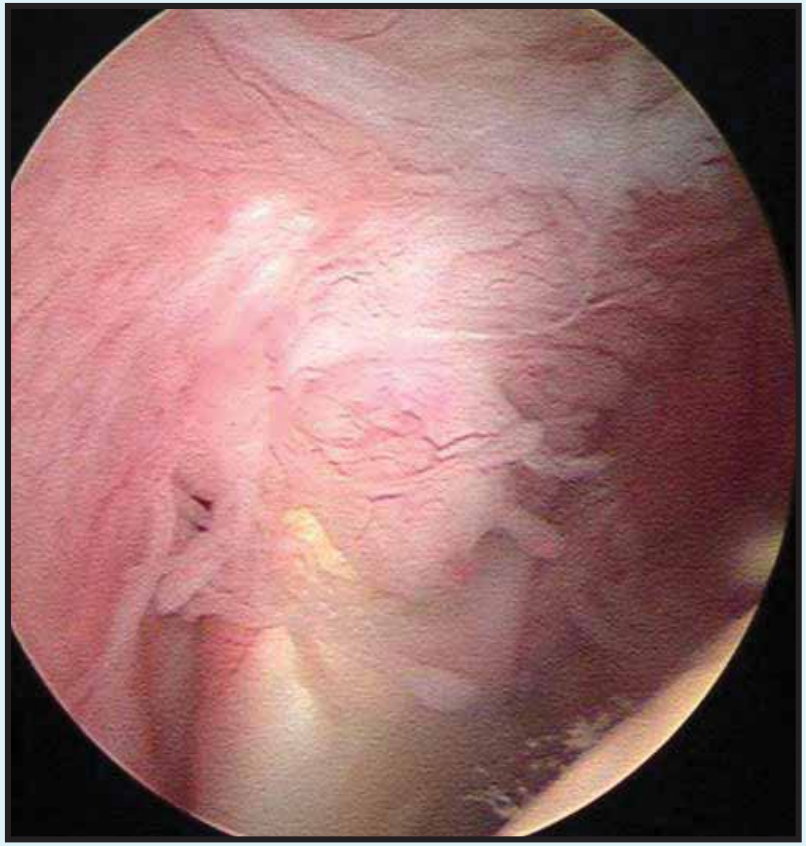


Shoulder Joint

- OCD
- Bicipital Tenosysnovitis
  - Lateral and AP views
  - Ultrasound

Shoulder Joint

- OCD
- Bicipital Tenosysnovitis
  - Lateral and AP views
  - Ultrasound
  - MRI
  - Arthroscopy



Biceps Release

Shoulder

- Soft Tissue Injuries
  - PE
  - Ultrasound
  - MRI
  - Arthroscopy
- Infraspinatus Contracture
- Supraspinatus tendinopathy
- MGHL Instability

Infraspinatus Contracture

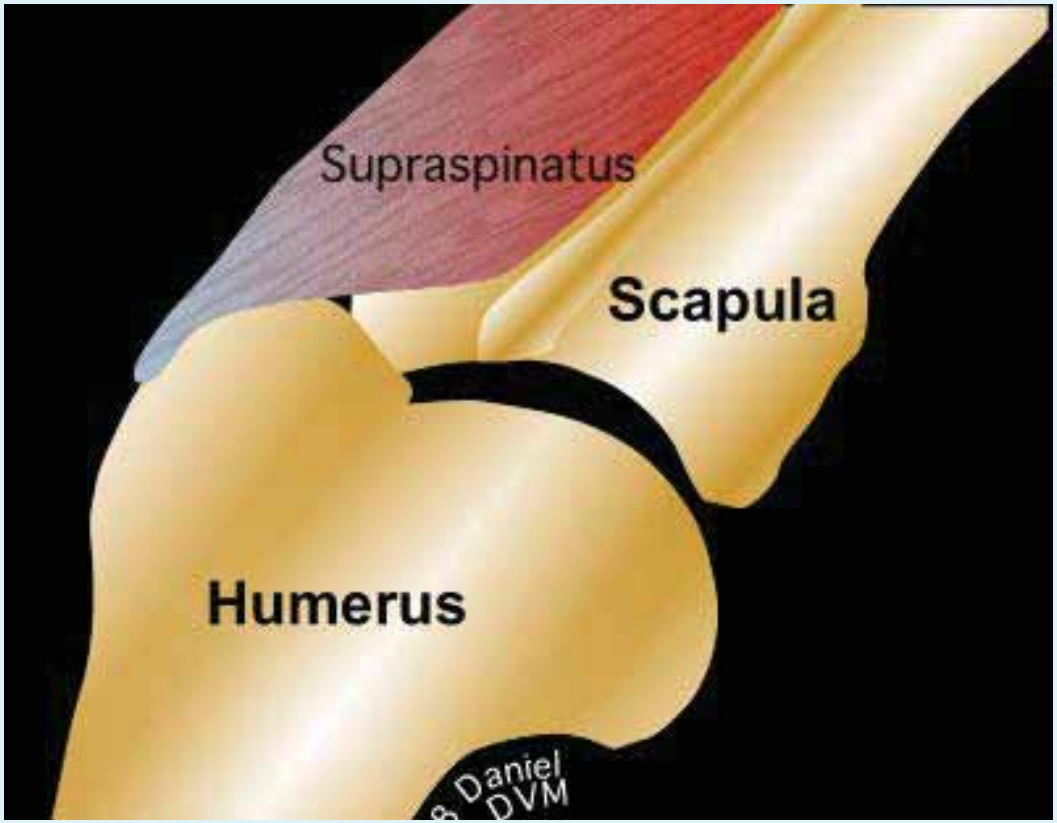
- HX and PE
- Characteristic lameness
  - Acute
  - Transient
  - Gradual
  - Non painful
  - Circumduction

