

A Case of CSF Rhinorrhoea Following Nasal Swab Testing For Covid-19

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Abstract

As per the Indian council of medical research (ICMR) guidelines for diagnosing Corona virus disease 2019 (COVID – 19), the testing strategy involves taking nasopharyngeal swab from suspected patients. The swab collection is a relatively simple test with mild discomfort to the patient. We report a case of CSF rhinorrhoea following nasopharyngeal swab collection in a patient with an asymptomatic meningoencephalocele.

Keywords

CSF Rhinorrhoea, COVID 19 Nasal swab testing, Meningoencephalocele

Date of Submission: 01-01-2021

Date of Acceptance: 13-01-2021

I. Introduction

CSF Rhinorrhoea is defined as the leakage of cerebrospinal fluid into the nasal cavity due to a failed containment of cerebrospinal fluid in the subarachnoid space. CSF leaks occur when the bony cranial vault and its underlying dura are breached, creating a trans-dural communication between the subarachnoid space and the nasal cavity. These fistulae must be treated early to avoid imminent life-threatening complications like ascending meningitis and pneumocephalus. The annual risk of developing meningitis in patients with an active leak has been quoted as 10 % (Eljamel et al) [1]. In a recent study, Daudia et al found out that the overall risk of meningitis in patients with persistent CSF rhinorrhoea is 19% [2]. Ommaya et al classified CSF rhinorrhoea based on the aetiology as congenital, spontaneous, post-traumatic and tumour associated [3]. The spontaneous type of leaks are thought to represent a variant of benign intra cranial hypertension. The increased intra cranial pressure with associated pulsatile forces produces thinning of bone, being evident in the weakest areas of the skull base. The more common sites are lateral recess of a well pneumatized sphenoid, the area of lateral lamella of the cribriform and the ethmoid roof.

As the Corona virus disease 2019 (COVID – 19) continues to remain as a global pandemic, the testing strategy gives importance to the need to detect every single case. Nasopharyngeal swab and RT-PCR test remains the cornerstone of COVID-19 testing strategy. The COVID-19 RT-PCR test is a real-time reverse transcription polymerase chain reaction (rRT-PCR) test for the qualitative detection of nucleic acid from SARS-CoV-2. The other available tests like TrueNat, CBNAAT and Rapid antigen Test also use nasopharyngeal or oropharyngeal swab.

II. Case Report

A 45-year-old gentleman presented to our ENT OP with unilateral watery nasal discharge of 20 days duration. The patient had undergone nasopharyngeal testing for COVID – 19, as part of a routine surveillance, following which he developed right sided watery nasal discharge. There was no prior history of watery nasal discharge or nasal block. Active leak was noted from the right nostril during the clinical examination more while bending forward. The fluid was tested for glucose and chloride levels (Glucose 62 mg/dl, Chloride 121mmol/L).

Radiological evaluation, as per our hospital protocol for CSF rhinorrhoea, thin section high resolution computed tomography (HRCT) of skull base and magnetic resonance imaging(MRI) brain were done which

showed multiple bone defects in the skull base (Fig 1). A 4.4mm defect was noted in the lateral wall of right sphenoid sinus with brain herniation into the sinus and nasal cavity. Another small defect of size 2.9 mm was seen involving the right cribriform plate. After the initial work up, he was admitted for endoscopic CSF rhinorrhoea leak repair under general anaesthesia. During the procedure lumbar puncture was done and low dose intrathecal fluorescein dye(1%) was injected to aid the identification of CSF leak. A meningoencephalocele approximately 1cm x 1.5 cm in size with active CSF leakage was noted medial to the right middle turbinate coming through the sphenoid ostium (Fig 2). It was cauterised and excised. Right sphenoid ostium was then widened and the defect over lateral wall of right sphenoid sinus identified (Fig 3). Another leak was noted in the right cribriform area with meningeal herniation. Layered closure of the defects were done with fat graft reinforced with fibrin glue and gel foam. Middle turbinate was then cut and rotated superiorly to support the graft. The leaking of CSF stopped and this was confirmed with intra-operative Valsalva manoeuvre. Patient was monitored post operatively in the ICU for 24 hours. Lumbar drain was retained with controlled drainage of cerebrospinal fluid for 3 days. Antibiotics were administered based on anti-meningitis protocol. He was discharged after 5 days. When reviewed after one month, he was asymptomatic and underwent nasal endoscopy for confirmation of successful repair.



