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Spontaneous resolution of postoperative lumbar pseudomeningoceles: A report of four cases

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Abstract

Go to:

Pseudomeningocele is an extradural cerebrospinal fluid collection arising from a dural defect, that may be congenital, traumatic, or more commonly as a result of postoperative complication. Majority of the postoperative pseudomeningoceles occurring after lumbar spine surgeries are small and resolve spontaneously. However, large pseudomeningoceles are rare and spontaneous resolution of such pseudomeningoceles has not been described. We report four cases of postoperative large lumbar pseudomeningoceles that presented as asymptomatic soft fluctuant swelling over the back which resolved spontaneously. We also reviewed the related literatures and operative records of these patients to find the possible mechanism of occurrence, their management, prevention, and reasons for spontaneous resolution. We conclude that nonoperative management under close observation can be employed for asymptomatic postoperative large lumbar pseudomeningoceles. Surgical exploration and repair should be reserved for symptomatic cases presenting with clinical features of intracranial hypotension, worsening neurology, external fistula or infection, thereby avoiding morbidity and potential complications associated with surgical treatment.

Keywords: Giant pseudomeningocele, large pseudomeningocele, spontaneous resolution

Introduction

Go to:

Pseudomeningoceles are abnormal extradural collection of cerebrospinal fluid (CSF) resulting from dura-arachnoid defect. It may be congenital, traumatic, or more commonly iatrogenic occurring as a result of incidental durotomy after posterior lumbar spine surgeries.[1,2] Postsurgical pseudomeningocele is created when CSF extravasates through a dura-arachnoid tear and becomes encysted within the wound, in a fibrous capsule, lying adjacent to the spinal canal. Its exact incidence is difficult to estimate as majority of them remain asymptomatic and go unnoticed. However, it is reported to be around 0.07-2% of lumbar laminectomies and discectomies.[1] It is more commonly seen after lumbar surgeries because of high intrathecal pressure and large number of surgeries performed in this region.[1] Pseudomeningoceles more than 8 cm in size are described as giant pseudomeningoceles[3] and those more than 5 cm as large pseudomeningoceles.[4] We report four cases of postoperative pseudomeningoceles, out of which two had giant pseudomeningoceles and two had large pseudomeningocele. To describe these cases together, we used the term large pseudomeningoceles.

Case Report

Go to:

Case 1

A 17-year-old boy underwent posterior instrumentation from L2-S1 vertebra and anteriorcolumn reconstruction for an unstable burst fracture of L4 vertebra. Intraoperatively, the left L4 nerve root was avulsed with a dural defect. A fat graft was used to seal the CSF leak at the time of wound closure. The patient had complete motor and sensory loss in left L4 root distribution which remained unchanged postoperatively. Postoperatively, the patient was put on routine antibiotics for gram positive and negative coverage and analgesics. He was catheterized and advised strict bed rest. On the 5th postoperative day, when the patient was mobilized, a fluctuant swelling of approximately 12 × 8 cm was noticed at the operated site. Since the patient remained asymptomatic and the wound healed uneventfully, he was discharged after suture removal and was observed closely. At 3 months followup, the swelling had resolved completely both clinically and radiologically [Figure 1].

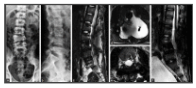


Figure 1
X-ray lumbosacral spine anteroposterior (a) and lateral (b) views showing burst fracture of L4 vertebra. (c, d) Postoperative T2W MRI, sagittal and axial images, showing giant pseudomeningocele. (e, f) MRI at 3 months followup showing resolution of pseudomeningocele **...**

Case 2

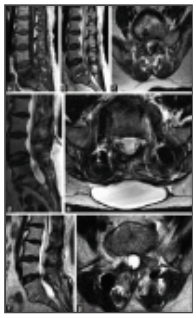
A 24-year-old male presented to us 4 months following a right L4-L5 fenestration and discectomy, with a fluctuant swelling of about 5 × 4 cms at the operated site. He had grade 4 power in right long toe extensors which remained the same after surgery. He was otherwise asymptomatic. He was advised exploration and repair, but he declined. He was followed-up and at 6 months postoperatively, the pseudomeningocele was found to have resolved completely both clinically and radiologically [Figure 2].

