

Case report

## A Case of Descending Necrotizing Mediastinitis Penetrating to the Esophagus

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### Abstract

Here, we present the case of a 78-year-old man with a deep neck infection that caused descending necrotizing mediastinitis that extended from the pharynx to the stomach and was accompanied by two large esophageal fistulas and multiple gastric ulcers. We believe that the series of lesions were the signs of a hidden carcinoma.

**Key words:** tonsillitis, cervical cellulitis, cervical abscess, descending necrotizing mediastinitis, esophageal abscess, gastric ulcer, conservative treatment

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### Introduction

Malignant tumors are associated with 2.3% of cervical abscesses caused by cellulitis and are associated with abscesses in the head and neck region resulting from odontitis, peritonsillitis or cervical cellulites<sup>1</sup>. Moreover, these ailments sometimes lead to descending necrotizing mediastinitis (DNM) as a life-threatening complication. DNM in turn can be followed by severe complications, such as tracheal rupture, vascular compression<sup>2</sup>, septic shock<sup>3</sup> and multiorgan failure, including pneumonia and cardiac or renal failure<sup>3, 4</sup>. This is especially true for patients with immune system disorders such as those caused by diabetes mellitus. On the other hand, esophageal perforation caused by DNM has been only reported in a single retrospective study by Roccia *et al.*<sup>3</sup>, and the details remain unclear. Here, we present the case of a 78-year-old man with DNM caused by deep neck infection, which was accompanied with two large esophageal fistulas and multiple gastric ulcers.

### Case Report

A 78-year-old man presented at our hospital with elevated body temperature, dysphagia and an abnormal sensation on the right side of his neck, all of which had persisted for 7 days. The patient had previously been administered broad-spectrum intravenous antibiotics for 2 days by another physician, who made a diagnosis of right peritonsillitis and referred the patient to our hospital. The patient's medical history consisted of only hyperlipidemia, which was diagnosed when he was 60 years old and is being treated with oral medication, and angina pectoris, which was diagnosed when he was 75 years old and was being treated with nitroglycerin. He had no remarkable family history.

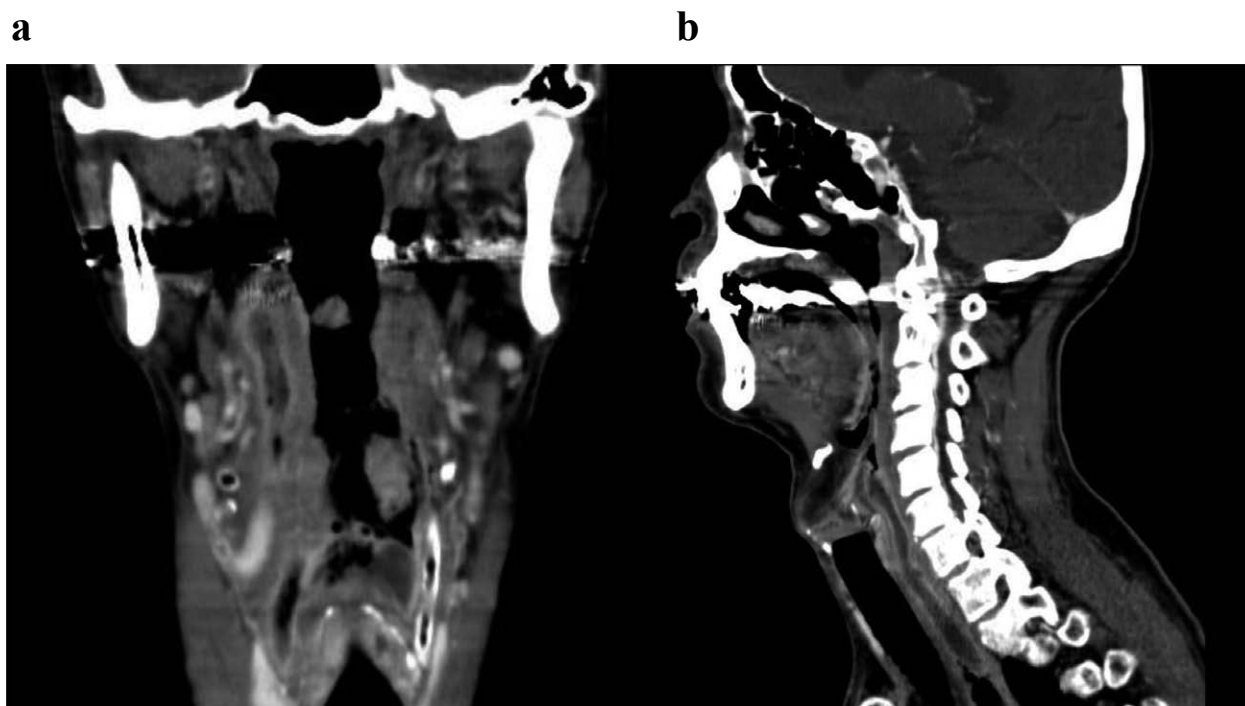
Upon initial examination, we did not detect right peritonsillitis, a neck mass, neck erythematous swelling or neck tenderness, though we did detect a small amount of serous fluid in a piriform sinus. The laboratory findings were as follows: WBC count, 9,050 cells/ $\mu$ l with 93% segmental neutrophils; C-reactive protein, 18.39 mg/dl; K, 5.04 mEq/l; Hb, 13.4 g/dl; and BUN, 21 mg/dl. At that time, the patient was administered fluid, hydrocortisone, cefazolin (CEZ) and clindamycin (CLDM) while he abstained from eating any food. On his second day in hospital, the patient began to cough up sputum with a strong effluvium.

