

Pharyngo-oesophageal diverticulum perforation 18 years after anterior cervical fixation

Ingemar Almre^a, Andres Asser^b and Tanel Laisaar^{c,*}

^a Department of Thoracic Surgery, North Estonia Medical Centre, Tallinn, Estonia

^b Department of Neurosurgery, North Estonia Medical Centre, Tallinn, Estonia

^c Department of Thoracic Surgery, Tartu University Clinics, Tartu, Estonia

* Corresponding author. Department of Thoracic Surgery, Lung Clinic, Tartu University Hospital, Puusepa 8, 51014 Tartu, Estonia. Tel/fax: +372-7-318937; e-mail: tanel.laisaar@kliinikum.ee (T. Laisaar).

Received 24 June 2013; received in revised form 7 August 2013; accepted 19 August 2013

Abstract

Anterior cervical spinal surgery can lead to various complications. We hereby present a case of two rare complications combined—pharyngo-oesophageal diverticulum and its perforation after cervical plate dislodgement. A 53-year old male patient presented with progressive dysphagia 18 years after anterior cervical spinal fusion with tricortical bone graft and custom-made plate at the C6/7 level. Oesophagography revealed a pharyngo-oesophageal diverticulum in front of the cervical plate. It was confirmed by subsequent oesophagoscopy, which also demonstrated a 3-cm longitudinal defect at the posterior wall of the diverticulum. During surgical exploration of the patient's neck, the plate was removed, the diverticulum was completely mobilized and excised, the oesophageal wall manually sutured and a cricopharyngeal myotomy performed. An oesophageal suture line failure was suspected postoperatively, but was not confirmed during reoperation. A year later, the patient has no dysphagia or any other symptoms.

Keywords: Oesophageal perforation • Pharyngo-oesophageal diverticulum • Postoperative complication

INTRODUCTION

Anterior cervical spinal fixation has been widely utilized for various clinical conditions. Although generally the procedure is considered safe, it is still associated with several potentially life-threatening complications. One of those, oesophageal perforation, can occur either in the early postoperative period or even years after primary spinal instrumentation [1]. Another, yet rare, complication is formation of a diverticulum due to oesophageal wall injury or scarring after the spinal operation [2, 3]. We hereby present a unique case of these two complications combined—delayed oesophageal perforation of a pharyngo-oesophageal diverticulum occurring 18 years after primary operation.

CASE REPORT

A 53-year old male patient presented with progressive dysphagia over a 6-month period. He had undergone an anterior cervical spinal fusion operation with a tricortical bone graft and custom-made plate at the C6/7 level after blunt trauma in 1992. According to our knowledge, no complications occurred during surgery and recovery, yet no medical records are available to confirm that.

During an outpatient visit, our patient's overall physical and laboratory examinations did not reveal any abnormalities or signs of infection. Cervical X-ray imaging demonstrated a dislodged

anterior cervical fixation plate (Fig. 1). Water-soluble contrast oesophagography was carried out to investigate the cause of dysphagia. A 5.5 × 3.5 cm pharyngo-oesophageal diverticulum in front of the cervical plate was detected (Fig. 2). The finding was confirmed by subsequent oesophagoscopy, which also demonstrated a 3-cm longitudinal defect at the posterior wall of the diverticulum through which the fixation plate was clearly visible.

Surgical exploration of the neck was carried out under general anaesthesia using a left-sided oblique incision along the anterior border of the sternocleidomastoid muscle. The diverticulum and the spinal fixation plate, held in place by a single remaining screw, were explored. The plate and the loose screw were removed, the diverticulum was completely mobilized and excised, the oesophageal wall defect manually sutured using 3-0 PDS (polydioxanone) suture and a cricopharyngeal myotomy was performed. Another screw, covered by dense fibrous tissue, was not removed. One drain was left in place and the neck incision was closed in layers by a running suture.

On the third postoperative day, the patient developed high fever and oesophageal suture line failure was suspected during oesophagography. The wound was opened for inspection, but no leak was detected. The wound was irrigated and drained. Postoperative antibacterial treatment and parenteral nutrition were administered for 10 days. No further complications occurred. On the seventh day after the reoperation repeated oesophagography with contrast medium verified and confirmed no leak; the patient returned to a normal diet 3 days later and was discharged on day 17.

