

Case Report

An external auditory canal swelling: a pseudo meningocele

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ABSTRACT

The author presents a case of an external auditory canal swelling. A pseudo meningocele, delayed complication of mastoidectomy. Differential diagnosis of swelling in the ear canal includes various conditions. The study aims to discuss management and review the literature of this uncommon condition. A 34-year lady presented with right ear canal swelling, reduced hearing and occasional watery ear discharge. Patient had undergone ear surgery 14 years back. Radiological studies including computed tomography and magnetic resonance imaging were suggestive of defect in the tegmen and posterior canal wall and presence of swelling containing cerebrospinal fluid (CSF) in mastoid cavity. Post aural trans mastoid approach was planned and multi layered closure of the defect was done under adequate antibiotic coverage. Pseudo meningocele may manifest as delayed complication of mastoid surgery and risk of meningitis is higher as CSF containment to its space is failed. Trans mastoid resection of swelling and reconstruction of the skull base is preferred modality of treatment considering size of the defect.

Keywords: Acquired meningocele, Computed tomography, Mastoid bone, Cerebrospinal fluid

INTRODUCTION

The swellings in the external auditory canal (EAC) continue to remain deceptive in their presentation. A much simple looking swelling might have its origin due to furunculosis, an exostosis or ostemata, facial neuroma arising from mastoid segment of seventh cranial nerve and less commonly they may be even herniating contents of cranial cavity a meningocele, meningoencephalocele or pseudo meningocele.¹⁻⁵

The global prevalence of chronic ear diseases by World Health Organization stands between 0.4% to 46%.⁶ The number of cases requiring mastoidectomy procedure for infective and non-infective causes have increased in last decade. The ever-improving results of these surgeries also have flip side of associated risk of complication in few cases, like damage to skull base and adjacent dura. Sometimes, even leading to immediate or delayed and

covert cerebrospinal fluid (CSF) leaks.⁴ In addition, changing lifestyle and associated obesity has up the overall risk profile for delayed spontaneous CSF leak and herniation of cranial contents through congenital or iatrogenic tegmen defects.⁷

CASE REPORT

A 34-year, female patient presented with complaints of swelling in the right EAC, difficulty in hearing and occasional watery ear discharge. Patient had undergone ear surgery on the same side at the age of 14 years.

All her blood investigations were unremarkable except for raised thyroid stimulating hormone level of 10.4 mU/l suggesting hypothyroid state. A high-resolution computed tomography was showing of ipsilateral post-operative mastoid changes and soft tissue mass filling the cavity with continuation of same through EAC defect in

posterior bony EAC. There was defect in the tegmen tympani region which was measuring 5×4 mm (Figure 1). The contrast study revealed that the mastoid cavity and EAC swelling was filled with fluid. The magnetic resonance imaging (MRI) showed hyper intense signals on T2 weighted sequences without herniation of brain parenchyma (Figure 2).

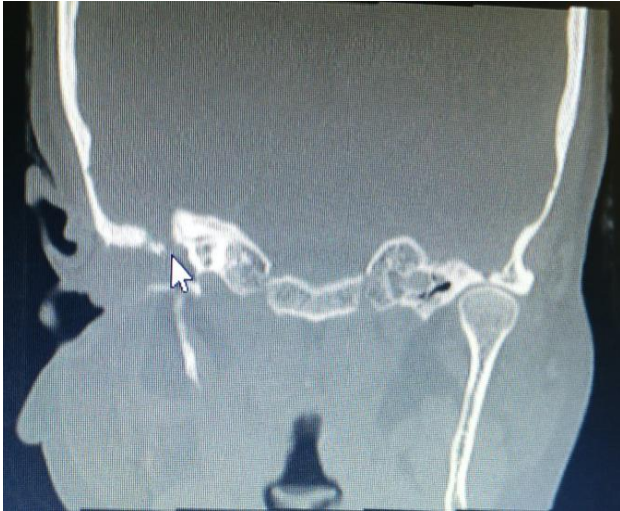


Figure 1: High resolution computed tomography temporal bone coronal section showing defect in the tegmen tympanum (marked by white arrow).

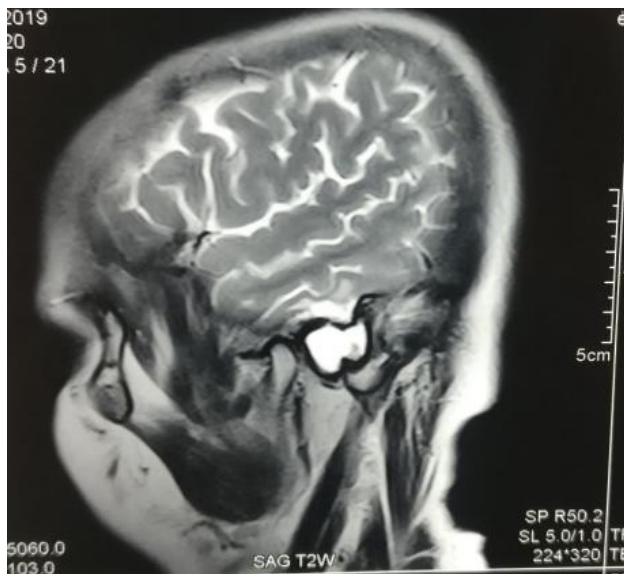


Figure 2: MRI sagittal section showing T2 weighted hyperintense signals in the mastoid cavity similar to CSF in sub arachnoid space.

