



Case Report

# Intramural esophageal dissection after endoscopy: A case report in a hypopharyngeal cancer patient treated with concurrent chemoradiotherapy

By Jae Hwi Park<sup>1</sup>, Sun Young Jeong<sup>1</sup>,, Hyun Joo Song<sup>2</sup>, Miok Kim<sup>2</sup>, Su Yeon Ko<sup>1</sup>

<sup>1</sup>Department of Radiology, Jeju National University School of Medicine, Jeju, Republic of Korea

<sup>2</sup>Department of Internal Medicine, Jeju National University School of Medicine, Jeju, Republic of Korea

**Abstract** Intramural esophageal dissection is a rare disorder characterized by a separation of the mucosa and/or submucosa from deeper muscular layers of the esophagus, with or without perforation. Iatrogenic instrumentation such as endoscopy is one of the major causes of IED. We report a case of IED after endoscopy in a patient with hypopharyngeal cancer treated with concurrent chemoradiotherapy, and suggest that a history of chemoradiotherapy can be a risk factor of IED on endoscopy. In this case, chest computed tomography scans show not only typical esophageal double lumen but also eccentric esophageal wall thickening and abnormally thin the other side esophageal wall, and this CT finding may also be important to diagnose IED.

**Key words:** Esophagus, Dissection, Endoscopy, Chemoradiotherapy, Computed tomography

## INTRODUCTION

Intramural esophageal dissection (IED) is a rare disorder characterized by a separation of the mucosa and/or submucosa from deeper muscular layers of the esophagus, with or without perforation.<sup>1-3)</sup> The causes of IED include mucosal injuries from ingestion of sharp foreign body, abrupt increase in intraesophageal pressure such as forceful vomiting, anticoagulation therapy or inherent coagulopathy, and iatrogenic instrumentation including endoscopy. Among them, iatrogenic instrumentation such as endoscopy is probable the most important risk factor.<sup>3-5)</sup> Patients with IED usually present with abrupt


retrosternal chest pain, dysphagia, and hematemesis.<sup>5,6)</sup> Traditionally, a fluoroscopic contrast swallow study or upper gastrointestinal (GI) endoscopy has been used to diagnose IED. Recently, chest computed tomography (CT) scan has proven useful to assess the full extent of IED, evaluate the presence of esophageal perforation, and differentiate IED from acute cardiovascular disease and other esophageal diseases.<sup>1,6,7)</sup>

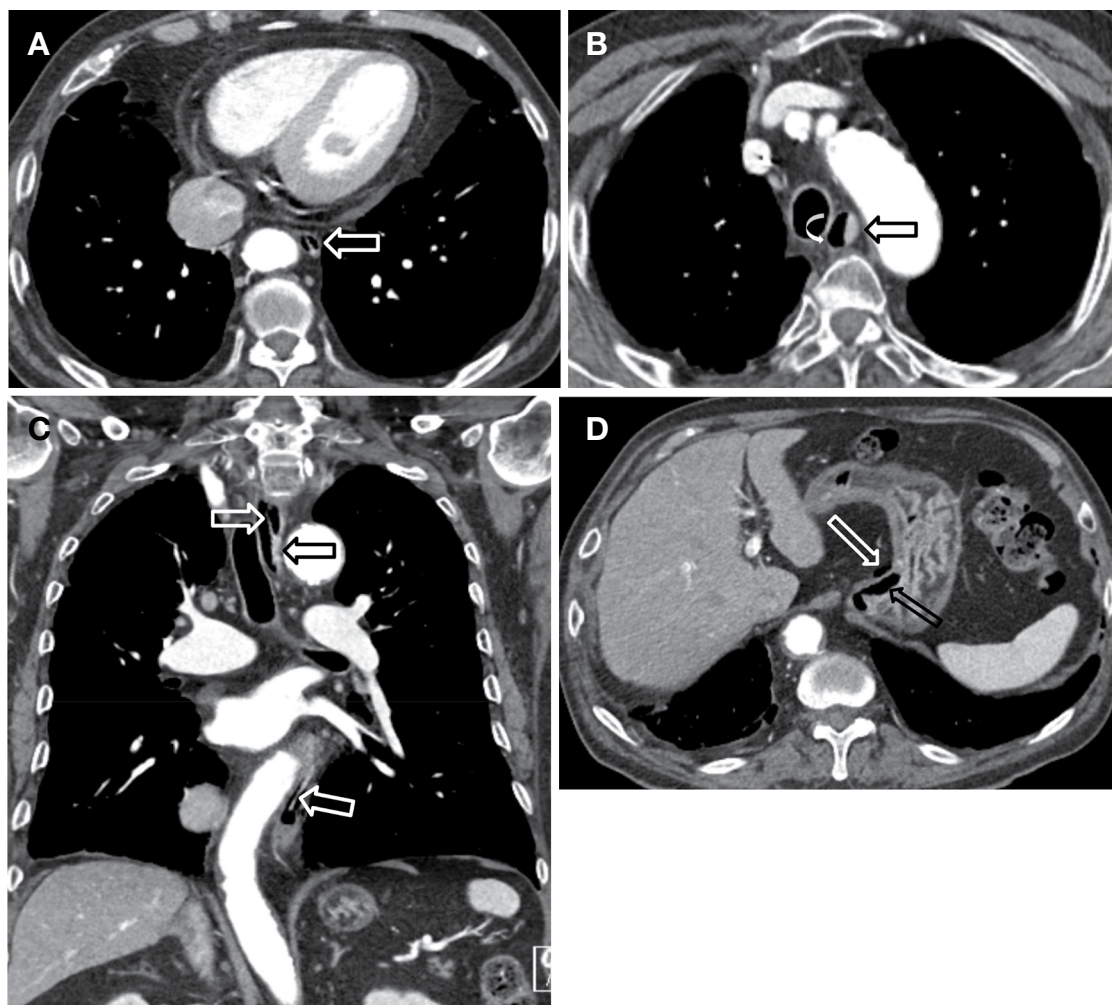
We herein describe a case of IED after endoscopy in a patient with hypopharyngeal cancer treated with concurrent chemoradiotherapy. In this case, chest CT successfully established a diagnosis of IED extending to the gastric wall and a suspicion of microperforation.

