

Acute sciatica and progressive neurological deficit secondary to facet synovial cysts: A report of two cases.

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Objective: *To describe two patients with lumbar facet synovial cysts causing sciatica and progressive neurological deficit.*

Clinical Features: *A 52-year-old female with bilateral sciatica and a neurological deficit that progressed to a foot drop; and a 54-year-old female with worsening sciatica and progressive calf weakness were seen at a major tertiary care centre. Diagnostic imaging studies revealed the presence of spinal nerve root impingement by large facet synovial cysts.*

Interventions and Outcomes: *Activity modification, gabapentinoid and non-steroidal anti-inflammatory medications were unsuccessful in ameliorating either patient's symptoms. One patient had been receiving ongoing lumbar chiropractic spinal manipulative therapy despite the onset of a progressive neurological deficit. Both patients eventually required surgery to remove the cyst and decompress the affected spinal nerve roots.*

Objectif : *Description de deux patientes ayant des kystes synoviaux facettaires lombaires leur causant de la névralgie sciatique et un déficit neurologique progressif.*

Caractéristiques cliniques : *Deux femmes ont été examinées à un grand centre de soins tertiaires. La première, âgée de 52 ans, est atteinte de névralgie sciatique bilatérale et d'un déficit neurologique qui a progressé jusqu'au pied tombant; la deuxième, âgée de 54 ans, souffre d'une névralgie sciatique qui s'empire et d'une faiblesse progressive au mollet. L'examen de l'imagerie diagnostique a révélé un coincement de la racine du nerf rachidien, causé par de grands kystes synoviaux facettaires.*

Interventions et résultats : *La modification de l'activité et les médicaments gabapentinoïdes et anti-inflammatoires non stéroïdiens n'ont pas réussi à améliorer les symptômes des patientes. Une des patientes suivait une thérapie continue de manipulation rachidienne chiropratique malgré l'apparition d'un déficit neurologique progressif. En fin de compte, les deux patientes ont eu besoin de chirurgie pour extraire les kystes et décompresser les racines du nerf rachidien affectées.*

Conclusion : *Les patients atteints de névralgie sciatique aiguë qui développent un déficit neurologique progressif alors qu'ils reçoivent des soins doivent, sans*

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Funding Sources: None

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Conclusion: *Patients with acute sciatica who develop a progressive neurological deficit while under care, require prompt referral for axial imaging and surgical consultation. Primary care spine clinicians need to be aware of lumbar facet synovial cysts as a possible cause of acute sciatica and the associated increased risk of the patient developing a progressive neurological deficit.* (JCCA 2012; 56(3)173-178)

KEY WORDS: synovial cyst; facet joint; progressive neurological deficits, radiculopathy; chiropractic

Introduction

The etiology of lumbar facet joint synovial cysts (SC) is thought to be associated with vertebral segmental hypermobility and/or segmental instability.¹ Patients with lumbar facet joint SC typically present with acute sciatica, rather than lower back pain. When the cysts are large in size or atypical in morphology they can cause focal radiculopathy, neurogenic claudication and even cauda equina syndrome.^{1,2} However, unlike patients in whom spinal nerve root trauma is secondary to lumbar disc herniation, the natural history of acute sciatica secondary to a SC is generally unfavourable and any associated neurological deficit can become progressive.³

Previous reports of the clinical management of acute radiculopathy secondary to SC have described a wide variety of therapeutic approaches. These include the use of differing forms of chiropractic spinal manipulative therapy⁴⁻⁶, image-guided injection therapies including aspiration or distension/rupture⁷⁻¹² and surgical treatments such as either excision and fusion or excision alone.^{2,13,14}

This paper describes the diagnosis, clinical course and treatment of two patients with atypical forms of SC, one associated with an anterolisthesis and the other with SC calcification.

Case 1

A 52-year-old female presented to the Combined Neurosurgical and Orthopaedic Spine Program (CNOSP) outpatient clinic with a six week history of progressive numbness and

délai, être orientés pour une imagerie axiale et une consultation chirurgicale. Les cliniciens de premiers recours traitant la colonne vertébrale doivent être mis au courant que les kystes synoviaux facettaires lombaires peuvent causer une névralgie sciatique aiguë et, en conséquence, un accroissement du risque que le patient développe un déficit neurologique progressif. (JCCA 2012; 56(3)173-178)

