



CASE REPORT

Post-Traumatic Haemorrhagic Tarlov's Cyst: a Case Report and Review of Literature

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Abstract

Tarlov's cysts (TC) are benign dilations of the spinal nerve root sheaths that can arise all along the spine, more frequently at sacral level. In the majority of cases, TC are incidental and asymptomatic, but they can cause a large variety of symptoms if there is an increase in their size or if rupture or intracystic haemorrhage occurs. We present the case of a 55-year-old woman with sciatica-like pain ensuing from rupture and intracystic bleeding of a Tarlov's cyst after a lumbo-sacral trauma due to a syncope. Tarlov's cysts can cause a wide variety of symptoms. In our case, the rupture and intracystic haemorrhage of the Tarlov's cyst caused a sciatica-like pain. We were able to ascertain the presence of an intracystic haemorrhage thanks to a previous MR in which the cyst had CSF-like content.

Keywords Tarlov's cyst · Sacral cysts · Haemorrhagic sacral cysts · Trauma · Case report

Introduction

Tarlov's cysts are benign dilations of the spinal nerve root sheaths that originate at the junction of the dorsal root of a spinal nerve and its corresponding ganglion [1]; they are filled with cerebro-spinal fluid (CSF) and communicate with the subarachnoid space, being classified as type II meningeal cysts (extradural meningeal cysts with spinal nerve root fibres) [2]. These cysts can be found all along the spine but more frequently at sacral level. Sacral cysts were first described by Tarlov in autoptic studies [1]. Their pathogenesis is still unclear, but TC can increase in size by means of a "ball-valve effect" [3, 4]. Their estimated prevalence in the adult population is around 4.18% [5], and in most cases, sacral cysts are incidental and asymptomatic. However, in a small portion of patients, an increase in size, rupture, or haemorrhage of the cyst can result in compression and inflammation of the adjacent spinal nerve, causing a wide variety of symptoms such as low back pain, sciatica, sensory alterations of the pelvic area, cauda equina syndrome, urinary and bowel dysfunction, or abdominal pain.

We present the case of a woman with a past history of sciatica with a symptomatic Tarlov's cyst with intracystic bleeding due to a lumbo-sacral trauma.

Case Presentation

A 55-year-old woman was referred to our radiology department to perform a magnetic resonance (MR) of the lumbar and sacral spine to investigate a persisting left sciatica and sacral pain after a fall, due to a syncope, with head and lumbo-sacral trauma, occurred 3 months before.

On that occasion, the patient underwent a head CT and an X-ray and a CT of the lumbo-sacral spine in the emergency department of our hospital. The head CT showed no evidence of trauma-related lesions. The X-ray and CT of the lumbo-sacral spine revealed a small fracture of the superior endplate of L1 at its anterior border with no fragment dislocation, combined with a slight depression of the superior endplate due to a compression fracture.

The patient was then discharged and prescribed rest, immobilisation by means of an orthopaedic brace, and analgesic therapy.

The patient had a past history of sciatica: a previous MR of the lumbo-sacral spine performed 8 years prior revealed a small L5-S1 hernia, a left intraforaminal L4-L5 disc bulge, and many TCs, located in the sacral canal, the largest at S2-S3 level, paramedian on the left, measuring 47 mm in length, with a CSF-like content (Figure 1a-c).

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Fig. 1 a–c Magnetic resonance imaging of the lumbo-sacral spine obtained 8 years prior to our examination: the sagittal images show a sacral Tarlov cyst at S2-S3 level on the left, with CSF-like content in T1- (a), T2- (b), and STIR-weighted (c) images

At the 3-month follow-up after the trauma, the patient reported cessation of the lumbar pain but complained of a persisting sacro-coccygeal pain that migrated to the left glute and the back of the thigh down to her left knee.

The MR that we performed indicated no modification of the size of the L4-L5 bulge and of the L5-S1 hernia. It also showed an advanced consolidation of the partial L1 fracture and of the compression fracture; the left paramedian TC displayed a slight decrease in size (42 mm vs 47 mm of the former MR) and a variation in its intracystic content, now showing a fluid hemosiderin level compatible with a previous intracystic haemorrhage (Figure 2a-c). Thanks to the availability of the previous MR, in which the cyst showed CSF-content, we speculated that the lumbo-sacral trauma, though it did not cause any sacro-coccygeal bone fracture, had provoked the haemorrhage of the cyst and that this complication was to be held accountable for the persisting sciatica-like pain.

We decided to continue the follow-up of the patient and the analgesic treatment.

