

Endoscope-assisted conservative resection and reconstruction in recurrent subglottic carcinoma

Shawn T. Joseph MD¹  | Jose Tharayil MD² | Mohan T. Mihir DNB¹ |
B.S. Naveen MDS¹

¹Department of Head and Neck Surgical Oncology, VPS Lakeshore Hospital, Cochin, Kerala, India

²Department of Plastic Surgery, VPS Lakeshore Hospital, Cochin, Kerala, India

Correspondence

Shawn T. Joseph, Department of Head and Neck Surgical Oncology, VPS Lakeshore hospital, NH-47 Bypass, Maradu, Nettoor P.O, Kochi, Kerala, India.

Email: shawndr@gmail.com

Section Editor: Peter Andersen, MD

Abstract

Background: Very few cases of conservative laryngectomy in recurrent carcinoma of subglottis postradiotherapy have been reported. Technical aspects of conservative resection and reconstruction in subglottic carcinoma have not been well described.

Methods: Herein, we present a case of recurrent carcinoma of subglottis for which conservative resection with adequate margins was done with endoscope assistance and defect reconstructed by buccal mucosa, conchal cartilage, and temporoparietal free flap. The technique of resection, reconstruction, complications, postoperative outcome, and our suggestions are described.

Results: The lesion could be removed with wide margins. Reconstruction could preserve the voice, and deglutition was unaffected. There was no donor site-related complication. Complications were a result of the choice of the stent, which included infection and difficulty in removal.

Conclusion: Selected cases of recurrent carcinoma of the subglottis can be managed by conservative resection with adequate margins and appropriate reconstruction with good functional outcomes.

KEYWORDS

conservative laryngectomy, postradiation larynx, postradiation subglottis, subglottic carcinoma, temporoparietal flap

1 | INTRODUCTION

Carcinoma of the subglottis is relatively rare compared with other laryngeal subsites.^{1,2} Recurrence in a case of carcinoma subglottis, which was previously treated by radiotherapy, is usually managed by total laryngectomy.³ The reasons for this are the difficulty to leave a functional larynx after oncological resection and difficult visualization for surgical access. A detailed literature review on the subject shows that conservative open surgical resection and/or reconstruction of

recurrent carcinoma of the subglottis has not been explored much before.

2 | CASE REPORT

We present the case of a 49-year-old man who came to us with the complaint of hoarseness of his voice. He had a known case of carcinoma of the subglottis, for which post laser excision was done on August 14, 2013, followed by radiotherapy at a dose of 60 Gy/30 fractions, which was completed on October 25, 2013. There was no history of any addictions or systemic diseases. He was apparently normal for 1 year when he developed hoarseness of his voice, for which he underwent a CT scan at a local center, which

This article was published online on 5 February 2018. An error was subsequently identified. This notice is included in the online and print versions to indicate that both have been corrected 16 February 2018.



FIGURE 1 Preoperative endoscopy showing the subglottic mass [Color figure can be viewed at wileyonlinelibrary.com]

showed a recurrent lesion in the glottic-subglottic area. The presence of the lesion was confirmed by videolaryngoscopy, which showed a proliferative lesion involving the subglottis, mainly to the left and center (see Figure 1). The lesion appeared to be close to the undersurface of the vocal cord. Both vocal cords were equally mobile. He underwent a direct laryngoscopy examination and biopsy, which proved recurrence of moderately differentiated squamous cell carcinoma. The positron emission tomography CT scan was done, which showed fluorodeoxyglucose avid disease recurrence in the subglottic region, but no evidence of regional or distant metastases.

The case was discussed in a multidisciplinary tumor board and a decision of salvage surgery was reached. Because the lesion was limited to the subglottis with mobile vocal cords, the option of conservative laryngeal resection was considered. In this scenario, a plan was made to

approach the lesion from below, assisted by a videoendoscope. A tracheal entry was planned with an adequate margin below the lesion but keeping adequate length of trachea below to maintain the vascularity of the trachea in case of a tracheal advancement or autotransplantation later on. This was also done to prevent too low a stoma in case a total laryngectomy was required.

Intraoperatively, a horizontal mid neck crease incision was placed. The subplatysmal flap was elevated and strap muscles separated in midline. A tracheostomy was done below the fourth tracheal ring and a flexometallic endotracheal tube was placed. Ventilator support was shifted down and away from the surgical field. A 70-degree rigid endoscope was used to visualize the subglottic mass from below through the tracheostoma (see Figure 2). The flexometallic tube allowed enough pliability for the scope to pass. Using a scalpel blade and under endoscopic visualization, the trachea was entered below the second tracheal ring at an adequate margin away from the lesion. Then, under direct visualization with endoscopic control, wide local excision of the tumor was done involving parts of the cricoid, thyroid, and upper tracheal rings, preserving the rest of the larynx (see Figure 3). The temporoparietal fascia free flap based on superficial temporal vessels was harvested from the left side (see Figure 4). A buccal mucosa graft and conchal cartilage were harvested from the left side. The defect was reconstructed in layers using conchal cartilage sandwiched between the folded temporoparietal fascia flap and the buccal mucosa placed as a graft over the lumen facing side of the temporoparietal fascia. The flap was fixed by taking a few sutures to the surrounding tissues. Anastomosis of superficial temporal vessels was done to the left superior thyroid vessels. A tracheal stent was fashioned with a silastic sheet and

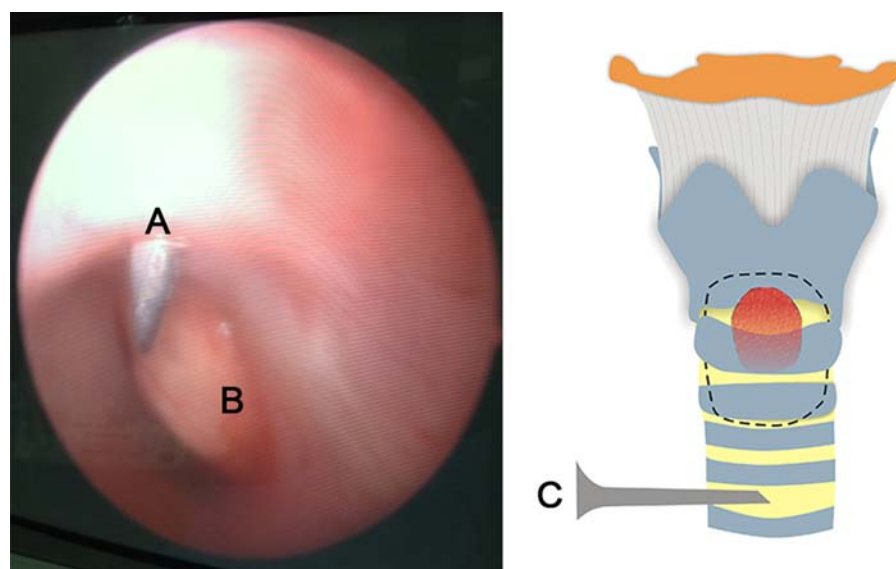


FIGURE 2 Endoscopic view showing the needle away from the mass. A, Needle. B, Subglottic mass. C, Endoscope passing through the tracheostoma [Color figure can be viewed at wileyonlinelibrary.com]

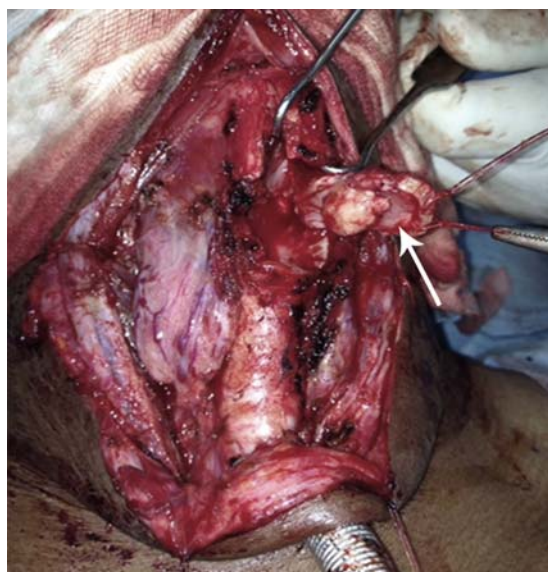


FIGURE 3 Wide local excision was done involving parts of the cricoid, thyroid cartilage, and upper tracheal rings [Color figure can be viewed at wileyonlinelibrary.com]

fixed with transcutaneous sutures to keep the lumen patent. The sheet was used for its unfolding action so as to maintain the lumen size to the maximum without collapse. Hemostasis was confirmed and the wound was closed in layers. A double lumen Portex tracheostomy tube was placed through the stoma. The stent could be removed after 3 weeks and the patient was decannulated after 1 month.

3 | DISCUSSION

Conservative resection of squamous cell carcinoma limited to the subglottis has not been well described, to the best of our knowledge. The main complication that can arise during conservative subglottic carcinoma resection can be

cricoarytenoid joint injury causing functional damage and resultant dysfunctional larynx.⁴ Another important problem would be difficult visualization and margin assessment of the subglottic lesion by the transoral route, if the surgeon is intending to preserve both vocal cords.

These difficulties for resection could be comfortably overcome by using the transtracheal endoscopic approach from below the lesion. This allows excellent visualization of the lesion throughout the resection, ensuring that the cricoarytenoid joint and the true vocal cords were not damaged. Although we could not find any report in the literature of a similar approach for subglottic carcinoma resection, we feel that this method of subglottic mass resection can be easy for a trained head and neck surgeon.

The patient in our case was also irradiated added the onus of handling poor vascularity and tissue healing issues, apart from the restricted neck extension making any transoral procedure difficult.⁵ We considered tracheal advancement only as a second option in view of the recent irradiated status of the larynx and trachea. In addition, a preoperative tracheostomy was necessary for the resection. We based our reconstruction concept on the method described by Gilbert et al,⁶ for a vertical partial laryngectomy, which was modified to suit our case. Our patient was suited for a conservative approach because the glottis was free of disease, the vocal cord mobility was normal, and the disease was not breaching cartilage. Considering the poor viability of the irradiated tissue and that one of the main complications of subglottic procedures is stenosis, it was decided to lend improved healing capacity by using a vascularized graft that was thin and pliable enough to cradle a cartilage graft so as to maintain lumen size. The temporoparietal flaps remain the only single-layered fascia flap that has been used as a free or pedicled vascular flap in the head and neck.⁷ Temporoparietal flaps can drape into concave surfaces and also over convex surfaces, such as the conchal cartilage used here.

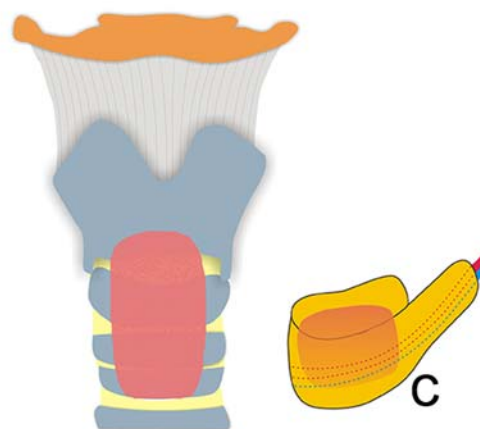


FIGURE 4 A, Temporoparietal fascial flap. B, Conchal cartilage. C, Schematic diagram showing defect lined by composite graft (inner to outer buccal mucosa, conchal cartilage sandwiched between the temporoparietal fascial flaps) [Color figure can be viewed at wileyonlinelibrary.com]



FIGURE 5 Six-month postoperative endoscopic view [Color figure can be viewed at wileyonlinelibrary.com]

The problems that we encountered were during stent removal because the sheet could not be retrieved easily. In addition, the use of the silastic sheet led to collection of secretions between the folds of the sheet leading to wound infection. It may be recommended that a Montgomery tube⁸ or stents with a tug line can be used to ease the retrieval of the stent. The other problem encountered was the difficulty to directly monitor the flap vascularity. This was overcome by monitoring the pedicle pulsations using a portable bedside Doppler. The patient was able to communicate well with reasonably good quality of voice. He was not subjected to the discomfort and social trauma of a permanent laryngostoma and good arytenoid mobility ensured that the patient could take oral feeds without aspiration (see Figure 5). The patient was kept under follow-up and monitored by office endoscopy. A positron emission tomography CT scan done 1 year after surgery showed no evidence of locoregional or systemic disease. The patient could continue his profession and is now 2 years postsurgery with no evidence of any locoregional disease.

ORCID

Shawn T. Joseph MD  <http://orcid.org/0000-0002-8649-0287>

REFERENCES

- [1] Marchiano E, Patel DM, Patel TD, et al. Subglottic squamous cell carcinoma: a population-based study of 889 cases. *Otolaryngol Head Neck Surg.* 2016;154(2):315-321.
- [2] Bahar G, Nageris BI, Spitzer T, Popovtzer A, Mharshak G, Feinmesser R. [Subglottic carcinoma]. *Harefuah.* 2002;141(10):914-918, 929.
- [3] Agra IM, Ferlito A, Takes RP, et al. Diagnosis and treatment of recurrent laryngeal cancer following initial nonsurgical therapy. *Head Neck.* 2012;34(5):727-735.
- [4] Jie XJ, Rong XT, Chang XQ. Laryngeal pathological findings following trauma to cricoarytenoid joint. *J Voice.* 1991;5(3):252-256.
- [5] Leung SF, Zheng Y, Choi CY, et al. Quantitative measurement of post-irradiation neck fibrosis based on the young modulus: description of a new method and clinical results. *Cancer.* 2002;95(3):656-662.
- [6] Gilbert RW, Goldstein DP, Guillemaud JP, Patel RS, Higgins KM, Enepekides DJ. Vertical partial laryngectomy with temporo-parietal free flap reconstruction for recurrent laryngeal squamous cell carcinoma: technique and long-term outcomes. *Arch Otolaryngol Head Neck Surg.* 2012;138(5):484-491.
- [7] Cheney ML, Varvares MA, Nadol JB Jr. The temporoparietal fascial flap in head and neck reconstruction. *Arch Otolaryngol Head Neck Surg.* 1993;119(6):618-623.
- [8] Prasanna Kumar S, Ravikumar A, Senthil K, Somu L, Nazrin MI. Role of Montgomery T-tube stent for laryngotracheal stenosis. *Auris Nasus Larynx.* 2014;41(2):195-200.

How to cite this article: Joseph ST, Tharayil J, Mihir MT, Naveen BS. Endoscope-assisted conservative resection and reconstruction in recurrent subglottic carcinoma. *Head & Neck.* 2018;00:1-4. <https://doi.org/10.1002/hed.25083>