Role of Frozen Section in Neck Dissection of Oral Cancer Patients

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Abstract

Introduction: Oral carcinoma is emerging as growing problem in many areas of the World and 4th most common cancer among women in India. Globally, over 3,00,000 people are diagnosed with oral cavity cancer each year. Radical or modified radical neck dissection is usually a choice of surgeon in node positive patients. Frozen section when performed along with supra-omohyoid neck dissection provides solution to this dilemma of surgeon by detecting the metastasis in cervical lymph nodes intra-operatively during neck dissection. This study was planned to establish usefulness of frozen section examination in decision of correct plan of management of patients of oral cancer with clinically nonodal metastasis in neck (N0).

Objectives: To study appropriate plan of management for clinically neck examination with lymph node status N0 in patients of oral cancer and to determine efficacy of frozen section examination in detection of occult nodal metastasis in neck in patients of oral cancer.

Method and Materials: In 102 cases, excision of lesion, followed by supra-omohyoid neck dissection was primary mode of treatment and lymph nodes at various levels were sent to frozen section for assessment of metastasis by cancer cells. Intraoperatively during frozen section,if any of the lymphnode between levels I to levels III is found positive for the metastatic disease then the plan of surgery was changed to a more comprehensive Modified radical neck dissection.

Results: Maximum cases were carcinoma tongue followed by cases of carcinoma of gingiva-buccalsulcus. Carcinomas of stage 1,stage 2,stage 3 are 43.8%, 52.2% and 3.9%. Histopathological grading of oral squamous cell carcinoma was done by Broader's grading system as Well differentiated SCC (52 cases), Moderately differentiated SCC (42 cases), poorly differentiated SCC (08 cases). Supra-omohyoid neck dissection was initial plan of management in cases but it changed to modified radical neck dissection in 42 cases as lymph nodes between level 1 to 3 were positive for metastasis of SCC.

Conclusion: Oral cancer should be surgically managed intra-operatively by frozen section examination of alllymph nodes to avoid short term recurrences and institution of post-surgicalchemo/radiotherapy. Frozen section examination of yielded lymph nodes in these surgeries canmodify the extent of dissection of neck.

Keywords: *Oral carcinoma, frozen section, supra-omohyoid neck dissection (SOND), modified radical neck dissection (MRND).*

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Introduction

Oral cancer is an emerging as an growing problem in India, with prevalence of 60%[(1,2)]. Men are 2 – 3 times more commonly affected than women. 98% of cases occur in patients aged more than 40 years and are linked to tobacco chewing or smoking[(3-7)]. The spread of oral cancer from primary site to cervical lymph nodes has

been well addressed [8]. The presence of occult metastasis ranges between 10 – 52%. Lymph node metastasis has been found to be one of the most important factors in prognosis of oral squamous cell carcinoma and successful treatment depends on the management of neck. When compared to Node negative disease, the presence of even a single micro-metastasis in a lymph node is associated with a significance difference in recurrence and survival. Supra omohyoid neck dissection (SOND) has been described as a quality staging procedures for OSCC in clinically N0 nodes by some authors[9-11]. Radical neck dissection/MRND is usually a choice of surgeon in Node positive patients.Frozen section when performed along with SOND provides solution to the surgeon by detecting the metastasis in cervical lymph nodes intra-operatively during neck dissection. Incase frozen section detects occult nodal metastasis then SOND get modified to RND/MRND[12-14].

Aim and Objective:

The aim of our study was:

1. To study appropriate plan of management for clinically N0 neck examination in patient of oral cancer
2. To determine efficacy of frozen section examination in detection of occult nodal metastasis in neck in patients of oral cancer

Materials and Method

It was a Prospective study of 2 years conducted in 102 patients of oral malignancy with clinically N0 neck in Pathology department, Jawaharlal Nehru Medical College, Sawangi, (M) Wardha.

Inclusion Criteria:

- Biopsies of patients in OPD of oral and maxillofacial surgeries with ulcer or growth over tongue, lip or buccal or gingivobuccal sulcus were collected with no palpable nodes in neck.

Exclusion Criteria:

- Patients with carcinoma of thyroid and oropharynx
- Patients with diagnosis other than SCC
- Patient with recurrent malignancies
- Patients with lymph node status other than N0

Materials required for frozen section:

- Cryostat (Leica)
- Materials for rapid H and E staining
- Lymph-node specimen
- Tissue freezing medium
- Compound light microscope
- Glass slides and slide marker
- Scalpel and blade
- Normal saline
- Filter paper, forceps and gloves

Method:

Procedure[15]: During the neck dissection lymph nodes at various levels of neck were sent to frozen section for assessment of metastasis. All the resected lymph-node submitted for intra-operative frozen section were grosslyexamined and the respective areas were sectioned and embedded in optimal cutting temperature compound and were freezedat -20 °C to -30 °C in cryostat. The sections were cut approximately 4- 5 µm thick and picked on glass slides whichwere stained with rapid Hematoxylin and Eosin .

Observation: The total of 102 cases in IPD of oral and maxillofacial surgery meeting the inclusion criteria were included and studied for defined objectives. The observation of the study is described in the following tables.

Table 1: Sitewise distribution

Site	No. of Cases and Percentage
Tongue	41(40.19)
Gingivo-buccal sulcus	28 (27.45)
Buccal mucosa	22 (21.57)
Alveolus	07(6.87)
Lip	04 (3.92)

The present study has observed maximum number of cases belonging to carcinoma tongue followed by GB sulcus, by buccal mucosa, alveolus and lip.

