

# Dysphagia Improvement Following Sublingual Nifedipine Administration in Long-Segment Esophageal Stricture: A Case Report

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## Abstract.

*Dysphagia is a difficulty in swallowing either solid food or liquid. Esophageal stricture being one of the most common causes of dysphagia can be caused by inflammation, fibrosis, or neoplasia damaging the esophageal lumen. If left untreated, dysphagia can lead to malnutrition, aspiration, and decreased quality of life. Another common cause of dysphagia is esophageal motility disorder, an impairment in peristalsis of the esophageal. Calcium channel blockers such as nifedipine have been reported to improve dysphagia and may serve as alternative therapy while waiting for endoscopic intervention. A 27-year-old man presented with a two-month history of progressive dysphagia to solids, semisolids, and liquids, after an episode of hematemesis. Esophagogram showed esophageal stricture with impaired peristaltic. Contrast-enhanced CT result was suggestive of an intraluminal esophageal stricture. The patient was given sublingual nifedipine before meals as an alternative therapy while waiting for endoscopic intervention, and showed gradual symptomatic improvement. Dysphagia caused by long-segment esophageal stricture can be exacerbated by secondary motility disorder. While definitive treatment requires endoscopic intervention, sublingual nifedipine offered effective short-term symptomatic relief by reducing esophagogastric junction pressure and improving bolus transit through the narrowed lumen.*

**Keywords:** *Dysphagia; esophageal stricture; motility disorder and nifedipine.*

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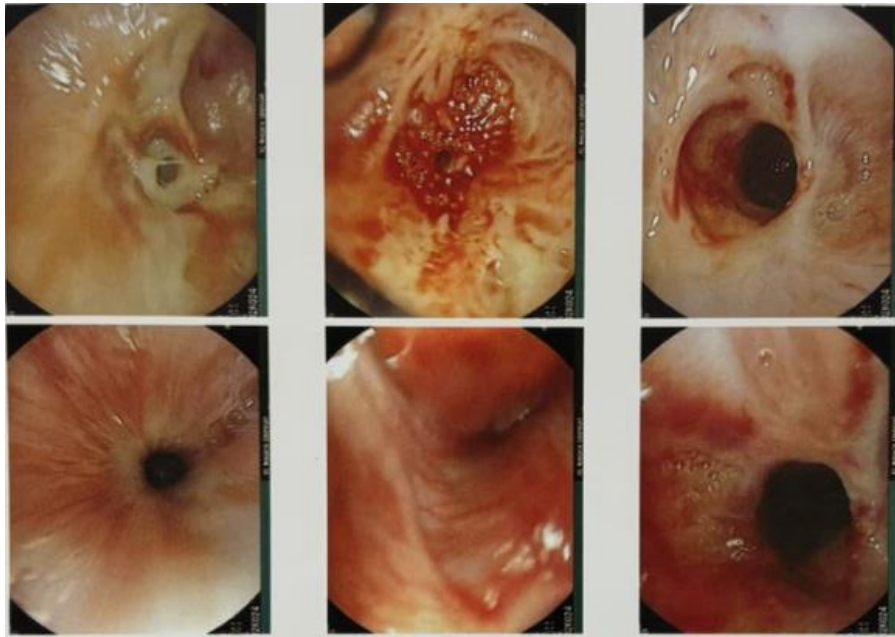
## I. INTRODUCTION

Dysphagia refers to difficulty in swallowing food or liquid which disrupts their movement from mouth to the stomach. The causes of dysphagia are diverse but generally classified into oropharyngeal dysphagia, esophageal dysphagia, or mixed. Oropharyngeal dysphagia can result from anatomical such as lesions obstructing the lumen or compressing the oropharynx or neuromuscular disorders. Esophageal dysphagia can be caused by mechanical obstruction, stricture inflammation, or motility disorder [1], [2]. The global prevalence of dysphagia ranges from 2% to 20%. A study conducted in 2018 over 31,000 Americans reported 1 in 6 adults have dysphagia [3]. One of the major cause of dysphagia is esophageal stricture, an abnormal narrowing of the esophageal lumen which often presents as dysphagia or difficulty in swallowing. It can be due to inflammation, fibrosis, or neoplasia damaging the mucosa of the esophagus [4], [5]. This can lead to malnutrition, aspiration, and decreased quality of life if the symptoms persist. Most of esophageal strictures are caused from chronic gastroesophageal reflux disease (GERD) or corrosive substance ingestion [6].

Management of esophageal strictures depend on the underlying causes and generally in conjunction with endoscopic management [7]. Esophageal motility disorders are also a common cause of dysphagia. Impairments in esophageal peristalsis or relaxation of the esophageal sphincter during swallowing can manifest as dysphagia, regurgitation or chest pain. Generally, dysphagia to solids is suggestive for primary mechanical causes, while dysphagia to liquids raises suspicion to esophageal motility disorder [8]. Calcium channel blocker such as sublingual nifedipine pre-meal have been reported to reduce esophagogastric junction, therefore can be considered as an alternative to improve symptoms [9]. Given the diverse causes and overlapping presentations of dysphagia, particularly when strictures coexist with motility disorders, management can be challenging. This case report highlights a patient with esophageal stricture and suspected motility disorder who experienced notable symptom improvement after sublingual nifedipine, offering insight into its potential role in complex dysphagia cases.

