

Dysphagia in a 76-year-old male after C5-C7 anterior discectomy and anterior plate fusion: a case report.

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Abstract

Introduction:

Esophageal perforation can be a serious and possibly a fatal complication after anterior cervical discectomy and fusion (ACDF). It usually occurs acutely (first 24 hours post-surgery) and in rare cases, it can progress and persist chronically. Unfortunately, this condition can be masked by various symptoms such as recurrent aspiration pneumonia, fever, dysphagia, and neck pain, making it difficult to diagnose. Awareness and early recognition along with appropriate management are crucial factors that can improve the overall outcomes.

Management:

We encountered a 76-year-old male who underwent C5-C7 anterior discectomy and anterior plate fusion. After the procedure, there were no acute complications. The patient was feeling well until several months post-procedure when he began to develop vague dysphagia associated with weight loss of unknown etiology. The CT scan 6 months post-op was negative for perforation. In the following months, he underwent a battery of tests at multiple institutions without any diagnosis established. He later presented to our network for further workup and treatment recommendations.

Outcome and discussion:

Upper endoscopy was performed and showed fistulation between the esophagus and the metal hardware in the cervical spine, esophagogram demonstrated no obstruction but decreased peristalsis of the lower esophagus and lateral deviation to the right of the left upper cervical esophagus with minimal mucosal irregularities due to mass effect by the cervical plate, the diagnosis was made. Furthermore, the patient was successfully treated with a surgical approach using EGD guide repair in layers and sternocleidomastoid muscle flap. We presented a rare case of delayed esophageal perforation after ACDF and successful treatment of the perforation by surgical repair using the dual technique.

Introduction

Esophageal perforation can be a serious and possibly a fatal complication after anterior cervical discectomy and fusion (ACDF). It usually occurs acutely (first 24 hours post-surgery) and in rare cases, it can progress and persist chronically. Unfortunately, this condition can be masked by various symptoms such as recurrent aspiration pneumonia, fever, dysphagia, and neck pain, making it difficult to diagnose. Awareness and early recognition along with appropriate management are crucial factors that can improve the overall outcomes.

A 76-year-old male who presented with a history of C5-C7 anterior discectomy and anterior plate fusion a year ago due to cervical stenosis associated with left upper extremity pain and weakness. There were no complications the early post-operative period, the patient reported that his neurologic complaints resolved completely. However, he noticed some difficulty swallowing since surgery that has been progressively worsening associated with unintentional weight loss. He denied signs or symptoms of infection and alleviating or exacerbating factors.

Management and Outcome

X-rays of the cervical spine on flexion and extension at six months showed the acceptable placement of the anterior plate and screws at C5, C6, and C7 with no motion across the fused levels.

CT of the neck showed the good placement of the hardware and satisfactory surgical fusion from C5-C7 with no significant canal stenosis. It reported some residual multilevel foraminal narrowing. Nevertheless, the patient reported dysphagia regardless of vast complimentary studies and physician evaluations in the following 6 months.

As part of his work up, an upper endoscopy was performed, which showed fistulation between the esophagus and the metal hardware in the cervical spine. The esophagogram demonstrated no obstruction but diminished primary and secondary esophageal peristalsis in the lower half of the esophagus and evidence of a mass effect, the left upper cervical esophagus presented a slight lateral deviation to the right in the vicinity of the anterior cervical plates with minimal mucosal irregularities. Involving the posterior wall cervical esophagus overlying the anterior plate and screws without evidence of leak or fistula.

The patient was managed initially with pre-habilitation goals that were achieved prior to surgery, a feeding tube was placed and his nutrition was optimized in preparation for a staged approach to repair the esophageal defect. However, after the induction of anesthesia, the patient presented with bradycardia and hypotension. After resuscitation, the procedure was rescheduled. A Cardiology workup was performed after stabilization of the patient, including a nuclear stress test which was negative for any abnormalities. One month later, the patient underwent removal of the cervical spine hardware and a surgical repair guided by EGD with muscle flap reinforcement (image 1). A feeding gastrostomy tube was placed, he had an uneventful procedure and did well in the postoperative period, the patient was discharged six days after surgery with a JP drain and gastric tube feedings.

In a follow-up visit, the patient underwent esophagogram which demonstrated no evidence of leakage and a completely healed operatory wound. A modified barium swallow was performed to evaluate swallowing which was normal. The patient continued tolerating liquids with minimal JP output and no evidence of dysphagia, aspiration or infection. The patient passed speech evaluation without aspiration, the voice returned to baseline and progressed to solid food.

