

# Current trends of carcinoma tongue at a Medical College in Central India: A retrospective study

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## ABSTRACT

**Context:** Oral cancer is the most common cancer in India and tongue is one of the most commonly affected site. **Aims and Objectives:** The current study assesses the clinico-epidemiological trends of carcinoma tongue, its survival rates in different stages and relationship between different variables in central India. **Materials and Methods:** This was a retrospective study of 121 carcinoma tongue patients admitted between the period of 2½ years in a hospital of central India. The data collected were age and sex distribution, location and site of the tumor, tumor stage, histopathological type and grade, nodal status, modality of treatment, recurrences and survival. The disease free survival (DFS) was analyzed against stage, nodal status and recurrences using log rank test. **Results:** In this study, the incidence of cancer was more in males (male: female = 6.1:1) particularly in their fifth decade (mean 52.7 years) and the most common location was anterior 2/3<sup>rd</sup> of the tongue mainly on right lateral side. Most of the patients presenting to out-patient department were having neck nodes positive status. The clinical stage at presentation was mainly advanced stages with well-differentiated squamous cell carcinoma. The most common treatment offered was surgery with radiotherapy (RT), followed by chemotherapy plus RT. The mean DFS time was of 27.8 ± 1.68 months, and it was directly related to tumor stage ( $P < 0.0001$ ) in comparison to nodes positivity and recurrences. **Conclusion:** The study signifies better prognosis of carcinoma tongue in early stages and warrants more awareness campaigns and health education in the health facilities as well as in community for early diagnosis of the disease with proper staging and subsequently multimodal treatment for increasing survival rates.

**Key words:** Carcinoma tongue, disease free survival time, neck dissection, squamous cell carcinoma

## INTRODUCTION

Tongue cancer is one of the most common cancers of the oral cavity in India having incidence rate of 9.4/100,000/year.<sup>[1]</sup> The incidence rate varies according to age, sex, dietary habits, and race. The tongue cancer is prevalent in India due to widespread tobacco abuse, human papilloma virus, Epstein-Barr virus, Plummer Vinson syndrome, metabolic polymorphism, etc., The histopathological type is predominantly squamous cell carcinoma (SCC).<sup>[2]</sup> The overall current estimates of age standardized incidence and mortality

being 6.6/100,000 and 3.1/100,000 in men and 2.9/100,000 and 1.4/100,000 in women, respectively.<sup>[3]</sup> The survival rates for patients of oral cancer reaches only up to 30% in developing countries when compared to 54% in developed countries.<sup>[4]</sup> The poor survival in developing countries may be attributed to the presentation of patients in advanced stages, delayed diagnosis, and treatment with poor compliance to treatment.

The treatment modalities available for oral cancer are surgery, radiotherapy (RT), chemotherapy (CT), and combined modalities.<sup>[5]</sup> These procedure leads to significant morbidity as tongue is involved in swallowing, speech, and breathing. This study gives an emphasis on distribution of carcinoma tongue and different aspects of treatment modalities with their outcome in the studied patients.

## MATERIALS AND METHODS

This is a retrospective clinico-epidemiological study of the carcinoma tongue conducted on 121 patients admitted to

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our oncology unit at Sri Aurobindo Medical College and Post Graduate Institute, Indore, Madhya Pradesh, India from January 2011 to July 2013. The total patients with a confirmed diagnosis of Ca tongue was included in the study. Detailed data from the case files were collected and compiled for further analysis. The data analyzed were most common age group of presentation, gender preponderance, most common stage at presentation along with the most common histopathological type with the most common grade. We assessed the nodal involvement at presentation, and the different treatment modalities offered in patients. The recurrence rate, its relation with neck node positivity, histopathological type and grade, treatment taken primarily were also studied. The disease free survival (DFS) was also analyzed against stage, nodal status and recurrences. The data were analyzed by statistical methods using SPSS version 20 (IBM, SPSS 20, Chicago, Illinois, USA) and statistical tests applied were Chi-square test, Kaplan–Meier survival analysis and log rank test.

