The Journal of Emergency Medicine, Vol. 43, No. 6, pp. e419–e423, 2012

0736-4679/$ - see front matter

ELSEVIER

doi:10.1016/j.jemermed.2011.05.079

Clinical Communications: Adults

A CASE OF RAPID DIAGNOSIS OF BOERHAAVE SYNDROME BY THORACIC DRAINAGE

Manabu Suzuki, MD,*† Naoki Sato, MD,* Junya Matsuda, MD,* Naoya Niwa, MD,* Koji Murai, MD,* Takeshi Yamamoto, MD,* Shinhiro Takeda, MD,* Kengo Shigehara, MD,‡ Tsutomu Nomura, MD,‡ Akihiko Gamma, MD,† and Keiji Tanaka, MD*

*Intensive and Cardiac Care Unit, †Internal Medicine, Department of Pulmonary Medicine, Infection, and Oncology, and ‡Surgery for Organ Function and Biological Regulation, Graduate School of Medicine, Nippon Medical School, Tokyo, Japan

Reprint Address: Manabu Suzuki, MD, Intensive and Cardiac Care Unit, Nippon Medical School, 1-1-5 Sendagi, Bunkyo-ku, Tokyo 113-8603, Japan

□ **Abstract—Background: Boerhaave syndrome is a rare and often fatal syndrome. Delayed diagnosis and treatment is closely associated with prolonged morbidity and increased mortality. In general, esophagography is usually chosen as the diagnostic procedure, but it has a relatively high false-negative rate. There are no reports, to our knowledge, regarding the efficacy of thoracic drainage, although it is easier to perform and more immediate than esophagography in the emergency department. Objectives: To report the efficacy of thoracic drainage for rapid diagnosis and treatment of Boerhaave syndrome. Case Report: An 80-year-old woman was admitted with vomiting and sudden onset of postprandial chest pain radiating to the back. Initially, myocardial infarction or aortic dissection was suspected, but was excluded by point-of-care tests and computed tomography (CT) scan, which revealed a left-sided pneumothorax, heterogeneous left pleural effusion, and pneumomediastinum at the lower level of the esophagus. Boerhaave syndrome was suspected and confirmed by thoracic drainage, which drained off bloody fluid and residual food such as broccoli. Emergency thoracotomy was performed within 4 h after onset of symptoms. The patient made an uneventful recovery. Conclusion: Findings in this case indicate that chest pain, left-sided massive effusion on chest radiography, and left-sided massive heterogeneous effusion on CT scan are important for the diagnosis of Boerhaave syndrome. Subsequent thoracic drainage is useful for confirming Boerhaave syndrome, and such a strategy might lead to a good prognosis for patients with this rare but critical disease.** **Crown Copyright © 2012 Published by Elsevier Inc.**

□ **Keywords—chest pain; differential diagnosis; pleural effusion; esophagography; mortality; Boerhaave syndrome**

INTRODUCTION

Spontaneous esophageal rupture, called Boerhaave syndrome, was first described by Dutch physician Hermann Boerhaave in 1724 (1). Boerhaave syndrome is rare and occurs mainly in males and at the left posterolateral wall of the distal esophagus without any apparent precipitating factor. Previous case reports have focused on clinical features, work-up, and prognosis without any description of how to diagnose and rapidly treat it (2–8). Delayed diagnosis and treatment are closely associated with prolonged morbidity and increased mortality. The nonspecific nature of the symptoms may contribute to a delay in diagnosis and lack of appropriate treatment, often resulting in a fatal outcome due to subsequent mediastinitis or sepsis. Mortality ranges from 10% to 50% or greater, depending on the speed of diagnosis and adequate treatment (9). Water-soluble contrast esophagography is usually chosen as the diagnostic procedure. However,

RECEIVED: 17 June 2010; FINAL SUBMISSION RECEIVED: 21 October 2010;
ACCEPTED: 20 May 2011

