INTRODUCTION

Lateral hip pain is often diagnosed as trochanteric bursitis, but research over the last 15 years has increasingly challenged the notion of bursal inflammation. Instead, imaging, histological, and surgical investigations have identified a non-inflammatory insertional tendinopathy (Kingzett-Taylor et al., 1999; Bird et al., 2001; Fearon et al., 2010). The pain and dysfunction from this condition reported by patients are said to be like advanced hip osteoarthritis in severity (Fearon et al., 2014); other studies have reported more moderate symptoms. In practice, you are likely to see a range of reported symptom severities. Gluteal tendinopathy most commonly affects women >40 years of age (Segal et al., 2007) and is the most common lower-limb tendinopathy (Albers, Zwerver and van den Akker-Scheek, 2014). This high prevalence may be partially due to the increased participation in running events by older age groups or because of a generally increasing size of this demographic.

This chapter provides evidence-informed and clinically useful guidance for the treatment of gluteal tendinopathy, also termed trochanteric pain syndrome or, simply, lateral hip pain.
ANATOMY

Gluteal tendinopathy has been identified in both the gluteus medius and minimus. The anatomy of the iliotibial band (ITB), including its superior attachments to the gluteus maximus and tensor fasciae latae (TFL), are also important structures to assess and are covered in this anatomical section.

Pelvis and hip joint

The basic muscular anatomy of the pelvis and hip joint is shown in Figure 7.1. There are notable differences between the adult male and female pelvis, which are relevant to the increased incidence of gluteal tendinopathy among women. In comparison to the male pelvis, the female pelvis is wider, has a smaller, more anterior acetabulum, and a less vertical ilium (Figure 7.2).

![Musculature of the lateral hip](image)

**FIGURE 7.1** Musculature of the lateral hip.
Evolution
The increased lateral orientation of the ilia during evolution was likely necessary to allow us to stabilise the pelvis during single-leg stance as required during the normal bipedal gait cycle. In primates, the ilia have less lateral orientation and their equivalent gluteal muscles function predominantly as extensors during quadrupedalism (Earls, 2014). In theory, this means that primates and other quadrupeds should be unable to walk on two legs like humans. There are many reports of quadrupeds (from monkeys to dogs) performing bipedalism, but even when they do, a lack of trunk stability and hip extension and the inefficiency of the movement is evident.

The role of the gluteal muscles during the gait cycle
Walking and running are full body movements that involve a complex interplay of controlled joint movements. Poor function of the hip and pelvis during gait has been identified as a key area to assess because of its potential links to the onset of gluteal
tendinopathy. The bony arrangement and joint mechanics of the pelvis, femur, and hip joint fulfil multiple functions during the gait cycle, while preserving the ability to allow less common movements more akin to our arboreal (tree-dwelling) ancestors. Hip joint function is reviewed in Chapter 10 and it is also discussed in Chapter 2.

Located under the gluteal tendons are three key lateral hip bursae: the subgluteus maximus (trochanteric) bursa; the subgluteus medius bursa; and the subgluteus minimus bursa (Figure 7.3). The large trochanteric bursa is the most superficial bursa located beneath the gluteus maximus and iliotibial tract, covering the posterior and lateral facets of the greater trochanter and gluteus medius tendon (Pfirrmann et al., 2001). Historically, this was implicated as the main pathological structure causing lateral hip pain. Gluteal tendinopathy is now considered the most likely pathology, although the two may coexist. A recent retrospective review of the sonography results of 877 individual patients for lateral hip pain reported that 80% did not demonstrate a bursitis on ultrasound (Long, Surrey and Nazarian, 2013).

**FIGURE 7.3** The three subgluteal bursae.
The gluteal muscles

*Gluteus minimus*

The gluteus minimus is shown in Figure 7.4.

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**FIGURE 7.4** (a) The anatomy of the gluteus minimus and medius. (b) Cross-section of the hip musculature showing the separations within the contractile tissue. Recreated line drawing, adapted from (Grimaldi, 2011).
The proximal attachment is at the lateral ilium, between the anterior and inferior gluteal lines. The muscle is also directly attached to the superior hip joint capsule. The distal attachment is at the anterior facet of the greater trochanter.

