A Role of the Pectoralis Major Muscle Flap in the multidisciplinary treatment of Esophageal Cancer: Case series

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Learning Objectives

- Following this presentation, attendees will:
- Describe measures taken when multiple complications of varying severity arise following esophagectomies leading to the use of pectoralis major regional flaps.
- Review the role of disciplines when treating complications related to esophageal reconstruction.

Introduction

This case series highlights three patients who underwent esophagectomy with or without neoadjuvant chemoradiotherapy. Complications, including tracheoesophageal fistula, stenosis, tracheal defect, and gastric conduit necrosis, were managed with the assistance of the pectoralis major muscle flap, with both myocutaneous and myofascial transfers. The management was conducted by a multidisciplinary team including Thoracic and Head and Neck surgeons.

Literature review

- No English papers were found on the use of the pectoralis major flap for the management of a multitude of complications arising from esophagectomy.
- Previous papers have described the role of the pectoralis major flap to repair a fistula arising after a total esophagectomy.
- A case of reconstruction of a posterior tracheal wall defect with a pectoralis major flap after dissection of an esophageal tumour has been documented.

Cases

Case 1:
A 58-year-old male had upper GI endoscopy revealing a sizeable exophytic, ulcerative tumour mass within the cervical esophagus. Biopsies were consistent with squamous cell carcinoma.

- tumour was stuck to the posterior wall of the membranous trachea, requiring resection defect that was reconstructed with a serratus anterior muscle flap and a gastric conduit was lifted
- developed persistent dehiscence and leak from his anastomosis and ischemia of the proximal end of his gastric conduit
- was managed with a proximal salivary stent as well as a mid-esophageal stent, which eroded into his airway, causing a tracheogastric fistula
- developed a large cavity and infection in the right apex of the chest, resulting in sepsis, and a Clagett window was created
- Stent was removed and a defect in the esophagus was identified and Montgomery stent was brought back to bridge the gap to maintain the track
- right pectoralis major was used as a muscle buttress, and given its size, it was felt to be adequate and bulky enough

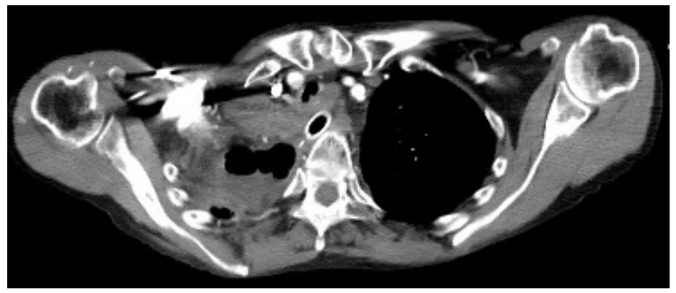

Figure 1. Computerized tomography post esophagectomy with gastric pull-up, tracheoesophageal fistula repair with serratus and pectoralis major muscle flaps. Previous connection between the gastric conduit and Clagett window has been repaired following reconstruction with right pectoralis major flap.

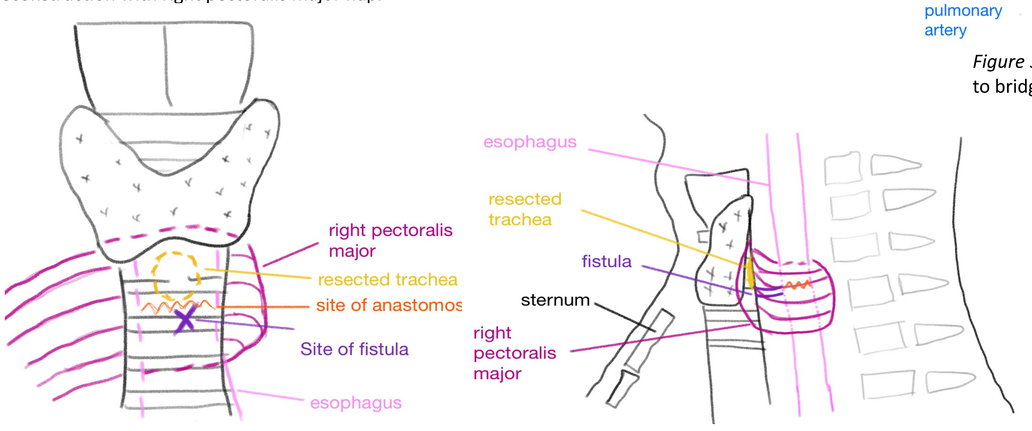

Figure 2. Frontal and sagittal view illustration depicting the use of the pectoralis major flap to buttress the anastomosis, repair the resected trachea and repair the fistula.

Case 2:
A 69-year-old female received induction chemoradiotherapy followed by esophagectomy at an outside institution.

- developed a stricture refractory to dilatation and was jejunostomy tube dependent for nutrition
- received induction chemoradiotherapy followed by esophagectomy at an outside institution
- developed an anastomotic stricture refractory to dilatation.
- resection of the stricture was reconstructed with a tubed pectoralis major myocutaneous flap that was rotated over a defect in the trachea which had been created during dissection of dense adhesions surrounding the esophagus
- Flap was inset as a bridge between the proximal esophagus and the remaining conduit, with a fish-mouth anastomosis to widen the anastomosis to the cervical esophagus
- Distal anastomosis of the flap was low in the chest, necessitating anastomosis deep and inferior to the pulmonary artery.

