Pharyngovertebrocutaneous Fistula Reconstructed with a Supraclavicular Flap

Brittany E. Howard MD\(^1\), Thomas H. Nagel MD\(^1\), Carrlene B. Donald PA-C\(^1\), Richard E. Hayden MD\(^1\)
\(^1\)Department of Otolaryngology – Head and Neck Surgery, Mayo Clinic Arizona, Phoenix, AZ

Abstract

Outcome Objectives: 1) Describe a case of acquired pharyngovertebrocutaneous fistula and 2) recognize the potential role of the pedicled supraclavicular flap in its management and reconstruction.

Methods: Case report and review of the literature.

Results: A 24 year old quadriplegic female presented with a pharyngovertebrocutaneous fistula following cervical spine surgery with 4 prior failed attempts at closure. The fistula traversed from the posterior cervical esophagus, through a vertebral column defect at C6-C7, medial to the carotid, and exited the anterior cervical skin. The vertebral bony defect was consistent with reported prior expulsion of vertebral bodies through the fistula. During surgical repair, the fistula was resected including anterior cervical skin and the esophagus was closed primarily. There was a resultant large defect posterior to the esophagus measuring 2.3 x 2.5 x 4.4 cm. A supraclavicular pedicled flap measuring 5 x 15 cm was harvested to provide vascularized tissue reconstruction. The flap was de-epithelialized and used to reinforce the esophageal repair. A swallow study obtained 2 weeks postop showed no evidence of a fistula and the patient resumed an unrestricted oral diet. Prior studies support the utility of the pedicled supraclavicular artery island flap for reconstruction of esophageal and cervical defects.

Conclusions: The supraclavicular flap provides an excellent regional vascularized tissue reconstructive option for management of pharyngeal fistulas and cervical defects given its proximity, color match, pliability, ease and rapidity of harvest, reliability, low donor site morbidity, and thin/pliable nature.

Introduction

- Esophageal/pharyngeal perforation is a rare complication of anterior cervical spine surgery occurring in 0.2 – 1.2% of cases.\(^1\),\(^2\)
- We present a rare case in which the fistula tracked from the pharynx, through the vertebral column, and out the anterior cervical skin. It resulted in prior extrusion of the cervical hardware and vertebral bodies through the fistula.
- Reconstruction was achieved utilizing a pedicled supraclavicular flap.

Case Report

A 24 year old with prior MVA resulting in quadriplegia and previously requiring anterior and posterior approach for cervical spine stabilization. Postoperatively she developed a pharyngovertebrocutaneous fistula that persisted despite 4 surgical attempts at resection and closure at outside institutions. During that time she extruded the anterior cervical construct through the fistula tract as well as multiple bony segments that were consistent with vertebral bodies. The patient maintained an oral diet by packing the fistula tract with chicken and bread material.

On imaging (Figure 1) a large mouthed fistula arose from the posterior pharynx/esophagus and involved spinal column from the level of C4 to C7. There was a large osseous defect within the vertebral column at C6 to C7 with air and particulate matter in direct contact with the posterior longitudinal ligament.

Surgical repair of the fistula included excision of the anterior cervical skin and the entirety of the fistula tract (Figure 2). This required a combined approach with the Otolaryngology and Neurosurgical team as the fistula tract coursed through the C6-C7 vertebral bodies and communicated with the spinal cord at this level. Following resection, the esophagus was closed primarily, but there remained a large defect posteriorly measuring 2.3 x 2.5 x 4.4 cm. A sternocleidomastoid muscle flap was inadequate for full obliteration of the dead space. Thus, a vascularized tissue reconstruction with a supraclavicular pedicled flap used for complete eradication of the dead space and to provide vascularized tissue support to the esophageal closure. A 5 x 15 cm flap was harvested, de-epithelialized, and rotated into position. The cervical incision and donor site were both closed primarily.

Postoperatively the patient resumed an unrestricted oral diet within 2 weeks. At 2 years follow up she has had no recurrence of the fistula.

Discussion

Surgical repair of pharyngeal and esophageal defects can be problematic with high rates of failure following primary closure alone. In cases with large or recurrent defects, the utilization of vascularized tissue reconstruction can improve likelihood of successful closure.\(^3\)

The supraclavicular flap was originally described as an axial pattern flap by Lamberty in 1979.\(^4\) Based upon the supraclavicular artery and vein, it allows harvest of a sizable fasciocutaneous flap from the tissue overlying the shoulder. Given its excellent color match, pliability, ease and rapidity of harvest, there is renewed interest in its application for reconstruction of head and neck defects. Especially for defects of the upper aerodigestive tract the flap is ideally located to provide vascularized tissue for reconstruction of a variety of pharyngeal, esophageal, and tracheostomal defects.

We describe a case in which the flap is utilized for reconstruction and support of a complex pharyngeal/esophageal defect.

Conclusions

- Pharyngeal and esophageal perforation following anterior cervical spine surgery is a rare but problematic complication
- For large or recurrent defects the utilization of vascularized tissue for reconstruction decreases the likelihood of recurrence.
- The supraclavicular flap is an ideal flap choice for reconstruction of esophageal/pharyngeal defects given its proximity, ease of harvest, and pliability.

References