

# Spontaneous Esophageal Injury: Esophageal Intramural Hematoma

Yu-Hui Chiu<sup>1,2,5</sup>, Jen-Dar Chen<sup>3,5\*</sup>, Chia-Yang Hsu<sup>4,5</sup>, Chorng-Kuang How<sup>2,5</sup>,  
David Hung-Tsang Yen<sup>2,5</sup>, Chun-I Huang<sup>2,5</sup>

<sup>1</sup>Department of Emergency Medicine, Taipei Medical University–Wan Fang Hospital, Departments of

<sup>2</sup>Emergency Medicine, <sup>3</sup>Radiology and <sup>4</sup>Internal Medicine, Taipei Veterans General Hospital, and

<sup>5</sup>National Yang-Ming University School of Medicine, Taipei, Taiwan, R.O.C.

Acute chest pain can indicate a life-threatening condition and it is important for physicians to diagnose and treat it as a matter of urgency. We report 1 rare case of esophageal intramural hematoma (IMH) that presented with chest pain at the emergency department and which was initially clinically suspected to be due to aortic dissection. The case was diagnosed preoperatively by multidetector computed tomography. Esophageal IMH may represent an intermediate stage between Mallory-Weiss tear (mucosal) and Boerhaave's syndrome (transmural). Multidetector computed tomography is a useful noninvasive imaging modality for accurate diagnosis of these spontaneous intramural and transmural ruptures of the esophagus, and aids in the differential diagnosis of aortic and other mediastinal diseases with acute chest pain. [*J Chin Med Assoc* 2009;72(9):498–500]

**Key Words:** Boerhaave's syndrome, esophageal injury, esophageal intramural hematoma, Mallory-Weiss tear

## Introduction

Acute chest pain can indicate a life-threatening condition, so it is important for physicians to make an accurate diagnosis and undertake appropriate management as a matter of urgency. Here, we report a case of acute chest pain that was initially suspected to be due to aortic dissection, but finally found to be due to esophageal intramural hematoma (IMH) as shown by multidetector computed tomography (CT). This disease is a spectrum of spontaneous esophageal injury, which is a rare cause of acute chest pain in the emergency department (ED). Some authors believe it represents an intermediate stage between Mallory-Weiss tear (mucosal) and Boerhaave's syndrome (BS) (transmural).<sup>1–3</sup> Despite the increasing number of reports, many physicians are still unfamiliar with this condition. The CT features and differential diagnosis of acute chest pain from an esophageal origin are discussed.

## Case Report

A 77-year-old female presented to our ED with sudden onset of severe retrosternal and epigastric pain which radiated to her back with diaphoresis. Before these symptoms, she had suffered from forceful vomiting with a small amount of coffee ground material after taking a pill. She had a medical history of long-term low-dose aspirin intake. Vital signs showed a blood pressure of 135/63 mmHg, a pulse of 60 beats/min, and respiratory rate of 17/min. Epigastric tenderness without muscle guarding and normoactive bowel sounds were noted on physical examination. Chest radiography showed unremarkable findings. Electrocardiography showed normal sinus rhythm. Cardiac enzymes were within normal ranges.

Multidetector CT of the chest was performed under the clinical impression of aortic dissection. It demonstrated long segmental, eccentric, submucosal,



\*Correspondence to: Dr Jen-Dar Chen, Department of Radiology, Taipei Veterans General Hospital, 201, Section 2, Shih-Pai Road, Taipei 112, Taiwan, R.O.C.

E-mail: jdchen@vghtpe.gov.tw • Received: February 16, 2009 • Accepted: June 15, 2009

high-attenuated, soft-tissue density over the thoracic esophagus suggestive of IMH (Figure 1). Esophagography revealed several patches of filling defects at the upper and middle thirds of the esophagus, which was compatible with esophageal submucosal lesion.

The patient received conservative treatment with nothing by mouth and parenteral nutrition. Twenty days later, chest CT revealed markedly regressive changes of the esophageal IMH. The patient was discharged in a stable condition.