Infraspinatus Contracture – TX

- Open sx
- Severe tendon
- Rest
- Curative

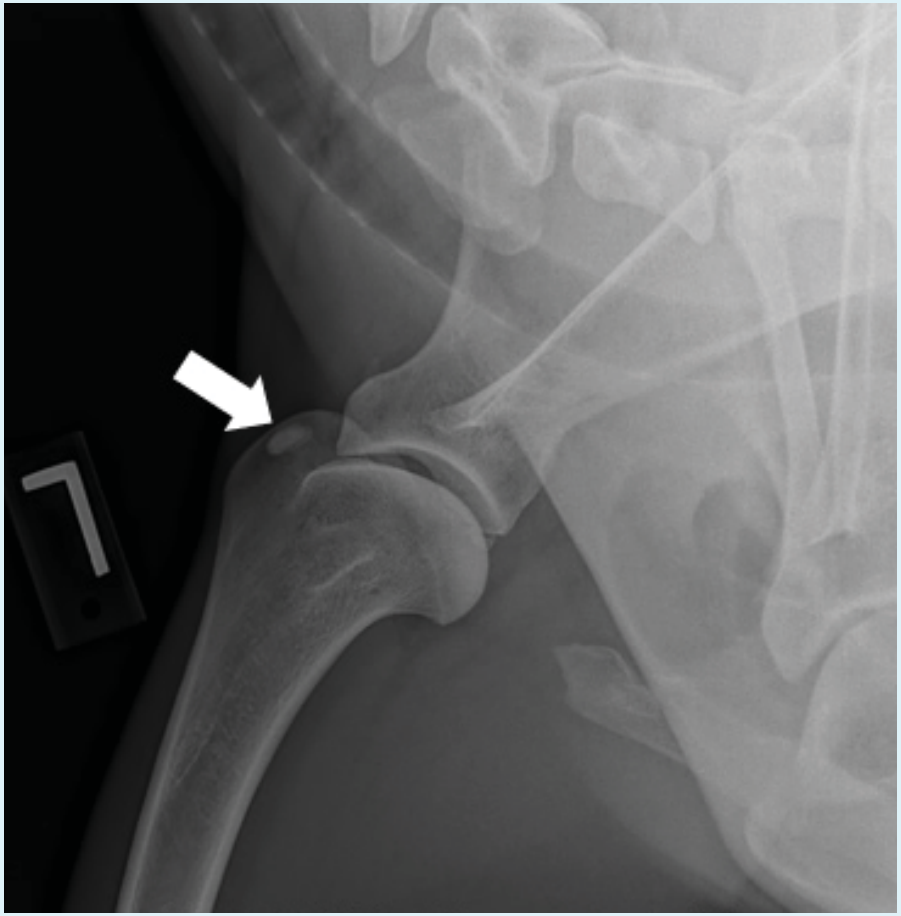
Supraspinatus Tendinopathy

- High activity/agility
- Swimming
- Pain?
  - Flexion
  - Palpation

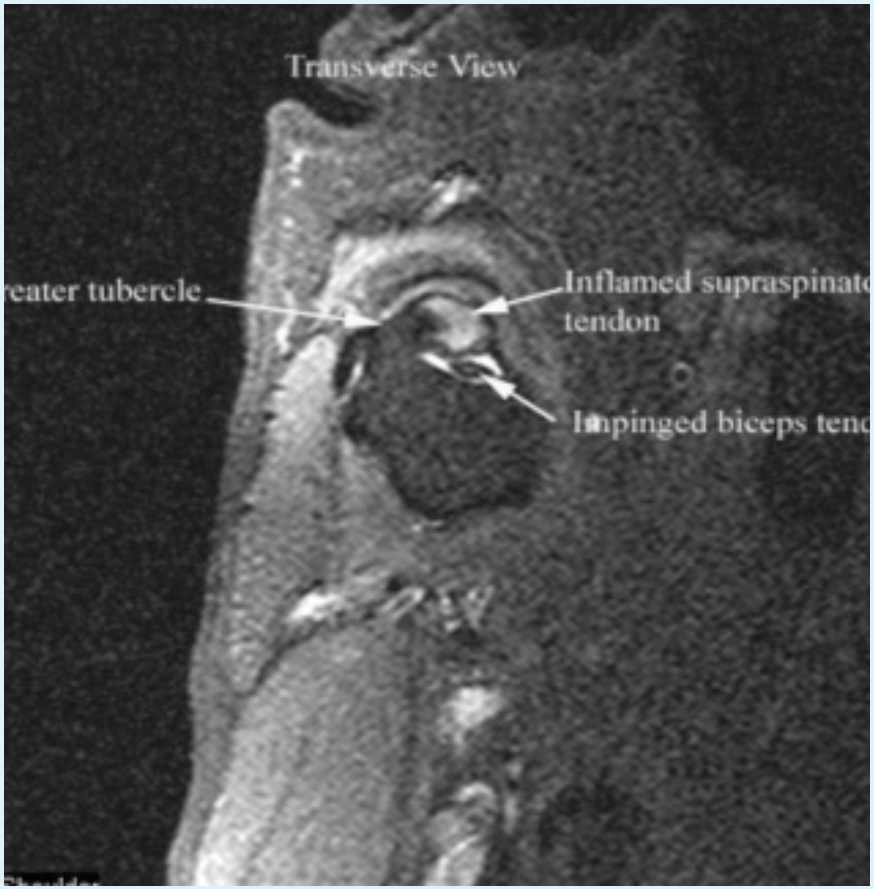


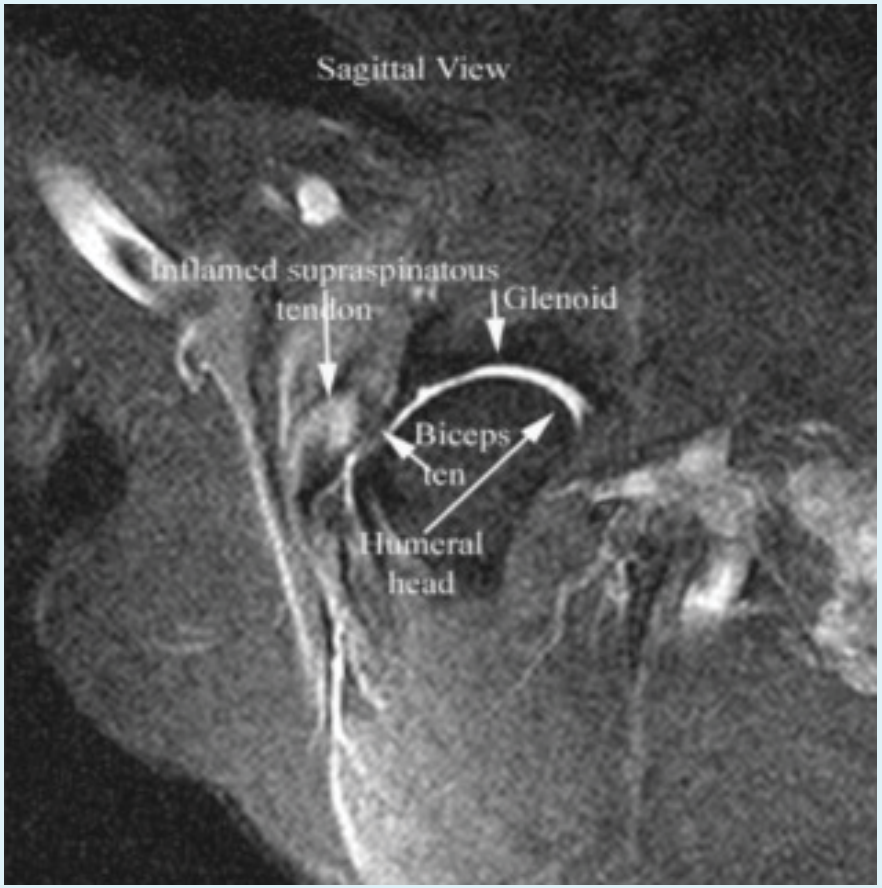
Supraspinatus Tendinopathy

- Radiographs
- MSK US
- Advanced Imaging



Suprapinatus – MRI



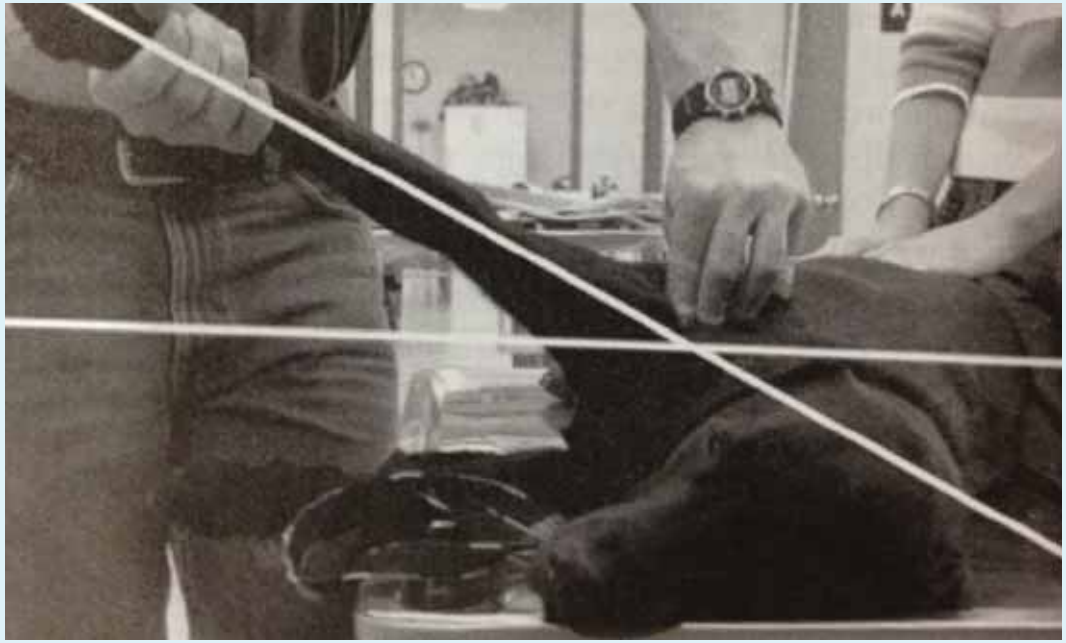


Supraspinatus Tendinopathy

- Tx
  - Surgical removal
  - Conservative
- ADPC/PRP
  - 55 dogs
  - US guided IL injection
  - 88% normal
  - 12% markedly improved

MGHL Instability

- Abduction angles?
  - 30-55 degrees
  - Refuted
  - Not repeatable
- Imaging
  - MRI
  - Arthroscopy



MGHL Instability

- Tx Options
  - PT
  - Sx

Scapula

- Palpate thoroughly
  - Acromion
  - Glenoid
  - Spine
  - Body
  - Musculature
    - Atrophy
    - Shoulder joint??
- Luxation

Axilla

- Axillary Masses
  - Usually nervous tissue origin
  - Often painful
    - Deep palpation
    - Palpable mass?
  - Often overlooked
  - Diagnosis
    - MRI
    - Tru-cut

Cervical Spine Evaluation

- Unilateral lesions
  - Common presentation for lameness
- Reassess proprioception
  - Spinal reflexes if indicated
- Palpate firmly for pain
  - Weakness
- Commonly
  - IVDD
  - Cervical instability
  - Neoplasia??

Summary

- Less common presentation
- Multiple causes exist
  - More difficult to isolate
- Many breed specific
- History & Signalment
  - Imperative
    - Direction
    - Initial rule-outs

The “Arthropathies”

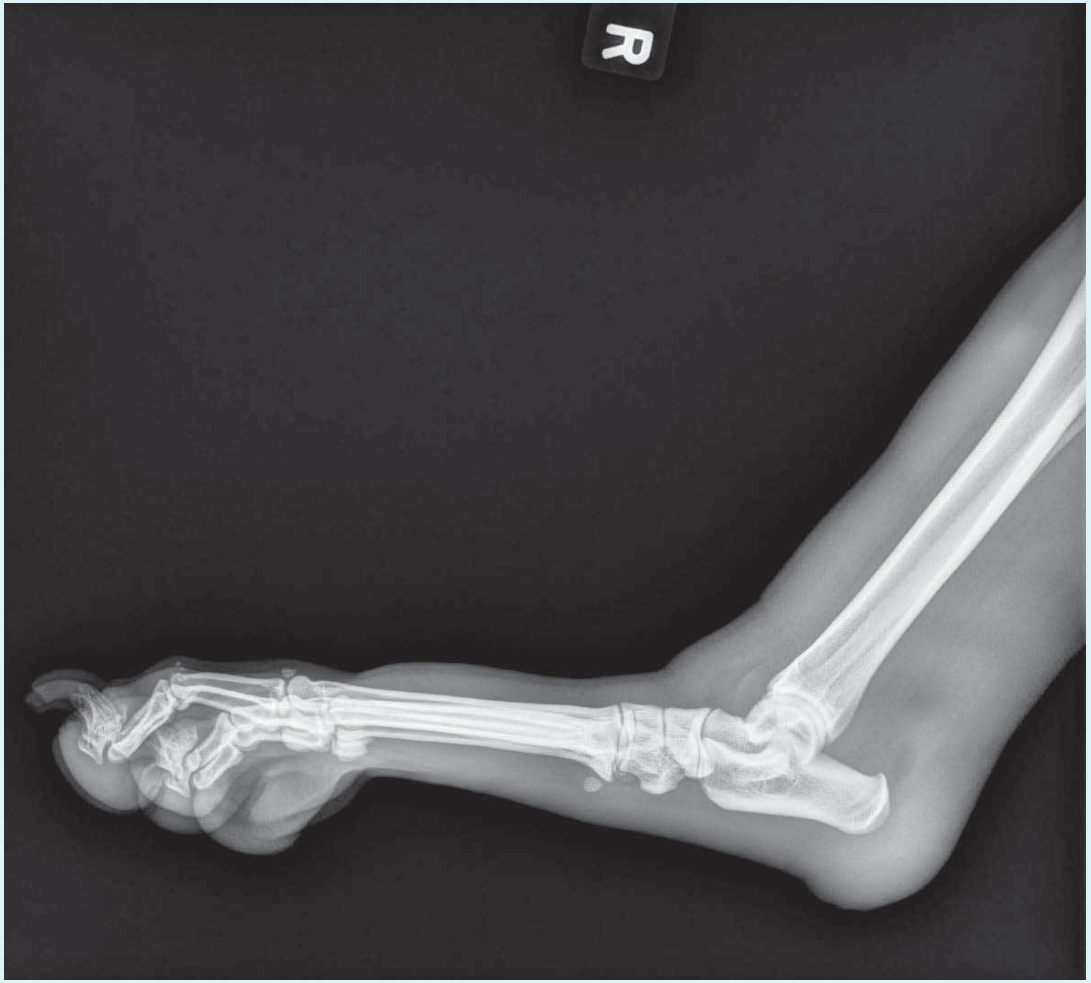
- Monoarthritis
  - Infectious
- Polyarthritis
  - Infectious
  - Neoplastic
  - Rheumatoid
  - IMPA

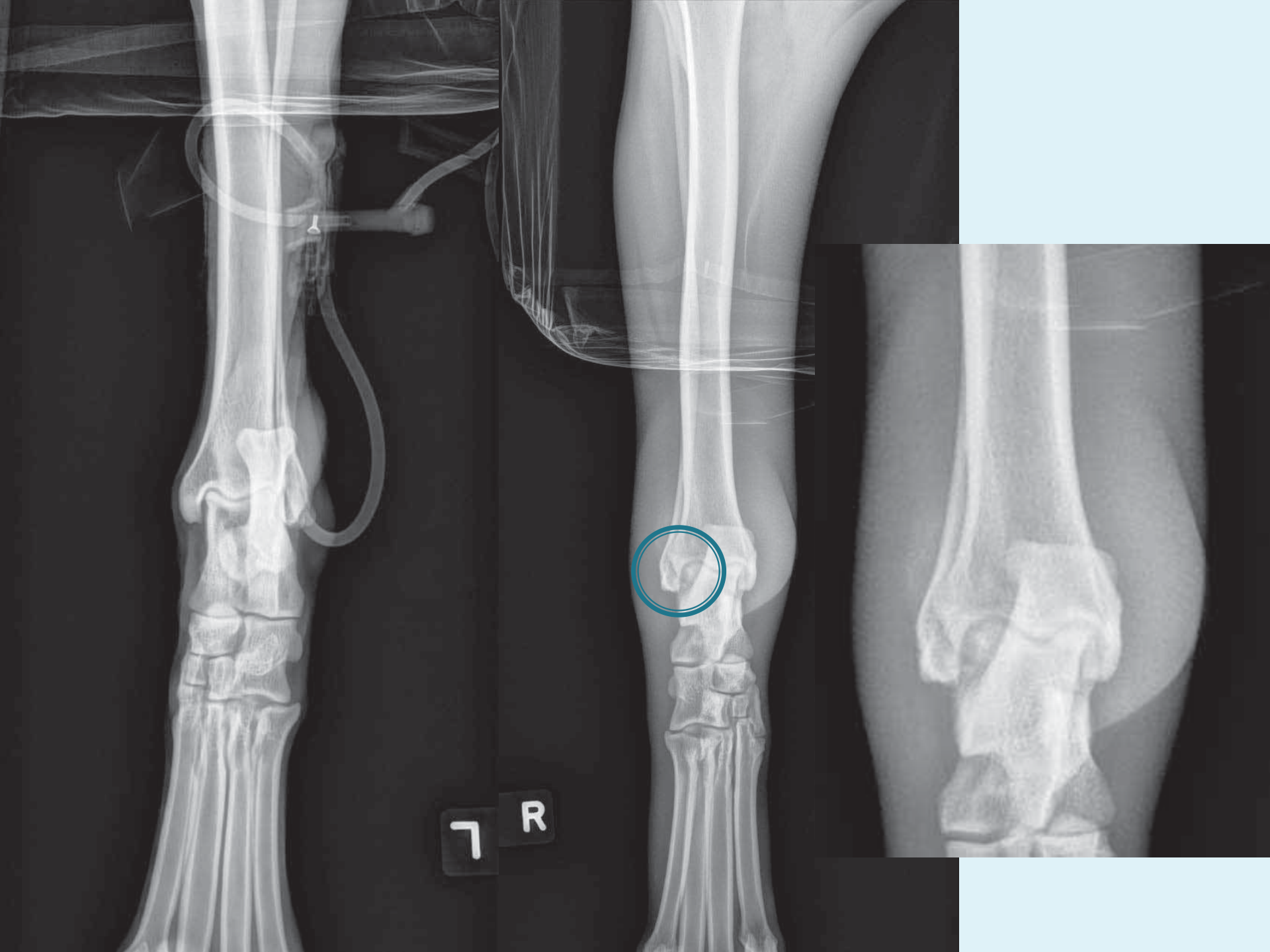
Infectious Arthritis

- Single/any joint
- Acute onset
- Marked NWB
- Marked pain
- Swelling/warm
- Usually traumatic or penetrating wound
- +/- fever

Infectious Arthritis

- Radiographs

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Infectious Arthritis

- Arthrocentesis
  - Surgical prep
  - Sterile gloves
- Cytology
  - Degenerate neutrophils
  - Bacteria
- C/S
  - Aerobic/Anaerobic – 100%
  - Staph/strep

Infectious Arthropathy

- Gold standard of tx
  - IVF, broad spectrum IV antibiotics, pain management, anti-inflammatory drugs for 24-48hrs
  - Coverage
- Broad spectrum abx
  - 6 weeks
- Pain management PRN
- Sx
  - Not indicated

Rheumatoid Arthritis

- Erosive polyarthropathy
  - Few options
- Medical management
  - Steroid or NSAID
  - Multimodal pain mgmt
- Surgical
  - Pancarpal arthrodesis?
  - More aesthetics for people

IMPA

- Hx and PE
  - Reluctance to walk/move/jump
  - Anorexia
  - FUO
  - Pain on ROM
  - Walking on eggshells
  - Effusion?
  - Little white dogs

IMPA

- Full diagnostic work up!
  - CBC, chem, U/A
  - Immune panel – Coombs, ANA, rH factor
  - Tick panel
    - Serology and PCR
  - CXR
  - Abdominal U/S
- **Joint taps and cytology**
  - **Distal**
  - **Multiple**

IMPA

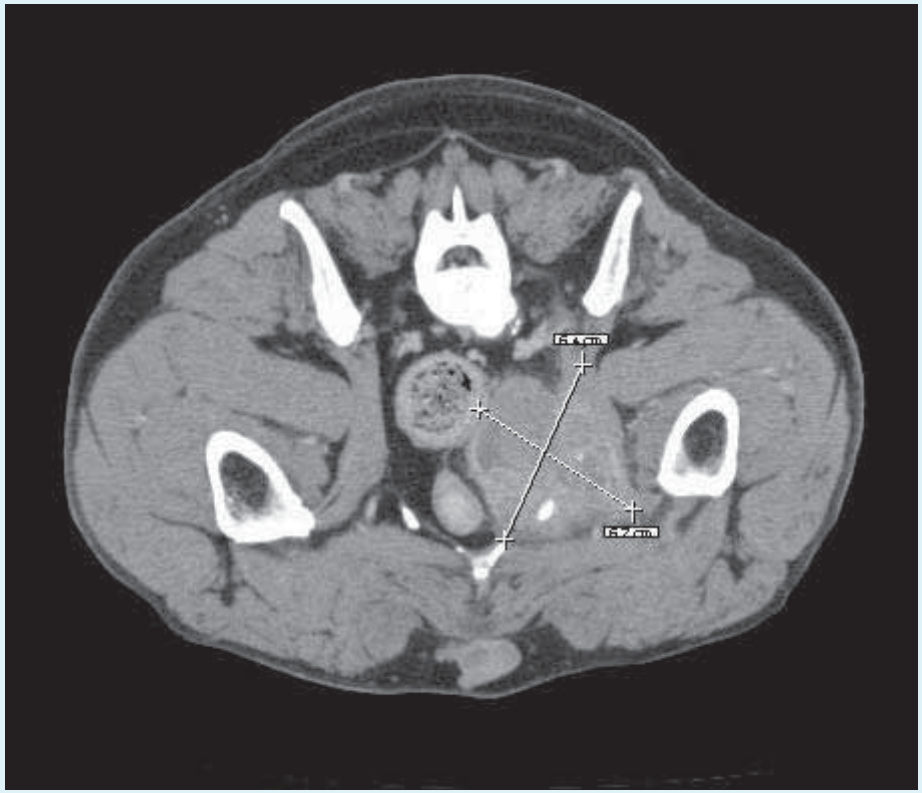
IMPA

- Treatment
  - Immune suppression
  - Prednisone - tapering
  - Recheck/monitor
  - D/C
  - Relapse
    - ~30%
    - Pred
    - Cyclosporine
    - Azathioprine
    - Leflunomide

Anatomy – Pelvic limb

- Digits
- Tarsus
- Achilles mechanism
- Stifle
- Coxofemoral joint
- Inguinal region
- Pelvis – rectal exam!!

