Herniation of the cauda equina into the facet joint through a pseudomeningocele: A case report and literature review

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INTRODUCTION

Incidental durotomy occurs in 0.5–18% of spinal operations.4,6,10 Persistent cerebrospinal fluid (CSF) leakage/fistulas may result in pseudomeningoceles and multiple attendant complications: meningitis, intracranial hypotension, and in the lumbar spine, herniation of the cauda equina into pseudomeningoceles.1 Here, we report a case in which the cauda equina herniated into a pseudomeningocele that penetrated the left facet joint. Once the defect was repaired at surgery, the patient’s symptoms improved.

CASE PRESENTATION

Clinical findings

A year ago, a 67-year-old male presented with the acute onset of left-sided low back, hip, and left lower extremity pain for which he underwent a left-sided L4-L5 laminectomy. During surgery, there
was a 2 mm left-sided durotomy that was repaired with a nylon suture and a fat patch graft. The subsequent MR examinations documented a persistent CSF leak that spontaneously resolved 3 months later. However, the patient again presented a year later with recurrent left-sided radiculopathy characterized by SLR 10 degrees, 3–4 motor function involving the iliopsoas, tibialis anterior, and extensor hallucis longus muscle distributions, and decreased left patellar and Achilles responses.

Radiological findings

The lumbar X-ray showed the prior operative defect at the L4–L5 level, while the MR documented a left-sided pseudomeningocele extending into the left L4–L5 facet joint [Figure 1]. The myelo-computed tomography further confirmed the presence of contrast in the left L4–L5 facet [Figures 2]. The patient underwent a left L4 selective nerve root block with 60% pain relief.

Secondary surgery

The patient underwent a secondary procedure 7 days later consisting of a L4–L5 facetectomy with posterior L4–L5 lumbar interbody fusion [Figure 3]. At surgery, we found that the cauda equina had herniated into the pseudomeningocele that then penetrated the left L4–L5 facet joint [Figure 4]. Once the cauda equina was repositioned within the dural sac, the durotomy was repaired with a nylon suture, fascia patches, and fibrinogen containing factor XIII. Fourteen days postoperatively, the patient was discharged without any residual symptoms or signs and continued to do well up to 1 year later.

DISCUSSION

Patients who experience traumatic intraoperative dural tears during lumbar surgery may develop postoperative recurrent/persistent radiculopathy and/or cauda equina syndromes attributed to herniation of neural tissues into pseudomeningoceles.

In this case, the cauda equina herniated into a pseudomeningocele that extended into the left L4–L5 facet joint. Other authors have reported herniation of nerve roots/cauda equina through dural defects attribute to similar lumbar surgery (e.g., transdural cauda equina incarceration after microlumbar discectomy),[5] nine cases of ventral and one case of dorsal nerve root entrapment, and extension into the intervertebral disc space [Table 1].[2,3,5,8,9]
However, only rarely has the nerve root herniated into a pseudomeningocele that then extended into a facet joint (e.g., in Nishi et al. the nerve root herniated into a large pseudomeningocele [10 mm]).

Here, a pseudomeningocele developed due to an inadequately repaired dural tear during a lumbar discectomy and resulted in cauda equina herniation into the resultant pseudomeningocele that then extended into the facet joint. In the future, such dural repairs should avoid nylon sutures; rather, it is best to 7-0 Gore-Tex sutures or its equivalent where the needle is smaller than the suture itself, and the suture/knot will not “unfurl.” Further, it muscle patch grafts not fat grafts should supplement dural closures, as a fat graft shrink/resorb, thus failing to maintain occlusion the leakage site.

**CONCLUSION**

During a left L4–L5 laminectomy, a durotomy resulted in the cauda equina herniation into a left-sided L4–L5 pseudomeningocele with extension into the left L4–L5 facet joint. Once the pseudomeningocele was repaired, the patient’s recurrent radiculopathy/cauda equina syndrome was repaired.

**Ethical approval**

This study was approved by the Medical Ethics Board of Noshiro Kosei Medical Center (approval number YD-057).

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent.

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Nil.

**Conflicts of interest**

There are no conflicts of interest.

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