VETERINARY MEDICINE

Case Presentations of Lameness and Musculoskeletal Abnormalities in Foals

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Fall Conference 2023

Overview

- Contracted Tendons
- Angular Limb Deformity
- Neuropathy
- Septic arthritis/physitis

Case 1

8-12 hour hold Quarter Horse colt

- Bilateral forelimb flexural contracture
- Mild at carpus
- Moderate at fetlock/distal limb
- Recipient mare, heavy milk production

Case 1

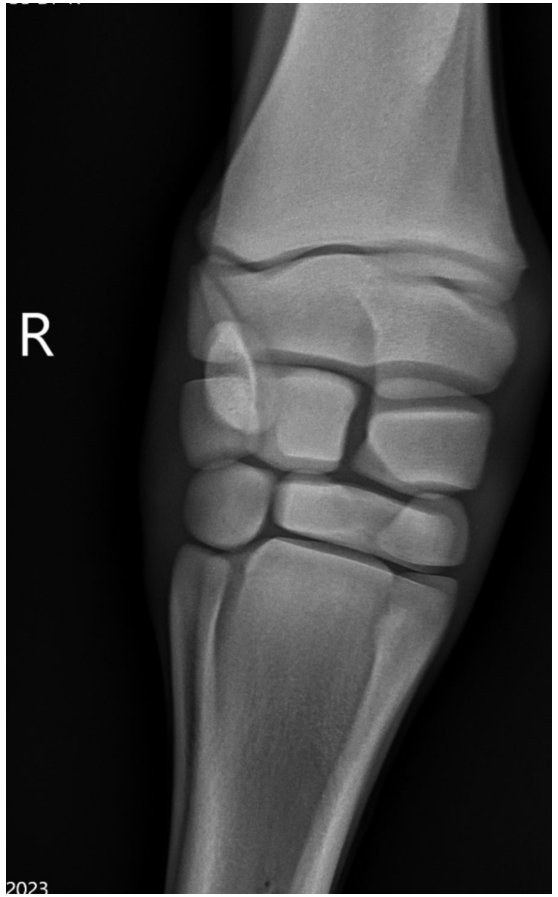
8-12 hour hold Quarter Horse colt

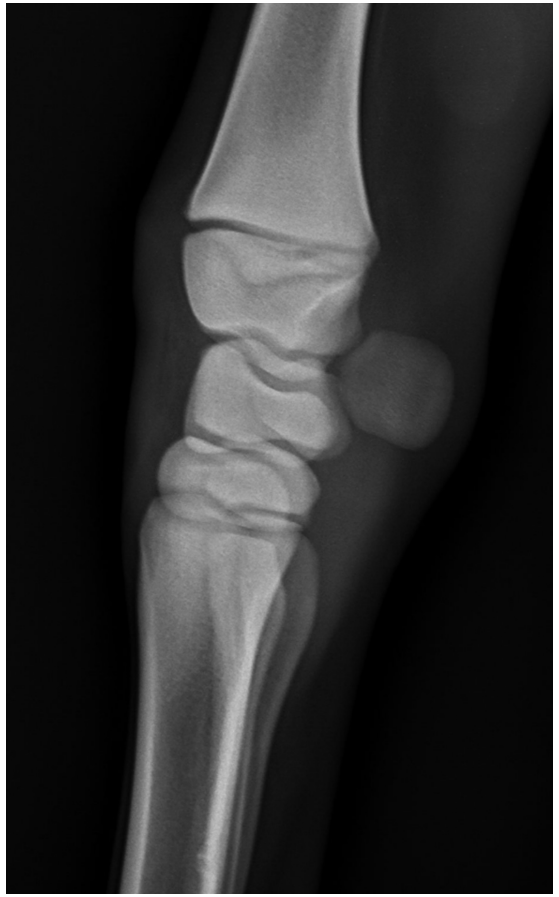
- Radiographs

Case 1

8-12 hour hold Quarter Horse colt

- Radiographs





Case 1

Treatment

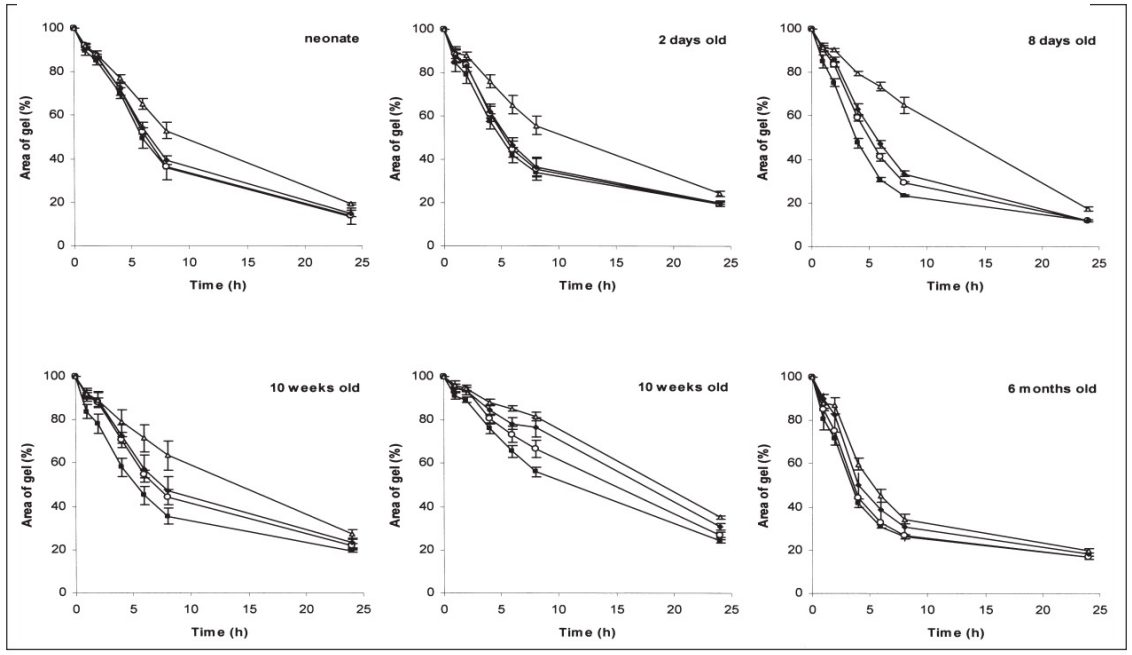
- Oxytetracycline
  - 3g IV administered in 1L 0.45% NaCl
- Analgesics
  - Ketoprofen
    - 0.5 mL IV once
  - Fentanyl patch
    - 50 mcg/kg/hr x 2
- Bandages/Splints
  - Full limb bandages with caudally placed full limb splints 12 hours

Case 1

Review: Basic Principles for Treating Congenital Tendon Contracture

In vitro effects of oxytetracycline on matrix metalloproteinase-1 mRNA expression and on collagen gel contraction by cultured myofibroblasts obtained from the accessory ligament of foals

Steven P. Arnoczky, DVM; Michael Lavagnino, MS; Keri L. Gardner; Tao Tian, PhD; Zachary M. Vaupel, BS; John A. Stick, DVM



- Oxytetracycline
  - Mediated by inhibition of MMP-1 mRNA expression in equine myofibroblasts
  - MMP-1 = component of cell's ability to remodel and align ECM in developing ligaments and tendons
    - Inhibiting normal collagen organization/structural remodeling
    - More biomechanically compromised tissue
  - Tissue is more susceptible to creep/elongation with weight-bearing
  - Effect is dose-dependent
  - Significant reduction in efficacy with increasing age

Case 1

Review: Basic Principles for Congenital Tendon Contracture

- Oxytetracycline Adverse Effects
  - Ensure foals are nursing, adequately hydrated

veterinary sciences

MDPI

Case Report

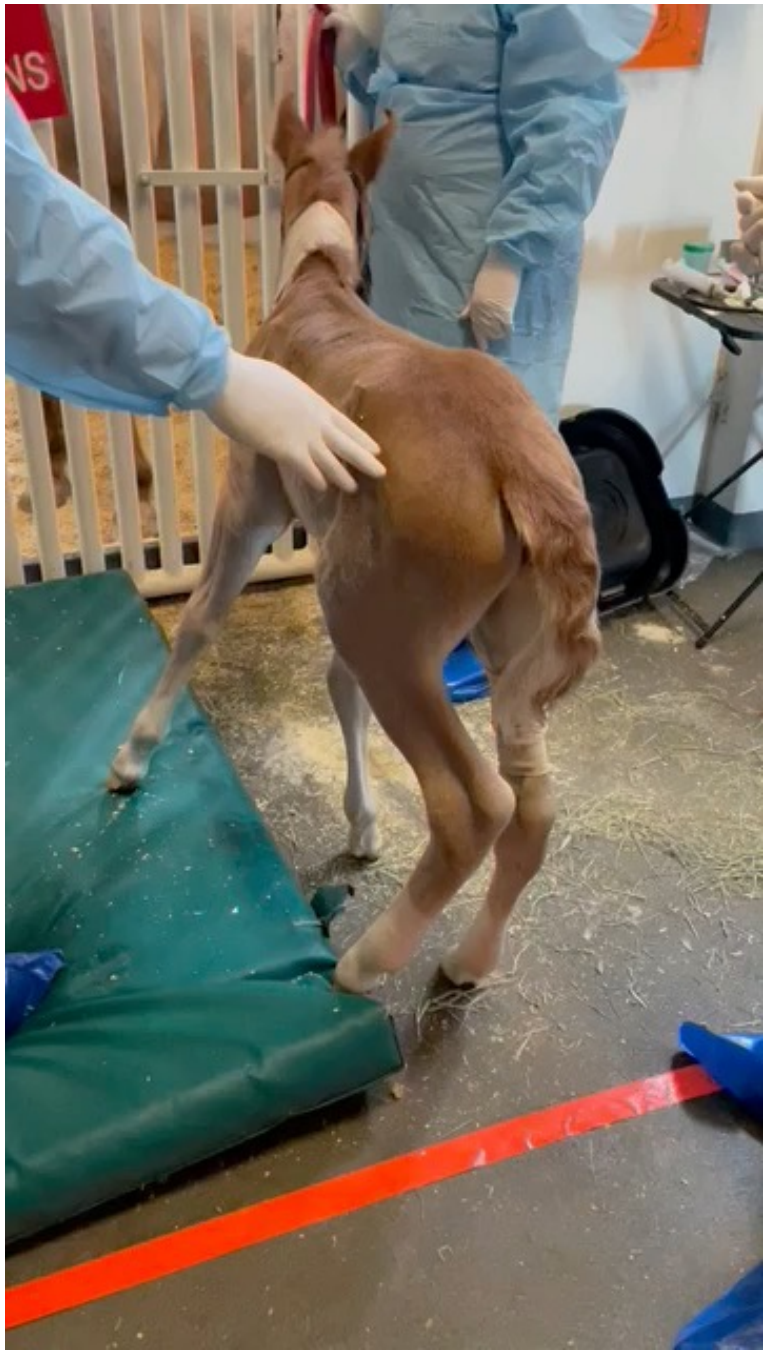
Rhabdomyolysis and Acute Renal Failure Associated with Oxytetracycline Administration in Two Neonatal Foals Affected by Flexural Limb Deformity

Nicola Ellero [1], Francesca Freccero [1,*], Aliai Lanci [1], Maria Morini [1], Carolina Castagnetti [1,2] and Jole Mariella [1]

Case 1

Treatment

- Bandages/Splints
  - Removed bandages/splints at 12 hours
  - Left unbandaged the rest of the day
  - Continued improvement



Case 1

Treatment

- 48 hours later
  - Colt still in hospital due to diarrhea
  - Some distal limb contracture noted to be returning
  - Distal limb bandages placed for 24 hours
  - New fentanyl patch x 1
  - Next day added limited controlled exercise

Case 1

Treatment

- Another 48 hours later
  - Mild contracture noted immediately following controlled exercise
  - Distal limb bandages applied again
  - Marginal improvement noted next day
  - 2nd dose of oxytetracycline and re-applied splints
  - 12 hours on, 12 hours off bandaging for a total of 5 days

