

Synchronous Reconstruction of the Esophagus and Trachea with the use of the Strap Muscles in a Gunshot Wound Patient

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Introduction/Background

We present a unique case of synchronous strap muscle reconstruction of the lower cervical esophagus after traumatic perforation x2 by gunshot wound (GSW).

Case Scenario

The patient is a 24 year-old male that was shot through his right neck. A CT of his neck and chest showed esophageal and tracheal injury.

Emergent flexible bronchoscopy with esophageal stent placement was performed for temporary coverage of the esophageal defect, which allowed time for conducting a more thorough evaluation and surgical planning.

The patient's esophagus and trachea were exposed in the operating room by a J-type incision in the inferior neck, revealing 2 large defects in the cervical esophagus.

A decision was made intraoperatively to cover the defects with 2 muscle flaps based on the sternohyoid and the sternothyroid. Transection of the muscles at their insertion was performed and the two muscles were rotated 180° and coaptated to the anterior and posterior esophageal defects.

Patient was placed in a liquid diet and advanced to a soft diet by the time of discharge



Figure 1

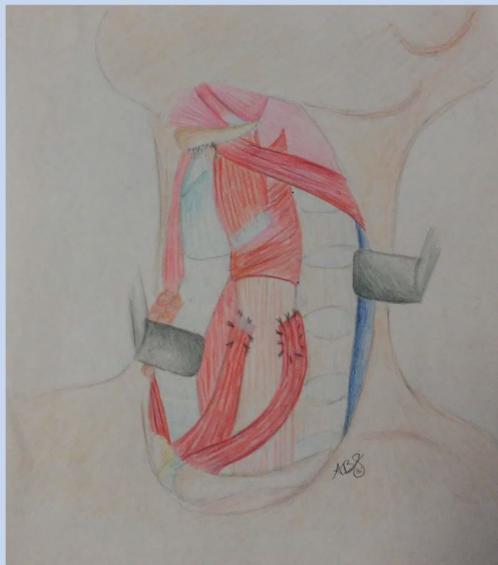


Figure 2

Figure 1 and Figure 2:

Anterior and anterolateral depiction of the sternothyroid and sternohyoid muscle flap coaptation to the cervical esophageal perforations

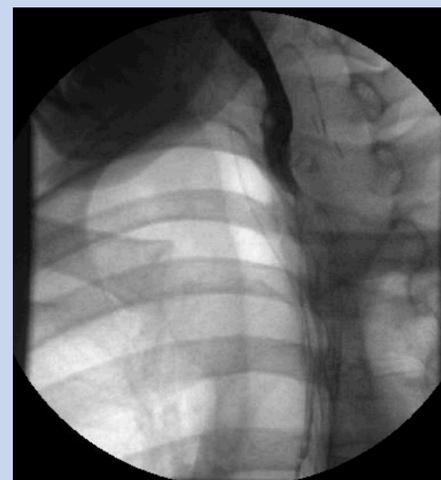


Figure 3

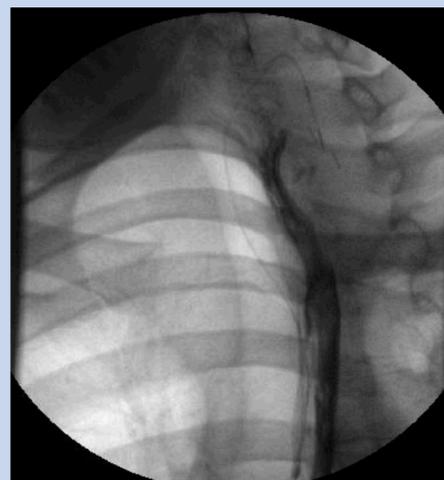


Figure 4

Figure 3 and Figure 4:

An esophagogram was performed 7 days postoperatively showing no leak.

Discussion and Conclusions

The large size of the esophageal defects secondary to the path of the bullet prevented primary closure.

Other options included a local sternocleidomastoid flap, regional pectoralis flap, or distant free tissue transfer.

Transection of the sternohyoid and the sternothyroid muscles (“strap muscles”) at their insertion, while preserving their origin, allowed for 180° rotation. This enabled local reconstruction of the lower cervical esophagus at the level of the superior thoracic aperture without the increased surgical morbidity associated with a distant regional pedicle flap or free tissue transfer flap with microvascular anastomosis.

The inferior portions of the infrahyoid muscles are supplied by branches of the inferior thyroid artery and internal thoracic artery (aka internal mammary artery). By preserving the muscular origin and carefully dissecting to achieve rotation, these muscle flaps act as a well vascularized patch. This patch simultaneously prevents esophageal and tracheal leak, while providing an enriched, robust blood supply for healing of the defect.

Ideally, techniques for reconstruction of the lower cervical esophagus and trachea after trauma will provide rapid restoration of function with low morbidity, and result in a rapid recovery and brief hospital stay. This technique achieved these goals, and is not well described in the literature.

References

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