

Oesophageal perforation by an anterior cervical fixation device : Management in debilitated patients

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Abstract

Oesophageal perforation following anterior cervical fixation has been reported in the neurosurgical and orthopaedic literature as a rare complication of such procedure. The complications associated with oesophageal perforation may range from minor symptoms to mediastinitis and death.

We report two oesophageal perforations following cervical fixation device migration in patients with poor prognosis, managed successfully with conservative surgical and endoscopic techniques. (*Acta gastroenterol. belg.*, 2005, 68, 267-269).

Key words : oesophageal perforation, self-expanding metallic stents, endoscopic management.

Case 1

A 48 year old man was admitted following a direct shock on the neck. On physical examination quadriparesia with areflexia in both upper and lower extremities was observed. A cervical spine radiography revealed a C4-C5 fracture-dislocation. A trans-cranial traction was applied. The quadriparesia worsened rapidly into quadriplegia. An internal fixation of C3-C5 with autogenous bone grafting and a Morscher plate osteosynthesis via an anterior approach was performed. Per-operative and postoperative radiographic control were satisfactory.

Four days later, the patient presented with an inhalation bronchopneumonia with Adult Respiratory Distress Syndrome (ARDS) associated to laryngeal hypoesthesia necessitating a tracheotomy, enteral nutrition via a gastric tube and an intensive care unit stay.

On the second postoperative month, following the displacement of his gastric tube, an upper gastrointestinal endoscopy was performed. It revealed a large posterior oesophageal wall perforation (> 5 cm) with protrusion of the Morscher plate into the lumen. A cervical X-Ray confirmed the dislodgement of the inferior part of the plate with a C5-C6 angulation (Figure 1) and a medullar compression.

A trans-cranial traction was applied. Removal of the osteosynthesis material associated to devitalized tissue excision and direct closure of the posterior oesophageal tear and drainage were performed via the same anterior cervicotomy. The postoperative radiographic control showed a correct alignment of the cervical spine. Large spectrum antibiotics were given for 6 weeks.

One and half month later, the trans-cranial traction was withdrawn. Cervical CT-scanner showed no more

sign of infection but a retro-listhesis was noted. A control gastroscopy revealed a complete healing of the oesophagus. Two months later, the patient was able to leave the ICU and was admitted in a readaptation center.

Case 2

A 48 year old woman underwent three years ago a multimodal therapy consisting of right mastectomy with radiotherapy and hormone-therapy for a breast cancer. In the meantime the patient presented epidural metastases treated by cervical radiotherapy associated to a C6-D1 Morscher plate osteosynthesis. She was admitted in October 2002 suffering of severe dysphagia. On admission, physical examination and blood sample tests were normal.

An upper gastrointestinal endoscopy was performed and revealed a large defect in the posterior wall of the oesophagus (> 5 cm) with protrusion of the osteosynthesis material into the oesophageal lumen. A CT-scanner was achieved and confirmed the displacement of the plate and the inferior screw, and the presence of extra visceral air in the pre vertebral space without any collection (Figure 2).

The treatment consisted of material withdrawal, curettage of devitalized tissues and direct suture of the oesophageal tear associated to cervical drainage. An aspiration gastrostomy and an alimentation jejunostomy were performed. Large broad antibiotics were administered for six weeks. On the 7th postoperative day, upper gastrografine series were obtained and revealed a postero-lateral oesophageal leak which was stented with a fifteen centimeters covert prosthesis (Ultraflex-Boston Scientific-USA). The choice of this prosthesis depended on the sharp angulation of the oesophagus at the level of the fistula. Therefore only an Ultraflex covered stent was considered adequate. The radiographic control revealed a very thin peri-prosthetic leak. Two weeks later, the gastrografin control was normal and oral intake was allowed and was well tolerated (Figure 3). The patient was discharged two weeks later.

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Figure 1. — Cervical X-Ray, profile view shows the dislodgement of the inferior part of the plate with a C5-C6 angulations.