## CASE REPORT

A 74-year-old woman admitted to our hospital with complaints of nausea and swallowing difficulty. She had been diagnosed with hypopharyngeal cancer 6 months

Received: March 28, 2020; Revised: March 28, 2020; Accepted: April 22, 2020

 Correspondence to : Sun Young Jeong  
Department of Radiology, Jeju National University School of Medicine, Aran  
13gil 15, Jeju-si, Jeju Special Self-governing Province 63241, Republic of  
Korea  
Tel: 82-64-717-1369, FAX: 82-64-717-1377  
E-mail: sy7728.jeong@gmail.com



**Figure 1.** Chest CT images of a 74-year-old woman with abrupt chest pain during upper GI endoscopy. A, B. Transaxial CT images show not only typical esophageal double lumen (white arrow) but also eccentric esophageal wall thickening (black arrow) and abnormally thin the other side esophageal wall (curved arrow). C. A coronal CT image shows esophageal double lumen, intervening mucosal flap (white arrows), and eccentric esophageal wall thickening (black arrow). D. A transaxial CT image shows air dissecting gastric wall (long black arrow) and small amount of perigastric pneumoperitoneum (long white arrow).

ago and treated with concurrent chemoradiotherapy until 2 months ago. An upper GI endoscopy was done showing edematous change in the epiglottis and pyriform sinus. When the endoscope was advanced towards cervical esophagus, the patient suddenly complained severe neck and chest pain and the endoscopy was aborted with suspicion of esophageal perforation. Chest CT was immediately performed to evaluate the esophagus for a through perforation and other mediastinal complications. Axial and coronal CT images revealed extensive intramural dissection from the thoracic inlet level esophagus to the lesser curvature of the stomach (Fig. 1A~C). Tiny air density around the distal esophagus and small amount

of perigastric pneumoperitoneum were noted (Fig. 1D) but definite perforation site or evidence of mediastinitis were not delineated on CT scans. The diagnosis of IED with microperforation was made, and the patient was treated with conservative management including fasting, fluid therapy, and the use of antibiotics and painkillers. An esophagography using water-soluble contrast media performed nine days later showed no evidence of esophageal dissection or contrast leakage. The patient was given oral feeding with rice-water for the next few days, and was finally allowed soft foods just before her discharge on the 14th day after admission. She was discharged with relieved pain symptom, and follow-up endoscopy per-

formed 3 months later showed no abnormal finding in the esophagus and stomach.

## DISCUSSION

Intramural esophageal dissection is a relatively rare disorder characterized by a separation of the mucosa and/or submucosa from deeper muscular layers of the esophagus.<sup>1-3)</sup> It was first described as “intramural rupture of the esophagus” by Marks and Keet in 1968, and has also been referred to as “esophageal apoplexy” and “submucosal hematoma”.<sup>7-9)</sup> Hanson and co-workers suggested the term of “intramural esophageal dissection” in 1991, because this is an accurate description of the radiologic findings regardless of the pathogenesis.<sup>9)</sup>

Two theories of pathogenesis of IED have been proposed. The first theory is that intramural dissection is initiated by submucosal bleeding secondarily tears the mucosa, decompressing the hematoma into the esophageal lumen. Spontaneous IED in patients with anticoagulation therapy or inherent coagulopathy may belong to this category. The second theory postulates that the mucosal tears come first and are followed by secondary dissection of the submucosa.<sup>9,11)</sup> Iatrogenic cause including endoscopy or sharp foreign impaction could be considered as this category.