Figure 2
(a, b) Preoperative T2W MRI sagittal and axial images of lumbosacral spine showing L4-L5 right-sided intervertebral disc prolapse. (c, d) Postoperative T2W MRI sagittal and axial images showing pseudomeningocele. (e, f) 6 months followup T2W MRI sagittal **...**

Case 3

A 61-year-old lady who underwent posterior instrumentation, debridement, and fusion of L5-S1 vertebra for tuberculous spondylodiscitis. She presented after 18 months postoperatively with fluctuant swelling of approximately 9 × 6 cm at the operated site. She did not have any neurological deficit she had taken antitubercular course for 9 months. She had noticed the swelling 2 months after surgery but did not seek any medical attention as it was completely asymptomatic. She had completed a 9-month course of anti tubercular regime. The diagnosis of a large pseudomeningocele was confirmed on a magnetic resonance imaging (MRI). She was advised exploration and repair but she declined. She returned for followup 3 years later and the lesion was found to have resolved completely both clinically and radiologically [Figure 3].

Figure 3
(a-c) T1W and T2W MRI sagittal and axial views showing L5- S1 infective spondylitis. (d, e) Postoperative T2W MRI sagittal and axial views showing giant pseudomeningocele. (f, g) 3 years followup T2W MRI sagittal and axial views showing resolution of **...**



Case 4

A 26-year-old male, who underwent a left sided L4-L5 fenestration and discectomy, presented 10 days later with a fluctuant swelling over the back. His neurological status was normal. His radicular symptoms were relieved but had occasional postural headache. He was planned for surgical exploration and repair of the dural defect. During the waiting period for surgery, as he showed spontaneous regression, the surgery was deferred and it was decided to observe the patient closely. At 3 months, he showed complete resolution of the swelling which was further confirmed on the MRI [Figure 4].

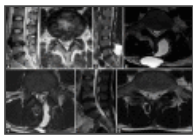


Figure 4
(a, b) Preoperative T2W MRI sagittal and axial views of lumbosacral spine showing L4-L5 intervertebral disc prolapse. (c, d) Postoperative T2W MRI sagittal and axial views showing pseudomeningocele. (e) T2W MRI axial view showing partial resolution of **...**

Discussion

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The exact incidence of postoperative pseudomeningoceles cannot be determined as many of them are small and resolve spontaneously.[1] In our center, four such large pseudomeningoceles were identified during a period of 7 years from January 2005 to December 2011. A total of 2446 spine surgeries were performed during the same period giving an incidence of large pseudomeningoceles as 0.16% of all spine surgeries in our center. In all our cases, the diagnosis was confirmed by noncontrast MRI which showed a continuity between the extradural CSF collection and the subarachnoid space through a defect in the posterior elements. The length and width of the pseudomeningoceles in cases 1,2,3, and 4 in the MRI were 12 × 7.5, 4.7 × 3.4, 8.2 × 5.3, and 5.4 × 4 cm, respectively. However, the exact nature and the dimensions of the dural defect could not be made out. Other diagnostic modalities described in the literature like myelogram, estimation of glucose levels and electrophoresis of the aspirated fluid[5] were not employed.

Intraoperative dural tear with inadequate repair is a known cause of postoperative pseudomeningocele formation[5] which occurred in one of our patients. The exact reason for the occurrence of postoperative pseudomeningocele in the other three patients without an identifiable intraoperative dural tear is not known. Unidentified small dural tears are known to occur intraoperatively during lumbar spine surgeries.[5,6] It is also described that dural punctures might occur postoperatively due to residual bony spikes.[7] Majority of these heal with the help of fibroblast or fibrocytes.[6] However, persistence of these dural tears may result in chronic CSF leakage into the extradural space with eventual encapsulation causing a pseudomeningocele. The use of anti-adhesive gel also has been reported to cause postoperative late pseudomeningocele in the lumbar spine. Anti-adhesive gel has been used locally to prevent postoperative adhesions. This has been reported to inhibit fibroblast migration and interfere with the normal healing of small dural tears, resulting in pseudomeningocele formation.[6] The review of operative records revealed local application of gel foam in two of these patients while its use in another patient could not be confirmed. These are the possible explanations for the development of late pseudomeningoceles in three of our patients without identifiable intraoperative dural tears.

