

Massive Rhinorrhea as a Complication of COVID-19 Nasopharyngeal Swab

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Abstract

The nasopharyngeal swab for COVID-19 testing is generally considered safe; however, it is primarily performed by staff that may not completely understand the anatomy of the nasal cavity and nasopharynx. We report the treatment of a 48-year-old man who developed unilateral left rhinorrhea after a nasopharyngeal swab sample. It is aimed to draw attention to this complication that can be prevented with the appropriate technique during nasopharyngeal swab sampling.

Keywords

COVID-19 Testing, Nasopharyngeal Swab, Rhinorrhea

1. Introduction

Nasopharyngeal swab testing, which has greatly increased in utilization due to the COVID-19 pandemic, is generally safe and well-tolerated, although it may be rarely associated with adverse events. The most common complications were swab fractures resulting in the retained foreign body (47%), followed by epistaxis (17%), and headache (11%). The most serious adverse event was meningitis following the cerebrospinal fluid leak [1]. This can cause neurological sequelae and vital complications. For that reason, they should be repaired urgently as soon as they are diagnosed [2].

In this case presentation, the rhinorrhea of the cerebrospinal fluid (CSF) during the nasopharyngeal swab sampling and its fixation has been explained.

2. Case Presentation

2.1. Patient Information

A 48-year-old man presented with 3 months history of progressively worsening

headaches and rhinorrhea. His past medical history was a medication for arterial Hypertension. He reported a massive cerebrospinal fluid (CSF) leak from the left nostrum when he bent forward or in case of increased abdominal pressure. The first experience of the CSF leak was a day after a nasopharyngeal swab for COVID-19 testing. He denied any trauma or other inciting event.

2.2. Clinical Findings

Physical examination found a conscious patient in good general status, complaining of a persistent headache without fever neither vomiting nor seizure. There was a left nasal leak of a clear water-like fluid exaggerated on the Valsalva maneuver. The beta-2 transferrin test applied in order to understand the origin of the rhinorrhea came up positive for the CSF.

2.3. Diagnostic Assessment

The paranasal Computed Tomography Imaging showed a linear bone defect antero-posterior and lateral wall of the left sphenoid sinus with opacifications (**Figure 1(a)**). The magnetic resonance imaging (MRI) confirmed the CSF leak defect with encephalocele herniated inside the sinus via bone defection on the inferolateral wall of the sphenoid sinus. (**Figure 1(b)**).

2.4. Therapeutic Intervention

The patient underwent surgery the next day for the repair of the left skull base defect by an endoscopic transnasal/transsphenoidal approach with a nasoseptal flap (**Figure 1(c)**). After opening the ethmoid cells, the sphenoid sinus ostium was located anteroposteriorly. No additional pathology causing rhinorrhea in the cribriform plate, and fovea etmoidalis were detected. Grafts prepared from the fascia lata and fat tissue were laid between the defect dura and a tiny bone fragment.

2.5. Follow-Up and Outcome

Post-operatively after being monitored for three days in the ward, the patient was given bed rest, antibiotics (Kefzol), and an anti-diuretic (acetazolamide). No CSF rhinorrhea was detected at the endoscopic examination on the 14th day after surgery. At three months follow-up, the patient was doing good without complaint.

3. Discussion

From the previously published paper on this subject, it was theorized that the swab itself did not result in a violation of the bony skull base. Still, it rather caused trauma to the patient's pre-existing encephalocele. However, in the case we reported here, there was no radiographic or visual evidence of an existing encephalocele before the nasal swab. Since the beginning of the COVID-19 pandemic, the use of the nasopharyngeal swab has increased significantly [3] [4].

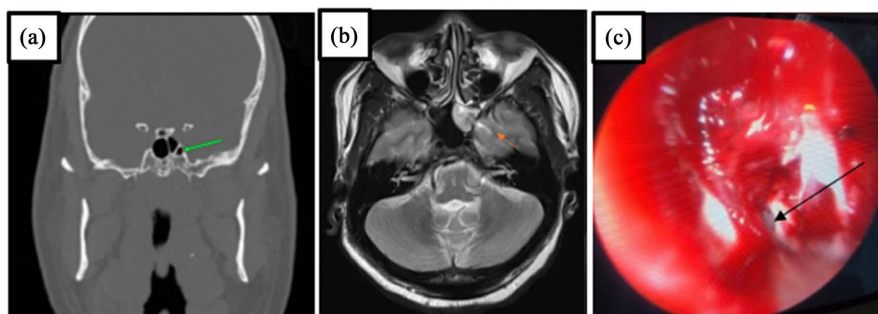


Figure 1. (a) Bone window Coronal head CT-Scan showing on the left sphenoid sinus lateral, dehiscence area related to mid-cranial fossa (Green arrow); (b) Axial MRI showing encephalocele herniating through sphenoid defect into sphenoid sinus with surrounding T2 hyperintensity (CSF) (Red arrow); (c) Defect after left sphenoid sinus lateral wall encephalocele excision (Black arrow).

The nasopharyngeal swab has been utilized in the past, typically by experienced caregivers for hospitalized patients, to diagnose viral upper respiratory infections. Still, with the current public health strategy based on early detection and isolation, the test has been deployed on a massive scale [5] [6]. A recent large cohort study demonstrated the nasopharyngeal swab to be generally safe, with rare associated adverse events [1]. The possibility of adverse events, however, cannot be ruled out. These include fracture of the swab into the nose, epistaxis, and CSF leak. The concern for CSF leaks is significant, as 10% - 25% of patients with traumatic CSF leaks will develop meningitis [1] [7] [8].

The average distance from the nasal opening to the sphenoid ostium was estimated to be 6.2 cm and was reached at an angle of 34.3, the average height from the palate to the anterior skull base is 4.5 cm [9] [10]. Knowing that most commercially available swabs exceed these dimensions, improperly directed swabs can cause mucosal damage and potential damage to the skull base. Encephaloceles within the sphenoid sinus are subdivided by their location into a medial, peri-sellar type and a lateral, sphenoid recess type. The lateral sphenoidal type is exceedingly rare, but rather unfortunately presented by our patient.

4. Conclusion

The Public Health recommendation from the Laboratory Network of inserting the swab 2 - 3 cm or “until resistance is met” as well as the head tilt when collecting nasopharyngeal swab may lead to increased complications. For the main time, repair of the skull base defect by an endoscopic transnasal/transsphenoidal approach with a nasoseptal flap can achieve a good resolution of the CSF leak.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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