The gluteus minimus is the deepest muscle of the hip abductor muscle group and the smallest gluteal muscle. The attachment to the hip joint capsule may offer dynamic stabilisation to the otherwise passive capsular and ligamentous tissue.

The gluteus minimus is innervated by the superior gluteal nerve associated with the L4-S2 spinal and sacral vertebrae. This nerve separates into two branches: cranial (L4-S1); and caudal (S1-S2). The gluteus minimus may receive innervation from both branches (Duparc et al., 1997) or solely from the cranial branch (Flack, Nicholson and Woodley, 2012).

**Gluteus medius**

The gluteus medius is attached to the lateral ilium, between the anterior and posterior gluteal lines. Some texts also note attachments to the iliac crest and gluteal aponeurosis (Flack, Nicholson and Woodley, 2012). The gluteus medius tendon is composed of two parts: a strong, round tendon that attaches to the superoposterior facet of the greater trochanter; and a thin, lateral part that attaches to the lateral facet of the greater trochanter (Pfirrmann et al., 2001).

Grimaldi (2011) reported that the gluteus medius has three fascially distinct portions (Figure 7.4b): anterior, middle and posterior.

Therapeutically, it is more helpful to be aware of the separate functions of the anterior and posterior portions of the muscle, with the middle (superficial) portion receiving little attention in the literature and not reported in some anatomical texts. The posterior and anterior portions appear to be the most important functionally.

The gluteus medius is innervated by the superior gluteal nerve associated with the L4-S2 spinal and sacral levels. The superior gluteal nerve separates into two branches, one of which innervates the posterior gluteus medius (cranial branch L4-S1) and the other innervates the anterior gluteus medius (caudal branch S1-S2).

**Tensor fasciae latae**

The proximal attachment of the TFL is the anterior lateral portion of the ilium, often extending laterally to the anterior superior iliac crest and often attaching on the ilium below the iliac crest.
The distal attachment of the TFL involves the contractile fibres of the TFL inserting into the fascia latae and ITB. The fascia latae and ITB then blend with the patellar retinaculum and insert onto the tubercle of the tibia distally. There is anatomical variation in this arrangement (Standring et al., 2008), but the TFL along with the ITB span both lateral hip and knee joints.

Less information exists on the anatomy of the TFL muscle. The long, slender muscle is about 15 cm long (Moore and Dalley, 1999), but this varies with height. The muscle is very superficial and easy to palpate; it is often tender to the touch in runners and those with lateral hip pain.

The TFL is innervated by the superior gluteal nerve associated with the L4-S2 spinal and sacral levels. (Flack, Nicholson and Woodley, 2012).

The fasciae latae and iliotibial band
The fasciae latae is the deepest of the three divisions of fascia over the lateral thigh; it resides under the lateral intermuscular septa of the thigh, which thickens superficially into the ITB.

The proximal origin of the ITB is a bony attachment from the middle to the anterior iliac crest. The ITB also has muscular attachments to the superficial fibres of the gluteus maximus and the TFL.

The vastus lateralis muscle increases ITB tension by pushing the band out laterally, providing a mechanical advantage for the TFL and superior gluteal fibres.

PATHOLOGY

The biological contents of a tendon are primarily structured to tolerate tensile forces while allowing the necessary pliability needed to bend and become compressed during joint movements. A tendinopathic response begins at the lateral hip following unaccustomed tensile force, a compression mechanism, or a combination of both. The gluteus medius or minimus tendons at their attachment to the greater trochanter are most at risk and potentially affected by additional compressive force from the overlying ITB. A tendinopathy continuum is likely to occur; the continuum theory is covered in Chapter 3.
BIOMECHANICS

To prevent the “hip drop” that is typical of the Trendelenburg gait pattern and excessive leg adduction during the single-leg stance phase of the gait cycle, two key lateral hip stabiliser mechanisms work in synergy (Figure 7.5).

The abductor mechanisms

The gluteus medius and minimus provide 70% of the abductor force required for pelvic stability during single-leg stance (Kummer, 1993). The ITB stabilisation mechanism provides the remaining 30% of abductor force during single-leg stance (Kummer, 1993). ITB tension is increased by the contraction of the fibres of the upper gluteus maximus, the TFL and the lateral expansion of the vastus lateralis muscle during its concentric contraction.