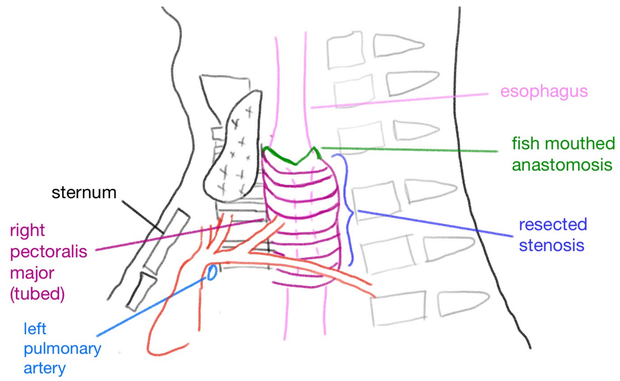

Figure 3. Illustration of the use of the pectoralis major flap to bridge the proximal esophagus and the conduit.

Case 3:

- presenting complaint of dysphagia led to a diagnosis of adenocarcinoma of the distal esophagus
- had near complete obstruction at the time of diagnosis, an esophageal stent was placed
- 3-hole esophagectomy and gastric pull-up resulted in proximal gastric conduit necrosis
- necessitated creation of an esophageal spit fistula
- gastric conduit loss and resection resulted in discontinuity, requiring a colonic interposition flap with a gastrocolonic anastomosis
- right middle colic was rotated in an antegrade antiperistaltic fashion with the proximal colon going up into the neck
- anastomosis was completely buttressed with a pectoralis major myofascial flap behind and anterior to the anastomosis in order to increase the likelihood of success in this heavily operated and irradiated area.
- Inset of the pectoralis flap and colonic interposition required transection of the clavicle and first rib laterally

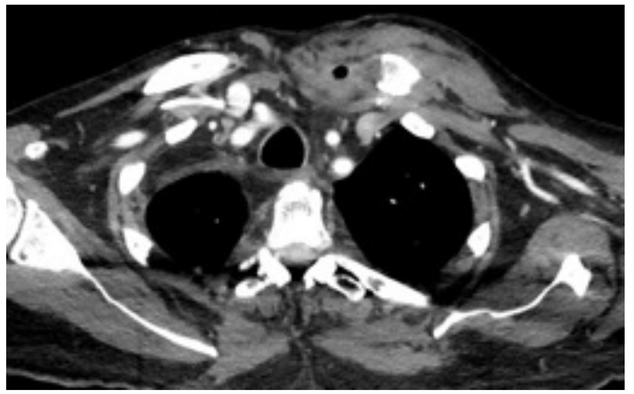

Figure 4. Computerized tomography of pectoralis major flap rotation and bolstering of conduit.

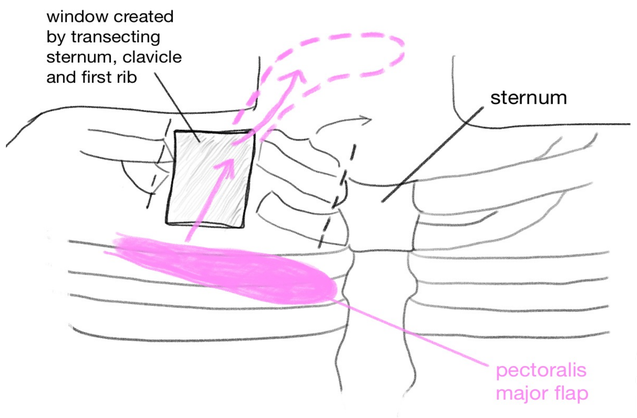

Figure 5. Illustration of the window created to allow the pectoralis flap to be rotated around the anastomosis.

Multidisciplinary approach

Role of Thoracic Surgeon:

- mobilize segments of the stomach or colon and provide the length of gastrointestinal (GI) conduit that is needed for a tension-free anastomosis reconstruction
- prepare the proximal esophagus and thorax for reconstruction, which can involve partial resections of the manubrium, clavicle, and first rib to provide access to the thoracic vessels for the pectoralis major flap
- Perform proximal esophago-jejunal or esophago- colonic anastomoses in the neck
- Complete necessary bypasses for the remaining bowel
- perform the vascular anastomoses between the flap to the recipient's vessels

Role of Otolaryngologists:

- Regional flap selected for reconstruction will be harvested and transferred to the esophagus for anastomosis simultaneously while Thoracic Surgery prepares the esophagus for anastomosis
- Tracheotomy if required

Although dissection within the neck is commonly performed by thoracic surgeons during esophagectomy procedures, in these cases the head and neck surgeon dissected the proximal esophagus, pharynx, and recurrent laryngeal nerve to allow more proximal control of the esophagus.

Conclusion

Although esophagectomy is a complex surgical procedure with many possible postoperative complications, a group of experienced specialists working together increases the probability of good results when adverse events arise. In this series, we have showcased clinical situations in which the addition of a reconstructive otolaryngologist to the established multidisciplinary team may be of benefit.

Please contact presenter for appropriate references. The authors declare no conflicts of interest

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