



A CHALLENGING CASE OF LARYNGOTRACHEAL STENOSIS AND ITS MANAGEMENT

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ABSTRACT

Laryngo Tracheal stenosis [LTS] is a complex clinical entity to diagnose and manage for an airway surgeon. Post intubation LTS is the commonest cause, however airway stenosis after trauma have also been reported. However, this is a unique case of an 24yr old gentleman who presented to the emergency department with an alleged history of road traffic accident, sustaining cervical spine injury and resultant quadriplegia. Further evaluation after initial cervical stabilisation and tracheostomy revealed LTS with co-existing challenges of bilateral abductor palsy, supra stomal collapse and restricted cervical mobility which made conventional tracheal resection and anastomosis not feasible. The challenges in successful evaluation and management of this case is discussed.

KEYWORDS

Laryngotracheal stenosis, Bilateral abductor palsy, Supra stomal collapse, Traumatic LTS

INTRODUCTION

Laryngotracheal stenosis (LTS) encompasses partial or complete cicatricial narrowing of the endo larynx, trachea or both. Prolonged endotracheal intubation has been implicated as the commonest cause of LTS [1-3]. Reported incidence of tracheal stenosis following tracheotomy and laryngotracheal intubation ranges from 0.6%–21% to 6%–21%, respectively [2,3]. However, incidence of LTS following trauma varies from one region to other. Trauma to the laryngotracheal anatomy has also been reported to result in LTS where traumatic injuries to other parts of the body complicates the situation and warrants management as a whole. In general, appropriate management protocol for a case of LTS has always been a tricky challenge to the otolaryngologist because of the complex nature of injuries, varied presentations and associated co-existing challenges. Most patients with such injuries are candidates for resection and anastomosis [4,5,6]. However, situations where surgical management is not a viable option as in our case, management has to be tailor made for each patient keeping in mind the feasibility of the protocol to be used. A difficult situation management of such a case of LTS is discussed here.

CASE REPORT:

A 24yr old gentleman with no known co morbidities presented to the emergency department of a outside hospital following an alleged history of a road traffic accident. A thorough physical examination done which revealed tachycardia, a GCS of 3/15 and quadriplegia. All other vitals were within normal limits. Other systemic examination was found to be normal. Patient was intubated with a 7.5 mm Endotracheal tube to prevent airway compromise. A CT Brain from an outside hospital showed an odontoid fracture with prevertebral epidural hematoma. MRI of the cervical spine done showed a fracture dislocation at the body of dens anteriorly resulting in focal spinal canal stenosis at C2 level, mild cord compression with mild focal oedema/contusion, intact posterior longitudinal ligament and a prevertebral hematoma at C1 to C4 level. The patient underwent tracheostomy the following day with a 7 mm single lumen tube with reduction and posterior stabilization of C1 and C2 vertebra under general anaesthesia with failed decannulation attempts further.

With improvement in quadriplegia, general condition and multiple failed decannulation attempts, he presented to us with progressive worsening of dyspnoea on exertion. A Fibre optic laryngoscopy with retrograde tracheoscopy done showed features suggestive of Grade I supra stomal stenosis (Anterior wall collapse) with a bilateral abductor palsy [figure 1]. CECT Neck done showed features suggestive of supra stomal narrowing suggestive of a stenotic segment [figure 2].



Figure 1: Flexible Fiberoptic retrograde tracheoscopy showing supra stomal collapse with bilateral cords in adducted position

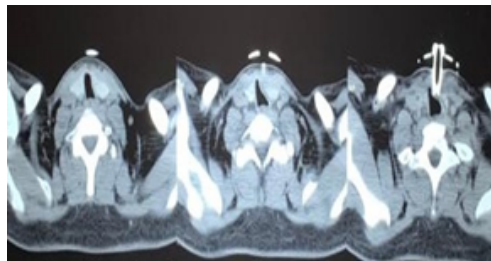


Figure 2: Contrast enhanced Computed tomography of neck showing supra stomal airway narrowing

Tracheostomy tube was downsized to 6mm Portex tube followed by a right posterior cordectomy under general anaesthesia [figure 3]. Spigotting was done for the patient which was tolerated well during the day however he developed respiratory distress and episodes of desaturation during the night.



