

Self-extruding Anterior Cervical Discectomy and Fusion Plate Causing Dysphagia and Posterior Pharyngeal Wall Perforation: Successful Endoscopic Management

Lisa Mitchell, Prerana Rao, Panagiotis Asimakopoulos, Muhammad Shakeel, Kim W Ah-See

Department of Otolaryngology-Head and Neck Surgery, Aberdeen Royal Infirmary, Aberdeen, AB25 2ZN, United Kingdom

ABSTRACT

Introduction: Anterior cervical discectomy and fusion (ACDF) is one of the most commonly performed spinal procedures for degenerative cervical spine disease. This procedure is associated with a high risk of complications including dysphagia which usually settle down in 2 years. Where dysphagia persists after 2 years consider further imaging or direct visualisation to exclude displacement of metal work. **Aim:** To share our experience of managing a patient presenting with dysphagia associated with self-extruding ACDF plate. **Case presentation:** A 74 year old Caucasian female was admitted with progressive dysphagia over a 6 week period. Relevant surgical history included a previous C3/4 and C4/5 anterior cervical discectomy and fusion 6 years ago for symptomatic cervical myelopathy. An upper gastrointestinal endoscopy found a foreign body in her pharynx which was confirmed to be a ACDF plate during pharyngoscopy under general anaesthetic. The plate was removed trans-orally and the posterior pharyngeal wall perforation was treated conservatively. The patient made a full recovery. **Conclusion:** Pharyngeal wall injury is a rare but serious complication of anterior cervical discectomy and fusion. Physicians should promptly refer patients with marked dysphagia to an ENT surgeon for full assessment including visualisation of the pharynx. In select cases the metal plate would need to be removed to allow resolution of dysphagia.

Key words: Cervical Discectomy, complication, dysphagia, extrusion, metal plate

INTRODUCTION

Anterior cervical discectomy and fusion (ACDF) is one of the most commonly performed spinal procedures^[1] for degenerative cervical spine disease. It has been demonstrated that anterior approaches are beneficial for anterior pathogenic structures but are associated with a high risk of complications, including dysphagia, hoarseness, or arterial injury.^[2] Although the mortality rates for ACDF are low, there are significant morbidity rates varying from 13.2% to 19.3%.^[3] Rates of post-operative dysphagia are thought to affect as many as 28–57%^[4] of patients. This almost completely resolves after 2 years, with only 2%

reporting persistent dysphagia.^[4] This means that clinicians must maintain a high index of suspicion in patients where dysphagia persists after 2 years and consider further imaging or direct visualization to exclude displacement of metalwork.

CASE REPORT

A 74-year-old Caucasian female was seen by her general practitioner with a history of persistent sore throat, odynophagia and progressive dysphagia over a 6 week period. It had progressed to the point where she was struggling to swallow saliva and was admitted to a medical ward and treated for aspiration pneumonia. Past medical

Address for correspondence:

Mr. Muhammad Shakeel, Department of Otolaryngology-Head and Neck Surgery, Ward 210, ARI, Aberdeen, AB25 2ZN

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history included osteoarthritis and cervical myelopathy. Relevant surgical history included a previous C3/4 and C4/5 ACDF with RABEA lordotic cages and anterior plating for C3–C5 vertebrae [Figures 1 and 2] 6 years previously for symptomatic cervical myelopathy.

The primary procedure was complicated by the need for pharyngeal wall repair for inadvertent lateral and posterior pharyngeal wall breach which only became apparent after spinal instrumentation. Her admission at this time was further complicated by a chest infection requiring admission in the high dependency unit and a prolonged period of nasogastric tube (NGT) feeding. She continued to have issues with her swallowing despite maximal input from speech and language therapists. Eventually, 3 months after the initial surgery, it was decided to remove the cervical metal plate to improve her dysphagia. This was unfortunately unsuccessful due to scar tissue making visualization of the plate too difficult [Figure 3]. A decision was made at the time to not make further attempts to remove the metal plate to prevent any injury to her upper aerodigestive tract.

The patient remained under the care of neurosurgeons where she was closely monitored clinically and radiologically. In addition to spinal magnetic resonance imaging scans, she

underwent serial X-rays of her cervical spine at regular intervals [Figures 4 and 5].

