

POSTINTUBATION TRACHEAL STENOSIS AND SUBGLOTTIC RESECTION



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Airway problems have always been among the major challenges that physicians had to deal with. Among different etiologies such as congenital, traumatic, rheumatologic, infectious or tumorous, postintubation tracheal stenosis (PITS) has remained to be the leading cause of airway narrowing [1]. In their pioneering work, Drs. Cooper and Grillo defined the main cause of tracheal stenosis being the high-pressure low-volume cuffs [2]. Grillo and his colleagues searched and studied the technical details of anesthesia in open airway surgery, the vascular supply of trachea, tolerable resection margins, and anastomotic tension as well as appropriate anastomotic techniques in experimental studies [2-5]. These principles defined then are still applicable in today's modern airway surgery. Thoracic surgeons such as Pearson and Couraud also contributed to the related literature by their successful results following complex airway stenosis resections [6-9].

The injury in PITS usually occurs at the level of the cuff where its pressure due to overinflation blocks the submucosal circulation leading to ischemia, subsequent necrosis, and cartilage destruction [10,11,12]. After that stage, a fibrous stricture is inevitable once the need for mechanical ventilatory support is finished and the patient gets extubated. The appearance of dyspnea may either be evident as an immediate respiratory failure right after the extubation or may appear

later, mostly averaging about 1-3 months after extubation.

Regular tracheal resection and reconstruction is a relatively straightforward procedure practiced by many, if not all, thoracic surgeons. However, when the tracheal injury reaches cranially including the cricoid cartilage, a circumferential resection would not be possible anymore as the recurrent laryngeal nerves enter the subglottic region at the posteromedial aspect of the inferior cornua of the thyroid cartilage.

PATIENT PRESENTATION AND INITIAL EVALUATION:

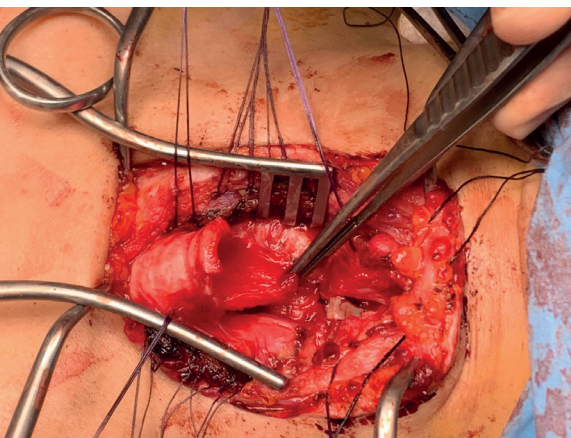
Clinical findings of respiratory insufficiency are quite striking with gasping for air, tachypnea, tachycardia, significant loss of effort capacity, use of secondary respiratory muscles, low oxygen saturation, and cyanosis. However, PITS is among the rarest etiologies of respiratory insufficiency, which makes the diagnosis possible only with a careful medical history and examination as well as a high index of suspicion. This fact is reflected in the presentation of the PITS patients to thoracic surgeons as the majority of them come with a previous diagnosis and treatment of asthma or COPD for variable durations.

Although tracheal stenosis formation is directly linked to the mechanical trauma by the

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Picture 12. Rib cartilage prepared to be placed in the posterior cricoid split.



Picture 13. The cartilage graft is inserted in the posterior cricoid separation and the membranous part of the distal trachea is trimmed as a tongue to cover the cartilage surface.

In conclusion, utilization of the cutting-edge infrastructure and advanced surgical techniques in specialized centers under the supervision of specialists from different disciplines, such as Thoracic Surgery, Anesthesiology, and Otolaryngology, good to satisfactory results in almost all cases is not a far target [23]. However, even

in such centers, it should also be kept in mind that complex benign glottic and subglottic strictures always carry a potential for unexpected series of failures which in some cases may even be life-threatening. Although 5-6 cm of tracheal resections were reported frequently, the long length and multifocality of such lesions always pose extra difficulty and case-specific management plans are required [24-26]. To successfully treat these very complex and challenging laryngotracheal stenosis cases, the surgeon and his team should always have a B and even C plan. Only with this detailed planning it may be possible to expect a satisfactory end-result with normal breathing and good voice quality in these patients.

P.S. All of the figures and pictures used in this script are taken from the personal collection of Sina Ercan, MD and can only be used with permission.

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