Operative Techniques in Thoracic and Cardiovascular Surgery

Total Laryngopharyngoesophagectomy and Tracheal Resection With Free Tissue-Reinforced Gastric Pull-Up

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Total laryngopharyngoesophagectomy with tracheal resection is an uncommon procedure. The resectability of a hypopharyngeal and cervical esophageal tumor typically depends on the ability to obtain clean surgical margins. The extent of the resection requires careful surgical planning and execution. Concomitant tracheal resection and manubriectomy due to tracheal invasion increases the complexity of these already challenging conditions. Although gastric pull-up procedures have been used to successfully reconstruct laryngopharyngoesophageal defects after tumor resection, a free tissue augmented reconstructive approach should be considered in more aggressive tumors with invasion of surrounding structures. Herein, we describe the use of combining gastric pull-up with anterolateral thigh free tissue transfer for optimal repair after radical tumor resection.
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Introduction

Reconstruction of surgical defects after resection of proximal esophageal and upper airway tumors remains clinically challenging.[1] Reconstructive efforts are focused on the need to maintain continuity of the digestive tract, a secure airway, and adequate soft tissue coverage. Secondary goals are to encourage optimal swallowing and voice restoration after these procedures, while also minimizing morbidity. The literature on laryngopharyngoesophagectomy reconstructive techniques reflects the complexity of these challenging cases, with significant variations having been described.[2] Contemporary management of these complex defects rests upon 2 primary options as gastric pull-up and free tissue transfer.[3]

We describe an approach that uses a combination of these 2 primary treatment modalities using gastric pull-up reinforced by anterolateral thigh free flap reconstruction for optimizing surgical success. This operation is useful for the reconstructive surgeon in the treatment of complex defects following extensive laryngopharyngoesophagectomy with or without involvement of adjacent structures.[4-10]

Reliance on a team approach is of paramount importance in the successful completion of these operations. Preoperatively, the surgical decision should include input from medical oncology, radiation oncology, head and neck surgery, thoracic surgery, reconstructive surgery, pathology, and radiology. Intraoperatively, the 3 surgical teams (thoracic surgery, head and neck surgery, and reconstructive surgery) need to be in close step with respect to surgical planning and execution.

Operative Technique

Part 1: Laryngopharyngectomy and Neck Dissections

The patient is positioned supine. The arms are tucked and the legs are placed in split leg positioners. The table is turned 180° from the anesthesia unit to permit access to the head and neck with simultaneous abdominal surgery. Surface landmarks are identified (Fig. 1).

Following gastric and esophageal mobilization with manubriectomy, a cervical incision is performed in a U-shaped fashion from just below the mastoid tip bilaterally. The incision is taken through the platysma muscle. Subplatysmal flaps are raised superiorly and inferiorly. This exposure allows for access to the entire length of the sternocleidomastoid muscle, hyoid bone, and paratracheal contents (Fig. 2).

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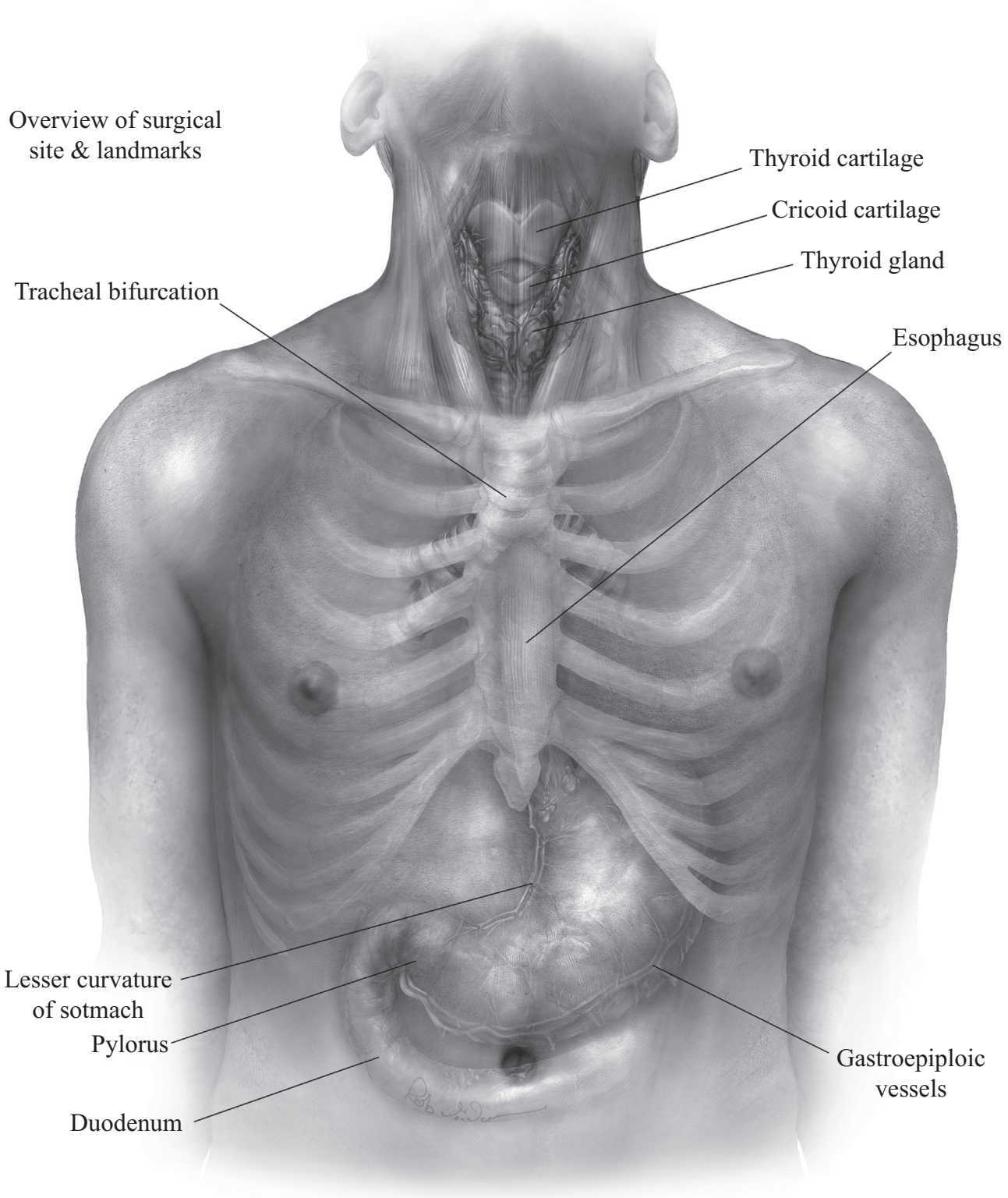

Figure 1 Overview of surgical site and landmarks.

Cervical lymph nodes in levels 2 through 4 are dissected bilaterally in the standard fashion with preservation of the internal jugular vein, carotid artery, spinal accessory nerve, and sternocleidomastoid muscle. The strap muscles are dissected inferiorly off the clavicle and superiorly off the hyoid bone. Dissection proceeds along the plane between the laryngotracheal complex and the carotid sheath, inferior to superior, with ligation of the neurovascular bundles that enter the larynx. The hyoid bone is carefully skeletonized in its entirety as to avoid injury to the hypoglossal nerve laterally. Once complete, the pharynx is entered superiorly at the level of the vallecula and a circumferential cut is performed. The specimen is dissected off the prevertebral fascia (Fig. 3).