

Case Report

Successful treatment of left subclavian artery penetration due to ingestion of a safety pin by an elderly person

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Background: Ingestion cases are increasing in elderly persons. Herein, we report a rare case of ingestion of a safety pin by an elderly person.

Case presentation: The patient was an 87-year-old bedridden woman who had fever with left pleural effusion. Chest X-ray revealed a foreign body, confirmed to be a safety pin, in the cervical esophagus. A contrast multidetector row computed tomography scan revealed that the opened safety pin penetrated the left subclavian artery, leading to the diagnosis of an esophageal foreign body penetrating the left subclavian artery. The safety pin was removed, and the subclavian artery aneurysm caused by the penetration was embolized by interventional radiology. After treatment, she was returned to the nursing home on postoperative day 8.

Conclusion: Penetration by ingestion of a safety pin is rare; in this case, safe treatment was possible due to a team of certified specialist physicians and surgeons.

Key words: Aneurysm, esophageal foreign body, ingestion, safety pin, subclavian artery

INTRODUCTION

AGING POPULATIONS ARE growing in developed countries, especially in Japan; hence, diseases related to aging are also increasing.¹ Ingestion cases often occur in elderly persons and are presented to the emergency department due to progressive loss of physical, cognitive, and deglutition functions in these patients. In some cases, ingestion can result in serious complications because the esophagus is in contact with other important organs. We report the successful treatment of safety pin ingested by an elderly person that penetrated the left subclavian artery.

CASE REPORT

AN 87-year-old bedridden woman was transferred to the emergency department of our hospital for fever

with left pleural effusion. She was entering a nursing home and had a fever for 1 week. Her body temperature was 37.8 and her other vital signs were normal. On physical examination, her breath sounds were diminished on the left side. Chest X-ray revealed the foreign body, thought to be a safety pin, in the cervical esophagus, and a large quantity of pleural effusion collected in the left pleural cavity (Fig. 1A). Thoracentesis was carried out and the thoracentesis fluid was serous. A contrast multidetector row computed tomography (CT) scan revealed that an opened safety pin had penetrated the left subclavian artery (Fig. 1B). However, active bleeding could not be observed on the CT.

A diagnosis of esophageal foreign body penetrating the left subclavian artery was made, and immediate treatment was indicated. The patient was a bedridden elderly person with dementia, and surgery was dangerous in this case. Therefore, we planned non-operative treatment for her. In collaboration with otolaryngology, radiology, and cardiovascular surgery experts, the plan we formulated was as follows. The otolaryngologist would remove the penetrated safety pin under an esophagus direct-scope and the subclavian artery aneurysm caused by penetration would be treated using interventional radiology by the radiologist. If it became difficult to control the bleeding, it would be stopped using an occlusion balloon. The surgical procedure would

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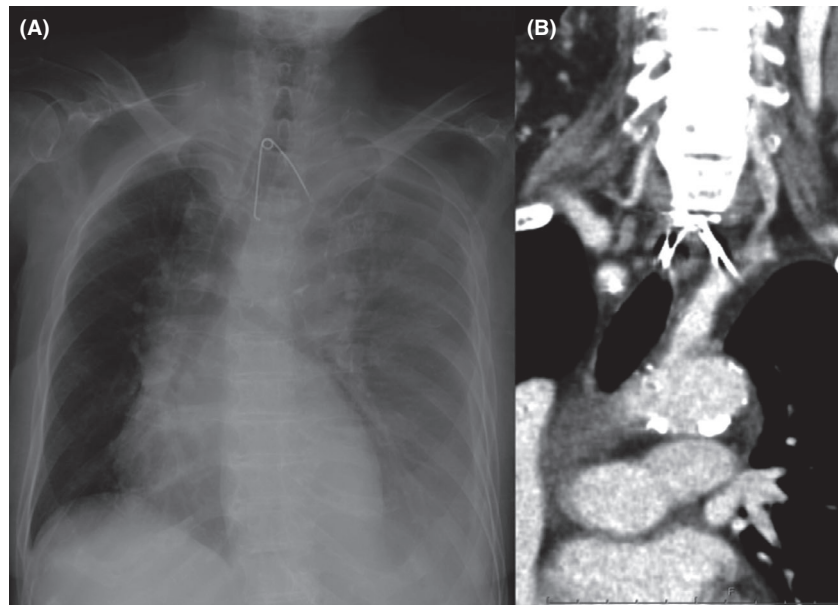


Fig. 1. Chest X-ray of an 87-year-old woman revealed a foreign body, thought to be a safety pin, in the cervical esophagus. A large quantity of pleural effusion was collected on the left pleural cavity. A, A contrast multidetector row computed tomography scan revealed the opened safety pin had penetrated the left subclavian artery. B, Active bleeding was not observed in the scan.

be carried out by the cardiovascular surgeon with the patient in a supine position and with a sternal splitting incision.