Table 1. Laboratory Findings on Admission

Hematology		Biochemistry		Rapid test	
WBC	7100/μL	GOT	19 IU/L	TROP-T	(–)
RBC	383 $\times$ 10^4/μL	GPT	14 IU/L	H-FABP	(–)
Hb	12.2 g/dL	LDH	200 IU/L	D-dimer	0.38 μg/mL
Ht	37.6%	T.Bil	0.3 mg/dL	Pro-BNP	452 pg/mL
Plt	21.9 $\times$ 10^4/μL	CK	72 IU/L		
		CK-MB	1.5 ng/mL	Arterial blood gas analysis (12 L/min with reservoir mask)	
Coagulation		TP	7.3 g/dL		
PT-INR	0.90	Alb	4.9 g/dL		
APTT	23.0 s	BUN	18.3 mg/dL	pH	7.356 mm Hg
Fibrinogen	278 g/dL	Cr	1.09 mg/dL	pO_2	79.2 mm Hg
		Na	147 mEq/L	pCO_2	49.8 mm Hg
		K	4.1 mEq/L	HCO_3^-	26.8 mmol/L
		Cl	103 mEq/L	BE	1.2 mmol/L
		CRP	< 0.10 mg/dL	SaO_2	93.4%
		Glu	196 mg/dL		

WBC = white blood cell; RBC = red blood cell; Hb = hemoglobin; Ht = hematocrit; Plt = platelet; PT-INR = prothrombin time-international normalized ratio; APTT = activated partial thromboplastin time; GOT = glutamic oxaloacetic transaminase; GPT = glutamic pyruvic transaminase; LDH = lactate dehydrogenase; CK = creatinine phosphokinase; CK-MB = creatinine phosphokinase-MB; TP = total protein; Alb = albumin; BUN = blood urea nitrogen; Cr = creatinine; Na = sodium; K = potassium; Cl = chloride; CRP = C-reactive protein; Glu = glucose; H-FABP = heart-type fatty acid-binding protein; Pro-BNP = Pro-brain natriuretic peptide; HCO_3^- = bicarbonate ion; BE = base excess; SaO_2 = oxygen saturation.

a relatively high false-negative rate (15–25%) has been reported, and furthermore, esophagography is not performed immediately after admission (10). The other technique to confirm the diagnosis, thoracentesis or thoracic drainage, has been reported in the literature (4,6). We report here a case of Boerhaave syndrome that was rapidly diagnosed and treated by immediate thoracic drainage, which drained off food particles such as broccoli that were visible with the naked eye.

Immediate thoracic drainage is useful in such a case. However, to our knowledge, the efficacy of thoracic drainage for confirming Boerhaave syndrome has not been previously reported.

CASE REPORT

An 80-year-old woman presented with vomiting and sudden onset of postprandial chest pain radiating to the back. Initially, acute myocardial infarction or aortic dissection was suspected, and the patient was admitted to the Cardiac Care Unit of Nippon Medical School Hospital. Forty minutes after the onset of her symptoms, she arrived in our intensive and cardiac care unit. On admission, she had chest pain and tachypnea. Her height was 148 cm and her weight was 57 kg. Blood pressure was 150/84 mm Hg, the same in both arms. Pulse rate was 118 beats/min and regular. Body temperature was 35.2°C. Percutaneous oxygen saturation was 93.4% on 12 L/min with a reservoir mask. Breathing sounds were diminished on the left side. Hematological and biochemical analyses of troponin T, heart-type fatty acid binding protein, and D-dimer were within the normal range (Table 1). Electrocardiogram and echocardiogram were both unremarkable. Chest X-ray study on admission revealed a right-sided shift of the mediastinum, a decrease in the volume of the left aerated lung, and a left-sided pleural effusion (Figure 1A). Chest computed tomography (CT) scan was performed to rule out acute aortic dissection. The CT scan showed a left-sided pneumothorax, heterogeneous left pleural effusion, and pneumomediastinum at the lower level of the esophagus (Figure 1B, C).

Two hours after the onset of the patient's symptoms, Boerhaave syndrome was suspected and confirmed by thoracic drainage, which drained off bloody fluid and residual food, including broccoli (Figure 1D). Emergency thoracotomy was performed within 4 h of symptom onset. Extensive mediastinitis and a linear rupture of the distal lateral wall of the esophagus were observed. The lesion was repaired and mediastinal fat was reinforced; thoracic and feeding tubes were then inserted. Water-soluble contrast esophagography was performed on the 10th post-operative day and was unremarkable. The patient made an uneventful recovery.

DISCUSSION

Delayed diagnosis and treatment of Boerhaave syndrome, especially more than 24 h after symptom onset, is reportedly fatal (2–8). The patient in this case received immediate thoracic drainage that confirmed the diagnosis of Boerhaave syndrome, and she was treated rapidly and recovered. The process of thoracic drainage was very important for the rapid diagnosis in our case; however, to the best of our knowledge, it has not been previously reported.

Boerhaave syndrome typically occurs in patients aged 40–60 years and is more common in men than in women