During her acute admission due to her worsening dysphagia, now 6 years post ACDF, an upper gastrointestinal endoscopy was arranged to investigate her progressive dysphagia and weight loss. This was accomplished through nasal route. In the pharynx, a foreign body which resembled a screw [Figure 6] was found embedded in the soft tissues giving the appearance of a pharyngeal pouch [Figure 7].

At this point, an NGT was inserted to allow feeding to be commenced keeping the patient nil orally. The plan was made

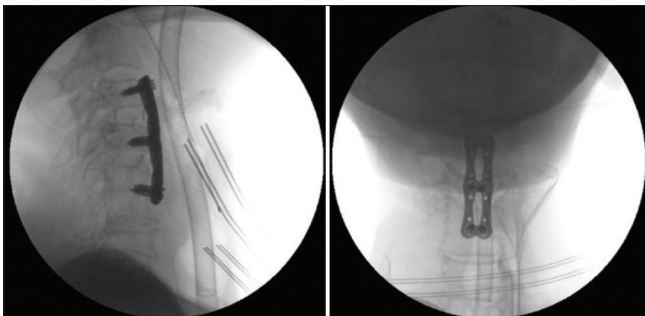


Figure 1: Anterior cervical discectomy and fusion and plating C3-5 (intraoperative imaging)

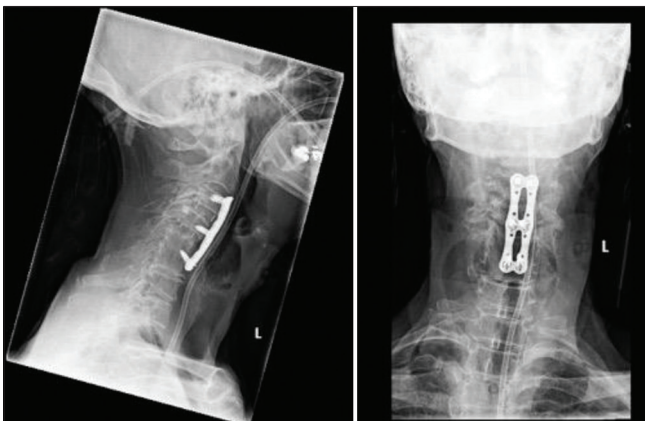


Figure 2: Anterior cervical discectomy and fusion and plating C3-5 (Post-operative imaging)

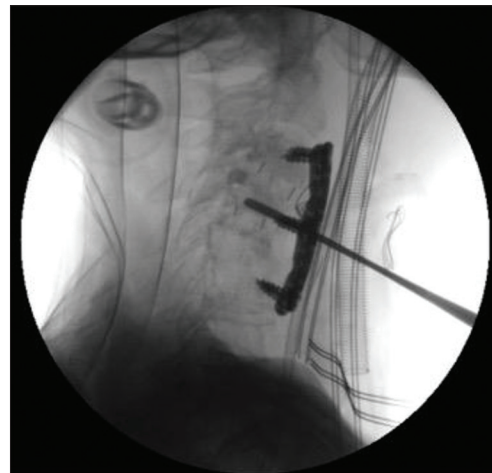


Figure 3: Anterior cervical discectomy and fusion noted at C3/4/5. There is convexity of cervical curvature at this level with a gap between the metalwork and the anterior margin of cervical spine. Disk cage replacement is also noted. NG tube *in situ*. The findings suggest metal work failure

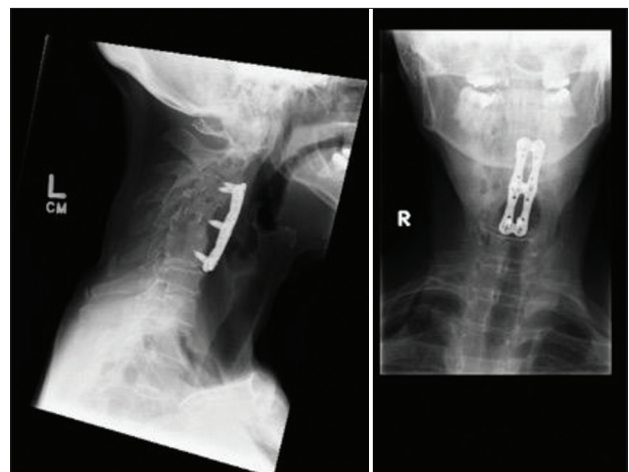


Figure 4: Neck X-rays at 18 months after initial surgery showing some flexion in the mid-cervical spine in the fused segment. The vertebral bodies appear completely fused together and are stable

to discuss the findings with neurosurgeons and the ear, nose, and throat surgeons.

