Hamstring Injuries

For information on all types of injuries visit:
http://www.cssphysio.com.au/Doctors/fordoctors.html

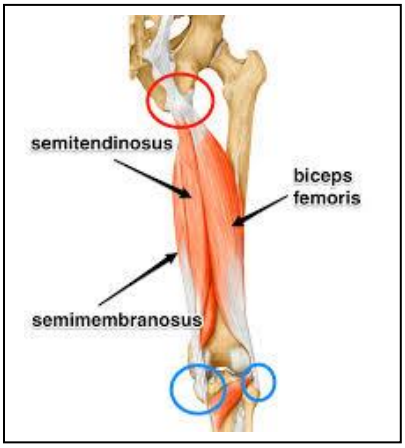
Hamstring Origin Tendinopathy

Following on from my last correspondence on hamstring origin rupture, this newsletter will focus on a common source of pain in the lower buttock region – hamstring origin tendinopathy (HOT). This is an update of a previous newsletter (June 2014). Like any tendon attachment in the body, the hamstring origin is prone to overuse and wear-and-tear. Unlike most tendons, the source of ongoing trouble – tendon compressive loading – is almost impossible to avoid in the proximal hamstring.

As you know, tendinopathy is a non-inflammatory tissue wear or breakdown at the enthesis. It can occur due to tensile overload, but expert consensus is that compressive loading between the tendon and bone is the main causative factor. This can be direct compression, such as sitting on a hard chair for the hamstring origin, lying on one's side for the gluteal tendons, or kneeling for patellar tendinopathy. It can also be due to joint and muscular movements which place the (underside) tendon into a position where it is brought into closer contact with the bone. This occurs for the Achilles insertion during dorsiflexion, for the gluteus medius tendon when sitting cross-legged, and for the hamstring when the hip joint is flexed.

Anatomy

The lateral hamstring, the biceps femoris, forms a conjoint tendon with the medial semitendinosus. The conjoint tendon arises from the inferior, posterior & lower lateral facet of the ischial tuberosity. Further superiorly, the biceps femoris tendon is continuous with the superficial fibres of the sacrotuberous ligament. The semimembranosus attachment is somewhat more lateral than the conjoint tendon attachment. The sciatic nerve is closely related and passes just laterally to the hamstring origin.



Pathology

Tendinopathy occurs due to areas of compression between the undersurface of the tendon & the bone interface. The biceps femoris & semimembranosus are the tendons most affected. At the cellular level, there will be increased cellularity, ground substance accumulation, collagen disorganization, & neurovascular ingrowth. Scanning may reveal localized bony oedema & insertional tendon clefts. There will sometimes be involvement of the ischiogluteal bursa. As with most tendinopathies, it is likely that chronic disease will make the hamstring origin prone to partial tearing or avulsion injuries. Proximal hamstring rupture is discussed at:
http://www.cssphysio.com.au/pdfs/Proximal-hamstring-rupture2.pdf

Predisposing Factors

Like the majority of insertional tendinopathies, HOT is caused by excessive compression of the tendon against the bone. This occurs due to direct compression (sitting) or positions of hip flexion &/or adduction that approximate the undersurface of the tendon to the bone. The condition is associated with sports that involve excessive tensile or compressive loads in positions of hip flexion or adduction (including hockey, tennis, the football codes, lawn bowling, sprinting, hurdling, and dancing). Excessive stretching (e.g. during yoga or Pilates) may also be a causative factor. HOT may arise secondary to partial hamstring origin tear, or post-surgical repair for complete rupture.

More specifically, contributing factors may include

training errors, poor running or walking gait, gluteal or hamstring muscle weakness, tightness in the hip flexors or hamstrings, excessive uphill running, postural factors including anterior pelvic tilt, restricted hip extension range, poor lumbo-pelvic control, over-stretching, and heavy weight training. Intrinsic factors include older age, increased BMI, certain metabolic conditions including diabetes, and hormonal factors. Along with other tendinopathies, HOT is common in perimenopausal women, as falling oestrogen levels have been shown to adversely affect tendon health. In middle-aged and older individuals, prolonged sitting or sitting on low or hard seats is the most common cause.

