



## Posterior stabilisation of a malignant cervico-thoracic vertebral bone defect

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Oesophageal cancer is frequently complicated by malignant fistulae. Necrosis of the tumour following radiotherapy or chemotherapy may lead to the development of fistulae between the oesophagus and adjacent tissues and organs. We report the expansion of an extra-luminal oesophageal cancer after resection, invading the cervico-thoracic spine, fortunately without neurological deficit, and leading to instability and formation of a malignant fistula linking the tracheo-bronchial tree to the subarachnoid space. To prevent imminent paraplegia and to alleviate severe pain, we rigidly stabilised the spine at the cervico-thoracic junction using an angle-stable system through a single posterior approach. Further post-operative follow-up revealed no signs of neurological deterioration. Cervico-thoracic stability was preserved until the patient died nearly five months post-operatively. This case shows that posterior stabilisation and decompression may be a palliative option for patients with imminent paraplegia and severe pain due to advanced tumour infiltration of the cervico-thoracic spine.

### INTRODUCTION

Carcinoma of the oesophagus represents about 1.5% of all cancers and about 7% of all gastrointestinal carcinomas. Worldwide regional differences in incidence and age distribution can be found: In the United States the incidence is 10 men per 100000 population per year, predominantly occurring between the fifth and seventh decades of life. In contrast, in Japan, 46.3 men per 100000

population are affected at younger age (6). In oesophageal carcinoma, the prevalence of fistulae between the oesophagus and the trachea or bronchial tree are a relatively common complication (5-10%) (2, 3). Communicating fistulae between oesophagus and the aorta, pericardium, pleural space and various other intrathoracic or mediastinal structures have been reported (4, 7). Preoperative radio-chemo-therapy may increase the risk of development of fistulae (1, 3).

### CASE REPORT

A 60-year-old cachectic white man was referred to our department with a short history of severe neck pain, increasing stiffness and conspicuous hyperkyphosis of the cervico-thoracic spine. Physical examination revealed a slight deficit of rotation to both sites and tenderness at the cervico-thoracic

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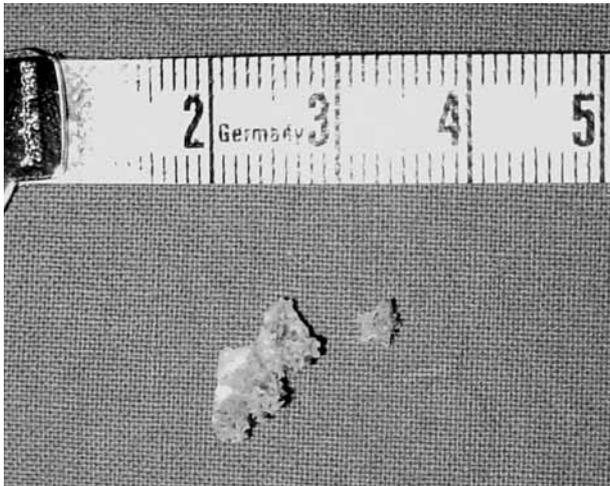


Fig. 1. — Coughed-up bone pieces

spine. The patient had coughed up bone fragments (fig 1).

An oesophageal squamous cell carcinoma had been detected 2.5 years earlier. After a neo-adjuvant radio-chemo-therapy (80 Gray combined with 4 cycles of CDDP (cisplatin and 5-fluorouracil) the patient underwent 7 months later an abdomino-thoracic oesophagectomy. The oesophagus was markedly indurated 5 cm above and 5 cm below the bifurcation. About 4 cm above the bifurcation it was firmly fixed to the trachea. Quick section histology revealed tumour cells in the resection margin. Retrosternal elevation of a stomach-tube and completion of a collar anastomosis completed the procedure.

Plain radiographs, computer tomography (CT) and magnetic resonance tomography (MRI) showed an osteolytic destruction with collapse of the thoracic vertebral bodies I, II and III by an extraluminal tumour recurrence of the oesophageal carcinoma, resulting in a highly unstable situation and hyperkyphosis (fig 2a, b and 3). The tracheo-bronchial tree was invaded and air was seen between the affected vertebrae and in the spinal canal, suggestive for dural infiltration. A technetium bone scan demonstrated increased uptake at the cervico-thoracic spine and at the right third rib. Plain radiographs and computer-tomography of the thorax did not reveal further metastases. Life

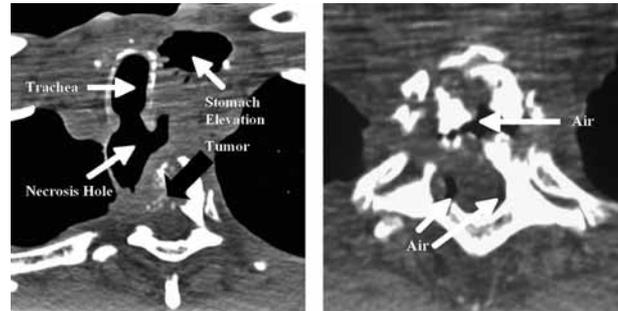


Fig. 2 a-b. — Computer tomography : the coughed-up bone pieces and the air the infiltration of the cervico-thoracic spine strongly suggest a fistula between the spinal canal and the trachea.

