Naturally Nasal-esophageal Fiberscope in COVID-19 Pandemic - Prevent Sneezing Without Anesthesia

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Case report

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Abstract

Background: We are laryngologists, to observe natural phonatory and swallowing functions, in every clinical examination with trans-nasal laryngeal fiberscope (TNLF), before the observation, we use epinephrine to enlarge and smoothen inside common nasal meatus (bottom of nostril), then insert wet swab inside the nose, like a swab culture in nasopharynx. In particular current COVID-19 pandemic situation, this careful technique prevents any complications even nasal bleeding, painfulness, and inducing sneezing. Here we introduce our routine to observe esophageal movement in swallowing in natural setting (sitting position) without anesthesia.

Case presentation: A case was 70-year-old female who complained something stuck esophagus or strange sensation below the larynx and pharynx. After enlarge and smoothen inside common nasal meatus we insert the TNLF (slim type ∅29mm fiberscope, VNL8-J10, PENTAX Medical, Tokyo, Japan.) in a same way. Then observe the phonatory and swallowing movement of vocal folds. To get natural movements we had never used any anesthesia. There was no pathological condition in the pyriform sinus, we asked a patient to swallow the fiberscope. At that timing we push the TNLF and insert the tip a bit deeper simultaneously with swallowing, which make the fiberscope easily enter the esophagus like the insertion of nasogastric tube. Then asked the patient to swallow sip of water or saliva, the lumen of esophagus cleared and enlarged. This makes to observe esophagus easily without any air supply. The esophagus is completely normal except glycogenic acanthosis with tone enhancement scan.

Conclusions: The advance point of this examination is easily able to perform in sitting position without anesthesia, also takes only a minute and minimum invasive to observe the physiologically natural swallowing. It is also possible without anesthesia until esophagogastric junction using with a thin type flexible bronchoscopy. In the future, diameter of gastric fiberscope even with narrow band imaging (NBI) function might be gradually getting thinner. Before that time every physician should know this technique. Just insert along the bottom of nose.

Background

We are laryngologists, to observe natural phonatory and swallowing functions, in every clinical examination with trans-nasal laryngeal fiberscope (TNLF), we use epinephrine to enlarge and smoothen inside common nasal meatus (bottom of nostril), then insert wet swab inside the nose, like a swab culture in nasopharynx. (Video-1) In cases of hypertension, we use physiological saline solution to get moisten inside the nose to insert the fiberscope smoothly because to prevent any affect for phonation and articulation.

In COVID-19 pandemic situations, the standardization of nasopharyngeal culture is necessary to get accurate Polymerase Chain Reaction (PCR) study[1], such technique was revised and introduced[2]. To get satisfactory nasopharyngeal culture, we insert the swab along the nasal septum and bottom of nasal meatus below the inferior turbinate, with careful not to touch the inferior turbinate; it is important to never

touch the inferior turbinate. We had never anesthetized patients' nose in nasopharyngeal culture. In this time of COVID-19, this careful technique prevents any complications even nasal bleeding, painfulness, and inducing sneezing.[1]. Here we introduce our routine safety technique to observe esophageal movement in swallowing without anesthesia with natural sitting position.

Case Report (Video-2)

A case was 70-year-old female who complained something stuck esophagus or strange sensation below the larynx and pharynx. After enlarge and smoothen inside common nasal meatus (same as Video-1), we inserted the trans nasal laryngeal fiberscope (TNLF) (slim type ∅29mm fiberscope, VNL8-J10, PENTAX Medical, Tokyo, Japan.) in a same way. (Video-2, 0:00–0:03) Then we observed the phonatory and swallowing movement of vocal folds. (0:06 – 0:16) To get natural movement, we did not use anesthesia. There was no pathological condition in the pyriform sinus, we asked the patient to swallow the fiberscope (0:18). At that timing, we push the TNLF and inserted the tip a bit deeper simultaneously with swallowing, which make the fiberscope easily enter the esophagus like the insertion of nasogastric tube. Then we asked the patient to swallow sip of water or saliva, the lumen of esophagus cleared and enlarged. (0:25-) This makes to observe esophagus easily without any air supply. The esophagus was completely normal except glycogenic acanthosis with tone enhancement scan[3] (TE scan). (0:37 – 0:41)

Discussion And Conclusions

Based on a physiological study under topical anesthesia with lidocaine,[4] sensory inputs from the mucosal receptors are important to trigger voluntary swallowing and their absence or dysfunction may contribute to oropharyngeal dysphagia and laryngeal aspiration. Based on 186 healthy volunteer study showed the effect of different body postures on the self-perceived difficulty while swallowing in another report. In comparison of all tested postures, self-perceived difficulty for swallowing was found to be least while subjects were sitting upright.[5]

The advance point of this examination is able to perform easily in natural sitting position without anesthesia, also takes only a minute and minimum invasive to observe the physiologically natural swallowing. It is also possible without anesthesia until esophagogastric junction using with a thin type flexible bronchoscopy. In the future, diameter of gastric fiberscope even with narrow band imaging (NBI) function[6] or TE scan[3] might be gradually getting thinner. Before that time every physician should know this technique. "Just insert along the bottom of nose."

Abbreviations

TNLF: trans-nasal laryngeal fiberscope, PCR: Polymerase Chain Reaction, TNLF: trans nasal laryngeal fiberscope, TE: tone enhancement scan, NBI: narrow band imaging

Declarations

Availability of data and materials:

All data generated or analyzed during this study are included in this published article [and its supplementary information files]

Competing interests:

The authors declare that they have no competing interests.

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Authors' contributions:

KT was a major contributor in writing the manuscript. All authors contributed this study equally, read and approved the final manuscript.

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Not applicable

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Written informed consent for publication of details was obtained from the patient

Conflict of Interest:

none declared

References

1. Tsunoda K, Takazawa M. Standardization of Nasopharyngeal Culture for COVID-19. https://jamanetwork.com/channels/health-forum/fullarticle/2764750
2. Marty FM, et al. NEJM Procedure: Collection of Nasopharyngeal Specimens with the Swab Technique. https://www.youtube.com/watch?v=DVJNWefmHjE
3. Testoni PA, Notaristefano C, Di LM, et al. High-definition with i-Scan gives comparable accuracy for detecting colonic lesions by non-expert and expert endoscopists. Dig Liver Dis. 2013 Jun;45(6):481–486.
4. Ertekin C, Kiylioglu N, Tarlaci S, Keskin A, Aydogdu I. Effect of mucosal anaesthesia on oropharyngeal swallowing. Neurogastroenterol Motil. 2000 Dec;12(6):567-72.

5. Alghadir AH, Zafar H, Al-Eisa ES, Iqbal ZA. Effect of posture on swallowing. Afr Health Sci. 2017 Mar;17(1):133-137.
6. Masaki T, Katada C, Nakayama M, Takeda M, Miyamoto S, Seino Y, Koizumi W, Tanabe S, Horiguchi S, Okamoto M. Narrow band imaging in the diagnosis of intra-epithelial and invasive laryngeal squamous cell carcinoma: a preliminary report of two cases. Auris Nasus Larynx. 2009 Dec;36(6):712-6.

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