

Cerebrospinal Fluid Rhinorrhea Post COVID-19 Nasopharyngeal Swab: a Case Report

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Case report

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Abstract

Background: Cerebrospinal fluid rhinorrhea is a potentially life threatening condition and it is a rare emergency presentation. Most cases has been related to head trauma. However, CSF leak post COVID swab has been rarely reported.

Case presentation: We report a 10 year old Emirati male, who presented to emergency department complaining of unilateral clear watery nasal discharge for 14 days, the discharge started after COVID-19 nasopharyngeal swab. The patient is a known case of 3MC syndrome and he underwent surgical repair for cleft lip and cleft palate. From the history and physical examination CSF rhinorrhea was highly suspected and nasal endoscopy confirmed the diagnosis of cribriform defect on the left side. The patient underwent surgical repair and his symptoms resolved after the surgery.

Conclusion: We can conclude that COVID-19 nasopharyngeal swab has potential life threatening complications and one should consider the contraindications and the alternative methods available to detect COVID-19 to minimize the potential risks.

Background

CSF rhinorrhea has been rare yet a potentially life threatening condition. The most common cause of CSF rhinorrhea is head trauma, which attribute to 90% of the cases. Other causes include congenital defect, brain tumor eroding into the anterior cranial fossa and iatrogenic causes related mainly to surgical procedures involving the skull base. The most feared complication of CSF rhinorrhea is meningitis with an incidence of occurrence reaching up to 40% depending on the etiology (1).

A single case report has been reported about CSF rhinorrhea post COVID-19 swab in USA, where a women in her 40s developed CSF rhinorrhea post COVID-19 nasopharyngeal swab and was complicated by meningitis, she is a known case of idiopathic intracranial hypertension. CT and MRI brain showed a previously undiagnosed 1.8-cm encephalocele extending through the right ethmoid fovea into the middle meatus and a right sphenoid wing pseudomeningocele. She underwent endonasal repair and her symptoms resolved (2).

Case Presentation

A 10-year-old Emirati male presented to the emergency department (ED) on 12th of November 2020 complaining of unilateral clear, watery nasal discharge from the left nostril for 14 days. His symptoms started immediately after he presented to the ED 14 days ago complaining of low grade fever (38 deg C), dry cough, nasal congestion and body aches, was found to have congested throat, otherwise unremarkable physical examination. COVID PCR nasopharyngeal swab was done in this ED visit and the patient was discharged home on symptomatic treatment.

As per the patient, the clear nasal discharge was started immediately after COVID swab was done in the same nostril, whenever he bends his neck forward the discharge increases. He started to feel dizzy recently but denies headache, fever, nausea, vomiting, neck stiffness, blurred vision or rash.

The patient is a known case of 3MC syndrome (autosomal recessive disorder characterized by distinctive facial features like hypertelorism, blepharophimosis, blepharoptosis, highly arched eyebrows and cleft lip and palate. Other findings include growth deficiency, cognitive impairment, and hearing loss) (3).

He underwent surgical repair for cleft lip when he was 3 months old and cleft palate when he was 6 months old (stage 1). The second stage of surgery was done on October 2019 where he underwent alveolar bone grafting.

On physical examination, the patient was lying on bed comfortably, vitals were as follows: heart rate of 76 beats/minute, respiratory rate of 23 breaths/minute, blood pressure of 90/55 mmhg, oxygen saturation 99% on room air and a temperature of 36.4 degree C.

Facial dysmorphic features were noted, he had a broad forehead, low set ears and hypertelorism. The patient was alert and oriented to self, time and place. His GCS was 15. No focal neurological deficit, negative Kernig and Brudzinski signs. Focused exam showed active clear watery discharge from the left nostril as shown in the picture (Picture 1). The rest of the physical exam was unremarkable.

Cerebrospinal fluid leak was highly suspected from the history and physical examination. Labs done were unremarkable, including normal WBC count and inflammatory markers. CT brain without contrast was done and reported as following "No intracranial abnormality identified. Poor definition of the cribriform plate and with significant rightward deviation of the nasal septum warrants further assessment with high-resolution MRI scan" (Picture 2 and 3). However, MRI was not done for unknown reason.

The patient was started on prophylactic antibiotics and he got admitted under pediatrics neurosurgery. He underwent surgical repair on the second day of admission by ENT and neurosurgery teams. Nasal endoscopy was done and showed medial lamella cribriform defect about 1 mm with meningocele in the left side. An Endoscopic Endonasal repair of CSF leak was done.

After the surgical repair, the patient reported complete resolution of his symptoms. The patient was kept for observation for five days post surgery, no complication were observed during this period. One week post discharge, he was followed up in the clinic and no complications were reported.

Discussion And Conclusion

From this case report, we can understand the possible complications related to COVID-19 nasopharyngeal swab and importance of considering the patient's history before proceeding to COVID-19 swab. It is critically significant to consider high quality training for all individuals involved in taking COVID-19 swab and to emphasize the correct way of taking it (4). As we can see the number of cases has been increasing and so the number of COVID-19 swabs, in United Arab Emirates alone, more than

20 million swabs were done so far (5), and this may increase the risk of complications if the patient history is not considered and or the technique in taking the swab was wrong.

