



FOCUS ON REHAB

Welcome

This issue features the role of rehabilitation therapy in diagnosing and managing iliopsoas strains. In winter, hip flexors strains are a common injury. Slippery surfaces can cause dogs to lose their footing on one or both hind legs resulting in a splay and subsequent strain of the hip flexors, including the iliopsoas. This is a difficult condition to diagnose and often goes unrecognized. Patients return to function too soon and often re-injure or never fully heal from this injury.

Cold Laser Therapy

Low-level laser therapy, commonly known as cold laser, is a noninvasive, drug free modality, frequently used in veterinary rehabilitation. Laser increases the speed, quality and tensile strength of tissue repair, decreases inflammation, and decreases pain. It is a safe and very effective modality for treating a variety of conditions such as soft tissue injuries, post-operative conditions, arthritis, and wounds.

Laser is “Light Amplification by Stimulated Emission of Radiation.” Radiation is emitted in the form of photons. All light travels as photons but laser generates a beam of very intense light, which is monochromatic, polarized and coherent. Photons from laser are in perfect order and concentrated. This allows the light to penetrate through the skin with no heating effects and no known side effects, to selectively target damaged tissues. Tissue repair occurs through a process of photo biostimulation. Photons are absorbed by

photoreceptive molecules in the mitochondria, which stimulate the mitochondria to accelerate production of ATP. As cellular ATP levels increase, it stimulates DNA and RNA synthesis; protein synthesis; mitosis and cell proliferation resulting in tissue repair.

When working with lasers it is important to know the laser type (class) and wavelength (nm) as well as output power (mW). Dosages are based on these variables, as well as the type of condition and size of area being treated. The smaller the wavelength, the greater the ability to penetrate tissue (low level laser ranges from 600-1000nm). Laser units can range from 5 to 600mW of power for low level laser as compared to 3,000 to 10,000mW for surgical lasers. The greater the milliwatt power, the shorter the treatment time needed.

Cold laser therapy has many benefits. It accelerates collagen synthesis, increases the vascularization of healing tissue, and reduces pain. It has shown to be effective but not limited to the treatment of the following conditions: soft tissue sprains and strains, ligament, tendon, and muscular injuries, arthritis, inflammation/edema, myofascial trigger points, chronic and acute pain, lick granulomas and post-operative conditions.

Cold laser is a very effective, non-invasive, easy to administer modality. When designing an individual comprehensive rehab program, laser is often used in combination with manual therapy, exercise and a home program in order to achieve the most successful outcome.



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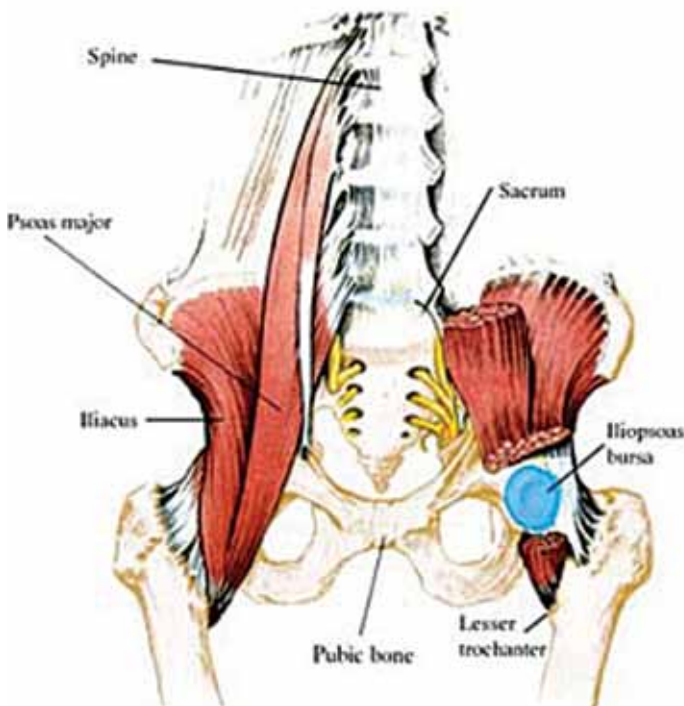
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Iliopsoas Strain

