Post Surgical Pseudomeningocele in a Patient with Cervical Neurinoma; a case report and literature review

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ABSTRACT

Our patient was a 43-year-old woman with a suboccipital headache and pain in the upper cervical region from 3 years ago with a progressive generalized weakness in the last 3 months. Neuroimaging study showed a dumbell shaped lesion with compression of the spinal cord in the cervical region that was identified as a neurinoma. The tumor had been completely removed by surgery but after the operation, site of surgery bulged and consequently the patient was reevaluated. The bulging was diagnosed as a pseudomeningocele that did not response to conservative management and was removed surgically. Possible causes for the development of post operative pseudomeningocele can be soft tissues and paravertebral muscles damage or high intradural pressures that cause leakage of cerebrospinal fluid from a very small dural defect. Shunt insertion should be reserved for patients with impaired cerebrospinal fluid absorption or those with a refractory fistula despite medical therapies and direct surgical repairs.

Keywords: Post surgical, Cervical pseudomeningocele; Cervical neurinoma; Pseudocyst

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INTRODUCTION

Pseudomeningoceles is an extradural collection of cerebrospinal fluid (CSF) in an arachnoid-lined capsule that can occur following dural tearing or inadequate closure during spinal surgery[1]. There are 3 types of extradural pseudomeningocele: congenital, iatrogenic and traumatic. However, postsurgical pseudomeningoceles are uncommon complications after spinal surgery[2].

The Lesion size depends on the size of the defect in the dura-arachnoid, the pressure of spinal fluid and the resistance from the surrounding soft tissues of the pseudocyst. Pseudomeningocele can appear with symptoms such as wound swelling, headache, and focal neurologic defects[3]. In a small dural tearing the intradural pressure causes a constant extravasation of spinal fluid, that can lead to a gradually enlargement of the lesion and eventually formation of a giant pseudocyst with compression to the spinal cord, causing several of neurological defects. The diagnosis of the Pseudomeningocele can be difficult[1].

The management and approach of this pseudocyst depends on the size, symptoms of the patient and the period of time between surgery and appearance of this pseudocyst. This article is a case report with review of the literature concerning diagnostic method and management of pseudocyst and their fallow up.

CASE PRESENTATION

A 43-year-old woman visited with complaint of an uncomfortable suboccipital headche and pain in the upper cervical region from 3 years ago. About 3 months earlier, she had experienced progressive difficulties with walking. On physical exam moderate spasticity of trunk and lower extremities was noticed and the deep tendon

reflexes were increased with bilateral positive Babinski sign. Cervical CT scan showed a dumbbell shaped and homogenously enhancing lesion that extended to the adjacent intervertebral foramen. (Appendix 1) The cervical magnetic resonance imaging (MRI) indicated compression of the spinal cord at the level of the C2-3. The signal intensity of lesion was low on T1 and high on T2 (Figure 1).

The patient was operated in a prone position. After posterior cervical laminectomy of C2-3 the extra and intradural components of the tumor content with neurinoma was resected totally. The dura was closed in watertight fashion and the operation was event free. The patient was discharged 7 days later with feeling improved.

In the follow up visit the gait of the patient was improved but she complained of progressive pain and paresthesia and mild bulging at the surgical site. On the physical exam, the general condition was good and she was afebrile and without any signs of meningitis. The surgical wound healing was good and she had no sign of erythema or warmth on the wound but the site of surgery was bulged. We admitted the patient in the Hospital for further work up. The Lab tests and cervical X-rays with flexion -extension views only showed post operation related changes. A lumbar puncture (LP) was performed for analysis and culture of CSF which was negative for meningitis. The brain and cervical MRI was performed that showed that the pseudocyst was still present (Figure 3, Appendix 2).

For the management of the pseudocyst**,** the patient was placed in complete bed rest position and Acetazolamide, Lasix and stool softeners were prescribed, and therapeutic LPs were performed. After 2 weeks the swelling was reduced, and the patient was discharged and advised to take medication at home and visit the clinic weekly. After 2 months, the bulging was still present and another cervical MRI was performed that showed that the cyst was not resolved (Figure 3).

Since the cyst was not resolved satisfactory we admitted the patient again and performed multiple direct subcutaneous puncture. Then posterior cervical swelling reduced but one month later another cervical MRI was performed that again didn't show improvement and elimination of the cyst (Appendix 3).

In view of the fact that previous measures were not satisfactory we considered surgery. In the surgical procedure we reopened the wound and explored the surgical site and evacuated the pseudomeningocele and repaired it with paravertebral fascia. At the end a lumbar drain was inserted. The Surgery was event free and the patient was discharged after 2 weeks. For the patients fallow up a cervical MRI was done 1 month after the second surgery that showed the cysts size was reduced (Appendix 4). Another MRI was done 5 months afterwards that showed complete resolution of the cyst (Figure 4).

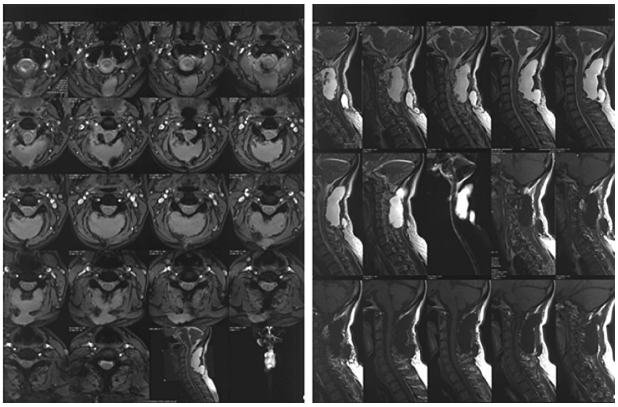

Figure 2. The first post operation cervical MRI two weeks after the surgery.

