Equine Lameness & Imaging Techniques

Peter Heidmann DVM MPH
Specialist in Equine Internal Medicine

Montana Equine Medical & Surgical Center
www.montanaequine.com  406-285-0123
Types of lameness

• **Skeletal Disease**
  – Any type of joint inflammation
    • Hock, pastern, stifle, coffin joints
    • Most often cumulative stress
      – Wear and Tear
    • Following injury
    • Developmental Diseases
      • Usually worsens during flexion test
        – Diagnosis: Radiographs, CT/MRI, Scintigraphy

• **Soft Tissue**
  – Tendons, Ligaments, Muscles, Bursa
  – Usually improves with rest, worsens after work
  – Diagnosis: Ultrasound, CT/MRI
Orthopedic Abnormalities: Bone

• Routine Diagnostics:
  – Radiographs
    • Digital and Computed Radiology
    • +/- Fluoroscopy
Arthritis

- Hock Arthritis, Pastern Arthritis
  - “Ring-Bone”
  - Wear-and-Tear
    - Gradually increasing inflammation over months or years
  - Acute Trauma
    - Collateral Ligament Tears
    - Chip Fractures

- Diagnosis:
  - Where?
    - Nerve and/or Joint Blocks
  - What?
    - Radiographs
Radiographic Changes post Soft Tissue Injury

• Collateral: “CO”-lateral
  – Injury follows twisting and shearing trauma
    • Worst in deep footing
  – Provides stability to joints
    • Medial to Lateral Support
    • Wrapping can support collateral ligaments

• Response to Injury
  – Varying Degrees of Instability
  – Joint is unstable : new bone formation
Nuclear Scintigraphy

- Measures bone metabolism
  - Technesium isotope “bound” to phosphorus
  - Increased metabolism with inflammation
  - Gamma Camera measures density of isotope
Soft Tissue Injury

• Routine Diagnostics:
  – Ultrasound
Soft Tissue Injury

• Tendons and Ligaments are fiber bundles
  – When fibers tear: Produces pain, weakens the entire unit

• Classically:
  – Occur with rapid change in direction
  – More Frequent with deep footing
  – Moderate Intermittent Lameness
  – Worse towards outside of circle

• Diagnosis:
  – Where? Nerve Blocks
  – What?
    • * Ultrasound *
    • MRI/CT Scan
Flexor Tendon Injuries

• Mild “Bow”: Peritendinous Swelling
  – E.g. “Bandage Bow”
  – Short-Term Rest - Weeks

• Severe “Bow”:
  – Fiber Tearing
  – Long-term rest - Months

• The Classic Soft Tissue Injury
  – Early: Obvious to See and feel
  – Late: May palpates normal
    • May have minimal Lameness until extended work
Suspensory Ligament

- Occurs during sliding stops
- Suspensory Branches
  - Just above the fetlock joint
- Origin of the Suspensory
  - Just below the knee/hock
Computed Tomography

Magnetic Resonance Imaging
Arthroscopic Evaluation

- Synovial Structures
  - Joint, Tendon Sheath
- Offers direct visual evaluation of the area
- Areas inaccessible to U/S or MRI
  - E.g. Deep Flexor Tendon within Tendon Sheath
  - Cruciate Ligaments of Stifle
Digital Radiography vs MRI
MRI: Magnetic Resonance Imaging

- Powerful magnet induces flux “vibrations” in tissue
- Different tissues vibrate differently
  - Complex Algorithms Generate Images
- High Power (1 T) vs. Low Power (0.3 T)
Computed Tomography: CT
Creates a series of circular Radiographs: “Slices”

Computer processes Images → Reassembles in ANY plane
So when do you need CT?
Heel Pain

- Aka “Navicular Disease”
- Navicular Bone is rarely the problem

- Instead:
  - Solar/Pedal Pain
  - Deep Digital Flexor Tendon
  - Sesamoidean Ligaments
  - Collateral Ligaments (Pastern, Coffin Jts.)
  - Navicular Bursa, Impar Lig.
  - Suspensory Lig. of Navicular
Treatments

• *Trimming and shoeing:
  – Hoof-pastern Axis:
    • Maintaining strong, wide heels
    • Minimizing the toe to ease Break-Over
  – “Bute” as needed
    – Side Effects
    – Does not treat the primary inflammation
• Shockwave
  – Minimize pain
  – Stimulate soft-tissue healing
• Navicular Bursa Injections
  – Symptomatic Therapy
• Coffin Joint Injections
  – Coffin Joint Pain may be a component
  – “Reservoir” for treating the entire region
Contrast Enhanced CT

- **Helical**
  - Rapid
  - 1 slice per second
    - 45 seconds per limb
  - Thin slices
    - Min 1 mm

- **Contrast**
Contrast Enhanced CT

- **Equine use:**
  - **Intra-arterial**
    - 100 – 150 mL
    - Concurrent scanning and administration
      - Blood vessel i.d.
      - Contrast extravasation
Case I

8 Year-old Warmblood Medial Lobe DDF Tear

Very Difficult to ID without Contrast
Case II: WB Jumper

- Blocked to Palmar Digital Nerve
- Blocked to DFTS

Radiographs were Normal...
Case II

8 year old Warmblood

TS and PD to block
Case II

8 Year-old Warmblood Jumper

88 limbs

59 DDFT

26 CL
Case II
Case III

5 yo reining horse

PDNn – No Change

Abaxial Sesamoid - Resolved
Further Evaluation

Radiographic Evaluation

NSF

77 Horses
25% NSF
Areas of Interest
Collateral Ligament Injury Of The Coffin Joint

Often Will Not Improve With Coffin Joint Anesthesia
2nd most common soft tissue lesion in foot area

• Collateral ligament injuries
Collateral Ligament of the Coffin Joint
Thank You!!!
heidmanndvm@mac.com
406-285-0123
406-220-1221

Peter Heidmann DVM MPH
Specialist in Equine Internal Medicine
heidmanndvm@mac.com
Montana Equine Medical & Surgical Center
www.montanaequine.com 406-285-0123