Discussion

Tarlov's cysts are often incidental and asymptomatic; therefore, they usually do not require any treatment. In a small number of cases, however, TC can lead to complications, or increase in size, and become symptomatic. While their pathogenesis remains unclear, in many studies, it is reported that Tarlov's cyst might increase in size due to hydrodynamic and pulsatile forces of the CSF combined with a "ball-valve" mechanism [3, 4] that allows influx and restricts efflux of CSF. Another cause of enlargement of the cyst, described by Kong et al. [6], can be a subarachnoid haemorrhage (SAH), in which increased CSF hydrostatic pressure during or after an aneurysmal rupture can push the CSF and SAH into a pre-existing Tarlov cyst, and that, together with the inflammatory effect of the blood clot, are considered to be the cause of a rapid expansion of the cyst resulting in lumbo-sacral pain. On the other hand, rupture or bleeding of the cyst may occur because of trauma, as was in our case, because of surgical treatment of the cyst, or because of compression by adjacent organs, as hypothesised by Akahori et al. [7]. Voyadzis et al. noticed worsening of symptoms in a patient treated with percutaneous aspiration of a symptomatic perineural cyst and suggested that this could have been due to haemorrhage of the cyst wall or to nerve root injury [8]. Literature reports of a case of spontaneous haemorrhage of a TC, which caused lower back pain, perineal numbness, and urinary retention, as a rare complication of anticoagulant therapy, that



Fig. 2 a–c Magnetic resonance imaging of the lumbo-sacral spine performed at our examination to investigate the cause of the sciatica-like pain, sagittal images: on the T1-weighted image, the cyst's signal is homogeneously more hyperintense compared to that of the CSF (a), while in the T2- (b) and STIR-weighted images (c), an intracystic fluid haemosiderin level can be observed. These findings indicate a subacute intracystic haemorrhage. Furthermore, it is possible to observe signs of the advanced consolidation of the L1 fracture as a fine streak parallel to the superior endplate, hyperintense in the STIR-weighted image (c), and hypointense in T1-weighted image (a); the superior endplate of L1 appears slightly depressed when compared to the previous MRI in Fig. 1 because of the vertebral compression fracture

ceased, along with all the symptoms, without need of treatment [9]. Bone sacral fractures extending into a TC [10–12] might cause cerebral fat embolism through the CSF, and in these cases, there is an association of neurological symptoms and a history of sacro-coccygeal trauma.

When there is an increase in size, or when rupture or bleeding occur, TCs can provoke a large spectrum of symptoms and syndromes caused by the compression on adjacent anatomical structures, especially of the spinal nerve and nerve roots, or by the inflammation due to the irritative effect of the haematoma. If the cyst ruptures, it can also cause intracranial hypotension via a CSF leak [13].

Clinical manifestations vary greatly: typically, a complicated TC can cause compression, or inflammation of the spinal nerves, inducing sciatica [14, 15]; lower back pain [16]; cauda equina syndrome [14]; bladder, bowel, and sexual dysfunction; numbness; and loss of sensitivity or pain in the pelvic area [7]. Godel et al. describe the case of a TC located at the anterior aspect of the sacrum that causes recurring abdominal pain [15].

The symptoms can be secondary to the enlargement of the cyst or to a cyst complication. In the latter case, it is reported that the cyst complication may lead to complete resolution of the clinical manifestations, removing the need for surgical treatment, as reported by Akahori et al., who describe the case of a woman with right anal and vulvar pain and bladder dysfunction [7] that resolved completely after the cyst ruptured, probably because of compression by adjacent organs.

Sudakhar et al. describe a case of rupture and bleeding of a TC with urinary retention and lower back pain that mimics a spinal carcinomatosis, which was ruled out by means of CT-guided needle biopsy [16].

There is currently no consensus on the optimal management of symptomatic TC. Conservative approaches consisting of anti-inflammatory and analgesic treatment or physical therapy achieve varying degrees of success in pain and symptom relief. As for surgical interventions, laminectomy, fenestration, and marsupialisation are some of the proposed solutions. There are also microsurgical techniques, among which CT-guided percutaneous aspiration provides a minimally invasive approach, though studies have reported mixed outcomes [17].



Regarding our patient, thanks to the previous MR in which the cyst had CSF-like content, we were able to ascertain the presence of an intracystic haemorrhage. Furthermore, as the patient did not suffer from coagulation or platelet diseases, was not on chronic anticoagulant or anti-platelet medication, conditions that could both make her prone to bleeding, and as the head-CT did not show signs of SAH, the intracystic bleeding was very likely related to the lumbo-sacral trauma. Additionally, these cystic complications can also explain the modification of the pain reported by the patient, which had started in the lumbar region, because of the L1 fracture, and then shifted into sacro-coccygeal, migrating down to the left knee as a result of the TC haemorrhagic complication.

Conclusion

To the best of our knowledge, this is a rare case of post-traumatic intracystic haemorrhage of a Tarlov's cyst, after a fall with lumbo-sacral trauma. The intracystic bleeding was responsible for the persisting sciatica-like pain. We were able to demonstrate this correlation thanks to the availability of the previous MR in which the cystic content was CSF-like.

Tarlov's cyst can be an alternative cause of an otherwise unexplained sciatica-like pain or low back pain or, as it was in our case, modifications of the symptoms reported by the patient. Furthermore, given the great variety of symptoms that TC can provoke, either because of enlargement or complications, it is important to look for and describe TC, even when found incidentally, and consider them in the differential diagnosis.

Author Contribution All authors contributed to the study conception and design. Material preparation and data collection were performed by Dr. Davide Gadda, MD, and Dr. Cesare Pandolfo, MD. The first draft of the manuscript was written by Dr. Sara Imreh, MD, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Data Availability Not applicable.

Code Availability Not applicable.

Declarations

Ethics Approval Not applicable.

Consent to Participate Not applicable.

Consent for Publication The participant has given written consent to the submission of this case report to the journal.

Conflict of Interests The authors declare no competing interests.

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