

## Background

Esophageal erosion following anterior cervical spine surgery is rare and reported to be between 0.02 and 1.49%, and it has a mortality rate close to 6 percent [1]. Although most esophageal erosions occur intra-operative or immediately following surgical intervention, few cases have been reported with a delayed presentation [2]. Diagnosis of esophageal perforation can be made with cervical imaging studies, including X-ray, computed tomography (CT) scan, and magnetic resonance imaging (MRI). However, negative imaging does not rule out esophageal injury, and further evaluation with surgical exploration is warranted in the presence of high clinical suspicion.

## Case presentation

A 58-year-old male patient with a past medical history significant for Parkinson's disease and solitary cervical spinal sarcoma underwent corpectomy, a fusion of C3- C6 with cervical fixation plate placement, and stereotactic body radiation therapy and presented with three weeks history of dysphagia, concomitant with weakness, diplopia.

His symptoms started eighteen months post-operatively. On presentation, the patient was febrile (Temperature of 103F), with a blood pressure of 112/65 mmHg, heart rate of 98 beats/min, and respiratory rate of 16 per minute. Initial workup revealed leukocytosis (WBC: 11500), with normal Chest X-ray and urine analysis. Further workup was negative for Myasthenia Gravis (Acetylcholine receptor binding antibody less than 0.3 nmol/L).

The cervical magnetic resonance imaging (MRI) showed the presence of a metallic cervical plate, and the absence of expected soft tissue with the posterior wall, suggestive of hardware, without evidence of fluid collection or spinal cord compression (Figure 1). However, the evaluation was limited due to magnetic susceptibility artifacts from fusion hardware.

