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Case Report

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Piriformis syndrome caused by rare intramuscular lipoma: A case report

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Abstract

We present the case of a 73-year-old man with history of back and left sciatic nerve pain, who came to our hospital centre due to perform a lumbar spine MRI.

The MRI scan didn't reveal compression of the left nerve roots by hernia formations, but collaterally showed a well-defined lesion, with MRI characteristics of adipose tissue, localized in the left piriformis muscle, compatible with a lipoma that displaced the ipsilateral sciatic nerve but did not invade it.

After this examination, a targeted pelvis magnetic resonance study was performed for a more precise assessment of size and relationships of lipoma.

In literature this is the second reported case of intrapiriformis lipoma as a cause of secondary piriformis syndrome (PS), in people with sciatic nerve pain. This confirms the importance of considering piriformis syndrome among the differential diagnoses in the primary assessment of radicular pain [1].

Background

The prevalence of sciatic nerve pain has been reported in 12-27% in general population. Piriformis syndrome is a sciatica subtype determined by the nerve compression in the greater sciatic foramen and it is estimated that 6-8% of sciatica is consequence of this syndrome.

The principal contributing factors to develop the radicular compression seems to be a trauma in the buttock area, an anatomical variant of the muscle (such as bipartite muscle), muscle hypertrophy or an intramuscular mass/lesion [2,3].

The diagnosis of PS is a diagnosis of exclusion. MRI of the pelvis can identify anatomical variations correlate to pathology onset, as do side-to-side differences resulting from an enlarged piriformis muscle. Instead, Lumbo-sacral MRI, as in our case, can demonstrate the presence of root compression [4].

Patients begin with conservative treatment, if resolution of symptoms is not reached, they move on to medical approach, until more invasive therapies are applied in non-responsive cases [5].

We report the case of a PS secondary to the presence of an intrapiriformis lipoma.

Case presentation

We present the case of a 73-year-old man with a history of increasing lower back pain that radiated along the path of the sciatic nerve, which branches through the left hips, buttock, and ipsilateral leg.

His primary care physician performed a clinical examination

and decided to investigate the disorder by prescribing a lumbosacral MRI, attributing the symptoms to a radicular compression.

Lumbosacral MRI was performed at our hospital centre using a 1.5-Tesla magnet system (Philips Ingenia Ambition/Elition). The protocol involved sagittal plane acquisitions with T1-weighted spin-echo, STIR TSE and T2-weighted spin-echo sequences; and axial plane acquisition with T2-weighted spin-echo sequences.

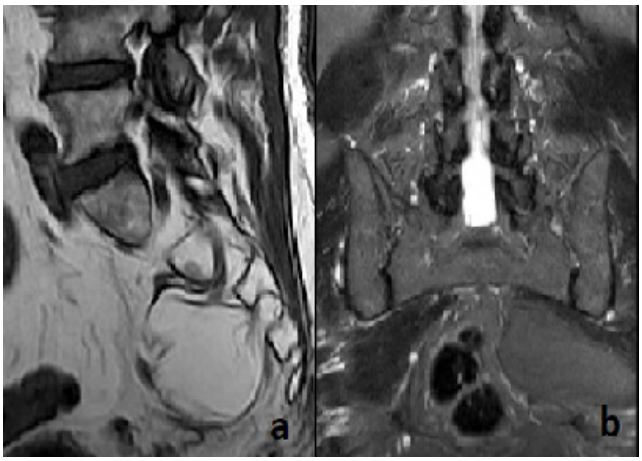

Figure 1: Lumbo-sacral MRI with sagittal T1 weighted (a) and coronal STIR TSE sequences showing a well-defined lipoma in left piriformis muscle.

The first images showed an intrapiriformis mass, then was performed a target coronal plane acquisition with STIR TSE sequences focused on nerve roots between L4-S3 and the result was not the compression of the left nerve roots by hernia formations, but the presence of an intramuscular lipoma that displaced the ipsilateral sciatic nerve (Figure 1).

The primary care physician afterwards decided to prescribe a targeted magnetic resonance of pelvis for a more precisely evaluation of size, localization, and relationships of lipoma with surrounding structures.

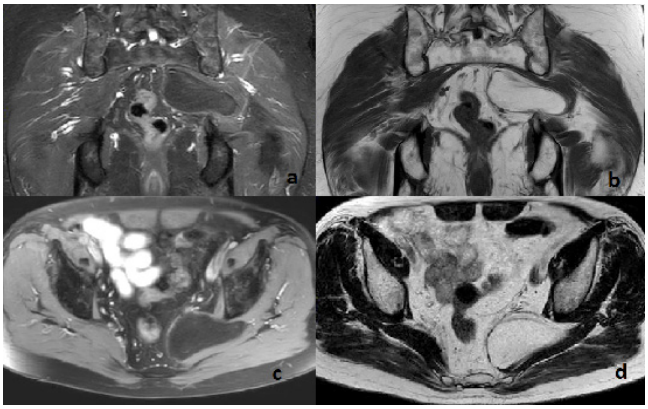

Figure 2: Pelvis MRI with coronal STIR TSE (a) and T1-weighted (b) sequences; and axial STIR TSE (c) and T1-weighted (d) sequences, confirming intrapiriformis lipoma and showing more precise relationships and size.

