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Richard A. Goldman, MD
Thomas Jefferson University Hospital

Jill N. D'Souza, MD
Thomas Jefferson University Hospital

Adam J. Luginbuhl, MD
Thomas Jefferson University Hospital

Joshua E. Heller, MD
Thomas Jefferson University Hospital

Joseph M. Curry, MD
Thomas Jefferson University Hospital

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Authors
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Cervical Spine Osteomyelitis after Esophageal Dilation in Patients with a History of Laryngectomy or Pharyngeal or Pharyngeal Irradiation

Richard A. Goldman MD1, Jill N. D’Souza MD1, Adam J. Luginbuhl MD, Joshua E. Heller MD2, Joseph M. Curry MD1, David M. Cognetti MD1
1Department of Otolaryngology-Head and Neck Surgery, Thomas Jefferson University, Philadelphia, PA

Introduction

A 72 year old male with a history of laryngeal cancer was initially treated with radiation therapy twenty years prior to presentation. Ten years prior to presentation he experienced a second recurrence of laryngeal cancer treated with total laryngectomy and adjuvant radiation therapy. One year prior to presentation he began to experience progressive dysphagia which was treated with serial esophageal dilatations every 3.5 weeks at another institution. The details of these procedures are unknown. The patient’s treatment began with neck pain and fever; imaging revealed a retropharyngeal collection consistent with cervical osteomyelitis. He was considered a high risk patient and managed medically with antibiotics when he presented to our institution for a second opinion. Follow-up imaging revealed progressive destruction of the cervical spine and identified an epidural abscess (Fig. 1). After multidisciplinary review the patient was taken to the operating room with the head and neck service and neurosurgery for debridement and reconstruction. The details of operative management and outcome are summarized in Table 1. Initially he was kept NPO due to a pharyngoesophageal fistula which was managed conservatively. He remained PEG tube dependent for nutrition but eventually was able to take a limited diet by mouth. He expired of unrelated causes one year later.

Discussion

Osteomyelitis is a rare complication of esophageal dilation that has not been well described in the literature. Mullen et al. reviewed seven reported cases associated with esophageal dilation with or without placement; all patients had a history of esophageal or laryngeal cancer1. Prior cancer treatment not only contributes to the anatomy requiring dilation but likely puts these patients at increased risk for this uncommon complication. The likelihood of prior radiation being a significant risk factor is reinforced by our experience, in that 4 of our 4 patients had been re-irradiated for a second squamous cell carcinoma. Transient bacteremia occurs in many endoscopic procedures and has been shown to occur in up to 30% of esophageal dilations. We suspect that by a similar mechanism of microtrauma, bacterial translocation and seeding of adjacent tissues occurs. Compromised immunity in radiosensitive tissues may also present underway to develop at these vulnerable sites including the cervical spine. While an undiagnosed perforation may have contributed in these cases, one of our patients never developed any perforation defect. Current guidelines of the American Society of Gastrointestinal Endoscopy regarding antibiotic prophylaxis do not recommend preoperative antibiotic for routine procedures including dilations and do not comment on prior radiation as a risk factor for infectious complications. The tissue damage and flux that makes these patients vulnerable to osteomyelitis also makes their surgical management difficult. A structural autograft was used and anterior cervical interbody fusion was utilized. In this patients, the cervical deformity was stable and those reconstructions using well vascularized flaps were employed. Under the direction of Infectious Diseases, patients were treated initially with IV antibiotics and eventually transitioned to long term oral therapy. All patients maintained or recovered full neurological function and returned to a limited or full oral diet.

Cervical spine osteomyelitis is a rare and serious complication that should be considered in patients with a history of pharyngeal surgery and radiation who undergo esophageal dilation. We would consider the use of prophylactic antibiotic prophylaxis for covering squamous flora in this special population. In our experience a multidisciplinary surgical approach to the cervical spine and pharynx along with extended antibiotics allowed for successful management of this challenging complication.

References


Case 1

A 72 year old man with a history of T12/L1HDDN axonal cell carcinoma of the pyriform sinus treated with transthoracic resection, neck dissection, and adjuvant chemotherapy developed a hypothenpbalic stenosis and dysphagia 3 months after treatment. He underwent dilation at our institution. He received prophylactic antibiotics (Cefazolin 2g) prior to dilation and eventually presented upon post-dilation esophagoscopy. Of note, he did have a persistent hypothenpical ulcer since adjacent tumor treatment. Seven weeks later he presented to another facility with upper extremity weakness and imaging revealed an epidural abscess, bone destruction, distruction, and retropharyngeal air (Fig 1 A). He underwent urgent drainage along with decompression and an anterior cervical decompression and fusion (ACDF) at the outside facility (Fig. 2). Postoperatively he developed a pharyngoesophageal fistula through his neck wound and was transferred to our facility for further management. Additional imaging revealed a pharyngeal defect and retropharyngeal collection. C5-6 discitis and osteomyelitis, and enlargement of the epidural abscess. After multidisciplinary review, the patient was surgically explored and found (Fig 3 C). He experienced a full neurological recovery and was able to resume an oral diet (Table 1). He remains living without long term sequelae at the time of this report 2.5 years after surgery.

Case 2

A 74 year old male was initially treated with radiation therapy for a tongue base cancer. Five years later he presented with shortness of breath, fatigue, fever, and a sensation of throat fullness. He was treated for tuberculosis and had undergone thoracic and cervical dilation for unexplained swallowing function. He did receive prophylactic antibiotics (Cefazolin 2g) post-procedure as well as on post-dilation esophagoscopy. Approximately 30 weeks following dilation a surveillance PET/CT revealed intense activity in the lower cervical spine. At that time the patient was experiencing neck pain but had no neurological deficits. A follow-up MRI of the spine revealed C5-6 discitis and osteomyelitis. He was managed similarly to previous cases (Fig 1). The patient remained intact and his soft tissue reconstruction was required. He recovered well and returned to an oral diet. He is living without long term sequelae at the time of this report 8 months after surgery.

Case 3

Case 4

Fig 1. A: Lateral Cervical Spine X-ray showing Intermittent low density. B: Preoperative CT Cervical Spine showing ACDF with interbody cage placed between C5 and C6 vertebrae.

Table 1. Case Details of Cervical Spine Osteomyelitis

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spine Osteomyelitis Cohort