


## CASE REPORT

# Two cases of cervical esophageal perforation treated by surgery

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## Abstract

Cervical esophageal perforation is rare, but it is associated with high mortality. We describe two patients with cervical esophageal perforation that required surgical treatment. In both cases, good outcomes were evenly achieved, despite the presence of risk factors. A prompt diagnosis and treatment with collaboration between a surgeon and a gastroenterologist are important.

## KEYWORDS

esophageal perforation, foreign body, gastroscop

## 1 | INTRODUCTION

Cervical esophageal perforation is rare, but it is associated with high mortality. It is most commonly caused by instrumentation, with other causes including foreign bodies, spontaneous rupture, and trauma; it also occurs secondary to the underlying esophageal disease. Esophageal perforation due to foreign bodies is relatively rare but is more common in Asian countries. We report on two patients with cervical esophageal perforation that required surgical treatment.

This retrospective study was approved by the Institutional Review Board of Yamaguchi Red Cross Hospital (R3-13).

## 2 | PATIENT 1

The patient was an 89-year-old man with a history of cerebral infarction, chronic gastritis, and Mallory-Weiss

syndrome. He underwent upper gastrointestinal endoscopy; however, there was difficulty in inserting the endoscope from the hypopharynx into the cervical esophagus (Figure 1A). Computed tomography (CT) confirmed extensive emphysema extending from the deep neck to the mediastinum and retroperitoneum (Figure 1B). Seven hours after injury, neck abscess incision and trans-cervical mediastinal drainage were performed (Figure 1C). The perforation was small and difficult to identify, and the patient was discharged 25 days later; however, the left vocal cord paralysis remained as a sequela.

## 3 | PATIENT 2

The patient was a 57-year-old woman that had a sore throat after eating fish. She was taken to the hospital 2 days later. Ultrasonography (US) and CT showed a foreign body (fish bone) in the cervical esophagus and an abscess

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**FIGURE 1** (A) Endoscopy strayed from the left cricopharyngeal level into the blind end. (B) CT confirmed extensive emphysema extending from the deep neck to the mediastinum and retroperitoneum (Yellow arrows). (C) Neck abscess incision and trans-cervical mediastinal drainage were performed (base of the neck is on the left).

in the dorsal right lobe of the thyroid gland (Figure 2A,B). Incision of the neck abscess and neck drainage, and endoscopic removal of the cervical esophageal foreign body were performed (Figure 2C,D). The perforation was small and difficult to identify, and the patient was discharged without sequelae 10 days later.

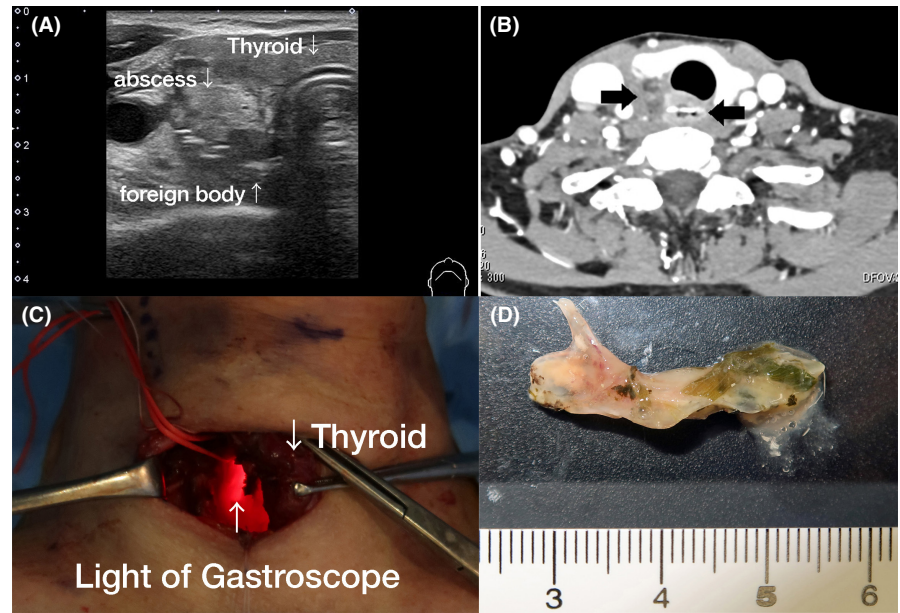
## 4 | DISCUSSION

The outcome of the treatment of esophageal perforation is affected by the location and size of the perforation, the age of the patient, the interval between perforation and diagnosis, the inflammatory status (as determined by the white blood cell count, CRP, and signs of sepsis), the etiology of the perforation, the nutritional status, and the presence of tumor or underlying disease. CT or US should be performed to identify possible complications (e.g., cervical and mediastinal abscess), especially since a delay in treatment of more than 24 h significantly increases mortality. The mortality rate at cases diagnosed at >24 h was reported to be 27% (0%–46%), while that in cases diagnosed within 24 h was reported to be 14% (0%–28%).<sup>1,2</sup>

