

Case report - Thoracic non-oncologic Oxidised regenerated cellulose: an unusual cause of paraplegia following oesophagectomy

Sumeet Dua^a, Nilendu C. Purandare^a, Nikhil H. Merchant^b, C.S. Pramesh^{c,*}

^aDepartment of Bioimaging, Tata Memorial Hospital, Mumbai 400012, India

^bDepartment of Radiodiagnosis, Tata Memorial Hospital, Mumbai 400012, India

^cDivision of Thoracic Surgery, Department of Surgical Oncology, Tata Memorial Hospital, Mumbai 400012, India

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Abstract

Oesophageal resection after neoadjuvant therapy is the treatment of choice in localized oesophageal cancer. Common complications after oesophagectomy include pulmonary infection and anastomotic leaks. Paraplegia or paraparesis after oesophagectomy is an extremely uncommon occurrence and has not been reported in medical literature. Possible causes include injury to the spinal cord due to epidural catheter insertion, epidural haematoma and anterior spinal artery thrombosis. Pressure on the spinal cord due to migrated oxidised regenerated cellulose (ORC) is an extremely rare cause. Meticulous haemostasis at the costovertebral angle with a combination of pressure and electrocautery is advocated to prevent this rare but catastrophic complication. We describe a middle aged woman who developed post-thoracotomy paraplegia following ORC compression on the spinal cord.

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1. Introduction

Surgery is the treatment of choice for localized oesophageal cancer. Oesophageal resections are complex surgeries with a relatively high rate of postoperative complications. The commonest include pulmonary complications (atelectasis, bronchopneumonia and respiratory failure) and anastomotic leaks. Postoperative paraparesis after posterolateral thoracotomy is rare, but not unknown. Possible aetiological causes include injury to the spinal cord due to epidural catheter insertion, epidural haematoma and anterior spinal artery thrombosis. Pressure on the spinal cord due to migrated oxidised regenerated cellulose (ORC) is an extremely rare cause.

2. Case report

A 51-year-old woman presented to us with a two-months' history of progressive dysphagia and weight loss. An upper gastrointestinal endoscopy showed an ulceroproliferative growth in the mid and lower third of the oesophagus. A contrast enhanced computed tomography (CECT) scan and positron emission tomography (PET)-CT scan showed extension of the growth into the cardia and enlarged, hypermetabolic perigastric and subcarinal nodes. There were no hepatic or pulmonary metastases, or infiltration of the surrounding mediastinal structures. We treated her with three cycles of neoadjuvant chemotherapy (Epirubicin,

Cisplatin and 5-fluoro uracil) to which she had a partial response. We performed a transthoracic total thoracic oesophagectomy (right posterolateral thoracotomy, laparotomy and a cervical incision) with oesophago-gastric anastomosis in the neck under general anaesthesia with epidural analgesia. The epidural catheter was inserted at the D7/D8 level and the procedure was uneventful. There was some bleeding from the posterior end of the thoracotomy (intercostals vessels) at the end of the thoracic procedure which was controlled by pressure and tight packing in the intercostal space with ORC (Surgicel) using a forceps.

After extubation, the patient noticed weakness and paresis in both lower limbs. Neurological examination revealed complete loss of tone, power and reflexes in both lower limbs and a sensory level at D10. Our initial suspicion was that of an epidural needle induced spinal injury, although the level of neurological deficit did not fit in with this possibility. We performed a magnetic resonance imaging (MRI) scan of the spine soon after extubation (12 h after completion of surgery), which showed compression of the spinal cord by a lobulated mass, hypo-intense on T1 and T2 weighted images (Fig. 1). It was seen extending from the paraspinal region into the spinal canal across the intervertebral foramen at the level of D6 vertebra. We performed an immediate decompressive laminectomy and extracted the migrated pieces of ORC. There was no deformity of the spinal cord and pulsations were well seen after decompression. However, the patient could not be weaned off the ventilator, developed fulminant ventilator associated pneumonia and died on the fourth postoperative

*Corresponding author. Tel.: +91-22-24177000; fax: +91-22-24146937.

E-mail address: cspramesh@gmail.com (C.S. Pramesh).