A likely mechanism for gluteal tendinopathy is an imbalance between the two abductor mechanisms, with atrophy of the gluteus medius and minimus causing an increased load on the ITB stabilisers, resulting in potential compensatory hypertrophy of the TFL (Sutter et al., 2013) and the associated gluteus maximus fibres. Increased tension through the ITB coupled with a likely increase in hip adduction during stance leads
to an increased compressive force over the greater trochanter and gluteal tendons. This may also present as “snapping hip syndrome” as the ITB is plucked over the greater trochanter during loaded hip extension from a position of flexion.

These changes indicate the need for specific testing procedures and provide guidance for therapeutic intervention. Potential options are discussed later in this chapter.

**BONY ANATOMY**

Specific anatomical measurements or “anthropometrics” have been correlated with an increased incidence of lateral hip pain due to the increased stress on the supporting soft tissues during the single-leg stance phase of gait.

The first of these is a lower femoral neck-to-femoral shaft angle, commonly termed coxa vara. This reduced angle places the greater trochanter in a more lateral position, effectively widening the hips but not the pelvis; thus, the ITB must bow out around the greater trochanter. This leads to an increased compressive force on the greater trochanter from the overlying ITB. Birnbaum and collaborators (2004), supported by Fearon, Stephens and Cook (2012), identified that patients with more severe gluteal tendon pathology have lower femoral neck shaft angles than pain-free individuals or those with hip osteoarthritis.

**Assessing for coxa vara**

The measurement of the femoral neck-to-shaft angle should be assessed with radiography, but some clinical signs of bilateral coxa vara may be evident. These include: increased prominence of the greater trochanters relative to the iliac crests (Viradia, Berger and Dahners, 2011); a waddling gait pattern; and limited abduction and internal rotation.

Coxa vara is uncommon and these are simple tests that lack specificity. Be cautious not to diagnose all wide-hipped patients with coxa vara.

**ASSESSMENT**

The Victorian Institute of Sports Assessment-Gluteal Tendon (VISA-G) questionnaire is an excellent clinical tool for measuring the severity of gluteal tendinopathy during the initial assessment and for monitoring purposes. The gluteal version of the well-known VISA-A questionnaire, is reliable and valid (Fearon et al., 2015). As rec-
ommended for the other VISA questionnaires, it is best used at monthly intervals and should not be used too often to avoid over-assessment.

There is no single test with high sensitivity and specificity for diagnosing gluteal tendinopathy; instead, a battery of tests is suggested to aid a correct differential diagnosis. Symptoms and the associated tests are described here.

**Lateral hip pain**

Pain and tenderness is often reported on or around the greater trochanter, possibly radiating down the lateral thigh. Pain onset is often insidious and tends to progressively worsen or be exacerbated by certain activities such as running and walking, or postures such as deep-seated positions, sitting cross-legged or prolonged standing while leaning on one leg (Figure 7.6).

![Figure 7.6](image)

**Figure 7.6** Standing in hip adduction places direct pressure on the lateral hip structures of the loaded leg and is an aggravating or causative factor for gluteal tendinopathy.

**SLEEP DISTURBANCE**

Gluteal tendinopathy typically disturbs sleep and can be especially uncomfortable for the patient when side-lying. With the painful side down, an external compressive mechanism is applied over the lateral hip by the bed; having the painful side on top places
the hip in an adducted position that increases internal soft tissue compression over the greater trochanter.

**Functional tasks**
Moving from hip flexion to hip extension often causes pain, so simple activities such as standing up from a chair or walking up steps often cause pain over the lateral hip. Single-leg stance during the gait cycle can provoke pain in patients with significant hip instability.

**Provocation tests**
Testing that initiates both an active contraction of the hip abductors and provides a compressive mechanism over the greater trochanter is most likely to reproduce symptoms. The following tests can be used for assessment.

*The 30-second single-leg stance test*
Instruct your patient to transfer their weight onto the affected leg and allow some hip adduction to occur (Figure 7.7). Have them remain standing on the affected leg for up to 30 seconds or until lateral hip pain is reproduced.