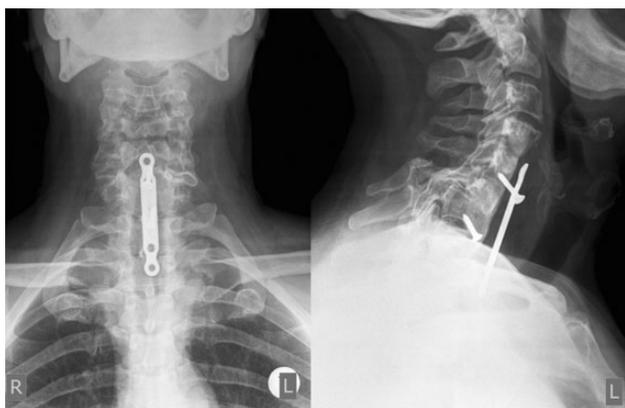


Figure 1: Cervical X-ray image of a patient who had undergone anterior cervical spinal fixation 18 years earlier. A dislodged plate, held in place with one screw only, is visualized.



Figure 2: Water-soluble contrast oesophagography of the same patient, demonstrating a 5.5 × 3.5 cm pharyngo-oesophageal diverticulum in front of the cervical plate.

At the 1-year follow-up, the patient had no signs of dysphagia or any other complaints.

DISCUSSION

Oesophageal injury after anterior cervical spinal fixation has been reported in up to 1.6% of cases [4]. Depending on the time of occurrence, the injury is classified as either early or late perforation. Early perforations are usually caused by intraoperative oesophageal dissection and manipulation. Late perforations are usually caused by hardware fixation loss or migration. A diverticulum can develop years after spinal surgery and is usually related to scar formation and dislodging of cervical plates [2, 3, 5]. According to our knowledge, our patient had the most delayed formation of diverticulum after spinal surgery and its perforation ever reported in medical literature.

On barium swallow a diverticulum that has developed after cervical spine surgery usually resembles the more common Zenker's diverticulum [5], however, the aetiology is different. During diverticulectomy in the majority of cases, extensive perioesophageal

scarring that inevitably contributed to the formation of the diverticulum has been found [2, 3].

Treatment of oesophageal injuries is complex and case-specific, depending on the diagnosis time, defect size, neck infection occurrence and the patient's overall condition. When the injury is recognized during surgery or in the early postoperative period, wound drainage and simple suturing are usually sufficient for treatment. When recognized late, more complex treatment is needed. For small contained defects non-surgical treatment, consisting of parenteral nutrition, antibiotic therapy and close observation has been suggested. However, usually, a more aggressive surgical approach with removal of all artificial materials, multiple debridements and closing of the oesophageal defect with or without suture line reinforcement is mandatory [1]. The combination of a diverticulum and oesophageal perforation undoubtedly requires surgical treatment. In our case, despite a large perforation, no neck infection was present, as the diverticulum densely adhered to the spine. Thus, hardware removal and diverticulum extirpation were performed. In addition to diverticulectomy, cricopharyngeal myotomy should be part of the operation to avoid recurrence [2].

Although, in our patient, we suspected suture-line failure in the early postoperative period, it was not confirmed during wound exploration. Yet poor oesophageal healing is common when treating oesophageal complications after spinal instrumentation. Suture line leak has been described in 1 of 2 cases when diverticulectomy after cervical fusion was performed [3]. In a study of oesophageal perforations that had developed after cervical spinal surgery, Rueth *et al.* [1] found oesophageal leaks even in 60% of patients after primary closure of the perforation. Suture line reinforcement by muscle or an omental flap might be considered here to reduce the risk of failure.

CONCLUSION

Oesophageal perforation and diverticulum development after anterior cervical spinal instrumentation are rare complications, especially in combination. Early diagnosis and appropriate individualized treatment are essential to manage this complex surgical issue.

Conflict of interest: none declared.

REFERENCES

- [1] Rueth N, Shaw D, Groth S, Stranberg S, D'Cunha J, Sembrano J *et al.* Management of cervical esophageal injury after spinal surgery. *Ann Thorac Surg* 2010;90:1128–33.
- [2] Allis TJ, Grant NN, Davidson BJ. Hypopharyngeal diverticulum formation following anterior discectomy and fusion: case series. *Ear Nose Throat J* 2010;89:E4.
- [3] Ba AM, LoTempio MM, Wang MB. Pharyngeal diverticulum as a sequel of anterior cervical fusion. *Am J Otolaryng* 2006;27:295–7.
- [4] Elerkay MA, Llanos C, Sonntag VKH. Cervical corpectomy: report of 185 cases and review of the literature. *J Neurosurg Spine* 1990;90:35–41.
- [5] Summers LE, Gump WC, Tayag EC, Richardson DE. Zenker diverticulum. A rare complication after anterior cervical fusion. *J Spinal Disord Tech* 2007; 20:172–5.