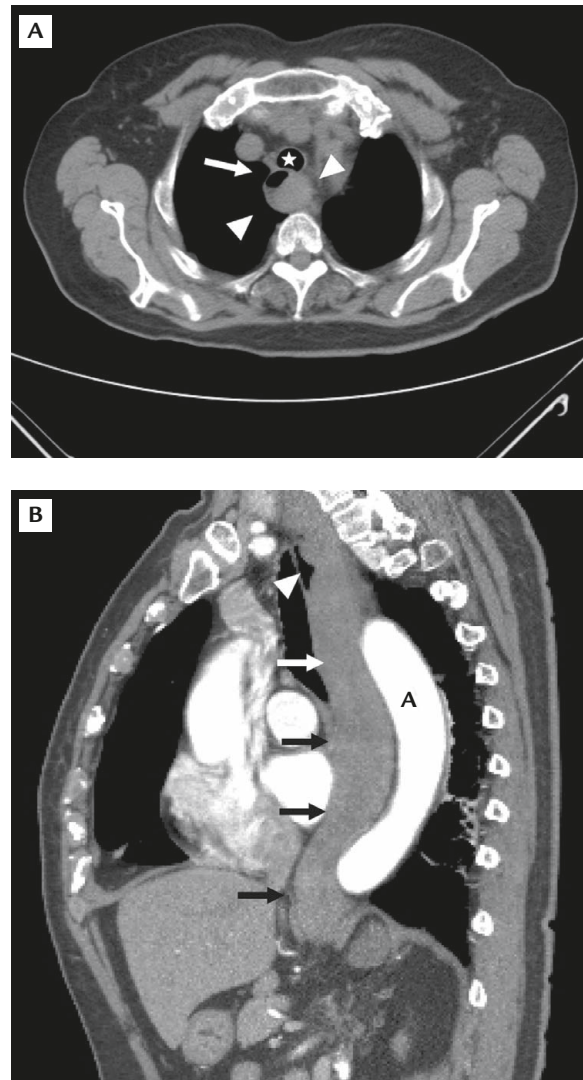
## Discussion

This patient had a medical history of long-term low-dose aspirin intake. With an increasing population of people who are on low-dose aspirin, the incidence of these spontaneous esophageal injuries causing acute chest pain may increase.<sup>4-7</sup> As their presentations primarily include acute chest pain, spontaneous esophageal injuries are easily misdiagnosed in the ED as acute aortic dissection, aortic aneurysm rupture, acute myocardial infarction, perforated peptic ulcer, pancreatitis, or other urgent conditions.

Among esophageal injuries, Mallory-Weiss tear, IMH and BS share similar etiologies and clinical presentations. A Mallory-Weiss tear is a mucosal laceration at the gastroesophageal junction or gastric cardia, followed by severe retching, coughing or forceful vomiting.<sup>3,8</sup> Hematemesis, the classic presenting symptom of Mallory-Weiss tear, has been reported in 30–80% of patients. Endoscopy is the diagnostic test of choice.<sup>8</sup>

IMH can be classified into 6 possible categories according to pathogenesis: (1) abnormal hemostasis; (2) emetogenic; (3) spontaneous; (4) traumatic (blunt trauma or food-induced trauma); (5) iatrogenic (i.e. complications of central venous catheter insertion or endoscopic procedures); and (6) related to aortic disease.<sup>3-5</sup> The clinical triad of IMH, with approximately 35% incidence, consists of retrosternal pain, dysphagia/odynophagia and hematemesis.<sup>3,9,10</sup> Among the imaging studies, chest radiographs usually reveal no significant abnormalities in IMH, except a very large soft-tissue density at the level of the esophagus, at the retrocardiac and/or paravertebral space.<sup>3,11</sup> The characteristic CT finding is a concentric or eccentric high-attenuated esophageal wall thickening with well-defined borders and variable degree of obliteration of the lumen.<sup>3,12,13</sup>

BS, which is defined as spontaneous transmural rupture of the distal esophagus by a sudden increase in intraesophageal pressure, has the classic presentation of vomiting, lower thoracic pain and subcutaneous



**Figure 1.** (A) Non-contrast computed tomography demonstrates eccentric high-attenuated intramural mass (arrowheads) compressing the esophageal lumen (arrow) compatible with intramural hematoma. White star = trachea. (B) Contrast-enhanced computed tomography with sagittal reformatted image shows long segmental non-enhanced esophageal hematoma (arrows) with marked compression of the esophageal lumen (arrowhead). A = aorta.

emphysema (Mackler's triad).<sup>9,10,14</sup> It has been reported following violent emesis, severe cough, blunt trauma, child birth, straining and weight-lifting.<sup>8,15</sup> The most common chest radiographic finding in BS is pleural effusion. Otherwise, chest film may reveal the V sign of Naclerio, which is caused by the collecting air in the mediastinum and along the diaphragm to form the shape of the letter V.<sup>16,17</sup> The most common CT findings showing the esophageal perforation directly are periesophageal air collections at a supra-diaphragmatic level in a typical location. The periesophageal air can sometimes extend to the periaortic and intraspinal regions and intra-abdominal space.

Also, pleural effusion, esophageal wall thickening, adjacent infiltrates, atelectasis, mediastinal fluid and pneumomediastinum are common findings of spontaneous esophageal perforation.<sup>18,19</sup>

The typical CT protocol for evaluating the esophagus with multidetector CT includes 3–5-mm slice thickness with 3–5-mm reconstruction interval. As compared to conventional CT, multidetector CT provides a more rapid scanning time and less misregistration from respiratory motion. It can demonstrate complex anatomy and evaluate the wall integrity of the esophagus by the capability of multiplanar reformation. Additionally, CT is a convenient and noninvasive imaging modality to evaluate the aorta and other mediastinal structures to differentiate from other non-esophageal intrathoracic diseases.<sup>3</sup>

Treatment of Mallory-Weiss tear and IMH is mainly conservative, with parenteral nutrition and intravenous analgesics.<sup>3,20</sup> BS is a lethal condition of esophageal rupture with a mortality of 10–50%.<sup>21</sup> Because BS often develops rapid onset of severe fatal mediastinitis, early aggressive surgical intervention is recommended.<sup>22,23</sup>

Multidetector CT is a useful noninvasive imaging modality for accurate diagnosis of spontaneous intramural and transmural ruptures of the esophagus, and aids in differential diagnosis from aortic and other mediastinal diseases with acute chest pain in the ED. Emergency physicians should consider these diseases in the differential diagnosis of acute chest pain.

