RARE COMPLICATION OF THE CERVICAL SPINE TRAUMA – TRAUMATIC ESOPHAGEAL FISTULA: CASE REPORT AND REVIEW OF THE LITERATURE

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RARE COMPLICATION OF THE CERVICAL SPINE TRAUMA–TRAUMATIC ESOPHAGEAL FISTULA: CASE REPORT AND REVIEW OF THE LITERATURE. (Abstract): Background and study aims: Esophageal fistula due to cervical spine trauma is a rare, potentially fatal complication, which changes significantly the treatment and the prognosis of the trauma patient. There is scarce data regarding this associated pathology of cervical trauma and it consists only of isolated cases, most of them being reported as a complication of the surgical treatment. We present the case of a female patient who suffered a fall from a wagon and who was diagnosed at presentation with cervical fracture and esophageal fistula.

Patient: A 65 years old female who suffered a fall from a train wagon presented for intense neck pain and bilateral brachial paresis. The MRI exam showed a C6–C7 fracture with bilateral facet dislocation in the context of a degenerative, spondylotic cervical spine. It also showed an anterior fragment from the C7 body, in contact with esophageal adventitia. The patient underwent surgery.

Results: a C6 corpectomy was performed, with arthrodesis with bone graft and cervical plate fixation. 24 hours after the procedure, the clinical signs of an esophageal fistula appeared and a CT-scan revealed the typical aspects of that complication. The patient underwent a second surgery in collaboration with the general surgeon with a good outcome and complete neurological recovery.

Conclusion: in the case of cervical spine trauma the imaging exploration has to look for potential signs of lesions to the neighboring vital structures. Although a rare complication of cervical trauma, esophageal fistula represents a formidable complication and requires immediate surgical sanction, the only factor decisive for a good prognosis. Keywords: ESOPHAGEAL FISTULA, CERVICAL SPINE SURGERY COMPLICATIONS

Cervical spine trauma represents a devastating event in the life of the patient especially if associated with lesion of the spinal cord. The presence of an associated lesion of the vital structures neighboring the spine makes an already difficult case even more difficult with direct impact on the outcome. Anterior approaches of the cervical spine are largely used for various pathology of the cervical spine and they are considered as safe procedures useful for both decompression of the neural structures and for the inter-body fusions (1, 2). An 8 to 12% rate of complications has been reported by various studies. Esophageal perforation is one of the rarest of all complica-
tions (0.1%) (3). Being so rare there is virtually no individual experience, especially in the treatment which is very controversial and specific to every particular case. The largest series we found is the one reported by Gaudinez in 2000 (3), which included 44 patients admitted in 25 years in a center dedicated for spinal injuries and a second one published by Newhouse who reviewed the data of the Cervical Spine Research Society and he found 22 cases (4). We present our experience with a 67 years old patient operated for a cervical C6-C7 fracture with facet dislocation complicated with esophageal fistula diagnosed in the early postoperative period.

**CASE REPORT**

A 67 years old woman who suffered a fall from a train wagon, presented in the emergency department of our hospital, complaining of intense neck pain, bilateral brachial paresis, left cervico-brachial neuralgia. Plain radiographs of the cervical spine were made but these showed no obvious traumatic lesions between C1 and C6. Because of the significant clinical picture it was decided to perform a cervical spine MRI which showed a C7 fracture with bilateral facet dislocation C6-C7 and a narrowed spinal canal in the presence of the retropulsed bone fragment from C7 and spinal cord compression with intramedullary hyperintensity on T2 weighted sequences (fig. 1). The patient underwent surgery: anterior corpectomy C7 with the high-speed drill, followed by an inter body fusion C6 to T1 using an iliac bone graft and anterior plate fixation. There were no incidents during surgery. Given that a good reduction wasn’t possible without a high risk, we preferred to perform C7 corpectomy.

**Fig. 1.** Preoperative MRI findings showing
A) C7 fracture with bilateral facet dislocation C6-C7,
B) The bone fragment that we found in relation with the site of the perforation,
C) Axial section revealing the bone fragment apparently in relation with esophageal adventitia
Immediately postoperatively the patient performed very well, she was discharged from the intensive care unit, the neck and brachial pain disappeared and she remained with some mild dypareesis. Two days later she developed dysphagia, fever, subcutaneous emphysema of the neck and face, tension at the level of the operatory wound. An emergency CT-scan was performed and it showed the large emphysema and the esophageal defect at the level of the lesion, as well as laryngeal edema (fig. 2).