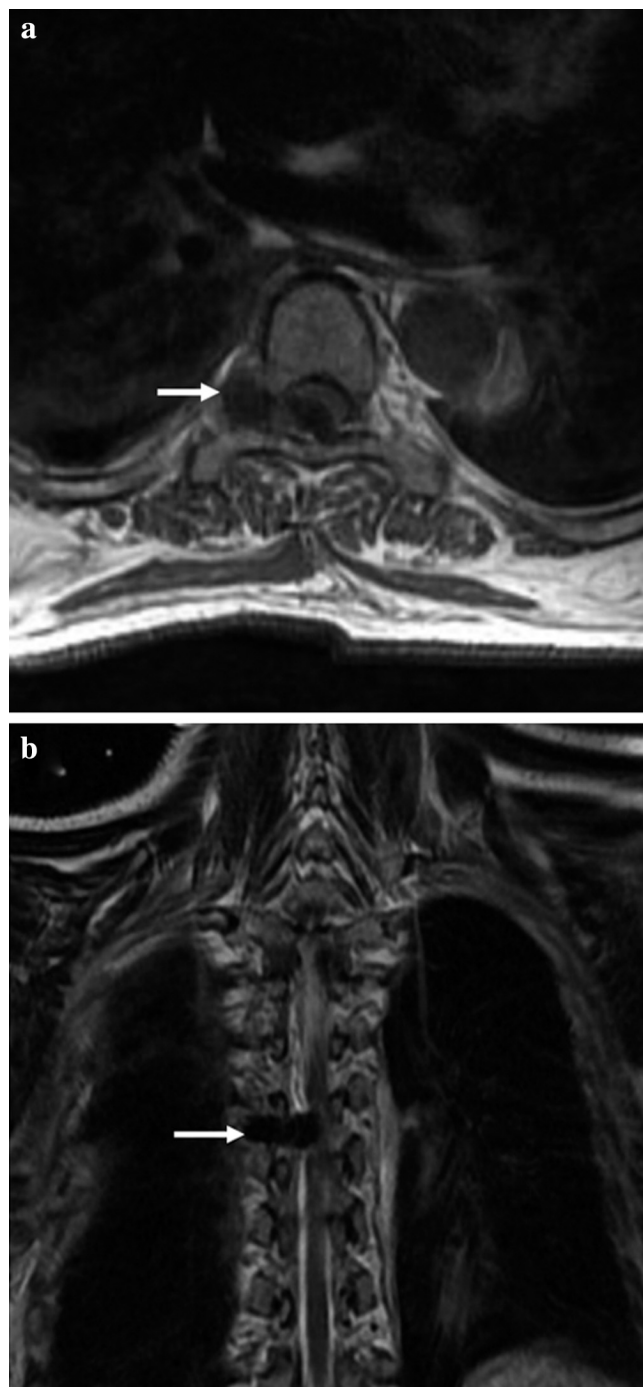


Fig. 1. MRI showing axial T1 weighted (a) and coronal T2 weighted (b) images showing a lobulated hypo-intense mass (arrows) extending across in the intervertebral foramen into the spinal canal causing compression of the spinal cord.

day. Neurological recovery could not be assessed as the patient was on continuous sedation after the decompression. A post-mortem could not be performed as the relatives of the patient declined consent.

3. Discussion

Oesophageal resection is a major surgical procedure associated with significant intra and postoperative complica-

tions. Haemorrhage is an infrequently encountered intra-operative complication, the most common source of bleeding being from the small direct oesophageal branches arising from the aorta. In most other cases, bleeding is venous and can be controlled with pressure or electrocautery; in refractory cases, especially where there is no definite point of bleeding, ORC is commonly used.

ORC is a sterile, bio-absorbable gauze-like thrombogenic material used to achieve haemostasis as a second line, following failure with electrocautery. ORC is inert and can be left in the surgical bed as it is absorbed and does not cause a foreign body reaction [1]. To date in the literature, there are only 15 documented cases of paraplegia caused by ORC [2, 3] although it is extensively used in general surgery. The commonest procedure among the reported thoracic surgical cases was lobectomy. This is the first case of paraplegia detected following thoracotomy for oesophageal resection caused by ORC. The common denominator, however, in all cases, including ours, was a posterolateral thoracotomy incision and bleeding at the costovertebral angle. Packing of the wound with ORC is the implicated causative factor. It is postulated that paraplegia results from migration of ORC into the spinal canal through the intervertebral foramen [4], aided by the pressure difference between the spinal canal and the pleural space, and the swelling of ORC. In hindsight, it is probably advisable not to extend the posterolateral thoracotomy too posteriorly towards the costovertebral angle. Haemostasis at this angle should also be meticulous using unipolar or bipolar diathermy.

The onset of paraplegia in most cases is not immediate. The delay is attributed to the gradual swelling of ORC and consequent spinal cord compression. The imaging appearance of ORC on conventional radiographs, ultrasonography and CT scans are non-specific, and can often be misdiagnosed for an abscess or other sinister lesions [5, 6]. Marked hypointensity on T2 weighted images with iso-hypo-intense signal on T1 weighted images is the characteristic MRI appearance of ORC. An acute epidural haematoma is the commonest radiological differential. Other possible causes of post-thoracotomy paraparesis include anterior spinal artery thrombosis, epidural haematoma, metastatic cancer and hypotension [4]. T2 weighted images are particularly useful in identifying ORC by virtue of its marked hypointensity [7].

Prognosis and recovery from the paretic episode depends on the time interval from onset of clinical symptoms to detection on imaging of decompressive laminectomy and the severity of the injury itself. We were unable to assess recovery from the injury because the patient could not be weaned off the ventilator. Surgeons operating close to the costovertebral angle, regardless of the procedure, need to be aware of this rare, but extremely morbid complication. Meticulous dissection at the posterior end of the thoracotomy, use of pressure and electrocautery for inadvertent bleeding and judicious use of ORC can reduce the potential risk of postoperative paraplegia. Patients with post-thoracotomy paraparesis should undergo an urgent MRI-scan and immediate decompressive surgery.

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