An X-ray of the cervical spine confirmed that the plate had migrated and the superior and medial screws were no longer in contact with the vertebral bodies [Figure 8].

The patient was taken to theatre and general anesthetic was administered with awake fiber-optic intubation. Direct transoral pharyngolaryngoscopy was carried out, revealing the proximal end of the metal plate freely mobile within the posterior pharyngeal wall tissues [Figure 9].

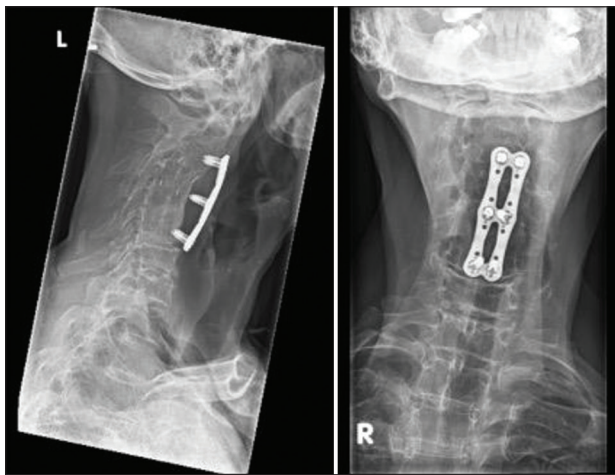


Figure 5: Neck X-rays 5 years after initial surgery showing unchanged position of anterior cervical discectomy and fusion. Fusion of C2/3/4/5/6 with focal kyphosis at these levels. Unchanged alignment of the cervical spine. No acute bony injury. Increased degenerative change with new osteophytosis of C6/7

The distal end screws of metal plate were embedded in the soft tissues of the posterior pharyngeal wall [Figure 10].

Under endoscopic guidance using strong forceps the lower end of metal plate was rotated 180 degrees to dislodge plate from the soft tissue of pharynx [Figure 11].

The plate was then removed easily [Figure 12].

The post-operative period was uncomplicated and the patient made a good recovery. Speech and language therapists stayed involved in her care and after assessment, she was deemed safe to restart taking oral diet. She was discharged home day 6 post-operatives and her last follow-up was 5 months postoperatively, where she reports no residual symptoms.

DISCUSSION

Although dysphagia is one of the most common complaints postoperatively, it usually reduces over time. However, as many as 12–14% of the patient may have persistent dysphagia at 1 year.^[5] This case highlights the importance of having a high index of suspicion of complications in patients who have undergone ACDF presenting with dysphagia.

Dysphagia is often caused by the anterior plate compressing or displacing the posterior wall of esophagus. Oesophageal injury carries significant mortality ranging from 20% to 65%^[6] with complications, including mediastinitis and systemic sepsis.^[6] In general, it can be classified as intraoperative (during surgery), perioperative (within 30 days), and delayed (occurring >30 days postoperatively).^[7] Oesophageal perforation may occur as a result of hardware