An emergency reintervention was performed and we found a small bone fragment inserted in the esophagus on his left side (opposite to our operatory view), with a small defect at the adventitia level. Two drainage systems were left in place, a nasogastric tube was inserted and parenteral large spectrum antibiotic therapy (including Imipenem and Metronidazole) was initiated.

The bacteriological results from the operatory wound revealed the presence of gram negative germs sensible at Imipenem. For a week after the second surgery the evolution was good yet, in the eighth day the local inflammatory changes reappeared, with fever and a mild superior digestive hemorrhage and the patient was reoperated. This time an esophageal suture was performed, and a gastrostomy feeding tube was left in place. After the third surgery the evolution was favorable without further complications. The patient remains though, with a permanent gastrostoma.

![Fig. 2](image)

Fig. 2. A and B) CT-scan showing the emphysema in relation with the pre-vertebral plan around the esophagus and in the operatory field with the plans dissected.
C) Control CT-scan, at one month, revealing remnant peri-esophageal emphysema
DISCUSSION

Anterior cervical approach, also known as Smith-Robinson approach, is in our days a very well known procedure which is a part of the surgical arsenal of any neurosurgeon dealing with cervical myelopathy or radiculopathy. The complication rates are variable between a medium of 10% and 19.3% as reported by Fountas (5) in a study on 1015 patients (196 complications).

The authors of this study found the dysphagia as the most common complication (9.5%), followed by postoperative hematoma (5.6%), esophageal fistulas being observed in 0.3% of cases. The list of possible other rare, anecdotal complication may be very large, as they are presented in various publications (5, 6, 7, 8), including carotid artery injury, vertebral artery injury, pneumothorax, glossopharyngeal, facial, hypoglossal paresis, lesions of the cervical plexus, epidural hematomas. Concerning the esophageal fistulas, they appear in different statistics in a range between 0% (6) and 1.62% in a study of Elerkay (9) in patients who underwent corpectomies, like our patient. There are not clearly identified predisposing factors but the patients with cervical spine fracture, esophageal diverticula or reflux disease (10), or who have had a corpectomy (9) might have some additional risk. There are not many protective measures, but what we can do is to visualize well and respect the esophagus during high-speed drilling and at the time of the instrumentation and care must be taken to the placement of the internal retractor blade under the longus colli muscle.

We know, as surgeons, that even in the most careful procedure, accidents may happened, but it’s important to recognize and to react promptly in face of a very rare situation, any delay or hesitation being associated with a poor outcome. Esophageal perforations occurring after a cervical spine fracture or as a complication of the surgical procedure is one of these very rare conditions, but they are potentially life threatening. The management of this extremely rare condition is not standardized and individual surgeon experience is poor. The diagnostic is mainly on clinical basis, the patient complaints are dysphagia, neck pains, subcutaneous emphysema, hoarseness, fever.

We can discover the complication during the operation or the onset can be acute, in the first 24 hours, sub acute, after 24 hours, or delayed, there is a report of a fistula discovered at 10 years (10).

We did not concluded clearly if, in our particular case, the esophageal perforation was traumatic or iatrogenic, but we consider that the most important is not why that happened but what you have to do when that happened. Most of the authors agreed that the treatment is case adapted. If the lesion is discovered during the surgery it is better to suture primary with protection with large spectrum antibiotics and insertion of a nasal-gastric tube.

The fistulas discovered early after surgery, like our case, have to be explored and the operatory field drained, and we consider now that the suture might be an option, because, even in a small defect, like we experienced, the evolution with drainage, esophageal rest with NG tube, and antibiotics (option indicated by many authors), was not very satisfactory and we were forced, finally, to suture.

We had the impression that the perforation was significantly larger when we reopened. In cases of large defects the suture is indicated and some authors recommended reinforcing the closure with
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Conclusions
Esophageal fistula associated with cervical spine trauma is a very rare complication, but the consequences may be tragic, the evolution can complicate with a mediastinitis or septicemia, that can be fatal.

The predisposing factors are not clearly identified, but the corpectomy, instrumentation, spondylotic changes, esophageal diverticula or gastro-esophageal reflux appear to play a role.

We present a case of a perforation discovered in the early postoperative period and our experience in that case make us to advocate an aggressive attitude, so to suture the defect, even it appear to be small.

The great majority of these complications being iatrogenic, we emphasize once again the role of a meticulous dissection, and anyone of us has to think, during the anterior cervical surgery, at this complication which can devastate a perfectly curable patient.

References