Acute Esophageal Necrosis Associated with Esophageal Foreign Body Injury and the Development of Pneumomediastinum

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CASE REPORT

A 74-year-old woman complained of dysphagia and hemoptysis after ingesting a fragment of crab shell while eating crab salted-fermented fish products, and presented dyspnea that had lasted for three days. Computed tomography indicated pneumomediastinum. Laboratory results revealed acute renal failure. The patient experienced respiratory distress and shock over the days following her initial presentation. Upper gastrointestinal endoscopy revealed black pigmentation of the esophageal mucosa from the middle to lower esophagus. Despite intensive care, the patient’s condition deteriorated and she died. This is the first case of acute esophageal necrosis associated with esophageal foreign body injury and the development of pneumomediastinum reported in Korea.

Keywords: Acute esophageal necrosis; Foreign body injury; Endoscopy; Pneumomediastinum

INTRODUCTION

Acute esophageal necrosis (AEN) is a rare condition characterized by endoscopic findings of dark esophageal discoloration that abruptly stops at the gastroesophageal junction [1-3]. The reported incidence of AEN is very low, ranging from 0.0125 to 0.2% [4,5]. The precise etiology of AEN is unknown, but the condition appears most often to arise from ischemia, viral infection, trauma, or corrosive injury [4,6,7]. The most common clinical presentation is upper gastrointestinal bleeding [8,9]. The prognosis of AEN is variable, and depends on the underlying illness [1]. We describe a case of AEN associated with pneumomediastinum that was caused by esophageal injury.

CASE REPORT

A 74-year-old woman complained of dysphagia and hemoptysis after ingesting a fragment of crab shell while eating crab salted-fermented fish products and presented to our department with dyspnea that had lasted for three days. The patient had a history of diabetes mellitus and hypertension. Upon admission to our hospital, she was afebrile, with a regular pulse of 99 bpm, a blood pressure of 160/70 mmHg, and a respiratory rate of 20 breaths/min. She suffered from dyspnea, but O2 saturation was sustained over 95% with 4 L of O2 administered by nasal cannula. The digital rectal examination was negative for blood. A test irrigation with normal saline via a nasogastric tube was also negative for blood. Non contrast-enhanced computed tomography revealed extensive pneumomediastinum but no definite esophageal injury site (Fig. 1). The patient’s laboratory values included white blood cell count 6,560/µL (neutrophils 84.1%), hemoglobin 13.4 g/dL, platelets 219,000/µL, blood urea nitrogen 106.5 mg/dL, creatinine 8.97 mg/dL, total bilirubin 6.1 mg/dL, sodium 124 mmol/L, and potassium 4.1 mmol/L. Laboratory investigation revealed acute renal failure. The patient was transferred to the intensive care unit and started continuous renal replacement therapy. On day 3, the patient suffered severe dyspnea and desaturated and was connected to mechanical ventilation. Endoscopy revealed black pigmentation of the esophageal mucosa with a friable hemorrhagic area covered with yellowish exudate from the mid to distal esophagus. There was no evidence of perforation throughout esophagus (Fig. 2A). The black pigmentation of the mucosa ended sharply at the gastro-
esophageal junction (Fig. 2B). An esophageal biopsy indicated an ulcer and necroinflammatory exudate (Fig. 3). Periodic acid-Schiff staining revealed no identifiable fungal hyphae. Immunohistochemical staining for cytomegalovirus was negative.

Despite intensive care, the patient remained hemodynamically unstable and required the administration of vasoactive agents. Her condition deteriorated over the following days. She went into multisystem organ failure and died from septic shock.

**DISCUSSION**

AEN, also known as black esophagus, is a rare condition [1-3]. It was first described by Goldenberg et al. [10] in 1990. The reported incidence of AEN is very low, ranging from 0.01 to 0.2% [5]. The most common clinical manifestation of AEN is upper gastrointestinal bleeding, but other common symptoms are epigastric pain or burning, dysphagia, and vomiting [4,5,11]. Malignant melanoma, acanthosis nigricans, pseudomelanosis, melanosis, coal dust deposition, and corrosive ingestion are conditions that should also be considered in differential diagnosis [9,12].

The pathogenesis of AEN appears to be multifactorial, and ischemia is the most likely cause [11]. The most frequent involved location of AEN is the distal third of the esophagus, which is less vascularized than the proximal and middle esophagus [6,9,13]. AEN is associated with multiple medical conditions including renal insufficiency, diabetes mellitus, cardiovascular disease, hemodyna-
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In our case, esophageal foreign body injury causing pneumomediastinum seems to have played an important role in selective esophageal ischemia. Most such foreign bodies will pass spontaneously without causing any complications. However, complications secondary to sharp esophageal foreign body injury have been reported such as esophageal perforation, fistulae, and pleural empyema [16]. Pneumomediastinum is normally complicated by either esophageal or pulmonary rupture, and esophageal rupture can occur as a result of foreign bodies or trauma in the system [17]. In a previous retrospective AEN case series, the most serious complications reported were mediastinitis and pneumomediastinum [1]. Our patient also had risk factors including old age, diabetes mellitus, prolonged hypotension and sepsis.

Several viral or fungal infections such as cytomegalovirus and Candida albicans can cause AEN [8,11,18]. However, immunohistochemical staining for cytomegalovirus and Periodic acid-Schiff staining for fungal infections were negative in our case.

The treatment of AEN is supportive, including adequate hydration and the use of proton pump inhibitors in most cases. Treatment should also address any comorbidities.

The prognosis of AEN patients is variable and depends on underlying clinical conditions. Deaths secondary to AEN occur in less than 6% of cases [9].

In conclusion, we present the first case of AEN associated with esophageal foreign body injury and the development of pneumomediastinum in Korea.

REFERENCES