Case 1

Treatment

- Discharge instructions
  - Stall confinement with round pen turnout for 30 minutes BID
  - Gradual increase in turnout time every 48 hours for 1-2 weeks
  - If limb conformation remains normal, transition to regular turnout
  - Avoid overly rich feeds for mare
  - Consider weaning early if flexural limb deformities continue to be a concern as the colt grows

Case 2

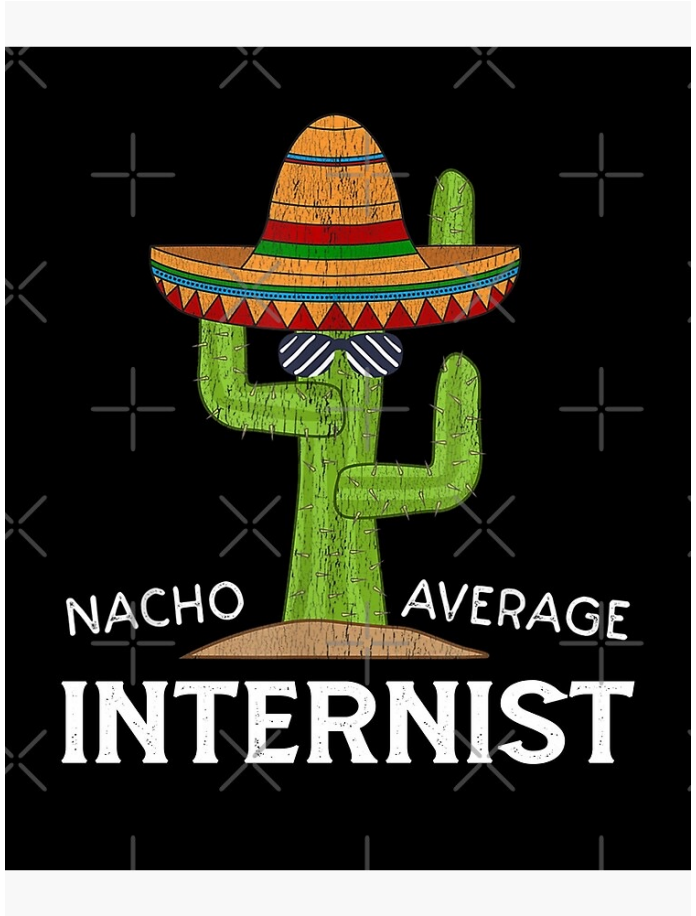
Warmblood colt, presented at 5 hours of age

- Presented to OSU Emergency
- Bilateral forelimb contracture at the fetlock, pastern, coffin joints (marked) and carpi (mild)
- Unable to stand to nurse at home

Case 2

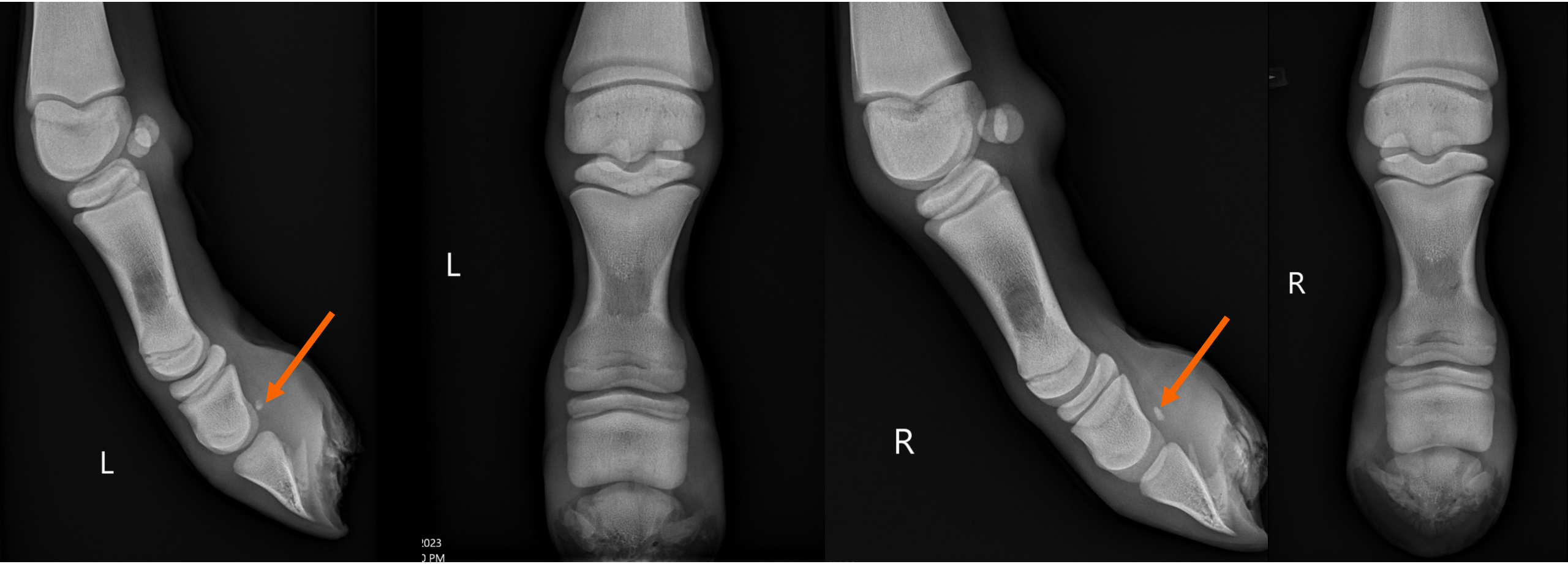
Warmblood colt, presented at 5 hours of age

- On Presentation:
  - Vital parameters WNL
  - Had not passed manure or nursed adequately
  - IgG below 400 mg/dL, received 1L hyperimmune plasma
  - Developed symptoms of hypoxic ischemic encephalopathy……



Case 2

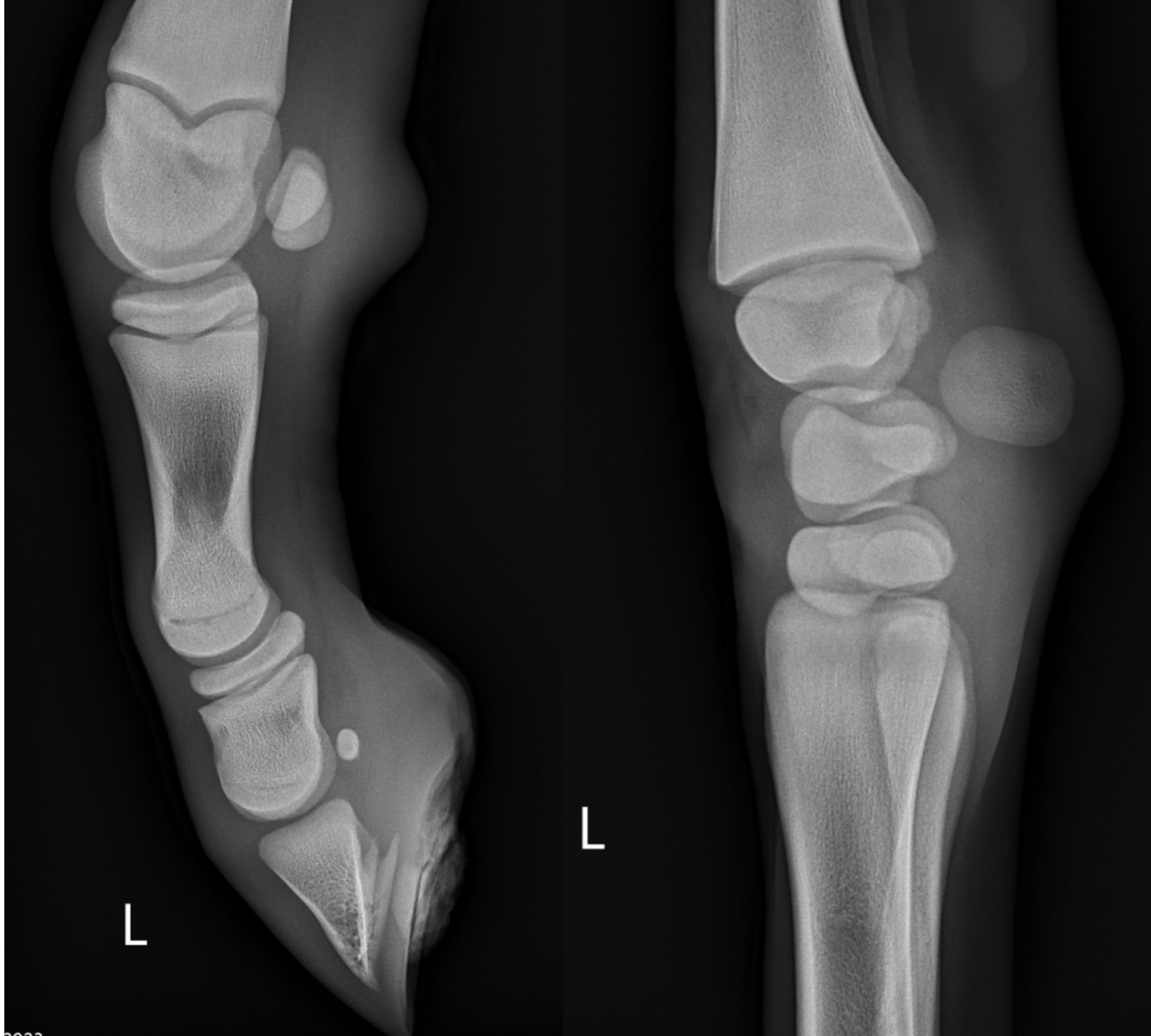
Radiographs



Case 2

Radiographs

- Foaling was appropriate for gestational age
- No known health issues for mare
- Intended for athletic use and/or sale



Case 2

- Normal gestational length (335 days)
- Placenta passed normally but had green discoloration diffusely
- Mare had premature mammary development
- 86 days hospitalization
- Foal ossified cuboidal bones completely and went on to do well

EQUINE VETERINARY EDUCATION
Equine vet. Educ. (2003) **15** (2) 72-81

Case Report

Incomplete ossification of the carpal, tarsal and navicular bones in a dysmature foal

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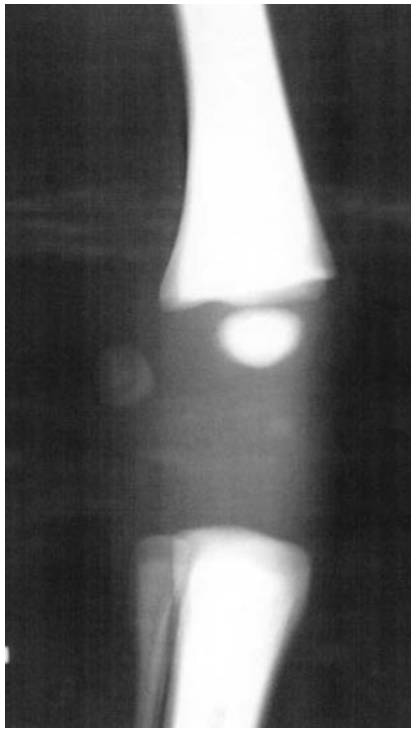
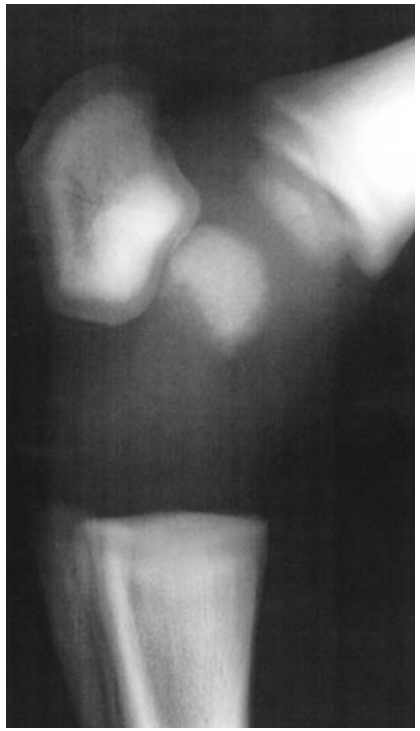
Keywords: horse; foal; dysmature; ossification; carpal bone; tarsal bone; navicular bone; cuboidal bones