## II. CASE REPORT

A 27-year-old male patient with chief complaint of difficulty in swallowing solid and liquid food since 2 months ago and worsened several days prior to admission, patient can only take 2-3 sips of water at a time. He reported a feeling of obstruction in his throat when swallowing to solid foods or drinking in large amount. His symptoms began 2 months ago after a sudden episode of vomiting blood. Then he developed difficulty in swallowing solid food, which progressively worsened to semisolid and liquid. Patient does not have history of alcohol consumption, ingestion of corrosive agents, or frequent dyspepsia. Patient also loss more than 10 kg of weight over the past two months because of swallowing difficulty. The patient was hemodynamically stable and had slight epigastric pain. His laboratory workup including complete blood count, bleeding and clotting time, liver and renal function, and electrolytes were within normal limits. The patient underwent esophagogastroduodenoscopy and the result showed a narrowed lumen in the middle third of the esophagus and the presence of blood suspecting esophageal achalasia.



**Fig 1.** Esophagogastroduodenoscopy result showed narrowed middle third of the esophagus with the presence of blood.

The esophagogram with iohexol contrast showed narrowed, irregular, multifocal esophagus extending from proximal segment at the level of T3 to gastroesophageal junction, consistent with a long-segment esophageal stricture, suggestive of chronic corrosive causes. The contrast also showed delayed filling from the esophagus to the stomach indicating impaired peristaltic.



**Fig 2.** Esophagogram showed a long-segment esophageal stricture, suggestive of chronic corrosive causes and impaired esophageal peristaltic.

Contrast-enhanced CT esophagography showed esophageal wall thickening with luminal narrowing at the level of vertebral bodies T5–T10, suggestive of an intraluminal esophageal stricture.



**Fig 3.** CT esophagography with contrast showed intraluminal esophageal stricture.

High-resolution esophageal manometry as the gold standard to assess esophageal motility could not be performed due to limited diagnostic facility. The patient was planned to be referred to a tertiary care hospital with consideration for invasive endoscopic intervention and further diagnostic evaluation. While waiting, initial management included parenteral nutrition, intravenous proton pump inhibitor and sublingual nifedipine 10 mg once daily administered 30 minutes pre-meal. After making sure there was no adverse reaction from sublingual nifedipine, the dose was increased to 10 mg twice daily. The patient's dysphagia gradually improved, especially soon after taking sublingual nifedipine.

### III. RESULT AND DISCUSSION

In this case, the patient presented with a two-month history of dysphagia that gradually worsened. CT esophagography with contrast and esophagogram showed intraluminal esophageal stricture with impaired esophageal peristaltic. While patient was waiting to be referred to a tertiary care hospital, patient was started on sublingual nifedipine 10 mg with gradually titrated dose to observed the adverse effects. Dysphagia symptoms showed improvement after initiation of sublingual nifedipine 10 mg twice daily. The etiologies of esophageal stricture are categorized into benign and malignant. Benign esophageal stricture can be caused by GERD, eosinophilic esophagitis, iatrogenic injury, and corrosive ingestion. Malignant stricture are usually caused by carcinoma or metastatic neoplasma from nearby organ. Benign esophageal strictures management consists of mechanical dilation and targeted therapy of the underlying causes [6], [10], [11]. Endoscopic treatment particularly endoscopic dilation is the first-line management because its minimally invasive and definite efficacy [11]. Benign esophageal stricture is caused by damage to the mucosal especially esophageal epithelial barrier (EEB), over time became scar and fibrosis on the esophageal mucosal lining leading to luminal constriction. Damage can be caused by chronic inflammation, exposure to acid reflux, or complication from mucosal resection [6], [11], [12].

Other management for esophageal stricture include Endoscopic intraluminal corticosteroids injection, steroids can inhibit local inflammatory pathways and decrease collagen deposition, reducing stricture and then followed by balloon dilation [7]. Dysphagia that occurs both solids and liquids often involves esophageal motility problem, this patient's symptom initially manifested as difficulty swallowing solid foods, radiologic workup showed esophageal stricture, indicating that the symptoms were most likely caused by mechanical obstruction [2]. However, patient's esophagogram showed impaired esophageal peristaltic, this could be secondary due to the chronic esophageal stricture. High-resolution manometry should be done in this patient to measure esophageal pressure and confirm esophageal motility disorder [13]. Esophageal motility disorders can be classified into primary and secondary, primary etiologies include achalasia, esophagogastric outflow obstruction, spastic motor disorders, and hypomotility disorders. Secondary etiologies are caused by various underlying conditions that affect the normal functioning of the esophagus including esophageal stricture due to eosinophilic esophagitis or peptic, hiatal hernia, tumors, diabetes, chagas's disease, and scleroderma.

Conditions that lead to fibrosis and thickening of esophageal tissues, can result in impaired motility [14], [15]. Management of esophageal motility disorders are based on the etiology. Pharmacologic treatment can be considered as temporary measure before more effective treatments such as local injection of botulinum toxin, pneumatic dilation, or myotomy [15]. Calcium channel blocker such as nifedipine sublingual 10 – 30 mg administered before meals can be used as pharmacologic treatment to reduce lower esophageal sphincter pressure. Nifedipine works by reducing intracellular uptake of calcium, leading to decreased muscle contractility, which relaxes the lower esophageal sphincter. Reduced lower esophageal sphincter pressure may facilitate the food bolus through the narrowed segment of the esophagus. Short duration of action (30 – 120 minutes) necessitates multiple dose daily, which may lead to side effects such as hypotension, headache, and edema. However, due to lack comparative trials, pharmacotherapy should only be used for patients who are not candidates for definitive therapies [16], [17]. Nifedipine also often leads to tolerance, reducing their long-term effectiveness [15]

#### IV. CONCLUSION

This case demonstrates that dysphagia in long-segment esophageal stricture may be worsened by secondary esophageal motility disorder. Definitive therapy of esophageal strictures require endoscopic intervention. However, sublingual nifedipine provided meaningful short-term improvement by reducing esophagogastric junction pressure and facilitating bolus passage through the narrowed lumen caused by the stricture. This case highlights the potential role of nifedipine as a temporary symptomatic option when definitive management is not immediately available.

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