- Spine
  - Lumbosacral joint



Foot and Metatarsus

- Common findings
  - Trauma
    - Fractures/luxations
  - Neoplasia
  - Hypertrophic osteopathy
  - Degenerative disease
    - IMPA vs Rheumatoid
  - Sesamoid fractures
  - Papilloma lesions

Tarsus

- Swelling
  - Palpate base of calcaneus
  - Dorsal joint surface
- ROM
  - Crepitation
- Stability
  - Flexion & extension
  - Long and short CLL
- Achilles tendon

Tarsus

- OCD
- IMPA, monoarthropathies
- Neoplasia
  - Synovial cell
  - OSA
- Trauma
  - Luxations
  - Fractures
  - Sheering injuries

Achilles Anatomy

- Tarsal extension
- 3 components
  - Gastrocnemius
  - SDF
  - Common tendon

Achilles Tendinopathies

- Signalment & Hx
  - Chronic non responsive lameness
  - Large breed, active
  - Trauma?
  - Cats – female/geriatric/BCS
- PE
  - Thickened
  - Non painful
  - Characteristic gait/stance
  - Palpate disruption

Achilles Tendinopathies

Achilles Tendinopathies

- Types
  - Partial rupture
  - Avulsion
  - Traumatic transection
- Diagnostics
  - Radiographs
  - US?

Achilles Tendinopathies

- Tx - ASAP
  - Anastomosis
  - Tendinorrhaphy
  - Suture pattern
    - 3-loop pulley
    - Double locking loop
    - Prolene
- External coaptation
  - ESF
  - Bivalved cast
  - Trans calcaneal screw

Tibia

- Fractures
  - Malleolar
    - Pins
    - External coaptation
  - Diaphyseal
  - Tibial tuberosity avulsion

Tibia – MIPO

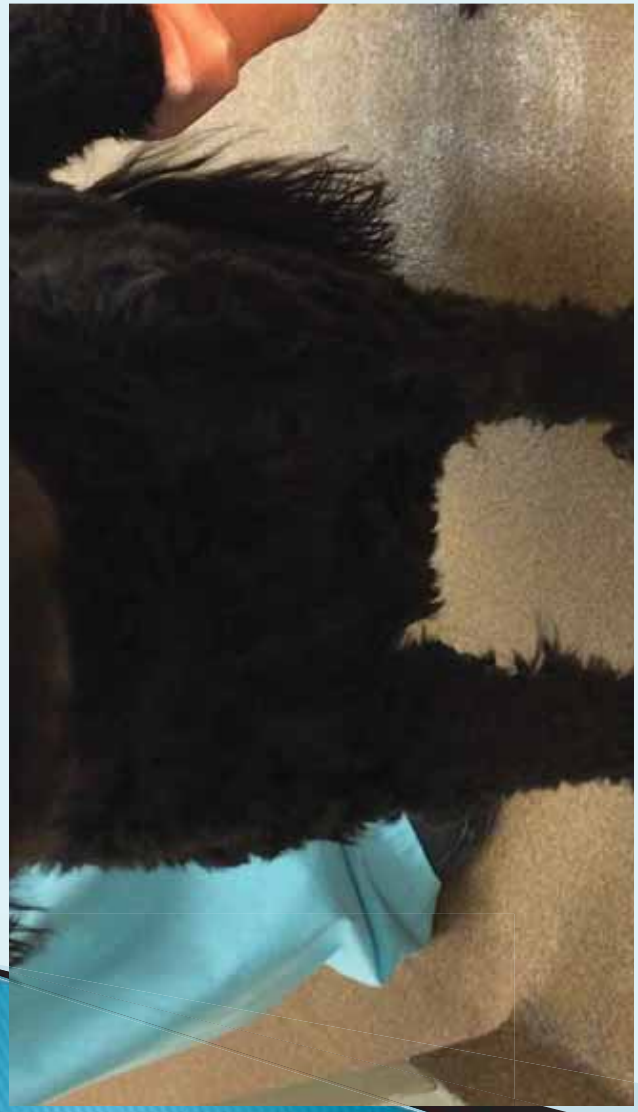
- Minimally invasive plate osteosynthesis
  - Biologic fracture healing
  - Contralateral limb
  - Fluoroscopy
  - Minimal morbidity
  - Faster healing

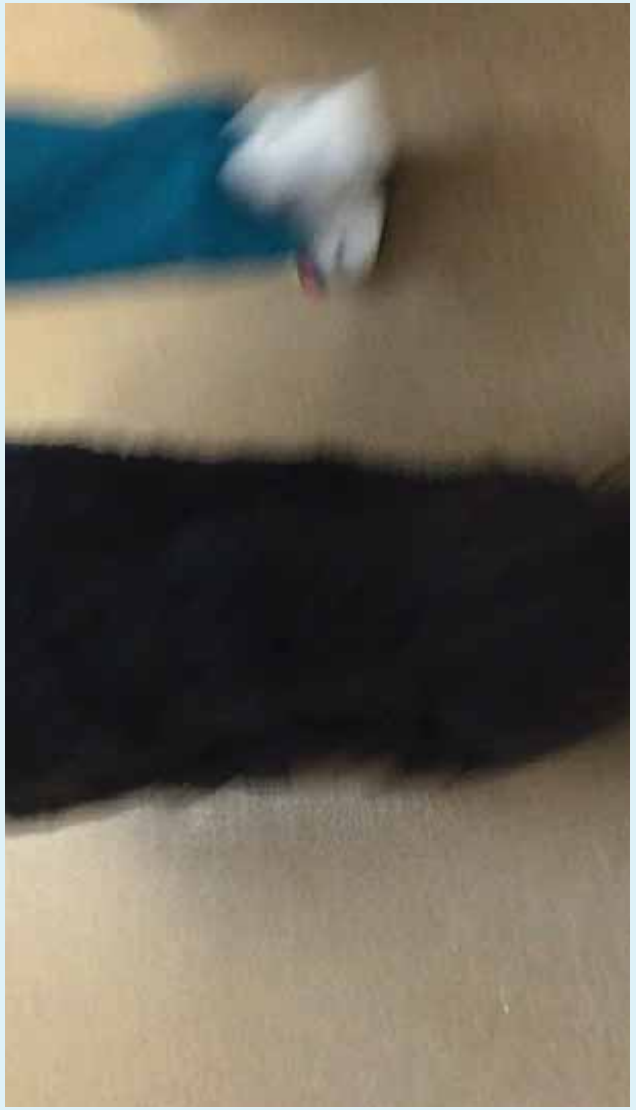
Tibia – ESF

- MI
- Fluoroscopy
- Limited

Tibia – ESF

Tibia – ESF





Tibia – TT Avulsion

- Acute onset lameness
- Juvenile
- ST swelling
- Effusion
- Pain on point palpation
- Palpable fragment
- Insertion quadriceps femoris
  - MPL
  - Patella alta

Tibia – TT Avulsion

Tibia – TT Avulsion

- Minimal displacement
- Flexed radiograph
- Contralateral radiograph
- Conservative mgmt
  - External coaptation
  - Small breed
  - 2-3 weeks

Tibia – TT Avulsion

- ORIF
  - K-wires
  - +/- tension band
- “Spiking” technique
  - Fluoroscopic
  - Closed
  - Similar outcomes

The Stifle

- Cranial cruciate ligament DISEASE
- Patellar luxations
  - Lateral
  - Medial

The Stifle – Anatomy

- CaCL
- CCL
  - Intra-articular
  - Extra-synovial
  - CCL – 2 bands
    - Caudolateral (larger)
    - Craniomedial
- Menisci
  - Cranial/caudal meniscotibial ligaments
  - Meniscofemoral ligament (LM only)

The Stifle – Biomechanics

- Diarthrodial
- Hinged – not pure
  - Cranial/caudal
  - Internal/external rotation
  - Lateral/medial translation
- Gait cycle
  - Up to 20% valgus/varus
  - Internal/external rotation

The Stifle – Physical Exam

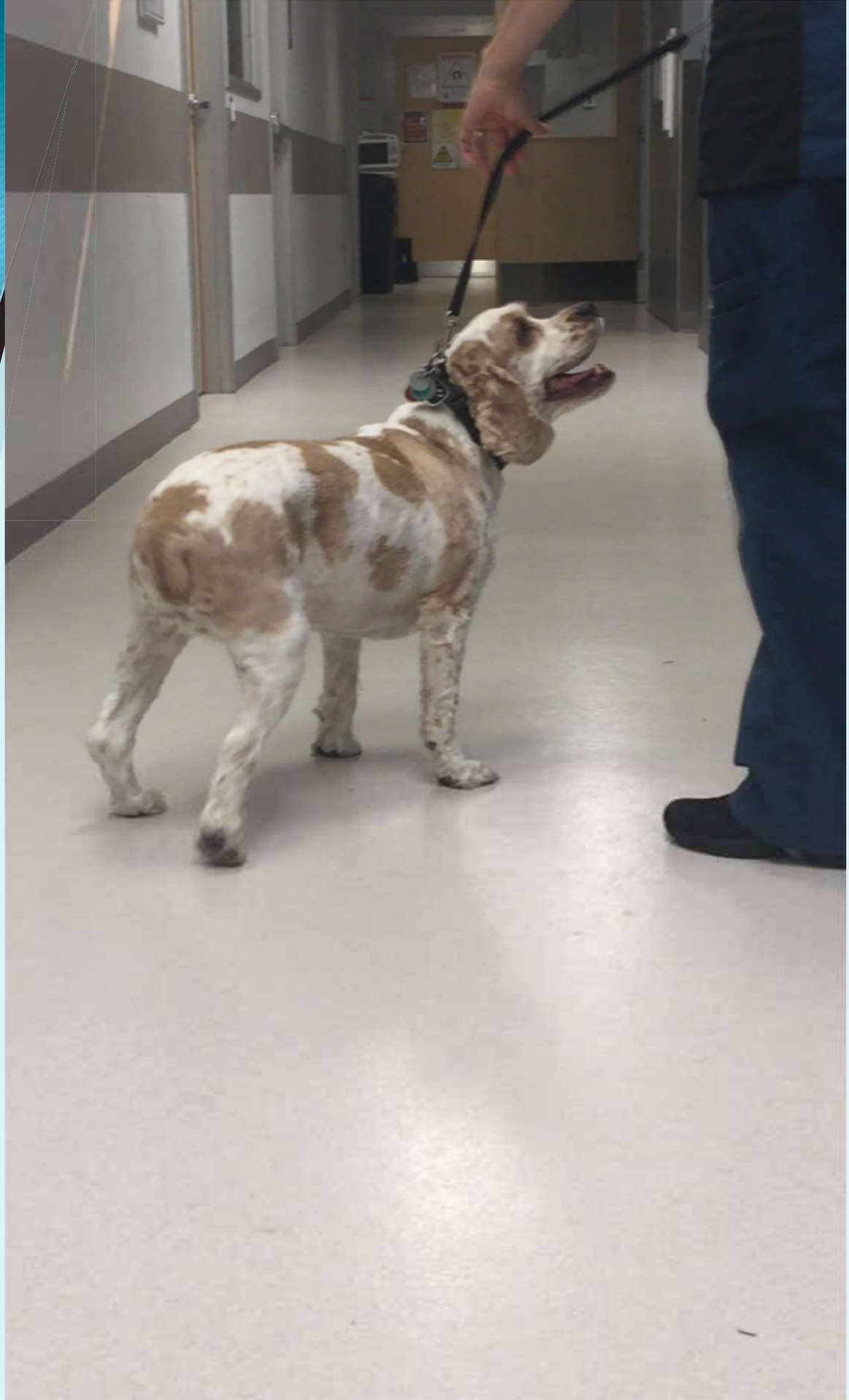
- Lameness – any type
- Pain on full extension
- Medial buttress
- Sit test
- Cranial drawer
  - False positives – juvenile
  - Domitor/opioid
  - Examine contralateral
- Cranial tibial thrust
  - Full extension only
  - NEVER lies!!

