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MINI COMMENTARY

Rhinorrhea following SARS-CoV-2 nasopharyngeal swab: A case for β2-transferrin testing

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Taking specimens from the surface of the respiratory mucosa is an established procedure used to evaluate patients with suspected upper respiratory infection. Nasopharyngeal (NP) swabs are regarded as the highest yield sample to detect respiratory viruses [1]. This method gained further attention during COVID-19 (coronavirus infectious disease 2019), one of the deadliest pandemics in history. The procedure involves the insertion of a long flexible swab through the nostril along the floor of the nasal cavity toward the nasopharynx. NP swabs need to be performed by trained professionals; fortunately, adverse events are rare. The few complications include nosebleed, headache, and earache. In the extremely rare condition of breakage of the swab tip, nasal endoscopy is required to examine for further injury and to retrieve the lost fragments [2]. Nonetheless, in some cases the swap tip is pushed forward toward the middle nasal meatus or even higher, thus reaching the area of the rhinobase, a delicate structure separated from the brain by a thin bony border.

In this issue, Alberola-Amores et al. report an anecdotal case of a 41-year-old woman in whom it is assumed that the NP swab procedure caused cerebrospinal fluid (CSF) leakage [3]. Admittedly, the spontaneous closure of the leak following antibiotic treatment remains an unusual observation. However, considering the anatomy of the nasal cavity and the fragility of the cribriform plate, it is conceivable that the NP swab examination caused mucosal injury as well as damage to the skull base. The main conditions leading to iatrogenic CSF leaks include intransal procedures or surgical trauma to the cribriform plate. In the meantime, further cases of CSF after an NP swab have been reported, providing evidence for the occurrence of this rare but potentially life-threatening complication [4,5]. Hence, the NP swab can be added to the list of iatrogenic causes. The procedure was not painful in most of the cases of NP swab-related CSF leakage, but rhinorrhea with metallic taste developed in close temporal relationship with the procedure. Importantly, among the reported cases is a patient who had a pre-existing encephalocele over the fovea ethmoidalis, and direct damage to the dura by the swab procedure is presumed [6]. Thus, in individuals with known anatomical variants or history of previous procedures/trauma to the nasal cavity/skull base, other options for the collection of a specimen including the oropharyngeal route should be considered.

Bacterial meningitis caused by CSF leakage is a life-threatening condition. The outcome critically depends on early diagnosis, initiation of appropriate antibiotic treatment, and surgical closure of the fistula. It needs to be noted that unilateral continuous rhinorrhea with metallic taste was observed 1 week after the procedure, and medical help was sought shortly thereafter, whereas it took 4 months until a CSF leak was suspected, after clinical signs of bacterial meningitis had occurred. CSF leakage was corroborated by detection of β2-transferrin in the nasal fluid and by visualization of the CSF fistula on imaging of the skull base.

Testing for SARS-CoV-2 is one of the key measures to bring the pandemic to an end. Further cases of iatrogenic fistula after NP swab can be expected based on the vast number of NP swab examinations. The reported case emphasizes not only the importance of detailed knowledge of the anatomic structures of the nose and rhinobase, but also educational measures and quality control to maintain safe administration of nasal swabs. The report also raises awareness of potential clinical signs and the importance of swift diagnostic workup. Rhinorrhea and metallic taste following NP swab require specific attention and need to be evaluated by β2-transferrin testing of nasal fluid.

CONFLICT OF INTEREST

None.

AUTHOR CONTRIBUTIONS

Julian Perneczky: formal analysis (lead), writing–original draft (lead).
Csilla Neuchrist: formal analysis (supporting), methodology (lead),

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writing–review & editing (equal). **Johann Sellner:** conceptualization (lead), formal analysis (equal), supervision (lead), writing–review & editing (lead).

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