Even though the occurrence of small pseudomeningoceles and their spontaneous resolution following lumbar spine surgeries has been described,[1] there is no literature describing the resolution of large pseudomeningoceles as was seen in our series. Various treatment options like close observation for spontaneous resolution, conservative measures such as bed rest, and application of an epidural blood patch, lumbar subarachnoid drainage, and definitive surgical repair have been described in the literature for management of postoperative pseudomeningoceles depending on their size and patient's symptoms.[1] Immediate surgical repair has been recommended in the literature for large pseudomeningoceles to prevent fistulous tract formation which is a conduit for infection.[2,8,5] The same was advised in all our patients, except in case1 where a dural repair was already attempted. Two of our patients declined surgical repair while one patient showed resolution during the waiting period for surgery. All patients showed spontaneous resolution without any complication at followup. Based on our series, we recommend nonoperative management under closed observation even for large or giant pseudomeningoceles when asymptomatic. Spontaneous resolution may occur over a period of 3 months to 3 years. Healing of the dural defect with gradual resorption of the intra-capsular CSF is the possible mechanism for resolution of these pseudomeningoceles. Surgical exploration, with repair of dural defect and postoperative subarachnoid drain as a treatment for pseudomeningocele, is described in the literature,[1,2,3,5] should be reserved for those cases presenting clinically with the features of intracranial hypotension, neurological worsening, external fistula, or infection.

The surgeon should be vigilant and carefully identify any occult dural tears or CSF leak during lumbar spine surgeries. In suspected cases, they should be ruled out by reverse Trendelenburg position or Valsalva maneuver. If detected, they should be managed appropriately. The use of anti-adhesive gels should be discouraged. Intraoperative dural tears should be repaired with running locking sutures using 5-0 or 6-0 nonabsorbable sutures incorporating fat graft or fascial graft in case of large defects. The repair should be tested by Valsalva maneuvers and overlying fascia should be closed in watertight fashion.[5] These measures may help in preventing postoperative pseudomeningocele formation.

We conclude that large pseudomeningoceles can be managed nonoperatively under close observation, expecting a spontaneous resolution. Surgical exploration and repair should be reserved only for symptomatic cases that present with the features of intracranial hypotension, worsening neurology, external fistula or infection. Thus the morbidity and complications associated with the surgical treatment of such large pseudomeningoceles can be avoided.

Footnotes

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Source of Support: Nil

Conflict of Interest: None

References

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1. Hawk MW, Kim KD. Review of spinal pseudomeningoceles and cerebrospinal fluid fistulas. Neurosurg Focus. 2000;9:e5. [PubMed]

2. Couture D, Branch CL., Jr Spinal pseudomeningoceles and cerebrospinal fluid fistulas. Neurosurg Focus. 2003;15:E6. [PubMed]

3. Weng YJ, Cheng CC, Li YY, Huang TJ, Hsu RW. Management of giant pseudomeningoceles after spinal surgery. BMC Musculoskelet Disord. 2010;11:53. [PMC free article] [PubMed]

4. Misra SN, Morgan HW, Sedler R. Lumbar myofascial flap for pseudomeningocele repair. Neurosurg Focus. 2003;15:E13. [PubMed]

5. Eismont FJ, Wiesel SW, Rothman RH. Treatment of dural tears associated with spinal surgery. J Bone Joint Surg Am. 1981;63:1132–6. [PubMed]

6. Kuhn J, Hofmann B, Knitelius HO, Coenen HH, Bewermeyer H. Bilateral subdural haematomata and lumbar pseudomeningocele due to a chronic leakage of liquor cerebrospinalis after a lumbar discectomy with the

application of ADCON-L gel. J Neurol Neurosurg Psychiatry. 2005;76:1031–3. [PMC free article] [PubMed]

7. Brookfield K, Randolph J, Eismont F, Brown M. Delayed symptoms of cerebrospinal fluid leak following lumbar decompression. Orthopedics. 2008;31:816. [PubMed]

8. Kotani Y, Abumi K, Ito M, Terae S, Hisada Y, Minami A. Neurological recovery after surgical treatment of giant cervical pseudomeningoceles extending to lumbar spine associated with previous brachial plexus injury. Eur Spine J. 2010;19:S206–10. [PMC free article] [PubMed]