MOTS CLÉS : kyste synovial; facette vertébrale; déficits neurologiques progressifs, radiculopathie; chiropratique

weakness in both lower extremities and a two week history of “floppy-feet” with poor balance and several falls. She denied any associated bowel or bladder dysfunction or saddle paresthesia. Her past medical history was remarkable for several prior episodes of lower back pain and bilateral buttock pain and numbness. She had received passive therapy and core strengthening exercises from a physiotherapist, which had not been helpful. Most recently she had been treated by a chiropractor who had administered side posture lumbosacral spinal manipulative therapy at a frequency of 2-3 times a week for 4 weeks. She denied or could not recall any other history of spine-related pain or other orthopaedic ailments. Her initial physical examination findings were a shuffling gait with a left-sided positive Trendelenberg test, grade 1/5 L4 and grade 3/5 L5 motor strength, and normal lower extremity sensation all on the left side. Her MRI scan showed a left-sided L3-4 synovial cyst (Figure 1a) and a Grade 1 anterolisthesis of L3 on L4 (Figures 1b), which was also visible on the lateral x-ray (Figure 1c). The patient underwent urgent L3-4 decompression and fusion surgery (Figure 2). She did not suffer any complications postoperatively. At hospital discharge, she was mobilizing independently. Her left L4 motor strength had improved to 4/5. She was transferred to the transitional care unit for further rehabilitation. The 6-week and 3-month postoperative follow-up assessments showed no evidence of persisting nerve root tension signs, and normal lower extremity motor and sensory testing. There were no surgical complications noted.

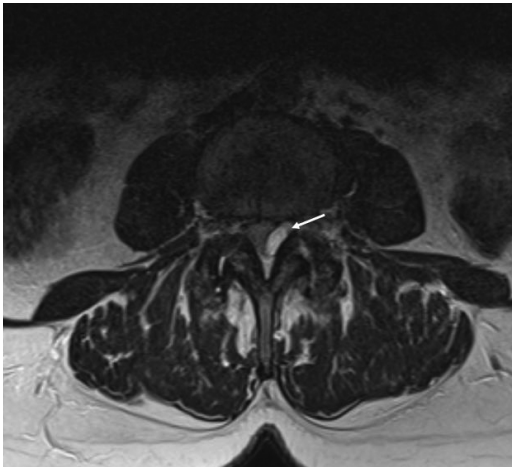


Figure 1a



Figure 1b

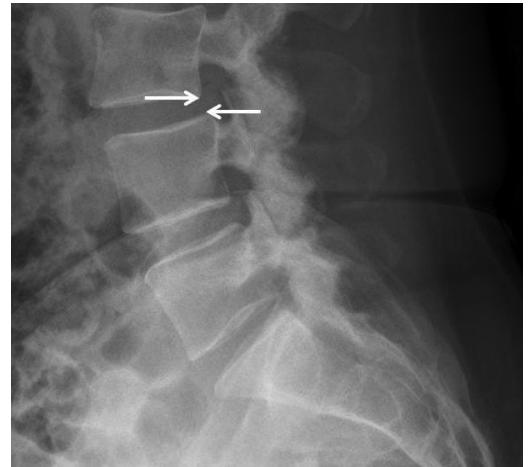


Figure 1c

Case 2

A 54 year-old woman presented to the CNOSP outpatient clinic complaining of progressively worsening left-sided buttock, posterior thigh, lateral calf and lateral foot pain. She further reported the recent onset of fatiguing of her left leg with walking for more than 10 minutes, and in the last month, collapsing of her right heel. She denied any associated cauda equina-like symptoms. Her past medical history was unremarkable for prior episodes of sciatica, lower back symptoms, and other spine or orthopaedic problems.

She reported that her symptoms began approximately seven months previously, initially with “nagging” left-sided lower back and buttock pain the morning after weight-training exercise in a gym. On the following day she experienced the onset of excruciating left-sided sciatica. She was seen initially by her family physician who detected positive straight leg raising, but no motor or sensory deficit in the left lower extremity. An urgent lumbar CT scan was arranged, which revealed the presence of a large, left-sided partially calcified joint synovial cyst at L5-S1. Moderate bilateral foraminal stenosis at the L5-S1 level was also identified. An acute lumbosacral radiculopathy (neurological level not specified) was initially diagnosed. Initial clinical management was activity modification as well as gabapentinoid and COX 2 class non-steroidal anti-inflammatory medications.

At the time of her initial assessment in the CNOSP clinic she had strongly positive left-sided nerve root ten-



Figure 2



Figure 3a



Figure 3b

sion signs without cross over features. Reflexes were grade 2/4 at the knees, grade 1/4 at the right ankle, and absent at the left ankle. Motor testing showed mild weakness (i.e. 4/5) of her left foot and ankle everters and some fatiguing during repetitive toe standing on the left. Sensory examination revealed diminished sensation to pin prick and light touch along the left lateral foot, consistent with the distribution of the left S1 nerve root. There were no upper motor neuron signs.