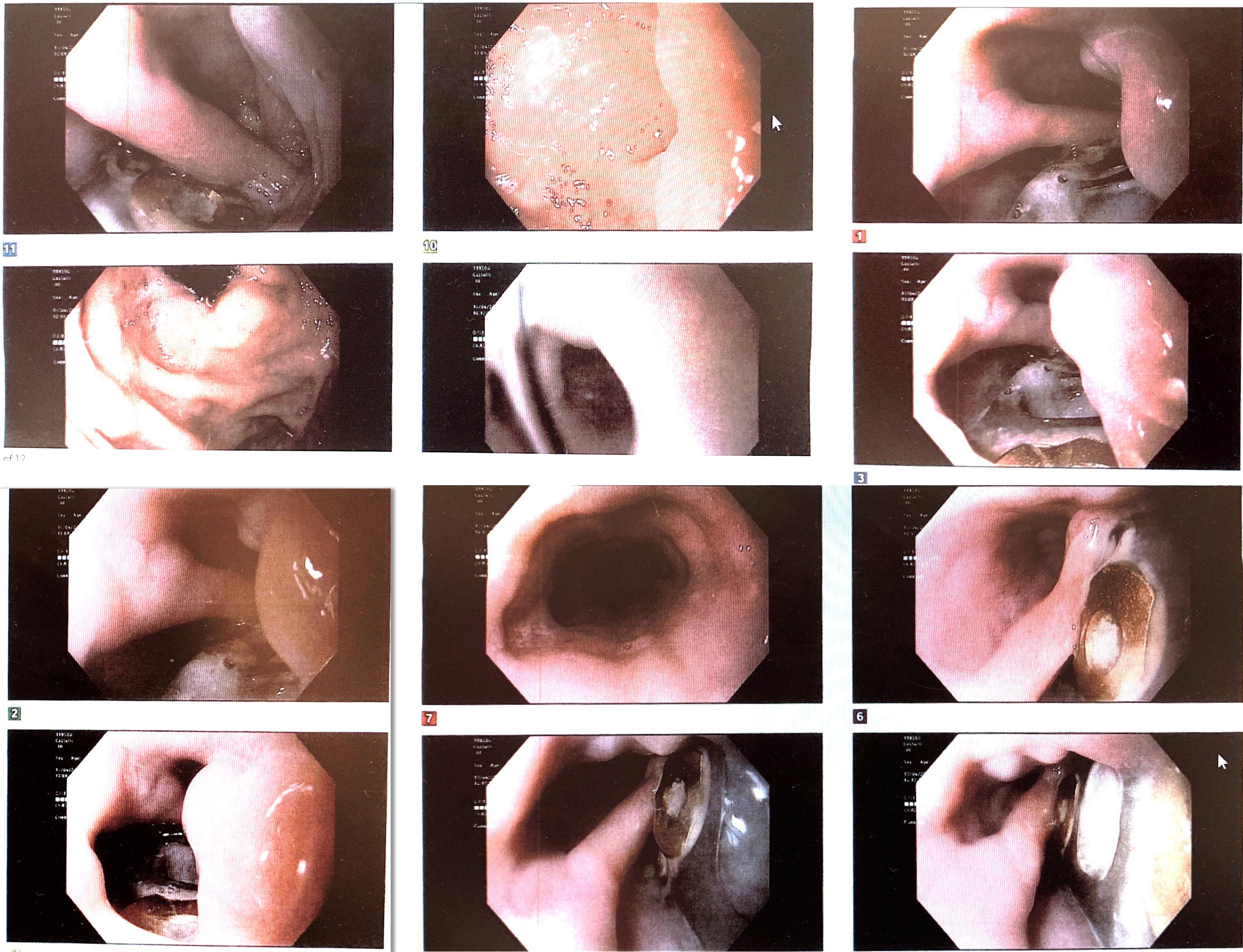


Figure 1. Exploratory esophagoscopy spotlighting the posterior defect. Metal plate seen at the C5-C7 level.

