Case report - Esophagus

Purulent spondylitis related to anastomotic fistula after esophageal cancer surgery

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Abstract

A 73-year-old man underwent neoadjuvant chemotherapy followed by transhiatal esophagectomy with gastric tube reconstruction for advanced esophageal cancer with palliative intent. Cervical esophagogastrostomy with circular-stapled end-to-side anastomosis was performed; however, anastomotic fistula developed. Fever, severe pain in the nape of the neck and numbness of the left hand were noted after drainage by wide opening of cervicotomy and the administration of empiric antibiotics. Magnetic resonance imaging revealed high signal intensity between the inferior C5 vertebral body and the intervertebral disc on T2-weighted images, and some areas were contrast-enhanced, suggesting purulent spondylodiscitis. Because methicillin-resistant Staphylococcus aureus was detected by bacterial culture from the drained pus, sensitive antibiotics were given, and those symptoms improved rapidly without sequelae.

Purulent spondylitis frequently occurs via hematogenous infection but sometimes develops via consecutive infection from the adjacent purulent focus or direct involvement of inflammation by invasive spinal procedures. Several case reports of purulent spondylitis caused by esophageal rupture, esophageal stent for benign stricture, or unresectable cancer have been published [1–4]; however, to our knowledge, there have been few reports of purulent spondylitis related to anastomotic fistula after surgery for esophageal cancer [5, 6].

1. Introduction

Purulent spondylitis frequently occurs via hematogenous infection but sometimes develops via consecutive infection from the adjacent purulent focus or direct involvement of inflammation by invasive spinal procedures. Several case reports of purulent spondylitis caused by esophageal rupture, esophageal stent for benign stricture, or unresectable cancer have been published [1–4]; however, to our knowledge, there have been few reports of purulent spondylitis related to anastomotic fistula after surgery for esophageal cancer [5, 6].

2. Case report

A 73-year-old man was referred to our hospital, complaining of dysphagia and weight loss of about 7 kg over two months. Routine evaluation, including esophagography, esophagogastroduodenoscopy with biopsy, and computed tomography (CT)-scan, revealed that he had lower thoracic esophageal cancer and invading adventitia with perigastric nodal involvement that was not confirmed by endoscopic ultrasound-guided fine-needle aspiration. His cancer was classified as stage III according to the TNM classification of the International Union Against Cancer (UICC). Neoadjuvant chemotherapy with cisplatin and 5-fluorouracil were repeated twice every three weeks. Cisplatin at a dose of 80 mg/m² was given on day 1; 5-fluorouracil was administered at a dose of 800 mg/m² by continuous infusion on day 1 through 5. Grade 3 neutropenia developed according to the Common Terminology Criteria for Adverse Events v3.0 (CTCAE), which improved spontaneously. Postchemotherapy evaluation by CT-scan showed a little shrinkage of the primary tumor and the involved perigastric nodes; however, a new nodule 12 mm in diameter appeared at the hepatic dome. Exploratory laparotomy was performed for restaging and a nodule at the right diaphragmatic surface was confirmed to be metastatic by intraoperative histological examination. Although endoscopic palliation seemed indicated to alleviate his severe dysphagia, there was concern that stent placement might be impossible considering the severe and long stricture on esophagography. Therefore, transhiatal esophagectomy, gastric tube reconstruction via the retrosternal route, cervical esophagogastrotomy with circular-stapled end-to-side anastomosis, and peritoneal metastasectomy were performed only for oral feeding restoration and macroscopic tumor clearance.

On the third postoperative day (POD), as a flare-up of the cervical wound and pus discharge from a drain were noted, a wide opening of the cervicotomy was performed and a daily dose of 1.5 g of imipenem was started. A local infection with abscess formation was suspected; however, saliva outflow from the drain was observed on the sixth POD. Fluoroscopic examination on ninth POD confirmed anastomotic fistula, but the insufficient imaging could not demonstrate an accurate size of suture dehiscence. Because of protracted inflammation, levofloxacin was given instead of imipenem. However, fever, severe pain in the

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nape of the neck and left shoulder, and numbness of the left hand were noted, and the C-reactive protein level rose to 11.7 mg/dl on the 15th POD. Magnetic resonance imaging (MRI) on the 16th POD revealed high signal intensity between the inferior C5 vertebral body and the intervertebral disc on T2-weighted images (arrow). Some areas were contrast-enhanced, suggesting purulent spondylodiscitis. POD, postoperative day.

