The Professional Medical Journal
www.theprofesional.com

DOI: 10.29309/TPMJ/2019.26.05.3605

ORIGINAL PROF-0-3605

A NOVEL MODALITY TO CURE EARLY GLOTTIC CARCINOMA.

Salman Baig[1], Nadia Shahid[2], Sara Sadiq[3], Asma Niaz Khan[4]

1. MBBS, FRCS
Associate Professor
Department of Otolaryngology
Ziauddin Hospital, Clifton, Karachi.
2. MBBS, FCPS
Assistant Professor
Department of Surgery
Ziauddin Hospital, Clifton, Karachi.
3. MBBS, M.Phil.
Assistant Professor
Department of Physiology
Ziauddin University Clifton, Karachi.
4. MBBS, MS, ADHPE, PhD Scholor
Associate Professor
Department of Medical Education
Karachi Institute of Medical Sciences, Karachi.

Correspondence Address:
Dr. Sara Sadiq
House No. 2146/81
Kamora Colony Nawabshah, Sindh.
dr.sarabhatti@gmail.com

Article received on:
11/06/2018
Accepted for publication:
15/11/2018
Received after proof reading:
22/05/2019

ABSTRACT… The current practice standards demand achievement of cure along with preservation of voice and laryngeal anatomy. The recommended approaches for early stage glottic carcinoma are both laser surgery (LS) as well as radiotherapy (RT). Both modalities having some merits as well as demerits**.** So the objective of the study is to compare the outcome of early glottic cancer patients having laser resection with the patients who received radiation therapy. **Study Design:** Cross sectional study. **Setting:** Ziauddin Hospital. **Period:** January 2013 up to July 2017. **Materials and Methods:** Patients aged 18 years and above with a history of constant hoarseness of voice from 2 months to 4 months were taken. Only the patients with stage 1 that is T_{1a} or T_{1b} squamous cell carcinoma of vocal cords with no nodal or distant metastasis ($T_1N_0M_0$) were included. **Results:** A total of 25 patients were diagnosed with glottic cancer of stage $T_1N_0M_0$. The mean age was 50.56 ± 11.8. Most of them were male with high prevalence of aggravating factors. Majority of patients had left sided vocal cord involvement. When comparing the both modalities, the results showed that Radiotherapy had more complications than Laser surgery. On follow-up visits, the complication with Radiotherapy subsides and larynx anatomy restored but there was no voice restoration in Laser surgery. **Conclusion:** It can be concluded that both treatment modalities including Laser Surgery and Radiotherapy had excellent outcome with good prognosis for voice. However, considering the survival rates, Radiotherapy showed bit superiority over Laser Surgery, despite its complications. Radiotherapy should be the first choice after diagnosing early stage of glottic carcinoma.

Key words: Decision Making, Laryngeal Cancer, Laser Surgery, T1 Glottic Cancer, Radiotherapy, Squamous Cell Carcinoma (SCC).

Article Citation: Baig S, Shahid N, Sadiq S, Khan AN. A novel modality to cure early glottic carcinoma. Professional Med J 2019; 26(6):961-965.
DOI: 10.29309/TPMJ/2019.26.05.3605

INTRODUCTION

Trend towards treatment of early laryngeal/ vocal cord carcinoma has changed over time. The current practice standards demand achievement of cure along with preservation of voice and laryngeal anatomy. The recommended approaches for early stage glottic carcinoma are both laser surgery (LS) as well as radiotherapy (RT).[1-4] Comparison of both modalities reveals that Laser Surgery is predominant over Radiotherapy in local control of tumor along with preservation of laryngeal anatomy.[3,5,6] Both modalities having some merits as well as demerits like Laser Surgery is expensive, quick, inch-perfect and improvement in hemostasis but require surgical skills and feasibility on the other hand Radiotherapy require longer duration of treatment and the lesion follows the sequel of fibrosis and mucosal edema.[7,8]

The objective of the current study is to compare the outcome of the early glottic cancer patients having laser resection with the patients who received radiation therapy.