Computed tomography performed on day 3 revealed an abscess extending from the right parapharyngeal space to the thoracic level of the left esophagus; the lesion progressed from the right to left side at the laryngeal level (Figure 1a). The vertical length of the lesion was more than 10 cm (Figure 1b). Based on the patient's history and the radiological findings, DNM, probably following peritonsillar cellulitis, was diagnosed. The CEZ and CLDM were replaced by carbapenem (PAPM/BP) with human gamma globulin, and the patient markedly improved by day 7; his WBC count declined to 6,620 cells/ $\mu$ l; C-reactive protein was down to

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**Figure 1.** Coronal and sagittal computed tomography images of the neck on day 3. An abscess was observed on the right parapharyngeal space and left hypopharynx. It is supposed that the abscess descended across from right to left at the laryngeal level (Fig. 1a). The pharyngeal abscess descended to the breastbone level via the left side of the esophagus. The longer axis extended to over 10 centimeters (Fig. 2b).

2.25 mg/dl; and his RBCs, Hb and Ht had declined to 330 cells/ml, 10.7 gm/dl and 31.5%, respectively. An oral proton pump inhibitor taken orally was added to the patient's medication, and the hydrocortisone was tapered until it was discontinued on day 9.

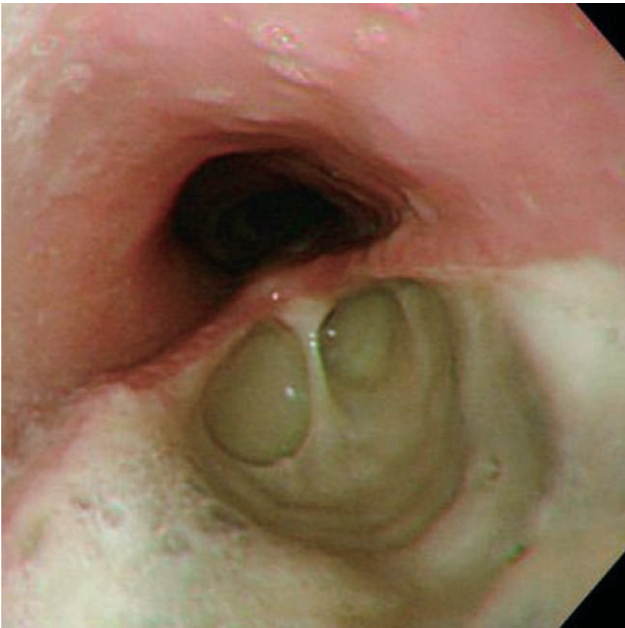
A gastrointestinal endoscopic examination performed on day 9 revealed two large esophageal fistulas, respectively, located between the esophageal orifice and broncho-aortic constriction (Figure 2). Also detected were three ulcers, respectively, situated on the posterior wall of the body and the anterior and posterior walls of the greater curvature of the stomach (Figure 3). When computed tomography and direct gastrointestinal endoscopic examination were subsequently performed on days 22 and 28, no abscesses were detected, and healing of the gastric ulcers was at the H2 stage. Moreover, pathological examination revealed no malignant cells in either the esophagus or stomach (Figure 4).

