Where is the iliopsoas muscle?

The iliopsoas muscle complex is composed of two ‘sub-lumbar’ muscles. There are four sub-lumbar muscles in total:

- Psoas major
- Psoas minor
- Iliacus
- Quadratus lumborum

All muscles have a start point (origin) and an end point (insertion). The Iliacus begins on a part of the pelvis called the Ilium; whereas, the Psoas major begins on the last two ribs (T12 and T13) and the transverse processes of the lumbar vertebrae.

Despite their differing origins, both muscles join together at their insertions on the lesser trochanter of the femur. The fusion of these two muscles is what forms the iliopsoas muscle. In a healthy, well-performing dog, the iliopsoas muscle’s key functions are to flex the hip joint, adduct the limb, to externally rotate and internally rotate the femur and provide core stabilisation.
Causes of Iliopsoas muscle strain

Acute muscle strains are usually the result of overstretching the muscle whilst it is active. This often occurs during sharp turns, explosive forward movements and jumping. This easily places sports such as agility and high performing dogs at the greatest risk of muscle strains. The injury is even more likely if the dog has not been correctly conditioned and prepared for the sport or activity that they are partaking in.

“So, don’t feel tempted to go for extra-long walks at the weekends if your dog is not accustomed to it!”

In the acute muscle strain category, there are three different grades of muscle strain:

Muscle strain grades

Grade i → Mild strain: no loss of function, 5% muscle involvement, mild fibre rupture. May heal in a few days.

Grade ii → Moderate strain: reduced muscle strength, >5% muscle involvement, mild-moderate fibre rupture. Require 1-3 weeks to heal.

Grade iii → Severe strain: Significant to complete muscle fibre rupture. May take months to heal with potentially permanent chronic damage.

Chronic injuries are usually caused by repetitive strain injuries. Meaning the dog may be being over-conditioned in the same method of training. Or, they are not being given enough time to rest and recover following intense training or a competition. In chronic cases, there may be calcification of the tendon (musculotendinous junction) which attaches the iliopsoas to its bony insertion on the femur. These injuries could also be the result of compensation over time for other orthopaedic conditions, such as, osteoarthritis.

How will I identify an Iliopsoas strain?

Has your dog always been very good at agility but has recently started to knock poles and slow down? Have you noticed your dog putting in a skipping action out on your walks? These are all signs of iliopsoas strain! With a very mild grade one strain, there may be some pain on palpation and a mildly shortened stride on the affected side. These injuries are likely to go unnoticed as the dog usually recovers quickly. In a more severe strain or a muscle tear, there is usually obvious lameness and significant swelling and bruising of the Iliopsoas. This causes greater pain on palpation from the swelling impinging on the femoral nerve. It is also likely that the dog will become increasingly lame with exercise when they didn’t previously. Skipping with the hindlimbs is a gait abnormality that is often seen and it can be consistent with signs of other conditions such as cranial cruciate ligament (CCL) tears and hip dysplasia. Therefore, it is very important that you take your dog to the vet for a correct diagnosis.
Diagnosis

Diagnosing acute injuries is usually based on the clinical signs the dog exhibits. Your vet will palpate close to the insertion of the iliopsoas. They may also place the dogs hindlimbs into hip extension and internal rotation of the hip during this movement to give a more definitive diagnosis. If the dog produces a pain reaction, i.e. yelping, moving away, becoming tense or turning to bite then it is likely the dog is suffering from an acute iliopsoas strain.

Palpation of the iliopsoas insertion

In some cases Ultrasound imaging or CT scans will be used. These allow the vet to examine the extent of the damage and concurrent images may be taken during rehabilitation to see how the injury progresses.

If the injury becomes chronic, X-rays may be used to determine whether there is calcification of the musculotendinous junction of the iliopsoas. X-rays are also useful to provide a differential diagnosis from any other conditions that may also be present such as hip dysplasia.

Can the injury be treated?