The Stifle – Physical Exam

- Cranial drawer – partial tear
  - Craniomedial (CM) band disruption
- Extension
  - Both taught
  - No laxity
- Flexion
  - CM taught, CL lax
  - Palpable laxity/drawer

The Stifle – Physical Exam

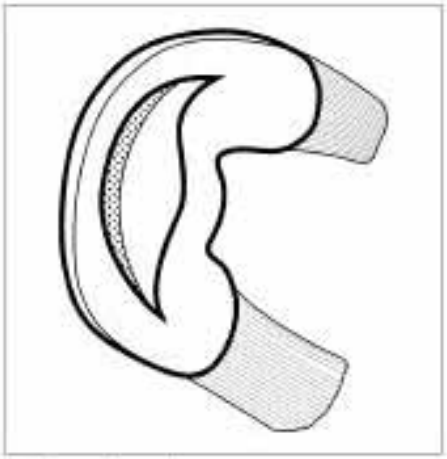
- Bilateral tears
  - Down in hind end
  - Appear neurologic
  - Hunched posture
  - Feet placed rostrally
  - Short-strided gait



The Stifle – Physical Exam

- Complete CCL rupture – 9.5x
- **Pain on flexion – 4x**
- **Palpable meniscal click – 11x**
  - High indication that tear exists
  - ~75% diagnostic accuracy
  - ~30% incidence of CMT


Longitudinal tear.


Bucket-handle tear.


Transverse tear.


Folded caudal pole.

The Stifle – Diagnostics

- Radiographs
  - 2 view orthogonal
  - Effusion
  - DJD
    - Distal patella
    - Fabellae
    - Proximal trochlea

The Stifle – Diagnostics

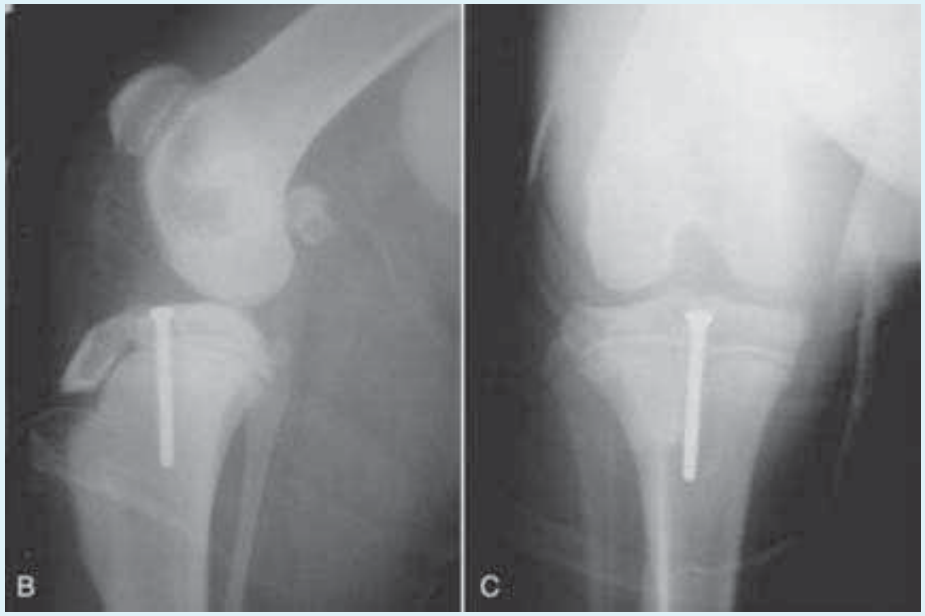
- MRI/CT?
- Arthroscopy
  - Intraoperative
  - Meniscal evaluation
  - Arthrotomy inferior
  - Probing – 2x accuracy

The Stifle – Surgery

- Conservative mgmt?
  - No evidence, not recommended
- Surgical stabilization
  - Proximal Tibial Epiphysiodesis (PTE)
  - ECS
    - Tightrope
    - Nylon band
  - Osteotomies
    - **TPLO**
    - **TTA**
    - CTWO
    - MMP

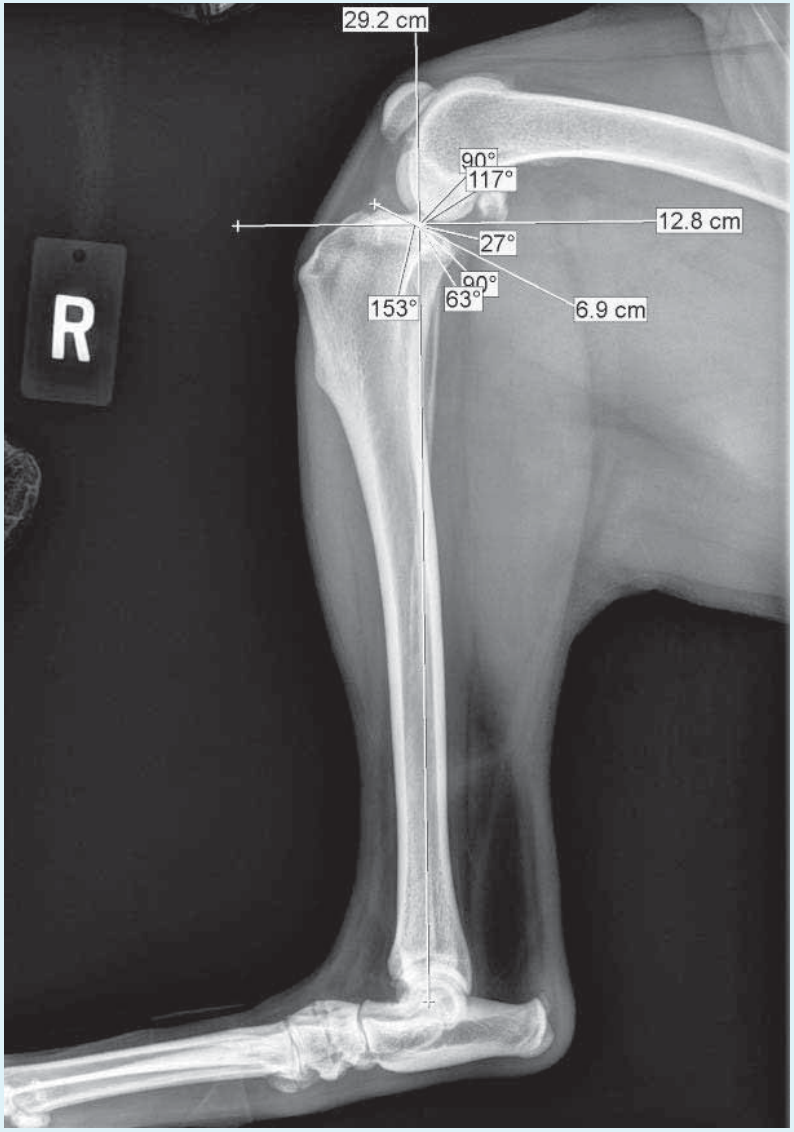
Proximal Tibial Epiphysiodesis

- Juvenile
  - ~ < 8 months
  - ~ < 11-12 Giant breed
- Mini approach
- Fluoroscopy
- K-wire, screw
- Cranial growth plate
- Plateau levelling
- Tibial valgus/varus

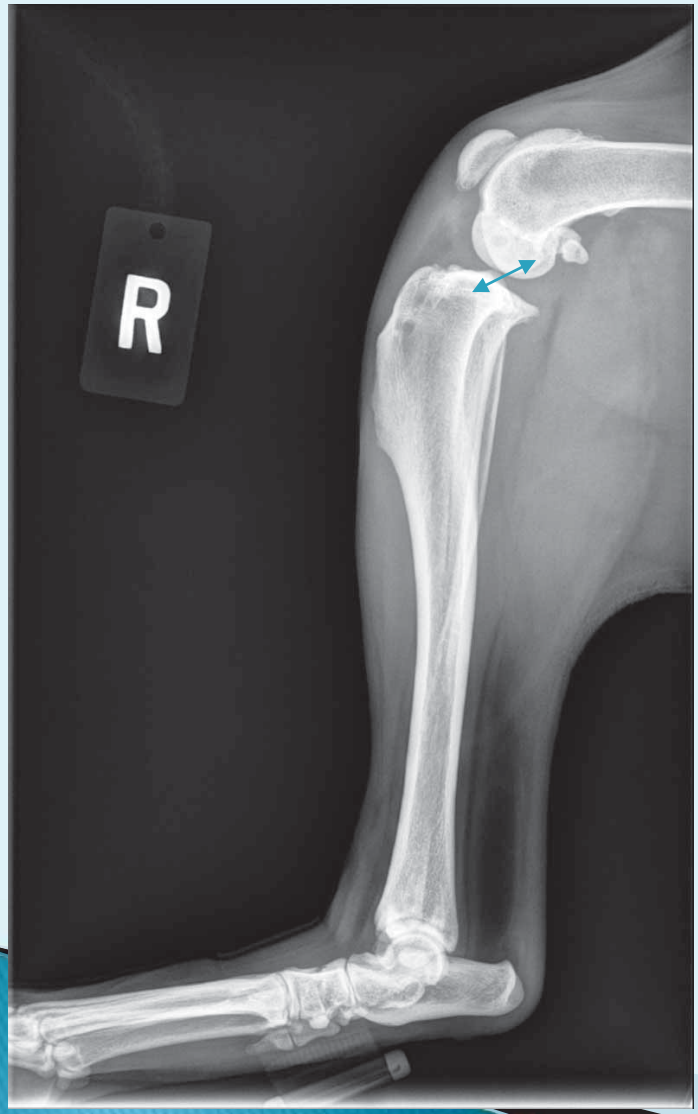


Extracapsular Stabilization

- Choose your cases!
- Joint evaluation
  - TPA angle
  - >30 degrees - osteotomy
- Anchor points
  - Isometry



Anchor Points – Isometry



Extracapsular Stabilization

- Choose your cases!
- Joint evaluation
  - TPA angle
- Anchor points
  - Isometry
- Ligament debridement?
- Double loop double crimp

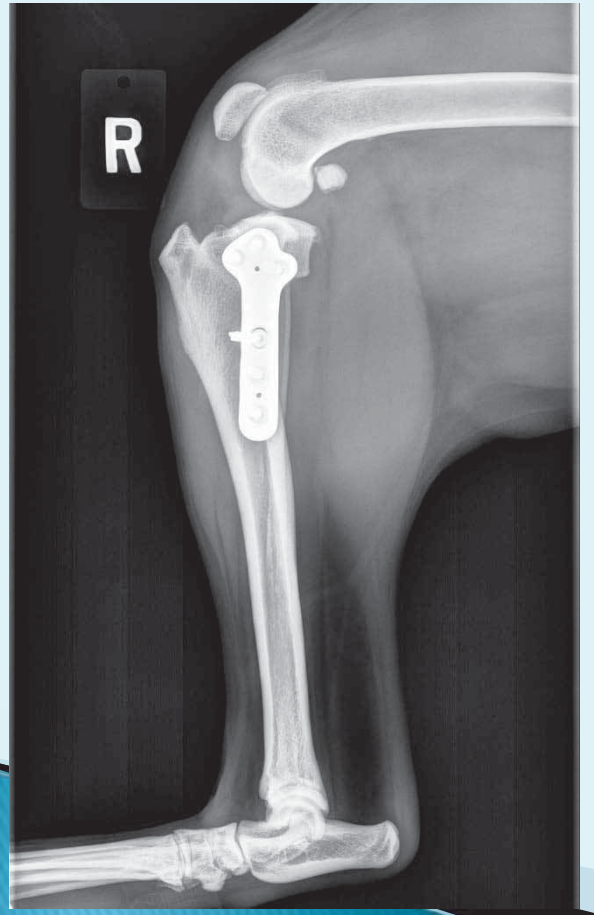
TPLO

- Eliminate cranial tibial thrust
- Expected **full** function

TPLO

Do's

- Make a good cut!!



Don'ts

- Make a shitty cut!!

TPLO

TPLO

Do's

- Arthroscopy/otomy
  - Meniscal evaluation
  - Probing
  - Partial meniscectomy
- Use locking plates
  - Bicortical screws
- Formal rehab

Don'ts

- Meniscal release
- Use a bandage PO
- Debride remnants

TPLO *vs.* ECS: Is one superior?

- Strength
  - SS implants
  - Bone healing

- *JAVMA Gordon-Evans et al 2013*
  - PVF walk & trot – 1 yr
  - 5-11% higher
  - Owner satisfaction (survey)
    - 93% *vs.* 75%

TPLO *vs.* ECS: Is one superior?