## RESULTS

There were 121 cases admitted with a diagnosis of tongue cancer over a period of 2½ year. The mean age of diagnosis was 52.7 years, ranging between 25 and 90 years. Most of cases (70%) were in between 30 and 60 years with most cases reported in the fifth decade (27%). The male: female ratio in this study was 6.1:1. In the majority of cases anterior 2/3 of the tongue was involved (63.6%), with 33% in the right lateral side and 27% on left lateral side. The lesion was crossing midline in five cases (4%) only. Similar pattern was seen in posterior 1/3 of the tongue (28%) where out of 34 cases right sided involvement (17 cases) was more than the left side (8 cases), 10 cases (8%) involved both anterior and posterior parts of the tongue. The neck nodes were found to be palpable clinically in 56% of cases at presentation. Around 96 cases (80%) presented at an advanced tumor stage, mainly in Stage III (50%) at first visit. Only 25 cases (20%) were in early stages and only 3% presented at Stage I. In almost all age groups, the presentation was in advanced stages. Histopathologically 116 cases were SCCs (96%), with few cases of verrucous carcinoma, malignant fibrous histiocytoma and mucoepidermoid carcinoma. When divided according to tumor grades, 48 cases (39.7%) belonged to Grade I, 39 cases (32.2%) belonged to Grade II, 29 cases (24.0%) were of Grade III histology and no grading were mentioned in five cases (4.1%) [Table 1]. Of 121 cases, 70 cases underwent surgery (58%), which was mainly wide excision with supra omohyoid neck dissection (SOHND) (56%) followed by hemiglossectomy with modified radical neck dissection (21%). There were six cases, which underwent hemimandibulectomy with PMMC reconstruction (9%). Nonsurgical management was done in 51 cases with RT plus CT given in the majority (32%). CT and

RT were mainly given in (i) posterior 1/3<sup>rd</sup> involvement (ii) advanced anterior 2/3<sup>rd</sup> cases or (iii) cases, which were unfit for surgery [Table 1].

Recurrence was noted in 12 patients within the study period. There was a significant relationship of recurrences with late stage of presentation ( $P = 0.008$ ) and treatment modalities ( $P = 0.0016$ ). Although increased recurrence rate

**Table 1: Result summary**

Characteristics	Number of cases (n=121) (%)
Sex distribution	
Male	104 (86)
Female	17 (14)
Age distribution	
21-30	3 (2.5)
31-40	27 (22.3)
41-50	23 (19.0)
51-60	33 (27.3)
61-70	20 (16.5)
71-80	13 (10.7)
81-90	2 (1.7)
Location	
Anterior 2/3 <sup>rd</sup>	77 (63.6)
Right lateral	40 (33.1)
Left lateral	32 (26.4)
Both	5 (4.13)
Posterior 1/3 <sup>rd</sup>	34 (28.1)
Right base of tongue	17 (14.1)
Left base of tongue	8 (6.6)
Both	9 (7.4)
Both anterior and posterior	10 (8.3)
Nodal status	
Nodes positive	68 (56.2)
Nodes negative	53 (43.8)
Stage at presentation	
Stage I	3 (2.4)
Stage II	22 (18.2)
Stage III	61 (50.4)
Stage IV	35 (28.9)
Histopathological types	
Squamous cell carcinoma	116 (95.9)
Verrucous carcinoma	2 (1.7)
Malignant fibrous histiocytoma	1 (0.8)
Mucoepidermoid carcinoma	2 (1.7)
Histopathological grade	
Grade I	48 (39.7)
Grade II	39 (32.2)
Grade III	29 (24.0)
Not specified	5 (4.1)
Treatment modalities	
Surgery only	2 (1.7)
Surgery+CT	3 (2.5)
Surgery+RT	37 (30.6)
Surgery+CT+RT	28 (23.1)
CT+RT	39 (32.2)
CT only	4 (3.3)
RT only	8 (6.6)
Types of surgeries (n=70)	
Wide excision+SOHND	39 (55.7)
Hemiglossectomy+SOHND	8 (11.4)
Hemiglossectomy+MRND	15 (21.4)
Total glossectomy+RND	2 (2.8)
Wide excision+MRND+hemimandibulectomy+PMMC flap reconstruction	6 (8.6)