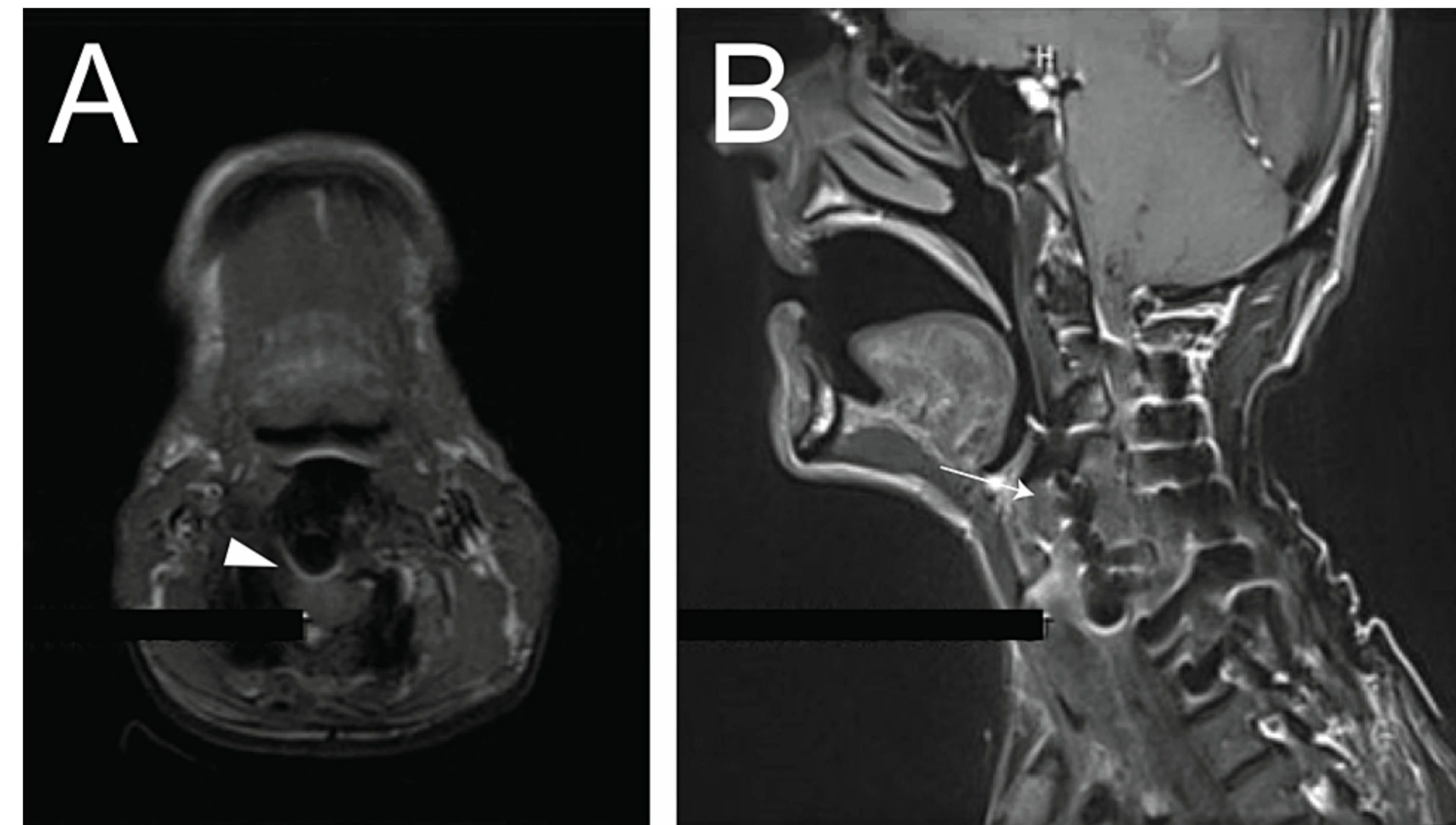
## Discussion

The esophagus lies directly anterior to the cervical spine, and it is vulnerable to injury post-operatively. Adventitia, the outermost esophageal layer, protects the underneath layers, including the muscular layer (longitudinal and circular) and the submucosal and mucosal layers. During anterior cervical surgery, aggressive or improper retraction of the esophagus may lead to esophageal erosion, a challenging clinical problem. Although most esophageal injuries occur intra-operative or immediately following surgical intervention, few cases are reported with a delayed presentation [2,3]. Symptoms include dysphagia and Mackler's triad (subcutaneous emphysema, chest pain, and vomiting) in the setting of esophageal perforation [4]. Early diagnosis and intervention reduce morbidity and mortality, so any intraoperative suspicion should warrant immediate investigation. Diagnosis usually requires direct visualization or imaging studies, including endoscopy, CT-scan, MRI, or contrast swallow studies. Treatment modalities include non-surgical, conservative management, and primary closure with flap placement [3].

## References

1. Amhaz HH, Kuo R, Vaidya R, Orlewicz MS: Esophageal perforation following cervical spine surgery: a review with considerations in airway management. *Int J Crit Illn Inj Sci.* 2013,
2. Kothari S, Almouradi T: Dysphagia caused by cervical plate erosion through the hypopharynx. *ACG Case Rep J.* 2018, 5:e1041-2. 10.14309/crj.2018.104
3. Hershman SH, Kunkle WA, Kelly MP, et al.: Esophageal perforation following anterior cervical spine surgery: case report and review of the literature. *Global Spine J.* 2017,

Figure 1. Neck MRI



The absence of expected soft tissue with the posterior wall is suggestive of hardware erosion (arrowhead- 1A).

There is an abnormal thickening of the laryngeal soft tissues, with medialization of the right vocal cord and loss of expected parapharyngeal fat (arrow- 1B).

Dysphagia progressed during hospitalization and got complicated with an episode of aspiration pneumonia during ingestion of medication, which progressed to respiratory failure requiring intubation and mechanical ventilation. The patient received empirical Piperacillin-Tazobactam while the sputum culture was positive for *Pseudomonas aeruginosa* (while the blood culture was negative).

The patient subsequently underwent endoscopic gastroesophageal duodenoscopy (EGD) for further evaluation and percutaneous endoscopic gastrostomy (PEG) placement in the body of the stomach (due to dysphagia and complicated aspiration pneumonia). EGD revealed erosion of the posterior pharyngeal wall and upper cervical esophagus and the presence of a cervical fixation plate, screws, and corpectomy fusion cage in the hypopharynx (Figure 2).

Figure 2 EGD, and PEG placement



Posterior pharyngeal wall and upper cervical esophageal erosion with the presence of cervical fixation plate (white arrow), screws (white arrowhead), and corpectomy fusion cage (white asterisk) in the hypopharynx (Figure 2A). PEG tube placement (Figure 2B) and pyloric valve (black arrow, Figure 2C).

PEG: percutaneous endoscopic gastrostomy; EGD: Esophagogastroduodenoscopy

The orthopedic surgery and otolaryngology-head and neck surgery services were consulted. The patient underwent surgical exploration of the cervical spine.

The anterior cervical fixation plate was removed with flap reconstruction, and the cervical dural tear was repaired with a resolution of his symptoms (Figure 3). The patient was discharged to a rehabilitation facility.

## Conclusions

Esophageal injuries following anterior cervical spine surgery are a potential and rare complication reported in the literature, usually detected during or acutely following surgery. Our patient presented with progressive dysphagia 18 months after anterior cervical surgery. Interestingly, he was asymptomatic for months following the surgery, and dysphagia was the initial complaint that warranted further evaluations. High clinical suspicion is required to detect esophageal injuries and warrant early intervention and correction.

## Acknowledgment

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