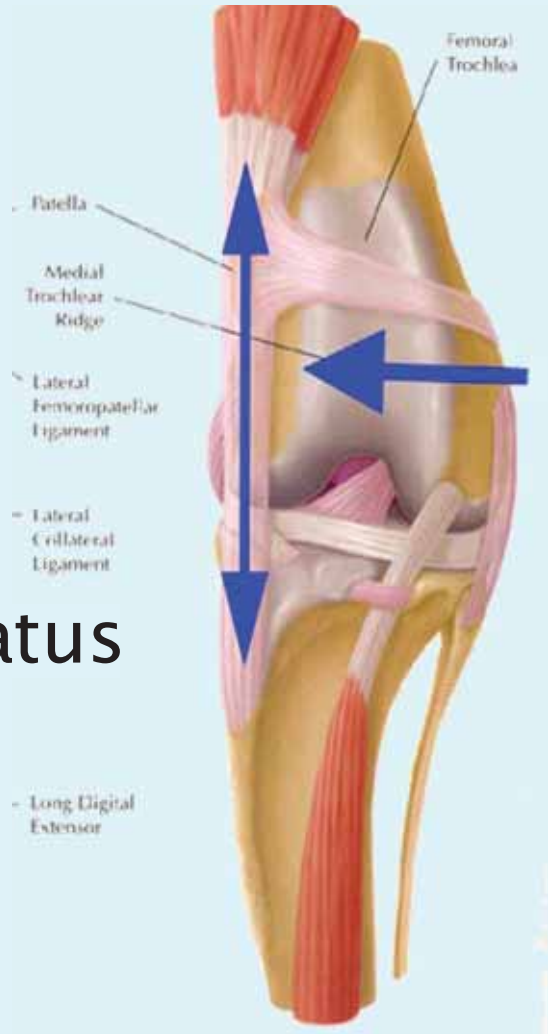
- *VetSurg Nelson et al 2013*
  - 8 weeks PO
  - PVF and VI – more symmetric limbs
  - 6 months PO TPLO same as control
  - ECS less symmetric at all times PO
  - TPLO by 1 yr PO
    - Limb function indistinguishable from control
- *VCOT Moeller et al 2010*
  - Thigh circumference – 1 to 5yr PO
    - 98.5% TPLO

Stifle Stabilization – Future

- Regardless of stabilization technique….
  - Some motion in stifle in stance phase
  - Boettcher et al – fluoroscopic 3D kinematics
    - CCL deficient stifle
    - TR/ECS > TTA > TPLO -all had motion!!
    - Explains post-liminary meniscal tears
- **Neutralize all forces**
  - Dynamic - TPLO/TTA
  - Static – extracapsular stabilization
  - Locking plate + Internal brace (knotless)

Patellar Luxation

- Developmental disorder
  - Internal tibial rotation
  - Proximal tibial varus
  - Hypoplasia medial femoral condyle
  - Shallow trochlear groove
  - Femoral varus
  - Coxa vara
- Malalignment of extensor apparatus
- Medial/lateral/bidirectional



Patellar Luxation

- Grade 1
  - Incidental
- Grade 2
  - Intermittent lameness
- Grade 3
  - Mild/moderate/severe
  - Continuous luxation during ambulation
  - Reducible
- Grade 4
  - Permanent luxation
  - Non reducible

Grade 4 MPL

Patellar Luxation

- Small breed
  - 95-98% medial
  - 50-65% bilateral
  - Female ~2:1
- Medium to giant breed
  - 83%, 81%, 67%
  - Male ~ 2:1
  - Labrador Retriever most affected

Decision Making

- Factors to consider
  - Degree of skeletal deformity
  - OA present
  - Rotational instability
  - Sagittal instability (CCL rupture)
  - **Potential for OA progression**
- **Individual tx plan**

Surgical or Conservative

- Grade 1
  - No clinical signs – conservative
  - Recurrent lameness – reevaluated
- Grade 4
  - Early correction

Surgical or Conservative

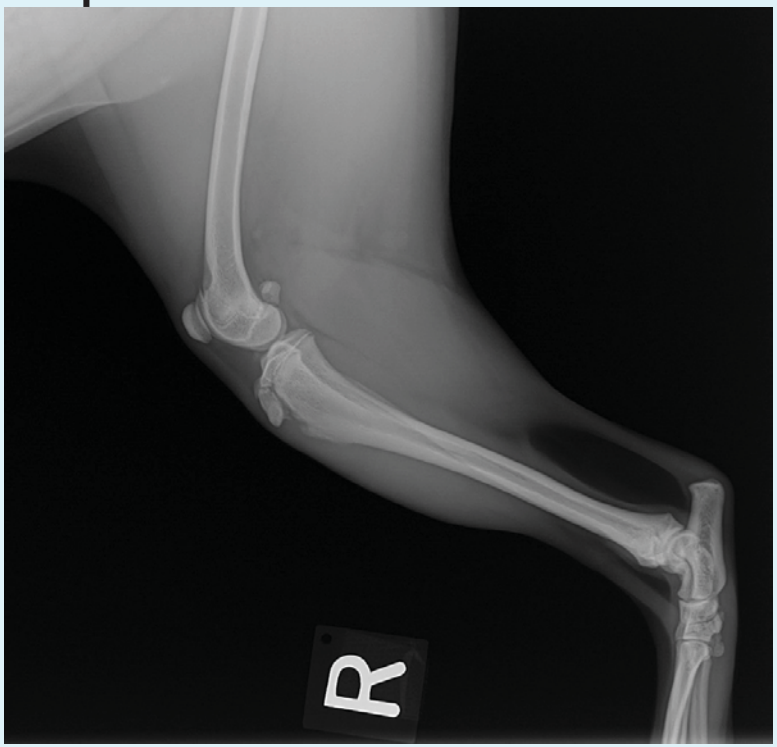
- **Grade 2**
  - Minimal OA
  - Mild/occasional clinical signs
    - Conservative w/ reevaluation
  - Significant clinical signs – correction
    - Episodes lasting ≥ 2-3 weeks
    - ≥ 3 episodes short time frame (1 month)
- **Grade 3**
  - Juvenile – correction
  - Adult?
    - Incidental finding – conservative
    - Clinical signs - correction

Surgical Correction

- Soft tissue reconstruction
  - Lateral imbrication
  - Medial release
    - Leave medial open if under tension

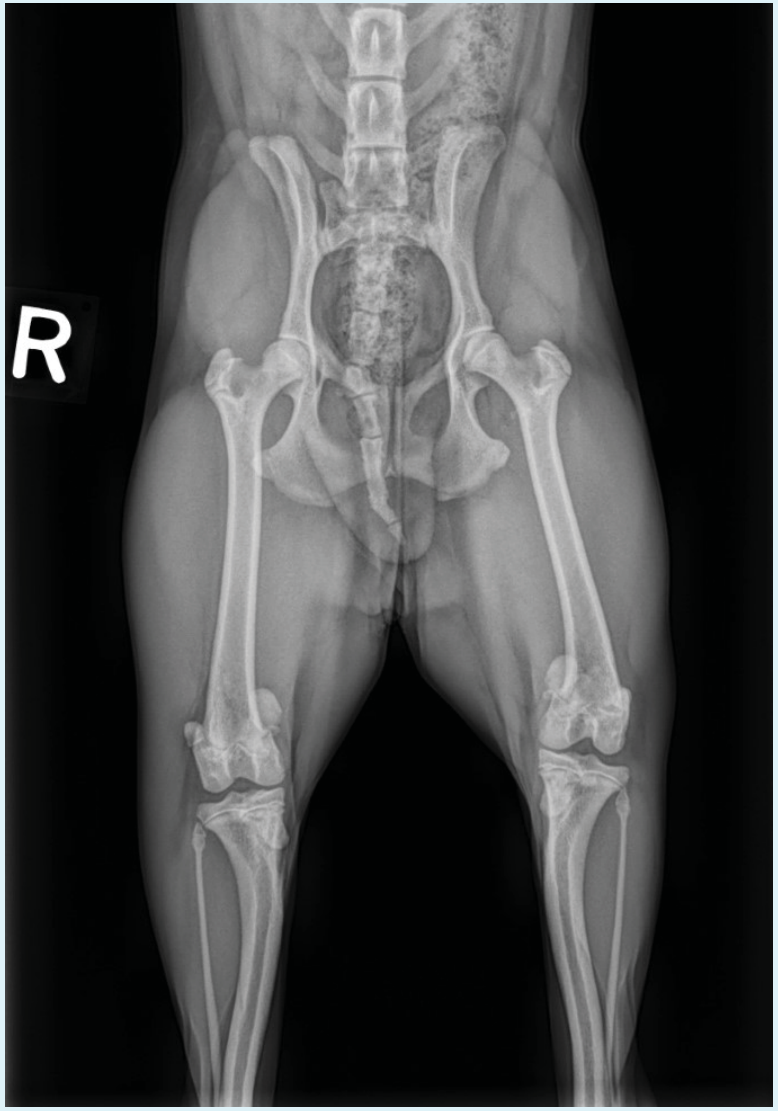
Surgical Correction

- RULES!
  - Never used as primary repair
  - UNLESS – traumatic PL
  - OR – 1st stage of two stage repair



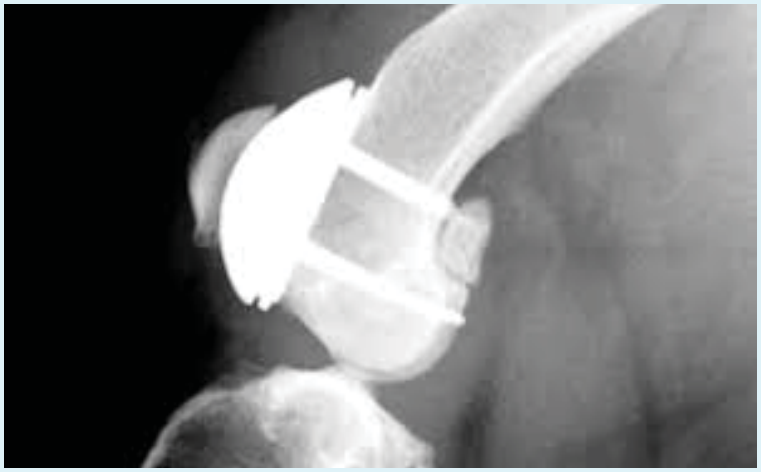
Surgical Correction

- Orthopedic
  - Always necessary!!!



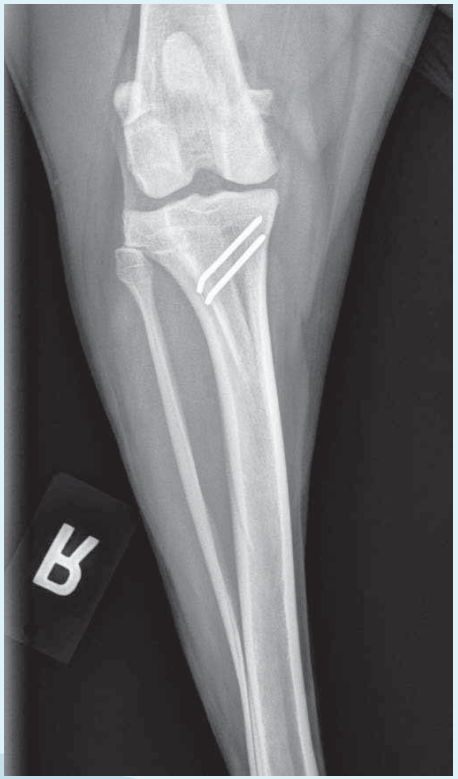
Surgical Corrcetion

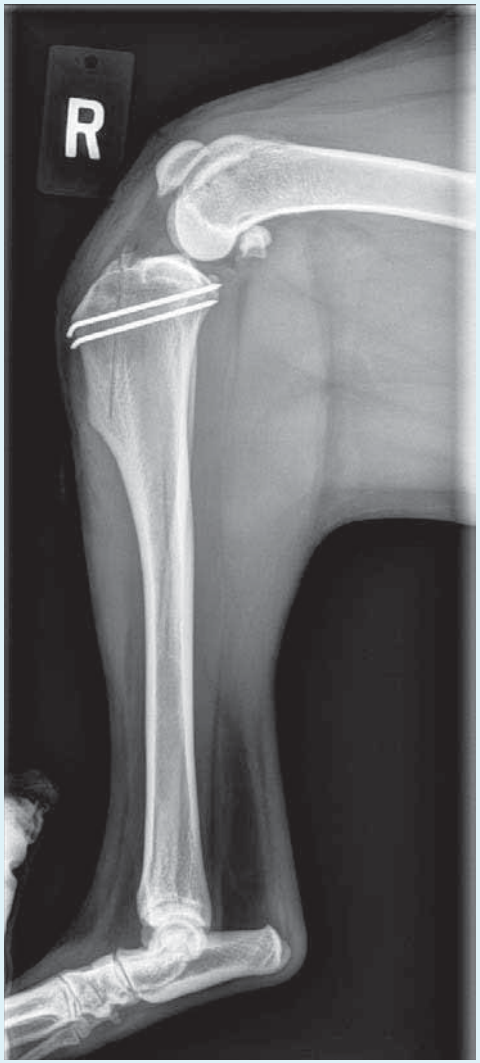
- “Plasty”
  - Wedge recession
  - Block recession
  - Chondroplasty
  - Trochleoplasty
  - Trochlear implant



Surgical Correction

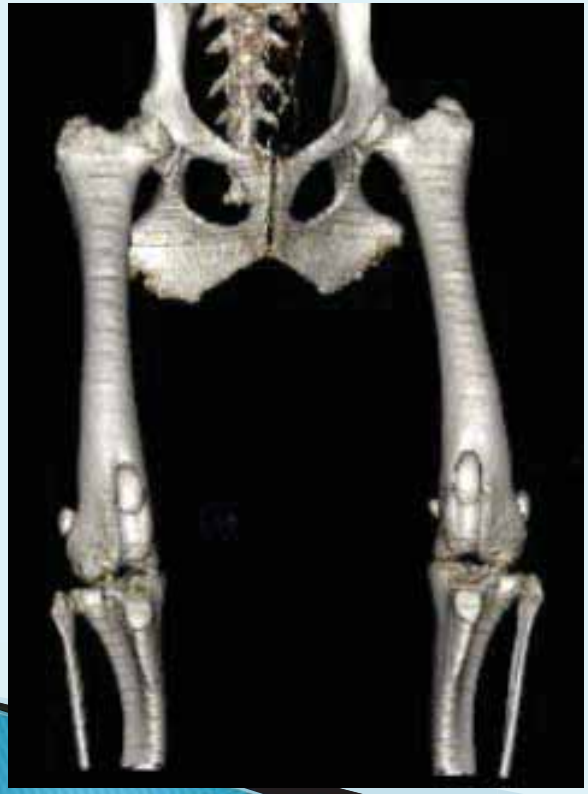
- Tibial tuberosity transposition
  - Divergent pins
  - Directional pins
  - +/- tension band





