



Thoracolumbar and Lumbosacral Considerations in Hind Leg Lameness

Duncan Peters DVM, MS
Equine Lameness and Sports Medicine
Michigan State University- CVM
East Lansing, Michigan

Indiana Association of Equine Practitioners
November 2012



Thoracolumbar and Lumbosacral Considerations in Hind Leg Lameness

- Back conditions diagnosed to be the cause of poor performance in many reports- estimates of 8-32%
- Specific diagnosis can be challenging-
 - Interaction of bones, joints, ligaments, muscle, nerves
 - Mass of the region
 - Can be difficult to image region effectively
- Anatomy complex- functional anatomy less fully understood

Clinical Signs and Performance History

- May be no overt lameness but gait "ain't right"
- Change in performance
- Back stiffness
- Loss of propulsion
- Gait quality loss
- Weakness of movement
- Jumping style change
- Crooked movement
- Asymmetry on turns



Clinical Signs and Performance History

- Problems with tack fit
- Behavioral changes
- Sensitivity to rider's weight
- Musculature change
- Insidious nature to occurrence of signs
- Often some form of traumatic incident in past
- Manifests with "step up" in level of competition




Other Musculoskeletal Concerns

- Insidious nature and clinical signs can mimic other problems
 - Developmental orthopedic disease
 - Early osteoarthritis
 - Cervical and pelvic concerns
 - EPM / Lyme's
 - Neurologic issues




Physical Examination

- Define specific versus general areas of back pain
- Structural abnormalities
- Muscular changes
- Flexion/extension limitations
- Lateral movement limitations
- Specific movement of the lumbosacral region





Physical Examination

- Visual observation-
 - muscle deformation
 - atrophy
 - conformation
- Segmental palpation-
 - Reaction to pressure
 - Heat or cool
 - Muscle tone
- Develop consistent pattern of examination



Mobilization Tests

- Flexion/extension
 - Lumbosacral area- 10-12 degrees of flex/extend
 - Thoracic segments- 1-2 degrees of flex/extend



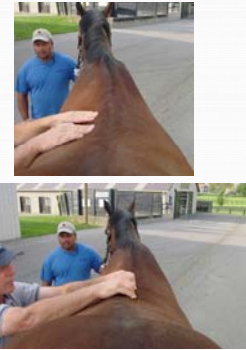
Mobilization Tests

- Retraction / traction- observation of muscle symmetry, contracture, spasms, strength, reaction with release of tension




Mobilization Tests

- Lateroflexion
 - T8-T15 greatest movement
 - Lumbar- limited
 - Associated rotational movements
- Lumbar is less mobile /flexible than thoracic region
- Rotational aspects of lumbosacral area are limited
- Perceived limited movement and behavioral/attitudinal change- suggestive of problem



Movement Evaluation

- Essential in hand, on lunge, free in corral and often ridden or in harness
- No specific “gait character”
- Impression of stiffness, reluctance, pain
- Muscle tone
- Overreach
- Suspension of gait
- Gait transitions
- Behavioral and postural changes




Movement Evaluation

- Variety of surfaces and terrain can be informative
- Walk
 - “Figure-eight” pattern
 - Muscle symmetry
 - Muscle tenseness
 - Postural and behavioral aspects
 - Lateroflexion and rotation of thoracolumbar spine


Movement Evaluation

- Trot / jog
 - Evaluate flexion / extension of back
 - Evaluate rotation
 - Rigid, stiff, gait choppy, muscles tense
 - Shuffle hind feet with little over reach
 - Lack elevation, bounce, suspension




Movement Evaluation

- Canter /lope
 - Flexion / extension of lumbosacral region
 - Deep vs. firm surface
- Under tack / harness
 - All characteristics can be exacerbated
 - Transitional gaits
 - Postural changes
 - Rider effect




Muscle Injury

- Muscle soreness is most common complaint of diagnosed back problem
- Primary strain or injury is likely underestimated
- Epaxial muscle injury- recognized heat, pain, and swelling
- Hypaxial muscle injury- rectal examination



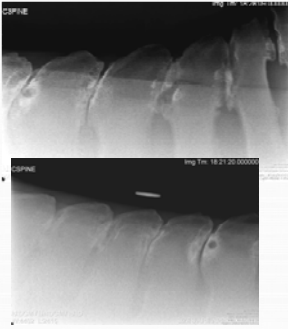
Impingement of Dorsal Spinous Processes (DSP)