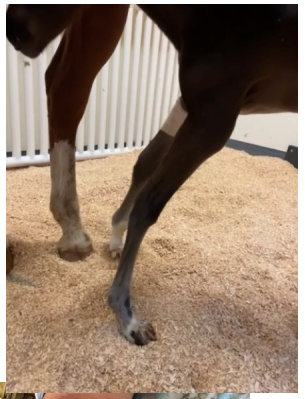




Case 2

Treatment of Tendon Contracture – Day 1

- Oxytetracycline
  - 3 g in 1L fluid bolus IV
- Caudally applied full limb splints
  - Left in place 24 hours
- Fentanyl patch 50 mcg/hr x 2



After first 24 hours of splinting

Case 2

Treatment of Tendon Contracture – Day 2

- Oxytetracycline, 2nd dose
  - 3 g in 1L fluid bolus IV
- Caudally applied full limb splints
  - Left in place another 24 hours
- Fentanyl patches still in place
- Add Acetaminophen 1.5 tabs Q12h PO

Case 2

Treatment of Tendon Contracture – Day 3

- Oxytetracycline, 3rd dose
  - 3 g in 1L fluid bolus IV
- Mild additional improvement to fetlock/coffin contracture
- Caudally applied full limb splints
  - Left in place another 24 hours
- Fentanyl patches still in place
- Acetaminophen
- Added cuff shoes with toe extensions

Case 2

Treatment of Tendon Contracture – Day 4

- Significant improvement to fetlock/coffin contracture
  - Stumbles occasionally
- Laxity to palmar carpus
- Full limb bandages with half limb caudal splints
- New Fentanyl patch applied (x1)
- Acetaminophen
- Continued cuff shoes with toe extensions

Case 2

Treatment of Tendon Contracture – Day 5

- Continued improvement to fetlock/coffin contracture
- Full limb bandages with half limb caudal splints
- Fentanyl patch still in place
- Acetaminophen
- Cuff shoes with toe extensions
- Significant ALD, particularly bilateral carpal valgus

Case 2

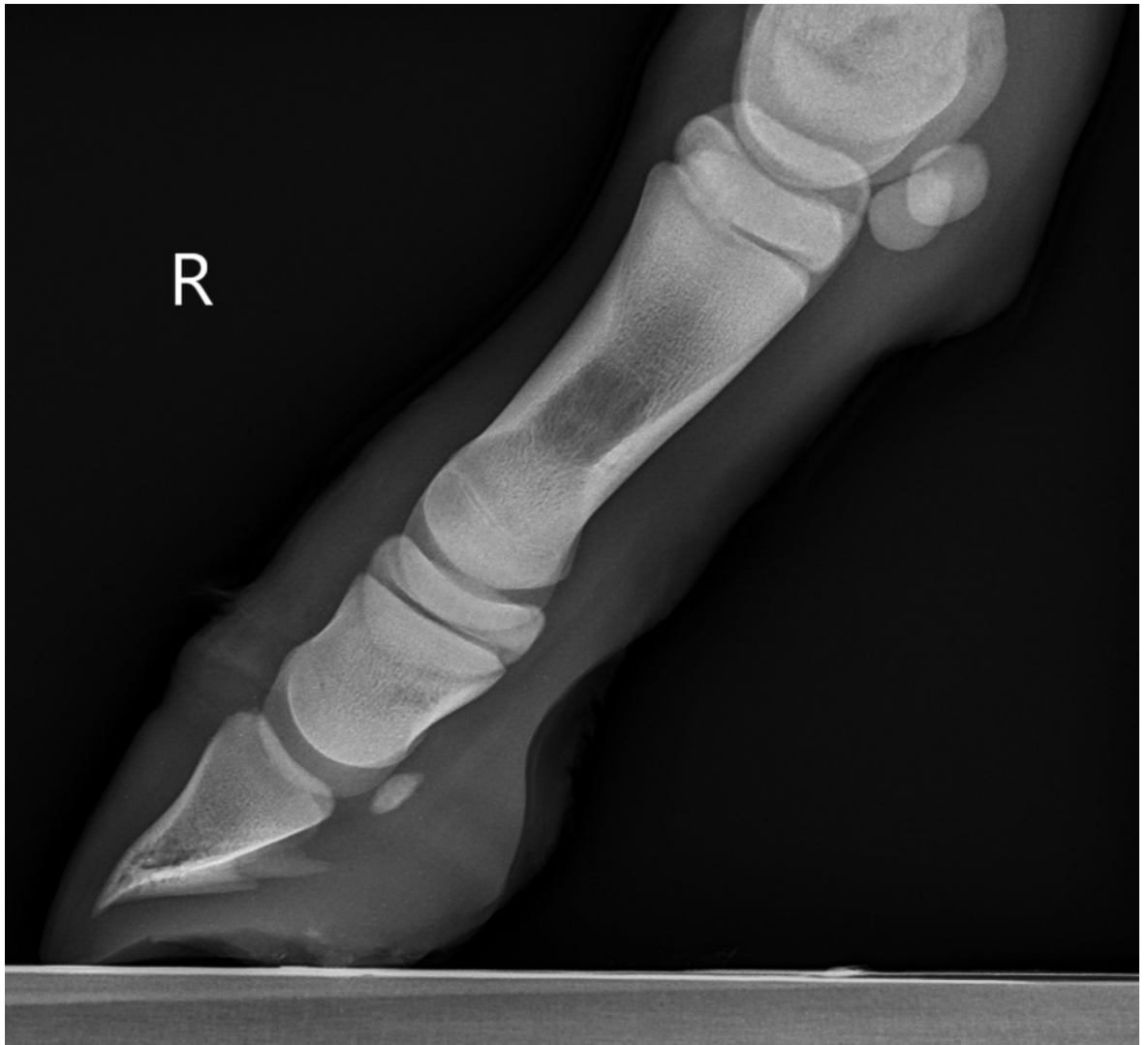
Treatment of Tendon Contracture – Days 6 - 11

- Full limb bandages with half limb caudal splints day 6
- Full limb bandages only day 7
- Cuff shoes with toe extensions removed day 7
- Day 8 went to wraps 12 hours on, 12 hours off
- Transitioned to distal limb wraps only 12 hours on, 12 hours off
- Discontinued bandages day 11
- Fentanyl patch discontinued day 10
- Acetaminophen through discharge, discontinued after 20 days

