Case report

Anterior thigh pain – A case report

Neasa De Burca*

Physiotherapy Department, University Hospital Galway, Ireland

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1. Introduction

Femoral nerve compression is uncommon when compared to other neuropathies (Al Hakim and Katirji, 1993). It has been reported after a number of surgical procedures at the hip including hip arthroplasties, femoral artery surgery as well as obstetric and gynaecologic procedures (Busis, 1999). According to Pozzati et al. (1982) it’s occurrence post inguinal hernia repair is rare. Diagnosis of femoral neuropathy is usually made by clinical examination, but in severe cases EMG studies may be justified (Walsh and Walsh, 1992). Prognosis relates to the degree of axonal loss and the age of the patient (Kuntzer et al., 1997).

2. Clinical presentation

A 75 year old male presented to the Physiotherapy Department at University Hospital Galway complaining of a 3 year history of left sided anteromedial thigh pain with associated paresthesia (see Fig. 1). The patient described the pain as intermittent, burning in nature and he scored it 6/10 on the numerical rating scale (NRS) (Hartrick et al., 2003). Intermittent paresthesia in the same area associated with the pain was also reported. The symptoms were aggravated by sitting for 20 min and by squatting while gardening for 20 min. Relief of the symptoms was achieved with lying down or walking for 15 min. His symptoms were worse in the evening when he sat down to watch television. He reported 5–10 min morning stiffness in both hips. No night pain, weight changes or constitutional symptoms were reported.

The patient first noticed his symptoms after sitting during a car journey. He denied any history of trauma or change in activities at that time. He attended his GP and was prescribed anti inflammatory medications. He was referred for hip radiographs. His symptoms settled over the following days, but he reported intermittent bouts of similar symptoms since. Over the last year, the frequency of the pain episodes had increased. He returned to his GP who ordered blood tests and an MRI of his lumbar spine and referred the patient to see an Orthopaedic Surgeon.

Past medical history included occasional low back pain since an injury at work 20 years previously for which the patient took paracetamol as required. Surgical history included bilateral laparoscopic inguinal hernia repairs 3½ years previously. He was otherwise fit and healthy and was on no regular medications. He was a retired general operative in road construction. He was a keen gardener and until recently spent 1–2 h daily in the garden and also played poker 2 nights per week. His symptoms had limited both of these activities in the last number of months. He walked 45 min daily. He was a non smoker and non drinker with no significant family history.

On objective examination the patient presented with a forward head posture, increased thoracic kyphosis and reduced lumbar lordosis. Lumbar spine active range of motion (ROM) was full and pain free but over pressure into flexion provoked local pain. Repeated and combined movements did not reproduce any symptoms. Hip ROM was slightly reduced bilaterally at end of range flexion and internal rotation with groin pain as the limiting
factor. Axial loading of the hip did not elicit any symptoms. Muscle length and strength testing at the hip was equal bilaterally.

Neurological examination revealed a normal gait pattern, Babinski and clonus. Myotomes and reflexes were normal, while on sensory testing there was an area of reduced sensation over the left lower anteromedial thigh, which corresponded to the sensory supply of the anterior cutaneous branches of the femoral nerve (Standring, 2009). On neurodynamic testing straight leg raise, slump and prone knee bend tests were negative. The slump knee bend (SKB) (Butler, 2000) (see Fig. 2) was positive for paresthesia and pain with full knee flexion and hip extension. Symptoms were relieved with cervical extension. Neural differentiation tests in SKB position biasing the obturator and lateral femoral cutaneous nerves did not alter symptoms. Palpation around the hip revealed no tenderness. The femoral nerve was palpated immediately inferior to the inguinal ligament lateral to the femoral artery. This revealed increased mechanosensitivity of the femoral nerve on the left. Passive accessory intervertebral motion (PAIVM) testing of the lumbar spine revealed tenderness over L4/5 and L5/S1 levels. Lumbar spine passive physiological intervertebral movements (PPIVM) were normal. Femoral, popliteal, dorsalis pedis and posterior tibial pulses were all present bilaterally.