- Thoracic- generally T12-Ti8
- Lumbar- L1-L6
- Variable effect on performance
- Flexion/extension extremes
- Age, breed, discipline
- Rider weight?
- Bone malformations



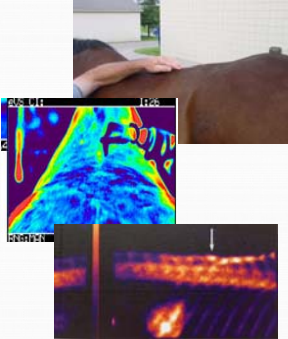
Impingement of DSP

- Commonly dorsal 1/3- 1/2 of spinous process
- Concurrently involve sprspinous and/or interspinous ligaments
- Changes ventrally represent more instability and vertebral concerns
- Grading system- (1-4)- mild narrowing, bone remodeling, sclerosis, osteolysis



Diagnosis of DSP Impingement

- Diagnosis
 - Focal pain on palpation or manipulation
 - Thermography
 - Radiographs
 - Ultrasonography
 - Bone
 - Soft tissues
 - Nuclear scintigraphy
 - Metabolic activity





Treatment of DSP Problems

- Local injection of corticosteroids or homeopathics- cranial and caudal
- Shockwave therapy
- Mesotherapy, acupuncture, manipulative therapies
- Surgical procedures



Treatment of DSP Problems

- Saddle fit and padding
- Stretching exercises
- Exercise management- work without weight
- Performance expectations?

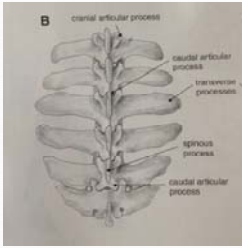



Articular Facet Arthropathy

- Overlapping facets form synovial joints (zygapophyseal)
- Varied articular joint orientation along vertebral column
 - Flat up to T12-T16- allows for lateroflexion
 - Caudal thoracic/Lumbar- more vertical- allows for dorsal/ventral mobilization
 - T15- caudal- more rounded synovial surfaces to allow for rotation
- Inflammation to osteoarthritis can limit movement and cause pain

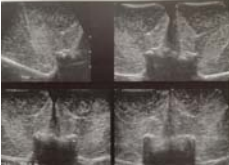

Articular Facet Arthropathy

- Abundance of nociceptive and proprioceptive fibers can cause neurogenic pain that affects muscular activity
- Single vertebral motion segment may be effected to cause pain- but usually multiple segments involved



Diagnosis of Facet Arthropathy

- Combination of techniques
- Radiology- powerful equipment, size of horse
- Ultrasonography- user experience, equipment
- Nuclear scintigraphy- physiologic activity
- Thermography- user knowledge



Treatment of Facet Arthropathy

- **USGI of corticosteroids or homeopathics**
- **Systemic NSAIDs- COX-1 or COX-2 inhibitors**
- **Bisphosphonate- (Tildren®)**




Treatment of Facet Arthropathy

- Shock wave therapy
- Acupuncture, Mesotherapy- may affect some of neurogenic and muscular activity of the segmental region
- Exercise management
- Performance expectations




Vertebral Body Abnormalities

- Problems can be degenerative, traumatic or developmental
- Convex shape cranially, concave caudally- mobility and stability
- Intervertebral disc- annulus and nuclear pulposus- provides axial force absorption
- Nocioceptive and proprioceptive nerve fibers in disc



Congenital Abnormalities

- Usually T10- L4
- Lordosis, kyphosis and scoliosis
- May not have visual back abnormalities
- May not have pain or performance limitations unless other tissues involved



Vertebral Body Abnormalities

- Stress fractures
 - T16- L6, young horses
 - Repetitive loading
- Compression fractures
 - Traumatic, minimally displaced
- Spondylosis
 - Degenerative disc and bony condition, T10- T16, nerve root or spinal cord impingement, ankylosis



Diagnosis and Treatment

- Radiology, nuclear scintigraphy, MRI (foals)
- Treatment- symptomatic
 - Systemic medication- NSAIDs
 - Exercise control- within pain limits
 - Bisphosphonates
 - Neural pain relief- Gabapentin
 - Shock wave therapy




Lumbosacral Concerns

- Degenerative process in region to cause dysfunction and poor performance
- Pivotal point to engage hindquarters to propel horse forward
- Most moveable point in spine between T1 and the sacrum
- Consists of 5 joints (1-intervertebral, 2-intertransverse, 2-articular process)
- Allows flexion/extension mobility
- Minimal rotation or lateral flexion possible

