CASE REPORT

CSF-OTORRHOEA: A RARE COMPLICATION OF MASTOIDECTOMY

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ABSTRACT: Iatrogenic cerebrospinal fluid (CSF) leak, or brain herniation, with meninges (meningoencephalocele) or without meninges (encephalocele) following mastoidectomy is rare, however the seriousness of the complication and the potential for its prevention necessitate periodic review and emphasis. CSF otorrhoea occurs on the basis of skull fracture, tumor, infections, congenital anomalies and operative trauma. This paper will discuss the presentation and management of CSF leak encountered in revision chronic ear surgery.

KEYWORDS: Cerebrospinal fluid, Herniation, Mastoidectomy, Meningoencephalocele, Otorrhoea.

INTRODUCTION: In the well-pneumatized temporal bone, the temporal lobe of the brain is separated from the middle ear and the mastoid process by a thin layer of bone known as the tegmen tympani. Congenital defects, infections and trauma can alter this structure in such a way that CSF otorrhoea results,⁽¹⁾ Intra-cranial surgery that extends through or into the temporal bone is the most common cause.⁽²⁾ CSF egress from the subarachnoid space into the pneumatized spaces of the temporal bone is most commonly the result of fracture associated with laceration of dura and arachnoid. The complications of CSF otorrhoea are potentially lethal, thereby emphasising the necessity for early recognition and correct management of these patients.

Fig. 1: Anatomy of Tegmen plate

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CASE REPORT: A 33 years old male patient presented with chief complaint of otorrhoea from (L) ear since 10 years, the discharge was muco-purulent in nature with occasionally blood stained, no complaint of giddiness, vomiting and tinnitus, history of mastoidectomy 11 years back for same complaints. On microscopic examination: high facial bridge, cholesteatoma flaks present in facial recess and mastoid tip area with Attic granulations and thick mucopurulent discharge present all over the mastoid cavity. After all necessary investigations done, patient was taken up for revision mastoidectomy under general anesthesia.

All the cholesteatoma matrix and granulations cleared, facial bridge lowered, mastoid cavity saucerization done there was a small defect noticed in tegmen plate covered with cholesteatoma, all the disease cleared temporalis fascia graft placed over the ossicles, mastoid cavity, and over the defect in Tegmen wound was closed in layers, ASD done.

On 2nd post-operative day patient complained of sensation of watery discharge in to mastoid cavity. The patient was kept on broad spectrum antibiotics and tablet Diamox for 15 days, not showing any improvement, patient was taken up for re-exploration via end-aural approach, cavity was well epithelialized. The epithelial layer over the tegmen plate dissected to expose the CSF leak area.

OPERATING FINDINGS: A defect seen in Tegmen plate, little bulging of meninges, site of CSF leak identified, the dura was elevated around the tear from the skull bone. The cartilage graft harvested from tragus, the defect was closed with cartilage and perichondrium in double layered and technique, this was supported by free muscle graft and gel foam medicated pack was kept in the cavity, which was removed after seven days. The leak was stopped completely the patient asymptomatic for past 10 months.

Fig. 2: Intra Operative Photo

Fig. 3: Defect in Tegmen plate

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Fig. 4: Intra operative Photo defect closed

DISCUSSION: CSF otorrhoea, the discharge of CSF from the ear, a rare, potentially life threatening situation that requires intervention to prevent meningitis, linked to an abnormal communication between the sterile sub arachnoid space with the sino nasal tract flora, it is arising from defects in the tegmen and middle fossa, may be spontaneous or secondary to trauma, infections, neoplastic and surgical treatment. Accidental trauma is thought to be the commonest causes of CSF Otorrhoea.⁽³⁾

Mastoid surgery for chronic ear disease is also a potential cause of an acquired CSF leak, while doing a mastoidectomy a thorough knowledge of the surgical anatomy of the temporal bone is very essential, the surgeon must be careful while drilling near the tegmen and posterior fossa dura, a large diamond drill should always be used to prevent trauma, when the dura is violated intra operatively, the defect should be repaired immediately if possible, with fascia and muscle. Frequently, however the dura is not injured, but a defect is left in the bony plate of the tegmen, over the years the continuous pulsations of the CSF causes the dura to thin, allowing the arachnoid or brain to prolapse through this defect. This dura may become thin and spontaneously rupture, resulting in a leak of CSF many years after the initial surgery even in the absence of surgical intervention, similar problems may result from middle ear disease, most notably cholesteatoma, cholesteatoma may erode the tegmen plate and allow herniation of dura or brain to occur over time.

CSF otorrhoea arising from defects in the tegmen and middle fossa dura can be managed by an intracranial repair, extracranial transmastoid or a combined approaches offer advantages in direct visualization and precise intra-and /or extra-dural, intra-cranial placement of a graft secured by sutures. The potential disadvantage is the morbidity associated with a temporal craniotomy.⁽⁴⁾ The popularity of the sub-occipital approach for acoustic neuroma removal is partly because of the lower incidence of CSF leaks compared with the translabyrinthine route, however Robson et al,⁽⁵⁾ shows a 17% incidence of CSF leaks requiring operative intervention. Drilling of the petrous bone will often open up mastoid air cells, which communicate with the middle ear cavity. Gordon et al,⁽⁶⁾ reported two cases of leak through the petrous bone following a sub-occipital approach, drawing attention to this air cell tract, and emphasising the importance of closing this potential site for a leak, at the time of the original operation.

In our case, operated by extra cranial trans mastoid approach the defect closed with cartilage along with perichondrium with double layered technique and the defect was closed successfully, post operatively no leak was found, patient was followed for 10 months. In patients with postsurgical and

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traumatic leaks, surgery may not be indicated it is reserved for those in whom conservative therapy is unsuccessful.

CONCLUSION: Leakage of Cerebrospinal fluid (CSF) through the ear structures is a rare but potentially life-threatening situation that requires rapid intervention. Here we are describing a case of CSF otorrhoea following mastoid surgery, treated with closure of the defect with cartilage by double layered technique with very good result.

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