THERAPEUTIC PROCEDURE

THE PROCEDURE WAS carried out under general anesthesia in a hybrid operating room. First, angiography was carried out; the safety pin was located in the cervical esophagus and its needlepoint penetrated the esophagus wall and the left subclavian artery. It formed false aneurysms in the subclavian artery (Fig. 2A). After catheterization of the subclavian artery to prevent uncontrollable bleeding at the time of removal, an esophagus direct-scope examination was undertaken. It was observed that the needlepoint of the safety pin in the cervical esophagus had penetrated the left side of the esophageal wall. Hence, the safety pin was removed with a pair of forceps without resistance. A little pulsatile bleeding from the penetrated part was observed just after removal, but it soon stopped naturally without hematoma formation.

After the safety pin was removed, the subclavian artery contrast was undertaken again. Because a covered stent graft causes the risk of occluding the vertebral artery, we used a bare-metal stent. The bare-metal stent was inserted in the false aneurysm part. However, blood flow in the false aneurysm remained. Therefore, a coil was inserted into the aneurysm, which interrupted the flow, leading to minimal blood

loss (Fig. 2B). The procedure time was 2 h and 45 min. The postoperative course was uneventful; hence, we carried out esophagography and endoscopic examination, which revealed closedown of the penetrated fistula (Fig. 3). After the chest tube was removed, the patient was returned to the nursing home on postoperative day 8.

DISCUSSION

FOREIGN BODY INGESTION is a common public health problem. Although most gastrointestinal foreign bodies pass spontaneously, some result in mortality and morbidity.² In the USA, it was reported that foreign body ingestion caused approximately 1500 deaths per year.³ Generally, foreign body ingestion occurs more frequently in children than in adults, whereas esophageal food bolus is a more common problem in adults; however, true foreign body ingestions appear more often in the elderly population.⁴ The elderly population is rapidly increasing in Japan. The progressive loss of deglutition and cognitive function increases the risk of mis-swallowing in elderly people. According to a previous report, there are many types of aspirated objects, including dentures and fish bones. However, reports of safety pin ingestion in adults are relatively rare.⁵

A safety pin is different from a normal pin, which is shaped as a straight line. The safety pin has a clasp that

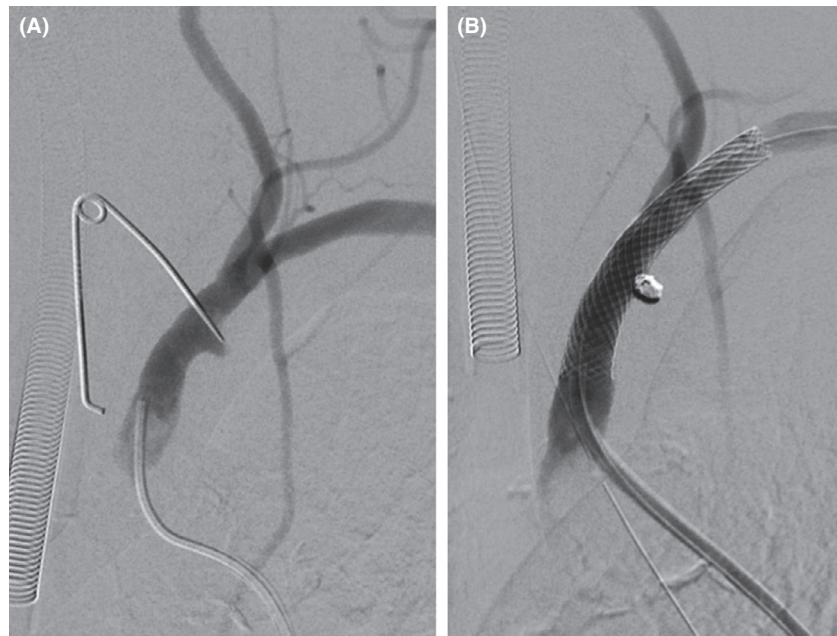


Fig. 2. Angiography of an 87-year-old woman who had ingested a safety pin. The pin was located in the cervical esophagus and the needlepoint penetrated an esophagus wall and the left subclavian artery. A, After the safety pin was withdrawn, the subclavian artery contrast was carried out again. A bare-metal stent was detained in the false aneurysm part. However, blood flow in the false aneurysm remained. B, A coil was inserted into the aneurysm and interrupted the blood flow.