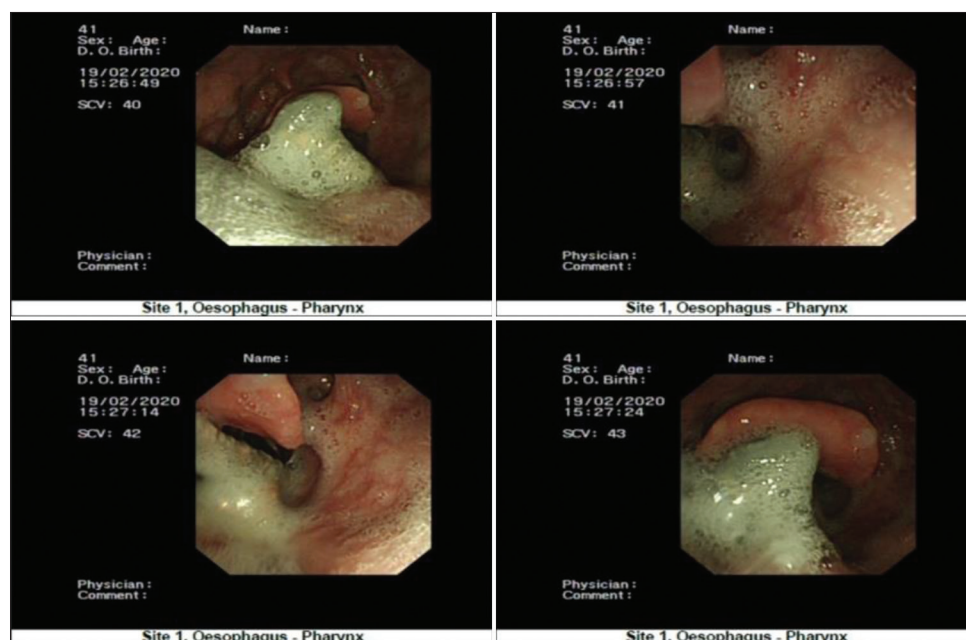


Figure 6: Findings at upper gastrointestinal endoscopy using a nasal endoscope



Figure 7: Findings at upper gastrointestinal endoscopy – an early pharyngeal pouch and foreign body (metal plate)

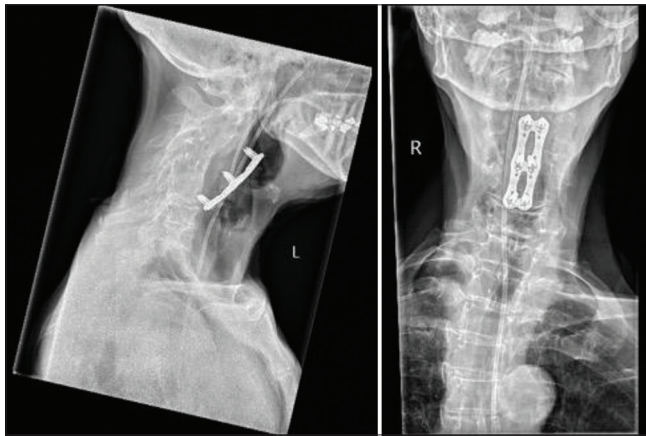


Figure 8: X-ray of the neck 6 years after initial neck surgery showing previous screw and plate fixation. Compared with the previous examination, the plate appears to have migrated with the superior and middle screws no longer in contact with bone on the lateral view. Unchanged advanced degenerative change and previous anterior cervical discectomy and fusion

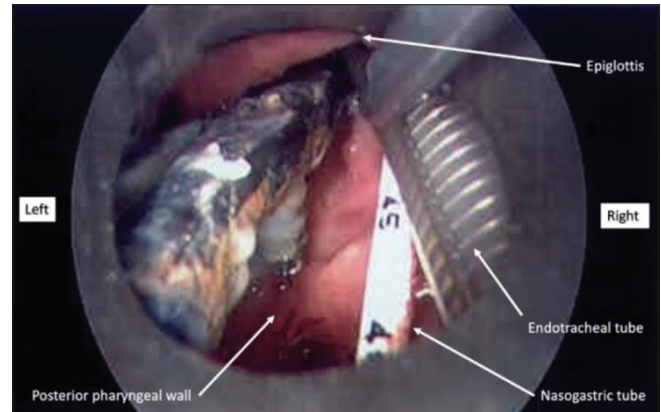


Figure 10: Transoral direct pharyngoscopy showing the middle part of the self-extruding anterior cervical discectomy and fusion plate adjacent to the 45 marking of the nasogastric tube. The patient is lying supine under general anesthetic and the operator is at the head end of the patient