METHODS

Patients aged 18 years and above with a history of constant hoarseness of voice from 2 months to 4 months were taken between January 2013 up to July 2017 at a tertiary care hospital. The diagnostic tool including flexible nasoendoscopy, direct laryngoscopy, biopsy and CT scan was done to rule out the stage of tumor. Only the patients with stage 1 that is T_{1a} or T_{1b} squamous

cell carcinoma (SCC) of vocal cords with no nodal or distant metastasis ($T_1N_0M_0$) were taken for the study. Patients were given a treatment choice to either select a Radiotherapy or Laser surgery. Decision was made on the basis of several factors including patient's preference, general anesthesia tolerating capacity and chance of operative complications. Patients with either bilateral vocal cord involvement or lymph node involvement or previous history of head and neck tumors or malignancy of any other organ were excluded from the study. Demographic and clinical data including age, gender, type and location of tumor, betal nuts ingestion, cigar, huqa, shisha or cigarette smoker, gutka intake or family history of laryngeal cancer were collected.

Statistical program for social science (SPSS) version 20 was used for descriptive analysis. All qualitative variables were presented as frequency and percentages.

RESULTS

A total of 25 patients were diagnosed as a case of early glottic cancer with a stage of $T_1N_0M_0$ during the study period. The mean age of the patients affected with glottic squamous cell carcinoma were 50.56 ± 11.8. The patients were divided into 5 subgroups and the most common age group affected were in between 40 to 60 years as shown in Table-I.

Most of them were male (n=18) with high prevalence of aggravating factors, including either betal nuts ingestion or cigar, huqa, shisha or cigarette smoker, gutka intake or family history of laryngeal cancer. Majority of the patients had left sided vocal cord involvement. The two treatment modalities including Laser surgery and Radiotherapy were applied over the patients. The radiations exposure given to the patients were of about 5200- 5600 cGy.

The characteristics of patients included in the study along with the two treatment modalities are mentioned in Table-II.

When comparing both modalities including Laser surgery and Radiotherapy, the results showed that Radiotherapy had more side effects than Laser surgery like laryngeal mucositis, pharyngolaryngeal pain and dysphagia, dermatitis, xerostomia and xerophthalmia while patients with Laser surgery manifested with hoarseness of voice. On follow-up visits, the side effects secondary to Radiotherapy subside and larynx anatomy restores but on the other hand, there was no voice restoration in Laser surgery.

Age Groups (Years)	n = 25	Percent (%)
20-30	1	4 %
30-40	5	20 %
40-50	7	28 %
50-60	7	28 %
≥60	5	20 %

Table-I. Frequency of early glottic cancer in different age groups

	n	Percent (%)
Total no: of Patients	25	100 %
Gender		
M	18	72 %
F	7	28 %
Risk Factors		
Betal nuts ingestion	3	12 %
Cigar smoker	5	20 %
Huqa smoker	3	12 %
Smoker	2	8 %
Ex-smoker	6	24 %
Non-smoker	1	4 %
Family history	1	4 %
Smoker + Alcoholic	2	8 %
Smoker + Gutka	1	4 %
Smoker + Shisha + Gutka	1	4 %
Type and Location of Tumor		
Left v.c scc	14	56 %
Right v.c scc	11	44 %
Treatment Modalities		
Laser Surgery (CO_2 laser)	8	32 %
Radiotherapy	17	68 %
RT with recurrence after 22 months	1	4 %

Table-II. Patients characteristics
v.c vocal cord; scc squamous cell carcinoma; LS laser surgery; RT radiotherapy

DISCUSSION

Among the malignant tumors of head and neck, the most common malignant tumor is laryngeal tumor, specifically the glottic carcinoma.[9,10] Mostly

the patients of glottic carcinoma are diagnosed at the early stage because of the involvement of vocal folds and the patient present with the complain of voice changes or hoarseness.[7]

Voice disruption is one of the most common symptoms in the early stage of laryngeal carcinoma. To rule out the differential diagnosis the best plan is to take tissue biopsy by using laryngoscope while prognosis for the voice depends upon the good treatment options.[11]

European Laryngological Society classification is widely used for lesion excision by laser surgery under general anesthesia. Literature revealed various advantages of Laser surgery like it showed little bit of laryngeal edema, decreased morbidity rate, few side effects and a quick procedure but on the other hand, reported some side effects as well, including relapse because of incomplete tumorous tissue to preserve the voice.[11,12] These findings are supported by the current study but contradicting to the studies that consider Laser surgery as a best option for early glottic cancer because of better survival and few complications.[1,13,14]