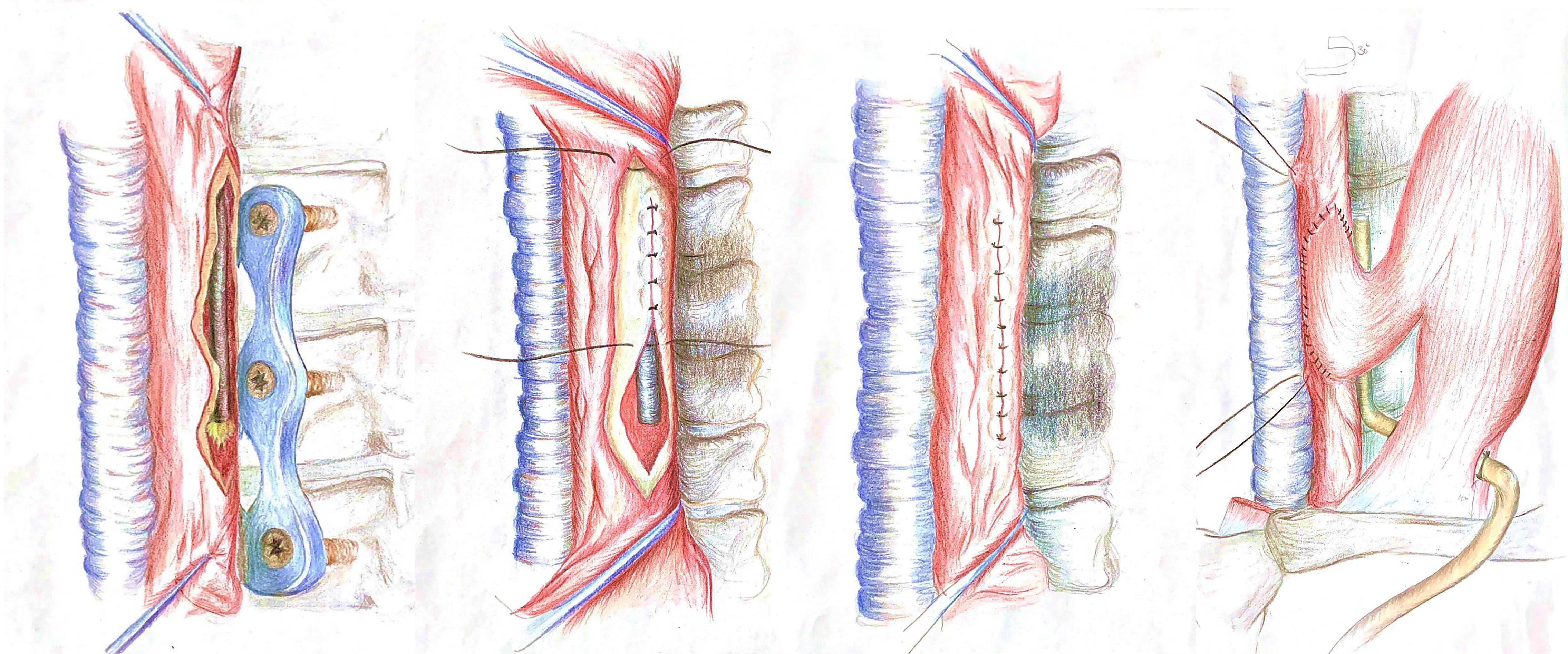


Figure 2. Esophageal exploration emphasizing the defect caused by the metal plate; removal of the disk plate and closure of the submucosal layer of the esophagus followed by the closure of the muscularis layer resulting in a complete repair of the fistula. Sternal insertion of the sternocleidomastoid muscle was used as a flap over the closed defect.

Conclusion

Anterior cervical spine procedures have been associated with satisfactory outcomes in most cases. Esophageal perforation is classified as acute and chronic. Acute esophageal perforation after an ACDF has a low incidence. In comparison, delayed esophageal perforation has an even lower incidence making it extremely difficult to diagnose. However, it should always be considered in patients with chronic symptoms or signs of local infection after ACDF.

We reported a case of delayed (chronic) esophageal perforation without instrumental failure occurring one year after ACDF. We conclude that the need for high suspicion, recognition, proper treatment, and long-term follow-up are all crucial factors for improving the outcome and decreasing the morbidity and mortality of this life-threatening pathology. As we achieve the avoidance or mitigation of complications, we may decrease the length of the length of hospital stay, the number of hospital re-admissions thus, significantly decreasing the overall health cost.

Discussion

Anterior cervical diskectomy and fusion (ACDF) have been used since the late 1950sby spinal neurosurgeons and orthopedic surgeons to treat patients with persistent neurologic symptoms and pain despite non-surgical methods. The anterior approach to the cervical spine is generally considered safe, having overall low morbidity and mortality with a good clinical outcome. (1,4,6,7)

According to Tasiouet al. the global complication rate of anterior cervical procedures is 13.2%, being generally minor problems necessitating minimal or no further intervention. (7)The most important complications include soft tissue swelling and hematoma, recurrent laryngeal nerve injury, carotid artery injury, cerebrospinal fluid leakage, root and cord injury, superficial wound infection and tracheoesophageal injury between others (1,5,7,14).

Soft tissue injury is a recognized complication of the anterior approach, the incidence of perforation from all causes varies between 0.25% and 1.49% (4).Esophageal perforation global incidence fluctuates between 0-3.4% (7). Tasiou et al. reported an incidence of 0.9%, (7)Fountas et al. reported 0.3%. (11) and Zhong et al. reported 0.45% (12).Therefore, it is considered a difficult diagnosis to determinate, requiring a high index of clinical suspicion.

The Cervical Spine Research Society described esophageal retraction and esophageal manipulation intraoperatively as the most important causes of perforation, followed by hardware failure (4). If the perforation is recognized intraoperatively a simple primary suture repair is needed. However, if the patient complains after the procedure of dysphagia, fever, swelling, subcutaneous emphysema or any sign of infection, esophageal injury should be considered and treated (1,2).

According to a study conducted by Newhouse et al. (5) 22 cases of esophageal injury where reported after ACDF in which 6 cases occurred acutely during surgery, 6 cases occurred in the post-surgical window and 10 cases occurred within weeks to months after the surgery. Remarkably, perforation after a previous anterior cervical procedure may occur as late as 8-10 years after surgery(13,14).

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