Figure 3: Video laryngoscopy depicting the bilateral vocal cords in adducted position with status post posterior cordectomy (right side)

With the above complexity of challenges and surgery not a feasible option, Patient underwent a tracheoplasty to address the supra stomal collapse combined with supra stomal granulation excision and insertion of 12 size Montgomery T tube under general anaesthesia [figure 4,5]. Post operatively, he developed surgical emphysema extending to the neck which was conservatively managed. T tube care and regular tracheal toileting was done.



Figure 4: Flexible retrograde tracheoscopy showing patent infra stomal airway with T-tube



Figure 5: Flexible retrograde tracheoscopy showing patent supra stomal airway with T-tube

During a six-month follow-up for T tube care he developed one episode of secondary infection of the stoma site which was managed with intravenous antibiotics based on culture and sensitivity. After six months, assessment with flexible laryngoscopy with retrograde tracheoscopy done which showed resolved supra stomal collapse and adequate glottic chink. [Figure 6]. Hence decannulation was attempted adhering to the decannulation protocol. Patient tolerated spigot well and was successfully decannulated. He was on regular follow up with a well healed and closed stoma at the end of one year [figure 7], asymptomatic and leading a normal healthy life.



Figure 6: Post T-tube removal status Retrograde Tracheoscopy showing resolution of supra stomal collapse with adequate glottic chink



Figure 7: Post Decannulated status – Stomal area well healed

DISCUSSION:

Laryngotracheal stenosis (LTS) is a complex airway entity seen in clinical practice. Patients with traumatic LTS present with airway related symptoms and are primarily managed by otolaryngologist. The treatment strategies are wide and patient centric and always aimed at establishing a patent airway, stable voice and better pulmonary outcome.[7] Post-traumatic stenosis should be considered as a whole and differentiated from post intubation stenosis.[7]

This case discusses post traumatic LTS posed with associated challenges that hinder necessitates need for alternative approach to management. Although, vocal cord paralysis has been reported post trauma/cervical spine procedures, Reza Nikandish et al has reported an incidence of 2-7% of temporary unilateral vocal cord paralysis post cervical trauma and a permanent unilateral paralysis 1-3.5%.[8] however, bilateral vocal cord paralysis associated with LTS has not been reported yet which makes the merit of our case.

As per Anton Pacheco et al, presence of supra stomal narrowing/collapse with granulation is a major reason for decannulation failure and when combined with a bilateral vocal cord paralysis increases the subglottic pressure which leads to poor surgical outcomes.[9] As reported by T V McCaffrey et al, various types of Laryngotracheoplasty was done for 75 cases of traumatic LTS based on site and severity and emphasized the need for individualization of each case.[10]

As reported by Kumar PS et al, out of 51 cases of LTS, 39 cases were managed by Montgomery T-Tube stenting and 83% were successfully decannulated with no mortality.[11] In a similar article published by Arjun et al, 71 cases of LTS who were not unfit for surgery underwent stenting with T-Tube and 63 of them were successfully decannulated. [12] Similarly, in our case, stenting was done once adequate glottic chink was achieved by posterior corpectomy. The importance of choosing the appropriate stent is also highlighted in our case as our patient is a combination of both stenotic and malacic segments of laryngotracheal region.

Hence, emphasis on the fact that a regular follow up and visualization of upper airway, supra and infra stomal trachea helps in planned decannulation and favorable outcome. Adopting a standard and single treatment strategy is generally not feasible and the treating surgeon should think wide with respect to management in these cases. This case is a citing example for the same where the challenges of limited use of cervical spine mobility combined with paralysis of the vocal cord and supra stomal airway collapse rendered adopting alternative treatment for effective outcome for the patient and the surgeon.

CONCLUSION:

Laryngotracheal stenosis and its management always poses questions in the minds of the surgeon. Associated problems with traumatic injuries lead to unpredictability in the pattern and extent of trauma. These advocates need for unique and versatile treatment strategies catering to each case on an individual basis dictated by the challenges posed. Airway stenting still has a role in management in inoperable or deadlock situations where resection anastomosis is not feasible as in our case with challenges of limited cervical spine extension, Bilateral abductor vocal cord paralysis, Supra stomal anterior wall collapse. It is also easier to introduce and maintain the stent over a long term with minor complications. Hence, judicial planning is of prime importance in handling these situations in order to achieve favorable outcome.

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