CT: Chemotherapy, RT: Radiotherapy, SOHND: Supra omohyoid neck dissection, MRND: Modified radical neck dissection, RND: Radical neck dissection, PMMC: Pectoralis major myocutaneous flap

was seen with higher tumor grades and nodes positivity, but it was not significant on statistical analysis. The mean DFS was  $27.8 \pm 1.68$  months. The DFS curve obtained was statistically significant with respect to tumor stages with  $P < 0.0001$ . There was no significant difference in DFS probability with nodes positivity ( $P = 0.479$ ) and recurrence ( $P = 0.749$ ) [Figure 1].

## DISCUSSION

The tongue is very commonly affected part in the oral cavity. In a review article by Coelho, the incidence of Ca tongue increased with the age and there was a lower incidence in females as compared to males in all age groups.<sup>[6]</sup> Vargas *et al.* have reported in a comparative retrospective study that the SCC of an anterior tongue shows more aggressive behavior in terms of recurrence rates and recurrence intervals, in young females than in older patients.<sup>[7]</sup> Lam *et al.* performed an epidemiological review of site of lesion in 611 cases of tongue carcinoma over a period of 24 years.<sup>[8]</sup> In their study, the site was not mentioned in 48.45% of cases. In the specified sites tip and the lateral border of the tongue was involved in 25% of cases, followed by involvement of the

base of the tongue in 18% of cases. In our study, there was a predominance of right lateral tongue border involvement, which could be explained by tobacco chewing habits in our country. Huang *et al.* did a comparative retrospective study in early cT1 and cT2 oral cancers and found that incidence of node positivity was 5.2% and 14.6%, respectively.<sup>[9]</sup> They also concluded that level I/II nodes were most common sites for occult metastasis in patients with elective neck dissection and recurrences in patients. The skip metastasis to level IV nodes is rare in early stage cancers.<sup>[9]</sup> In our study, the clinical nodal status was positive in the majority of cases, at presentation, and it was found that recurrences were more common in them. Durazzo *et al.* reported around 50% cases presented with clinically Stage IV lesions and the staging didn't change significantly after pathological examination.<sup>[10]</sup> Similar findings of delayed presentation also noted in our study. This finding can be attributed to delay in seeking professional help due to lack of awareness, delay in diagnosis and delay in referral to tertiary health care setup.

The treatment of oral tongue cancer requires a multidisciplinary approach. The main aims of treatment are tumor eradication,

