

# Endoscopic Internal Drainage Achieving Successful Closure of Iatrogenic Pharyngoesophageal Fistula

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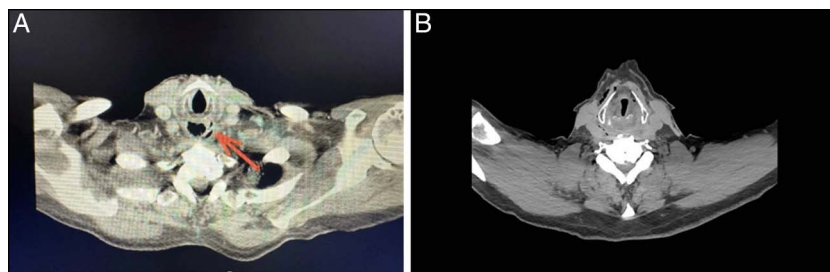
## ABSTRACT

Endoscopic internal drainage (EID) is a minimally invasive endoscopic technique that effectively closes upper gastrointestinal fistulas. We report the successful closure of an oropharyngeal fistula in a 78-year-old man with a history of supraglottic squamous cell carcinoma. He presented with inspiratory stridor after biopsy of a lateral wall lesion in the piriformis sinus. Imaging showed a fistula tract between the piriformis sinus and the esophagus. EID was performed using a double-pigtail stent inserted inside the fistula. Eventually, repeat imaging showed evidence of fistula closure. To our knowledge, this is the first reported case of using EID for repairing an oropharyngeal fistula.

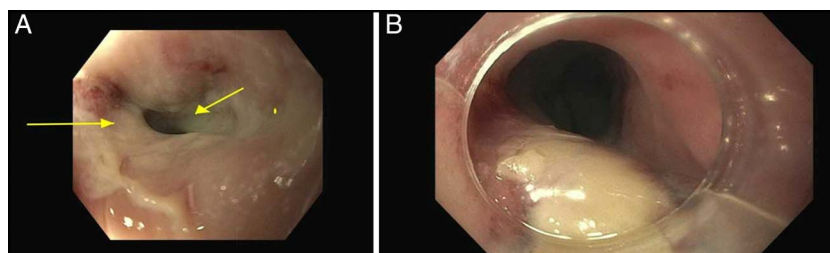
**KEYWORDS:** fistula; piriformis sinus; endoscopic internal drainage

## INTRODUCTION

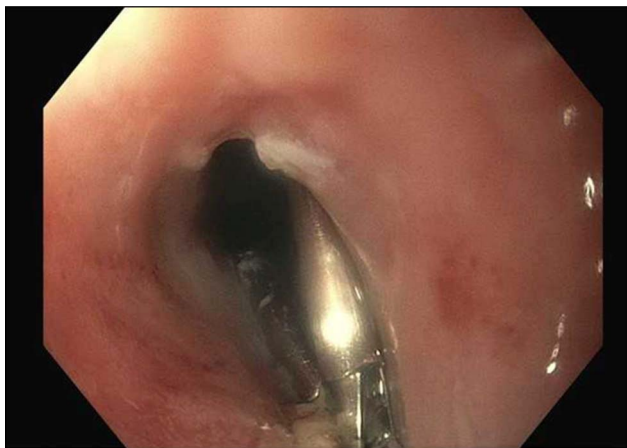
Endoscopic internal drainage (EID) is a treatment modality that can be used to close gastrointestinal (GI) leaks using pigtail catheters. Its use is becoming more common as a potential first-line treatment of leaks and fistulas.<sup>1</sup> GI leaks and fistulas most



**Figure 1.** (A) A small amount of extraluminal gas along the left lateral esophageal lumen. (B) Contrast tracking from the posterior aspect of the right piriform sinus into the retropharyngeal space.



**Figure 2.** (A) Necrotic orifice of the piriformis fistula and purulent material visualized on endoscopy. (B) A deep mucosal tear concerning for perforation in the cervical esophagus communicating with pharyngeal fistula.



**Figure 3.** Partially successful closure of the esophageal tear with endoscopic clips.

commonly occur postoperatively and have a high burden of mortality and morbidity.<sup>2</sup> Once these leaks or fistulas are discovered by radiology or direct visualization, they must be treated because of their high mortality rate, which can reach up to 60%.<sup>3</sup> Although the use of EID is becoming more common for GI leaks and fistulas, it has not been used before to close leaks that originate in the oropharyngeal area. We report a case of a piriformis sinus fistula in the oropharynx that extended into the upper esophagus and was treated using EID.

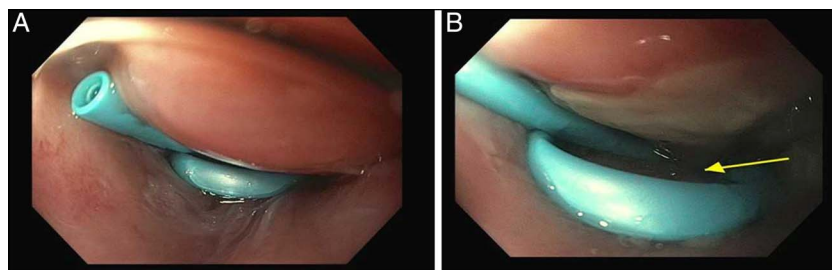
## CASE REPORT

A 78-year-old man with a medical history of left vocal cord paralysis and supraglottic squamous cell carcinoma underwent chemoradiation 10 years before presentation. He presented to the otolaryngology clinic for his annual fiberoptic laryngoscopy examination for surveillance of cancer recurrence. Fiberoptic laryngoscopy was performed in the clinic, and a 1 cm friable tan lesion was seen on the lateral wall of the right piriformis. The patient was hospitalized, and laryngoscopy-assisted biopsy of the piriformis sinus lesion was performed. On the following day of the biopsy, the patient developed inspiratory stridor and dysphagia. A neck and chest computed tomography scan showed extraluminal gas around the cervical esophagus and contrast tracking from the posterior aspect of the right piriform sinus into the retropharyngeal space near the upper most esophagus concerning for a fistulous communication between