*FIGURE 7.7* The single-leg stance test can be used for assessment and monitoring purposes; its primary function is to provoke pain, with a secondary function of detecting hip stability.
The timing of the onset of pain can be documented and used for monitoring purposes. This test differs from the Trendelenburg test, which assesses the maintenance of pelvic stability rather than pain and is of shorter duration; however, an inability to maintain stability of the pelvis should also be noted as an associated outcome measure.

The single-leg stance test has not been extensively researched, but a study by Lequesne and collaborators (2008) reported a test sensitivity of 100% and specificity of 97.3% in a small (17 people), predominantly female cohort with long-standing greater trochanteric pain syndrome with magnetic resonance imaging serving as the gold standard. Despite the paucity of research, the biomechanical basis of pain provocation logically fits with changes in normal biomechanical function (pathomechanics).

**The resisted external de-rotation test**

The resisted external de-rotation test (Figure 7.8) is used to provoke pain over the lateral hip and indicates the presence of gluteal tendinopathy. Lequesne and collaborators (2008) reported a sensitivity of 88% and a specificity of 97.3% for this test when they tested it alongside the 30-second single-leg stance test mentioned earlier.

![Figure 7.8](image.png)

**FIGURE 7.8** The resisted external de-rotation test can also be described as outer range-resisted internal rotation.

Passively flex the hip to 90 degrees and then externally rotate the hip to the end of available external rotation range. Full external rotation is often painful for patients
with lateral hip pain; if this is the case, external rotation should be gradually reduced to a pain-free position. From here, you should instruct your patient to resist further external rotation, effectively attempting to internally rotate their leg in response. A positive outcome is determined by the immediate onset of pain over the lateral hip.

**DIFFERENTIAL DIAGNOSIS**

Patients with hip osteoarthritis commonly share a similar clinical presentation to gluteal tendinopathy; however, those with hip osteoarthritis will have difficulty putting on socks and shoes when dressing because of hip joint limitation when flexing, whereas gluteal tendinopathy does not limit flexion (Fearon et al., 2013). This can be tested clinically with a simple passive hip flexion test or a FABER (Patrick’s) test (Figure 7.9).

![The FABER test is widely used for a variety of suspected hip and pelvic pathologies. FABER = Flexion, Abduction, and External Rotation.](image)

The FABER (Patrick’s) test begins with the patient supine; this is followed by the passive positioning into hip Flexion, Abduction and External Rotation (FABER). The test is widely used for a variety of suspected hip and pelvic pathologies. The test can be used to help differentiate between an arthritic hip and gluteal tendinopathy. If these pathologies coexist, which is not uncommon, the FABER test is not as effective.
Patients with gluteal tendinopathy, but without osteoarthritis, do not have a limited range during the FABER test, although they may experience pain at the end of the range. Patients with osteoarthritis present with a reduced range during the FABER test, again making it difficult to put on shoes and socks.

**Assessing lateral hip stability**

The modified Trendelenburg test is recommended over the standard Trendelenburg test, which insufficiently tests lateral hip stability and may lead to false results because other body segments, such as trunk alignment, are not routinely screened.

**Modified Trendelenburg test**

This test is adapted from the work of Grimaldi (2011). The test consists of two parts: self-select; and prompted correction.

**Single-leg stance: self-select**

Instruct your patient to stand on one leg with the non-weight-bearing hip in neutral. The presence or absence of a few key compensations should be noted. The ideal position is for the weight-bearing hip to stabilise with minimal adduction (5 degrees) while the trunk is kept upright over the pelvis with the arms relaxed (Figure 7.10a). The following compensations may occur: (1) lateral pelvic tilt and hip drop on the non-weight-bearing side (Figure 7.10b), which indicates instability and represents a positive test result; and (2) lateral trunk flexion towards the weight-bearing side (Figure 7.10c), which represents a positive result due to the trunk compensation for the lateral pelvic drop.

