Surgical Closure of an Iatrogenically Induced Cervical Tracheo-Esophageal Fistula Using the Infrahyoïd Musculocutaneous Flap ("Remmert Flap") and Autologous Tragal Cartilage

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Introduction

Long term intubation is an important etiology of acquired cervical tracheo-esophageal fistulas (TEF) in adults. The successful management by closure of such benign TEFs is challenging, particularly because careful handling of neck soft tissue structures, including the recurrent laryngeal nerve, is necessary. In previously published literature, various surgical techniques for closure of TEFs have been reported and described by utilizing free grafts and pedicle flaps. In the present case we, Otorhinolaryngology and Head & Neck surgeons, present an alternate surgical option to manage benign TEFs by utilizing the well-known infrahyoid muscular ("Remmert") flap and autologous tragal cartilage simultaneously.

The Procedure

A primary surgical closure of TEF was attempted. During the procedure, we identified a 3 cm membranous tracheal defect where a primary wound closure was not possible. The esophageal perforation, however, could be closed primarily. Closure of TEF was done with the infrahyoid muscular flap together with the autologous tragal cartilage. Alongside the closure of the TEF, it was particularly challenging to preserve the recurrent laryngeal nerve and the thyroid gland. This was followed by further endoscopic and imaging tests which confirmed a TEF with a diameter of 2.5 × 1.5 cm, at the level of second and forth tracheal rings.

In previous literature, various muscles have been used to obliterate the space between trachea and esophagus. Options included sternocleidomastoid, pectoralis major including its caudal pedicle or muscles detached from the hyoid including sternohyoid and/or thyrohyoid. In the present case the infrahyoid muscular ("Remmert") flap was successfully employed, a technique which has not yet been published in the literature.

The Case

A 42 years old patient from Bangladesh, suffered an acute myocardial infarction due to a stenosis of the right coronary artery. Coronary angiography with balloon angioplasty (PTCA) and stenting was subsequently performed. After coronary intervention, the patient developed ventricular fibrillation. His rhythm was stabilized after 25 minutes of resuscitation. Subsequently, invasive mechanical ventilation was required and long-term ventilation was performed through an elective percutaneous tracheostomy. After about 5 weeks and successful weaning of the tracheostomy tube the patient was transferred from the Cardiology unit to the rehabilitation center. Spontaneously closure of the tracheostomy stoma was in order while the nasogastric tube was removed. The patient had an event of suspected aspiration, consequently a Gastrografin swallow was done to reveal images of a highly suspected cervical TEF.

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Results

Postoperatively, the successful closure of TEF with the infrahyoid muscular flap together with the autologous tragal cartilage was confirmed by a gastrografin swallow test. The patient was able to eat normally again and did not suffer any dyspnea, stridor or dysphonia. After a close follow up for two years, there were no complications such as strictures of the trachea or the esophagus.

Conclusion

Numerous methods for surgical closure of benign TEF have been described in the literature. This is the first reported procedure in which the infrahyoid muscular flap together with the autologous tragal cartilage have been successfully used to treat a benign TEF. Thus, we would like to introduce this method as an additional option for the Head and Neck Surgeon in the management of TEFs.

References of Literature related to the Poster can be requested by the author.