

SIGNIFICANCE OF SURGICAL MARGINS ASSESSMENT IN ORAL SQUAMOUS CELL  
CARCINOMA: A SURGEON'S PERSPECTIVESanjeev Tomar\*<sup>1</sup> and Upma Tomar<sup>2</sup><sup>1</sup>Senior Lecturer, Dept. of Oral and Maxillofacial Surgery,<sup>2</sup>P.G. Student, Dept. of Oral Pathology & Microbiology,

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**ABSTRACT**

Oral squamous cell carcinoma (OSCC) is the most common malignant tumour of the oral cavity. It can be treated by surgery, radiation therapy, chemo therapy, and sometimes combinations of all these modalities and among all these modalities, surgery is the most accepted line of treatment. The purpose of Cancer surgery is achieving complete resection of the tumour and its success depends on not leaving any residual neoplastic cell. Despite all the recent advances in the diagnosis and treatment of these patients, OSCC is showing increasingly high recurrence rates. The surgical margins (SMs) or resection margins are the margins or boundaries of resection specimen, which is excised by the surgeon. The goal of this review was to evaluate the significance of surgical margins in adequate and proper treatment of HNSCC along with minimum recurrence.

**KEYWORDS:** Oral squamous cell carcinoma (OSCC), pattern of invasion, surgical margins (SMs), frozen section, tumour-free margins.

**INTRODUCTION**

Oral squamous cell carcinoma (OSCC) is the eighth most common cancer of oral-cavity around the world.<sup>[1,4]</sup> It may be treated by surgery, radiation therapy, chemo therapy, or combinations of all these modalities<sup>[1,2]</sup> and in all of these modalities, surgery is the most accepted line of treatment. Complete resection of the tumour and success depends on not leaving any residual cancer cell.<sup>[3]</sup> Due to the anatomical complexity of the oral cavity, it is always difficult for surgeon to remove tumours with clear surgical- margins during oncological surgery.<sup>[4]</sup>

**Types of Tumour Margin**

Broadly, the margins of tumour have been categorized as:

- **Clinical margins:** These are margins of tumour on clinical examination and palpation, which are included during resection of tumour tissue.<sup>[5]</sup>
- **Resection margin or surgical margin:** It is any tissue plane where the surgeon's knife meets the patient (Hinni *et al*).<sup>[2]</sup> Along with the surface mucosa (at the edge of the tumour), it also include the sub-mucosal and deeper connective tissues, all around the tumour.<sup>[6,7]</sup> SMs reflect the surgeons endeavour to excise all the neoplastic tissue along with preservation of adjacent unaffected anatomical structures, for the purpose of balancing the oncological as well as functional goals.<sup>[8]</sup>

Microscopically, SMs can be subdivided into histological and molecular margins.

- a. **Histological margins:** The pathologists screen the edges/margins of resection specimen for evidence of tumour cells.<sup>[3]</sup> The UK Royal College of Pathologist's guidelines proposes for screening of both the margins "deep margin" and "mucosal margin".<sup>[4]</sup>

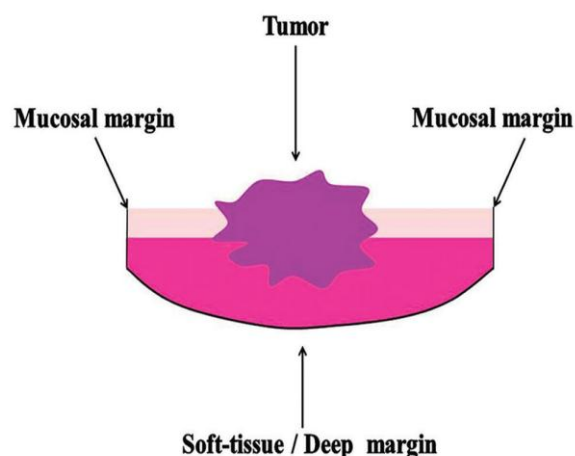


Fig. 1

Mucosal and deep margins are subdivided into clear, close, and involved margins depending upon the approximation of tumour cells.<sup>[5]</sup>

- **Clear / negative margin:** Histological distance of >5 mm from the invasive carcinoma to Surgical Margins.
- **Close margin:** Histological distance of 1–5 mm from the invasive carcinoma to Surgical Margins.
- **Involved/positive margin:** Histological distance of <1 mm from the invasive carcinoma to Surgical Margins.

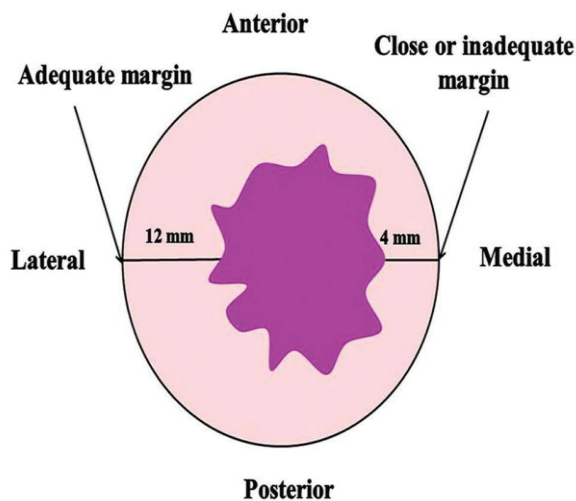


Fig. 2

**Molecular margins:** The histologically normal margins may harbour genetic changes.<sup>[4]</sup> Thus, various molecular markers have been recently employed to detect these fields of genetically altered cells.<sup>[5]</sup>