This MRI was also performed at our hospital centre, the protocol of pelvis involved coronal plane acquisitions with T1-weighted spin-echo and STIR TSE sequences; and axial plane acquisitions with T2-weighted SPAIR, STIR TSE and T1-weighted spin-echo sequences.

The examination confirmed the presence of a spindle lesion, well defined and sharply circumscribed within the left piriformis muscle. Imaging characteristics were like those of subcutaneous fat tissue, hyperintense in T1-weighted sequences and hypointense in fat-suppressed sequences, measuring 85 mm medio-lateral, 52 mm antero-posterior and approximately 40 mm cranio-caudal (Figure 2).

The fat-containing lesion that was growing between muscle fibers, caused a piriformis asymmetry with an enlarged left muscle causing compression of ipsilateral nerve roots. This is the second reported case of intrapiriformis lipoma conditioning a secondary piriformis syndrome.

Discussion

The classification of Soft Tissue Tumors divides benign fat-containing tumors into nine groups: lipoma, lipomatosis, lipomatosis of nerve, lipoblastomatosis, angiolipoma, myolipoma of soft tissue, chondroid lipoma, pleomorphic lipoma, hibernoma [1].

Benign lipomatous lesions are very common and represent the most of mesenchymal tumors. The precise estimation of their incidence is not possible because there is often an incidental diagnosis [2].

Intramuscular lipomas have their peak incidence on sixth-seventh decade, are less frequent than subcutaneous lipomas [3] and are most frequently localized in the lower extremity, the trunk is the second most common position, followed by the shoulder girdle and finally the upper extremity [4].

The most appropriate imaging for their study is represented by CT and magnetic resonance imaging. Typically, their shape is round or fusiform; CT shows a fat density mass, usually with streaks of the same density as soft tissue. MRI shows the same characteristics of subcutaneous adipose tissue, in particular these structures present hyperintensity signal in T1-weighted sequences and hypointensity signal in fat-suppressed sequences. The striated structures are better visible in the CT study than in the MRI and are generally made up of fibrous mesenchymal tissue. Typically, intramuscular lipomas don't have a capsule and the lesion grows between the muscle fibers [5].

Lipomas are long standing, usually run asymptomatic and are accidentally detected. In some cases, however, there can be a rapid growth that leads to local-regional swelling or to compression of the adjacent structures. Compression of nerve structures by lipoma have been reported, some examples are ulnar nerve compression at the wrist [6], carpal tunnel syndrome caused by median nerve compression [7,8] and trigeminal neuralgia caused by cerebellopontine angle lipoma [9]. There is a predilection for lipomas involving upper extremity nerves, in our case, instead, we present an involvement of lower extremity nerve roots with consequently piriformis syndrome.

Piriformis syndrome is a neurological syndrome caused by

sciatic nerve entrapment due to piriformis hypertrophy or inflammation. Typically, symptoms are like to those of intervertebral disc herniations with low back and buttock pain, often radiated along the path of the sciatic nerve until reach ipsilateral leg; sometimes patients report neurological symptoms such as dysesthesia [10]. In our case, the piriformis asymmetry was consequence of an intramuscular lipoma that caused a muscle enlargement with nerve roots dislocation.

There is not gold standard imaging for PS diagnosis. Standard radiographs of pelvis should be considered to exclude hip pathology such as lumbar spine MRI to rule out intervertebral disc herniations. Pelvis MRI can visualize intrapelvic mass or asymmetrical piriformis muscle with compression of sciatic nerve. Neurodiagnostic studies are often done in PS but generally with negative outcome [11].

Patients start with conservative treatment, if resolution of symptoms is not reached, they move on to medical approach. First-line therapy of PS involve non-steroidal anti-inflammatory drugs that usually provide short-term pain relief. Patients can also try physical therapy with stretching exercises including external rotation, hip flexion, and adduction [12].

Invasive therapies are applied in non-responsive cases, usually performed through local anaesthetic or steroid injections. Another choice consists in botulinum injections, which toxin causes dysregulation of sodium channels responsible of a decreased pain transmission [13].

The last therapeutic step is represented by surgery, in non-responsive cases for more than 3 months. The surgery is based on dissection and decompression of sciatic nerve. It can be performed with open technique or endoscopically [14]. In case of PS secondary to the presence of an intramuscular mass, such as our patient's lipoma, surgical treatment is the first therapeutic option of choice. The only other reported case of intrapiriformis lipoma, in fact, was subjected to surgical excision, with complete resolution of symptoms.

Conclusion

This case reports of an intrapiriformis lipoma with secondary piriformis syndrome. Discogenic pain in degenerative disc disease is not dissimilar to lower back pain in piriformis syndrome, this confirms the importance of pelvis structures study when lumbo-sacral spine imaging has negative outcome.

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