Case Report

Technical Nuances for Endoscopic Management of Complete Supraglottic Stenosis

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Abstract

Purpose: To report successful management of complete supraglottic stenosis using suspension microlaryngoscopy and an endoscopic technique.

Methods: A 51 year-old female with complete supraglottic stenosis was referred for consideration of decannulation. She had been radiated for oropharyngeal carcinoma several years prior, and had gradually developed progressive supraglottic and glottic stenosis requiring tracheotomy. Several endoscopic procedures had previously been done by another surgeon using local tissue flaps or balloon dilation, with only temporary short-term improvement in airway patency. Combined transoral and transstomal visualization was utilized to open a posterior glottic airway with a microlaryngeal spear and KTP laser. A silastic keel sheet was placed in the newly opened supraglottis and glottic aperture and left in place for 3 weeks.

Results: Following keel removal in the office, the patient experienced significant improvement in the patency of her supraglottic and glottic airway and was decannulated after one month. Her post-operative voice and breathing have been markedly improved, with no regression seen 3 months post-operatively.

Conclusion: Endoscopic management of complete Supraglottic cicatrization is feasible and yields excellent voice and airway results. This technique can potentially be applied to other complex cases of laryngeal stenosis.

INTRODUCTION

Supraglottic stenosis is a rare subset of laryngotracheal stenosis that typically presents with symptoms including shortness of breath at rest or with exertion, inspiratory stridor, voice alterations due to resonance changes, and dysphagia. Most isolated cases have been reported in children after prolonged orotracheal intubation or iatrogenic injury from previous oropharyngeal and supraglottic surgery; other common etiologies include radiation therapy, trauma, caustic ingestion, laryngopharyngeal reflux, inflammatory diseases or autoimmune diseases (e.g., sarcoidosis, Wegener’s granulomatosis, cicatricial pemphigoid, systemic lupus erythematosus, and lichen planus) [1,2]. Treatment for laryngotracheal stenosis can involve administration of immunosuppressants or a number of surgical techniques – including tracheostomy, endoscopic laser surgery, and buccal mucosa graft for laryngotracheal reconstruction [3,4].

The extant body of literature involving cases of this nature bears out the difficulty in treatment and the high likelihood that stenosis and other complications will reoccur. Many treatments - including both endoscopic and open - for laryngo-tracheal stenosis have been described in the pediatric population [5]. Custom made silastic sheets [6] have been used but have in large part been replaced by the Aboulker stent, and the Montgomery T-tube stents [7,8] CO2 laser is also used for supraglottoplasty in the pediatric population [9]. One recent series noted that 8 patients who underwent CO2 laser removal of supraglottic scar all required revision surgeries [4] The high rate of post-operative complications and reemergence of pre-operative conditions therefore demonstrates the need for improvements to existing techniques and treatments as well as for the cultivation of new approaches. The following case study describes the use of an endoscopic technique with keel placement for treatment of a patient with complete supraglottic stenosis.

CASE REPORT

The patient was a 51 year-old female seen for a second opinion regarding persistent supraglottic stenosis. In 1997 she was diagnosed with Stage 3 squamous cell carcinoma of the left tonsil and underwent definitive radiation therapy. Subsequent to this treatment she developed glottic and supraglottic stenosis requiring tracheotomy. Several endoscopic procedures had
Supraglottic stenosis is a rare condition; it is a subset of laryngotracheal stenosis and is most frequently associated with prolonged orotracheal intubation, iatrogenic injury, radiation therapy, trauma, or autoimmune diseases. Given its uncommon incidence, the treatment strategies are scarce and are often adopted from techniques used for more common areas of laryngotracheal stenosis, such as glottis, subglottis, and trachea. The optimal treatment for this condition is still unclear; however, the placement of the keel in this case has demonstrated notable efficacy in preventing restenosis of the supraglottis. Because stenosis of this severity can be difficult to treat, the positive outcome for this patient may demonstrate that this approach to treatment should be considered alongside other previously established treatments and techniques.

Moreover the use of the endoscope light through the scar tissue provides a guide for the direction of excision preventing the creation of a false passage with subsequent tracheal perforation and the use of laser within the soft tissue of the neck. The light was visible through a 2.4 cm width of scar tissue, however this technique might not be feasible for thicker scars. It remains a viable option if image guidance is not available.

**CONCLUSION**

The outcome of the surgical technique described above appears to demonstrate that endoscopic management of
complete supraglottic stenosis is feasible, and that in this case has yielded excellent results. The patient’s voice and airway constriction have both shown marked improvement, and follow-up examinations at one month and three months show that these improvements have been sustained with little sign of regression or reemergence of stenosis. With these results in mind, this technique can potentially be applied to other cases of this nature and should be considered as a possible treatment for a range of complex cases involving laryngeal stenosis.

REFERENCES


