

ORIGINAL ARTICLE

Endoscopic Excision of Early Laryngeal Cancer

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ABSTRACT

Laryngeal cancers form a major bulk of head and neck malignancies. If diagnosed early, the aggressive management can offer good cure rates and prognosis. Endoscopic excision is a viable alternative to radiation therapy along with its predictable consequences and complications. The author describes the usage of classical phonosurgery techniques in endoscopic extirpation of early laryngeal cancers.

Keywords: Early laryngeal cancer, Endoscopic excision, Laser.

INTRODUCTION

Laryngeal carcinoma is the fourteenth most common form of malignancy in India and worldwide, the incidence of laryngeal cancer has been reported to be 1.3 to 8.8 per 1,00,000 population, in six different regions of the country (ICMR 1992). Sixty percent of the global incidence of laryngeal cancer is found in developing countries. Cancer of the larynx is one of the five most common cancers in Indian males.

With a growing awareness and emphasis of the importance of voice in today's scenario of an ever expanding number of professional voice users, coupled with a fortunate increase in the number of voice clinics in India, laryngeal malignancies are being picked up at an early stage. It is possible to avoid a laryngectomy in early laryngeal malignancy, thus avoiding associated loss of laryngeal function which affects both speech and swallowing with a permanent tracheostomy and a resultant poor quality of life.

Irradiation therapy has been the conventional treatment of choice for early stage laryngeal cancer. However, radiotherapy affects both vocal folds, radiating normal vocal fold lamina propria also with resultant voice deterioration. Salivary glands are affected resulting in dryness of the mouth and poor lubrication with occasional oral ulcers. Radiotherapy in young adults with many years of life expectancy introduces the potential risk for possible irradiation induced cancer. Irradiation therapy given in cases of carcinoma *in situ* and dysplasia has been shown in some cases to result in full blown cancer.

Introduction of endoscopic techniques for surgical treatment of laryngeal cancer has made it possible to overcome these complications and achieve better results.

AIM

To study the feasibility of endoscopic surgery including both microflap surgery with subepithelial infiltration technique (SEIT) and transoral laser microsurgery (TLM) as a treatment

protocol in the Indian scenario in management of early laryngeal cancer.

MATERIALS AND METHODS

A retrospective analysis was conducted on patients diagnosed with early laryngeal cancer who had been treated endoscopically with either laser or cold steel instruments. Study parameters included free margins achieved at surgery, recurrence rate, quality of life after surgery and mortality in endoscopically treated cases.

Patients selected in this study were carcinoma *in situ*, T1 and T2 tumors with no regional lymph node metastasis (N0) and no distant metastasis (M0). A total of 14 glottic, 5 supraglottic and 1 subglottic cases operated between 2007-2008 were included in the study.

All the patients had squamous cell carcinoma barring one T1N0M0 glottic adenocarcinoma.

All patients with hoarseness of voice were evaluated with rigid and flexible telelaryngoscopy followed by stroboscopy.

Surgical Technique Used

Glottic lesions: Subepithelial infiltration technique (SEIT) with 1 to 2 cc of 1:10,000 saline adrenaline in the Reinke's space (Fig. 1) was employed in all cases to help determine the depth of infiltration of the glottic lesion.

Lesions with depth of infiltration upto the superficial lamina propria were excised by the microflap technique (Fig. 2) keeping a 1 to 2 mm margin (Fig. 3). All the lesions were sent for frozen section. If reported malignant, a wide excision with free margins of 1 to 2 mm was confirmed.

Lesions with infiltration into the vocalis muscle or only vocal ligament were excised using the CO₂ laser (Fig. 4).

