

Zenker-like pouch causing delayed wound infection after anterior cervical discectomy and fusion

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Summary: We report a case of delayed anterior cervical discectomy and fusion (ACDF) wound infection caused by a Zenker-like pouch, possibly a complication of endotracheal intubation. A tracheal intubation was performed on a patient with diabetes who underwent ACDF. Two years later the patient presented with a wound infection, neck pain, chronic coughing, hoarseness, and dysphagia. Cultures grew *Candida albicans*, *Streptococcus viridans*, and *Bacteroides* species. Magnetic resonance imaging suggested osteomyelitis. Computed tomography (CT) confirmed the diagnosis. The spacer was removed. Cultures grew organisms similar to the wound culture. Diatrizoate meglumine swallow test showed contrast in the surgical bed with an unrecognized esophageal tear. CT showed a fistula between the hypopharynx and ACDF. Intravenous antibiotics, gastrostomy, and tube feeding were implemented. Four weeks later, postdiatrizoate CT revealed obliteration of the tract without leakage of contrast agent. We postulate that a hypopharyngeal submucosal dissection during intubation caused evolution of the Zenker-like pouch.

Keywords: Anterior cervical discectomy and fusion, complication, Zenker pouch

Introduction

Prevertebral tissue can become infected due to perforation of the hypopharynx or esophagus. A prevertebral abscess can be the source of cervical osteomyelitis. Delayed anterior cervical discectomy and fusion (ACDF) and wound infection due to iatrogenic trauma secondary to endotracheal or nasogastric tube intubation has not been reported previously.

Case report

A 65-year-old patient with diabetes underwent ACDF. She had a challenging but uncomplicated intubation and no trauma was noted. Two years later the patient presented with a wound infection, neck pain, chronic coughing, hoarseness, and dysphagia. The wound culture grew *Candida albicans*, *Streptococcus viridans*, and *Bacteroides* species. Magnetic resonance imaging (MRI) suggested osteomyelitis. Computed tomography (CT; Fig. 1) confirmed the diagnosis.



Fig. 1. CT scan of cervical spine depicts solid fusion of C5-C6. The white arrow points to the cement spacer and the black arrow shows radiolucency around the spacer (evidence of inflammation).

The spacer was removed. Cultures grew organisms similar to the wound culture. Four days later saliva was coming out of the wound. Diatrizoate meglumine swallow test (Gastrografin; Bracco Diagnostics, Princeton, NJ) showed contrast in the surgical bed with an unrecognized esophageal tear. The postcontrast CT scan showed a fistula between the hypopharynx and the ACDF (Fig. 2). The patient

was treated with intravenous antibiotics, gastrostomy, and tube feeding. Four weeks later, diatrizoate CT scanning revealed obliteration of the tract with no extravasation of contrast agent. We postulate that a hypopharyngeal submucosal dissection during the intubation caused evolution of the Zenker-like pouch.



Fig. 2. Sagittal postdiatrizoate meglumine CT scan of the cervical spine depicts a tract between the oropharynx and the cement spacer.

Discussion

The posterior pharyngeal pouch was first described in 1769 by Ludlow [1] in a postmortem examination of a patient. In 1877 Zenker and von Ziemssen [2] described protrusion of the pharyngeal mucosa on the dorsal wall of the cricopharyngeus immediately proximal to the transition from the hypopharynx into the esophagus in 34 patients (the Zenker pouch).

Treatment of a Zenker pouch is surgical. In elderly or medically unfit patients with minimal symptoms, however, no treatment is recommended except careful observation. Esophageal perforation is a rare complication of ACDF. Delay in diagnosis and failure of aggressive treatment have a potentially catastrophic outcome [3].

Frot-Martin et al. [4] reported on a 56-year-old patient treated in the intensive care unit for a severe head injury. He was comatose for 2 weeks. He had an endotracheal tube and a nasogastric tube in place for 2 weeks and was discharged 2 months later. Four months after the

original injury, the patient presented with global neck pain and paresthesia of the left arm. The erythrocyte sedimentation rate was 62 mm/h. Magnetic resonance imaging with gadolinium contrast enhancement suggested prevertebral and epidural abscess and pyogenic cervical osteomyelitis. The patient was treated conservatively with antibiotics. Seven months after the head injury he presented with dysphagia. The treating physician requested a barium swallow that revealed a small posterior outpouching of the contrast agent at the level of C4. The patient underwent surgery for curettage of bone and soft tissue as well as repair of the pouch. Cultures were negative; a 1-year course of rifampin and ofloxacin was prescribed and the patient recovered fully. The authors believed that a spontaneous Zenker pouch perforation caused the prevertebral abscess. In our opinion, in this case the fistula at the level of C4 was too high to be called a true Zenker pouch; the tear could have been an iatrogenic Zenker-like pouch, as the result of endotracheal or nasogastric intubation, similar to our case.

Norman and Sosis [5] reported on a 49-year-old patient who underwent a difficult endotracheal intubation. The esophagus was accidentally intubated at least once. A satin-slip, #14 French intubating stylet was used followed by insertion of a nasogastric tube. The nasogastric tube was found to be nonfunctional and was revised in the recovery department with difficulty. Postoperatively the patient had persistent dysphagia. The diatrizoate swallow test showed complete esophageal obstruction at the level of the carina (perforation at the level of the piriform sinus) with accumulation of contrast agent between the trachea and esophagus. Chest radiography suggested mediastinitis. The patient underwent open cervical esophageal exploration.

He later required thoracotomy and eventually recovered.

Jougon et al. [6] described five patients who had difficult endotracheal intubations. All developed prevertebral abscesses and mediastinitis as a result of iatrogenic esophageal perforation. All were treated surgically and received long-term intravenous antibiotics. Two died and three survived after intensive medical and surgical treatment.

References

1. Ludlow A. A case of obstructed deglutition from a preternatural dilatation of and bag formed in the pharynx. In: Medical observations and inquiries, 2nd ed. London: Society of Physicians, 1769; 85–101.
2. Zenker FA, von Ziemssen H. Krankheiten des oesophagus. In: von Ziemssen H (ed) Handbuch der speciellen pathologie and therapie, vol 7(suppl). Leipzig: FCW Vogel, 1877; 1–87.
3. Taylor BA, Vaccaro AR, Albert TJ. Complications of anterior and posterior surgical approaches in the treatment of cervical degenerative disc disease. *Semin Spine Surg* 1999;11:337–346.
4. Frot-Martin B, Carlier RY, Morand-Blot V, Faye A, Bernard L, Vallée C. Zenker's diverticulum associated with multilevel cervical osteomyelitis. *Spine (Phila Pa 1976)* 2001;26: E193–E197.
5. Norman EA, Sosis M. Iatrogenic oesophageal perforation due to tracheal or nasogastric intubation. *Can Anaesth Soc J* 1986;33: 222–226.
6. Jougon J, Cantini O, Delcambre F, Minniti A, Velly JF. Esophageal perforation: life threatening complication of endotracheal intubation. *Eur J Cardiothorac Surg* 2001;20:7–10; discussion 10–11.