Intradural spinal arachnoid cyst – A complication of lumbar epidural steroid injection

Sir,

Spinal arachnoid cysts are outpouchings of the arachnoid lining.\[^1\] Arachnoid cysts can occur either in the intradural or extradural compartment. The majority of arachnoid cysts are thought to be secondary to a congenital defect in the diverticulum of the dura, whereas non-idiopathic etiologies include trauma, prior surgery, spondylosis, or chronic arachnoiditis. Surgical etiologies of arachnoid cysts have been described following conduction of various procedures such as a lumbar myelography, laminectomy, and vertebroplasty.\[^1\]–[^4\] Arachnoid cysts may enlarge due to a ball valve mechanism that expands its over time.\[^5\] To the best of our knowledge, the occurrence of an intradural spinal arachnoid cyst as a complication of lumbar epidural steroid injections has not been previously reported.

We present the case of a 36-year old schoolteacher with a 15-year history of back and bilateral leg pain and numbness. She was managed conservatively with epidural steroid injections. One of these injections resulted in an intradural spinal arachnoid cyst as a complication of lumbar epidural steroid injections. As her symptoms began prior to the epidural steroid injections. As her symptoms began before the appearance of the arachnoid cysts; and, remained the same prior to treatment, it was thought that the arachnoid cysts were asymptomatic. Thus, we recommended surgery for her discogenic back pain because she had failed conservative therapy. The arachnoid cyst was not operated upon.

Lumbar spinal arachnoid cysts account for only 5% of the intradural cysts found within the spine. Eighty percent of them occur in the thoracic, and 15% occur in the cervical region.\[^6\] They are often asymptomatic, similar to their intracranial counterparts. When they present with symptoms, the presentations can range from low back pain to neurological dysfunction. Symptoms are occasionally postural and related to the filling of the cyst with CSF. Differential diagnoses include intradural tumors and cysts arising from other neural and mesenchymal substrates such as an epidermoid, neurentic, epithelial, or teratogenic cysts.\[^6\] Contrast studies identify the presence of a tumor whereas diffusion-weighted imaging help in ruling out an epidermoid cyst.\[^6\]

The pathogenesis of development of these cysts is uncertain. While most often, they are believed to be congenital, several authors have postulated that that these cysts are caused by trauma or arachnoiditis. In our case, the findings correlated with a “traumatic” etiology since the previous MRIs did not show these lesions. In addition, multiple puncture attempts with dural violation could be the reason for formation of two cysts close to one another. Iatrogenic lumbar puncture could result in inflammation and arachnoiditis, resulting in loculation of the CSF and cyst formation. Once an arachnoid cyst develops, it may, by a ball valve mechanism, gradually increase in size. Injection of methylprednisolone into the intradural space could also incite a chemical reaction. The pathophysiology of iatrogenic spinal arachnoid cysts is essentially the same, as described above, and the treatment is based on corroboration with clinical symptoms. McLain\[^7\] reported a case of transient paralysis associated with an epidural steroid injection in a patient who recovered within 48 hours. Radiographic studies demonstrated a focal, space-occupying lesion in the spinal canal at the level corresponding to the neurologic deficit, which spontaneously resolved over the next 2–3 hours. Their speculation was that (a) an inadvertent thecal penetration during the injection may have produced an atypical anesthetic block; (b) loculation of the injected fluid may have caused a transient compressive lesion; or, (c) intrathecal injection may have produced an iatrogenic arachnoid cyst. They caution that, although pathologic confirmation of the cause was not possible, the potential for this alarming complication should be recognized by physicians prescribing epidural steroid therapy.

Whether or not the iatrogenic arachnoid cyst that developed in our case was truly symptomatic and was responsible for the

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Figure 1: (a) Sagittal and (b) axial T2-weighted MRI of the lumbosacral spine showing two well-defined loculated, intradural arachnoid cysts (arrows); (c) Sagittal T1 with gadolinium showing no enhancement of the cyst; (d) Fat-suppressed T2-weighted sagittal MRI ruling out lipomatosis.
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etiology of the pain, can only be determined by the patients’ clinical symptoms and the temporal profile in relation to the procedure. Mechanical disruption of the dura and arachnoid results in neural compression, which can lead to compression of the cauda equina, resulting in symptoms of pain or weakness. This is akin to the finding of previous laminectomies with unintended durotomy or postoperative adhesions resulting in symptomatic arachnoid cysts that need excision.\(^{[3,4]}\)

Surgical excision of symptomatic lesions is often straightforward, involving either total excision, direct repair of the dural fistula/defect when possible, or otherwise marsupialization. However, the more important decision is the timing of treatment of patients with arachnoid cysts in the presence of disc herniation. Recognizing the development of an intradural lumbar arachnoid cyst as a complication of an epidural steroid injection is important to help delineate the evolution of the patient’s symptoms in relationship to the imaging findings. This case highlights the importance that not all newly occurring lesions are symptomatic. A careful clinico-radiological examination should guide the management of chronic low back pain.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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Access this article online

How to cite this article: Turel MK, Kerolus MG, Deutsch H. Intradural spinal arachnoid cyst – A complication of lumbar epidural steroid injection. Neurol India 2017;65:863-4.

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