Supraglottic and subglottic lesions: These were excised using a CO₂ laser with a 5 mm cancer free margin confirmed by frozen

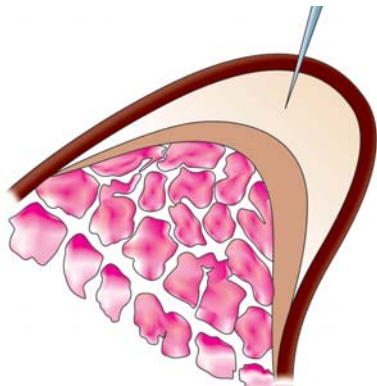


Fig. 1: Diagrammatic representation of no. 27 Infiltration needle in Reinke's space causing temporary increase in SLP volume in a normal vocal fold

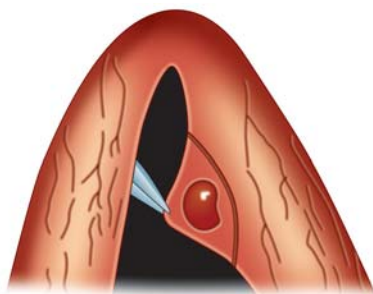


Fig. 2: Diagrammatic representation of microflap excision performed for glottic lesion involving epithelium and SLP

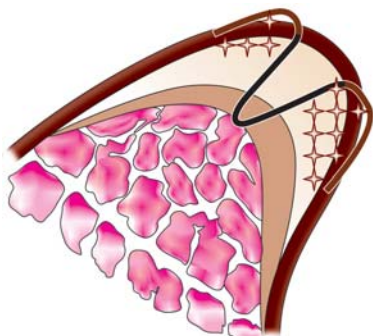


Fig. 3: Diagrammatic representation of vocal fold lesion infiltrating the vocal ligament and muscle with subepithelial infiltration ballooning up SLP surrounding the lesion (doughnut effect)

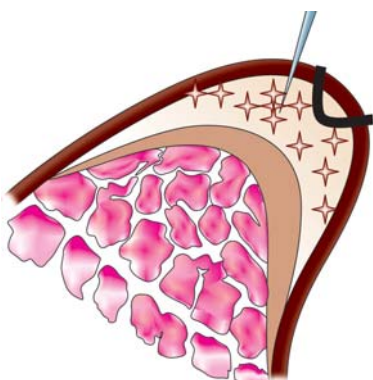


Fig. 4: Diagrammatic representation of vocal fold lesion in epithelium and SLP with subepithelial infiltration ballooning up entire SLP and lifting up the lesion

section. The tumor was removed *en bloc* when small and piecemeal when large. Care was taken to reconstruct the tumor when removed piecemeal, for the histopathologist.

Follow-up

For the first 6 months, patients were followed up every 2 months and for the next 6 months, they were reviewed 3 monthly.

In the 2nd year following surgery, patients were followed up 6 monthly.

In each follow-up visit, either a rigid or flexible laryngoscopy was done to detect local recurrence. In operated cases of glottic cancer, stroboscopy was done in each visit.

RESULTS

A total number of 20 patients of Tis/T1/T2N0M0 of the larynx were operated endoscopically in 2007-2008.

Out of these 20 patients, 14 were glottic, 5 were supraglottic and 1 was subglottic laryngeal cancer.

In the group of glottic malignancy, 4 were carcinoma *in situ*, 6 were T1 (4 T1a and 2 T1b with anterior commissure involvement) and 4 were T2 (1 with restricted vocal fold movement and anterior commissure involvement, 1 with anterior commissure involvement with supraglottic extension and 2 with spread to the supraglottis) tumors.

All the carcinoma *in situ* and 3 of the T1a lesions were operated by microflap technique using cold steel instruments (total microflap – 7). TLM was performed on 1 T1a and both T1b tumors.

One of the T1a tumors was adenocarcinoma and the rest were all squamous cell carcinomas. The patient with adenocarcinoma developed a polypoidal lesion within one month which on microflap surgery was confirmed as a benign lesion.

In two of the patients of the T2 group, free margins were not achieved and in one T2 patient the margins were not sure on histopathology. All three of these patients received postoperative radiotherapy.

In the group of supraglottic malignancy all of whom were operated by TLM, 3 patients had free margins. However, one of these patients developed a local recurrence and was reoperated with free margins but developed neck metastasis within 2 months. She received radiation therapy and is disease free since 16 months. The two patients with positive margins received postoperative radiation therapy. All patients started oral feeds by the 3rd to 7th day.

