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# Clinicopathological study of surgical margins in squamous cell carcinoma of buccal mucosa

S.M. Azeem Mohiyuddin [a,*], B. Vageesh Padiyar [a], T.N. Suresh [b], Kouser Mohammadi [a], A. Sagayaraj [a], Shuaib Merchant [a], Mahnaaz Sultana Azeem [c]

[a] *Department of Otorhinolaryngology and Head and Neck Surgery, Sri Devaraj Urs Medical College, Tamaka, Kolar 563101, India*
[b] *Department of Pathology, Sri Devaraj Urs Medical College, Tamaka, Kolar 563101, India*
[c] *Sri Devaraj Urs Medical College, Tamaka, Kolar 563101, India*

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**KEYWORDS**
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Margin of resection;
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**Abstract** *Objective:* To evaluate the margins of resected specimen of oral squamous cell carcinoma (SCC) and to document the surgical margin (measured at the time of resection) and margins at the time of pathological examination (after immersion of the specimen in formalin).
*Methods:* Patients who were diagnosed and confirmed with squamous carcinoma of buccal mucosa were included in the study. Patients underwent resection of the tumor with a margin of 1 cm. Soon after resection, the distance between outermost visible margin of the tumor and the margin of the specimen was measured and documented. Specimens were fixed in 10% formalin and submitted for gross and histopathological examination. The closest histopathologic margin was compared with the in situ margin (10 mm) to determine and document any shrinkage of the margin and the percentage of discrepancy if any.
*Results:* A total of 52 specimens were collected from patients between January 2014 and December 2014. All specimens were obtained from the oral cavity (n = 52) of which 43 (82.7%) were squamous cell carcinoma and 9 (17.3%) were verrucous variant of squamous cell carcinoma. The average decrease in tumor margins measured after fixation in formalin was

* Corresponding author. Tel.: +919845373279.
*E-mail addresses:* azeem_hn@yahoo.co.in (S.M.A. Mohiyuddin), gpadiyar@hotmail.com (B.V. Padiyar), sureshstn@rediffmail.com (T.N. Suresh), zamahmed1973@yahoo.com (K. Mohammadi), sagayaraj79@gmail.com (A. Sagayaraj), shoyu25@gmail.com (S. Merchant), mahnaazsa@gmail.com (M. Sultana Azeem).
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found to be statistically significant ($P < 0.05$) in 65% of cases.
*Conclusion:* Tumor margin shrinks significantly after formalin fixation by about 25%. The operating surgeon and pathologist should be well aware of such changes while planning for further management thereby ensuring adequate margin of resection and adjuvant treatment wherever required to prevent possible local recurrence of the disease.


## Introduction

Surgery is the most well-established and accepted mode of initial definitive treatment for a majority of oral cancers for well over a century. Obtaining tumor free surgical margin following resection of localized malignancies is an important requirement for ensuring success in onco surgery.[1] Oral cavity poses several special challenges to adequate resection. Primarily, it possesses a three dimensional complex anatomy which is difficult for insitu measurement of resection margins. Secondly the mucosa and underlying tissues vary widely in their ability to act as barriers to tumor spread. Tumor size is an important prognostic factor in head and neck cancers. Precise measurement of primary oral cavity lesions (both invasive and non invasive), and subsequent margin assessment both intraoperatively and postoperatively are crucial for accurate staging and appropriate management. If there is discrepancy in documenting margins of the tumor by either the surgeon or the pathologist, it can lead to subsequent improper staging of the lesion and inappropriate management.

According to AJCC, the pathological classification of a carcinoma is determined by evidence acquired before treatment which is supplemented and modified by additional evidence acquired during surgery.

The pathological T category is derived from the actual measurement of unfixed tumor in the resected specimen because up to 30% shrinkage of soft tissue may occur after formalin fixation.[2]

The optimal width of the surgical margin for oral cancer has always been an issue of debate. Microscopic tumor at the inked resection margin increases the chance of local recurrence by a factor of 2 or more in most series. The term "positive margin" should be reserved for patients with microscopic tumor at the inked resection margin.[3]

There are 2 explanations for the positive margin phenomenon. The first possible explanation is that microscopic tumor may extend beyond the clinically visible and palpable tumor. Routinely, 1-cm margin of clinically normal tissue around the tumor is resected to achieve at least 5 mm of histopathologically normal tissue; however, this is may not always be sufficient. Extensions or islands of tumor may invade out of the main mass of tumor, resulting in a margin that is closer than anticipated. Alternatively, tissue retraction that occurs after resection and pathologic processing of the specimen may decrease the size of the tissue margin.

The problem of margin shrinkage has been dealt with at other sites, but has not been addressed and quantified adequately in oral cavity cancers.

The aim of this prospective observational study was to evaluate the margins of resected specimen of squamous cell carcinoma (SCC) of buccal mucosa and to document the surgical margin (measured at the time of resection) and margins at the time of pathological examination (after immersion of the specimen in formalin).

## Materials and methods

This prospective observational study was performed in the Department of Otorhinolaryngology and Head and Neck surgery, R.L Jalappa Hospital, Tamaka, Kolar between January 2014 and December 2014 after approval by the Institute's Ethics Committee. This study was performed on resected specimens of 52 patients who satisfied the inclusion criteria.

Inclusion criteria was biopsy proved SCC of buccal mucosa with no previous treatment and good general condition allowing a major surgical procedure. Patients who received neoadjuvant chemotherapy, locoregional recurrence, patients operated or radiated earlier and patients with distant metastases were excluded from the study. All patients were informed regarding the purpose of the study and their written consent was obtained. Basic demographic data including age, gender, tumor location, tumor staging and histological features were documented.

A thorough clinical examination and routine preoperative laboratory tests followed by searching for locoregional and distant metastases were done with computed tomography (CT) and abdominal ultrasonography in all patients.

The studied groups included 52 patients: 38 females (73%) and 14 males (27%), with a female to male ratio 2.7:1. The age of the patients ranged from 45 to 65 (mean 55.15). The borders of the tumor were determined by visual inspection and palpation and were then marked with marking ink. Surgical margin of at least 10 mm was marked circumferentially from the clinically detectable tumor using metric ruler. The distance between visible outermost limit of tumor and the margin of resection was measured using calipers. After approximately 1—2 days of formalin immersion, the measurements were repeated as performed earlier and documentation was done with regard to any change or discrepancy in the measurements. Tumor stage and nodal stage are listed in Table 1. Addictions of the patients in this study are in Table 2.

For regional control, the surgical management included a radical neck dissection (RND), modified radical neck dissection (MRND) or selective neck dissection, depending