Radiotherapy is considered as a primary treatment option for early stage glottic cancer because of the preservation of laryngeal anatomy and voice as well. Radiotherapy has a notable strength that it cure without the side effects of general anesthesia but the Laser surgery can be done repeatedly when there is recurrence.[15] Literature review manifested various complications including xerostomia, xerophthalmia, tissue necrosis and the possibility of secondary tumors.[16,17] Current study supported these findings but also reported voice preservation within few months of recovery from other side effects of radiotherapy. The recommended radiation dosage is about 6000–6600 cGy but the current study reported good prognosis with a lower radiation dosage of about 5200-5600 cGy while few studies reported beneficiary effect with even lower dosage i.e. 2000-3000 cGy.[18,19]

Hong et.al compared both treatment modalities and concluded that there was shortened voice onset time and vowel duration after Radiotherapy rather than Laser surgery, might be due to muscular fibrosis leads to sluggish vocal cord movements[11] and this finding was supported by another study, that manifested multidimensional deficits in function of vocal cord for about 2-7 years.[20] On the other hand, the systematic review by Huang et.al reported the advantage of Radiotherapy as an increased maximum phonation time and reduced fundamental frequency.+7 But some of the studies showed no significant difference among the outcomes.[4,21]

Looking over the recurrence rate, majority of the patients with Laser surgery had tumor recurrence within 9 months to 1 year[22], while the patients treated with Radiotherapy showed lower recurrence with high disease-free survival[23], but these findings are contradictory to current study that showed recurrence within 22 months in Radiotherapy treated patients. A Japanese study supported the findings of current study by reporting recurrence within 18 months among patients treated with Radiotherapy.[24]

There was a limitation of small sample size in the current study.

CONCLUSION

It can be concluded that both treatment modalities including Laser surgery and Radiotherapy had excellent outcome with good prognosis for voice. However, considering the survival rates, Radiotherapy showed bit superiority over Laser surgery, despite complications. Radiotherapy should be the first choice after diagnosing early stage of glottic carcinoma.

REFERENCE

1. Mo H-L, Li J, Yang X, Zhang F, Xiong J-w, Yang Z-l, et al. **Transoral laser microsurgery versus radiotherapy for T1 glottic carcinoma: A systematic review and meta-analysis.** Lasers in medical science. 2017:1-7.

2. Stephenson K, Fagan J. **Transoral laser resection of glottic carcinoma: What is the significance of anterior commissure involvement?** The Journal of Laryngology & Otology. 2017;131(2):168-72.

3. Low THH, Yeh D, Zhang T, Araslanova R, Hammond JA, Palma D, et al. **Evaluating organ preservation outcome as treatment endpoint for T1aN0 glottic cancer.** The Laryngoscope. 2017;127(6):1322-7.

4. van Loon Y, Stiggelbout AM, Hakkesteegt MM, Langeveld TP, de Jong RJB, Sjögren EV. **Utility approach to decision□making in extended T1 and limited T2 glottic carcinoma.** Head & Neck. 2017;39(4):779-85.

5. van Gogh CD, Verdonck-de Leeuw IM, Wedler-Peeters J, Langendijk JA, Mahieu HF. **Prospective evaluation of voice outcome during the first two years in male patients treated by radiotherapy or laser surgery for T1a glottic carcinoma.** European Archives of Oto-Rhino-Laryngology. 2012;269(6):1647-52.

6. Huang G, Luo M, Zhang J, Liu H. **Laser surgery versus radiotherapy for T1a glottic carcinoma: A meta-analysis of oncologic outcomes.** Acta Oto-Laryngologica. 2017;137(11):1204-9.

7. Huang G, Luo M, Zhang J, Liu H. **The voice quality after laser surgery versus radiotherapy of T1a glottic carcinoma: Systematic review and meta-analysis.** OncoTargets and therapy. 2017;10:2403.

8. Eskiizmir G, Baskın Y, Yalçın F, Ellidokuz H, Ferris RL. **Risk factors for radiation failure in early-stage glottic carcinoma: A systematic review and meta-analysis.** Oral oncology. 2016;62:90-100.