Case 2

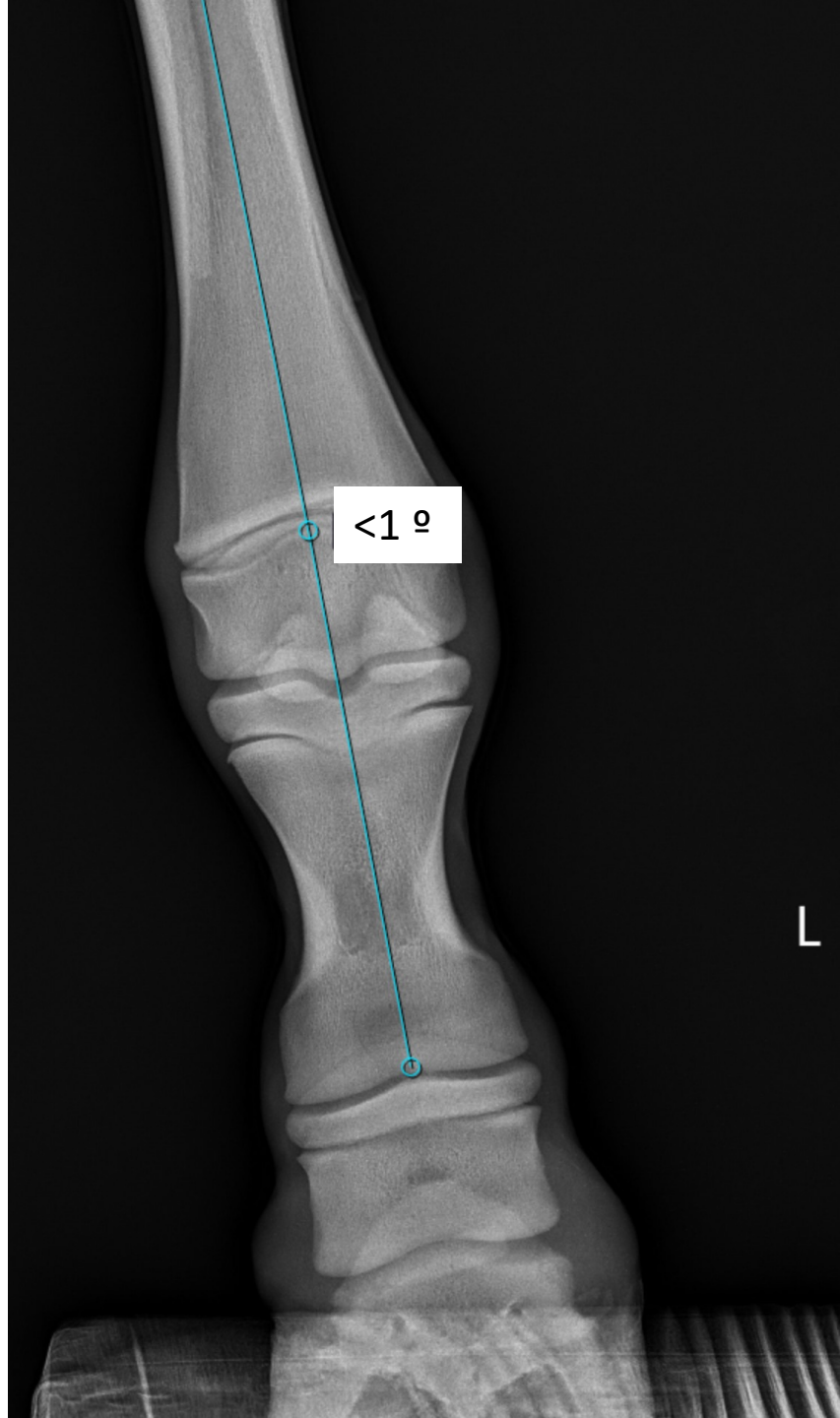
Radiographs

10 days old



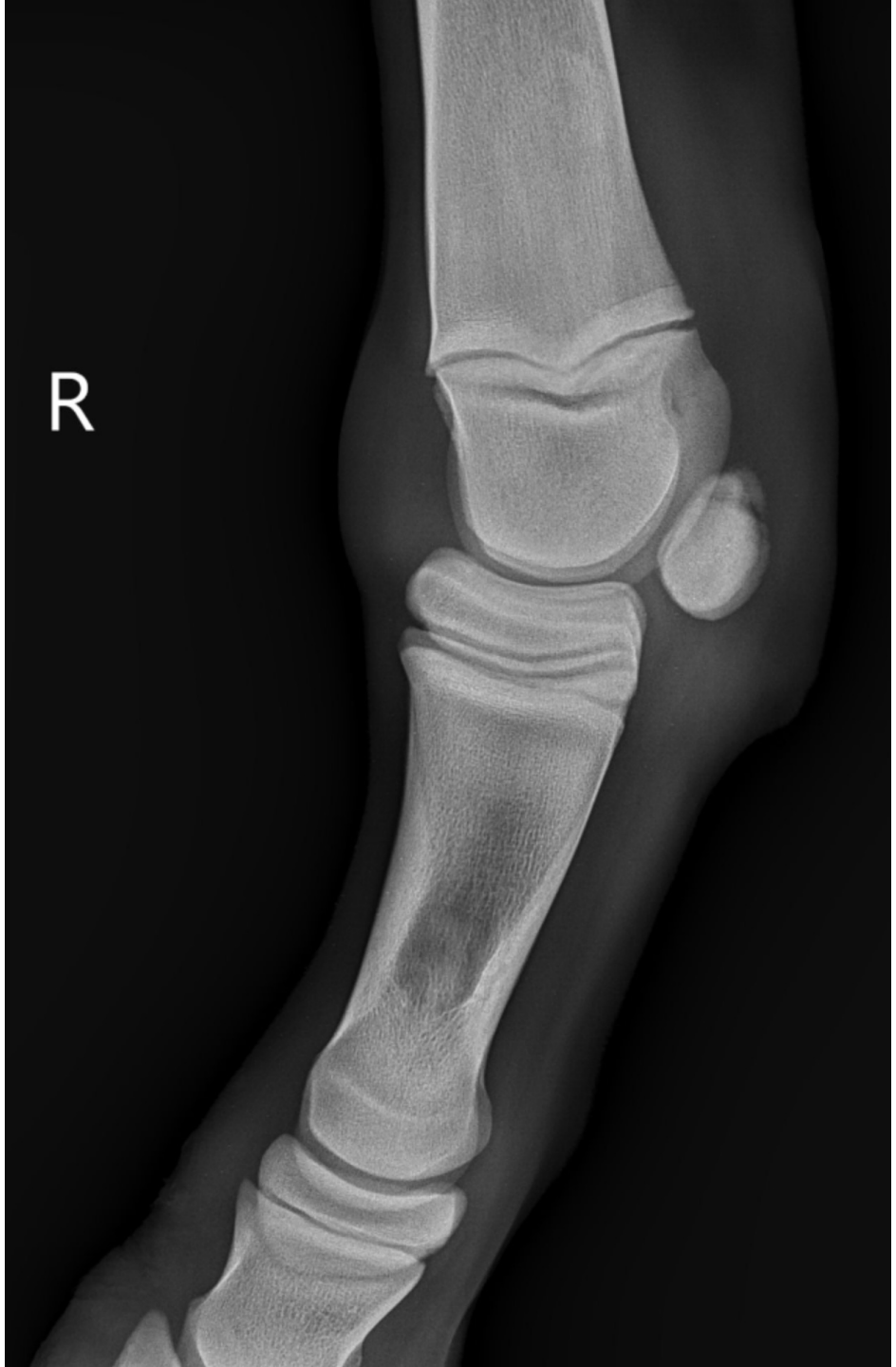
Case 2

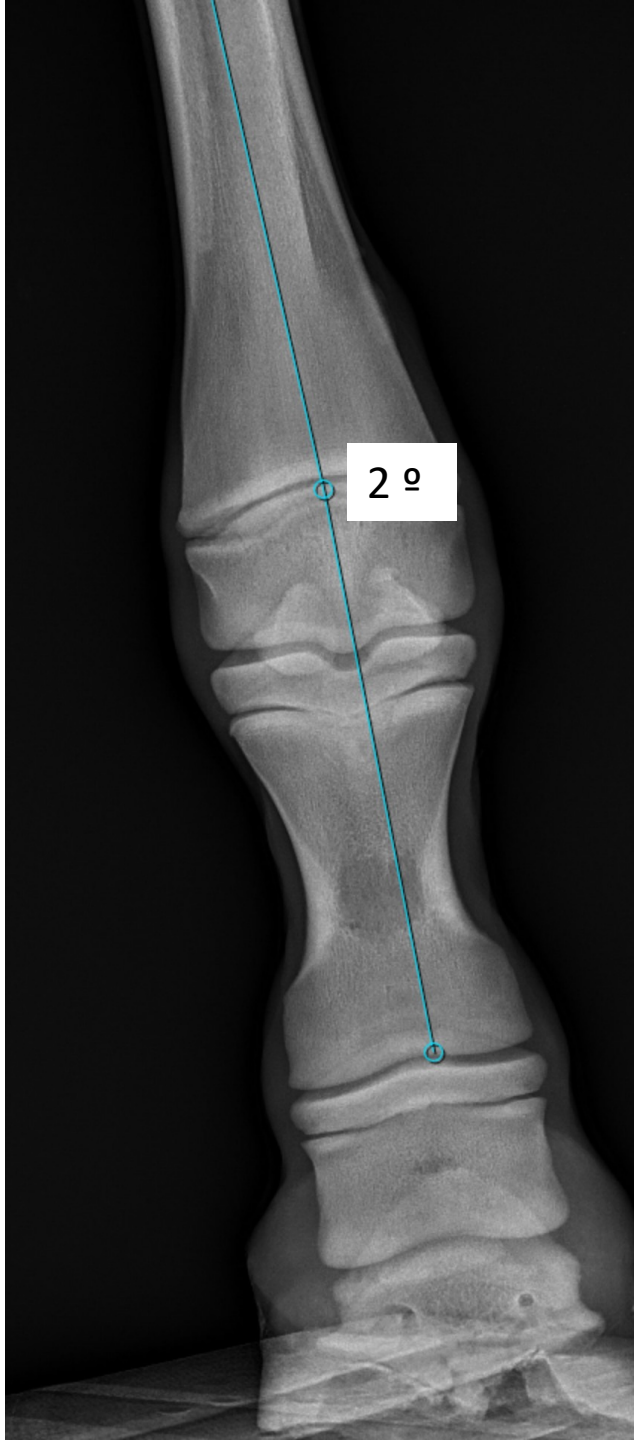
Radiographs



Case 2

Radiographs

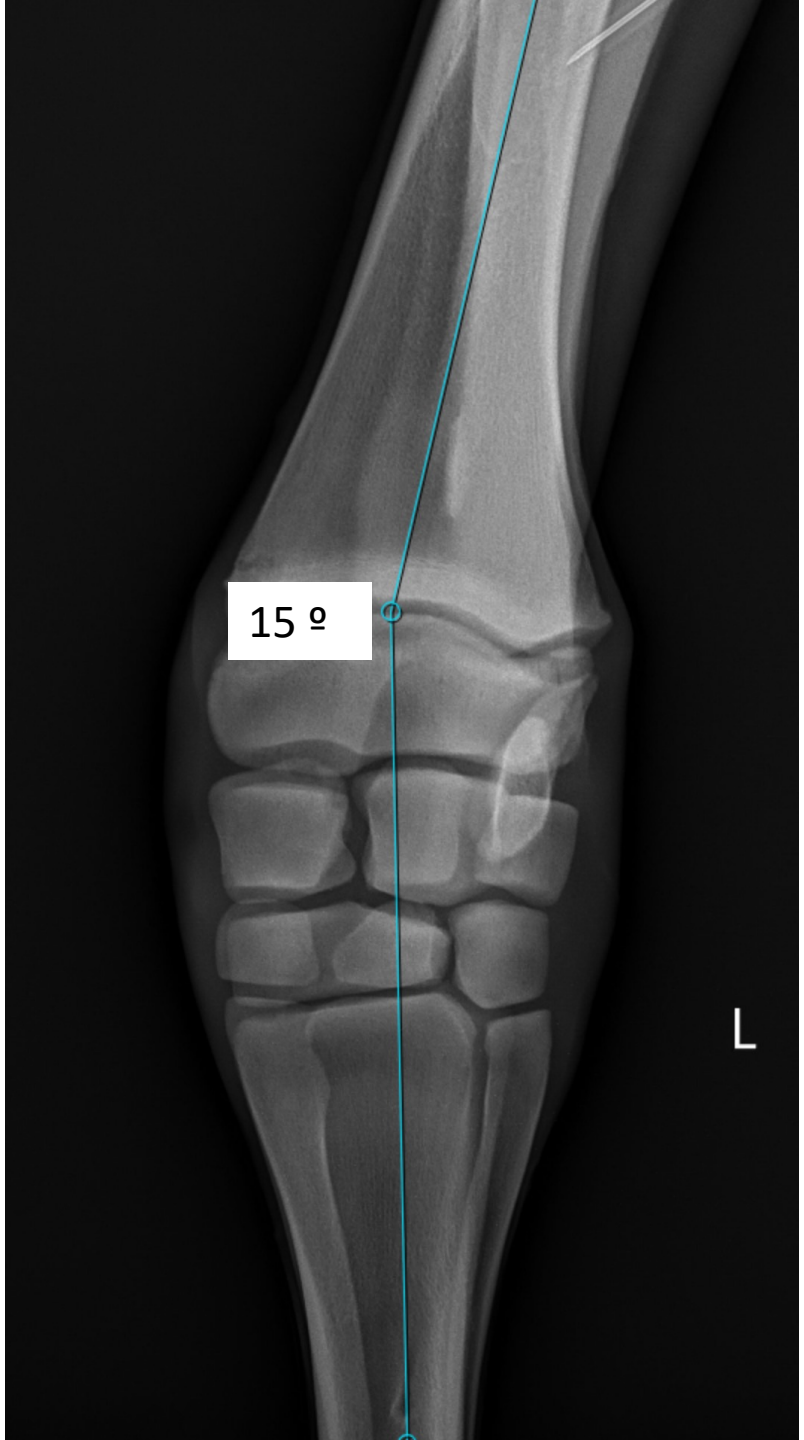


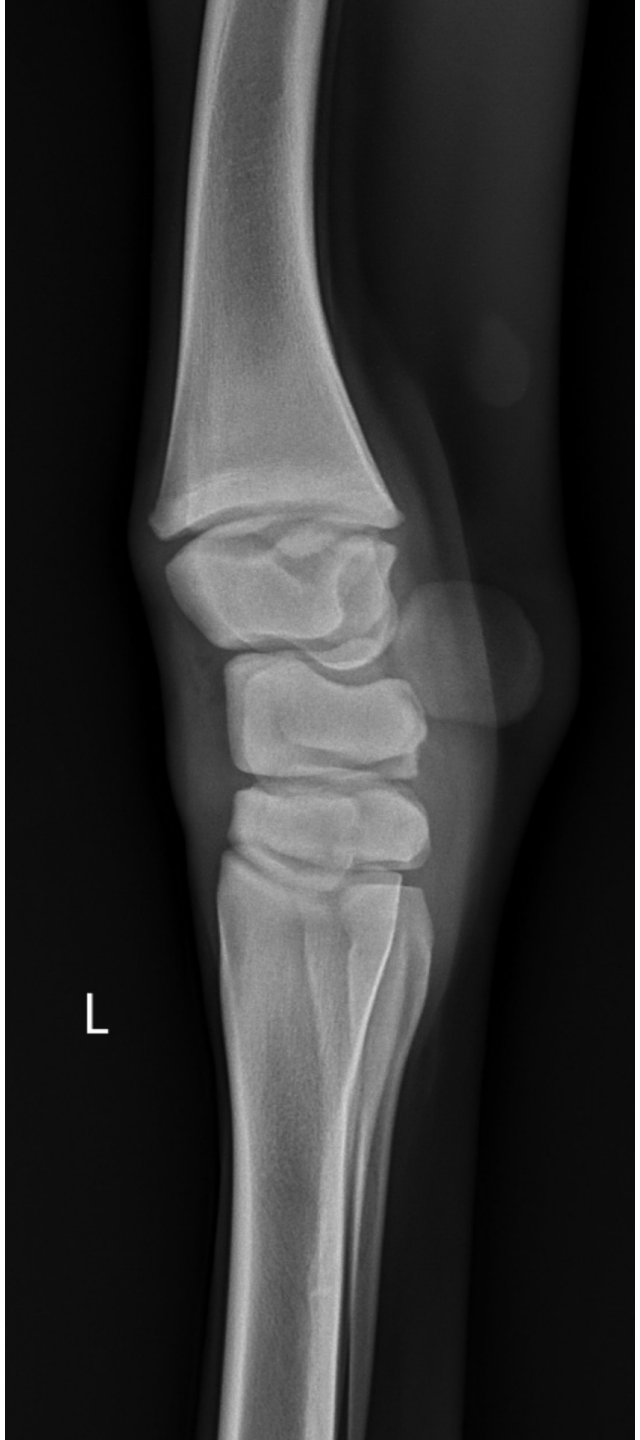


Case 2

