



Migration of spinal pedicle screw with aerodigestive perforation and subsequent device expectoration

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ABSTRACT

INTRODUCTION: Spinal fixation is a common surgical procedure. Frequently, fixation for spinal stabilization requires use of instrumentation such as pedicle screws and fixation plates. Aerodigestive and vascular perforations from such procedures are infrequent albeit known complications from these procedures.

PRESENTATION OF CASE: This case details an uncommon situation in which a patient with anterior cervical spine fixation in the distant past was found to have a migratory pedicle screw. The patient had symptoms of neck pain and dysphagia. Radiographic studies were helpful in demonstrating the problem. While undergoing a physical examination, the patient was witnessed to expectorate the screw. Further work up with panendoscopy was undertaken and the patient managed conservatively.

DISCUSSION: The upper aerodigestive system rarely experiences perforation from spinal stabilization hardware. When it occurs, management should include a dedicated investigation of the involved portions of the digestive system to avoid further complication.

CONCLUSION: This case presents an rare occurrence of aerodigestive perforation of a spinal pedicle screw which was self-removed.

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1. Introduction

Spinal surgery is done for a variety of indications. It carries a high rate of success both of the procedure and durable outcome. As with any surgical procedure, there are certain pitfalls which are inherent to such procedures. Among these include infection, neurologic injury, vascular injury and aerodigestive injury [3]. The incidence of esophageal dysfunction in the form of dysphagia is reported as 9.5% [3]. It is most often transient when it does occur. A more severe esophageal problem which occurs 0.2%–1.1% is that of perforation [3]. This occurs during esophageal mobilization, spinal dissection or from the placement of the fixation screw itself. The timing of presentation is either within the operation or in days to weeks after. Symptoms include fever, neck pain, crepitus, dysphagia, hoarseness, leukocytosis and can lead to wound drainage, pharyngeal abscess and subcutaneous emphysema [3,4]. It is more uncommon for such a problem to present at a later time [5–7].

We are presenting a case with interval presentation over 5 years from cervical spine fixation. The presentation was gradual and more subtle than the aforementioned ones. Though radiologic imaging

was suggestive of this problem, it was the patient's expectoration of the pedicle screw which confirmed the diagnosis.

This case report is presented in line with SCARE criterion [1].

2. Case presentation

A 65 year old female with a past medical history of chronic obstructing pulmonary disease, hypertension, cocaine abuse and a cervical spinal laminectomy and fusion five years prior. She presented after a one-week history of bilateral neck pain, dysphagia and dyspnea, as well as subjective fevers and cough productive of white sputum. She denied any history of hemoptysis, hematemesis, melena, chest pain, weight loss or regurgitation. On physical examination, she displayed a limited range of motion of the neck secondary to bilateral pain, diffuse paraspinal neck tenderness to palpation as well as bilateral rales and wheezing. No lymphadenopathy, neck or pharyngeal masses, swelling or inflammation were appreciated. The patient was admitted for management and diagnostic workup of her symptoms.

Upon initial imaging of neck and chest, the patient was found to have a displaced pedicle fixation screw from her previous spinal laminectomy and fusion. Computerized tomography of the neck confirmed the findings of a screw in the prevertebral soft tissues between the airway and the upper cervical esophagus (Fig. 1). No perforation of the esophagus was noted on esophagogram (Fig. 2A). While being evaluated by the thoracic surgery team, the patient had

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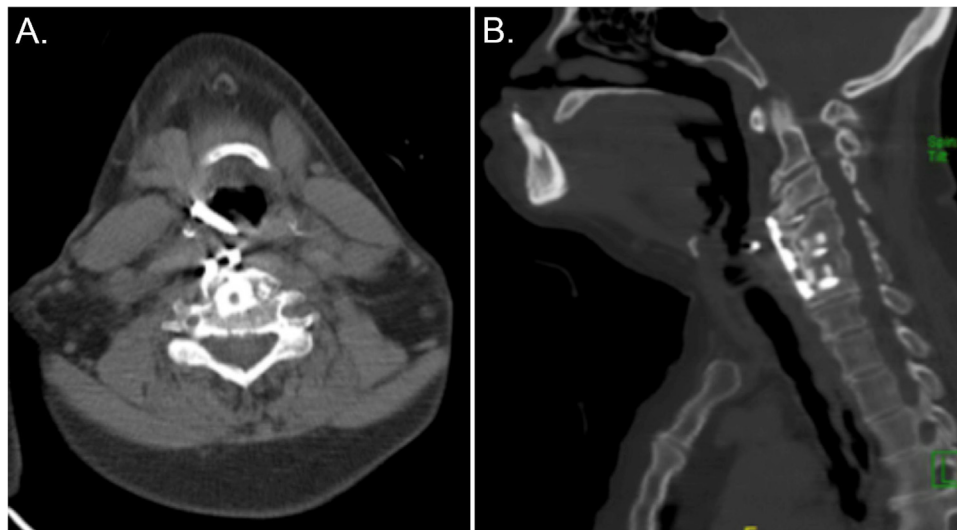


Fig. 1. Axial (A) and sagittal (B) computed tomography showing a dislodged screw in the prevertebral soft tissues.