Fig. 1. Magnetic resonance imaging (MRI) on the 16th POD revealed high signal intensity between the inferior C5 vertebral body and the intervertebral disc on T2-weighted images (arrow). Some areas were contrast-enhanced, suggesting purulent spondylodiscitis. POD, postoperative day.

3. Discussion

Iannettoni et al. reported that cervical osteomyelitis developed in three of 842 patients (0.35%) who underwent cervical esophagogastric anastomosis after transhiatal esophagectomy [5]. In these three patients, a suspension suture was placed between the anterior cervical prevertebral fascia and the very tip of the pulled-up stomach where the blood supply was most compromised, which might have caused focal gastric necrosis and subsequent infection involving the vertebral bodies. Although a suspension suture was not performed in this patient, it was possible for the fascia to be inadvertently injured during the anastomotic procedures. In any case, the mode of causing spondylitis may have been the direct spread of infection from the infectious focus, the same as in the three patients reported by Iannettoni et al., considering that the affected vertebral bodies were close to the impaired anastomosis and spondylitis manifested itself for relatively short duration after leakage. Additionally, it should be emphasized that age, immunosuppression caused by neoadjuvant chemotherapy, and highly advanced cancer with metastatic disease were associated with the occurrence of spondylitis in this patient, because a number of co-morbidities have been found to increase the risk of the disease [7]. Mecklenburg et al. reported an extremely rare case of esophagospinal fistula with spondilodiscitis after esophagectomy with gastric pull-up [6]. The patient had received neoadjuvant chemoradiotherapy for carcinoma of the mid-thoracic esophagus 18 months before presentation, which suggests...
not only an association with immunosuppression but also a direct effect of radiation itself.

MRI is the most sensitive and specific modality for confirming early diagnosis of spondylitis [7]. When neck or back pain with neurological deficit occurs in patients with highly advanced esophageal cancer, the differential diagnosis includes metastatic spinal disease. On MRI, spondylitis and metastatic spinal tumor are visualized as areas of low signal intensity on T1-weighted images and high signal intensity on T2-weighted images. Purulent spondylitis often involves the intervertebral disc, but the signal intensity of the intervertebral disc remains normal in patients with metastatic spinal tumor. MRI is, therefore, useful for differentiation. However, MRI is of limited value in monitoring response to the treatment. Imaging findings may actually persist or even worsen in spite of clinical improvement, as seen in this case, which does not necessarily represent deterioration or treatment failure [7].

*Staphylococcus aureus* is the most commonly isolated pathogen that complicates invasive spinal procedures, and methicillin resistance is found in 30–40% of nosocomially-acquired *S. aureus* strains [8]. A particular problem exists with MRSA spondylitis because of the poor bone penetration of vancomycin, which may correlate with the high failure rate of MRSA spondylitis treatment [8]. A switch to teicoplanin or linezolid was considered and would have been implemented if the treatment with vancomycin had failed; however, about 12 weeks of intravenous administration of vancomycin successfully controlled the pain and neurological symptoms until the patient’s death from esophageal cancer relapse.

It is to be regretted that quality of the rest of the patient’s life was impaired by prolonged spondylitis and early cancer relapse. Treatment selection is most important for patients with limited life expectancy so as not to suffer from unexpected complications by invasive procedures. Purulent spondylitis after esophagectomy is an extremely rare complication that can cause catastrophic sequelae, such as quadriplegia subsequent to epidural abscess. All esophageal surgeons should be aware of the disease for early detection and adequate treatment.

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**References**