We report a delayed postoperative injury to the esophagus in a patient who underwent cervical corpectomy for spondylodiscitis. The patient was a 72-year-old man. He was diagnosed by magnetic resonance imaging with spondylodiscitis at C5/6/7, with an epidural abscess at C5/6/7, and ossification of the posterior longitudinal ligament from C2 to C7. For surgical treatment, corpectomy and interbody fusion with a mesh cage at C5/6, an anterior plate and posterior laminectomy at C3/4, posterior screw fixation at C5/6/7/T1, and anterior cervical discectomy and fusion at C3/4 were performed. After 2 weeks, blood was detected in the Levin tube drain and gastroscopy was performed. Gastroscopy confirmed that the mesh cage was exposed because of damage to the esophagus.

Keywords: Cervical vertebrae; Esophageal perforation; Discitis

Case Report

The patient was a 72-year-old male. He presented to the hospital with severe neck pain, upper extremity radicular pain, and upper and lower extremity weakness. The patient was diagnosed with spondylodiscitis at C5/6/7, an epidural abscess at C5/6/7, and ossification of the posterior longitudinal ligament from C2 to C7 based on MRI. Treatment combined antibiotic and surgical approaches (Fig. 1). The preoperative antibiotic was intravenously (IV) ceftriaxone 2 g for 4 days. After surgery, methicillin-resistant Staphylococcus aureus bacteria were identified in the culture test. Therefore, IV vancomycin 1 g once a day and IV tabactam 4.5 g 3 times a day were used for 6 weeks. After 6 weeks of intravenous antibiotic treatment, trimethoprim 400 mg-sulfamethoxazole 80 mg 2 tablet 2 times a day was used for 2 weeks.

The surgical treatment consisted of corpectomy at C5/6, interbody fusion with a mesh cage, an anterior plate and posterior laminectomy at C3/4, and posterior screw fixation at C5/6/7/T1 (Fig. 2).

After surgery, symptoms improved, and the patient was discharged. After 8 months, the patient returned to the hospital with scapular pain. On computerized tomography (CT) and MRI no changes were apparent at the previously operated site (Fig. 3).

Anterior cervical discectomy and fusion at C3/4 were per-
formed because of the exacerbation of C3/4 intervertebral disc herniation visible in the MR images and the patient's symptoms improved afterwards (Fig. 4). After surgery, the patient complained of dysphagia and inability to eat. Therefore, we initiated Levin tube feeding. Starting at one week after tube insertion, the patient complained of phlegm accumulation and a sore throat when feeding through the tube. After 2 weeks, blood was discovered in the Levin tube drain and gastroscopy was performed. Gastroscopy confirmed that the mesh cage was exposed because of damage to the esophagus (Fig. 5). Otolaryngology, general surgery, and neurosurgery combine operation was performed. Skin paddle harvested from the left forearm with radial artery and vena comitantes, basilic vein. Anastomosis was performed between left superior thyroid artery of recipient site and radial artery of skin paddle. Another anastomosis was performed between facial vein of recipient site and cephalic vein of skin paddle under microscope. Esophagus defect was covered with a flap of interrupted 3-0 Vicryl suture. Feeding via the nasogastric route was started on postoperative day 4. Initial dose of tigecycline was 100 mg, followed by 50 mg every 12 hours. Two months after surgery, the patient was discharged with oral diet.

**Discussion**

Complications of anterior surgical exposure include laryngeal nerve injury, iatrogenic dysphagia, vertebral and carotid artery injuries, tracheal injury. Iatrogenic dysphagia is so frequent that it has been reported in 9.5% of cases [3].

Delayed injury to esophagus after anterior spine surgery has been reported. Kuriloff et al. [6] reported a case of delayed fistula after cervical spine fusion occurring 6 to 10 weeks after operation. Cagli et al. [7] delayed fistula after cervical spine fusion occurring 7 years after operation.

In case of doubt regarding an esophagus perforation, close clinical surveillance is mandatory [8]. Signs may be immediate or delayed by as much as a few days. Pain is the most frequent symptom (86%–100% of cases): neck pain, odynophagia, torticollis or retrosternal pain. Other frequent signs include hemorrhagic exteriorization, dysphagia with salivary stasis, fever, dyspnea, and tachycar-
Subcutaneous emphysema is found in 60% to 90% of cases [8].

Contrast-enhanced cervicothoracic CT is sensitive in screening for mucosal perforation, visualizing indirect signs such as air or effusion and local or regional complications. Rigid endoscopy under general anesthesia, combining hypopharyngoscopy and esophagoscopy is the examination of choice for exploring esophagus wounds [8].

Treatment of esophagus wounds remains controversial and requires multidisciplinary discussion between surgeon, gastroenterologist and anesthetist. It is agreed that small wounds (<0.5–1 cm) that are detected early can be managed medically. In case of sepsis, surgery is mandatory [8]. When enteral nasogastric feeding is not feasible, parenteral feeding is indicated.

Some spondylodiscitis patients require anterior cervical corpectomy. In this case, gastroscopy confirmed that the mesh cage and plate was exposed at corpectomy site. No perforation was observed in the anterior cervical discectomy and fusion site, only the thinned esophagus was observed. So esophageal injury was thought to be due to friction between the plate of corpectomy site and the esophagus. It is also believed that the manner of insertion of the Levin tube may have contributed to the damage.

Anatomically, the esophagus is located in front of and next to the cervical body. Therefore, the esophagus is likely to also be in a state of infection and inflammation in cervical spondylodiscitis. This re-
duces the thickness of the esophageal wall. Dysphagia after upper cervical surgery is a common occurrence [9]. Levin tube feeding may be necessary in cases of prolonged severe dysphagia, but Levin tubes in patients with a previous infection and an anterior plate should be considered very carefully [10].

It is important to accurately identify telltale signals of esophageal injury and start treatment early in patients at a high risk of esophageal damage. Such signs of damage to the esophagus include the accumulation of mucus and phlegm when ingesting food through a Levin tube. The rise in C-reactive protein levels in blood tests is also an important indicator.

**Conclusion**

Here, we report a case of delayed esophageal injury due to corpectomy and fusion in a patient with cervical spondylodiscitis. We conclude that tube insertion in a patient who has undergone surgery for infection should be performed carefully.

**Conflicts of interest**

No potential conflict of interest relevant to this article was reported.

**ORCID**

Young Hwan Choi, https://orcid.org/0000-0001-5630-8563
Yong Hun Pee, https://orcid.org/0000-0001-8924-3794
Il-Tae Jang, https://orcid.org/0000-0002-2121-0221

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https://doi.org/10.51638/jksgn.2022.00073