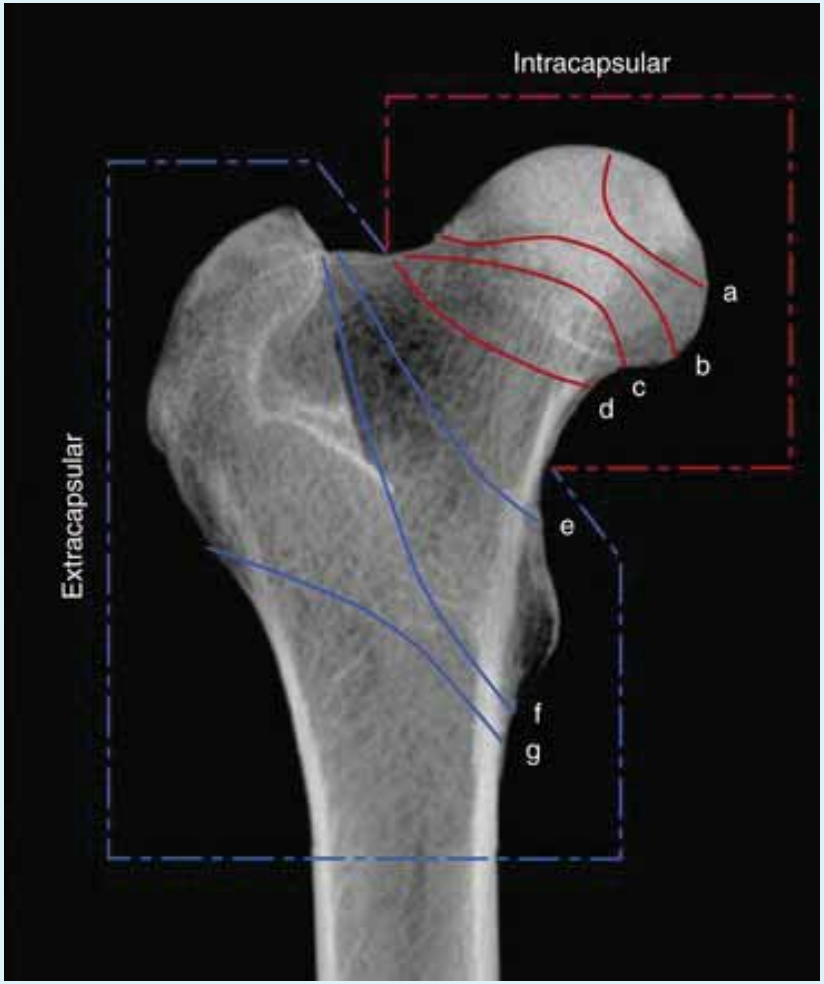
Surgical Correction

- Femoral reconstruction
  - Lateral closing wedge ostectomy



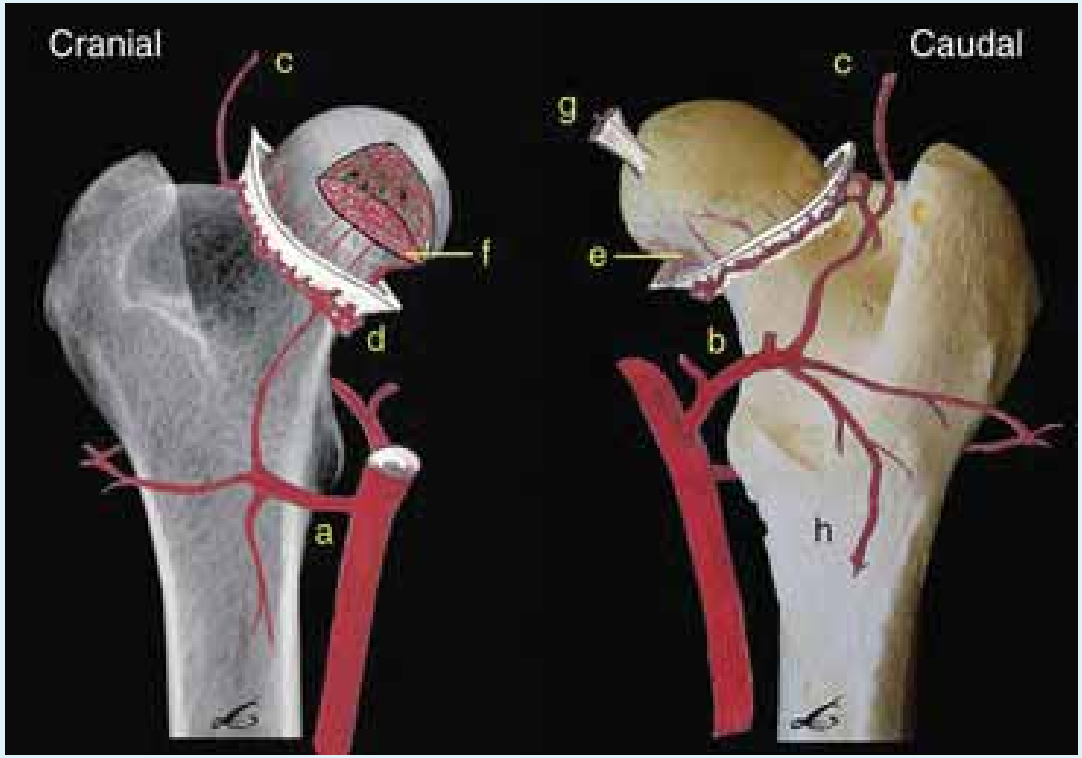
Femur

- Proximal
  - Epiphyseal
  - Physeal
  - Subcapsular
  - Transcervical
  - Basilar neck
  - Supratrocanteric
  - Subtrocanteric
- Blood supply

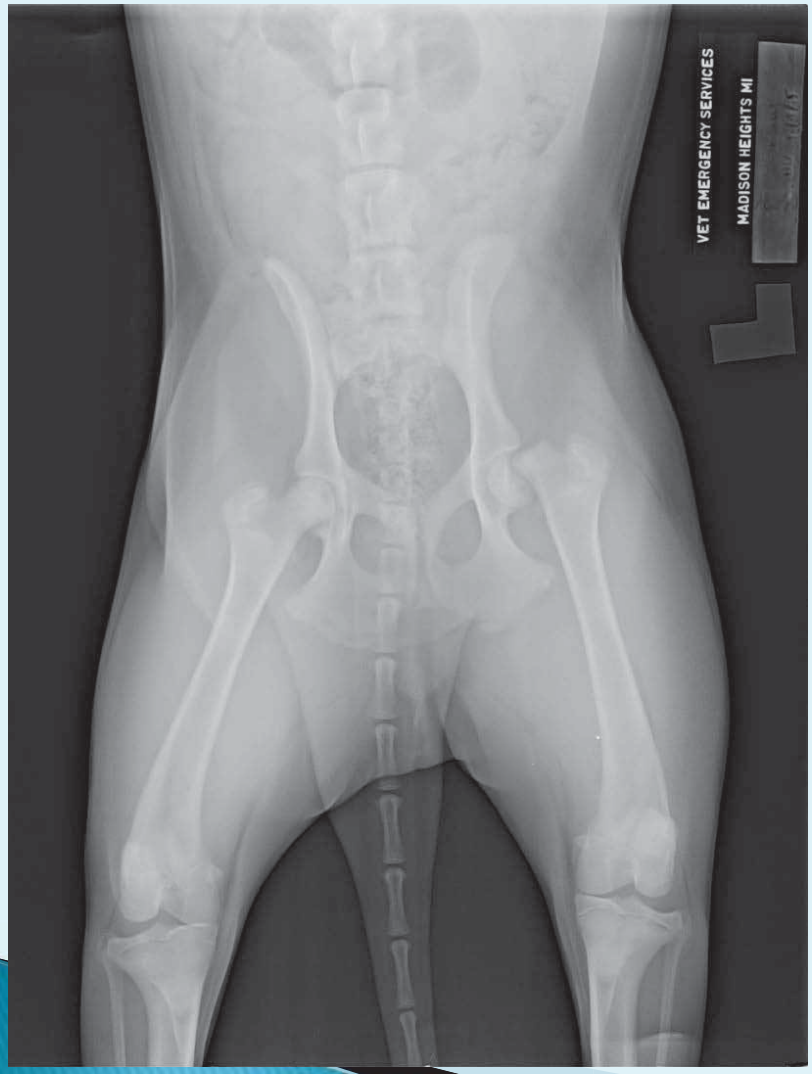


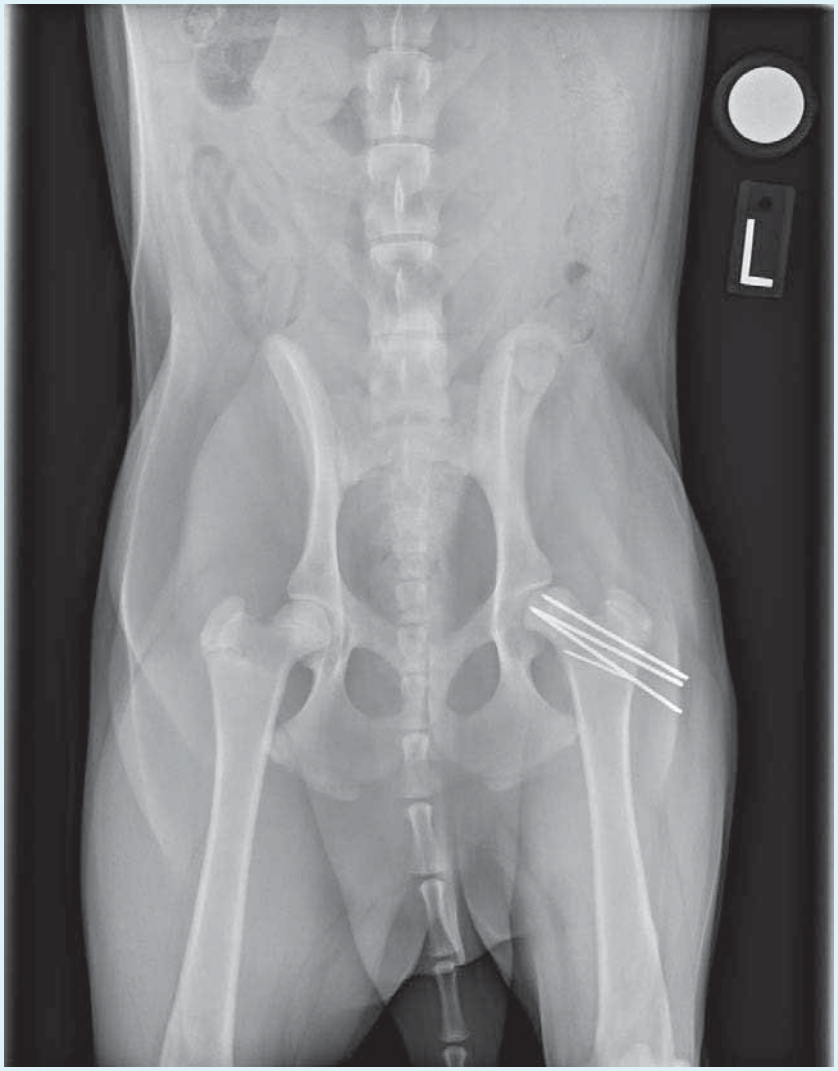
Femur

- Blood supply
  - Intraosseus
  - Intracapsular
  - Extraosseus
    - Extracapsular
    - Vascular ring
- Susceptible
- Surgery
  - Choose wisely!



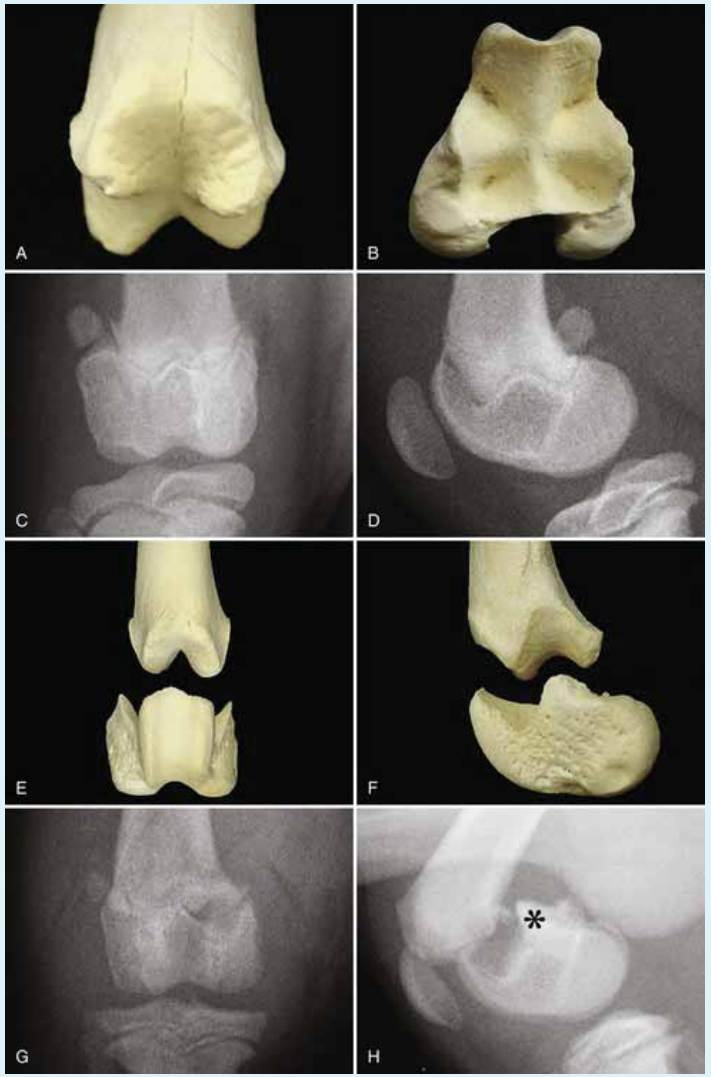
Femur





Femur

- Distal
  - S-H fractures
    - Type II dogs
    - Type I cats
- Surgery only
  - Semi insertions
  - Cross pinning