Patient was prepared for post aural, trans mastoid exploration of pseudo meningocele after written and informed consent. A swelling was noted buried in post aural soft tissue (Figure 3). The bony EAC was found eroded. As the swelling was opened near its bony attachment clear, watery, pulsatile fluid started to fill up mastoid and operative site. The swelling was extending

medially up to middle ear without any communication with former.



Figure 3: Intra operative post aural approach, asterisk mark (*) showing ear canal swelling from post aural region.

After excising the soft tissue, the leak was located at tegmen tympani region. Reconstruction of the dural defect was done with fat, fascia lata and conchal cartilage. Middle ear was reconstructed with temporalis fascia and rest of the cavity was draped with fascia lata. Patient was given adequate measures to reduce CSF pressure along with antibiotic prophylaxis. Minimum postoperative leak was stopped after conservative management.



Figure 4: CT Cisternography showing CSF in sub arachnoid space without any leakage from site of repair.

CT cisternography was done after day seven which did not reveal any leak from the operative site (Figure 4).

DISCUSSION

The differential diagnosis of EAC swelling include indigenous conditions. This includes exostosis from deep part of EAC, furunculosis of EAC with extremely painful swelling.^{8,9} Some are from deeper structure like neural or

vascular component; facial neuroma arising from mastoid segment of seventh cranial nerve or less commonly they may be even herniating contents of cranial cavity- a meningocele, meningoencephalocele or pseudo-meningocele.^{3-5,10}

Mastoidectomy done for chronic squamosal and mucosal disease remains most frequent indication in practice of otological surgeon.¹¹ Patient factors, nature of disease at the time of presentation and experience of surgeon have significant contribution to the outcome and related complications associated with these surgical procedures. An unnoticed inadvertent trauma to bony confines of skull base in patients with other comorbidities like obesity or benign intracranial hypertension may manifest with CSF leak. To add further, children with congenital otic capsule malformation are prone for spontaneous leaks.¹² Therefore, to make the procedure safer these factors should be addressed diligently. Thankfully, today in the era of virtual reality simulation training and structured self-assessment, mastoidectomy even in the hands of novice has less collision of important structures.¹³

Risk of meningitis is higher in spontaneous leaks and this may be still higher in cases of pseudo meningocele as compared to meningo encephalic herniations. In former the breach in meningeal covering continues to act as fistula and the CSF fluid gets accumulated in fibrous soft tissue walled cavity violating its sub arachnoid space.¹⁴

CT scan and MRI have definitely changed the way these swellings are managed.¹⁵ Any variation or a pathology can be better studied preoperatively, so as there remains no or minimal surprises while approaching these swellings during surgery. While MRI, in this case proved the communication between sub arachnoid space and mastoid cavity along with EAC swelling. Suspected silent leaks can be better appreciated up on CT cisternography than routine CT or MRI. A post-operative CT cisternography in this case helped confirmation of surgical sealing of the leak site after excision of the swelling containing CSF.

In a retrospective chart review of 14 patients by Pelosi et al all patient underwent trans mastoid repair while 2 patients also needed transcranial approach.¹⁴ Post aural trans mastoid approach with multilayered closure using temporalis fascia with cartilage and perichondrium or fascia lata with abdominal fat is preferred modality for small to medium sized defects placed in the skull base.¹⁶ Blind sac closure is done in case of cavity obliteration for multiple leaks or in case of larger defect to provide better stability. For medially placed defects middle cranial fossa or retro sigmoid approach is suitable. The debate for singular or combined approach in these cases is long due with pros and cons. Trans mastoid techniques are less morbid. However, disadvantages may include hearing compromise, cramped exposure, durability of closure. While trans cranial approaches are suitable for larger, recurrent, multiple and medially placed defects. Again,

the disadvantage includes neurological complications and seizures.¹⁴

CONCLUSION

Pseudo meningocele may manifest as delayed complication of mastoid surgery and the risk of meningitis is higher as CSF containment to its space is failed. Radiological investigations are vital in planning and management. Trans mastoid resection of the pseudo meningocele and reconstruction of the skull base under adequate antibiotic coverage is preferred modality of treatment.

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