3. Investigations

Hip radiographs taken 3 years previously showed mild degenerative changes bilaterally. MRI of the patient’s lumbar spine taken 1 year previously showed degenerative disc disease at L4/5 and L5/S1 levels along with mild canal stenosis of the lumbar spine. Blood tests taken 1 year previously were negative.

4. Diagnosis

The patient was diagnosed with entrapment of the anterior cutaneous branch of the femoral nerve as a result of scar tissue post inguinal hernia repair.

5. Management

The patient was given a home programme of nerve sliders for the femoral nerve on day 1 (see Fig. 3). These were progressed at the follow up session one week later (see Figs. 4 and 5), by which time the patient was symptom free, had a negative SKB, had no mechanosensitivity and had normal sensation. The patient was reviewed one month later and continued to be symptom free and was instructed to recommence the slider exercises should the symptoms reappear.

6. Outcome

The patient’s symptoms had resolved by the follow up session. At discharge he could sit indefinitely without symptoms, and had returned to all activities without any difficulties.

7. Discussion

This case reflects an unusual presentation of anterior thigh pain. The subjective examination led the therapist to generate a number of hypotheses detailed in Table 1. The objective examination was then prioritised in order to confirm or negate these hypotheses. The
Therapists reasoning process through the subjective and objective examination is detailed below.

Hip joint pathology as the source of the patient’s symptoms seemed unlikely after the subjective examination, primarily due to the patient’s lack of reported symptoms when walking. Although hip radiographs had shown minor degenerative changes, it was important that these findings were interpreted in terms of the overall clinical picture. Considering the patient’s age and radiographs, some restriction in hip ROM was expected. Although internal rotation and flexion were slightly limited, they did not reproduce the patient’s symptoms. This limitation in ROM was bilateral, while the patient’s symptoms were unilateral. Axial loading of the hip also failed to reproduce any symptoms. Other local sources such as quadriceps, gracilis or sartorius muscle strain and iliopsoas bursitis were negated by normal muscle length and strength tests and lack of tenderness on palpation.

A vascular source of symptoms such as a femoral artery aneurysm was considered as a possibility due to the location of symptoms. Patients who develop aneurysms generally have a history of peripheral vascular disease which was absent in this patient. This hypothesis was further negated by the presence of normal lower limb pulses on examination.

Visceral sources of symptoms such as a testicular tumour, intrapelvic mass or prostatitis could refer to the anteromedial thigh. While the patient’s age increased his risk of a visceral problem, the mechanical nature of the symptoms, the normal blood results and lack of ‘red flags’ in the subjective examination negated this hypothesis.
Table 1
Hypotheses post subjective examination.

<table>
<thead>
<tr>
<th>Local</th>
<th>Vascular</th>
<th>Visceral</th>
<th>Referred</th>
<th>Neurogenic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hip joint</td>
<td>Femoral artery aneurysm</td>
<td>Prostatitis</td>
<td>Upper lumbar radiculopathy</td>
<td>Meralgia paresthetica</td>
</tr>
<tr>
<td>OA</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Labral tear</td>
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<tr>
<td>Chondral lesion</td>
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<tr>
<td>Avascular necrosis of femoral head</td>
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<td></td>
</tr>
<tr>
<td>Iliopsoas bursitis</td>
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</table>

An upper lumbar radiculopathy was thought a likely source of symptoms after the subjective examination due to the location, quality and mechanical nature of pain, the presence of paresthesia, and the past history of low back pain. Lumbar spine examination failed to confirm this hypothesis. Babinski, clonus, myotomes and reflexes were normal. On sensory testing the patient reported reduced sensation over the area of the thigh innervated by the anterior cutaneous femoral nerve. The patient had a positive SKB, and it was reasoned that this could be due to neuropathy of the femoral nerve, as a nerve root lesion could not account for the specific loss of cutaneous femoral nerve innervation. Some lumbar spine degenerative changes were present on MRI, but there was no evidence of nerve root compression. Given the lack of symptom reproduction on objective testing, the non dermatomal distribution of the patient’s symptoms and the lack of evidence of nerve root compromise on the lumbar spine MRI the therapist negated an upper lumbar radiculopathy as the source of the patient’s symptoms.