Hip

- Luxations
- Dysplasia

Hip Dysplasia

- There's nothing new.....
- FHO
- THR
- TPO/DPO
- Medical management

BUT

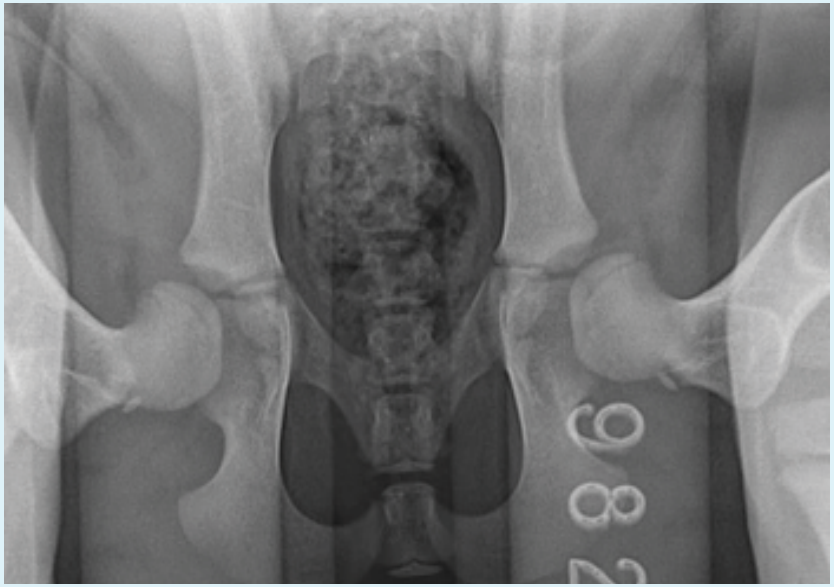
- Pain management
  - Tramadol 5mg/kg TID
- Prevention?
  - JPS

Juvenile Pubic Symphysiodesis

- Improve congruity
  - Increased Norberg Angle (NA)
  - Less laxity
  - Decreased distraction index (DI)
  - Similar to TPO/DPO
- Early screening
  - ~ 12-14 weeks of age
  - Ortolani
  - Specific breeds

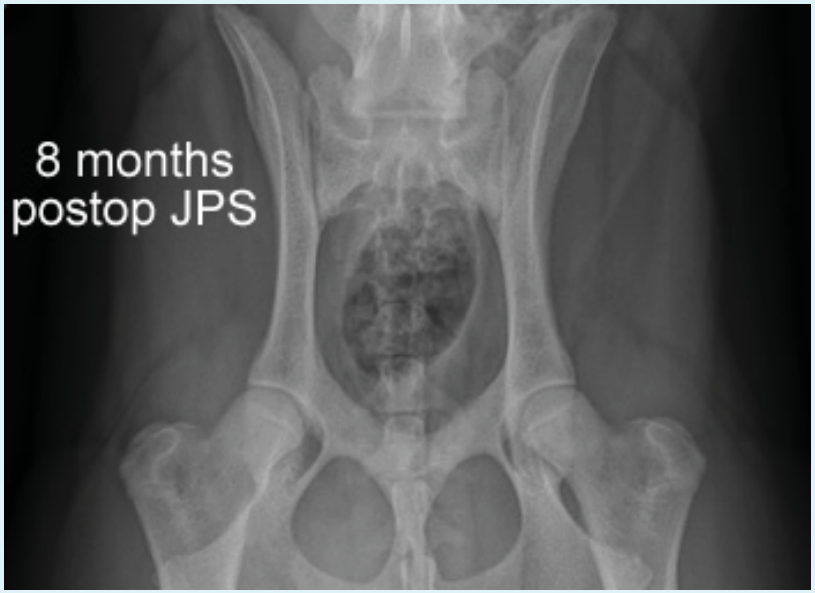
Juvenile Pubic Symphysiodesis

- Distraction Index
  - PennHip radiographs
  - 0.4-0.7
  - >0.7?
- Pubic growth plate
  - Cauterization
  - Cranial 1/3 only



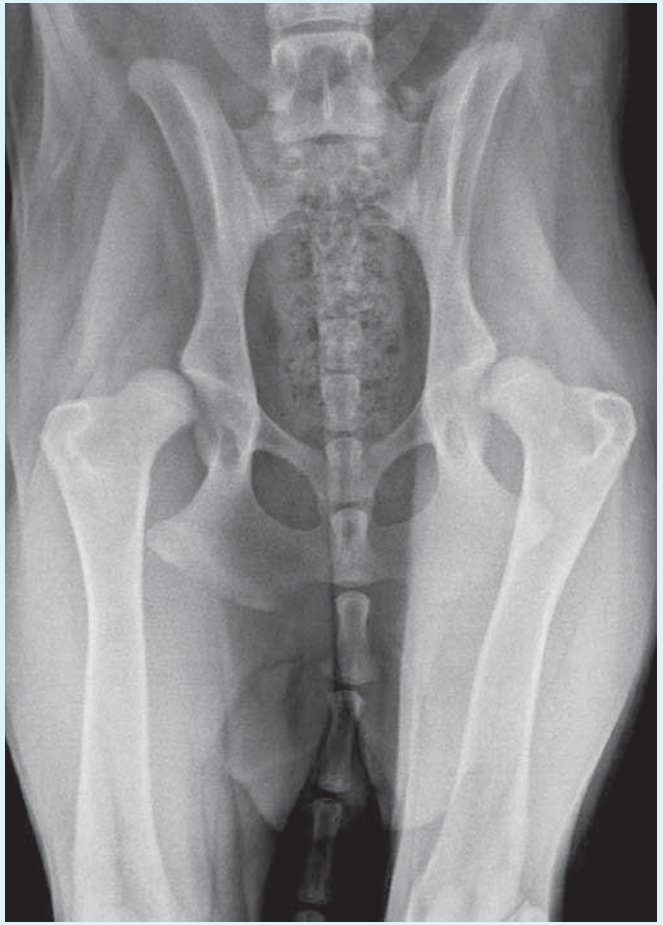
Juvenile Pubic Symphysiodesis

- Outcomes
  - 14-22 weeks
  - Best outcomes 12-18 weeks
  - Less benefit 19-24 weeks
  - Pelvic canal narrowing
- CT study
  - 2 year follow up
  - Control population
  - All improved



Hip Luxation

- Traumatic displacements
  - femoral head and acetabulum
- Subluxation
  - partial dislocation



Etiology

- Motor vehicle trauma
  - 60-85%
- Concurrent injuries
  - 35-55%
  - Fractures
  - Thoracic abnormalities
- Spontaneous

Anatomy

- Primary stabilizers
  - DAR, LHF, capsule
- Secondary stabilizers
  - Hip/gluteal muscles
  - Ventral acetabular ligament
  - Acetabular labrum

Classification

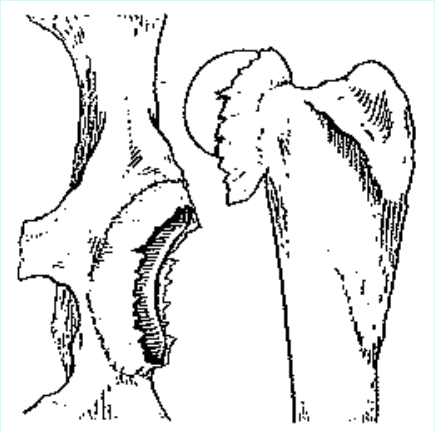
- Cranio-dorsal
  - Forces through femur
  - Joint stabilizers tear
  - Young dogs
- Caudo-ventral
  - Falls, abducted/internal rotation
  - 1-3%
- Bilateral
  - 3-6%

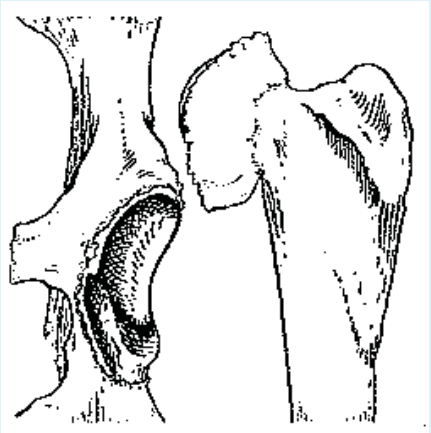
Capsular Tears

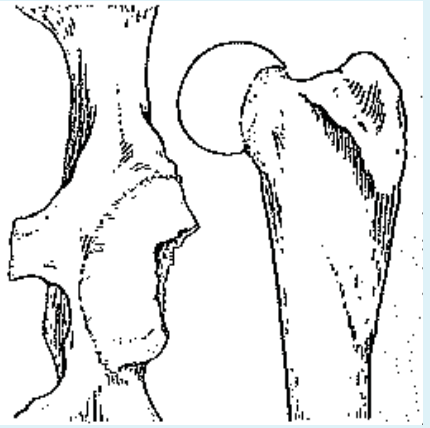
TYPE A

TYPE B

TYPE C





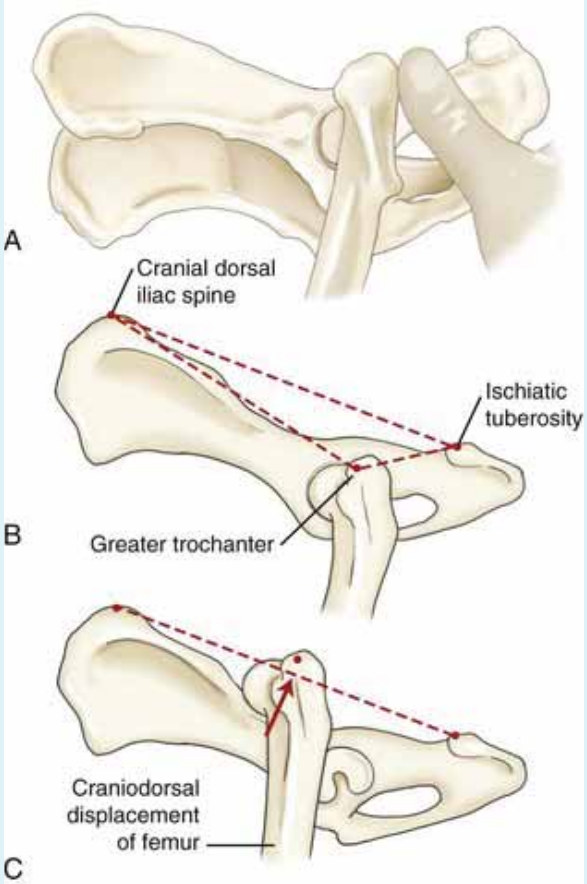


Diagnosis

- Physical examination
- Radiographs

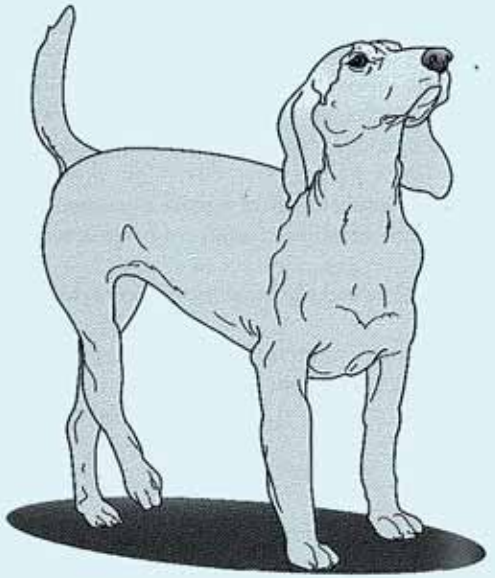
Clinical Signs

- PE and palpation
  - Lameness
  - Swelling
  - Pain
  - Crepitation
  - Greater trochanter



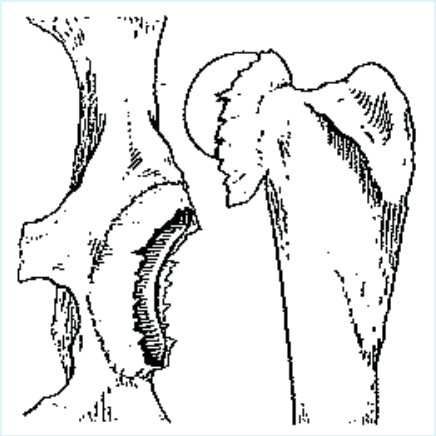
Limb Length and Position

- Cranio-dorsal
  - Shorter
  - Adduction
  - External rotation
  - Stifle outward, tarsus inward
- Caudo-ventral
  - Longer
  - Abduction
  - Internal rotation

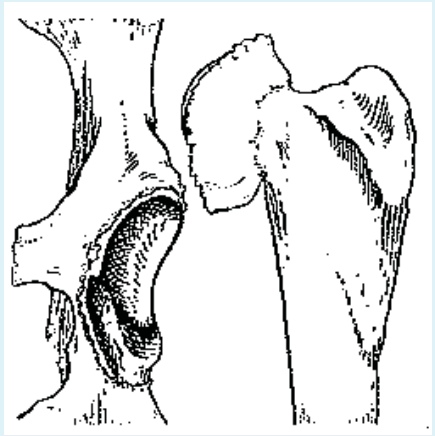


Capsular Tears

TYPE A



TYPE B



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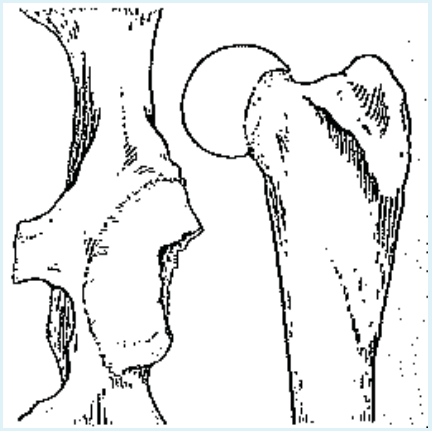


