International Journal of Research in Medical Sciences
Karthikeyan R et al. Int J Res Med Sci. 2023 Jun;11(6):2266-2268
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20231651

Case Report

A rare case of recurrent cerebrospinal fluid rhinorrhea

Ramalakshmi Karthikeyan*, Rahim A. Rashid

Primary Health Care Corporation, Doha, Qatar

Received: 21 February 2023
Revised: 17 March 2023
Accepted: 18 April 2023

***Correspondence:**
Dr. Ramalakshmi Karthikeyan,
E-mail: rkarthikeyan@phcc.gov.qa

ABSTRACT

Cerebrospinal fluid (CSF) rhinorrhea is the leakage of cerebrospinal fluid through the nostrils due to an abnormal communication between the nasal cavity and sub–arachnoid space. CSF rhinorrhoea can be traumatic or spontaneous. CSF rhinorrhea carries a risk of ascending infection leading to meningitis. CSF rhinorrhea is not very common and could be easily mistaken for rhinitis. Physicians need to have a high index of suspicion to diagnose and treat this rare and potentially serious condition. Here we discuss a case of delayed post-traumatic CSF rhinorrhea -an unusual presentation in a primary care setting, focusing on presentation and diagnosis.

Keywords: Cerebrospinal fluid rhinorrhea, Beta-2 transferrin, Primary care

INTRODUCTION

Cerebrospinal fluid (CSF) rhinorrhea is defined as the leakage of CSF through the nostrils due to an abnormal communication between the nasal cavity and sub–arachnoid space. It occurs due to a breach in four different layers: mucosa of the nose and paranasal sinuses, skull base, duramater and the subarachnoid membrane.[1]

CSF rhinorrhea can happen after trauma to the head and face or after a neuro-surgical or otolaryngological procedure (iatrogenic). Spontaneous CSF rhinorrhea, though rare has been reported.[2]

Persistent CSF rhinorrhea carries a risk of ascending infection leading to meningitis. Due to this risk of a potentially fatal infection, surgical repair is mandated in most cases.[3]

Here we discuss about an unusual presentation of a case of CSF rhinorrhea in a primary care setting, focusing on presentation and diagnosis.

CASE REPORT

A 45-year-old woman presented with a ten-day history of a clear nasal discharge from the left nostril. She reported that it was spontaneous in onset with no history of trauma or surgical intervention. She stated that the discharge had a salty taste and was copious enough to make her clothes and pillow wet, if she was lying in right lateral position. She also had a mild headache, which was worse when lying in the supine position. She had complained of occasional dizziness and blurring of vision. There was no history of fever, vomiting, photophobia or neck stiffness.

She is known to have obesity, type II diabetes mellitus, acquired hypothyroidism (post thyroidectomy for goitre with hyperthyroidism) and asthma. She had a dry cough and breathlessness in the week preceding her presentation and had been seen twice in the primary care health centre during that period. She was diagnosed as having an upper respiratory tract infection and prescribed antibiotics, nebulised bronchodilator and antihistamines.

A detailed history revealed that the nasal discharge first began eight months earlier, approximately five days after a minor head injury when she hit her head against a car doorframe whilst travelling abroad. On return to her home country a week later, an X ray skull was done which was reported to be normal. A magnetic resonance imaging (MRI) scan of the head was suggested, but as the watery nasal discharge had spontaneously ceased by then, the MRI was not done. She had remained asymptomatic for more than seven months until the recent presentation.

Physical examination revealed a transparent, watery discharge trickling from her left nostril on slightly bending the head forward. Previous thyroidectomy scar was evident in the neck. Her neurological examination and other systemic examination were unremarkable.

She was referred to the regional tertiary centre the same day for suspected CSF rhinorrhea. There, she was reviewed by the neurology, neuro-surgery and ophthalmology teams. A standard computed tomography (CT) head and sinuses done on the same day was reported as normal. The nasal discharge was sent for biochemical analysis including testing for beta-2 transferrin. She was commenced on cephalosporins as prophylaxis for meningitis. The biochemical analysis of the fluid was positive for beta-transferrin, confirming that the fluid was CSF.

A subsequent MRI of the head and sinuses showed a small defect in the left anterior ethmoidal roof and an associated CSF fistula with small encephalocele measuring 5 mm into the left anterior ethmoidal sinus (Figure 1). A pre-procedure lumbar puncture done for lumbar drain insertion revealed normal opening pressure of the CSF.

The patient underwent an elective, endoscopic trans-nasal repair of the skull base defect and the associated CSF fistula by a joint neurosurgical and ENT team. Fascia lata and fat graft from thigh was used to repair the defect. The lumbar drain was removed post-operatively and the patient had an uneventful recovery.

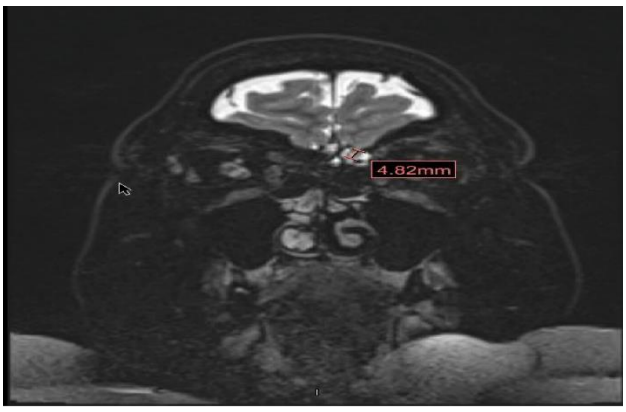

Figure 1: Coronal view of MRI brain showing a small left side anterior ethmoid cell roof defect and small brain tissue herniation measuring about 5 mm.