Fig. 1 CT image showing defect (white arrow)

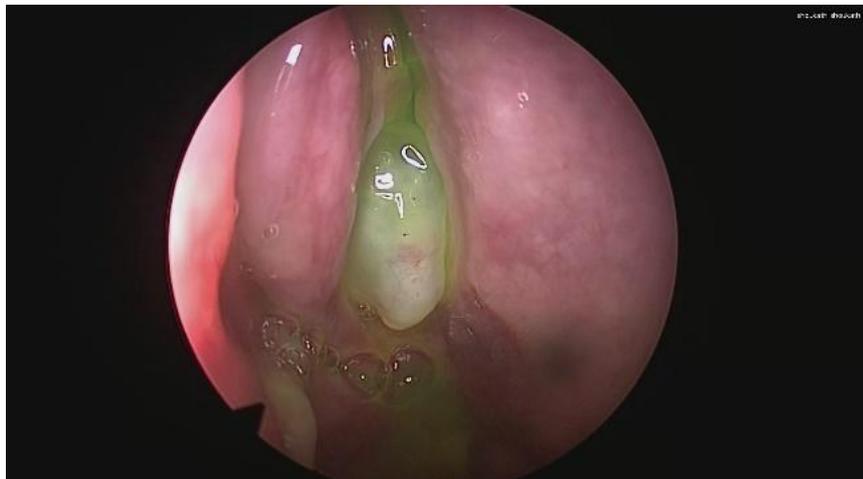


Fig. 2 CSF leak with meningoencephalocele

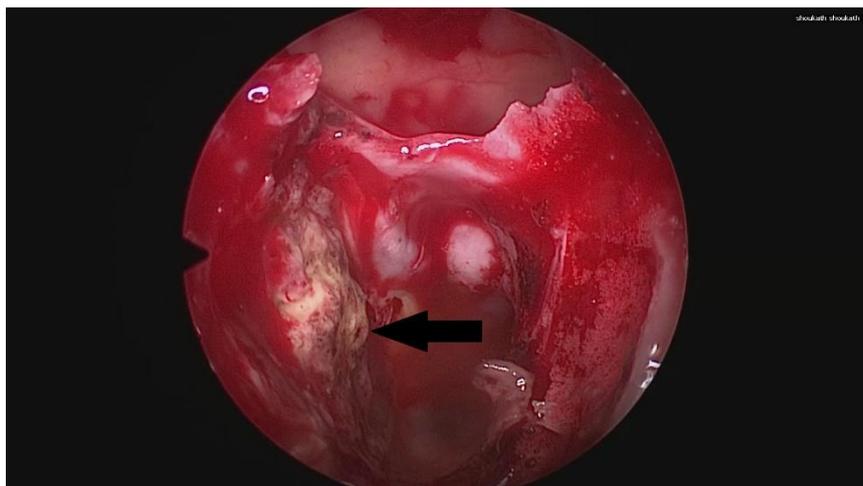


Fig. 3 Site of leak – lateral wall of right sphenoid sinus (black arrow)

III. Discussion

We are reporting this case due to the unique etiological basis for developing CSF rhinorrhoea. To the best of our knowledge, CSF rhinorrhoea following COVID 19 nasal swab testing is a rare entity with only one reported case from the USA [4]. Our patient had an undiagnosed defect in the sphenoid and cribriform plate with a meningoencephalocele. He developed CSF leak following the trauma sustained during the nasal swab test.

The Corona virus disease 2019 (COVID – 19) testing strategy involves taking nasopharyngeal and/or throat swab for detecting viral RNA or protein. Swabbing the nasopharynx is an invasive and blind procedure which causes temporary discomfort for many patients and complications like bleeding for a few patients. So, for a proper and safe testing for COVID-19 we are placing a few suggestions.

- 1) All the health care workers posted for swab collection must undergo training for nasal swab collection.
- 2) From each patient, history suggestive of any prior nasal surgery, chronic nasal block or nasal discharge, should be elicited.

IV. Conclusion:

Care should be taken while taking nasal swab for Covid 19 testing and every patient should be asked for history suggestive of any nasal pathology. A suitable alternative method for swab collection like oropharyngeal swab should be adopted in these patients.

Funding:

No funding received

Ethical consideration:

Nil

Conflicts of interests:

Nil

References

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Ravi A, et. al. "A Case of CSF Rhinorrhoea Following Nasal Swab Testing For Covid-19." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(01), 2021, pp. 57-59.