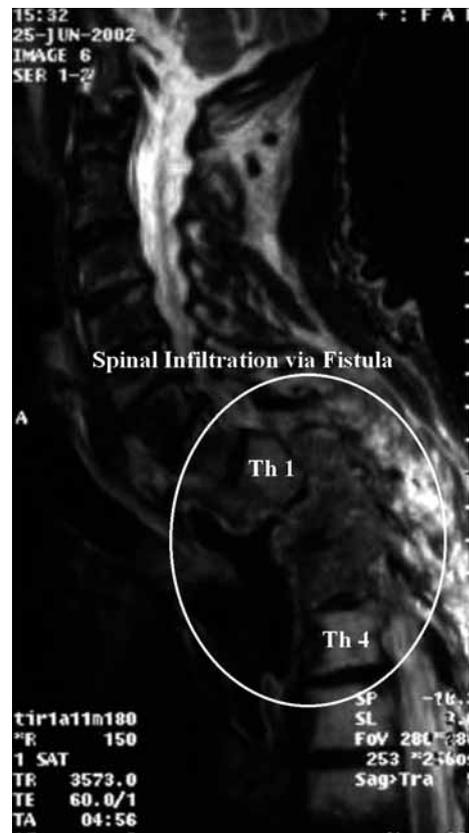
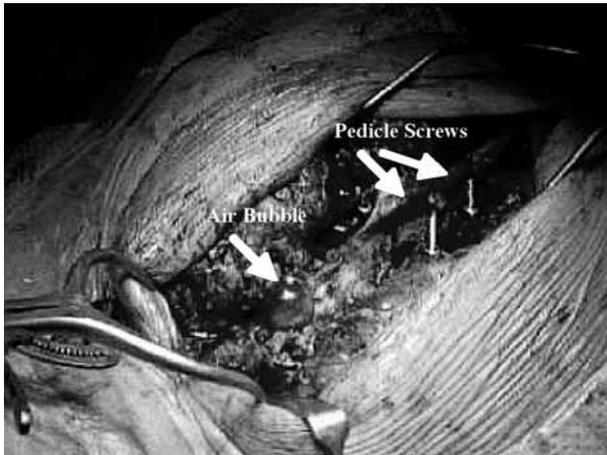


Fig. 3. — MRI : tumour infiltration of the spine

expectancy was estimated by the surgeons to be about 6 months.

To prevent paraplegia with this highly unstable situation of the affected vertebrae and to alleviate pain, we decided to stabilise the spine. A stabilisation was carried out from the cervical vertebral



*Fig. 4.* — Intraoperative air bubbles in the spinal canal visible after laminectomy.

body VII to the thoracic vertebral bodies IV/V together with dorsal decompression by laminectomy of the thoracic vertebrae II and III. We used the angle-stable modular rod-screw implant system for posterior instrumentation of the occipito-cervical spine (Neon®, Ulrich Spinal Implants, Ulm, Germany). This implant system has the advantage of a high biomechanical stability without the need of an anterior column support (5). Insertion of the pedicle screws was assisted by a CT-assisted opto-electronic navigation system (BrainLAB® Vector Vision Navigation Systems, Heimstetten, Germany). After laminectomy we found tumour tissue in the spinal canal at the T II level. Air was leaking at the site (fig 4). Postoperative CT-scan showed correct position of the pedicle screws (fig 5). Postoperative follow-up was uncomplicated. Two days postoperatively the patient was mobilised wearing a rigid cervical collar for 14 days. Amoxicillin (Augmentin®) was administered to prevent infection. The preexisting neck and shoulder pain and the tenderness over the cervicothoracic spine disappeared. Histological examination confirmed a squamous cell carcinoma. Two weeks after the operation the patient left our department with a soft collar. He was seen at the outpatient department 6 weeks and 3 months after the operation. Radiographs showed no implant failure, no dislocation, osteolysis or screw breakdown.



*Fig. 5.* — Computertomography demonstrating the correct position of the pedicle screws in vertebrae C7, Th4 and Th5.

Nearly 5 months after the operation the patient died in terminal cachexia without any neurological deficit or clinical signs of vertebral instability or implant failure.

### DISCUSSION

We describe a case of a fistula between the tracheobronchial tree and the subarachnoid space due to a recurrent oesophageal squamous cell carcinoma after oesophagectomy. The cervico-thoracic spine was unstable due to tumoral invasion of the vertebrae.

At the first consultation no neurological deficits could be detected. The risk of surgery and the relatively short life expectancy of the patient were balanced against the reduced risk for paraplegia with a successful intervention and the anticipation of considerable tumour pain reduction. The patient wished to avoid a Milwaukee-brace as an alternative and decided for an operation. Until his death (nearly 5 months after surgery), he developed no neurological deficit and no signs of spinal instability. The pain situation was manageable with oral analgesics and a cervical collar was not necessary.

### CONCLUSION

Posterior stabilisation with the Neon® system in a single posterior approach may be a palliative

option for patients with imminent paraplegia and severe pain due to advanced tumour infiltration of the cervico-thoracic spine.

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