DISCUSSION

Most CSF rhinorrhoea cases have traumatic or iatrogenic aetiology. Head trauma, blunt and penetrating facial injuries are responsible for 90% of all cases of traumatic CSF leaks. In traumatic cases, the leak is usually at the cribriform plate and fovea ethmoidalis. The rhinorrhea could be immediate (within 48 hours) or delayed.[2]

Iatrogenic causes include neurosurgical and otolaryngologic surgeries including functional endoscopic sinus surgery. The anterior skull base is the most frequent site for iatrogenic defects.[2] In endoscopic sinus surgery, the cribriform plate and posterior ethmoid roof can sometimes be accidentally breached.[2] Recently, few cases of CSF rhinorrhea, have been reported following nasal swab test for corona virus disease-19 (COVID-19).[4,5]

Majority of acute post-traumatic cerebrospinal fluid leaks resolve spontaneously within seven days.[6] In fact, many leaks may go unrecognized or resolve so quickly, in the setting of the assessment and treatment of other more life-threatening injuries, that they go undocumented in the patient's permanent record.[7]

95% of all delayed CSF leaks in non–surgical trauma occur within three months and are thought to occur as a result of a delayed elevation of intracranial pressure (ICP), lysis of blood clots in and around the site of injury, resolution of oedema, loss of vascularity with resultant necrosis of soft tissue and bone.[1]

Spontaneous CSF rhinorrhea accounts for only 4% of cases.[8] The exact cause of spontaneous CSF rhinorrhea is not yet fully understood; It is thought to be related to congenital skull base defects, dural malformations and conditions causing increased ICP.[9]

Detection of beta-2 transferrin in the watery nasal discharge is diagnostic of CSF.[10]

Several imaging modalities are available to identify anatomical sites for CSF rhinorrhea. High-resolution computed tomography (HRCT) provides better details than a standard CT and is a reasonable choice as an initial test. Cisternograms (CT MRI) are the gold standard tests to confirm the site of a CSF leak.[11]

Persistent CSF rhinorrhoea can lead to meningitis and is potentially fatal in 50% of cases.[8] To prevent meningitis due to ascending infection, surgical repair is recommended. The preferred approach is through endonasal endoscopy, due to its benefits of minimal morbidity, shorter hospital stay, and olfactory preservation.[1]

Ours was an unusual case of recurrent CSF rhinorrhea. The initial CSF leak was a delayed post-traumatic CSF rhinorrhea. It had started five days after a minor head trauma and had spontaneously resolved a month later. But

it recurred after many months without any inciting events. We consider this recurrent event as spontaneous CSF rhinorrhea.

CONCLUSION

Delayed post-traumatic or spontaneous CSF rhinorrhea could often be mistaken for rhinitis. In our case, the patients' symptoms were thought to be due an upper respiratory tract infection when she presented initially. The physician needs to have a high index of suspicion to diagnose and treat this rare and potentially serious problem, which could otherwise be easily missed.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Sumitha R, Hari PM, Kumar SR, Hariprasad R. A case of cerebrospinal fluid rhinorrhoea: a surgical challenge. J Clin Diagn Res. 2013;7(7):1447-9.
2. Shah N, Deopujari CE, Chhapola Shukla S. Spontaneous Recurrent CSF Rhinorrhoea: A Rare Case and Review of Literature. Indian J Otolaryngol Head. Neck Surg. 2017;69(3):420-4.
3. Ramsden JD, Corbridge R, Bates G. Bilateral cerebrospinal fluid rhinorrhoea. J Laryngol Otol. 2000;114(2):137-8.
4. Rajah J, Lee J. CSF rhinorrhoea post COVID-19 swab: A case report and review of literature. J Clin Neurosci. 2021;86:6-9.
5. Sullivan CB, Schwalje AT, Jensen M. Cerebrospinal Fluid Leak After Nasal Swab Testing for Coronavirus Disease 2019. JAMA Otolaryngol Head Neck Surg. 2020;146(12):1179-81.
6. Mincy JE. Posttraumatic cerebrospinal fluid fistula of the frontal fossa. J Trauma. 1966;6(5):618-22.
7. Friedman JA, Ebersold MJ, Quast LM. Persistent posttraumatic cerebrospinal fluid leakage. Neurosurgical Focus FOC. 2000;9(1):1-5.
8. Kuo W-M, Lin C-R, Shen K-H. Spontaneous CSF rhinorrhea. J Med Sci. 2003;23(6):355-7.
9. Chen GY, Ma L, Xu ML, Zhang JN, He ZD, He CY, Zet al. Spontaneous cerebrospinal fluid rhinorrhea: A case report and analysis. Medicine (Baltimore). 2018;97(5):e9758.
10. Warnecke A, Averbeck T, Wurster U, Harmening M, Lenarz T, Stover T. Diagnostic relevance of beta2-transferrin for the detection of cerebrospinal fluid fistulas. Arch Otolaryngol Head Neck Surg. 2004;130(10):1178-84.
11. Mostafa BE, Khafagi A. Combined HRCT and MRI in the detection of CSF rhinorrhea. Skull Base. 2004;14(3):157-62.
12. Rajwani KM, O'Connell M, Bucur S. Spontaneous cerebrospinal fluid rhinorrhoea: a rare clinical entity. BMJ Case Rep. 2014;bcr2013202808.

Cite this article as: Karthikeyan R, Rashid RA. A rare case of recurrent cerebrospinal fluid rhinorrhea. Int J Res Med Sci 2023;11:2266-8.