ANATOMY:

The iliopsoas is actually 2 muscles, the iliacus and the psoas major. The iliacus originates on the cranioventral ilium while the psoas major originates along the ventral bodies and transverse processes of the lumbar vertebrae. They insert together on the lesser trochanter of the femur. In the human this is comparable to our groin muscle. The function of this muscle is to flex the hip and lumbar spine.



CAUSES:

Until recently, muscle strains were rarely diagnosed or a specific muscle was not determined. With the increased specialization in rehabilitative and sports medicine, individual muscle strains are becoming more identifiable in our canine patients. A force resulting in internal rotation of the femur while the hip is extended in eccentric muscle contraction (i.e. stopping the hind limb from further extension) is an important factor in strain of the iliopsoas. Often this is seen as an acute muscle stretching injury in the canine athlete, especially agility or other activities requiring jumping, cutting, turning, etc. It is also recognized in patients with unmanaged hind limb orthopedic disease, dogs who splay after falling on a slippery surface, or after overactive rough housing with another dog. The strain is usually at the myotendinous junction where the muscle is weakest.

DIAGNOSIS:

Patients often present with unilateral hind limb lameness that increases with activity. The leg is commonly in a tucked position or the patient has a circumducted gait in an effort to avoid active limb extension. Agility performance dogs may avoid weave poles going more slowly than normal or knock bars. Palpation of the iliopsoas tendon of insertion results in a spasm and significant pain. To locate the insertion point the patient should be in a relaxed laterally recumbent position. The point is located at the ventral junction where the femur meets the pelvis over the lesser trochanter. It is a deep muscle lying along the internal part of the ilium. Alternately, stretching the muscle by extending the hip while internally rotating the limb may result in pain or spasm. Radiographs are generally of limited value, but CT and MRI may be useful.

TREATMENT:

Conservative treatment is important especially in the acute strain. Muscle relaxers and NSAIDs (non steroidal anti-inflammatory drugs) are commonly prescribed along with restricted activity and ice therapy. Re-injury to the muscle during the healing process is a frequent occurrence. Rehabilitation therapy is a very important and effective treatment. Supervised rehabilitation programs that focus on manual therapies, cold laser therapy, and controlled exercises provide a gradual return to function and help to limit premature stress on the muscle. Weekly laser sessions are generally recommended. As the healing progresses active range of motion exercises and strengthening activities are added. Owner education is critical to guide them with appropriate activity and exercise guidelines, as well as managing signs/symptoms of overuse. It may be several months until the muscle is strong enough to return to normal activity.

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Iliopsoas Case Study — Calais

SIGNALMENT

Calais: 4-y-o female Australian Shepherd

PRESENTING COMPLAINT

Episodic history of hind limb limping after exercise and stiffness when first getting up. Symptoms improved with rest and NSAIDS, but still became lame after returning to normal exercise regime. Calais is a very active dog, loves to run, play with other dogs swim and chase geese.

Physical Exam

- Tenderness to direct palpation of bilateral (left > right) iliopsoas muscle and tendon-bone insertion site.
- Discomfort noted on direct palpation of lumbosacral space and paraspinal musculature
- Iliopsoas test inconsistently reproducible in standing (stoic nature)
- Pain score 1/4
- Muscle atrophy of left hind limb, 2 cm difference
- Subtle/mild PWB (partial weight bearing) stance left, shortened stride on left at walk and trot (lameness score 1/4)
- PROM (passive range of motion) hip extension very guarded bilaterally (in lateral recumbent) ~ 140 degrees (n=160) with pain end range, yet has full active hip extension in upright “dance” posture.