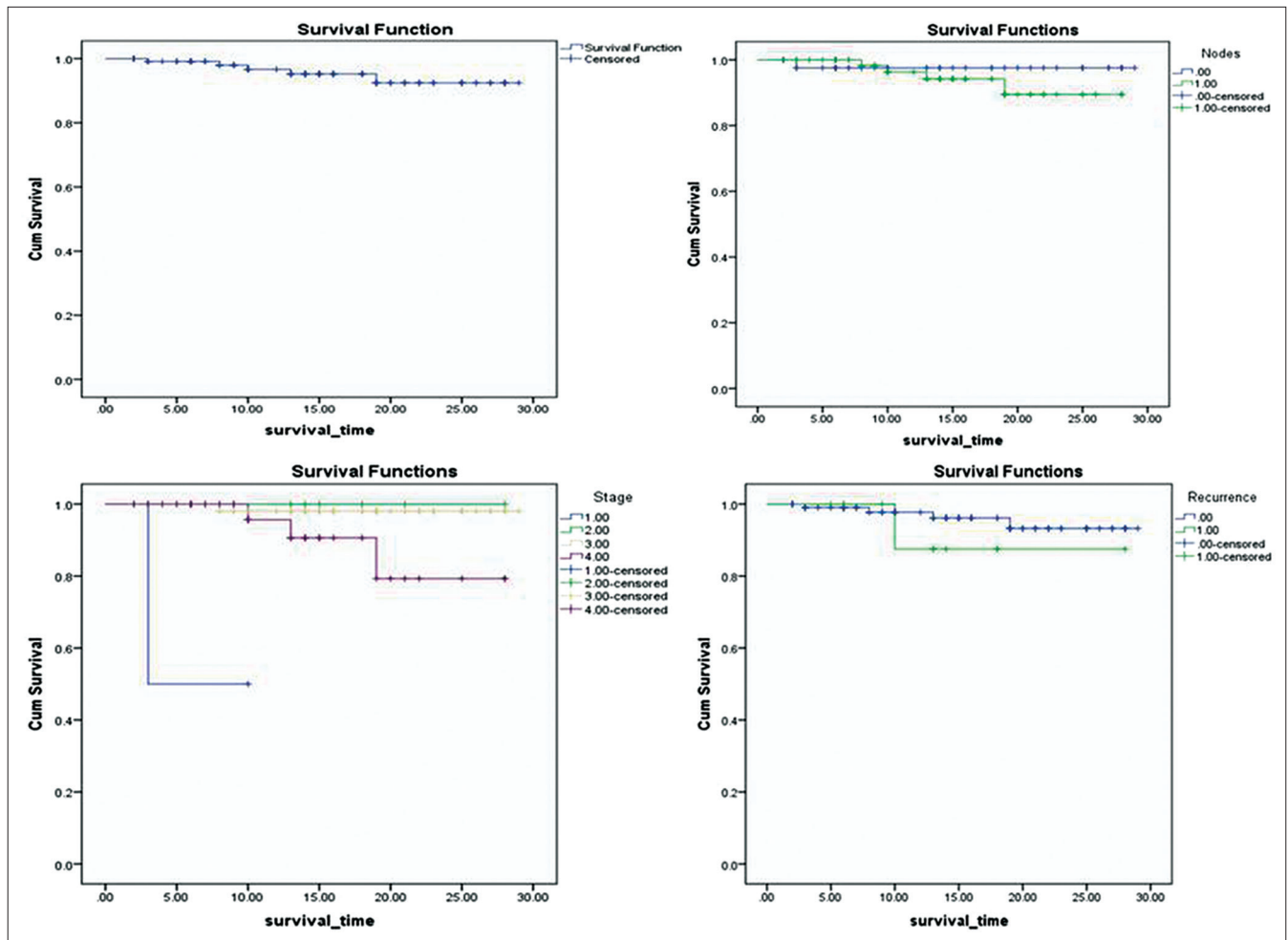


Figure 1: Curve A - Overall disease free survival (DFS) probability, Curve B - Node wise DFS, Curve C - Stage wise DFS, Curve D - Recurrence wise DFS

recurrence prevention and conservation and/or restoration of form and function of the tongue. The choices of treatment are surgery (which includes local resection with or without neck dissection), RT, CT or combined modalities. As earlier explained, the choice of treatment is based on the nature of carcinoma and patient's general condition. Hicks *et al.*<sup>[11]</sup> concluded in their study that locoregional control in patients with SCC of the oral tongue can be achieved with primary surgical therapy, after the results of 79 cases that were treated by surgery alone. Adequate margins are crucial to local control otherwise recurrences are common. Salvage neck dissection may result in long-term survival for patients with regional relapse. Due to the high rate of occult disease (41%), they recommend prophylactic treatment of regional lymphatics for primary clinical disease of T2 or greater. Sessions *et al.* didn't found any significant difference in either disease specific survival or cumulative disease specific survival probability by treatment modality within the stages in a retrospective review of 262 cases with bases of tongue cancer.<sup>[12]</sup> Huang *et al.*<sup>[9]</sup> advised elective neck dissection for all cT1 and cT2 cases even in the presence of nodes negative neck by computed tomography scan and magnetic resonance imaging. They concluded that SOHND is sufficient to remove the majority of lymph node metastases in early stage tongue cancers. In their study elective neck dissection and tumor stage were independent predictors of neck control rate and overall survival. In a retrospective study of 201 advanced staged tongue cancer Fan *et al.*<sup>[13]</sup> found multimodal spread, extra capsular spread (ECS), tumor differentiation and combined chemoradiotherapy (CCRT) as independent prognostic factors. If ECS was present, only CCRT significantly improved survival (3 years recurrence free survival with ECS and with CCRT = 48.2% vs. without CCRT = 15%,  $P = 0.038$ ). In the presence of other poor prognostic factors, results of the two treatment strategies did not significantly differ. In the absence of ECS, CCRT was not statistically better than RT alone. In cases of recurrent oral SCC, epidermal growth factor receptor inhibitor coupled with chemoradiotherapy, is the first line of treatment.<sup>[14]</sup> The treatment protocol of anterior 2/3 to posterior 1/3 of tongue cancer is different, but we have studied them together, which is the cause of the discrepancy in statistical data outcome. Furthermore, the duration of the study to comment on survival conclusively should be more rather than 2½ year.

