Print ISSN: 2321-6379
Online ISSN: 2321-595X

Original Article

A Clinical Study on Early Glottic Carcinoma Treated with Radiotherapy and Salvage Surgery for Recurrence

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Abstract

Background: Early glottic cancers are treated effectively with radiation or surgery but recurrence is a possibility which requires either salvage surgery or radiotherapy (RT) depending on the initial treatment modality adopted. Conservation surgery is feasible in approximately one-third of these recurrent cancers. Endoscopic resections using a CO_2 laser or open partial laryngectomy are the current options. Similarly, if initial surgery was used to treat glottic cancers (i) repeated RT with or without chemotherapy, (ii) salvage surgery, (iii) supportive treatment, and/or (iv) palliative chemotherapy is the choices of treatment.

Aim of the Study: The aim of the study was to clinically assess the result of RT as initial treatment in the control of squamous cell carcinoma (SCC) of vocal cord (T1) lesions and undertaking salvage surgery (endoscopic or open) when there is a recurrence.

Materials and Methods: Retrospectively medical records of 49 patients were analyzed with T1 SCC of the glottis in which RT was an initial treatment with a follow-up period of 5 years.

Observations and Results: The rate of recurrence after RT was 7/49 (14.28%) of the cases, mean diagnosis interval was 31.8 ± 8.75 months. 2/7 (28.57%) patients underwent salvage endoscopic surgery (transmuscular Cordectomy), 3/7 (42.85%) patients underwent open surgery and excision of the tumor and the vocal cord (Horizontal partial Laryngectomy). 1/7 (14.28%) patient was treated with total laryngectomy due to a new recurrence.

Conclusions: The recurrence rate was 14.28% in this study of treatment of early cancers of vocal cords (T1) by RT which is high when compared to the literature. RT can be a treatment option, but the patient must be aware that higher cure rates can be achieved through surgery. Partial laryngectomy was more effective for salvage surgery.

Key words: Glottic cancer, Laryngectomy and early glottic cancer, Radiotherapy, Recurrence, Salvage surgery

INTRODUCTION

Malignant tumors of the larynx account for 33.9% of all HNCs.[1] They typically affect middle-aged men, and the histopathological picture is usually squamous cell carcinomas (SCCs); account for 90% of laryngeal carcinomas. In early glottic cancer, lymph node metastasis is rare, with an incidence of clinically positive lymph nodes of nearly zero for T1 stage and <2% for T2 stage, and a complete cure can often be achieved.[3-5] At present, treatment modalities available are for treating early glottic cancer are, namely, radiotherapy (RT), cordectomy, and surgery (e.g., partial laryngectomy). The use of surgery has been found to be declining recently due to decreasing functional results and advances in RT and cordectomy.[6] Therefore, the goal is to achieve the best local control (LC) leading to a complete cure and optimal functional results. Recurrence rate is high in laryngeal cancer; in patients with T1 stage laryngeal cancer it varies from 5 to 13%, and with T2 stage cancer, it varies from 25% to 30%.[2] With T3 and T4 stage disease, the recurrence rate increases up to 30–50%.[7-9] The treatment options for recurrent laryngeal carcinoma treated initially with surgery are as follows: (i) Repeated RT with or without chemotherapy, (ii) salvage surgery, (iii) supportive treatment, and/or (iv) Palliative chemotherapy. The preferred method for the curative

Access this article online

www.ijss-sn.com

Month of Submission : 01-2019
Month of Peer Review : 02-2019
Month of Acceptance : 02-2019
Month of Publishing : 03-2019

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treatment of recurrent laryngeal cancer after failure of non-surgical (RT or chemo-RT) treatment failure is surgery. Conservation surgery is feasible in approximately one-third of these recurrent cancers. Endoscopic resection using a CO_2 laser or open partial laryngectomy (partial vertical, supracricoid, or supraglottic laryngectomies) can also be used.[7,9] The optimal treatment for early glottic cancer has continuously been an issue of debate, primarily due to the absence of results from large prospective randomized trials.[10] Recent studies have shown a similar LC between RT and cordectomy. Mendenhall *et al*.[11] compared various nonrandomized data and reported LC rates ranging from approximately 80% to 94% for T1 tumors and 70% to 85% for T2 tumors for both modalities.[12] In such circumstances, decisions regarding the management of early glottic cancer vary across institutions and countries.[13,14] In the absence of ideal randomized trials, it is important to review and compare retrospective studies within institutes to formulate future guidelines in the management of early glottic cancers. This study was conducted to clinically assess the result of (RT) as initial treatment in the control of SCCs of vocal cord (T1) lesions and undertaking salvage surgery (endoscopic or open) when there is a recurrence.