Radiographs

30 days old

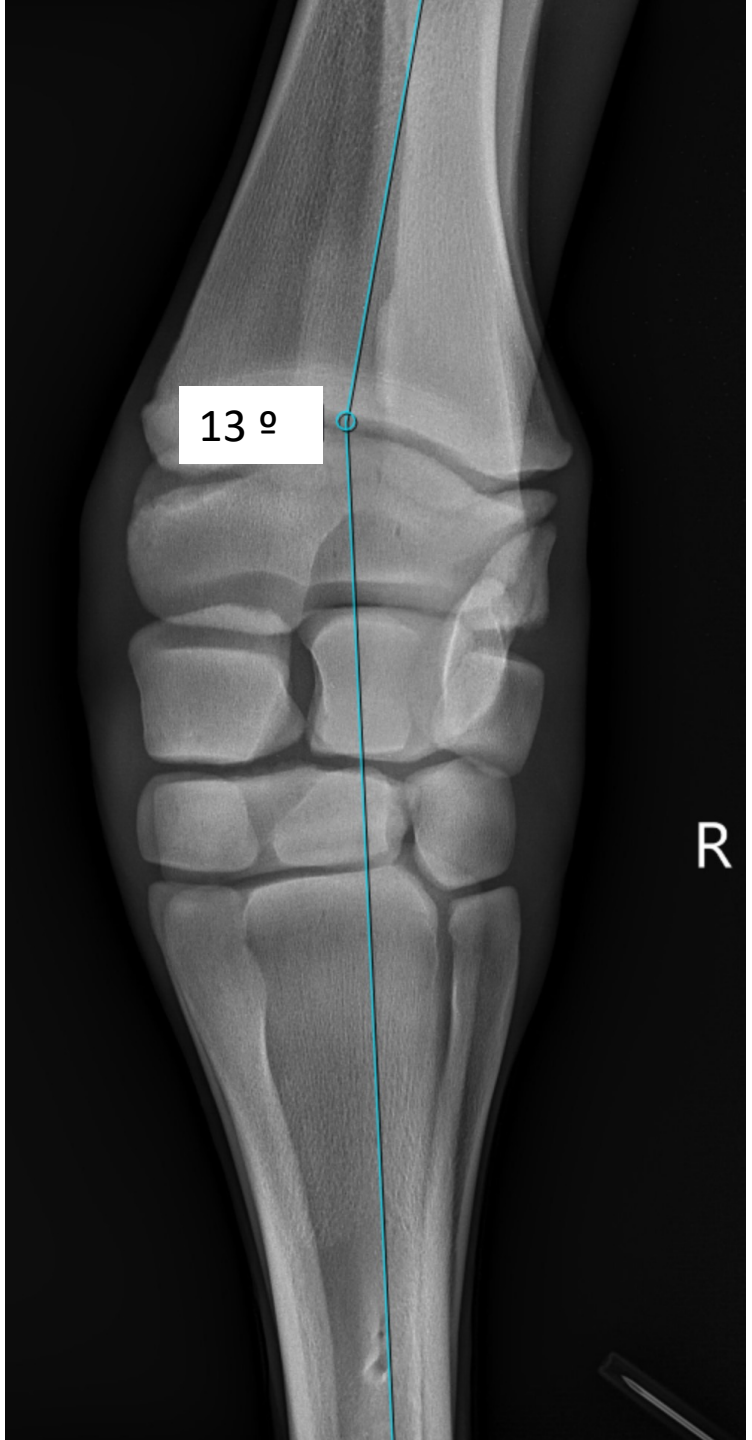




Case 2

Radiographs

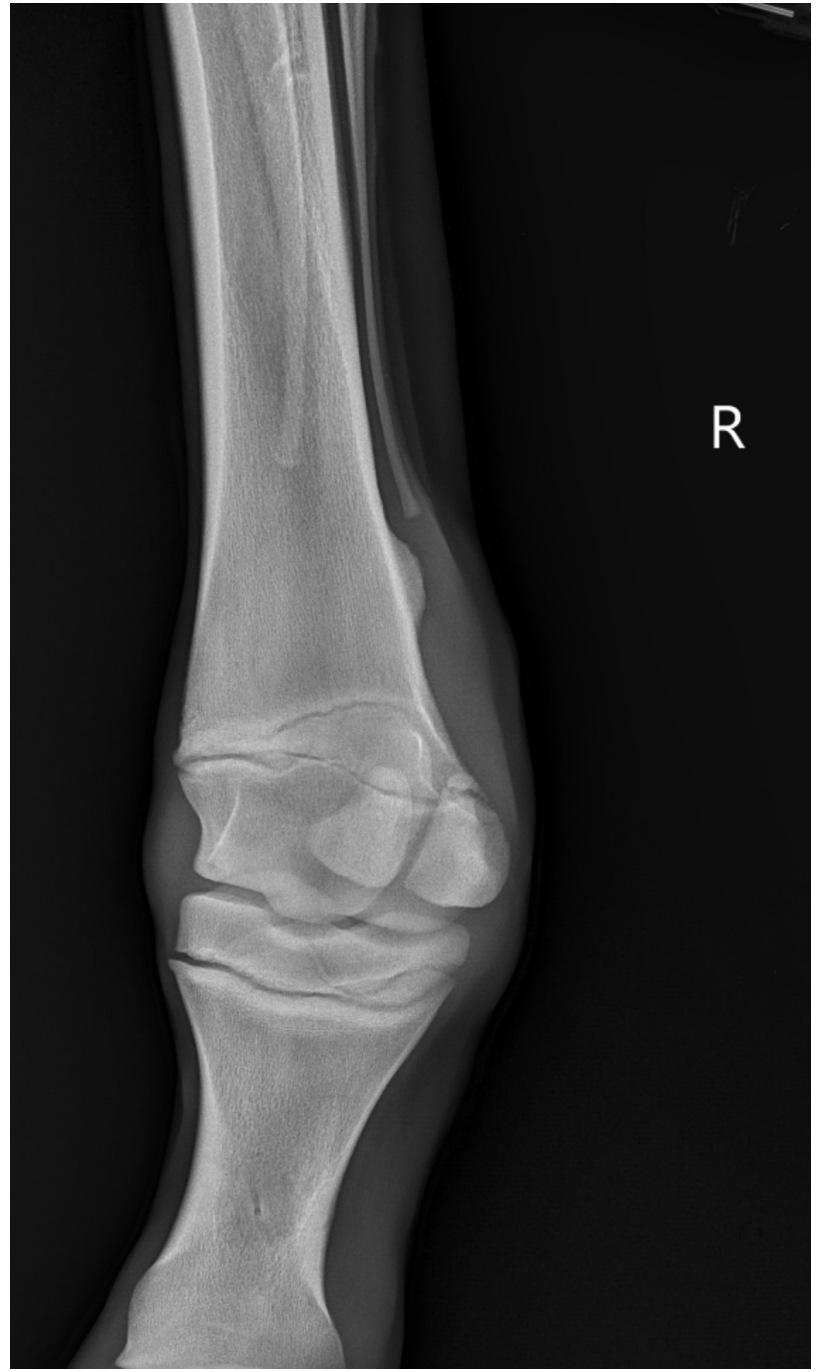
30 days old



Case 2

Recheck 60 days of age

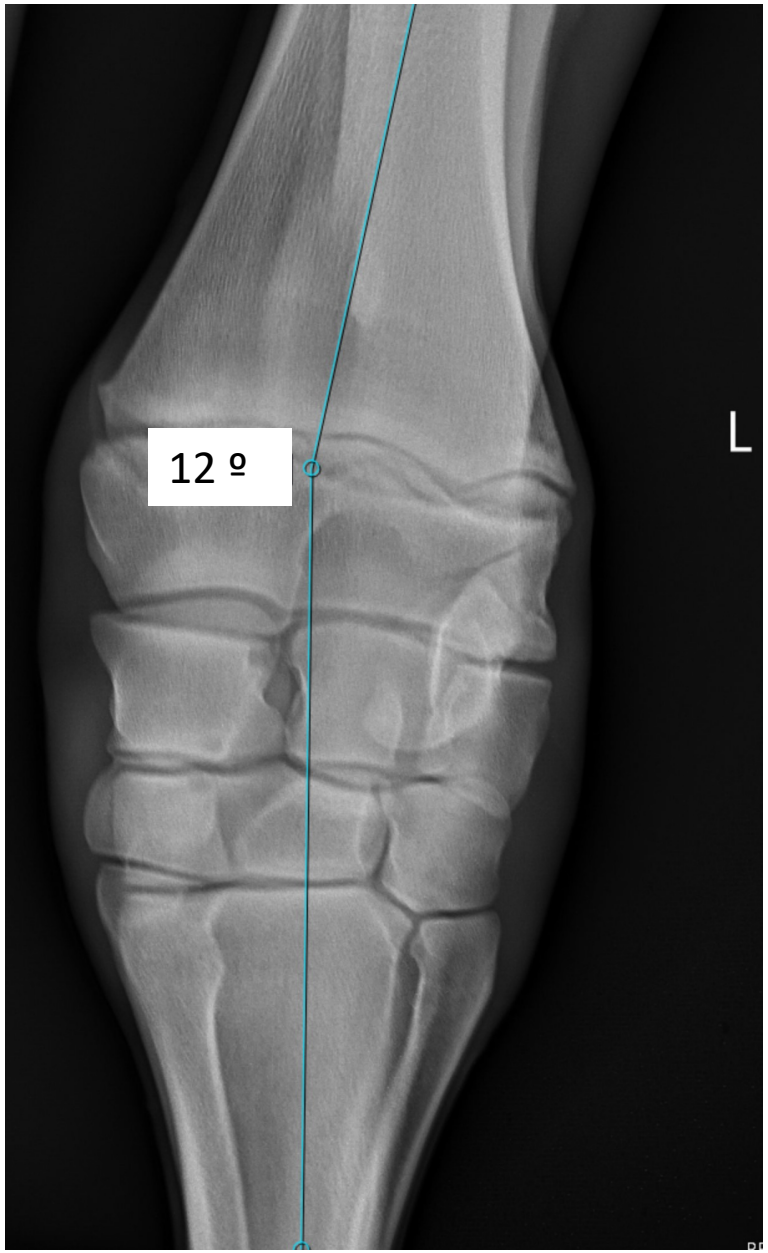
- Significant improvement in ALD on visual examination
- Recheck sesamoid fracture

