



A case of Cerebrospinal Fluid Rhinorrhea

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Abstract

Cerebrospinal fluid rhinorrhea (CSF) refers to leak of CSF through the nasal cavity. It can be classified into traumatic and non traumatic . following failure of conservative management ,definitive treatment most commonly involves an endoscopic csf leak repair of defect. We present a case of spontaneous rhinorrhea in a previously well 42 year old female ,which required surgical intervention due to failure of conservative management.

Introduction

The causes of cerebrospinal fluid rhinorrhea (CSF) can be classified as either spontaneous or non spontaneous . spontaneous or non traumatic causes include congenital anomalies of sub arachnoid space , maldevelopment of cribriform plate .whereas traumatic csf rhinorrhea related to surgical and accidental trauma .early diagnosis and effective management are needed to prevent the complications csf rhinorrhea such as meningitis , brain abscesses, pneumocephalus .

Case report

42 yr female patient presented with a history of watery nasal discharge since 2 months from left nasal cavity. There is a history of headache since 2 months (on & off) which aggravates on bending forward , not associated with fever ,neck stiffness, photophobia , vomitings . no h/o trauma.

●Past history: Had similar complaints in the past , csf leak repair done 3 years back. She's a k/c/o hypothyroidism on medication (thyronorm 50mcg) n/k/c/o D.M, HTN, asthma ,epilepsy .T.B.

●family history: there is no relevant family history .

●personal history: she takes mixed diet ,normal appetite ,her bladder and bowel movements are regular, with disturbed sleep. No addictions and no allergies.

●Local examination:

Nose : external framework : no external deformities , Vestibule: normal ,columella: normal ,olfaction: normal, anterior rhinoscopy: dns to rt

Ear: b/l T.M intact

Ct cisternography showed Defect in left ethmoidal roof/ cribriform plate junction with contrast leak through this defect into the ipsilateral nasal cavity and soaking the cotton swab in left nostril

Patient underwent endoscopic csf leak repair under GA, merocel pack in left nostril was removed after 4 days

,patient was followed up on 14th day and there was no leak on endoscopy.

DISCUSSION

CSF rhinorrhoea can occur directly from anterior cranial fossa through the nose or indirectly from middle or posterior fossa through the Eustachian tube [1]. CSF rhinorrhoea was first described by Galen in 200 BC [1]. Saintclair Thompson reported the first series of patients with spontaneous leak in 1889 [1]. The first successful surgical approach was attributed to Dandy in 1926, by intracranial route [2]. The commonest etiology of CSF rhinorrhoea is trauma (80 – 90%) followed by Iatrogenic leaks (10 – 16%) and non-traumatic spontaneous leaks [2,3]. The incidence of CSF in closed head injury is 1-3% and is upto 15% of all base of skull fractures [3]. Most patients with CSF leak due to non-surgical trauma present immediately where as only 50% of patients with Iatrogenic CSF leak present within the 1st week [4]. 95% of all delayed CSF leaks in Non-surgical trauma occurs within 3 months and are thought to occur as a result of a delayed elevation of ICP, lysis of clots in and around the site of injury, resolution of oedema, loss of vascularity, with resultant necrosis of soft tissue and bone. Non-traumatic CSF leaks are relatively uncommon. 45% of such leaks are high pressure leaks occurring due to Increased Intra cranial Tension due to tumor, hydrocephalus, etc.

Presence of headache should arouse the suspicion of Increased Intra cranial Tension [5]. Normal pressure leaks from 55% of nontraumatic CSF leaks, which is a very poorly understood entity and its origin remains unclear.

The choroid plexus produces 50% – 80% of Cerebrospinal Fluid and 30% is produced by ependymal surface. .roughly about 90 – 150ml of Cerebrospinal Fluid is in circulation and it is produced at the rate of 20 ml/hour and 500 ml/day. The commonest aetiology of a Cerebrospinal Fluid leak is trauma to the anterior skull bone, since the

dura in this area is tightly adherent to the thin skull bone and can be easily torn.

