



## Recurrent Meningitis With CSF Rhinorrhoea – A Case Report

### KEYWORDS

CSF rhinorrhoea, recurrent meningitis, ethmoidal air cell.

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**ABSTRACT** Cerebrospinal fluid (CSF) leaks are consequence of trauma which can be life threatening due to direct spread of infection and requires early diagnosis and management. We present a case with delayed CSF rhinorrhoea with recurrent meningitis who had traumatic Head injury.

### INTRODUCTION:

Cerebrospinal fluid (CSF) leak after traumatic Head injury (THI) is not an uncommon phenomenon. Generally CSF rhinorrhoea is observed during the first 48 hours in two third of cases after THI. In the rest of cases it is evident within 3 months. In exceptional cases, CSF rhinorrhoea does not appear even decades after TBI [1]. Such patients often present with recurrent meningitis and a CSF leak is detected during the work up for the cause of recurrent meningitis [2]. CSF rhinorrhoea is commonly caused by trauma involving the floor of the anterior cranial fossa with tearing of the duramater. Rarely, congenital defects in the skull base associated with cephaloceles [3] can result in CSF rhinorrhoea. However in exceptional cases, CSF rhinorrhoea does not appear even decades after THI. Biochemical confirmation and radiological localisation is imperative and should be initially treated conservatively and in case of no response surgical management is a must. Risk of infection persists 10 fold in untreated defects. This case illustrates some of the potentially devastating complications which can occur as a consequence of skull base lesions. The current case report presents a patient with history of intermittent running nose after closed head injury and discuss the problems in the diagnostic evaluation of this lesion.

### CASE REPORT:

A 20 years old male patient got admitted to acute medical care unit of Government General Hospital, Kurnool, with complaints of fever with altered sensorium of 5 days duration, not associated with seizures. Patient had initially upper respiratory infection followed by high grade fever and altered sensorium, patient had similar complaints and was hospitalised twice and recovered completely. No other family members had such complaints. Patient had sustained fall 3yrs back and the first episode of hospitalisation for fever and altered sensorium was after 1 year following injury. The fall was associated with loss of consciousness and re-

covered spontaneously after one day of hospitalisation without any deficit.



Figure 1. Benedict's test done bedside of fluid from left



Figure 2. CT coronal plane showing defect on the left nostril ethmoidal air cell



**Figure 3.** direct nasal endoscopy showing ooze from left ethmoidalostium

Patient on examination febrile, disoriented neck stiffness present. No pallor, icterus or rash, pulse rate 112/ beats/mt, regular, bounding and BP was 108/70 mmHg, temperature:101°F. Neurological examination revealed positive Kernig's sign with no focal neurological deficit.

Patient was investigated Heamogram Hb: 10 gm/dl, total leucocyte count:12,800/mm Biochemical parameters were normal. CSF analysis showed bacterial meningitis and awaiting CSF culture patient was started on antibiotics.

CSF analysis	At admission	After 14 days of treatment
Cells	1000(100% neutrophils)	3 cells (lymphocytes)
Proteins	270 mg/dl	59 mg/dl
Sugars	60 mg/dl	80 mg/dl

CSF culture showed growth positive for staph aureus and was sensitive for vancomycin

Patient gradually improved and was started on antibiotics according to culture and sensitivity reports .On further evaluation patient gave history of intermittent running nose in left nostril and was suspected to be CSF dribbling. Preliminary bedside benedicts test (Figure 1) was done which showed presence of glucose. Although beta transferrin is the most sensitive for confirmation of the csf, it was not done in this case because of non-availability and economic constraints of the patient. Nasal endoscopy was performed which showed an ooze of clear fluid from the left sided ethmoidal ostium. CT coronal planes of skull (Figure -2) showed a defect in the ethmoidal air cell. CT cisternogram (Figure -3) confirmed that the defect with meningocele. Neurosurgical consultation was taken and was opined for a conservative management in view of sub-

sidence of rhinorrhoea and patient was discharged with antibiotic prophylaxis and advised regular follow up.

#### DISCUSSION:

CSF leaks are most commonly traumatic and 80% due to non surgical trauma [4] and 16% surgical procedures. Remaining 4% is contributed by non traumatic causes usually due to tumors or direct erosive effects on skull base in normal pressure group. Post traumatic CSF leak often subsides spontaneously. The mechanism of natural healing is sealing by blood, clot, inflammation, or brain tissue herniation. The mechanisms of leak within few months are resolution of oedema, absorption of blood clot, contracture of scar, and necrosis of soft tissues or bone [2]. Incidence of delayed CSF rhinorrhoea beyond 1 year is rare [5].

Most common sites of CSF rhinorrhoea following accidental trauma is sphenoid sinus (30%), frontal (30%) and ethmoid/cribriform (23%) [6]. Clinically, in detection of CSF leaks patient may complain of a salty or even sweet taste in their mouth, which is positional in nature.

$\beta$ -Trace protein ( $\beta$ TP), recently identified as prostaglandin D<sub>2</sub> synthase [7], is another brain-specific protein that is produced mainly in the leptomeninges and the choroid plexus and is secreted into the CSF.  $\beta$ -Trace protein ( $\beta$ TP) is a component of human cerebrospinal fluid (CSF) and one of very few proteins which are not found in serum [8].

High-resolution computed tomography (HRCT) is the preferred method for localizing the site of skull base defect following cranial, maxilla and facial trauma, but can be coupled with magnetic resonance imaging (MRI) or cisternography [4]. Transethmoidal encephalocoele most commonly present with recumbent episodes of meningitis intermittent CSF rhinorrhoea. This patient had recurrent episodes of meningitis (bacterial) with transethmoidal meningocele, which was traumatic. Patient was managed conservatively. Data suggests that early surgical repair (<7 days) can reduce risk of meningitis. Endoscopic endonasal approach is preferred method of repair. However majority of traumatic CSF leaks resolve with conservative management fails.

#### Conclusion:

CSF rhinorrhoea can complicate recurrent infections and should be considered in every case of recurrent meningitis and appropriately investigated and managed in all old traumatic brain injury cases.

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