Treatment Options

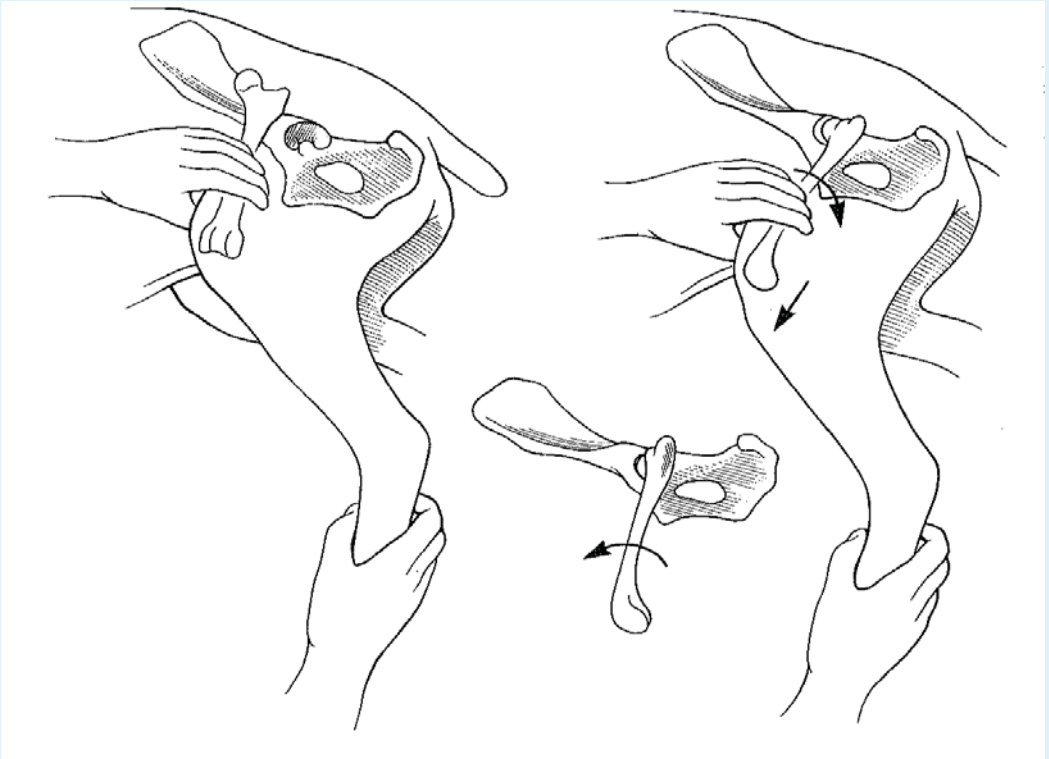
- Conservative management
- Surgical management

Conservative Management

- Closed Reduction
  - ONLY FOR KNOWN TRAUMA!
  - Type A
  - 4-5 days
- Complicating factors
  - Muscle contracture
  - Soft tissue
  - Joint capsule degeneration
- External coaptation
- Pain mgmt./NSAIDS

Closed Reduction

- Femoral head rotation
- Traction
- Repetitive ROM



External Coaptation

- Hobbles
- Ventral

External Coaptation

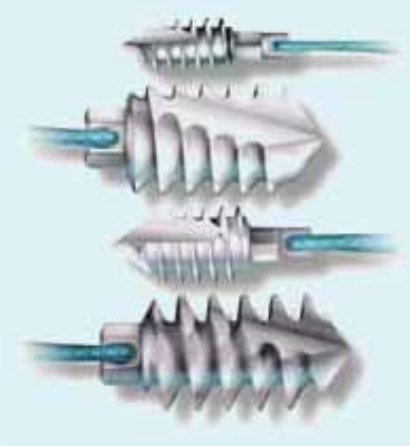
- Ehmer sling
  - Adduction
  - External Rotation
  - *dogleggs.com*

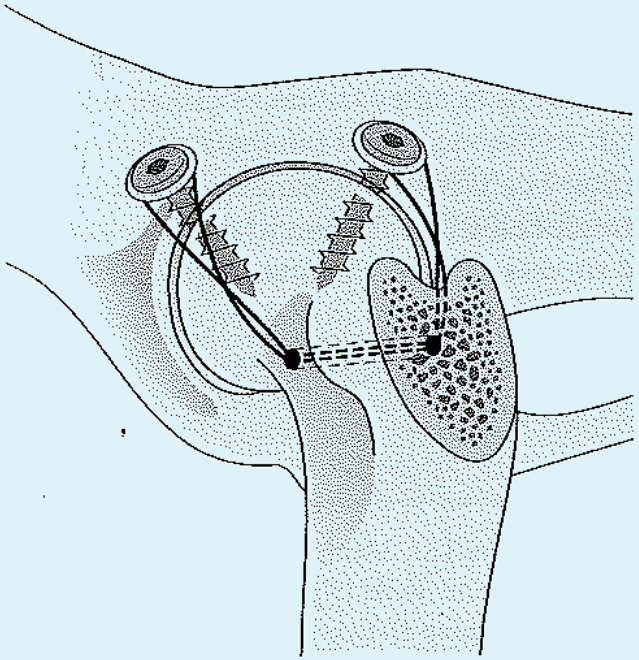
Open Reduction and Stabilization

- Anchored prosthetic capsule
- Toggle pinning
- FHO
- THR

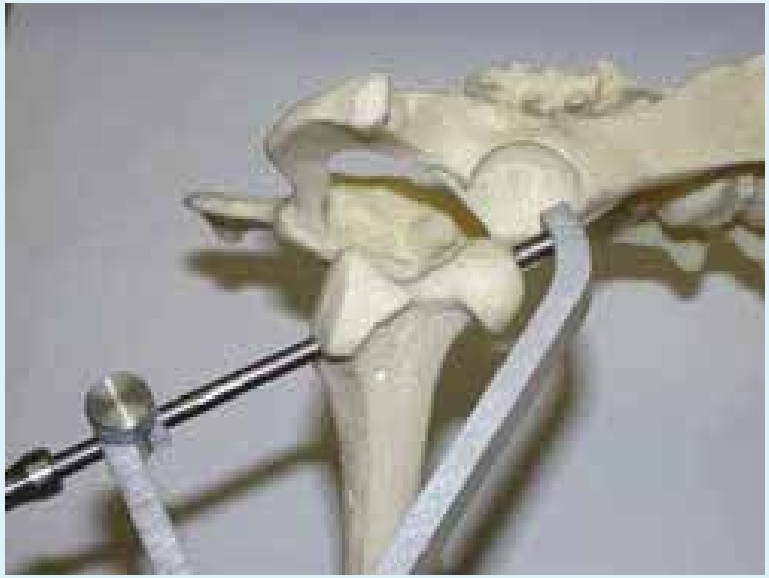
Prosthetic Capsule

- Left vs Right
- Implant position

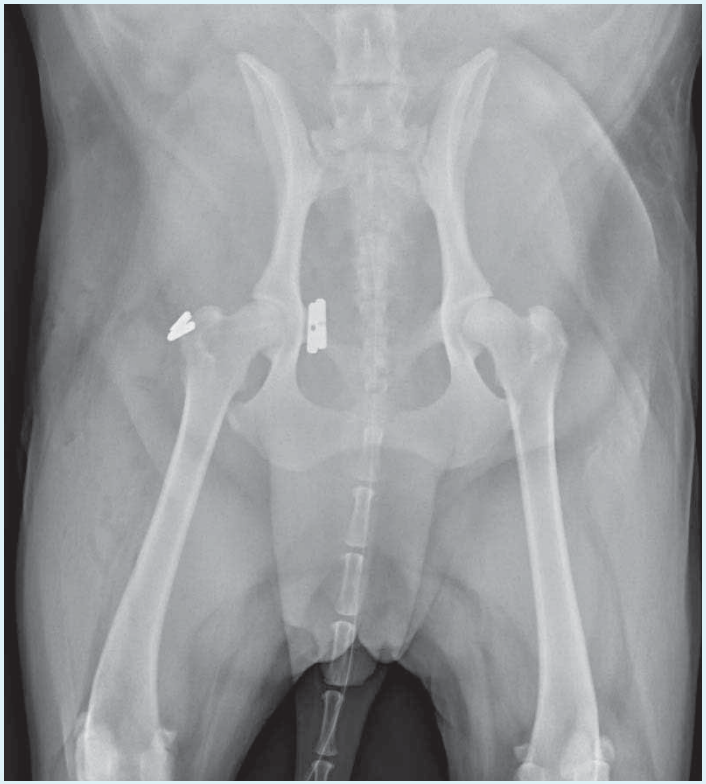




Toggle Pinning/Rod



Toggle Pinning/Rod

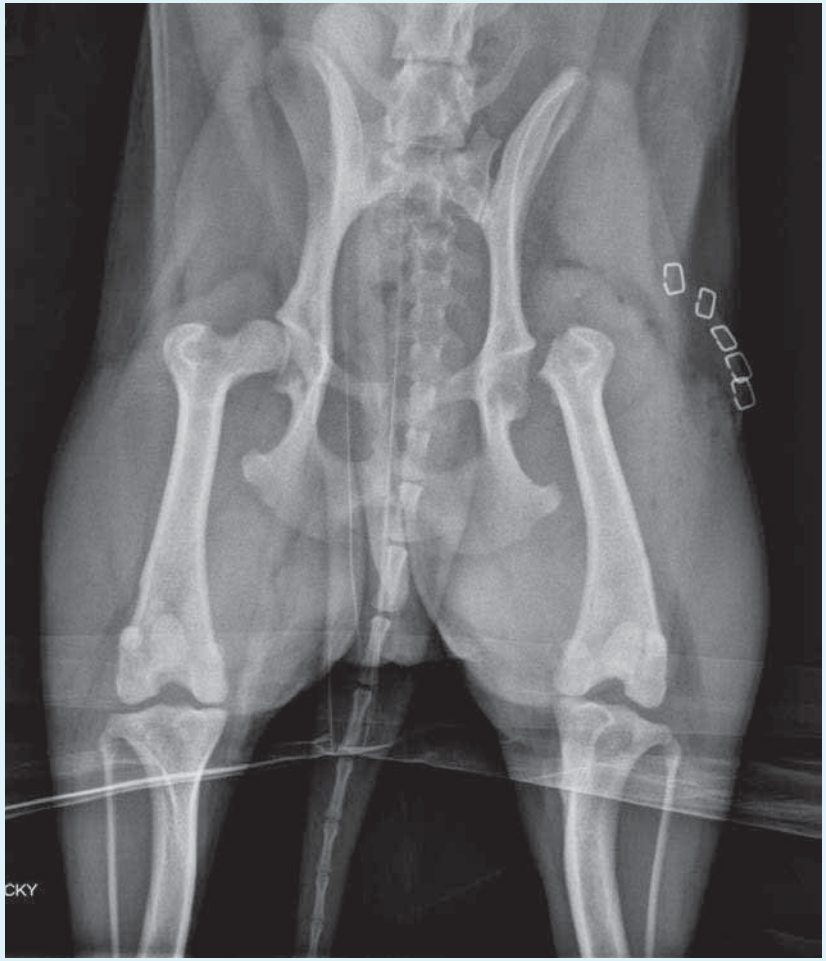


Complications

- Reluxation
- Implant migration or failure
- Neurologic
- Articular cartilage damage

FHO

- Bone cutters/sagittal saw
- Externally rotate
- Lesser trochanter

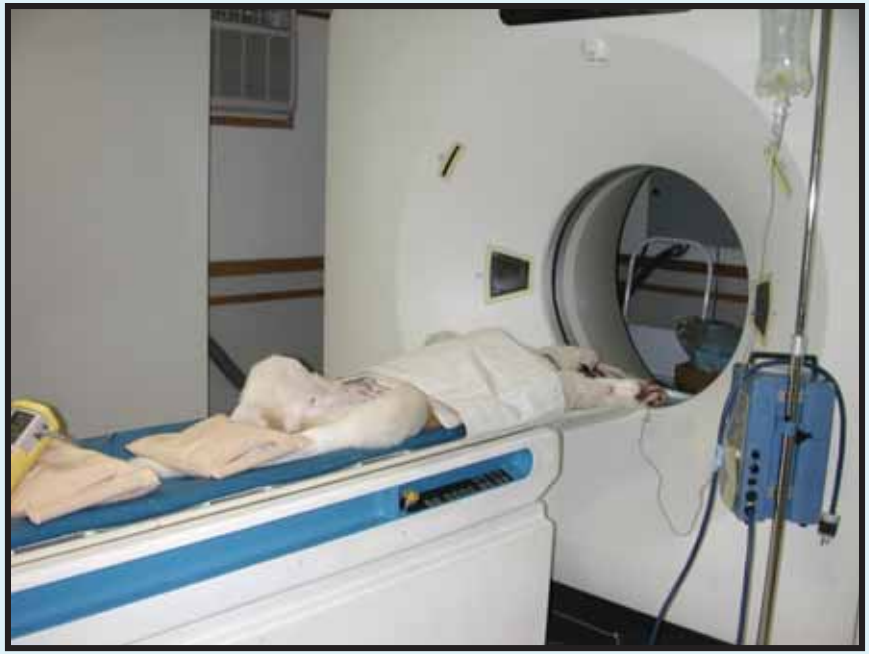


Summary

- Able to consistently identify problems
  - Complete examination
    - Systemic health
    - Forelimbs
    - Sound leg
    - Problem leg
- Imaging interpretation
  - DACVR Review

Imaging

- **Radiographs**
  - Focus on problem(s)
    - Contra-lateral view
    - Stress views
- Joint taps
- Advanced imaging
  - CT – bony lesion
  - MRI – soft tissue lesions
  - Ultrasound
    - Muscle & tendon injuries
- Neurological work-up



Problem Identified

- Medical vs. surgical problem
  - Ideal intervention
    - Prevent progression of arthritis
- Surgical intervention if applicable
- Appropriate aftercare
- Formal Rehabilitation