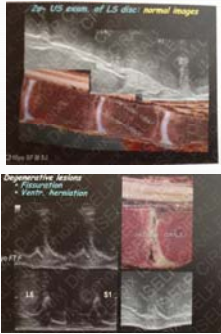
Lumbosacral Indications

- Clinically- poor performance; stiff, rigid gaits; poor impulsion; rarely lameness
- Poor canter gait
- Muscle atrophy, flattening at lumbosacral/ middle gluteal with prominent tuber sacrale
- Adverse reaction to ventral pressure of supraspinous ligament in area





Diagnostic Examination

- Radiology- difficult
- Transrectal ultrasound-
 - L6-S1- degenerative, traumatic and congenital lesions
 - Intertransverse joint- osteolysis, ankylosis, bone remodeling
- Nuclear scintigraphy- metabolic activity



Treatment of Lumbosacral Problems

- Dependent on location
- Systemic medications
- Shock wave therapy
- USGI corticosteroids or homeopathics
- Mesotherapy, acupuncture- break cycle of pain and muscle activity



Treatment of Lumbosacral Problems

- Electromagnetic blankets, chiropractic techniques, topical emollients, stretching exercises
- Exercise management-type of “frame”, turnout, equipment, gaits
- Balance “fitness for task” and the need for high level of training intensity
- Can be comfortable and successful



Event Horse 14 yr Geld

- Competing CIC ** recently
- Changed trainers within last 3 months
- Complaint of difficulty rounding up in dressage work
- Weakness in hindquarters and not putting on muscle
- Jumping flat in stadium phase
- “not as willing” in work




Event horse

- Rigid, stiff gait with no overreach of hind feet
- Poor flexion / extension of thoracolumbar region
- Specific reaction to supraspinous ligament base of withers and mid-thoracic
- Diagnostics?- Rads, US, NS



Event Horse

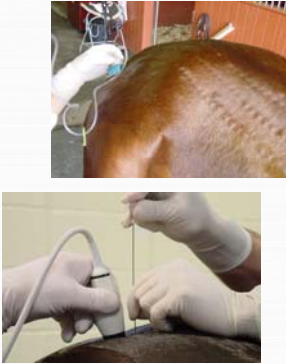
- Dorsal spinous process impingement
- Vertebral articular facet osteoarthritis



The image contains two medical scans. The top scan is an ultrasound showing a cross-section of a horse's spine with a probe. The bottom scan is an X-ray showing the vertebrae of a horse's spine, highlighting the articular facets.

Treatment

- Local treatment of most clinically responsive areas
- Mesotherapy
- Tildren IV
- NSAIDs- Equiox
- Shockwave
- Electromagnetic therapy



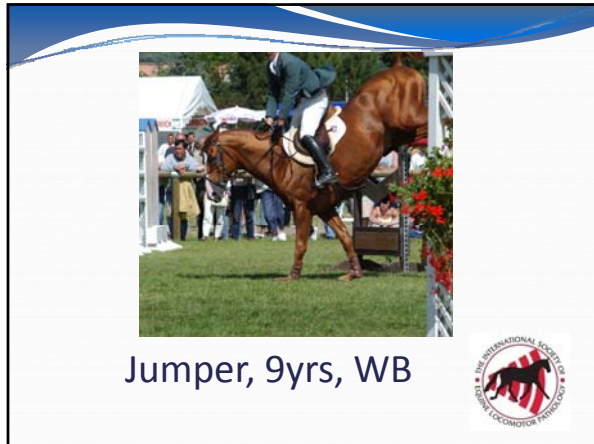
The image contains two photographs. The top one shows a person's hands performing a procedure on a horse's back, possibly mesotherapy or shockwave therapy. The bottom one shows a close-up of a person's hands using a device on a horse's skin.

Treatment

- Acupuncture
- Chiropractics?
- Exercise changes with good warm-up and cool-down
- Physical therapy- massage, grooming
- Pasture housing
- Reassess performance expectations!!



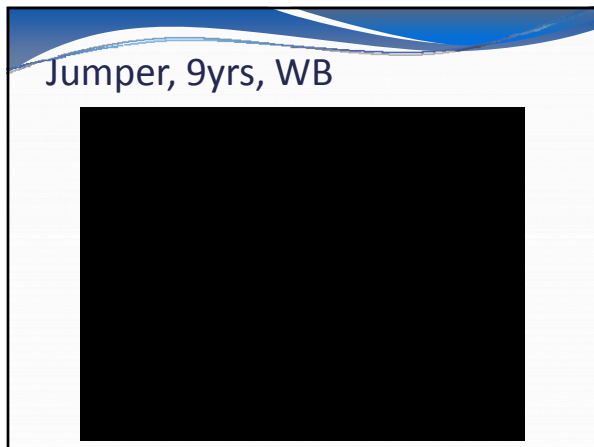
The image contains two photographs. The top one shows the back of a horse, possibly illustrating a treatment area. The bottom one shows a horse being ridden in an outdoor setting, possibly illustrating exercise or pasture housing.