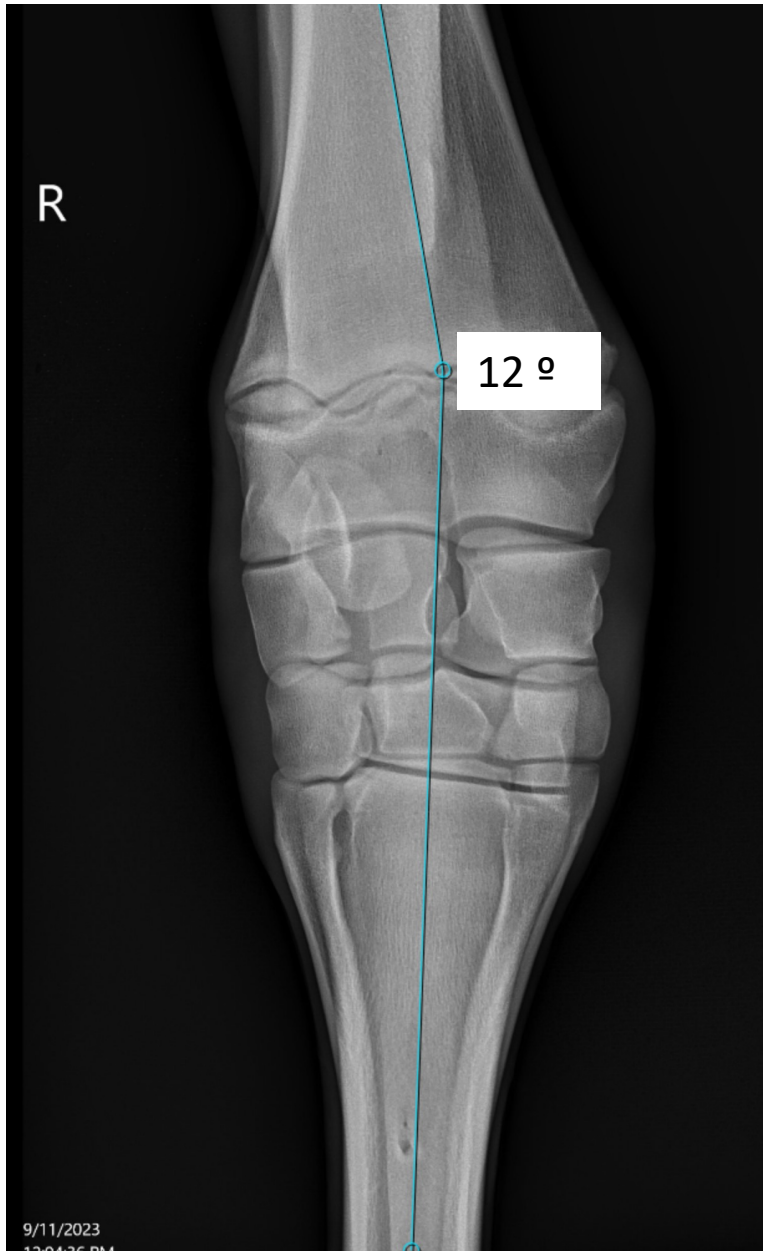


Case 2

Recheck 120 days of age

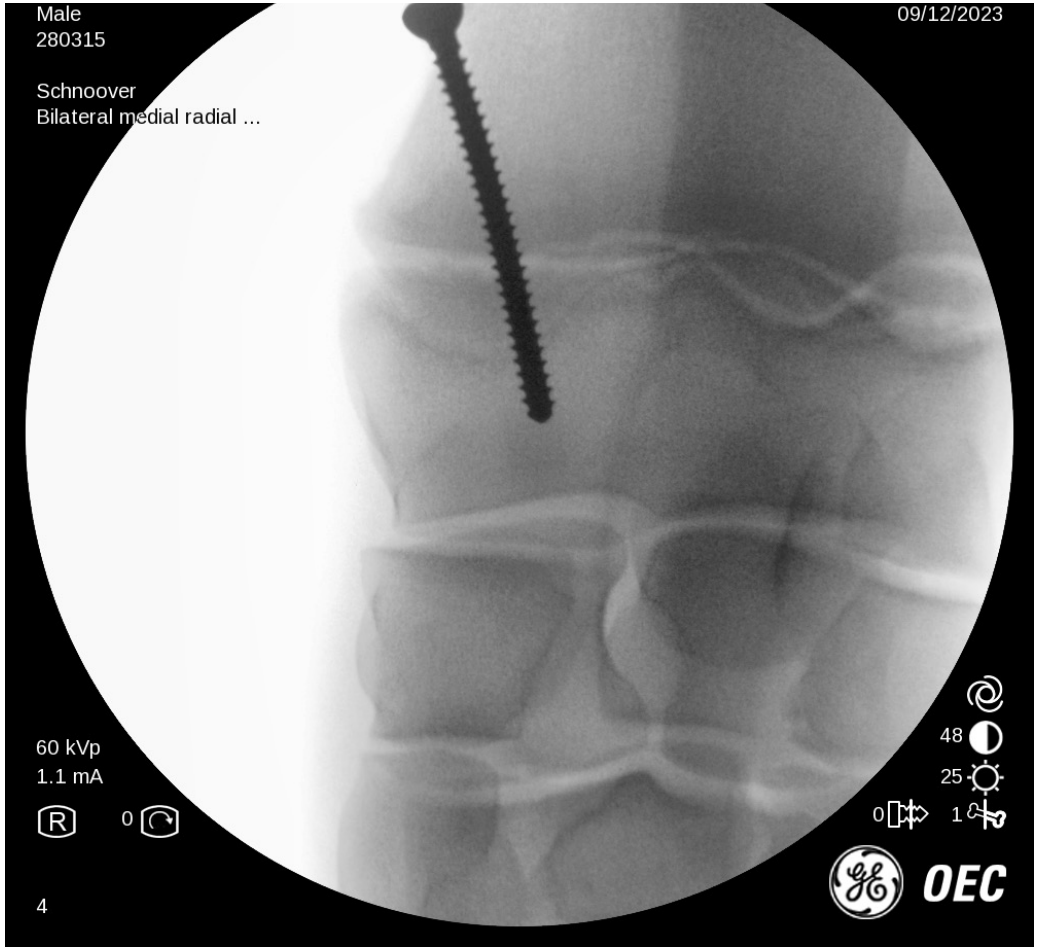
Surgical intervention elected given age of colt

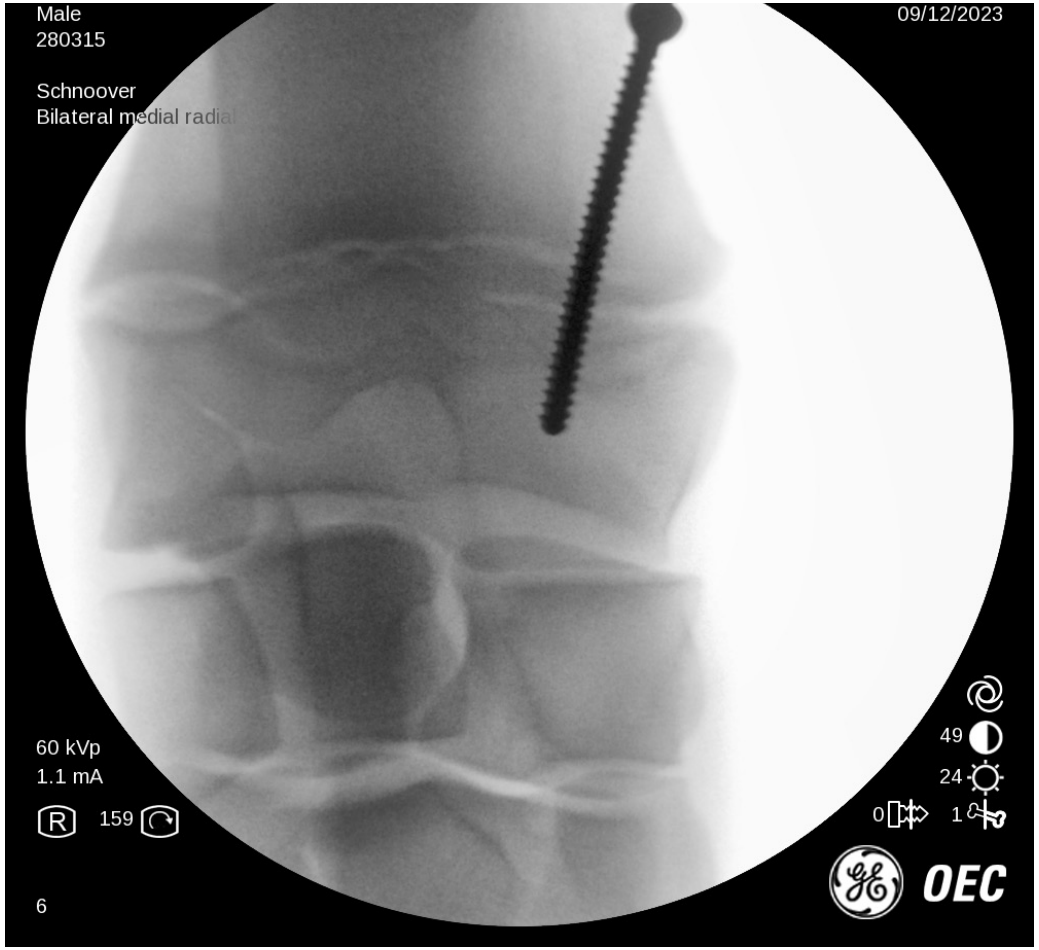




Case 2

Transphyseal Screw Placement 9/12/23

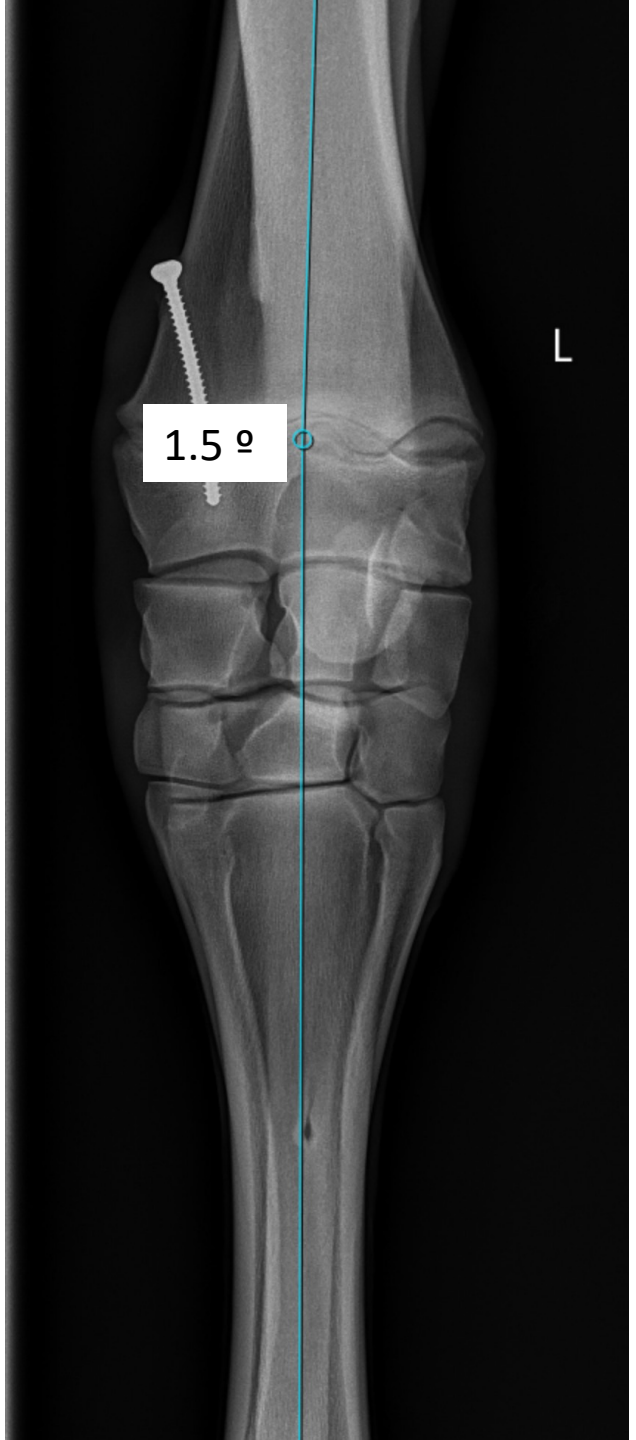


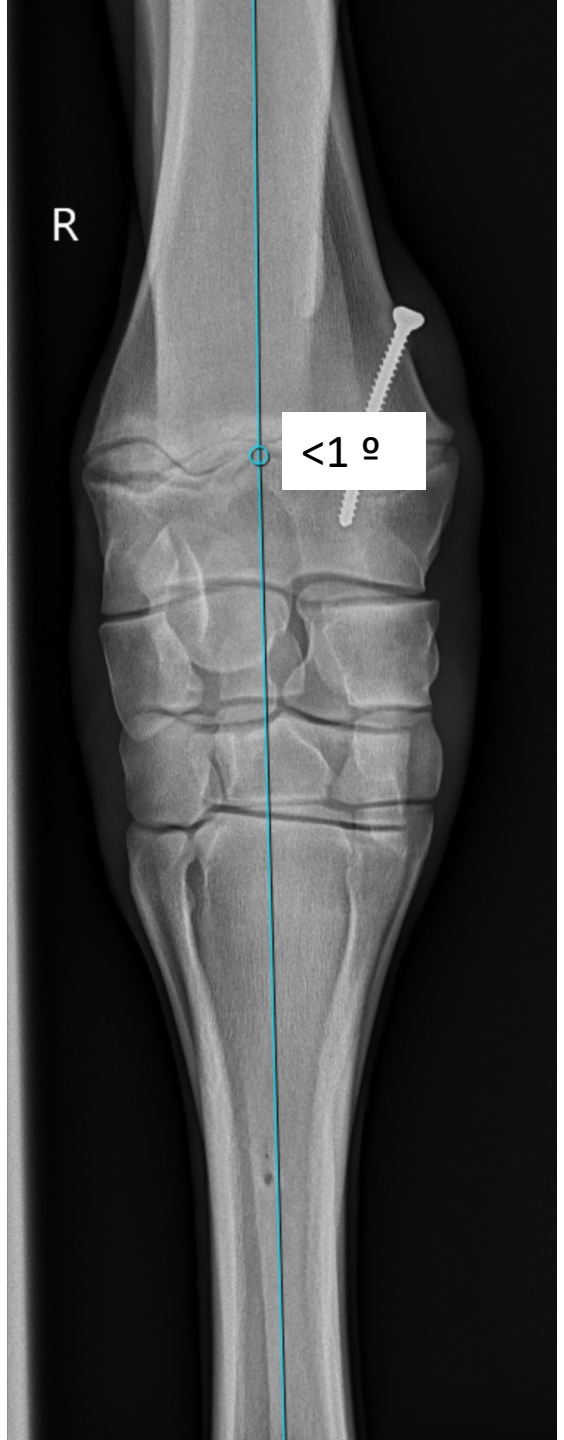


Case 2

Recheck 10/19/23

Ready for Implant Removal





Case 3

4-Day Old Bucking Stock Colt

- Presented for suspected injury of RF fetlock
- Born in pasture

Case 3

4-day old Bucking Stock Colt

- Presentation to OSU
  - BAR, vital parameters WNL
  - Severe congenital flexural deformity involving fetlock, pastern, coffin joints
  - Walking on dorsal hoof wall/toe
  - Range of motion in fetlock joint reduced