An MRI scan demonstrated a large cystic structure adjacent to the left L5-S1 facet joint causing significant deviation of the thecal sac and traversing S1 nerve root (Figure 3a). The left S1 nerve root was seen to be directly

compressed both ventrally and medially by the cyst and was cross-sectionally larger in size than on the right, suggesting swelling (Figure 3b).

Treatment options were discussed, including continuing to follow the natural history, image-guided injection-based interventions, manual therapies and surgical management. However, in view of the progressive neurological features of her clinical course, the large size and position of her SC, and the presence of significant calcification, the patient elected to undergo laminectomy and cyst excision as recommended by her surgeon. The six-week post surgical follow-up assessment showed mildly positive nerve root tension signs and a mild (4+/5) L5 motor deficit. The 3-month postoperative assessment showed no nerve root tension signs, and normal lower extremity motor and sensory testing. There were no surgical complications noted.

Discussion

Synovial cysts (SC) are classified according to their histopathology, origin and location.¹⁵ They are distinguishable from perineural or extradural arachnoid cysts in that they arise from facet joints, are continuous with the capsule and have a partial or complete synovial lining.¹⁴ The preponderance of facet degeneration, degenerative spondylolisthesis and synovial cyst formation at the most mobile lumbar spinal segment (L4-5) suggests that instability likely plays a major role in SC pathogenesis.^{2,15,16,17} In a recent study of patients with leg pain referred for MR imaging, the prevalence of SC was 2.3%.¹⁵

The natural history of synovial cysts is not well-understood. Spontaneous cyst resolution is known to occur in only a small number of cases.¹⁸ Reported studies of non-operative treatment outcomes have been limited to case reports and retrospective studies, with no prospective cohort studies or randomized trials being reported. Image-guided percutaneous SC interventions are now widely used as a first-line of treatment.^{10,19} Studies of image-guided SC aspiration, rupture or intra-articular steroid injection suggest that approximately half of treated patients obtain good to excellent long-term benefit (at 1.4 years post-intervention).^{7,8,9,11} However, in the subgroup of patients with synovial cysts that are either partially or extensively calcified, percutaneous procedures are less efficacious as the joint capsule cannot be effectively penetrated.

There are few published reports of lumbar SC cases

treated by chiropractors. Cox, reported two cases that benefitted from non-thrust manipulative techniques (flexion distraction) combined with physical therapy modalities. However, long-term outcomes were not reported.⁴ Taylor, using Cox's methods, reported similar benefits in a single case, but the patient's symptoms recurred and then necessitated ongoing visits and exercise therapy over a follow-up period of 4.5 years.⁵ In a third chiropractic case report, the patient received fifteen adjustments with only temporary benefit and eventually underwent surgical excision with good benefit.⁶

Surgical cyst excision is considered the gold-standard treatment for successful long-term outcomes and is recommended in all cases of neurologic deficit.^{13,20} Concomitant lumbar fusion is required in cases with spondylolisthesis and radiographically demonstrable segmental instability. In this regard, a systematic review of 82 studies showed that a substantial majority of surgically-treated SC patients obtained symptomatic resolution over the long-term (mean follow-up 25.4 months).²⁰

The presentation of a patient with an acute radiculopathy accompanied by a progressive neurological deficit should raise concern for all spine clinicians. As primary spine healthcare providers, chiropractors may well be the portal of entry into the healthcare system for many of these patients. With the recent trend towards standardized treatment pathways in mainstream spine patient management, the diagnostic acumen of chiropractors is facing ever-increasing scrutiny, and in this environment the minimum standard of care for spine patients must include diligent clinical monitoring and thorough record keeping.

The two cases that have been presented highlight the importance of considering the presence of a SC in the differential diagnosis of patients with acute sciatica. In particular, the spine clinician's index of suspicion for the presence of a SC should be raised when assessing a patient with a neurological deficit in combination with a degenerative spondylolisthesis and/or significant facet joint degeneration on plain film x-ray.

Summary

Primary care spine clinicians treating patients with acute sciatica need to be aware of the possibility of a synovial cyst as an underlying cause. Careful monitoring of the patient's lower extremity neurological function is prudent as the patient's clinical course unfolds. In patients

whose symptoms are not improving or are progressively worsening, axial imaging and prompt surgical referral is indicated.

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