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

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

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Osteomyelitis is a rare complication of esophageal dilation that has not been well described in the literature. Mullin et al. reviewed seven recent cases associated with esophageal dilation with or without placement; all patients had a history of esophageal or laryngeal cancer.1 Prior cancer treatment not only contributes to the etiology 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 ≥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 microbes, transmural infection, and seeding of adjacent tissues occurs. Compromised vasculature in radiated tissues may allow persistent infection 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 antibacterial prophylaxis do not recommend preoperative antibiotics for routine procedures including dilations and do not comment on prior radiation as a risk factor for infectious complications. The tissue damage and fibrosis that makes these patients vulnerable to osteomyelitis also makes their surgical management difficult. A structural autograft was used and short-segment cervical instrumentation was used to bridge the gap. In these patients, pharyngeal deformities 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 neumonic 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 antibacterial prophylaxis for covering esophageal flora in this special population. In our experience a multidisciplinary surgical approach to the cervical spine and pharynx along with extended antibacterial allowed for successful management of this challenging complication.

References

Figures
1. 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 occurrence 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 dilations every 3 to 5 weeks at another institution. The details of these procedures are unobtainable but the patient has now had many procedures and has significant pain and fear; imaging revealed a retropharyngeal collection with concern for 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 epidermal 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 pharyngostoma 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 without surgery across one year later.

Table 1. Case Details of Cervical Spine Osteomyelitis

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<tr>
<th>Case</th>
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<th>Management</th>
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<tr>
<td>2</td>
<td>Neck pain, fever</td>
<td>Postoperative ERUS, Antibiotics.</td>
<td>Necrosis, no return to PO diet</td>
</tr>
<tr>
<td>3</td>
<td>Neck pain, fever</td>
<td>Postoperative ERUS, Antibiotics.</td>
<td>Necrosis, no return to PO diet</td>
</tr>
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Figures
1. An 8 year old male with a history of T12/L2/A2 squamous cell carcinoma of the pyriform sinus treated with transoral robotic resection, neck dissection, and adjuvant chemoradiotherapy developed a hypopharyngeal abscess and dysphagia 3 months after treatment completion. He underwent dilation at our institution. He received preoperative antibiotics (Cefazolin 2g), no perforation or malacia was seen upon post-dilation esophagoscopy. Of note, he did have a persistent hypopharyngeal ulcer since adjuvant treatment. Seven weeks later he presented to another facility with upper extremity weakness and imaging revealed an epidural abscess, bone destruction, dura, and retropharyngeal air (Fig. A). He underwent urgent drainage along with decompression and an anterior cervical decompression and fusion (ACDF) at the outside facility (Fig. B). Postoperatively he developed a pharyngostoma fistula through his neck wound and was transferred to our facility for further management. Additional imaging revealed a pharyngeal defect and retropharyngeal collection. C-3 discitis and osteomyelitis, and enlargement of the epidural abscess. After multidisciplinary review, the patient was surgically explored (Fig. C). He experienced a full neurologic 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.

Fig. 2. A 34 year old male with a history of laryngeal cancer treated with total laryngectomy and radiation therapy developed progressive dysphagia 24 years after treatment. He initially received preoperative antibiotics; no perforation or laceration was seen on post-dilation esophagoscopy. Ten days later he presented to the Emergency Department of another institution complaining of fevers and neck pain. He was transferred for further management and CT and MRI imaging of the spine revealed retropharyngeal air, C-5/C-6 discitis and osteomyelitis as well as a communicating epidural abscess. Surgical management is detailed in Table 1. He recovered well from surgery and returned to an oral diet. He is doing well at this time of report is 2 months after surgery.