

Characteristics and associated factors of esophageal dysphagia

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Objective

Videofluoroscopic swallowing study (VFSS) is widely used to evaluate oropharyngeal swallowing. Chest x-ray is traditionally studied in Purpose of assessing the endobronchial barium coating implicating endotracheal aspiration. The residual esophageal barium in chest x-ray may suggest any neuromuscular dysmotility or obstructive lesions of esophagus. This study Purposed to evaluate prevalence of esophageal dysphagia with residual esophageal barium after VFSS and to identify characteristic of esophageal abnormality.

Methods

Medical records of 535 adults aged 19 years or older who tested VFSS from March 2016 to May 2018 were reviewed retrospectively. Chest x-ray was taken in all patients after VFSS, and was checked whether there were any abnormal findings in esophagus like barium wall coating or esophageal dilatation or mechanical obstruction like bird beak sign. Abnormal esophageal findings were analyzed and classified by anatomic level (cervical [cricoid to suprasternal notch] / upper thoracic [suprasternal notch to tracheal bifurcation] / midthoracic [tracheal bifurcation to diaphragmatic hiatus] / lower thoracic and abdominal [diaphragm to junction with stomach]), and by esophageal dilatation severity (minimal [barium wall coating normal] / mild [$<1\text{cm}$] / moderate [$1\text{-}2\text{cm}$] / severe [$>2\text{cm}$]). The cause of esophageal dysphagia was also reviewed.

Results

In 11% of the subjects (64/535), esophageal dysphagia was identified in post-VFSS chest x-ray. Esophageal dysphagia was more frequent in aged 65-79 (OR=2.43, $P<.05$), and dementia (OR=2.15, $P<.05$). Midthoracic (n=24) and lower thoracic and abdominal esophageal barium (n=25) were more frequent than cervical (n=1) and upper thoracic (n=14). Esophageal dilatation was minimal in 24, mild in 13, moderate in 19, and severe in 8 patients. The cause of esophageal dysphagia was reviewed 19 patients who undergone diagnostic evaluation such as gastrofibroscopy or chest CT. Esophagitis (n=5), myopathy (n=1), achalasia (n=1), and caner (n=3) were identified causes and there were no abnormalities in 8 subjects. Cancer patients were significantly associated with cervical or upper thoracic esophageal moderate to severe dilatation ($P<.01$). Two were known esophageal cancer patients, and one was newly diagnosed with a lung cancer with metastasis mediastinal lymph node which was compressing the esophagus at subcarinal level.

Conclusion

Esophageal dysphagia was a frequent finding in videofluoroscopic swallowing study. Esophageal dysphagia in proximal dilatation can be an important sign in several malignancies, making the chest x-ray taken after VFSS an important step to evaluate.

Table 1. Associated factors with esophageal dysphagia from univariate logistic regression analyses

	OR (95% CI)	P value
Sex		
Male	1	
Female	1.65 (0.98-2.78)	.6
Age		
<65	1	
65-79	2.43 (1.1-5.41)	<.05
80 or more	1.39 (0.58-3.31)	.46
Referred cause of dysphagia		
Stroke	1	
Dementia	2.15 (1.01-4.59)	<.05
Cancer	2.24 (0.45-11.2)	.33
Parkinsonism	-	
Others	0.72 (0.27-1.94)	.52
Unknown	1.24 (0.61-2.5)	.56



Figure 1. Classification of esophageal dysphagia by anatomic level (A) and by dilatation severity (B). A-1: Cervical (cricoid to suprasternal notch). A-2: Upper thoracic (suprasternal notch to tracheal bifurcation). A-3: Midthoracic (tracheal bifurcation to diaphragmatic hiatus). A-4: Lower thoracic and abdominal (diaphragm to junction with stomach). B-1: Minimal (barium wall coating). B-2: Mild (diameter less than 1cm). B-3: Moderate (diameter from 1cm to 2cm). B-4: Severe (diameter more than 2cm).

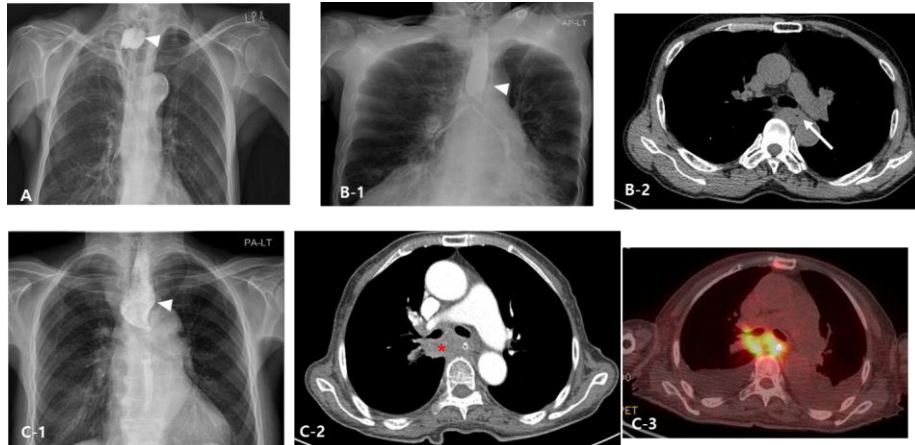


Figure 2. Chest roentgenogram which was taken after videofluoroscopic swallowing studies in 3 cases with obstructive esophageal dysphagia due to malignancy shows severe dilatation (arrow head) in cervical (A) and upper thoracic (B-1, C-1) esophagus. Two patients had been diagnosed as esophageal cancer and received bypass operation due to esophageal cancer in 5 years ago (A) or chemotherapy (B-1). Segmental circumferential wall thickening was noted in the mid esophagus (B-2). The third case who suffered from poor oral intake presented for unexplained swallowing difficulty. After videofluoroscopic swallowing study, severe esophageal dilatation is observed at upper thoracic level (C-1, arrowhead) in chest roentgenogram. The esophagus with nasogastric tube is compressed by metastatic lymph nodes (C-2, asterisk) with hypermetabolism in PET (C-3).