Case 3

Radiographs

Case 3

Initial Treatment Plan

- Oxytetracycline
  - 2.5 g in 1L saline IV
- Bandaging/splinting
  - Challenges related to bucking stock
  - Elected to splint dorsally, distal limb only
- Analgesia
  - Equioxx ¼ tab (57 mg tablet) PO SID

Case 3

Days 2 - 3

- Oxytetracycline
  - 2.5 g in 1L saline IV
- Bandaging/splinting
  - Continued splinting, changed every 24h
- Analgesia
  - Equioxx
- Steady progress made daily

Case 3

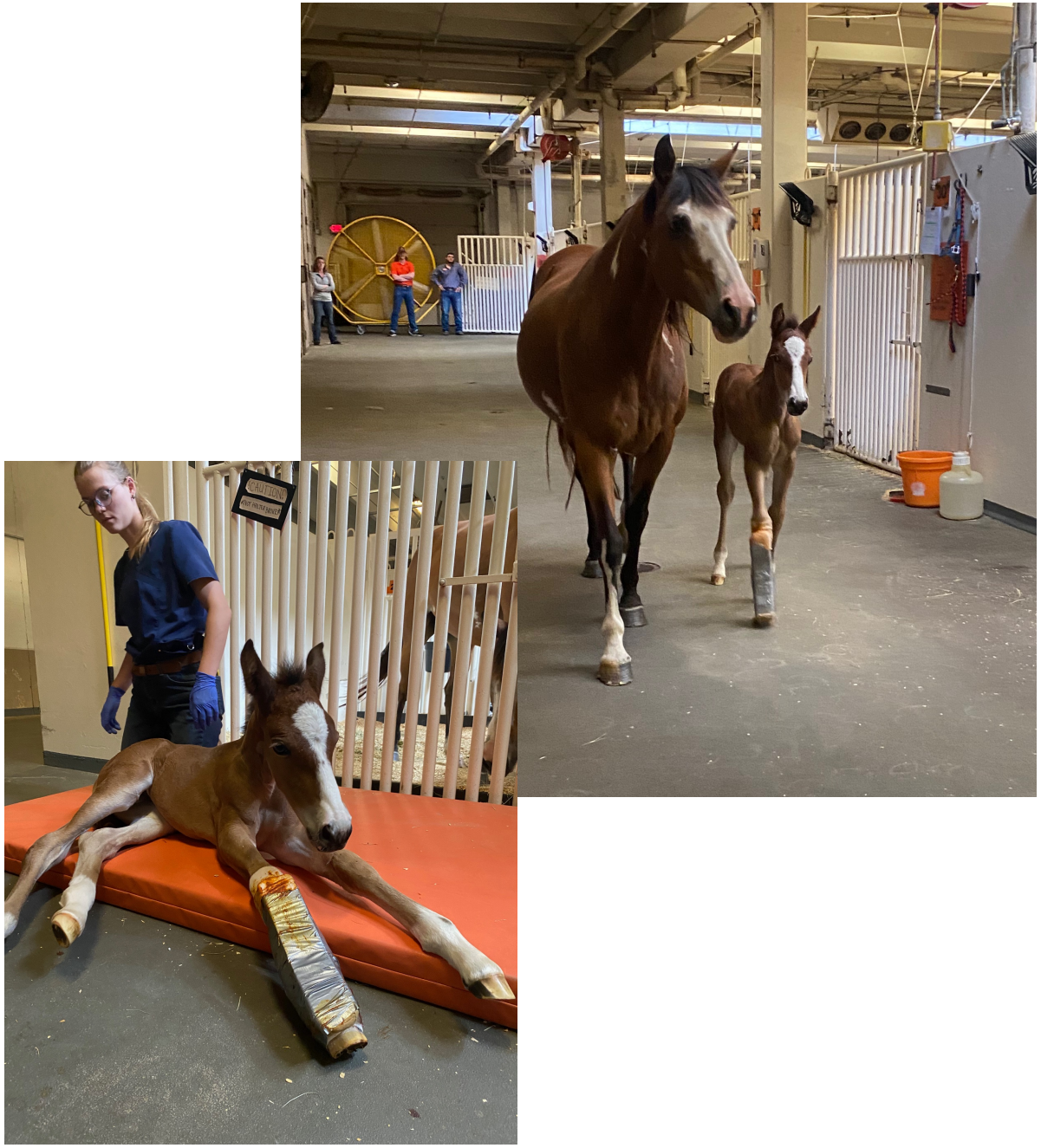
Days 4 - 8

- No additional oxytetracycline
- Continued Bandaging/splinting
  - Re-placed once daily
- Analgesia
  - Equioxx

Case 3

Days 9 - 11

- Prognosis???
  - Intended use
  - Quality of life
- Surgical treatment options?
  - Superior and inferior check desmotomy
  - Tenotomy
  - Suspensory ligament desmotomy
  - Joint capsule
- Oxytetracycline
  - 2.5 g in 1 L saline IV days 9, 10, 11
- Limited controlled exercise
- Continued Bandaging/splinting
  - Re-placed once daily



Case 3

Complications

- Prognosis, quality of life again discussed
- Continued splinting another 6 days
- Tissue sloughing
- Foal developed significant lameness
- Surgery???
  - Previous options discussed again
  - Long-term salvage option
    - Fetlock arthrodesis?!?

Case 3

Complications

- Degree of lameness and tissue slough directly overlying dorsal fetlock joint
  - Concerns for sepsis
- Arthrocentesis
  - Sympathetic neutrophilic inflammation
  - 500 mg Amikacin IA
  - No communication with wound
- Management of wound and flexural deformity
  - Distal limb cast for 3 days

Case 3

Complications

- Removed cast and assessed wounds
- Placed bandage cast
- Bi-valved to use as splint
- Changed daily to manage wounds

Case 3

Progression

- Owners unsure of how they would like to proceed
- Not ready to euthanize
- Elected to try to get the wound to heal before making additional decisions
- Discharged for management of wounds at home

1 month following discharge

Case 3

Last Effort

- 2 months from initial presentation
- Options
  - Flexor tendons are lax
  - Joint capsule fibrotic
- Do nothing = poor quality of life
- Fetlock arthrodesis at 2 months of age??????
- Elected to anesthetize, surgically transect flexors, joint capsule to see if able to get any correction
- Euthanized on table

Case 3

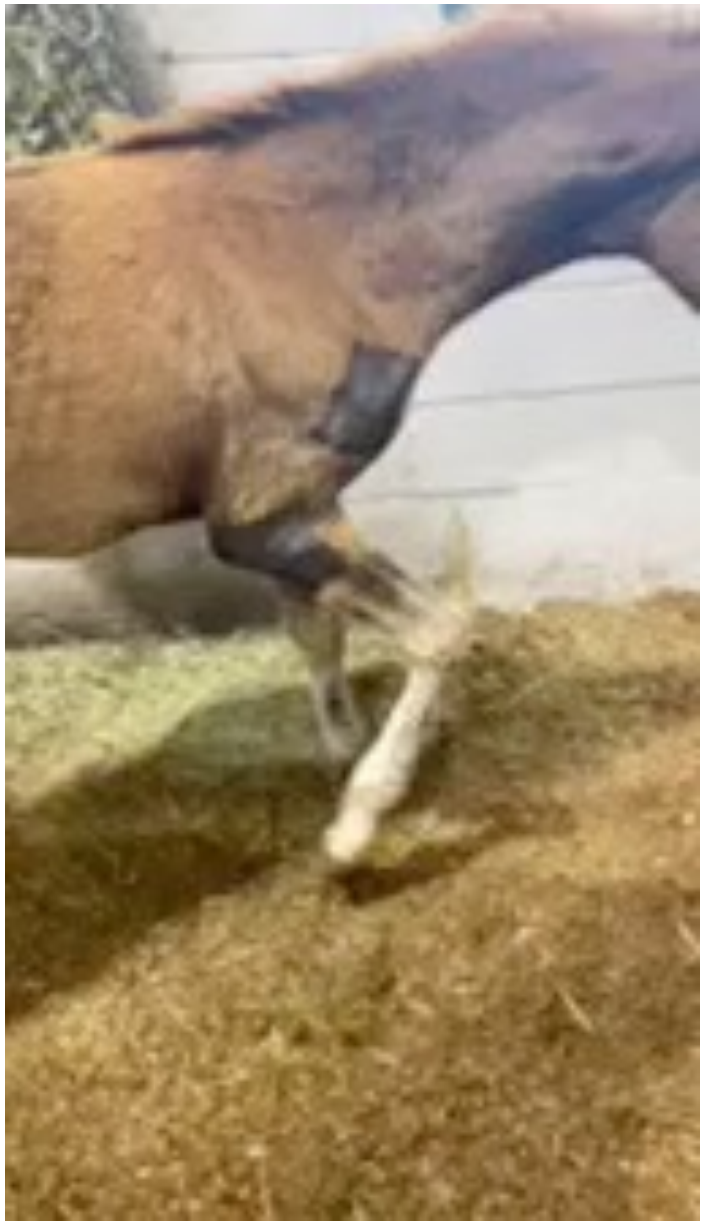
What could we have done differently?

- Foal presentation day 1
- Pursue surgical treatment earlier
  - Superior, inferior check desmotomy
- Difference in type/placement of splint
- Was this case doomed from the start?

Case 4

3-Month Old National Show Horse Filly

- Presented for acute onset non-weight bearing RF lameness
- Housed on pasture
- rDVM is an equine internist, performed radiographs and ultrasound of shoulder, humerus, radius/ulna
- No significant abnormalities
- Horse presented for CT scan
- Rule in/out more subtle fractures, septic physitis, etc.