9. of Thyroid-Head KS, Force NSGT, Ahn S-H, Hong HJ, Kwon SY, Kwon KH, et al. **Guidelines for the Surgical Management of Laryngeal Cancer: Korean Society of Thyroid-Head and Neck Surgery.** Clinical and experimental otorhinolaryngology. 2017;10(1):1.

10. Marur S, Forastiere AA, editors. **Head and neck squamous cell carcinoma: update on epidemiology, diagnosis, and treatment.** Mayo Clinic Proceedings; 2016: Elsevier.

11. Hong YT, Park MJ, Hong KH. **Characteristics of speech production in patients with T1 glottic cancer who underwent laser cordectomy or radiotherapy.** Logopedics Phoniatrics Vocology. 2017:1-9.

12. Gioacchini FM, Tulli M, Kaleci S, Bondi S, Bussi M, Re M. **Therapeutic modalities and oncologic outcomes in the treatment of T1b glottic squamous cell carcinoma: A systematic review.** European Archives of Oto-Rhino-Laryngology. 2017;274(12):4091-102.

13. Peretti G, Piazza C, Cocco D, De Benedetto L, Del Bon F, Redaelli De Zinis LO, et al. **Transoral CO2 laser treatment for Tis–T3 glottic cancer: The University of Brescia experience on 595 patients.** Head & neck. 2010;32(8):977-83.

14. Motta G, Esposito E, Motta S, Tartaro G, Testa D. **CO2 laser surgery in the treatment of glottic cancer.** Head & neck. 2005;27(7):566-74.

15. Lucioni M, Bertolin A, Lionello M, Giacomelli L, Rizzotto G, Marioni G. **Salvage transoral laser microsurgery for recurrent glottic carcinoma after primary laser□assisted treatment: Analysis of prognostic factors.** Head & neck. 2016;38(7):1043-9.

16. Johns MM, Kolachala V, Berg E, Muller S, Creighton FX, Branski RC. **Radiation fibrosis of the vocal fold: from man to mouse.** The Laryngoscope. 2012;122(S5).

17. Kim JW, Byeon HK, Choi H-S, Lee IJ. **Dose de-escalation to the normal larynx using conformal radiotherapy reduces toxicity while maintaining oncologic outcome for T1/T2 glottic cancer.** Scientific Reports. 2017;7(1):15732.

18. Yamazaki H, Suzuki G, Nakamura S, Yoshida K, Konishi K, Teshima T, et al. **Radiotherapy for laryngeal cancer—technical aspects and alternate fractionation.** Journal of Radiation Research. 2017:1-14.

19. Kimura K, Itoh Y, Okada T, Kubota S, Kawamura M, Nakahara R, et al. **Optimized treatment strategy of radiotherapy for early glottic squamous cell carcinomas: An initial analysis.** Nagoya Journal of Medical Science. 2017;79(3):331.

20. Angadi V, Dressler E, Stemple J. **A multidimensional study of vocal function following radiation therapy for laryngeal cancers.** Annals of Otology, Rhinology & Laryngology. 2017;126(6):483-92.

21. Ahmed J, Ibrahim ASG, M Freedman L, Rosow DE. **Oncologic outcomes of KTP laser surgery versus radiation for T1 glottic carcinoma.** The Laryngoscope. 2017.

22. Haapaniemi A, Väisänen J, Atula T, Alho OP, Mäkitie A, Koivunen P. **Predictive factors and treatment outcome of laryngeal carcinoma recurrence.** Head & neck. 2017;39(3):555-63.

23. Alkan U, Nachalon Y, Shkedy Y, Yaniv D, Shvero J, Popovtzer A. **T1 squamous cell carcinoma of the glottis with anterior commissure involvement: Radiotherapy versus transoral laser microsurgery.** Head & Neck. 2017;39(6):1101-5.

24. Itoh Y, Kubota S, Kawamura M, Nomoto Y, Murao T, Yamakawa K, et al. A **multicenter survey of stage T1 glottic cancer treated with radiotherapy delivered in 2.25-Gy fractions in clinical practice: An initial 5-year analysis.** Nagoya journal of medical science. 2016;78(4):399.

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Salman Baig	Desigend the manuscript acquisition & interpretation of data & revised it critically.	
2	Nadia Shahid	Designed manuscript & revised critically.	
3	Sara Sadiq	Did statistical analysis & drafted the manuscript.	
4	Asma Niaz Khan	Acquisition & interpretation of data.	