RADIOGRAPHY OF THE EQUINE APPENDICULAR SKELETON

VMB 960
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Reference Reading

- Pages 254-267
  - Anatomy

- Pages 370-401
  - Tarsus
  - Carpus
  - Metacarpus/tarsus

- Pages 409-459
  - Phalanges
  - Navicular Bone
Remember this?

- **Anatomy**
  - Bones
  - Soft Tissues: Ligaments, Tendons
    - Attachment
    - Function

- **Proper Terminology**
  - Directional terms
  - Radiographic nomenclature
    - Many highly specialized views
Directional Terminology

Figure 5-17. Proper anatomic directional terms as they apply to various parts of the body. (Courtesy of Dr. J. E. Smallwood.)
Naming Radiographs

- Direction of beam travel
Patterns of Bone Disease

- Limited response of bone to disease
Categories of Disease

- Degenerative
- Anomalous/Developmental
- Metabolic
- Neoplastic
- Infectious/Inflammatory
- Trauma
- Toxic
- Vascular
Degenerative

- Changes highly prevalent on radiographs
  - Do not always correlate with clinical signs

- Osteophytes
  - Periarticular

- Narrowing of the joint space
  - Weight-bearing radiographs

- Subchondral lysis or sclerosis

- Joint effusion
Anomalous/Developmental

- Osteochondrosis
  - Defect of articular cartilage formation
  - Lesions will involve articular surfaces of bones

- Joint effusion
- Subchondral defects/irregularity
- Osseous fragments
- Cyst-like lesions
Infectious

- **Hematogenous**
  - Foals (sources of infection...)

- **Direct Innoculation**
  - Trauma
  - Iatrogenic

- **Septic arthritis**
- **Osteomyelitis**
Infectious

- **Septic Arthritis**
  - Not an easy radiographic diagnosis – need complete picture
  - Joint effusion
  - Subchondral lysis

- **Osteomyelitis**
  - Sequestrum
  - Young foals
    - Metaphysis, Physis, Epiphysis
Trauma

- Other than fractures...

- Repetitive trauma (training)
  - How does bone respond?
    - or production
  - Certain anatomic locations prone to remodeling
  - Can also be considered a degenerative process
Remember the soft tissue structures that surround the bones/joints are subject to trauma as well.
The CARPUS
CARPUS – Normal Variants
Diseases of the CARPUS

- Developmental Abnormalities
  - Incomplete Ossification of the Cuboidal Bones
    - Foals, usually premature
  - Angular Limb Deformity
    - Usually valgus
    - Variety of causes
Diseases of the CARPUS

- **COMMON diseases localize DORSALLY**
  - **CARPAL BONE FRACTURES**
    - Distal Radius
    - Radial, Intermediate Carpal Bones
    - Third Carpal Bone
  - **DEGENERATIVE JOINT DISEASE**
    - Antebrachiocarpal Joint
    - Middle Carpal Joint
High Motion

Low Motion
The CARPUS

Distal Radius

Lat Dig Ext
Com Dig Ext
Ext Carpi Rad
• Fractures
• DJD
• Bony Remodeling (Sclerosis)
Distal Carpal Row

C2

C3

C4
Diseases of the TARSUS

- Osteochondrosis
  - Subchondral defect
  - Osseous fragment

- Degenerative Joint Disease
  - Distal Intertarsal Joint
  - Tarsometatarsal Joint
The TARSUS
The TARSUS

- Medial trochlea
- Lateral trochlea
- Intermediate ridge of tibia
- Calcaneus
The TARSUS
The TARSUS - Calcaneus

- Flex tarsus
- X-ray beam directed from Plantaroproximal-plantarodistal

Area of the deep digital flexor tendon

Calcaneus

Sustentaculum tali
The TARSUS - Calcaneus
Metacarpophalangeal & Metatarsophalangeal Joints
MCPJ & MTPJ Diseases

- Osteochondrosis
- Degenerative Joint Disease
- Soft Tissue Injuries
  - Suspensory Ligament
  - Flexor Tendons
  - Sesamoidean Ligaments
Metacarpophalangeal & Metatarsophalangeal Joints
MCPJ/MTPJ – OCD
MCPJ / MTPJ

DLPMO

DMPO
Susensory Ligament
The DIGIT

- Phalanges
  - Laminitis
- Navicular Bone

NO HOOF NO HORSE
Foot Must Be Prepared
The DIGIT – P3

**Lateral view**: Good for rotation of distal phalanx, also remodeling of navicular bone and DJD

*Up to 3-4° can be normal*

*Excessive toe length*
The Digit – P3

Good for distal phalanx fractures and solar margin evaluation

Severe pedal osteitis
Good to assess joint width, collateral cartilages and periphery of navicular bone
Navicular Bone

- Synovial Invaginations
Navicular Bone

- Synovial Invaginations

- Flexor eminence

- Palmar process of P3