![Figure 7.10](image)

**FIGURE 7.10** (a) Correct and stable one-leg stance. (b) Hip adduction showing contralateral pelvic drop. (c) Compensatory trunk flexion.
Single-leg stance: prompted correction
After assessing your patient’s self-selected single-leg stance, you can glean further useful information by prompting specific movements to assess the availability and control of movement and correct any compensations. The following actions should be prompted:

1. Lateral hip lift: whether the lateral hip has dropped or not, the ability to lift the non-weight-bearing side of the pelvis with the loaded abductors indicates the strength, control, range, and willingness of the loaded abductors. The onset of pain should also be noted. Watch out for compensatory trunk side flexion with this test.

2. If the trunk has flexed during the initial self-select test, then the patient should be encouraged to correct this. It is common for the pelvis to drop again when the trunk returns to an upright position; the onset of any lateral hip pain should be noted.

3. If compensation can be corrected without pain, this indicates a more modifiable movement pattern. If pain occurs with the reduction of the compensatory pattern, then this offloading mechanism remains until the associated pain can be reduced. Although movement patterns and corrective exercises can be performed in the presence of pain, patient compliance and exercise adherence are greatly reduced by poor pain management.

RISK FACTORS
Identifying potential risk factors for tendinopathy can help inform the diagnosis and treatment plan. Risk factors and their mechanisms include:

- Female gender: anatomical differences in pelvic anatomy may account for the gluteal tendinopathy gender bias towards women at a suggested ratio of 4:1 (Segal et al., 2007).
- Age: gluteal tendinopathy is commonly reported in people over 40 years of age.
- Poor lateral hip stability: the intrinsic and extrinsic reasons for this are explained within this chapter.
- Gluteal weakness: there may be poor gluteal function overall from a lack of conditioning, a sedentary occupation or lifestyle, and non-bipedal exercise habits. The synergistic function of the muscles is also a factor, as discussed in this chapter.
- Overstriding during running (and walking): an excessive stride length leads to an increased vertical ground reaction force and braking force per foot contact,
plus increased adduction from the end of the swing phase and during stance, all of which can be contributing factors.

- Hip to pelvic girth: this may be gender-related and may be classed as coxa vara if the femoral shaft-to-neck angle is below the normal range.
- High body mass index (BMI): excessive weight increases the stability demands on the lateral hip stabilisers and a high BMI is indicative of inactivity. In addition, blood lipids may increase the risk of tendon pathology at a cellular level.
- Hip osteoarthritis: osteoarthritis and pain lead to gluteal muscle inhibition followed by atrophy, which reduces hip stability and increases the risk of tendinopathy within this region.
- Leg length discrepancy: in clinical practice, this seems to have become an all-too-popular diagnosis. A significant leg length discrepancy would logically be a risk factor for many biomechanically driven issues, but this may not be the cause of the pain.
- Poor lower-limb muscle strength: if a patient has generally poor lower-limb muscle strength this would likely include the lateral hip stabilisers.
- Posture: standing habitually on an adducted leg “hanging on the hip”. This pain-provoking position may be a cause of gluteal tendinopathy by altering the length/tension relationship of the hip stabilisers and allowing a constant compression of the ITB over the gluteus medius and minimus tendons.

**MANAGEMENT**

**Modifying the risk factors**
The most useful risk factors are the ones easily identified and modified. A high BMI is easily identified but not so simple to modify. Advice regarding standing posture, not “hanging on the hip”, and sleeping with a pillow between the knees may provide some quick relief. The mainstay of treatment is based on strengthening the lateral hip region and avoiding aggravating postures.

**Strengthening programmes**
A variety of gluteal exercises can improve hip stability and reduce pain, but the targeted activation of the trochanteric abductors is most likely to be beneficial if it can be achieved without further strengthening the ITB mechanism or habitually recruiting it. While the gluteus medius and minimus remain inhibited. The habitual motor
pattern will continue to activate the ITB mechanism if this has become dominant. Reversing these aberrant recruitment patterns is potentially achievable by using the correct exercise positions. In addition, reducing muscle tone in the ITB tensioners appears to support the same outcome.

**Isometrics**
These exercises are designed to bias the trochanteric abductor mechanism and avoid ITB compression over the greater trochanter. Isometric loading aims to provide an exercise-based analgesic option in addition to a mechanical loading stimulus, which forms the beginning of a more dynamic and specific loading programme.