Radiographs

Pelvis: mineralization or an avulsion of the right lesser trochanter/iliopsoas insertion

Stifles: very mild effusion left

Medications

- Dasquin with MSM
- Robaxin 500 mg

TREATMENT PLAN/GOALS

Calais’s program emphasized a combination of medical management and rehabilitation therapy. Cold laser therapy was an important component of the rehab program. To achieve our rehab goals of returning Calais back to a pain free active lifestyle it was equally important to combine laser therapy with manual techniques, exercise and owner education. Calais’s exercise program was constantly monitored and gradually upgraded to progress towards more dynamic, higher intensity activity while preventing overuse injuries.



Calais receives cold laser therapy for an iliopsoas strain.

Rehab Goals

- Decrease pain 0/4
- Increase pain-free PROM for hip extension bilaterally to functional limits
- Improve symmetrical weight bearing in stance and gait to 0/4 lameness score
- Increase muscle strength/girth, to symmetrical in hind limbs
- Increase function for longer walks, uneven terrain, faster gaits, progress to off leash activity, return to herding
- Educate owner with a safe, appropriate and progressive home program

(Continued on back page)

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Next Issue: Acupuncture

Case Study: Calais, Australian Shepherd (contd.)

TREATMENT MODALITIES

Cold Laser:

Cold laser was applied to iliopsoas muscle origin and insertion, and lumbar spine region to decrease inflammation, pain and promote tissue healing. Ice/cold pack to the groin/iliopsoas region was used with signs of soreness or after exercise to decrease inflammation.

Soft Tissue Massage:

Areas targeted included paraspinal muscles; iliopsoas muscle belly, quadriceps, hamstrings as well as cervical/scapular muscles. Massage aids in circulation, decreases muscle spasm and promotes tissue healing and relaxation.

PROM/Stretching:

After laser therapy and massage, gentle slow PROM (in pain free range) for hip extension was attempted, but poorly tolerated due to muscle guarding/anxiety. Active strategies (ie front paws up on step) were more effective to achieve a sustained static stretch of the hip flexors. Hamstring and quadratus lumborum stretches were also performed.

Joint Mobilization Techniques:

Joint mobilization techniques can be effective to help restore joint mobility and aid in synovial fluid distribution.

- Thoracic and lumbar dorsal/ventral glides to increase spinal extension
- Gentle distraction to lumbar spine to decrease pain, increase spinal mobility
- Pelvic mobilizations to promote pelvic/hip mobility
- Approximation to hip and stifle to stimulate proprioception, joint nutrition

Therapeutic Exercise:

Isometric/trunk stability exercises were first introduced, such as weight shifting onto the involved side, progressing to 3-limb stance. As she progressed, these exercise were then performed on an unstable surface such as a physioball or tilt board. Gradually more isotonic exercises were added to increase strength of hip musculature, such as walking over cavalettis rails, walking up hills, and repeated sit to stand. As Calais was able to tolerate more challenging exercise, she progressed to balance/coordination activities, and direction



Calais working on physioball for rear limb weight bearing/strengthening.

changes (i.e. uneven terrain, figure eight). A walking program was also an integral part of Calais's daily home program, gradually progressing distance, inclines and speed. Education with the owner was critical to recognize symptoms of overuse, and modify the program as appropriate and limit high impact loading. A warm up and cool down period with exercise was also emphasized to minimize risk of soft tissue injuries.

Aquatic Therapy:

Underwater treadmill was initiated for low impact strengthening and conditioning. As she was able to tolerate greater exercise demands, she then progressed to swimming in the therapy pool to prepare her for swimming at home in the pond.

Outcome

After 6 weeks of rehab, Calais progressed to longer walks (> 1hr), steeper inclines, trotting and tighter direction changes. She also returned to swimming in the pond, playing at the beach, and controlled off leash activity. She still had some mild muscle atrophy and limitations in end range hip extension, but functionally was returning back to her normal activity with less lameness. She did have episodic flare ups however, if she was too active. Owner was knowledgeable with continuing to progress with Calais's home program and felt comfortable in managing flare-ups.