Jumper, 9yrs, WB

- Approx 5 months ago over a 6-8 week period had gotten progressively worse about wanting to jump and compete
- Appeared to work well on the flat and small fences (1.2m)
- Larger fences (1.4-1.5m)- twisting, stutter off the ground, tail-swishing, jumping to right, rearing, not wanting to enter ring
- Given 3 months off- coming back to exercise and some gait variation when ridden mainly at canter- right lead seems choppier

Jumper, 9yrs, WB

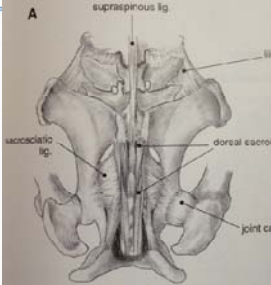


Jumper, 9yrs, WB


- No overt lameness to watch on lunge line or in hand
- Some muscle spasm right side to palpation of caudal longissimus m and cranial middle gluteal m
- Upper hind leg flexion tests very mild change with RH>LH

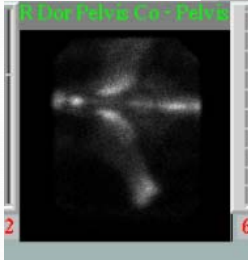


Jumper, 9yrs, WB



Jumper, 9yrs, WB





Jumper, 9yrs, WB

- Damage to right iliolumbar ligaments and bone of ilium- desmopathy
- Stress fracture of ilium?
- Strictly a soft tissue / bone interface problem?
- Prognosis- good with continued rest of 2 months, then slow return to exercise over 6 weeks, start jumping at 8 weeks
- Horse has been back to jumping and doing well at 1.3m for last month

Jumper, 9yrs, WB

Wmblid, 13 yr old, Mare, Hunter-
shown by trainer and junior rider

- Horse starts trot transition with a hop over last year
- Not quite comfortable when jumping- flat over fences, lost roundness to jump
- Trouble with stride length- has to rush down jump lines
- Cross canters between jumps
- Moves sideways- bends "funny" at times
- Appears "stiff through back" when ridden on circles or turns



Hunter Mare

- Flat musculature through back region
- Mild muscle soreness to palpation with spasms of right thoracolumbar area
- Essential normal croup muscling with mild flattening of gluteals



Hunter Mare

- No overt lameness on lunge line with a pleasant attitude
- Flexion tests- NSF
- Ridden- consistent hop with transition from walk to trot, tends to fall forward with downward transitions, body appears rigid on small circles, trouble lengthening and shortening stride



Hunter Mare

- Diagnostics?
 - Blocks
 - Radiographs
 - Ultrasound
 - Nuclear Scintigraphy
 - Acupuncture
 - MRI
 - Treatment
 - Psychic
 - Other

Hunter Mare

Static Image Report

NECK Cervical
NECK Thoracic
CERVICOTHORACIC Cervical
LUMBAR THORACOLUMBAR


Hunter Mare

Hunter Mare- Treatment

- NSAIDs
- Bisphosphonates-Tildren
- Management-
 - Stretching exercises
 - Relaxed, extended warm-up periods
 - Controlled lunge line work
 - Lower performance expectations
- Physical therapy
 - Electromagnetic blankets
 - Massage
 - Acupuncture, others?
- Discussion- PPE

Hunter Mare- Prognosis

- Guarded at current level of performance
- Good with reduced expectations



Hunter Mare

- Discussion- PPE about one year later

Summary

- Back pain is a common complaint related to performance of sport horses
- Signs easy to recognize, source of problem may be difficult to elucidate
- Investigation requires careful examination, movement evaluation and various imaging modalities
- Treatment incorporates local and systemic medications, adjunctive therapies, equipment fit and exercise management
- Many horses can be managed successfully for acute or chronic conditions

Thank you – Questions?



I.S.E.L.P.

AAEP

COLLEGE OF VETERINARY MEDICINE
MICHIGAN STATE UNIVERSITY