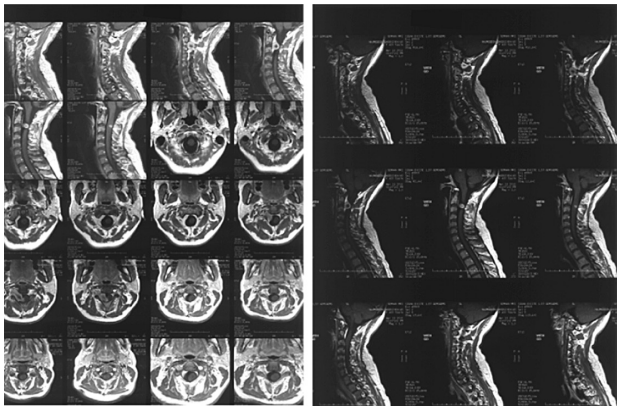

Figure 1. Vertebral MRI.

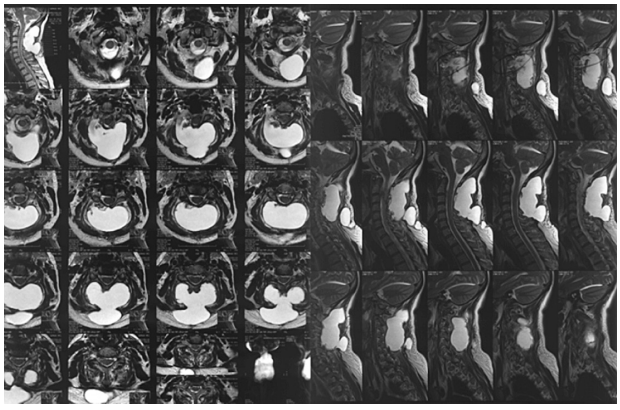

Figure 3. The Cervical MRI two months after the conservative treatment.

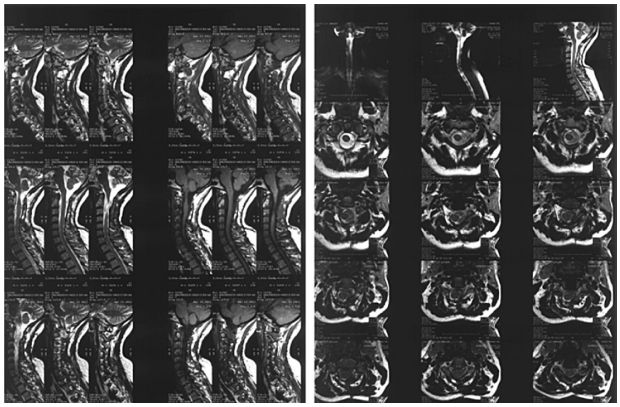

Figure 4. The Cervical MRI five month after the second surgery.

DISCUSSION

The formation of pseudomeningocele can be due to congenital, iatrogenic or traumatic causes[4]. Congenital pseudomeningoceles often are associated with neurofibromatosis and Marfan syndrome and mostly occur in the thoracic or thoracolumbar region[5]. The traumatic pseudomeningoceles are often in the cervical area[2] in which, the iatrogenic pseudomeningoceles are the most common one. The incidentally formation of this pseudocysts are often during spinal or intradural surgery[4].

The post operative pseudocysts are mostly seen after lumbar spinal surgery[6]. The intradural pressure is higher in the lumbar spine than in the cervical spine; this potentially explains why pseudomeningoceles occur more often at the lumbar level. A giant pseudomeningocele can develop in patients with a large dural defect or high intradural pressure. A giant pseudomeningocele is defined as a lesion ≥ 8 cm in diameters. The reports of such pseudocysts are rare and they are not well known[7].

There is a variety in symptoms of patients with pseudomeningocele from asymptomatic to common symptoms such as postural headache, localized back pain and radiculopathy. The patient with giant pseudomeningocele is mostly symptomatic and the most common symptom is headache[2].

The incidence of pseudomeningocele had been reprted to be about 0.068 % to 2% after laminectomy[8]. Although Injury of the dura at the surgery can lead to pseudomeningocele and if the patient had complications after the surgery, this diagnose should be considered and evaluated.

In the article form Rinaldi (1970) myelography is the initially recommended method to establish the diagnosis of pseudomeningocele[9]. CT and MRI are had been recommended as the choice diagnostic modality[10] and actually MRI showed to be the most effective method[2].

There are some controversies in the treatment of pseudocysts, especially in asymptomatic patients. The method of approach mostly depends on the pseudocysts size, location and symptoms of patient[8]. Conservative management is preferred in asymptomatic patients or in patient with early symptomatic and a CSF fistula the treatment should contain a spinal drainage and in patients with late symptoms (after weeks or months) surgery should be considered.

Mostly, pseudomeningoceles are surgically explored and gradually been dissected from the circumambient tissue and nerve roots and the fistulous tracts should be resected and the dural tear should be repaired and a subarachnoid catheter is implanted for drainage[2]. For giant pseudocysts a combined treatment protocol is advised that contain surgery for extirpation of pseudomeningoceles, repair of the dural tears, and implant of a subarachnoid catheter for drainage[2].

CONCLUSION

Possible causes for the development of post operative pseudomeningocele can be soft tissues and paravertebral muscles damage or high intradural pressures that cause leakage of cerebrospinal fluid from a very small dural defect. Shunt insertion should be reserved for patients with impaired CSF absorption or those with a refractory fistula despite medical therapies and direct surgical repairs.

Conflict of interest statement: None of the authors have any potential conflict of interest.

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