The causes of cervical esophageal perforation include endoscopy, foreign bodies, tumors, and vomiting. The frequency of esophageal perforation during endoscopy is estimated to be 0.03%; by contrast, that during rigid endoscopy is reported to be 0.11%.<sup>3</sup> As foreign bodies, common offenders include chicken or fish bones, partial dentures, plastic eating utensils, and metal safety pins. Most fish bone cases have been reported from Asia, where the incidence of esophageal perforation is presumably higher for dietary reasons (fish consumption).<sup>4,5</sup> Esophageal perforation due to foreign bodies are most likely to occur in the cervical esophagus, which tend to impact or lodge in areas of natural anatomic narrowing (e.g., the cricopharynx, aortic notch, and gastroesophageal junction). In one study, 76% of cervical esophageal perforations occurred at the level of the cricopharynx, which is also vulnerable due to the lack of muscle covering posteriorly to Killian's triangle.<sup>3,5</sup>

Surgical treatment as soon as possible is the first-line approach for esophageal perforation; primary closure may be an option within 6 h.<sup>4</sup> Conservative treatment may be considered with mild and localized contamination, good drainage into the esophagus, stable general condition, and no foreign bodies. However, if symptoms persist for more than 24 h even with conservative treatment, immediate surgical treatment should be considered.<sup>3</sup> Fasting, nutritional management, antibiotic therapy, and glycemic control in diabetes mellitus are common. In our two patients, one was relatively old and had extensive emphysema, and in the other, treatment was initiated beyond 24 h and

**FIGURE 2** (A/B) US and CT showed a foreign body (fish bone) in the cervical esophagus and an abscess in the dorsal right lobe of the thyroid gland (Black arrows in CT). (C) Neck abscess incision, neck drainage, and endoscopic removal of the cervical esophageal foreign body were performed (base of neck at bottom). (D) The foreign body (fish bone) was removed.



had foreign bodies, so the treatment plan was surgical treatment.

In both of our patients, we achieved good outcomes after prompt joint treatment with thoracic surgery and gastroenterology, even with risk factors such as old age, extensive emphysema, initiation of treatment at more than 24h, and foreign bodies. In the case of patient 1, endoscopy strayed from the left cricopharyngeal level into the extra mucosal (muscular) layer of the esophagus, creating a blind end, which was presumed to have caused mediastinal and retroperitoneal emphysema from emphysema within the esophageal wall. Although the recurrent nerve was preserved by cervical manipulation, left vocal cord paralysis occurred, probably due to mediastinal manipulation. In the case of patient 2, the foreign body could not be seen on pharyngeal fiberscopy, and no obvious perforation of the foreign body could be seen from outside the cervical esophagus during the cervical operation. Intraoperatively, the gastroenterologist inserted an endoscope and was able to identify and remove the fish bone at the level of the foot from the right cricopharynx. The recurrent nerve was also preserved in this case, and there was no problem with postoperative vocal fold movement.

Less-invasive treatment of esophageal perforation has evolved over the years, including minimally invasive thoracoscopic surgery, endoscopic stenting, and metallic endoclip application; however, the choice of surgical treatment or less-invasive treatment must be made carefully.<sup>1,3,4</sup> Particularly in patients with high-risk factors, prompt treatment should be initiated after consultation with surgeons and gastroenterologists. In both of our

cases, we were able to achieve a successful outcome with the cooperation of surgeons and gastroenterologists.

## 5 | CONCLUSION

We reported the cases of two patients with cervical esophageal perforation that required surgical treatment. In both cases, good outcomes were evenly achieved, despite the presence of risk factors. A prompt diagnosis and treatment with collaboration between a surgeon and a gastroenterologist are important.

## AUTHOR CONTRIBUTIONS

Tetsuro Yasui, served as a doctor in charge of patient 2, Ryunosuke Kogo, served as a doctor in charge of patients 1 and 2, made substantial contributions to conception and design, acquisition of data, analysis, and interpretation of data. Kazuo Nishiyama, served as a doctor in charge of patient 1, Shinsaku Itoyama and Asano Iwamoto, served as doctors in charge of patient 2, made substantial contributions to the acquisition of data.

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## CONFLICT OF INTEREST

There is no conflict of interest.

## DATA AVAILABILITY STATEMENT

None.

## CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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