Iatrogenic Full-Length Intramural Esophageal Dissection Associated with Pneumomediastinum after Attempted Diagnostic Gastroscopy

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Abstract

Upper gastrointestinal endoscopy is a usually safe procedure. Intramural Esophageal Dissection (IED) is a rare disorder often due to the abrupt increased intraesophageal pressure after given the existence of mucosal tear. We present an extremely rare case of iatrogenic IED complicated with pneumomediastinum after a failed gastroscopy for a healthy person. Reformatted computed tomographic images successfully established the diagnosis by means of the esophageal double lumen as full extent of intervening mucosal flap and mediastinal air. The patient got improvement following appropriate conservative management. Our case adds support of the hypothesis of gas diffusion across the muscular layers of the esophagus rather than real defect.

Keywords: Gastroscopy; Esophagus; Intramural dissection; Perforation; Pneumomediastinum

Introduction

Routine Esophageal Gastroendoscopy (EGD) is generally a safe procedure as we know. Esophageal laceration with intramural dissection is an uncommon injury demonstrating esophageal separation of mucosa and/or submucosa from deeper muscular layers, often due to the abrupt increased intraesophageal pressure. Progression to esophageal perforation is extremely rare as reported. We present a case developing Intramural Esophageal Dissection (IED) combined with extraluminal air leakage after an attempted diagnostic gastroscopy, in which chest Computed Tomography (CT) successfully established a diagnosis. Our patient recovered completely with conservative management.

Case Report

A middle-aged female patient received health gastroendoscopy. She denied any underlying disease, though sometimes acid regurgitation and heartburn sensation were mentioned. The EGD was performed by an experienced and senior gastroenterologist. However, the scope could not pass through the inlet of esophagus without excessive force reported; the procedure failed under suspicion of cricopharyngeal spasm. A few hours later, the patient came back to the hospital due to the complaint of sore throat, vomiting, and subsequently chest pain. An electrocardiogram showed no abnormal finding. There also was no relevant abnormality detected on the initial interpretation of chest radiograph. Chest CT scan (Figures 1a-c) was subsequently arranged and revealed full-length, circumferential intramural dissection of the esophagus manifesting the esophageal double lumen as air-distended false and collapsed true lumen, and small amounts of air in the paraesophageal space. The collapsed true lumen made it difficult to find subtle mucosal tear. The diagnosis of IED associated with pneumomediastinum was established on the basis of imaging findings.

Because there were no clinical sign of sepsis and the study demonstrated the mildest form of esophageal perforation, the patient got conservative management consisting of broad spectrum intravenous antibiotics, pain control, nothing by mouth, and total parenteral nutrition. When her general condition became stable with a tolerance of liquid diet, she was discharged on day 7, and had uneventful OPD follow-up. The esophagogram with barium (Figure 1d) was carried out two months later, and there was no evidence of contrast extravasation or luminal narrowing.

Discussion

Upper gastrointestinal endoscopy has now been conventional medical practice after developing the flexible fiberoptic endoscope, is generally a safe procedure. A large study in pediatrics revealed incidences of mucosal tear and esophageal perforation were 2.14 and 1.07, separately, per 10000 procedures [1].

Intramural esophageal dissection (IED), a rare disorder, was first mentioned in 1968 by Marks and Keet [2]. IED is initiated by a mucosal tear accompanying with a creation of a true and false lumen in the esophagus, conceptually similar to an aortic dissection [3]. It is generally considered that the most common causes of IED are iatrogenic, including instrument insertion (gastroendoscopy, nasogastric tube, and transesophageal echocardiography) and hemostatic applications (varical sclerotherapy and argon-plasma coagulation), as well as noniatrogenic causes (ingestion or impaction of foreign bodies) or spontaneously [4]. The first case of iatrogenic IED after attempted diagnostic gastroendoscopy was described in 2009 [5] with possible risk factors including direct injury by the tip of the endoscope, barotraumas from air insufflation during attempted intubation, or cricopharyngeal spasms; as we met.

The imaging documented full extent of circumferential intramural dissection of the whole esophagus was very rare [6]. In addition, only few cases associated with esophageal perforation were noted [3,4,6-9], which firstly reported coexistence of IED and extraluminal air leakage in 2008 [4]. Though, Monu and Murphy [3] thought that previously reported cases of IED that did not use CT might be underestimated and only able to exclude more serious esophageal perforations with...
obvious contrast leakage or large amounts of pneumomediastinum using contrast esophagography.

Review of existing English literature, our case was the first description of IED complicated with pneumomediastinum after an attempted diagnostic gastroscopy for healthy person. Unlike the other iatrogenic insult [4] during therapeutic endoscopy for removal of impacted food material with air expanding, perhaps induced extravasation of insufflated air into the mediastinum after mucosal injury with intramural dissection developed. In our case, similar to spontaneous one, given the existence of mucosal tear complicated by endoscopy was initiated; a subsequent increase in pressure within esophagus such as retching or vomiting then potentiated a separation of mucosa and/or submucosa from the deeper muscular layers.

Advanced CT images including volumetric data acquisition allowing for multi-dimensional reformating is the ideal investigative modality with high specificity for an accurate diagnosis, and will likely have an important role while simultaneously assessing for more serious conditions like esophageal rupture and aortic dissection. In CT imaging, the wall structure of a hollow organ can be best-visualized and analyzed using short axis plane (i.e., axial images), nevertheless reformatted sagittal and coronal images are useful to grasp the extent of the esophageal dissection in the long-axis direction and to detect a relatively smaller hole in the wall of esophagus.

IED complicated with a small amount of pneumomediastinum was considered the mildest form of esophageal perforation [3,10]. Besides, in contrast to the rest of the gastrointestinal tract, the esophagus is not protected by a serosal layer. We thought that our case adds support of the hypothesis [4] of gas diffusion across the muscular layers of the esophagus rather than real defect at the esophageal wall because of a failed gastroscopy and no extraluminal air around proximal esophagus detected. So the conservative treatment is possible as management of classical IED.

Based on clinically stable condition of the patient and aforementioned statement, supportive treatments with nil per oral, pain control, intravenous antibiotics and parenteral nutrition were successfully pursued.

Conclusion

In summary, we report an unusually complicated case of iatrogenic IED that involved full-length of the esophagus, combined with pneumomediastinum. In patients with chest pain after endoscopy, esophageal injury should be always taken into consideration. As our case, chest CT enabled the diagnosis with the use of reconstructive techniques as curved MPR. The mildest form of esophageal perforation, like the few reported instances [3,4,9], could heal without sequela spontaneously after conservative management.

References