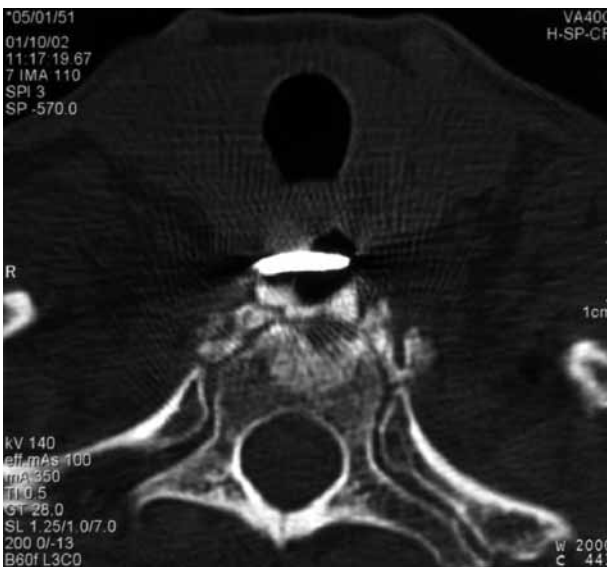


Figure 2. — CT scan of the cervical region. Axial view shows the metallic orthopaedic device inside the oesophageal lumen.

Discussion

Dysphagia is a common symptom observed in several disorders such as mechanical obstruction, fibrotic strictures, foreign bodies, carcinoma, external compression by aortic aneurysm, mediastinal nodes or other



Figure 3. — Oesophagography. Left anterior oblique view shows the correct position and good function of the oesophageal endoprosthesis.

tumours. Dysphagia may occur in neuromuscular disorders and pain. Usually the aetiology can be suspected by the patient history. The final diagnosis is based on complementary work-up as an upper gastrointestinal tract hydro-soluble radiography and an upper gastrointestinal endoscopy.

Perforation of cervical oesophagus can result from external or instrumental trauma, or swallowed foreign body. Anterior cervical fusion is a safe and an effective method for cervical spine fracture-dislocation stabilization. When posterior ligament injury is associated, late complications may occur (1,2). Osteosynthesis is essential in cervical fractures to prevent angulation or displacement. It provides immediate stability, improve bone union, correct spinal deformity and facilitate early mobilization (3). Posterior osteosynthesis gives also excellent cervical spine stabilization but without efficacy on anterior spinal compression. Therefore, in case of anterior spinal compression, anterior cervical fusion is chosen to perform a spinal decompression and to do an osteosynthesis. Cases of oesophageal perforation by migration of the cervical implants have been already described, mainly in the orthopaedic and neurosurgical literature (4-6). Dislodgement, bending, fracture or pull out of the plate or screw are all possible and may appear more frequently in osteoporosis or infected bone (2,3,7). The perforation symptoms vary from asymptomatic migration of screw with elimination into the faeces, to dysphagia with oesophageal compression or life-threatening mediastinitis (5,6).

The diagnosis is confirmed by cervical radiography demonstrating the displacement of the material, air collection in the pre-vertebral tissue plane on lateral incidence, or a widened retropharyngeal space due to an abscess. All these findings may be observed on cervical CT-scanner. A hydro-soluble upper gastrointestinal series seem essential to evaluate the localization and the size of the perforation.

The treatment of a minimal cervical oesophageal perforation in debilitated patients, in the absence of systemic signs, may be conservative and consists of no oral intake, aspiration gastrostomy, feeding jejunostomy, intravenous large spectrum antibiotics against aerobic and anaerobic bacteria, associated or not to wound drainage. For large perforations, a conservative surgical approach is attempted ; an excision suture-drainage may be sufficient at the cervical level and must be associated with material withdrawal. Oesophageal endoprosthesis may be helpful in the management of small leak on the suture line, avoiding heavy operative techniques. The stability of the cervical spine must be evaluated and if necessary an external immobilization must be applied. Long term intravenous antibiotics are essential to avoid osteomyelitis.

In conclusion, oesophageal perforation may occur following cervical spine osteosynthesis. Symptoms may be minimal in debilitated patients. Regular postoperative X-Ray controls are mandatory to rule out plate or screw dislodgment and the risk of oesophageal perforation. If promptly undertaken, conservative treatment may be life saving in the absence of systemic signs, avoiding mediastinitis and death that may ensues.

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