the right piriform sinus and the uppermost esophagus (Figure 1). A tracheostomy tube was placed to secure the airway along with a rigid diagnostic esophagoscopy. An upper esophageal tear with a fistulous tract between the right piriformis sinus biopsy site and the cervical esophagus was seen on diagnostic esophagoscopy. For further evaluation and management, decision was made to proceed with esophagogastroduodenoscopy by the gastroenterology team. An 8 mm fistulous tract opening was observed in the right piriformis sinus with purulent secretions (Figure 2). In addition, a deep mucosal tear that was also covered with purulent exudate was visualized near the upper esophageal sphincter level (Figure 2). To repair the esophageal defect, 3 clips were deployed and partial closure of the defect was achieved (Figure 3). After clip placement, EID was used for the management of the fistulous tract. A plastic 7 French by 3 cm plastic double-pigtail stent was inserted within the fistula tract with the proximal end in the hypopharynx and the distal end within the cervical mediastinum outside the esophageal perforation (Figure 4). After stent placement, the patient was kept non-per-oral and a gastrostomy tube was placed to prevent leakage into the fistula. The patient reported no dysphagia or pain after the procedure. The patient was eventually discharged in a stable condition. Four weeks after discharge, on outpatient follow-up, a computed tomography esophagram showed no leak from the esophagus to the pharynx or upper mediastinum, and the pigtail catheter in the stomach indicating successful closure of the iatrogenic fistula that developed after the biopsy of the pharyngeal lesion, which eventually was confirmed to be a new primary squamous cell carcinoma of the right piriformis sinus. Owing to the resolution of the fistulous tract, the gastrostomy tube was removed and the patient was started on a puree diet, which he tolerated well.

## DISCUSSION

Upper GI and oropharyngeal anastomotic leaks often cause a significant burden on quality of life, morbidity, or even mortality in patients in whom they develop.<sup>4</sup> Depending on their location, they increase the risk of aspiration, sepsis, or even peritonitis/mediastinitis, and thus, early diagnosis and treatment is a key factor to reduce significant complications.<sup>5</sup> Such leaks are diagnosed either radiologically or by direct visualization during endoscopy. There are many treatment modalities reported in the literature, including conservative management, endoscopic intervention, or surgical repair. Endoscopic intervention includes



**Figure 4.** (A and B) Successful insertion of the pigtail catheter into the fistulous tract opening.

endoscopic suturing, clipping, or EID.<sup>3,6</sup> Surgery is used for defects that cannot be repaired endoscopically because of technical difficulties or lack of center expertise. Surgery is also a first-line intervention for patients with large or complicated defects.<sup>7</sup> The choice of treatment modality is usually contingent on the clinical scenario and is tailored toward the individual patient presentation. Although many treatment modalities exist, there is no consensus on the optimal approach yet, and clinicians may find it difficult to initially determine the most suitable approach.<sup>8</sup>

EID is a treatment modality that is now being more commonly used for the closure of upper GI leaks using pigtail catheters. This approach is commonly used in laparoscopic gastric sleeve leaks and in the drainage of pancreatic pseudocysts.<sup>9</sup> In EID, a pigtail catheter is usually inserted into the anastomotic leak or fistula with one end in the lumen of the GI tract. The concept of using a pigtail catheter is to induce an inflammatory reaction inside the lumen of the fistula, which, in turn, leads to the production of fibrous tissue that eventually expels the foreign catheter and closes the defect.<sup>10</sup> EID also works by passive drainage of the purulent material behind the fistulous tract.<sup>11</sup> In their case series, Toh et al reported successful closure of anastomotic defects using EID in 9 of 12 patients with upper GI fistulas.<sup>12</sup> However, we were not able to find any reports published in the literature where the EID method was used in the closure of an oropharyngeal defect as in our case. To the best of our knowledge, this is the first reported case of repair of an oropharyngeal fistula using the EID technique.

In conclusion, EID is an endoscopic procedure that is less invasive than surgical intervention that can be considered for repairing upper GI fistulas. Further studies are needed to compare the outcomes of this method with other interventions. The use of EID can involve repairing oropharyngeal fistulas where the esophagus is involved, and this case demonstrates a successful closure in such defects.

## DISCLOSURES

**Author contributions:** A. Rimawi wrote the first draft of the manuscript, wrote the final draft of the manuscript, and is the article guarantor. Y. Al-Turk edited the first draft of the manuscript. A.M. Swied performed diagnostic EGD on the pt., provided pictures and captions of EGD images, edited the first

draft of the manuscript, and approved the final draft of the manuscript.

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**Informed consent** was obtained for this case report.

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