## References

1. Modi P, Edwards A, Fox B, Rahamim J. Dissecting intramural haematoma of the oesophagus. *Eur J Cardiothorac Surg* 2005;27:171–3.
2. Kerr WF. Spontaneous intramural rupture and intramural haematoma of the oesophagus. *Thorax* 1980;35:890–7.
3. Restrepo CS, Lemos DF, Ocazonez D, Moncada R, Gimenez CR. Intramural hematoma of the esophagus: a pictorial essay. *Emerg Radiol* 2008;15:13–22.
4. Borrie J, Sheat J. Spontaneous intramural oesophageal perforation. *Thorax* 1970;25:294–300.
5. Jalihal A, Jamaludin AZ, Sankarakumar S, Chong VH. Intramural hematoma of the esophagus: a rare cause of chest pain. *Am J Emerg Med* 2008;26:843.
6. Spiller RC, Catto JV, Kane SP. Spontaneous dissecting intramural haematoma of the oesophagus: a rare cause of haematemesis and dysphagia. *Endoscopy* 1981;13:128–30.
7. Tong M, Hung WK, Law S, Wong KH, Kwok KF, Wong J. Esophageal hematoma. *Dis Esophagus* 2006;19:200–2.
8. Younes Z, Johnson DA. The spectrum of spontaneous and iatrogenic esophageal injury: perforations, Mallory-Weiss tears, and hematomas. *J Clin Gastroenterol* 1999;29:306–17.
9. Cullen SN, McIntyre AS. Dissecting intramural haematoma of the oesophagus. *Eur J Gastroenterol Hepatol* 2000;12:1151–62.
10. Enns R, Brown JA, Halparin L. Intramural esophageal hematoma: a diagnostic dilemma. *Gastrointest Endosc* 2000;51:757–9.
11. Lowman RM, Goldman R, Stern H. The roentgen aspects of intramural dissection of the esophagus. The mucosal stripe sign. *Radiology* 1969;93:1329–31.
12. Fadoo F, Ruiz DE, Dawn SK, Webb WR, Gotway MB. Helical CT esophagography for the evaluation of suspected esophageal perforation or rupture. *AJR Am J Roentgenol* 2004;182:1177–9.
13. Meulman N, Evans J, Watson A. Spontaneous intramural haematoma of the oesophagus: a report of three cases and review of the literature. *Aust N Z J Surg* 1994;64:190–3.
14. Maher MM, Murphy J, Dervan P, O'Connell D. Aorto-oesophageal fistula presenting as a submucosal oesophageal haematoma. *Br J Radiol* 1998;71:972–4.
15. Curci JJ, Horman MJ. Boerhaave's syndrome: the importance of early diagnosis and treatment. *Ann Surg* 1976;183:401–8.
16. Ng CS, Mui WL, Yim AP. Barogenic esophageal rupture: Boerhaave syndrome. *Can J Surg* 2006;49:438–9.
17. Rochford M, Kiernan TJ. Images in emergency medicine. Boerhaave's syndrome (spontaneous esophageal rupture). *Ann Emerg Med* 2007;49:746, 777.
18. Di Maggio EM, Preda L, La Fianza A, Dore R, Pallavicini D, Di Maggio G, Campani R. Spontaneous rupture of the esophagus (Boerhaave syndrome): computerized tomography diagnosis in atypical clinical presentation. *Radiol Med (Torino)* 1997;94:52–7.
19. Ghanem N, Altheoefér C, Springer O, Furtwängler A, Kotter E, Schäfer O, Langer M. Radiological findings in Boerhaave's syndrome. *Emerg Radiol* 2003;10:8–13.
20. Barone JE, Robilotti JG, Comer JV. Conservative treatment of spontaneous intramural perforation (or intramural hematoma) of the esophagus. *Am J Gastroenterol* 1980;74:165–7.
21. Lewis AM, Dharmarajah R. Walked in with Boerhaave's. *Emerg Med J* 2007;24:e24.
22. Mackler SA. Spontaneous rupture of the esophagus: an experimental and clinical study. *Surg Gynecol Obstet* 1952;95:345–6.
23. Tsalis K, Vasiliadis K, Tsachalis T, Christoforidis E, Blouhos K, Betsis D. Management of Boerhaave's syndrome: report of three cases. *J Gastrointest Liver Dis* 2008;17:81–5.