Presentation

There is usually deep buttock soreness localised over the ischial tuberosity. There will often be associated aching into the hamstring, due to secondary muscle tension or sciatic nerve irritation. In chronic cases, sciatic-related symptoms may include paraesthesia in the posterior thigh. However this is not common. The pain is often aggravated by walking, stretching, running, squatting, lunging and sitting. Hard chairs become very uncomfortable. The pain will often improve during activity when the tissues are warm, but be worse on cool-down. Post-activity exacerbation may last several hours to a few days. Sometimes pain initially improves but worsens toward the end of activity. Stiffness will sometimes be present in the morning or after rest.

Palpation findings are often reported to be inconclusive, however in my experience tenderness can usually be located laterally or posteriorly on the ischial tuberosity, some 1-2 cm proximal to the inferior aspect. Diagnosis is assisted through the use of provocative testing. This involves progressively loading the tendon in positions of increasing hip flexion (e.g. see Goom et al 2016).

Differential diagnosis

Other causes of pain in this region may be lumbar spine or SIJ referral, lumbar radiculopathy, proximal hamstring tear, and piriformis syndrome. Less likely is hip joint referral.

Physiotherapy Management

Most tendon rehabilitation programmes will take between 3 to 6 months. A progressive loading approach is the key to effective management. The aim is to reduce pain and promote tissue healing. There will often be a fine balance between insufficient and excessive loading. The type and degree of load will depend on the stage of the condition and the response to exercise. Loading will usually commence in outer range to minimize compression, and gradually progress to inner range as symptoms improve and strength returns.

Other intervention strategies include:

- Education to ensure the patient minimizes activities that increase tendon compressive loading.
- Soft tissue techniques to release tight myofascial structures.
- Strengthening of synergists including the ‘core’, the gluteal muscles and sometimes the adductors.
- Neuromeningeal techniques if necessary to address neural tethering and restriction.
- When necessary, running technique modification / gait retraining.
- Correction of aberrant movement patterns and postures including anterior or lateral pelvic tilt.
- Postural re-education & exercises.
- Use of unloading cushions and positions for sitting.
- Kinetic chain strengthening and gradual return to sport and work specific activities.

References:

1. Brukner, P & Khan, K (2012). Clinical Sports Medicine, 4th ed. McGraw Hill.
2. Goom, T et al (2016). Proximal hamstring tendinopathy: clinical aspects of assessment and management. Journal of Orthopaedic & Sports Physical Therapy, 46, 6, 483-493.
3. Malliaras, P & Purdam, C (2014). Proximal hamstring tendinopathy assessment & management. Sport Health, 32, 1, 21-29.
4. Miller, S et al (2007). The proximal origin of the hamstrings and surrounding anatomy encountered during repair: a cadaveric study. The Journal of Bone and Joint Surgery, 89-A, 1, 44-48.
5. Rees, J et al (2009). Management of tendinopathy. American Journal of Sports Medicine, 37, 9, 1855-1867.
6. Woodlety, S et al (2005). Anatomy of the sacrotuberous ligament. New Zealand Journal of Physiotherapy, 33, 3, 91-94.

For information for doctors on physiotherapy management of all types of injuries visit:
http://www.cssphysio.com.au/Doctors/fordoctors.html

Information for patients is at:
http://www.cssphysio.com.au/forpatients.html

Concord Sport & Spine Physiotherapy

Concord Sport & Spine Physiotherapy
202 Concord Road
Concord West, NSW 2138
Sydney, Australia.

Ph (02) 9736 1092
Email: info@cssphysio.com.au
Web: www.cssphysio.com.au