Only one patient was in the subglottic group operated by TLM. The lesion was small and easily excised after achieving good exposure with the help of a vocal fold retractor. The margin was cancer free, however the patient was given postoperative radiotherapy and is disease free at 1 year.

Out of total 20 cases of laryngeal cancer operated endoscopically, free margins were achieved in 14 cases and 7 cases required radiotherapy. No patient required a tracheostomy and no mortality has been reported so far.

DISCUSSION

Early glottic cancer is an invasive carcinoma confined to the lamina propria, not involving the adjacent muscles and cartilages but still capable of metastasis to the lymph nodes or distant sites.¹

Carcinoma *in situ* should be, strictly speaking, not included in early glottic cancer. Nevertheless, there is a general agreement in grouping Tis, T1, T2 lesions together for diagnostic and therapeutic purposes.²

In this study T1 and T2 Supraglottic and T1 Subglottic carcinoma have also been included.

There exists a dichotomy of opinion among laryngologists on the use of laser versus cold steel instrumentation in early glottic carcinoma. One of the main challenges that the author has faced in the use of the CO₂ laser for small volume early glottic suspected malignancy is an accurate diagnosis by the histopathologist of the lesion itself and the free margins. In lesions on SEIT are found to involve only the SLP, cold steel microflap surgery allows excellent preservation of the deeper layers of the SLP, at the same time allowing the histopathologist to comment on margins without any laser artifacts being introduced. Thus, cold instrument dissection is performed if the lesion is confined to the epithelium and/or SLP so as not to obscure the tissue margins from the thermal trauma induced by the laser.³ Minimizing healthy tissue removal has become the cornerstone of the so called phonomicrosurgical approach to vocal cord cancer.⁴

The laser provides stable hemostatic cutting, which is especially helpful during dissection of vascular tissue, such as the vocal muscle. Resection of these neoplasms requires less tangential dissection and there is no consideration of preserving the SLP (except at the lesions perimeter).⁵

The European Laryngological Society published a consensus paper with a classification that includes five types of endoscopic cordectomies. Type 1 (subepithelial cordectomy), Type 2 (subligamental cordectomy), Type 3 (transmuscular cordectomy), Type 4 (total cordectomy) and Type 5 (extended cordectomy).⁶

There is a misconception that T1 cancers at the anterior commissure have a great predilection for under staging and that many of these lesions have occult invasion of the thyroid cartilage (T4 stage). Kirchner and Carter⁷ have documented that T1a and T1b carcinomas rarely transgress Broyle's ligament to invade thyroid cartilage.

CONCLUSION

Organ preservation with best possible vocal outcome and swallowing function without compromising on cure rate should be the mantra to be followed for early laryngeal cancer. Though

chemoradiation has a definite role in select cases, its use is debatable in the younger population and in carcinoma *in situ*. The effect of radiation on the healthy vocal fold and salivary glands is another factor to be borne in mind.

An open approach involves a preliminary laryngofissure for cordectomy which can be avoided in endoscopic surgery thereby maintaining the integrity of the thyroid cartilage.

Compared to the traditional open surgery techniques, endoscopic surgery offers several advantages in treatment of laryngeal cancer, early recovery of swallowing being of paramount importance in supraglottic malignancies with shortened hospitalization. In open surgery cases, average hospital stay is 7 to 14 days and RT feeds are started by the 7th to 10th day whereas in endoscopically treated cases, patients can start taking oral feeds by the 2nd postoperative day and usually gets discharged by the 3rd day.

Tracheostomy is avoided and thus the lack of any external incision represents an important psychological boost for the patient.

In our study of 20 patients of early laryngeal carcinoma, 7 patients needed postoperative radiation therapy and all patients were disease free.

Thus, endoscopic surgery is an ideal approach for management of early laryngeal cancer cases as compared to radiotherapy and open resection methods.

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