In this case, iatrogenic mucosal injury during the endoscopy was presumed as a main cause of IED. However, an expert endoscopist who has over 10 years of experience in endoscopy performed the procedure, and endoscopic and chest CT findings revealed edematous change/wall thickening in the hypopharynx and cervical esophagus suggesting the radiation change. Our patient had been diagnosed with hypopharyngeal cancer 6 months ago and treated with concurrent chemoradiotherapy until 2 months ago. We suggest that a history of chemoradiotherapy can be a risk factor of IED on endoscopy.

IED is conceptually similar to an aortic dissection in terms of mucosal/intimal tear, creation of a true and false lumen, and sudden onset of severe chest pain as presenting symptom.<sup>7,9,10)</sup> Traditionally, a fluoroscopic contrast swallow study or upper gastrointestinal endoscopy has been used to diagnose IED. Recently, chest CT scan has proven useful for clear identification of the extent of IED and differentiation of IED from acute cardiovascular disease and other esophageal diseases.<sup>1,6)</sup> Furthermore, chest CT scan easily detect a small amount of air collection

from the esophageal perforation and adjacent mediastinal fat infiltration representing mediastinitis. In this regard, chest CT is superior to fluoroscopic esophagography, and such a one-step procedure would be both convenient and cost-effective for patients.<sup>1)</sup>

CT findings of IED have been reported as a mucosal flap with submucosal distribution of gas or contrast material, giving the esophagus the classic double-barreled appearance.<sup>5)</sup> In our case, chest CT scans show not only the typical esophageal double lumen but also eccentric esophageal wall thickening and abnormally thin the other side esophageal wall which represent collapsed true lumen and distended false lumen. We believe that this CT finding may also be important to diagnose IED.

In summary, we report a case of IED after endoscopy in a patient with hypopharyngeal cancer treated with concurrent chemoradiotherapy, and suggest that a history of chemoradiotherapy can be a risk factor of IED on endoscopy. In this case, chest CT successfully established a diagnosis of IED extending to the gastric wall and a suspicion of microperforation. In addition to the classic esophageal double barrel appearance, eccentric esophageal wall thickening and abnormally thin the other side esophageal wall may also be an important CT finding to diagnose IED.

## REFERENCES

1. Khil EK, Lee H, Her K. Spontaneous intramural full-length dissection of esophagus treated with surgical intervention: multi-detector CT diagnosis with multiplanar reformations and virtual endoscopic display. *Korean J Radiol* 2014;15:173-7.
2. Krishnam MS, Ramadan MF, Curtis J. Intramural esophageal dissection: CT imaging features. *Eur J Radiol (extra)* 2005;56:17-9.
3. Soulellis CA, Hilzenrat N, Levental M. Intramucosal esophageal dissection leading to esophageal perforation: case report and review of the literature. *Gastroenterol Hepatol (N Y)* 2008;4:362-5.
4. Han KT, Kim SS, Kim JH. Intramural esophageal dissection after endoscopy: a case report. *J Korean Soc Radiol* 2011;65:491-4.
5. Young CA, Menias CO, Bhalla S, Prasad SR. CT features of esophageal emergencies. *Radiographics* 2008;28:1541-53.
6. Chiu HH, Lee SY. Intramural dissection of the esophagus: endoscopic findings. *J Internal Med Taiwan* 2006;17:302-5.
7. Monu NC, Murphy BL. Intramural esophageal dissection associated with esophageal perforation. *R I Med J* 2013;96:44-6.
8. Marks IN, Keet AD. Intramural rupture of the oesophagus. *Br Med J* 1968;3:536-7.

9. Phan GQ, BA, Heitmiller RF. Intramural esophageal dissection. *Ann Thorac Surg* 1997;63:1785-6.
10. Huang YC, Hsueh C, Lee CW, Ho SY, Chen WL. Intramural esophageal dissection as an esophageal emergency. *J Radiol Sci* 2016;41:13-7.
11. Kim SH, Lee SO. Circumferential intramural esophageal dissection successfully treated by endoscopic procedure and metal stent insertion. *J Gastroenterol* 2005;40:1065-9.