According to The royal children's hospital practice guidelines, they recommend against COVID-19 nasopharyngeal swab in the following groups: Childers at risk of obstruction (croup), bleeding disorders (platelet count $< 30 \times 10^9/L$), recent facial trauma, fracture or surgery (6).

It is important to consider other ways of testing for COVID-19 such as saliva sample. A recent meta-analysis regarding the sensitivity of saliva sample in detecting COVID-19 showed a sensitivity of 91% compared to nasopharyngeal swab that has a sensitivity of 98%. This study showed a promising alternative to the nasopharyngeal swab especially when COVID-19 detection is needed and the patient has contraindications limiting the use of nasopharyngeal swab (7).

In conclusion, we do understand that COVID-19 is a new viral illness and there has been many diagnostic procedures to help in the detection of the virus, however, it is of importance to consider the contraindications and the alternative methods available to detect COVID-19 as this might prevent unwanted potentially life threatening complication.

Abbreviations

CSF: cerebrospinal fluid; ED: Emergency department; USA: United States of America; CT: computer tomography; WBC: white blood cell; MRI: magnetic resonance imaging

Declarations

Consent

Written consent for publishing this case report including the images was taken from the patient.

Authors' contributions

SA carried out the literature review and wrote the manuscript draft. SB reviewed and edited the manuscript. All authors approved the final manuscript.

Ethics approval and consent to participate

Written consent from the patient was obtained.

Consent for publication

Written consent was taken from the patient to publish this case report and related images.

Competing interests

The authors declare that they have no competing interests.

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Figures



Figure 1

Focused exam showed active clear watery discharge from the left nostril



Figure 2

MRI scan

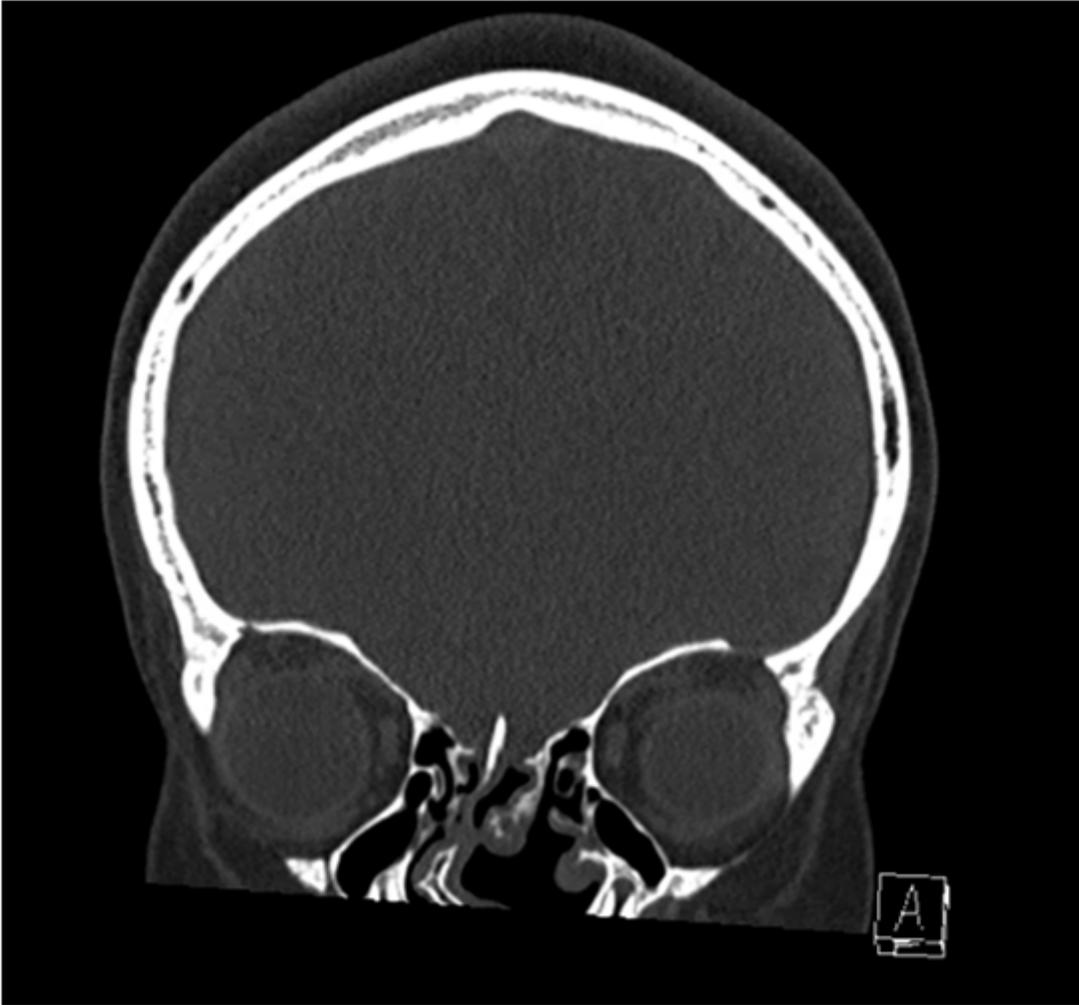


Figure 3

MRI scan