The benefits of isometric exercises for analgesia have been reported for a variety of conditions including patellar tendinopathy (Rio, Kidgell and Moseley, 2013), fibromyalgia (Kosek, Ekholm and Hansson, 1996) and in healthy individuals (Kosek and Lundberg, 2003; Hoeger Bement et al., 2009), but not specifically for lateral hip pain. I have found them to work clinically in most cases. Isometrics are a popular pain management tool for lower-limb tendon pain.

**Abductor wall push**
The aim is to isometrically contract the gluteus medius and surrounding muscles in a stable position.

With your patient supine, the hips should be flexed, and the knees bent. The inner leg should abduct out towards the wall. Place a cushion between the knee and the wall to reduce the amount of necessary abduction. Instruct your patient to abduct the leg towards the wall for 45–60 seconds and repeat 3–4 times (**Figure 7.11**).

This exercise can be tested when lateral hip pain has been exacerbated to see if it provides an analgesic effect.
FIGURE 7.11 The abductor wall push is a simple isometric exercise to load the hip abductors from a stable and relaxed posture.

**Double-abductor hold**

This bilateral exercise can be performed sitting down or lying with a belt or band to provide resistance. It is an excellent option for people who sit for long periods during the day.

Your patient should be lying or sitting with their hips flexed and knees bent. Apply a band or belt around their knees to resist hip abduction. Get your patient to abduct their legs by parting their knees and maintaining an isometric resistance against the band for 45–60 seconds, repeating this 3–4 times (Figure 7.12).

This is a great exercise to get less active people to perform isometric exercises in the hope that they will progress to more dynamic exercises if pain is reduced.
**Gluteal activation research**

Most of the gluteal muscle activation studies have used surface electromyography (EMG) measurements to determine the best exercises to activate the gluteus maximus and medius. Some of these studies used EMG to measure the TFL, based on the premise that the TFL can become overactive; therefore, exercises with a higher gluteal muscle/TFL ratio would be beneficial for correcting this imbalance. Based on EMG research, the consensus is that single-leg squats and deadlift exercises provide the highest activation of both gluteus maximus and medius (Distefano et al., 2009). To bias the gluteus medius, a hip abduction-based movement is required, potentially benefitting further from a small amount of internal rotation as the hip abducts (McBeth et al., 2012). For a more isolated gluteus maximus contraction, a hip extension exercise can be used.

**Isolation exercises**

**The clam**

In contrast to the research supporting the clam, McBeth and collaborators (2012) found that the clam exercise produced high EMG output for the TFL and low EMG output for the gluteus medius. They concluded that the exercise has poor efficacy for gluteal retraining. Their findings are supported by the literature describing the altered function of the gluteus medius after 40 degrees of hip flexion (DiStefano et al., 2009).
Despite this, Lee and collaborators (2014) found that the gluteus medius dominated over the TFL during the clam exercise, with the hip flexed at different ranges between 30 and 60 degrees. The research does not show a consensus; in practice, the clam remains one of the most commonly prescribed gluteus medius exercises. The aim of the clam exercise is to stimulate contraction of the gluteus medius and associated muscles.

Your patient should be side-lying with the hips flexed to 30 degrees and the knees bent to approximately 90 degrees (Figure 7.13a). From side-lying, they should tilt the pelvis forward so that their upper knee slightly overhangs their lower knee. Do not allow the pelvis to rock backwards during the exercise. Place a pillow between your patient’s knees to reduce hip adduction.

Have your patient keep their pelvis stable and heels together while lifting their upper knee up until the pelvis begins to rock backwards, then lower their leg back to the starting position under control.

Get your patient to focus on controlling their movement and maintaining the correct form. Repetitions are not the focus of these exercises.
FIGURE 7.13  (a) The clam exercise is a common exercise for hip stability. Although simple to complete, attention should be given to the correct positioning so that the gluteus medius and minimus can be targeted effectively. (b) Abducted clam. (c) Banded clam. (d) Extension clam.

Clam progressions

Abducted clam

By getting your patient to slightly lift their upper foot and maintain this abducted position, gluteus medius activation is increased significantly (Figure 7.13b).