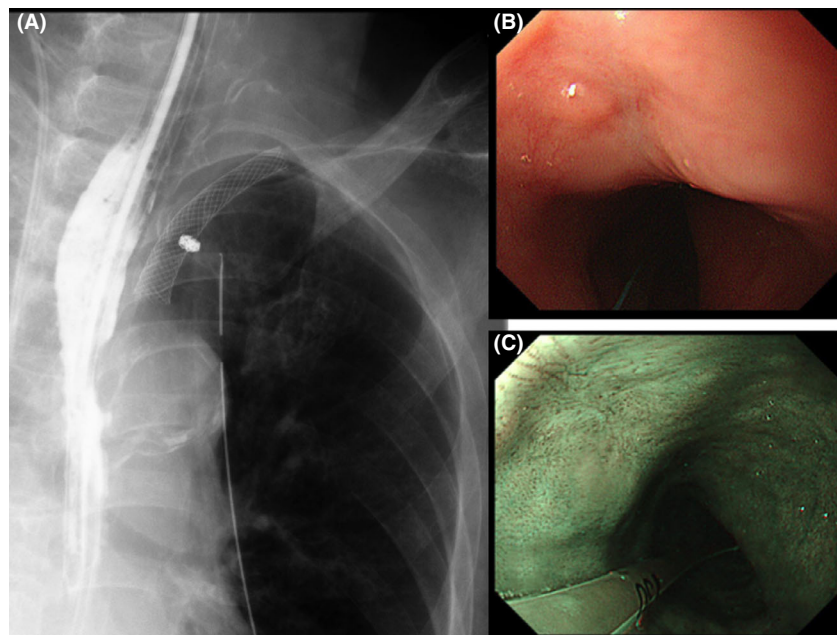


Fig. 3. Esophagography in an 87-year-old woman following the removal of a safety pin from her cervical esophagus. A, Esophagography showed no leakage of the esophagus. B, C, Endoscopic examination revealed close-down of the penetrated fistula of the esophagus with scar tissue.

covers the needlepoint, and it is thought to be safer than other type of pins. In addition, it is difficult for an open safety pin to pass through the pharyngoesophageal junction by deglutition. However, in this case, the closed safety pin entered the pharyngoesophageal junction and opened spontaneously because of the force of the deglutition movement. After opening, the safety pin became stuck in the cervical esophagus. It is thought that the patient's dementia also contributed to the mechanism of this rare case.

Many cases of esophageal foreign body penetrating the mediastinum, thoracic cavity, thyroid gland, and lung have been reported. In particular, cases in which an open safety pin penetrated blood vessel systems, such as the aorta and carotid artery, were severe.^{6,7} The main aim of the treatment for penetrated esophageal foreign bodies is extraction. The onset of false aneurysms is assumed if the esophageal foreign body penetrated a blood vessel system. Therefore, treatment is necessary for the blood vessel in addition to esophageal foreign body extraction.

This case was that of an elderly person who needed great care, and we chose a treatment with as low aggression as possible. General anesthesia was necessary, but the treatment was safe because of low aggression using an endoscope and interventional radiology without the need for an outside incision.

CONCLUSION

WE REPORT THE successful treatment of an elderly person who had ingested a safety pin, which had penetrated the left subclavian artery. It is thought that ingestion cases of elderly persons will increase in the future. Penetration caused by ingestion of a safety pin is rare, but in this

case, safe treatment was achieved by a team of certified and specialist physicians and surgeons.

DISCLOSURE

Approval of the research protocol: N/A.

Informed consent: Informed consent was provided by the patient's family to publish this case.

Registry and the registration no. of the study/trial: N/A.

Animal studies: N/A.

Conflict of interest: None.

REFERENCES

- 1 Nawaz S, Tulunay-Ugur OE. Dysphagia in the older patient. *Otolaryngol. Clin. North Am.* 2018; 51: 769–77.
- 2 ASGE Standards of Practice Committee, Ikenberry SO, Jue TL, *et al.* Management of ingested foreign bodies and food impactions. *Gastrointest. Endosc.* 2011; 73: 1085–91.
- 3 Uyemura MC. Foreign body ingestion in children. *Am. Fam. Physician* 2005; 72: 287–91.
- 4 Birk M, Bauerfeind P, Deprez PH, *et al.* Removal of foreign bodies in the upper gastrointestinal tract in adults: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. *Endoscopy* 2016; 48: 489–96.
- 5 Sugunan S, Ajith Krishnan AS, Devakumar VK, Arif AK. Safety-pin induced hemopericardium and cardiac tamponade in an infant. *Indian Pediatr.* 2018; 55: 521–2.
- 6 Schumacher KJ, Weaver DL, Knight MR, *et al.* Aortic pseudoaneurysm due to ingested foreign body. *South Med. J.* 1986; 79: 246–8.
- 7 Passey JC, Meher R, Agarwal S. *et al.* Unusual complication of ingestion of a foreign body. *J. Laryngol. Otol.* 2003; 117: 566–7.