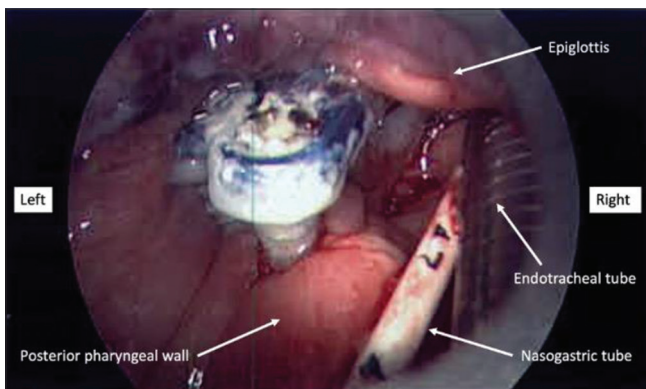


Figure 9: Transoral direct pharyngoscopy showing the upper end of the self-extruding anterior cervical discectomy and fusion plate adjacent to the 47 marking of the nasogastric tube. The patient is lying supine under general anesthetic and the operator is at the head end of the patient

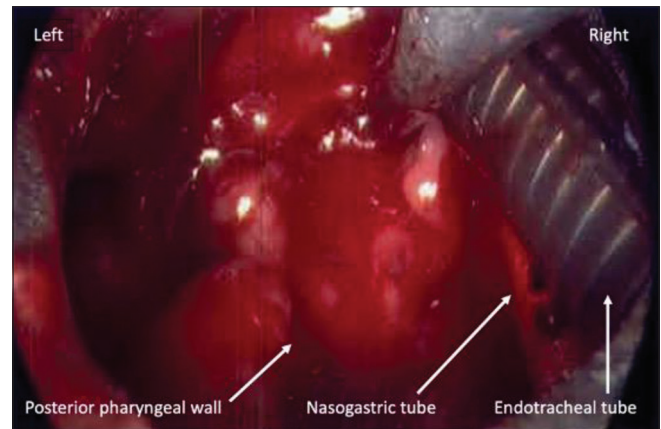


Figure 11: Transoral direct pharyngoscopy showing the posterior pharyngeal wall after removal of the anterior cervical discectomy and fusion plate. The patient is lying supine under general anesthetic and the operator is at the head end of the patient

failure, hardware erosion, or intraoperative injury,^[8] with hardware complications being the more common etiology.

Although, in this case, the main symptom was dysphagia, it is important to be aware of other common symptoms,



Figure 12: Anterior cervical discectomy and fusion plate after transoral removal from the posterior pharyngeal wall

including fever, odynophagia, upper limb weakness, and neck pain.^[9]

Patients suffering from post-operative dysphagia should have lateral radiographs or CT scan to assess bone graft dislodgement, retropharyngeal abscess, or hematoma.^[10] Direct visualization may also be beneficial by flexible laryngoscopy to determine the position of hardware and plan for surgical management.

It has been suggested that removal of hardware and avoidance of replacement is favorable as prolonged exposure to saliva and associated pathogens introduces the risk of biofilm growth and subsequent ongoing infection despite antimicrobials and debridement.^[9] Management in such situations should involve consultation with neurosurgeons to determine the status of fixation and if removal is appropriate.^[11] Broadly the management can be split into conservative or surgical intervention. Conservative management involves keeping the patient nil by mouth and initiating feed by NGT or parenteral nutrition with broad-spectrum antibiotics.^[12] Surgical management options include primary repair of the defect with or without flap interposition and removal of hardware.^[12] In our patient, the ACDF plate had gradually extruded and was mostly lying in the soft tissues of the pharynx. The metal plate was removed in one piece without any bone drilling. The posterior pharyngeal wall defect healed by secondary intention with no serious residual side effects.

CONCLUSION

Pharyngeal wall injury is a rare but serious complication of ACDF. Physicians should promptly refer patients with marked dysphagia to an ENT surgeon for a full assessment, including visualization of the pharynx. Management can be conservative or surgical depending on several factors, including status of the metal plate fixation in relation to the

cervical vertebrae. In select cases, the metal plate would need to be removed to allow the resolution of dysphagia.

CONFLICT OF INTEREST

None declared.

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