Banded clam

Using a resistance band around the knees increases muscle activation. It is important for the patient to maintain the correct technique (Figure 7.13c).

Extension clam

Starting from the abducted clam position, have your patient move their upper leg back into hip extension and then perform internal-to-external hip rotations from this extended hip position (Figure 7.13d).
**Side-lying hip abduction**

This is one of the most commonly used exercises, supported by EMG studies, to facilitate the gluteus medius. Performing it with internal hip rotation may allow a reduced contribution from the TFL (Figure 7.14a).

Your patient should be side-lying in a similar position to the clam but with their upper leg extended in line with their torso. Get them to abduct the upper leg to approximately 30 degrees of abduction.

The exercise is more challenging if the leg is not lowered fully. The length-tension relationship of the gluteus medius muscle may be positively influenced by repeating the movement within the muscle’s inner range.

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**FIGURE 7.14**  
(a) The side-lying hip abduction exercise is a simple alternative to the clam exercise. The author prefers to focus on the clam exercise with most patients, but it is important to have different exercise options available. (b) The side plank hip abduction is not easy. Patient selection is important.
Hip abduction progressions

*Side plank hip abduction*

The side plank with hip abduction exercise provides a challenging progression (Figure 7.14b). The side plank can also be performed in isolation with or without bending the knee.

*Kneeling hip stability*

This is a challenging hip stability exercise for more physically able patients. Balancing on a bent knee reduces the contribution from the ITB tensioners (Figure 7.15).

Your patient should be kneeling on one knee on a raised surface with cushioning. The unweighted leg should not be weight-bearing during the exercise. Actively hitching the lateral pelvis with the loaded abductors should provide a challenging isometric hold for your patient, while further reducing the compressive mechanism associated with adduction. Hip flexion and extension can also be performed, as can further balance challenges.

It is important for your patient to maintain an upright trunk and avoid too much compensation from the trunk lateral flexors. A stick can be used for stabilisation and to help teach the correct positioning.

**Figure 7.15** This exercise is an effective way to challenge hip stability. Make sure the set-up is safe and cushioning is provided under the knee for comfort.
**Abduction steps**
This is a dynamic exercise, which loads the lateral rotators (Figure 7.16). Your patient should be standing with a resistance band securely attached around the knee.

Ask your patient to walk sideways using a controlled abduction movement of the leading leg against the resistance of the band.

Make sure the band is secure and does not roll up the leg. Teach your patient how to achieve this before they do this as a home exercise.

![Figure 7.16](image)

*A resistance band is used to provide resistance into abduction during this dynamic exercise.*

**Abduction resistance squat**
Attaching a resistance band around your patient’s knees during squat and deadlift activities stimulates an increased abductor moment to maintain the external rotation of the lower limbs (Figure 7.17).
Abduction resistance squat. Adding a resistance band to a simple squat motion to increase abduction resistance can increase the contribution of the gluteus medius.

**Figure 7.17**

Single-leg squat and single-leg straight leg deadlift

These two exercises require maximum hip stability. As discussed earlier, the EMG recordings for both gluteus maximus and medius are consistently reported to be high for these two exercises. These exercises should only be performed by patients assessed as suitably physically fit and capable of performing the activity. They are not the goal of all strength training programmes for gluteal tendinopathy. Essentially, they are presented as an advanced “option” (**Figure 7.18a,b**).
Strengthening summary

I recommend reading Chapter 9 before prescribing a strengthening programme for the gluteal musculature. Reducing lateral hip pain can be achieved by placing the hip away from adduction during exercise and rest. A strengthening programme should begin with simple isometric exercises followed by progressive isolation exercises leading to compound exercises and then functional rehabilitation, including gait changes if required. This suggested order of progression is one used within many rehabilitation plans, but it is not a golden rule. Experimenting with a mixture of exercise types at the same point in a rehabilitation plan is also possible.

OTHER TREATMENTS

Massage options

The key areas to massage that often decrease lateral hip pain from tendinopathy are: (1) TFL; (2) posterior superior gluteal muscles; (3) vastus lateralis muscle; and (4) the quadratus lumborum muscle, which may also benefit from massage treatment if it has been compensating for hip instability (Figure 7.19a-d).
Massage theory and options are discussed further in Chapter 11.