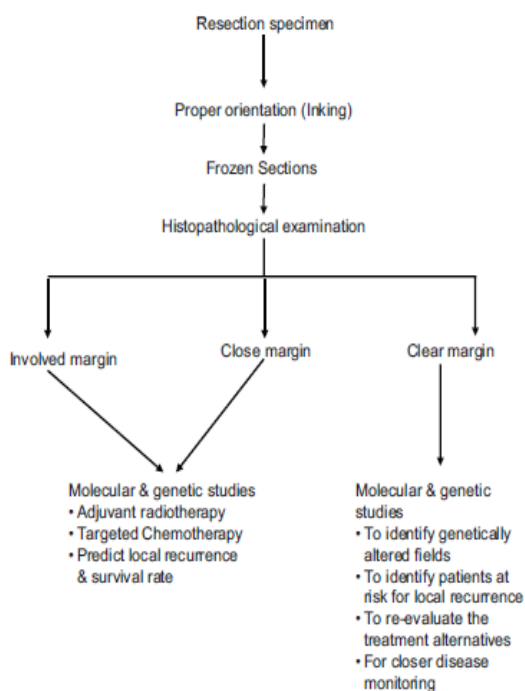


Fig. 3

So, Anatomical site, clinical stage, and pathological features of the primary tumour are the essential elements to guide HNSCC treatment.<sup>[3]</sup> During surgical removal, the visible neoplastic area must be resected with a threshold of normal tissue, whose edge represents the mucosal margin.<sup>[5]</sup>

## DISCUSSION

### Inadequate Margin: Mucosal Tissues versus Deep tissues

Surgeons are consistently experience troubles in accomplishing sufficient careful edges for more profound connective tissue planes as contrasted and mucosal edges. Anatomic requirements may likewise limit the specialist's capacity to accomplish satisfactory profound resection edges. Peri-neural and lympho-vascular invasion and infiltrative growth patterns are primary factor for inadequate deep soft tissue margins.

### Intraoperative margin surveillance

Specialists ink the distinctive resection edge planes with various tones and also keep carefully the records which are an extra segment of planning (eg, red ¼ superior).<sup>2</sup> Different inking is especially significant at whatever point a segment will incorporate more than 1 edge (ie, profound and ventral) on the slide. In the wake of situating, planning, and inking the resection example, the pathologist intently notices the resection planes by cutting into the example at 2-to 4-mm stretches opposite to the resection edge plane. This gross evaluation gives significant essential data. After which, specialist may choose to get back to the imperfection right now to extract more tissue based on the gross assessment result, as slides are being handled. This is followed by microscopic examination, which further refines the information. Sometimes "Deformity bewilderment" can restrict the specialist's capacity to precisely move the site of deficient edges. This bewilderment can be expected and redressed by denoting the different edge focuses inside the careful deformity by utilizing of clasps or stitches, prior to carrying the resection example to the frozen area suite. A pseudo- negative frozen segment report is typically the consequence of testing blunder; in some cases carcinoma might be missing in the genuine frozen area slide yet shows up in the lasting segments after more profound cutting into the formalin-fixed paraffin-implanted square.

### Bone margins

Because of, its high mineral substance and need for decalcification, bone isn't prudent to fast tissue analysis.<sup>[2]</sup> Osseous edges have along these lines been constantly decided before a medical procedure by investigate imaging. Anyway the requirement for a more complete and prompt histologic intraoperative assessment of bone edges for remaining tumor is self-evident and has been the subject of several studies.<sup>[3]</sup> Rather than frozen area, surgeons utilized intraoperative cytology evaluation of bone marrow scrapings to

anticipate edge status. This system end up being simple, savvy, and dependable.

### Management of positive margins

There is by all accounts little agreement on the treatment of positive edges other than maybe dodging them in any case. For tumors from oral and oro-pharyngeal sites which are accessible for open or trans-oral surgical procedure and excised with insufficient final edges, numerous surgeons will select to re-excite the tissue if possible, particularly if this would annul the requirement for adjuvant chemo or radiotherapy.

### CONCLUSION

Inadequate surgical resection margins may contribute to increased chances of local recurrence and morbidity rates, decreased survival rates, and hence increased cost to society. It might commit patients to adjuvant chemo or radiotherapy, which may not have been necessary otherwise. Therefore surgeons need to obtain adequate resection margins whenever possible. At present there is no consistency in the meanings of adequate surgical margins. Nonetheless, we do suggest that margin distance should be estimated in millimeters and recorded on the surgical pathology report. Inside the oral cavity 5 mm addresses the most regularly utilized margin standard. Positive margins ought to be precisely cleared at whatever point conceivable. In the event that this isn't practical, chemo and radiotherapy is better than adjuvant radiotherapy alone. Other tumor highlights, for example, lymphovascular invasion, perineural spread, and high-risk status are likely implied in the risk evaluation for nearby repeat and effect the choice for adjuvant treatment. Head and neck surgeons and pathologists should cooperate toward standardizing margin evaluation from a multidisciplinary and multi-institutional point of view. Hence achieving adequate resection margin is always "operator dependent" with respect to onco-surgeons and pathologists. The appropriate surgical management of HNSCC would greatly benefit from a more accurate and standardized approach to resection margins. The objective of this review was to sum up the discussions in regards to the surgical margins, reviewing the literature, give evidence or a reasoning for consensus and standardization.

We conclude that, accomplishing adequate resection margins at the time of surgical procedure is acceptable practice. This can possibly dispose of the necessity for extra surgical procedure or adjuvant treatment.

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