MATERIALS AND METHODS

After obtaining Institutional Ethical Committee Clearance, medical records for 49 patients were obtained from the records section of the hospital.

Inclusion Criteria

(1) Patients of both sex groups were included. (2) Patients of all age groups were included. (3) Patients with vocal cord growths with T1 stage glottis epidermoid carcinoma were included.[4] Patients submitted to RT as initial treatment were included.

Exclusion Criteria

(1) Patients who were treated with cordectomy and partial laryngectomy were excluded. (2) Patients with T2, T3, and T4 stage carcinomas were excluded. (3) Patients with other histopathological findings were excluded. All the patients in the study were classified according to TNM/UICC 2002 classification, after indirect laryngoscopy obtained by video-laryngoscopy and/or nasal fibroscopic laryngoscopy. All the cases were confirmed by histopathological examination of the biopsy. The available treatment modalities were presented (RT or surgery) to patients with T1 glottic carcinoma; patients were explained about the respective pros and cons of the treatment. Radiation treatment was based on external beam at the dose of 6000–6800 rads in 30–34 fractions. The basic criteria for selection of RT were either patient was clinically ineligible for surgery or the patient's choice. To analyze the results obtained by RT, the patients were grouped according to primary tumor localization on the vocal folds as follows: Group A - T1a: Tumor not involving the anterior Commissure (n = 22). Group B - T1b: Tumor involving the anterior commissure with or without invasion of the contralateral fold anterior third. All the patients were subjected to RT. After RT, all the patients were followed up for a period of 5 years or more, and in the first 6 months, they returned monthly to the clinic. Indirect laryngoscopy was done with a goal to identify any suspicious lesions at the earliest. After tumor recurrence diagnosis, the situation was recorded in the patient's chart and the patient was referred to salvage treatment as soon as possible, which first option was partial open laryngectomy (frontolateral vertical) in the cases with or without commissure involvement. Patients with T1a tumors on recurrence who were clinically unfit were submitted to an endoscopic tumor resection (transmuscular cordectomy), since it is an approach with less morbidity than open surgery.

OBSERVATIONS AND RESULTS

A total of 49 patients diagnosed as T1 glottic carcinoma and undergone RT was included in the study. The demographic data showed that the age range was from 33 years to 76 years with a mean age of 51.60 ± 6.24 years. There were 37 (75.51%) males and 12 (24.48%) females. Patients from rural area were 29 (59.18%) and urban areas were 20 (40.81%). History of smoking was present in 36 (73.46%). 26 (53.06%) patients from low socioeconomic status, 14 (28.57%) were from the middle group, and 9 (18.36%) were from the high economic group. History of alcohol intake was observed in 38 (77.55%) patients. All the patients presented with hoarseness of voice (100%) [Table 1].

All the patients were subjected to RT. There was recurrence in 7/49 patients (14.28%). All the recurrence patients were males. The mean age of the patients with recurrence was 58.30 ± 7.10 years. The mean time lapse between the last RT dose and occurrence of symptoms was 31.8 ± 8.75 months. Moderately differentiated epidermoid carcinoma was the most frequent histology type. It was present in 6/7 (85.71%) patients. Well-differentiated type of histology was observed in 1/7 (14.28%) patients. In Group A, where the initial lesion did not involve the anterior commissure, there was recurrence in 3/7 (42.85%). In Group B, in which the initial lesion invaded the anterior commissure with or without the involvement of the contralateral vocal fold, the recurrence rate was 2/7 (28.5%). All the patients with recurrences with no locoregional metastasis were staged according to TNM and

Table 1: The demographic data (*n*–49)