Hypothesized theory for a Normal pressure non – traumatic leak (a spontaneous leak) is a result of physiologic alterations in Cerebrospinal Fluid pressure and constant dural pulsation, leading to erosion of skull base. Congenital cases of Cerebrospinal Fluid leaks are considered as different entities, as they may have/not have increased Intracranial tension. The commonest causes are failure of closure of anterior neuropore, a persistent craniopharyngeal canal [7] and empty sella syndrome

Our case was an interesting case of a normal pressure, non-traumatic, Cerebrospinal Fluid leak with more than two months duration. In most of the cases, a Cerebrospinal Fluid leak is a clinical diagnosis with a good history and physical examination. A ring or halo sign can further help in physical examination, where Cerebrospinal Fluid is mixed with blood. When it is placed on a piece of filter paper, blood will separate out [central blood with a clear ring of Cerebrospinal Fluid [9]. Biochemical analysis of fluid for glucose (more than 30mg/dl) can help in diagnosis. Test for beta 2 transferrin is considered as gold standard for conforming Cerebrospinal Fluid.

Our case was diagnosed, by DNE (diagnostic nasal endoscopy) examination and CT cisternography done which showed site of leak accurately.

A majority of acute post – traumatic Cerebrospinal Fluid leaks resolve spontaneously within 14 days. Initial treatment is always a conservative line, bed rest in decubitus position with a maximum inclination of 10°, fluid restriction, anti-histamines and stool softners , tab.diamox

In our case, we started the patient on intravenous antibiotics, week prior to surgery and continued for seven days post operatively.

Surgical closures through Intracranial route showed a higher incidence of cerebral oedema due to brain

retraction, anosmia and haemorrhage, increased morbidity. Endoscopic Endonasal closure of csf rhinorrhoea has gained great support due to decreased morbidity. The major advantages include a better visualisation, reduced hospitalisation, no external scars, no brain retraction, no anosmia and decreased recurrence rate. The success of Endoscopic closures mainly depend on exact localisation of site of leak and precise placement of graft (underlay/onlay).

PROCEDURE

- Under GA local infiltration done with 2% xylocaine in(1:200000) adrenaline, with help of 0 degree endoscope.
- A gap measuring 3mm x 6-7 mm communication found in fovea ethmoidalis



Figure 1: defect in left ethmoidal roof/ cribriform plate junction

- Fat lobule from right thigh taken
- Mucosal flap 2x2 cm taken from lateral wall of right nasal cavity.
- Raw area created all around the opening (1cm) Fat lobule sutured over 3.0 vicryl over a knot , fat lobule inserted in the opening (defect) intra cranially . slightly pulled down to make it snugly fit.
- Free mucosal flap kept over the surface of skull base over the raw area created.
- Gelfoam used for support , merocel pack placed in left nostril for support of flap.

- Raw area around the opening covered with mucosal flap and gelfoam used for support of graft. .high incision closed with 3.0 vicryl. Patient followed every month for period of 6 months, no recurrence seen.

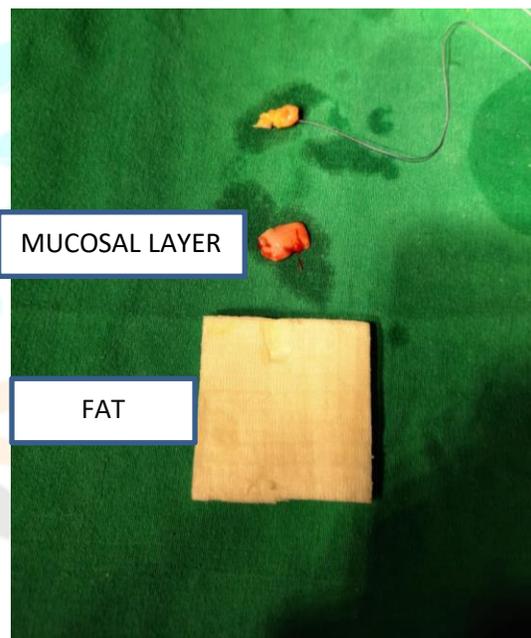


Figure 2:order of layers used to close the defect



Figure 3:closure by mucosal layer

CONCLUSION

Endoscopic repair of csf leaks is preferred because of better visualization of the defect and better success rates.in our case mutlilayered(3 layers) technique was done.

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