Case report

Delayed extensive lumbar sub-dural effusion following discectomy – Clinical imaging and case report

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ABSTRACT

Incidental durotomy during lumbar spine surgery is a commonly reported complication. Those presenting with cerebrospinal fluid (CSF) leak are usually recognized and repaired intraoperatively. In some circumstances, it may either be unrecognized or occur as a delayed complication. Such delayed occurrences cannot be predicted and its management remain a challenge to the surgeon, especially when it presents as a sub-dural effusion. We report a 55-year-old man who underwent mini open lumbar discectomy through left side for a prolapsed L4-L5 disc. Recurrent worsening radicular symptoms along with a palpable cystic swelling at the previous surgical site became eminent, three months after surgery. MRI revealed distinctive anterior translation of all rootlets with subdural fluid collection posterior to it, within a normally placed dura, extending from L1 to L5 levels. A concomitant pseudomeningocele with a fistulous tract was also evident. Draining of pseudomeningocele with widening of previous laminotomies revealed a dural defect of less than 0.5 cms that prompted the CSF leak. Subdural effusion was drained following which the defect was repaired with inlay polyester urethane dural substitute patch and augmented with fibrin sealant. Symptoms regressed and follow up was uneventful. Occurrence of sub-dural effusion in lumbar spine is inevitably uncommon. We advise to suspect this condition in patients with recurrent symptoms following satisfactory lumbar decompression surgeries. Recognising this condition, followed by appropriate drainage of subdural effusion and direct repair of the dural defect is highly recommended for a better prognosis.

1. Introduction

Subdural effusion occurring in the lumbar region was earlier described in 1973 [1]. It can be described as subdural loculation or collection of cerebrospinal fluid (CSF) in the dura – arachnoid interface. Incidental durotomy during lumbar spine surgery is a commonly reported complication and a primary repair by direct suturing is widely recommended [2-4]. Rarely, patients may develop delayed CSF leak even if there was no dural tear noticed during initial surgery. Such CSF leak can be attributed to an unrecognized dural tear or to a de novo delayed dural tear [5]. This report depicts a rare occurrence of subdural effusion coupled with a large pseudomeningocele, late after initial satisfactory lumbar decompression surgery. We portray its unique imaging characteristics and a novel approach to management.

2. Case Report

A 55-year-old male was initially encountered with clinical and radiological indications for lumbar decompression surgery. A mini open discectomy through left L4/L5 laminotomy was performed. Intraoperative and initial post-operative period was uneventful and patient improved symptomatically. He developed recurrent radicular symptoms, 3 months following initial surgery. Symptoms included frequent headache and dizziness associated with difficulty in walking. Clinical examination revealed a positive straight leg raising test on left side with no neurological deficit. A 5 × 5 cm palpable cystic swelling was present in the previous
3. Discussion

Incidental durotomies may remain undiagnosed when there is no obvious CSF leak, especially if the arachnoid membrane is intact. It may later open due to an increased intradural pressure during recovery [6]. Rarely, a de novo delayed dural tear can occur late after surgery due to a bony spicule projecting into the spinal canal that erodes and punctures the dura [5, 7]. During the initial surgery in our patient, we did not notice any CSF leakage. So, the later presentation may be due to a missed tear or a de novo delayed dural tear, but neither of it can be predicted nor substantiated [5]. Chronic CSF leak causes symptoms of headache and dizziness [8, 9]. Presence of associated radicular symptoms imply the possibility of canal stenosis. If stenosis is not due to a recurrent disc, other lesions inside the spinal canal such as subdural hematoma, subdural effusion, subdural hygroma or arachnoid

surgical site (Fig. 1).

MRI was repeated and sagittal cuts revealed abnormal distinctive anterior translation of cauda equina from L1 to L5 levels (Fig. 2a). Axial cut images showed anterior translation of all rootlets that were arranged in a linear pattern within a normally placed dura (Fig. 2b, 2c, 2d). Subdural accumulation of fluid posterior to the rootlets was certain as the dura was clearly visible adjacent to posterior wall of the spinal canal unlike epidural accumulations where the dural is pushed forward. This obvious subdural collection was monotonous from L1 to L4 levels and less obvious in L5 level. We hypothesize it as CSF accumulation since it was similar in intensity compared to CSF in both T1 and T2 weighted images. A large pseudomeningocele communicating to the previous laminotomy site through a fistulous tract was also evident (Fig. 2e). This MRI picture was pathognomonic to confirm that the collection of fluid was subdural and not extradural. A diagnosis of extensive lumbar subdural effusion associated with a pseudomeningocele was made.

After draining the pseudomeningocele, a fistulous tract was found that connected it to the laminotomy site. Widening of previous left sided L4 and L5 laminotomies were done and a dural defect of less than 0.5 cms was identified just above the shoulder of L5 nerve root that prompted the leak. Subdural effusion was drained by slightly widening the dural defect. The drained fluid from the subdural space was xanthochromic in appearance. After satisfactory drainage of subdural effusion, the arachnoid membrane and dura were brought together and a polyester urethane patch was used as an inlay dural substitute which was secured to the ends of the dural defect using 7-0 prolene (Fig. 3). A fibrin sealant was used to augment the dural repair. No further leakage of CSF was noted intraoperatively.

Symptomatic improvement in our patient was noted with no complaints of headache or dizziness in the days following surgery. Straight leg raising test was negative on both sides on the first postoperative day. Neurological status remained normal. Rehabilitation protocols were well tolerated and the patient was discharged on the 5th Postoperative day. A review was scheduled every week in the first postoperative month and every month thereafter until final follow up. Patient was back to full functional status by 3 months and remained asymptomatic for rest of the follow up with no clinical or radiological

recurrence.
4. Conclusion

This report depicts a rare complication following satisfactory lumbar decompression surgery. Delayed CSF leak causing subdural effusion or other complications cannot be predicted if the initial surgery was uneventful. Intraoperative meticulous handling of dura may prevent such complications. Repeating MRI study is the only key to diagnosis. Direct repair of the dural defect is highly recommended for a better prognosis.

Conflicts of interest

The authors have no conflicts of interest relevant to this article.

REFERENCES