## Discussion

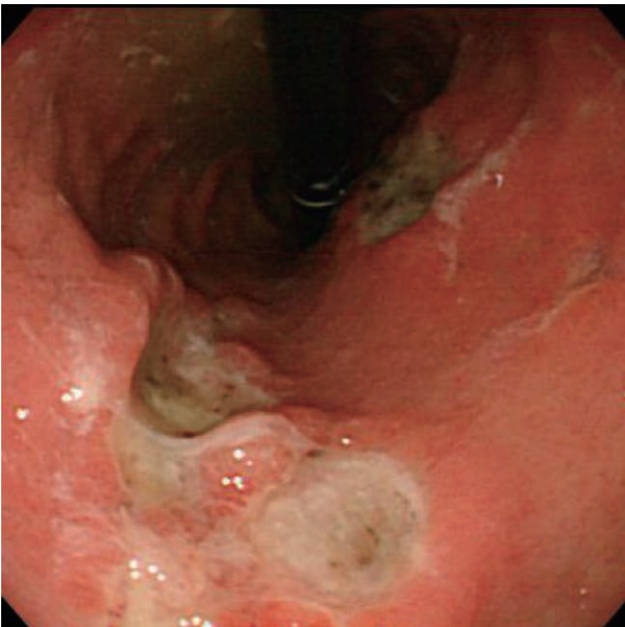
An elevated WBC count with a high concentration of segmental neutrophils accompanied by elevated C-reactive protein and hyperkalemia suggested a serious infection in

this patient. On day 3, DNM was diagnosed based on CT findings and the absence of any obvious neck abnormality, which is consistent with the earlier reported findings of Endo *et al.*<sup>5)</sup>. Although surgical drainage is recommended for treatment of DNM<sup>6, 7)</sup>, we chose a conservative treatment consisting of broad-spectrum intravenous antibiotic therapy because the thoracic abscess was thought to have caused the fistula into the esophageal lumen. Although mediastinitis secondary to esophageal perforations is associated with a high rate of mortality, broad-spectrum intravenous antibiotic therapy is reportedly a satisfactory approach<sup>8)</sup>.

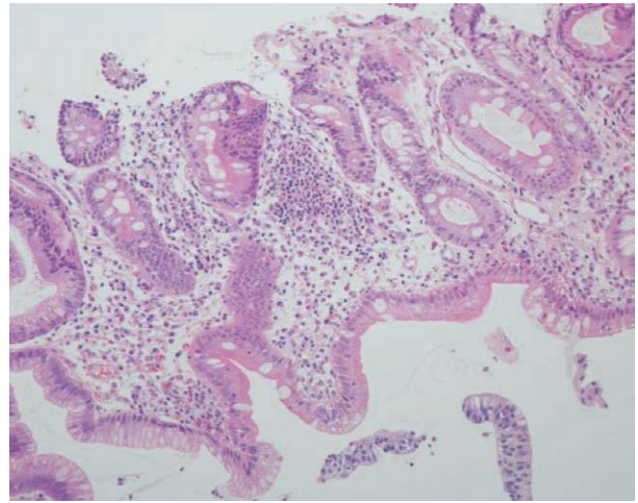
On day 9, direct upper gastrointestinal endoscopic examination revealed two large esophageal fistulas and three gastric ulcers that perhaps formed as a result of the rupture of submucosal lesions. When multiple ulcers appear in both the pharynx and esophagus, double cancer or advanced esophageal cancer with multiple gastric lesions should be considered. Other differential diagnoses include infectious diseases such as tuberculosis and cytomegalovirus infection, systemic diseases such as sarcoidosis and benign tumors such as gastrinoma. In the present case, the possibility of malignant lesions was excluded by repeated examinations. Although the origins of deep neck infections remain



**Figure 2.** Esophageal findings on day 9. There were two major fistulas on the left side of the esophagus, 15 and 20 centimeters, respectively, from an incisor (figure corresponding to the upper sides of the fistulas).



**Figure 3.** Gastric findings on day 9. Three ulcers located on posterior wall of body and anterior and posterior walls of the greater curvature of the stomach showed no petechial hemorrhage and no erosion circumferentially.



**Figure 4.** Pathology of the gastric mucosa on day 28. There were no malignant cells in the gastric mucosa and the gastric ulcers were diagnosed as being at the H2 stage.

unknown in 22% to 50% of patients, despite detailed examination<sup>1, 10, 11</sup>), in the present case, we were able to diagnose DNM following peritonitis that penetrated into the esophagus and produced multiple gastric ulcers. That said, close follow-up is required in this case because deep neck infections are sometimes associated with occult tumors<sup>12, 13</sup>). In addition, the mechanism by which DNM led to formation of the esophageal fistulas and gastric ulcers remains unknown.

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