Case 4

Presentation to OSU

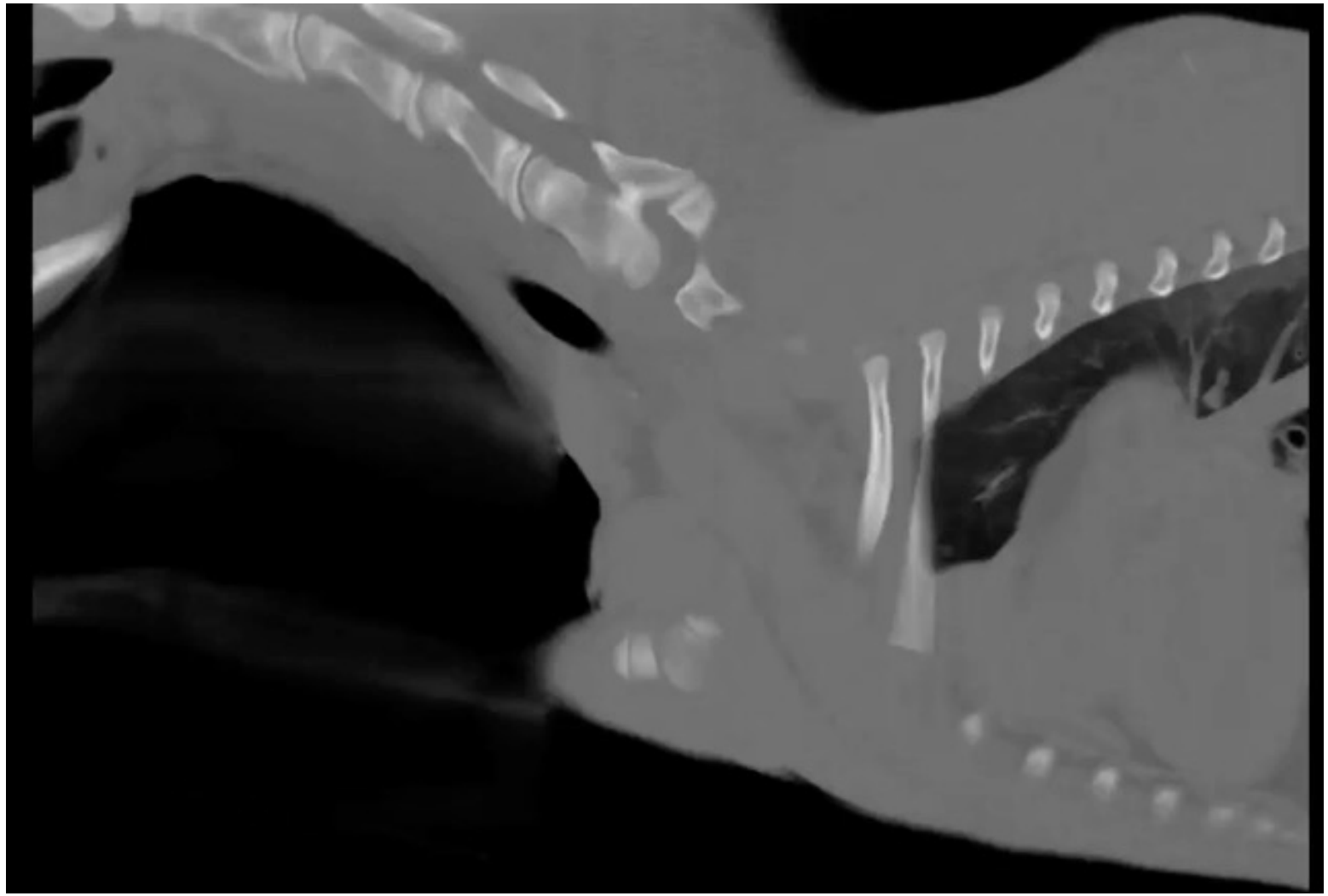
- BAR
- Vital parameters WNL
- Non-weight bearing RF
- Mild swelling in triceps region
- No heat, pain, crepitus on palpation anywhere on limb
- No loss of skin sensation
- Remainder of neurological examination WNL

Case 4

CT

Case 4

CT



Case 4

Proposed Diagnosis

- Neuropathy, unknown etiology

Case 4

Peripheral Neuropathy

- Brachial Plexus
  - Compression between scapula and ribs
  - Can appear similarly to radial n. injury
- Radial Nerve
  - Prone to compression injuries
  - Innervates triceps musculature
  - Branches to carpal and digital extensors further distally
  - **“Dropped Elbow”, inability to extend joints distal to shoulder and to bear weight**
  - Chronic cases: inability to protract limb when jumping, intermittent lameness, stumbling
- Musculocutaneous Nerve
  - Coracobrachial muscle, limb adduction and shoulder joint extension
  - Biceps and brachialis muscle, flexors of elbow joint
  - Isolated injury unlikely
- Median and Ulnar Nerves
  - Motor to flexors of carpus, digit
  - Damage to these is rare
  - Decreased flexion of carpus and fetlock, abnormal lim bswinging during protraction

Case 4

Conservative Treatment Options for Peripheral Neuropathy

- Neuromuscular electrical stimulation
  - No data on feasibility for large limb muscles in horses
- Hydrotherapy
- Aquatic rehabilitation
- Exercise restriction and time

Case 4

Conservative Treatment

- Full limb splint support 2-3 weeks
  - Did seem more content, comfortable with splint in place
  - Developed sores from the splint so removed and left off
- Anti-inflammatories for one week

Case 4

Progress at home

- 9 days post-CT

Case 4

Case Progression

- Continued to make gradual improvement
- Update 6 months out
- Doing well on full turnout, still takes occasional lame steps
- Prognosis still uncertain for use as a performance horse but maybe a breeding prospect

Case 4

- JAVMA 2016
- Suprascapular nerve 11 horses
  - 8 returned to intended use after mean 9.3 months
- Axillary nerve 2 horses
  - Both returned to intended use after 3.5 months
- Radial nerve 14 horses
  - 9 returned to intended use after mean 13.3 months

Peripheral neuropathy of a forelimb in horses: 27 cases (2000–2013)

Anne-Laure Emond DVM
Lélia Bertoni DVM
Maeva Seignour DVM
Virginie Coudry DVM
Jean-Marie Denoix DVM

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Address correspondence to Dr. Emond (anne-laure.emond@laposte.net).

Case 4

Case 5

3-week-old Quarter Horse Filly

- LF lameness beginning one week prior to presentation
- Owner heard crashing noises coming from the pen, suspected trauma
- Has had diarrhea since birth
- IgG levels were normal
- BAR, nursing well
- Referred specifically for CT
- Radiographs taken by rDVM unremarkable

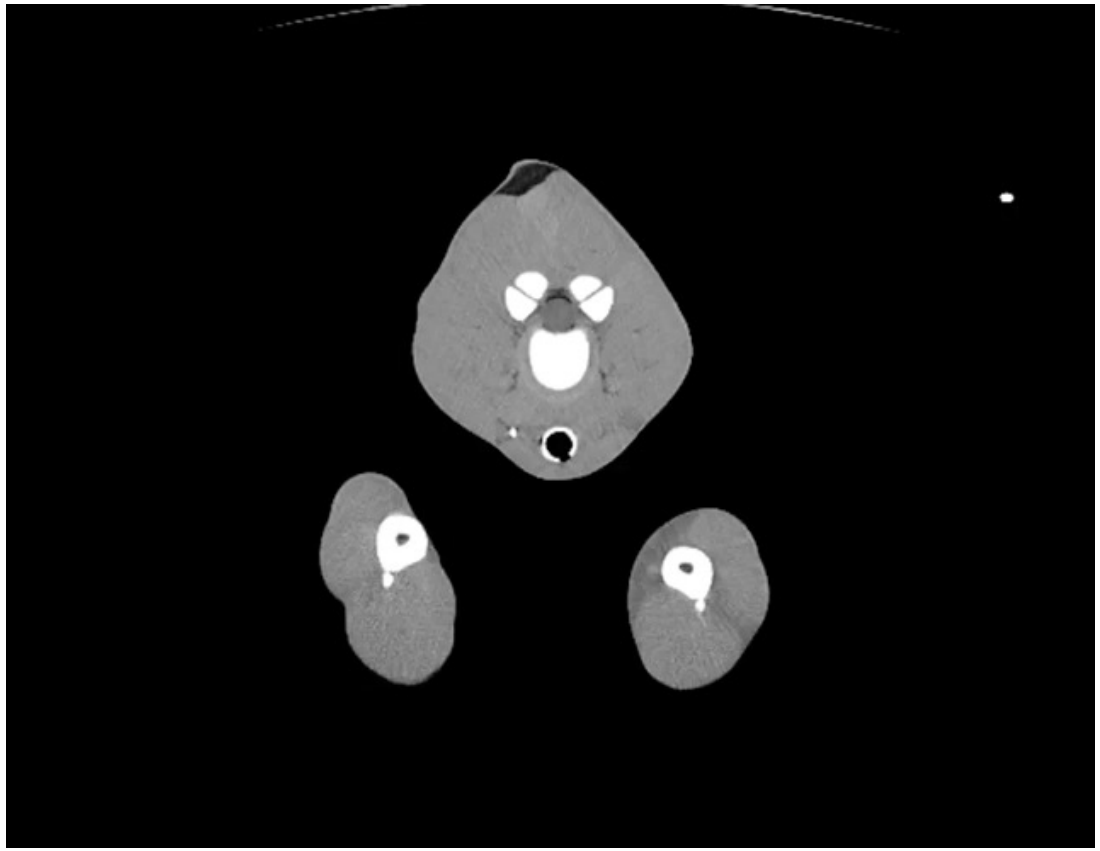
Case 5

Evaluation at OSU

- Temperature 101.4 F
- BAR, remaining vitals WNL
- 4/5 lame left front
- Firm, painful swelling palpable in left axillary regions
- All other joints palpate WNL
- Umbilicus palpates WNL

Case 5

CT



Case 5

CT

- Left Scapulohumeral septic arthritis
- Septic osteomyelitis
  - Left proximal humeral epiphysis and metaphysis
- Left Brachialis myositis and regional cellulitis
- Right humeral lucent lesion
  - Additional septic focus or osteochondrosis

Case 5

Additional Diagnostics

- Ultrasound-guided aspiration of fluid from left axillary region
- Submitted for culture and sensitivity
  - Large # Salmonella sp.

Case 5

Septic Arthritis/Osteomyelitis in Foals

- S-Type
  - Synovial membrane and fluid
  - Foals less than 2 weeks of age
  - Often prior history of illness
  - Tarsocrural, stifle, MCP/MTP most commonly affected
- E-Type
  - Articular epiphyseal complex or bone adjacent to articular cartilage
  - Older foals
  - Often prior history of illness
  - Distal femur, talus, proximal and distal radius, distal tibia, patella
- P-Type
  - Older foals (weeks to months), generally healthy without history of systemic illness
  - Long bone physes, can extend to joint capsule attachment
  - Distal tibia, MCIII/MTIII, distal radius

Case 5

Recommendations

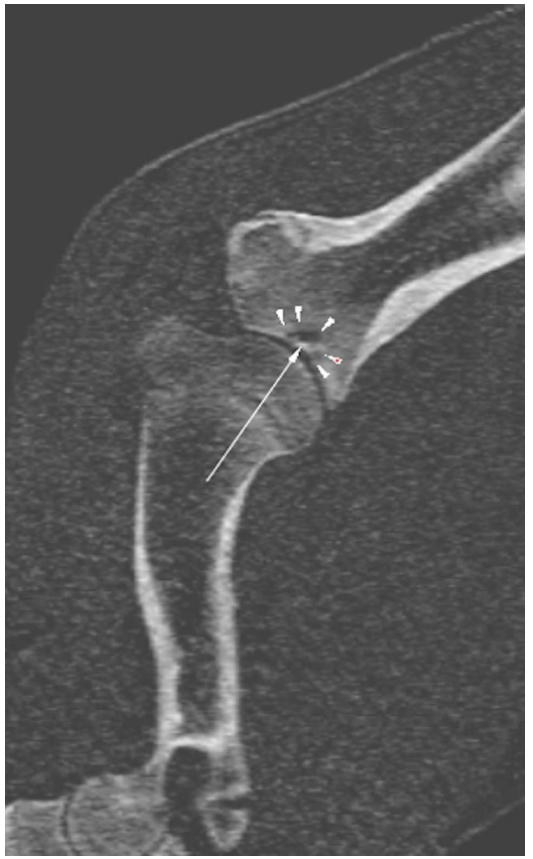
- Surgical debridement of infected bone and debridement/lavage of septic scapulohumeral joint
- Hospitalization with intravenous antimicrobial therapy based on culture/susceptibility results
- Filly was bred for racing – prognosis for high level performance poor
- Humane euthanasia recommended if aggressive treatment is not pursued

Veterinary Record Case Reports

HORSES AND OTHER EQUIDS

Septic epiphysitis and sequestrum formation in the glenoid of the scapula in a five-month-old foal diagnosed by computed tomography

Peter E Clements,[1] Becky Jones,[2] Richard Coomer[3]



Case 5

Retrospective study of 108 foals with septic osteomyelitis

KM Neil,[a*] JE Axon,[a] AP Begg,[a,c] PG Todhunter,[a,d] PL Adams,[a] AE Fine,[b] JP Caron[b] and AR Adkins[a]

- 2010 Australian Veterinary Journal
- 19.4% had radiographic bone lesions
- 70.4% had concurrent septic arthritis
- 80.6% discharged from hospital
  - 65.8% of these went on to race
    - Overall 48% of foals treated for osteomyelitis raced
- 34.6% responded to first choice antimicrobials
  - 70 foals did not
    - 19 responded to second choice
    - 30 required additional changes to therapy

- 10 foals treated with antimicrobials only
- Surgical treatment for 98 foals:
  - Joint lavage in 56
  - Joint lavage and bone debridement in 27
  - Bone debridement alone in 15
- Foals with concurrent septic arthritis → poorer prognosis
- Poorer prognosis with increasing number of joints involved
- Of the non-survivors, 81% had concurrent septic arthritis

Questions?

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Williams - Case Presentations of Lameness and Musculoskeletal Abnormalities in Foals

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