## CONCLUSION

The study signifies the male preponderance of carcinoma tongue that has a good prognosis provided it is diagnosed at an early stage. The choice of treatment should be multimodal (i.e. surgery with adjuvant chemoradiation) to prevent recurrence and increase DFS. The surgery itself should include tumor resection with neck dissection for adequate tumor removal. This study emphasizes the current clinico-epidemiological trends of carcinoma tongue in central

India and needs more studies on this issue to tackle the situation efficiently. The study also warrants health education and more awareness campaigns for early diagnosis and proper treatment at initial stages for a better prognosis of the disease.

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## REFERENCES

1. Prince S, Bailey BM. Squamous carcinoma of the tongue: Review. *Br J Oral Maxillofac Surg* 1999;37:164-74.
2. Bray F, Sankila R, Ferlay J, Parkin DM. Estimates of cancer incidence and mortality in Europe in 1995. *Eur J Cancer* 2002;38:99-166.
3. Carvalho AL, Singh B, Spiro RH, Kowalski LP, Shah JP. Cancer of the oral cavity: A comparison between institutions in a developing and a developed nation. *Head Neck* 2004;26:31-8.
4. American Cancer Society. *Cancer Facts and Figures*. Atlanta: American Cancer Society; 2005.
5. Schantz SP, Yu GP. Head and neck cancer incidence trends in young Americans, 1973-1997, with a special analysis for tongue cancer. *Arch Otolaryngol Head Neck Surg* 2002;128:268-74.
6. Coelho KR. Challenges of the oral cancer burden in India. *J Cancer Epidemiol* 2012;2012:701932.
7. Vargas H, Pitman KT, Johnson JT, Galati LT. More aggressive behavior of squamous cell carcinoma of the anterior tongue in young women. *Laryngoscope* 2000;110:1623-6.
8. Lam L, Logan RM, Luke C. Epidemiological analysis of tongue cancer in South Australia for the 24-year period, 1977-2001. *Aust Dent J* 2006;51:16-22.
9. Huang SF, Kang CJ, Lin CY, Fan KH, Yen TC, Wang HM, *et al.* Neck treatment of patients with early stage oral tongue cancer: Comparison between observation, supraomohyoid dissection, and extended dissection. *Cancer* 2008;112:1066-75.
10. Durazzo MD, de Araujo CE, Brandão Neto Jde S, Potenza Ade S, Costa P, Takeda F, *et al.* Clinical and epidemiological features of oral cancer in a medical school teaching hospital from 1994 to 2002: Increasing incidence in women, predominance of advanced local disease, and low incidence of neck metastases. *Clinics (Sao Paulo)* 2005;60:293-8.
11. Hicks WL Jr, North JH Jr, Loree TR, Maamoun S, Mullins A, Orner JB, *et al.* Surgery as a single modality therapy for squamous cell carcinoma of the oral tongue. *Am J Otolaryngol* 1998;19:24-8.
12. Sessions DG, Lenox J, Spector GJ, Chao C, Chaudry OA. Analysis of treatment results for base of tongue cancer. *Laryngoscope* 2003;113:1252-61.
13. Fan KH, Lin CY, Kang CJ, Huang SF, Wang HM, Chen EY, *et al.* Combined-modality treatment for advanced oral tongue squamous cell carcinoma. *Int J Radiat Oncol Biol Phys* 2007;67:453-61.
14. Lorch JH, Posner MR, Wirth LJ, Haddad RI. Seeking alternative biological therapies: The future of targeted molecular treatment. *Oral Oncol* 2009;447-53.

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