FIGURE 7.19  Massage options for (a) tensor fasciae latae, (b) gluteal muscles, (c) vastus lateralis, and (d) quadratus lumborum.
**Extracorporeal shockwave therapy**

Although two studies have reported positive outcomes for lateral hip pain using extracorporeal shockwave therapy (ESWT) (Furia et al., 2009; Rompe et al., 2009), further review of the methodology highlighted that it was radial wave and not shockwave. Chapter 13 on ESWT explains the important difference.

**Corticosteroid injections**

Corticosteroid injections are popular because they often reduce the pain from chronic musculoskeletal conditions quickly and their effect can be maintained for anywhere between a few weeks and a few months. They are also quick, cheap, and easy for doctors to administer. Unfortunately, corticosteroids provide poor long-term outcomes, mainly due to the failure to address the underlying cause of the problem. If the aggravating factor remains, the pain is likely to return when the effects of the corticosteroid have reduced. One option is to simply continue injecting the lateral hip. A systematic review of the efficacy of trochanteric bursitis treatments reported on one patient group that had received five lateral hip injections over a 4-year period (Lustenberger et al., 2011). The efficacy of corticosteroid injections for gluteal tendinopathy remains questionable and is not clear. They seem to provide medium-term pain relief (Labrosse et al., 2010), but they may also have a negative impact on the tissue response to load and loading (Coombes et al., 2013).

**Surgery**

Surgery should be considered after conservative physical therapy methods have failed. Different surgical options exist for lateral hip pain and gluteal tears. Repairs can be performed endoscopically or as open procedures. Post-surgical follow-up reports after ≥1 year are very positive (Walsh, Walton and Walsh, 2011), even though control groups for comparison are not available. Common procedures for lateral hip pain focus on trochanteric bursectomy and ITB release techniques (e.g. Z-plasty). The longer-term follow-up from ITB release methods is poor and there is valid concern for the disruption of the ITB hip stabilisation mechanisms.

**Taping**

Kinesiology taping has become increasingly popular for the management of musculoskeletal conditions. Some research has documented the advantages of taping around the buttock region to improve local muscle activation (Dowarah, 2011; Mostert-Wentzel et al., 2012; Miller et al., 2013). From my experience, kinesiology taping for lateral
hip pain can be used as a simple analgesic tool and to facilitate gluteal activation. This may be achieved with one application, different applications, or a combination of applications, such as a lateral hip decompression and a lateral line ITB taping. Gluteal taping options are described in Chapter 12.

**Gait manipulation**

Overstriding causes a more anterior and midline-oriented foot strike that increases ITB compression over the greater trochanter. Overstriding is often coupled with a low step rate that increases the ground reaction force per foot contact. The pelvis needs to control this loading and may allow an increased adduction to absorb the higher impact forces from increased vertical displacement. The initial strike pattern (heel or mid-foot) also influences force absorption further up the kinetic chain. Gait manipulation is a valuable tool for managing gluteal tendinopathy (Figure 7.20). Chapter 10 reviews the research and techniques.

![](image)

**FIGURE 7.20** An increased stride length leads to an increased hip adduction at the terminal swing, and initial stance along with an increased load through the lateral hip tissues.
CONCLUSION

Evolutionary biology informs us that our hips and pelvis have evolved to allow an upright stance as our default posture and position of ambulation, while preserving our ancestral mobility by allowing us to squat down or climb. Functional anatomy research allows us to identify the specific muscles likely to require intervention, for example, an overactive TFL or inhibition of the gluteus medius. The trochanteric and ITB stabiliser mechanism proposed by Kummer (1993) provides a practical rationale for assessment and treatment planning.

What potentially makes this condition distinct from the other common lower-limb tendinopathies is the compressive mechanism over the greater trochanter, which may be a larger contributory mechanism than it is for other tendinopathies. This highlights the importance of movement correction, from static posture to gait changes.

A selection of simple tests with good validity and sound biomechanical underpinning, plus the VISA-G questionnaire, increases the ability to assess and monitor this pathology.

REFERENCES


**FURTHER READING**