Other neurogenic sources of symptoms were considered during the subjective examination. Entrapment neuropathies of the obturator, femoral, genitofemoral, ilioinguinal and lateral femoral cutaneous nerves were possibilities given the patient’s surgical history. Laparoscopic hernia repair can result in injury to the structures passing through the groin, not only at the time of surgery due to sutures or staples, but also post operatively due to scar tissue formation (Garcia-Urena et al., 2005). Anatomically, at the point that the femoral nerve passes under the inguinal ligament it divides into its many motor and sensory branches including the anterior cutaneous femoral nerve (Natelson, 1997). The patient’s aggravating factors were sitting and leaning forward and these positions have been reported to further compress the nerve as it passes posterior to the inguinal ligament (Edelson and Nathan, 1977). The location of the symptoms on the lower anteromedial side of the thigh negated the anterior cutaneous femoral, genitofemoral and ilioinguinal nerves as a source of symptoms. The anterior cutaneous branches of the femoral nerve seemed a more likely source given the location of symptoms (Standring, 2009) and the absence of weakness at the hip. The obturator nerve can have cutaneous branches supplying the medial and distal thigh region (Hollis and Lemay 2010). Other causes of neuropathies were negated due to the lack of an associated medical history.

On objective examination, the positive SKB together with the mechanosensitivity of the femoral nerve led the therapist to consider a nerve entrapment as the most likely source of symptoms. Differentiation tests in the SKB position biasing the obturator and lateral femoral cutaneous nerves were negative confirming clinically a cutaneous branch of the femoral nerve as the source of symptoms.

The SKB test is used to assess the mechanical function and sensitivity of the nervous system including the mid lumbar nerve roots, the femoral nerve and its branches and the musculoskeletal structures innervated by the femoral nerve (Shacklock, 2005). It is indicated when symptoms occur in the lumbar, hip, groin thigh or knee region (Shacklock, 2005). Neurodynamic tests are not very sensitive for minor neuropathies and because of this lack of sensitivity these tests must often be taken to their end of range to be of value (Shacklock, 2005). For this reason the SKB was chosen instead of the PKB as it increases the load on the nervous system by flexion of the spine (Butler, 2000).

Femoral nerve sliders were chosen as treatment since the source of the problem was reasoned to be entrapment of the anterior cutaneous branch of the femoral nerve in scar tissue at the inguinal ligament. Sliders are the treatment of choice when dealing with a problem of a nerve’s mechanical interface (Shacklock, 2005). Coppieiers and Butler (2008) reported that nerve sliding exercises may not only prevent post operative adhesion formation, but may also decrease already elevated endoneural fluid pressure. Slider techniques have also been shown to cause gliding of the nerve with minimal increase in nerve strain, and by mobilising a nerve through an area of increased pressure it may enhance dispersal of local inflammatory products in and around the nerve (Coppieiers and Butler, 2008).

The Therapist firstly explained the technique to the patient including number of repetitions, expected response and reasons to discontinue the technique. All techniques were demonstrated to the patient by the therapist and were then practised by the patient. When using nerve mobilisation exercises it has been suggested to start movements away from the presumed site of pathology (Butler, 2000). The Therapist commenced with a general slider for the femoral nerve (Fig. 3) and progressed the exercise by using movements near the site of pathology (Figs. 4 and 5).

8. Conclusion

Anterior thigh pain is a relatively common complaint seen in physiotherapy clinics. It is important that as clinicians developing hypotheses, less common pathologies such as peripheral nerve entrapments are not ignored. They can be associated with a confusing clinical picture which can lead to ineffective patient management.

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References


