Laryngotracheal Reconstruction with a Prefabricated Flap

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OBJECTIVE

Laryngotracheal stenosis (LTS) can leave patients with persistent or recurrent airway obstruction or tracheotomy dependence. Some patients have severely altered anatomy due to underlying diseases or previous reconstruction attempts. While there is extensive literature on surgical techniques to treat patients with LTS at onset, there are few techniques described for complex adult LTS after prior airway surgery. Our objective was to develop a procedure that could be used in patients who require structural augmentation for complex LTS or previously failed laryngotracheal reconstruction (LTR).

PATIENT 1

65 year old man with squamous cell carcinoma of the larynx who underwent suprarnasal partial laryngectomy with microsurgicallaryngoscopy for persistent disease following irradiation. Post-operatively, he developed a tracheomalacia requiring a tracheostomy at the base of the neck. A tracheostomy tube was placed for months. A laryngectomy was performed due to persistent structural support and poor soft tissue quality after previous surgery and radiation.

METHODS

This is a case series of two patients with complex LTS who were treated with a prefabricated composite graft consisting of auricular cartilage delayed in a radial forearm free flap. During the first stage of repair, a conchal cartilage graft was implanted subcutaneously into the forearm. Gelfoam was placed in the concave portion of the graft to encourage angiogenesis at the side of the graft in opposition to the muscle. Six weeks later, the patients returned to the operating room for the second stage repair. A tracheostomy was placed for both patients. A vertical incision was made through the stenotic portion of the airway and a Montgomery stent was placed. For patient 1, the incision was covered with local skin flaps. The composite radial forearm graft was harvested and inset with the auricular cartilage replacing the defects in the cricoid cartilage.

CONCLUSIONS

A prefabricated graft using auricular cartilage delayed in a radial forearm free flap can be a useful surgical reconstruction in patients with complex adult LTS who are not candidates for resection or alternative augmentation procedures. The prefabricated flap allows for necessary customization and prefabrication maintains the integrity of the osseous cartilage graft. It is a reliable and versatile technique for complex adult LTS in two patients with very different airway defects and underlying diseases. Furthermore, the reconstructive method provided satisfactory cosmetic and functional results.

As the etiology, extent of the defect, and overall tissue quality of patients with LTS can vary, it may be helpful for other surgeons to learn this flap provides a reliable solution to larger reconstructions of the laryngotracheal region compromised by prior locoregional therapy.

RESULTS

Both patients were reconstructed successfully with good wound healing. They were both decannulated and have adequate voice and swallow. The tracheostomies fascia and skin were passedatraumatic photograph closed spontaneously.

PATIENT 2

27 year old man with subglottic and tracheal stenosis due to Wegener’s granulomatosis. He was tracheotomy dependent for several years. In 2003, he underwent laryngectomy of the first two tracheal rings and anterio tracheal cartilage followed by laryngotracheoplasty with an x-b cartilage graft. His airway patency was maintained with dilation, stent insertions, and topical mitomycin C six month intervals. The time interval between dilations began decreasing, and he required repeat LTR. Local tissue reconstruction was again impossible due to chronic inflammation from Wegener’s granulomatosis as well as previous airway surgery.

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