Observation	Males 37	Females 12	Residing		Low economic 26	Middle economic 14	High economic 09	Smoking		Alcohol	
			Rural	Urban				+ve	−ve	+ve	−ve
Age											
30–45 years	08	04	10	09	08	04	03	13	05	10	04
46–60 years	14	06	07	07	14	05	04	11	04	15	03
66–75 years	15	02	12	04	04	05	02	12	04	13	04

UICC classification. 2/7 (28.57%) patients were referred to as salvage endoscopic surgery (transmuscular cordectomy) because they were clinically unfit. 3/7 (42.85%) patients were submitted to open surgery and excision of the tumor and the vocal cord (Horizontal partial Laryngectomy). 1/7 (14.28%) patient was treated with total laryngectomy due to a new recurrence. None of the patients died in this study. The cure rate among the patients who underwent open laryngectomy procedures the cure rate was higher 5/7 (71.42%). 2/7 (28.57%) patients had to undergo total laryngectomy after a period of 6 years.

DISCUSSION

Oncological control and eradication of cancer and function preservation of the larynx should be the aim of treatment. The effective surgical treatment of T1 Laryngeal cancer consists of cordectomy, vocal cord stripping or CO_2 laser fulguration of the tumor mass of the vocal cord. RT replaced surgery as the function preservation was far superior with the former. High cancer control rate and 5-year survival chances were more with RT, and it remained the treatment of choice for T1 laryngeal growths.[15,16] The common disadvantages of RT used for early laryngeal cancers are persistent edema, glottic stenosis, or hypothyroidism whereas its advantages are the preservation of phonation and swallowing.[17,18] Few authors opine that while RT tends to keep the glottic region as the sound source, in patients submitted to surgery such source tends to shift to the supraglottic region, with a worsening in vocal quality, but keeping a socially acceptable voice, especially when there is speech therapy associated.[19,20] According to Bron *et al*.,[16] T1a carcinomas had similar LC in 5 years with RT or cordectomy, 77% and 84%, respectively. In T1b carcinomas, RT had lower success rates when compared to surgery (supra-cricoid partial laryngectomy), 66% and 100%, respectively. Other papers report 80–95%[21-24] success rate of RT in T1 laryngeal carcinomas. Our results with RT to treat T1a and T1b tumors showed recurrence in 7/49 (14.28%) patients. Therefore, surgical treatment should also be kept as an option to control this disease, especially in T1b cases with suspected anterior commissure involvement. There is a shift in trend toward performing more conservative surgical procedures especially after the advent of CO_2 laser especially in cases of tumor recurrence after RT, instead of doing a total laryngectomy. In a study carried out by Schwaab *et al*.,[25] patients with initial glottic tumors (T1a, T1b, and T2 with preserved vocal cord mobility) who had recurrence after RT were submitted to total or partial laryngectomy (vertical or subtotal with cricohyoidopexy) with 77% and 100% locoregional control in 5 years, respectively. Ganly *et al*.[26] opine that patients with recurrence after RT for T1 cancers of vocal cords, treated by total or partial laryngectomy, had global survival rates of 50–89%, respectively. The complication rates also being similar but with good disease control and preservation of laryngeal functions with partial surgery, when feasible.[27] Among partial laryngectomies, the endoscopic approach in cases of post-RT recurrence must be avoided, having in mind the low rate of locoregional disease control, besides missing on an opportunity to do an open surgery with partial laryngeal preservation, as observed in few patients in this study. This may be due to difficulty in establishing lesion margins in an accurate way in a previously irradiated larynx, associated with the limitation of achieving broad margins.

CONCLUSIONS

The recurrence rate was 14.28% in this study of treatment of early cancers of vocal cords (T1) by RT which is high when compared to literature. RT can be a treatment option, but the patient must be aware that higher cure rates can be achieved through surgery. Open partial laryngectomy without neck dissection is an efficient option to treat glottic cancer after RT failure in patients who remain in stages T1a or T1b, bearing satisfactory cancer control without the mutilation of a total laryngectomy.

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How to cite this article: Ohal MM. A Clinical Study on Early Glottic Carcinoma Treated with Radiotherapy and Salvage Surgery for Recurrence. Int J Sci Stud 2019;6(12):32-35.

Source of Support: Nil, **Conflict of Interest:** None declared.