Yes! Acute iliopsoas injuries heal very well with conservative management and so more aggressive treatment may not be necessary. Some vets may offer extracorporeal shock wave therapy (ESWT); but it is an expensive treatment and results are not usually any better than conservative treatment. It’s more likely that your vet will prescribe 5-10 days’ worth of non-steroidal anti-inflammatories (NSAIDs), muscle relaxants and rest.

In chronic injuries, whereby the tendon tissue which attaches the iliopsoas to its bony insertion, has calcified. More invasive techniques such as surgery or injections of platelet rich plasma and stem cells may be required. If invasive techniques are not opted for, then the inflammatory process needs to be re-started in order for the injury to heal. It is not advised that NSAIDs are given to dogs with chronic injuries, as they stop the inflammatory response from reoccurring.

Muscle and soft tissue injuries follow three main stages of healing; the inflammatory phase, proliferation phase and remodelling phase. The end goal of these phases is to produce and lay down type I collagen which creates strong and functional muscle tissue. Rehabilitation plans are usually formulated based on the timings of each of these stages. Developing a rehabilitation plan on your own can be hard. Working alongside an experienced Veterinary Physiotherapist will help to provide the best rehabilitation plan for your dog. The rehabilitation triangle (pictured below) demonstrates roughly what you should be aiming for during each stage of rehabilitation.

“So, I have a diagnosis! what can I do now?!”

During the inflammatory phase, following RICE (rest, ice, compression and elevation) is recommended. The muscle should be rested as much as possible for the first 3-5 days. Ice is essential as it will greatly help to reduce pain and swelling alongside the NSAIDs. Your physiotherapist may also apply Pulsed electromagnetic field therapy (PEMF) on a
vasoconstriction setting which will help to reduce swelling and pain.

After the first 72 hours, heat may now be applied. Heat promotes good circulation; thereby encouraging provision of nutrients to the damaged area and removal of waste products. Due to the location of the iliopsoas, superficial heat may struggle to reach the required depths. If the dog is not in too much pain then light massage can provide similar benefits to circulation. However, if the dog is in too much pain to accept massage then electrotherapies, such as, therapeutic ultrasound (TU), PEMF and laser therapy provide a very similar effect. TU is usually the electrotherapy of choice for iliopsoas strain due to its depth of heating.

After the initial immobilisation period, at around day 5, mobilisation exercises should begin. However, your physiotherapist is likely to be the best judge of your dog’s capabilities. If they are undertaken at the correct time, mobilisations are vitally important in recovery as they provide an improved blood supply, speed up type I collagen formation and improve alignment of new collagen fibres being laid down within the muscle. Passive range of motion and slow lead walking are both considered as mobilisations. In order for correct collagen fibre arrangement to occur, a load on the limbs must be provided, i.e. slow walking. This also encourages the dog to load every limb equally in order to prevent compensation in other areas of the body. During this time, passive stretching can also begin to be incorporated. This is one of the most important aspects of rehabilitation of the iliopsoas muscle as it helps to reduce adhesion formation and therefore, chronic iliopsoas damage. Stretches should be performed three times a week and only when the muscle tissue is warm. Either after a period of exercise, using a heat pack or TU.

When entering the final stage of remodelling, undertaking core strengthening exercises on a regular basis will ensure that your dog has adequate core strength to perform a greater range of activities without the increased risk of injury. Core exercises may include weight shifting, balancing on unstable surfaces, pole work and even using an underwater treadmill.

These ‘protected’ exercises of slow walking and core strengthening should continue for around 6 weeks post-injury before resuming ‘normal activity’. Due to the high risk of re-occurrence, in the early stages of ‘normal activity’, tight turns and weaving should be avoided. A proper warm up should also be included, such as 10-15 minutes of walking and trotting before participating in any more intense exercise. Alongside this, a correct cool down is crucial. This should incorporate a slow transition to walking, a thorough stretching regime along with application of alternate ice/heat therapy.

Remember! With a moderate to severe muscle tear or strain, the muscle may continue to strengthen for up to 12 months. So, be careful not to do too much with your dog too soon.
Reference List:


