

# Septal graft in laryngeal reconstruction

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## ABSTRACT

A 62-year-old woman presented with symptoms of dyspnea. Ultrasonography and computed tomography examinations revealed mass extending from the cricoid cartilage to the left lobe of thyroid gland and thyroid cartilage. Cytology revealed possibility of cartilaginous origin, which was proven to be chondrosarcoma (Grade 1) from the biopsy specimen obtained during panendoscopy. She underwent one stage radical resection and immediate reconstruction of laryngeal skeleton defect by mucocartilaginous graft from the nasal septum. Her postoperative course was optimal with preservation of all the laryngeal functions. Twenty-eight months postoperatively, she had to undergo total laryngectomy as a salvage procedure for the advanced local recurrence. We report on the relatively easy technique for functional reconstruction of the large laryngeal defect with the employment of cartilage graft from the nasal septum.

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Surgery is the treatment of choice in cases of laryngeal chondrosarcomas with partial laryngeal resections employed in majority of cases. Removal of large part of cricoid interrupts the laryngeal support. Variable options for reconstruction have been described in the literature with most being 2 staged procedures. Utility of one stage resection, and reconstruction by employment of autogenous septal cartilage graft was reported in limited number of cases only. We present the case of a patient diagnosed with chondrosarcoma of cricoid cartilage invading the thyroid gland and thyroid cartilage, who underwent one stage radical resection and immediate functional reconstruction of laryngeal skeleton defect by mucocartilaginous graft from the nasal septum.

**Case Report.** A 62-year-old Caucasian woman with a history of hypertension, suffered with gradually progressive dyspnea without other symptoms for one year. Her initial investigation in the Department of Internal Medicine excluded cardiopulmonary

cause of dyspnea. Her initial ultrasound of the neck revealed non-homogenous nodal mass in the left lobe of the thyroid gland with suspected extension to the trachea and further nodular mass in the right thyroid lobe. There were none suspicious lymph node metastases. Fine needle aspiration biopsy was performed, and the cytology has shown possibility of cartilaginous neoplasm. Computed tomography (CT) of the neck revealed a moderately enhancing laryngeal mass with multiple calcifications below the left vocal fold. The lesion was 2 x 1.8 cm narrowing the tracheal lumen, invading the lower third of thyroid cartilage and the left lobe of the thyroid gland. The chest x-ray did not show any pathological findings. She was referred to the Department of Otolaryngology and Head and Neck Surgery. On physical examination, submucosal mass narrowing left subglottis without impaired vocal fold mobility was inspected. Direct microlaryngoscopy, tracheo fibroscopy, and esophagoscopy were carried out. Intraoperative inspection revealed hard bulging

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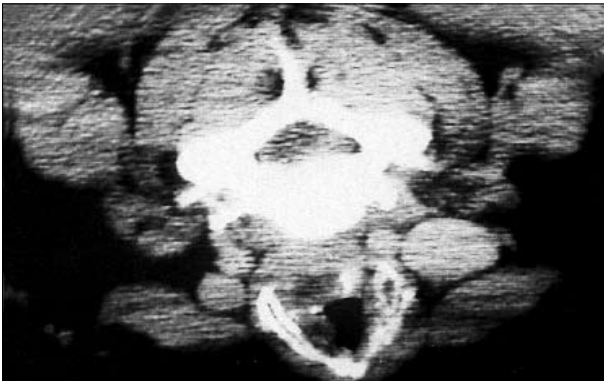
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**Figure 1** - Autogenous mucocartilaginous free graft from the nasal septum fixed by Vicryl sutures in the postresectional defect.



**Figure 2** - Computed tomography scan of the recurrent chondrosarcoma in the neo-cricoid.

tumor, extending 2 cm subglottically. Histological examination of the biopsy taken from the tumor during endoscopy proved low-grade chondrosarcoma (Grade 1). She was counseled and chose an attempt of radical surgery.

Surgical resection was carried out under the general orotracheal anesthesia. The airways were further secured by tracheostomy on the fourth tracheal ring. After the dissection of prelaryngeal musculature, the tumor was found to invade the left lobe of thyroid gland. After division of thyroid isthmus, laryngofissure was performed, which revealed intralaryngeal extension of the tumor with invasion of the lower third of thyroid cartilage sparing the vocal cord and arytenoid cartilage. Tumor was widely resected en-bloc (left hemithyroidectomy, left hemicricoidectomy, and partial resection of the left lamina of thyroid cartilage) with adjacent perichondrium. The round defect approximately 22 x 20 millimeters in diameter precluded the primary closure. It was reconstructed by mucocartilaginous free graft

from the nasal septum fixed by Vicryl sutures (**Figure 1**). Finally, laryngofissure was closed and laryngeal skeleton was further wrapped by the infrahyoid muscles. The remaining mucoperichondrium of the nasal septum was supported by the nasal splints. On gross examination, the tumor was hard, approximately 22x20x15 mm in size with yellowish focally glistening cut surface. The tumor infiltrated the adjacent lobe of the thyroid gland. Histopathological examination confirmed the chondrosarcoma Grade 1. Lobules of chondroid tissue were formed by irregular and binuclear large chondrocytes. Some of the cells have shown cytological features of atypia. On the sixth postoperative day, she was decannulated and 2 weeks later after secondary healing of donor site wound, the nasal splints were removed. The nasal septum was without perforation. Flexible fibrotracheoscopy revealed patent and clear respiratory tract without signs of original disease with only mildly limited left vocal cord mobility (not shown). She followed-up regularly. Six months later, control CT and direct microlaryngoscopy were performed, which did not reveal the original disease. Good preservation of voice without impaired breathing and swallowing quality was achieved. Twenty-eight months after the initial surgery, she presented with dyspnea and inspiratory stridor. The CT and magnetic resonance imaging scan, and triple endoscopy were performed for the suspicion of local recurrence of the process (**Figure 2**). Biopsy confirmed the recurrence of chondrosarcoma in the neo-cricoid. Extent of the disease precluded conservative laryngeal resection; thus, total laryngectomy was performed as the salvage procedure. Two years later, the patient has no evidence of disease.

**Discussion.** Cartilaginous tumors of the larynx are rare entities, however, chondrosarcomas represent the most frequent nonepithelial tumors in this location.<sup>1</sup> These tumors were almost exclusively found in the hyaline cartilages of laryngeal skeleton. Their etiology is unclear.<sup>2</sup> Literature supports the idea that, surgery is an appropriate treatment with excellent prognosis and the overall 5-year survival rate approximately 90%. As the eventual recurrences do not compromise, patient's survival attempts for initial conservative laryngeal resections are acceptable in the majority of cases.<sup>3,4</sup> Although, cosmesis and functional outcome of surgical treatment may be very morbid. As most of these tumors arise in cricoid, removal of its large part interrupts the laryngeal support. Total laryngectomy is often necessary due to the inability to repair a large laryngeal defect.<sup>5</sup> Various reconstruction options have been described with the majority requiring very skilled surgical team.<sup>1</sup>

We report on a possibility of one stage conservative surgical resection of large laryngeal chondrosarcoma and reconstruction of larynx using the mucocartilaginous graft from the nasal septum. These similar techniques using an autogenous graft from the costal cartilage, are merely cited methods for nonneoplastic stenosis treatment only. However, its application for functional reconstruction of larynx after oncological resections could gain more widespread popularity soon.<sup>6</sup>

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## References

1. Baatenburg de Jong RJ, van Lent S, Hogendoorn PC. Chondroma and chondrosarcoma of the larynx. *Curr Opin Otolaryngol Head Neck Surg* 2004; 12: 98-105.
2. Thompson LD, Gannon FH. Chondrosarcoma of the larynx: a clinicopathologic study of 111 cases with a review of the literature. *Am J Surg Pathol* 2002; 26: 836-851.
3. Kozelsky TF, Bonner JA, Foote RL, Olsen KD, Kasperbauer JL, McCaffrey TV, et al. Laryngeal chondrosarcomas: the Mayo Clinic experience. *J Surg Oncol* 1997; 65: 269-273.
4. Slavíček A, Betka J, Taudy M, Mírejovský P. Chondrosarcoma of the larynx. *Cesk Otolaryngol* 1996; 45: 152-156.
5. Delaere PR, Vertriest R, Hermans R. Functional treatment of a large laryngeal chondrosarcoma by tracheal autotransplantation. *Ann Otol Rhinol Laryngol* 2003; 112: 678-682.
6. Rhee JS, Toohill RJ. Single-stage adult laryngotracheal reconstruction without stenting. *Laryngoscope* 2001; 111: 765-768.