

Tracheoesophageal Fistula Identified by Videofluoroscopic Swallowing Study: A Case Report

Ji Hyun Kim¹, Tae Uk Kim¹, Jung Keun Hyun,^{1,2,3} Seong Jae Lee¹, Seo Young Kim¹

¹Department of Rehabilitation Medicine, College of Medicine, ²Department of Nanobiomedical Science & BK21 PLUS NBM Research Center for Regenerative Medicine, ³Dankook University, Institute of Tissue Regeneration Engineering(ITREN)

Introduction

Tracheoesophageal fistula (TEF) is a rare complication that can occur due to a variety of causes, with the most common cause of acquired non-malignant TEF being prolonged endotracheal intubation or tracheostomy. Most patients with TEF complain of cough, nausea, and vomiting. It is important to consider the possibility of TEF in patients with these symptoms, and a prompt diagnosis is necessary to prevent serious complications such as recurrent pneumonia.

TEF can be diagnosed by flexible laryngoscopy, bronchoscopy, and esophagography. Computed tomography (CT) is another method for diagnosing TEF. Here, we report a case of a patient in whom TEF was primarily diagnosed by videofluoroscopic swallow study (VFSS) in the absence of clear findings of TEF on laryngoscopy and CT.

Case Description

Admission	Tracheostomy	T/F to RM	VFSS	Neck CT Laryngoscopy	Esophagography
Hospital date (HD)	HD12	HD20	HD21	HD22	HD23

Patient's Profile

❖ 25 year-old male

❖ Chief complaint

Repetitive coughing

❖ Present Illness

He admitted to neurosurgery department for management of traumatic subarachnoid hemorrhage after a pedestrian accident in September, 2022. He had undergone a conservative management in an intensive care unit and tracheostomy was performed for prolonged intubation. After he was transferred to department of rehabilitation medicine for inpatient rehabilitation, VFSS was performed for the evaluation of dysphagia.

❖ Past medical History

- DM/HTN (-/-)
- OP Hx (-)

❖ Neurologic examination

Mental state: Alert
 Motor power: U/Ex generally (4/4), L/Ex generally (4/4)
 Sensory: (intact/intact)
 Deep tendon reflex: BJ(+++/+), TJ(+++/+), KJ(+++/+), AJ(+++/+)

Clinical course

Admission to Department of Neurosurgery

Ventilator care start in ICU

- SAH
- Scalp swelling and hematoma, left F-P area
- Multiple petechial hemorrhage in the both cerebral and cerebellar hemisphere.

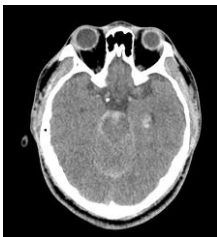


Figure 1. Brain CT axial view

HD#12. Tracheostomy for prolonged intubation

HD#20. Transferred to Department of Rehabilitation Medicine

While receiving enteral nutrition with NG tube, he suffered repetitive coughing and increased secretions

HD#21. VFSS performed for evaluation of swallowing function

- No definite abnormality in the oral and pharyngeal phase
- A reflux of the swallowed bolus into the airway observed at the level of the tracheostomy



Figure 2. VFSS



VFSS

HD#22. Laryngoscopy & Neck CT scan for a diagnosis of TEF

- No clear presence of TEF in a laryngoscopic view
- A focal defect at the anterior portion of upper thoracic esophagus, T1 level in Neck CT scan



Figure 3. Laryngoscopy

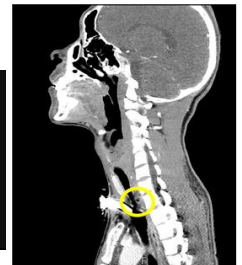


Figure 4. CT sagittal view

HD#23. Esophagography for a definite diagnosis of TEF

- Aspiration of significant amount of barium contrast
- Tracheoesophageal fistula at T1 level



Figure 5. Esophagography

Conclusion

The standard diagnostic methods for TEF are esophagography and laryngoscopy. CT scans are also known to be helpful in diagnosis. However, as in this case, TEF findings are not easily detected on laryngoscopy and CT scans, depending on the extent and location of the lesion. Also, esophagography is a highly sensitive diagnostic modality, but has the risk of massive aspiration of barium contrast. Therefore, this case suggests that VFSS can be a useful and relatively safe diagnostic tool for TEF. It may be necessary to consider the possibility of TEF when conducting VFSS on patients with a t-cannula.