

## CLINICAL IMAGE

# Esophageal perforation and epidural emphysema as complications of nasogastric tube placement

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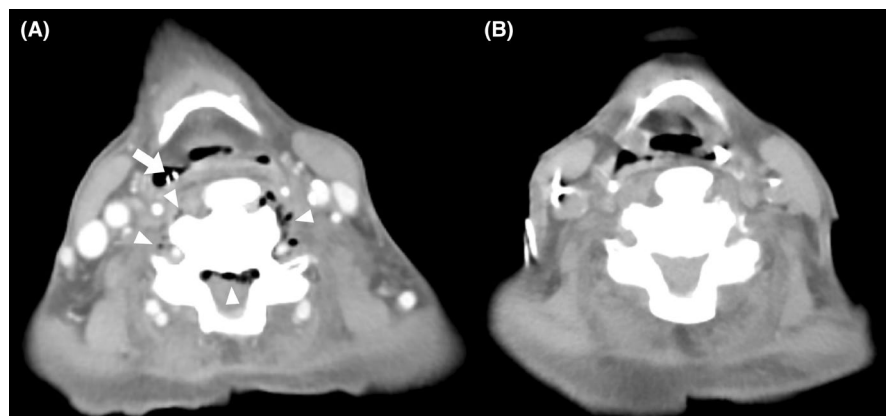
Email: [yusukeito.mi@gmail.com](mailto:yusukeito.mi@gmail.com)**KEYWORDS**

epidural emphysema, esophageal perforation, nasogastric tube

A 72-year-old man with end-stage renal disease and Hashimoto encephalopathy requiring 25 mg/day of prednisone was referred from another hospital with chief complaints of neck and left shoulder pain. The patient was unable to eat orally because of cerebral dysfunction, requiring nasogastric tube placement for nutrition. He had experienced recurrent self-extraction and reinsertion of the tube, with the current insertion 12 days prior. Three days prior to the presentation, he complained of neck and left shoulder pain. The patient did not report any limited range of motion in the neck or shoulders, arthralgia, muscle tenderness, chest pain, shortness of breath, limb weakness, or paresthesia. On physical examination, he was afebrile, with a heart rate of 81/min, and a blood pressure of 92/46 mm Hg. There was no warmth, edema, erythema, or crepitus in the neck or extremities. Laboratory tests revealed an elevated white blood cell count of 15,010/ $\mu$ L and a serum C-reactive protein level of 20.47 mg/

dL (reference range: <0.3 mg/dL). Computed tomography (CT) scan revealed cervical emphysema around the tube and in the epidural space (Figure 1A), consistent with epidural emphysema because of esophageal perforation by a nasogastric tube. Cerebrospinal fluid culture was negative, and two sets of blood cultures were positive for *Enterococcus* species. The tube was removed, and intravenous ceftazolin 1 g/day plus clindamycin 1200 mg/day was started. The neck and shoulder pain subsequently improved. On Day 41 of hospitalization, a CT scan showed resolution of the emphysema (Figure 1B).

To our knowledge, this is the first report of esophageal perforation and epidural emphysema as complications of nasogastric tube placement. Common causes of epidural emphysema include herniated intervertebral disc, barotrauma, surgical, diagnostic or anesthetic procedures, and peritoneal penetration.<sup>1</sup> Epidural emphysema caused by esophageal perforation has been rarely reported, which



**FIGURE 1** (A) An axial view of cervical CT revealed a nasogastric tube (arrow) and subcutaneous and epidural emphysema (arrowhead). (B) CT on Day 41 revealed resolution of subcutaneous and epidural emphysema.

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was associated with esophageal carcinoma.<sup>2</sup> Emphysema is generally considered to be a condition with a good prognosis.<sup>3</sup>

Esophageal perforations are mostly because of iatrogenic esophageal injury,<sup>4</sup> including nasogastric tube insertion.<sup>5</sup> Typically, air leakage from esophageal perforation because of nasogastric tube insertion is limited and unlikely to cause epidural emphysema. However, tissue vulnerability from conditions such as esophageal cancer or chronic use of steroids may lead to air leakage sufficient to cause epidural emphysema in patients with esophageal perforation, as in our case.<sup>2,6</sup> This case demonstrates that esophageal perforation because of nasogastric tube insertion with epidural emphysema can be effectively managed with antibiotic therapy and close monitoring. Although nasogastric tube insertion is a common procedure, clinicians should remain vigilant for its complications, and if there are signs of accidental tube obstruction or dysfunction, or if symptoms appear in the head, neck, or upper torso, a thorough evaluation for potential complications is crucial.

#### CONFLICT OF INTEREST STATEMENT

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

#### ETHICS STATEMENT

Ethics approval statement: None.

Patient consent statement: We explained this report to the patient and his family members. The patient consented the publication, but did not write down the form because of cerebral dysfunction. Written informed consent was obtained from his relative.

Clinical trial registration: None.

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