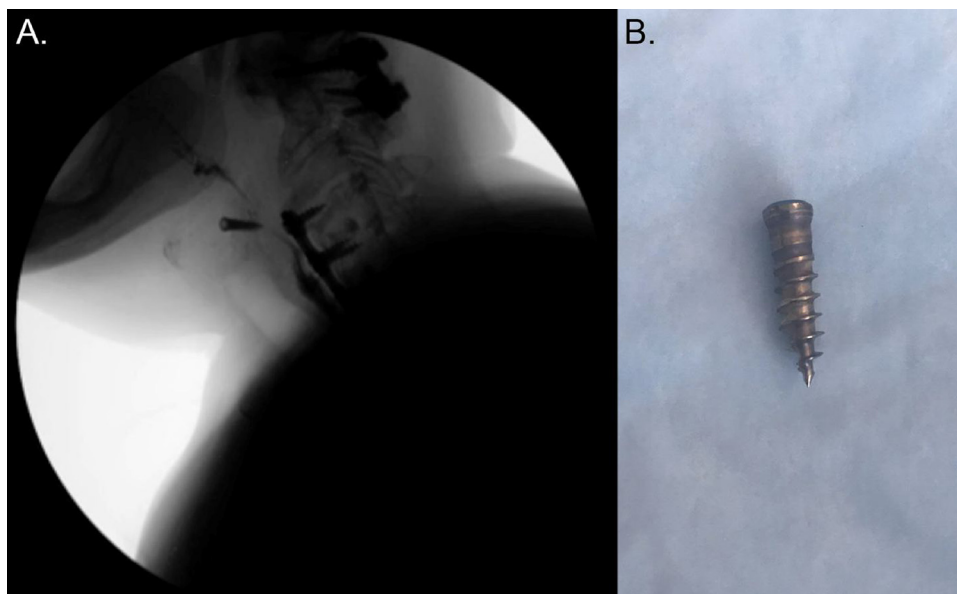


Fig. 2. Barium swallow lateral view (A) of the dislodged screw showing no communication with the esophageal lumen. Gross appearance of the expectorated screw (B).

a coughing fit during which she expectorated the screw ([Fig. 2B](#)). She was immediately placed on supplementary oxygen and was assessed for signs of perforation or bleeding. The migration of the foreign object was later confirmed by flexible bronchoscopy and esophagoscopy which showed an esophageal mucosal tear with no tracheal injury. The patient was treated conservatively and her postoperative course was only complicated with fever which responded to appropriate antibiotic therapy. Further studies failed to show subcutaneous emphysema and the patient had complete resolution of her symptoms.

3. Discussion

The use of bone fixation devices for spinal stabilization is one of the most frequent surgical interventions done in the cervical and thoracic spine. The esophagus and trachea are prone to damage by placement of these plates and screws given the intimate relation to vertebral bodies and the prevertebral fascia with the esophageal adventitia. There have been cases reported of pedi-

cle screw migration into the neck and thoracic cavity causing perforation, both in the setting of trauma and elective surgery [2,3]. Such cases are few in number when compared to perforation occurring around the time of surgery. The timing of screw migration and esophageal perforation is variable but usually occur after years of the initial operation (1–8 years) [4–8]. Such was the case of our patient who presented with symptoms five years after surgery, despite the screw being appropriately positioned in imaging studies done 4 months prior, suggesting that migration can occur acutely. In the thoracic cavity, pedicle screws have also been associated with migration and perforation in the setting corrective scoliosis surgery. The overall rate of perforation in this setting was 20.3% of which 1.4% were in the lung, 1% in the aorta, 0.5% in the esophagus, and 0.25% in the trachea [9]. Treatment reported in the literature ranges from fasting and nasogastric tube placement, neck exploration and drainage, to primary repair and sternocleidomastoid myoplasty. Overall, these lesions seem to be benign in nature and complete resolution of symptoms is global despite specific treatment management. To our knowledge, there have been

no prior reports of such screws migrating and subsequently being expectorated by the patient.

4. Conclusion

While uncommon, tracheo-esophageal perforations are increasingly being reported in different settings in the literature following spinal pedicle fixation which warrants clinical suspicion in patients with a history of spinal surgery and symptoms consistent with upper airway or digestive injury. Here we presented a rare case of cervical pedicle screw migration with spontaneous expectoration five years after initial spine surgery.

Conflicts of interest

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Author contribution

M. Leiva-Juarez: Data collection, data analysis, writing the paper.

Y. Greenberg: Data analysis, writing the paper.

C. La Punzina: Study concept, data analysis, editing of paper.

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