Table 2 :Stage wise distribution (n=102)[16]

Stage	No. of Cases and Percentage
T1N0M0 (Stage I)	44 (43.84)
T2N0M0 (Stage II)	54 (52.24)
T3N0M0 (Stage III)	04 (3.92)

TNM staging (AJCC) was adopted for staging of oral squamous cell carcinoma. Stage of oral squamous cell carcinoma defines aggressiveness and prognosis of the tumour .In the study 54 cases belong to stage II followed by 44 cases belonging to stage I category. Only 4 cases of high grade tumour were observed.

Histopathological grading of oral squamous cell carcinoma was done by broader's grading system.[17]

Table 3: Distribution of cases diagnosed on biopsy prior surgery (n=102)

Diagnosis on Biopsy	No. of Cases and Percentage
Well differentiated SCC(WDSCC)	52 (50.99)
Moderately differentiated SCC (MDSCC)	42 (41.16)
Poorly differentiated SCC (PDSCC)	08 (7.85)

In the present study, maximum cases were observed of Well differentiated grade i.e. 52 cases followed by Moderately differentiated grade i.e. 42 cases and only 8 cases belong to poorly differentiated category.

Table 4. Distribution of Lymph node status on frozen section [18]

Initial Surgery Planned	Diagnosis of Lymphnode on FS	No. of Cases and Percentage	Final Surgery Performed
SOND	Negative for metastasis	60(58.82)	SOND
	Positive for metastasis	42(41.18)	MRND

The initial plan of management of all cases was SOND . The level of lymph nodes resected in SOND were level I, IIand III. These lymph nodes were sent for frozen section study. Incase the frozen section detected nodal metastasis, the neck was further dissected upto the level V, which meant that neck dissection was converted from Supra Omohyoid Neck DIssection (SOND) to Modified Radical Neck Dissection (MRND).

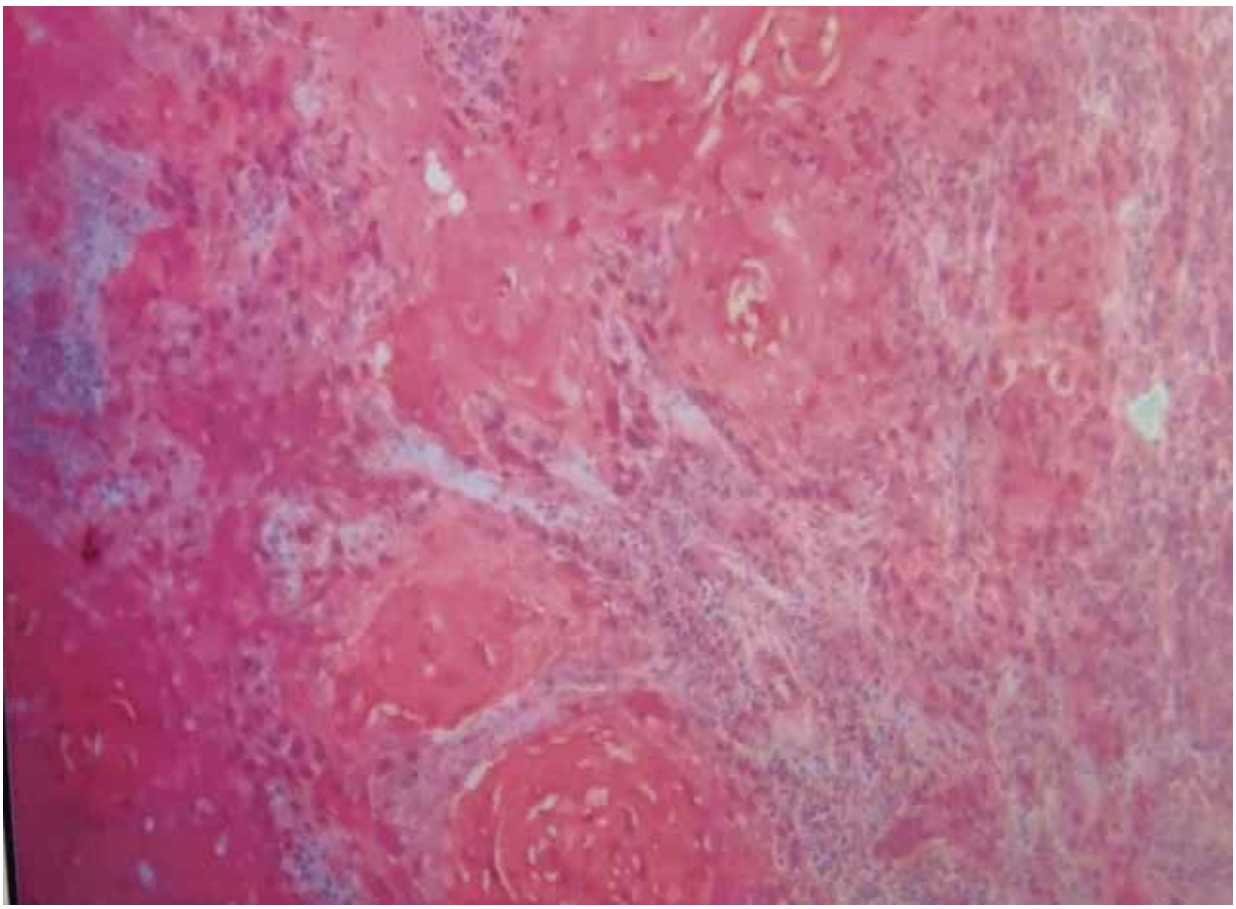

Fig. 1: 10x view of metastasis of WDSCC in lymphnode in FS

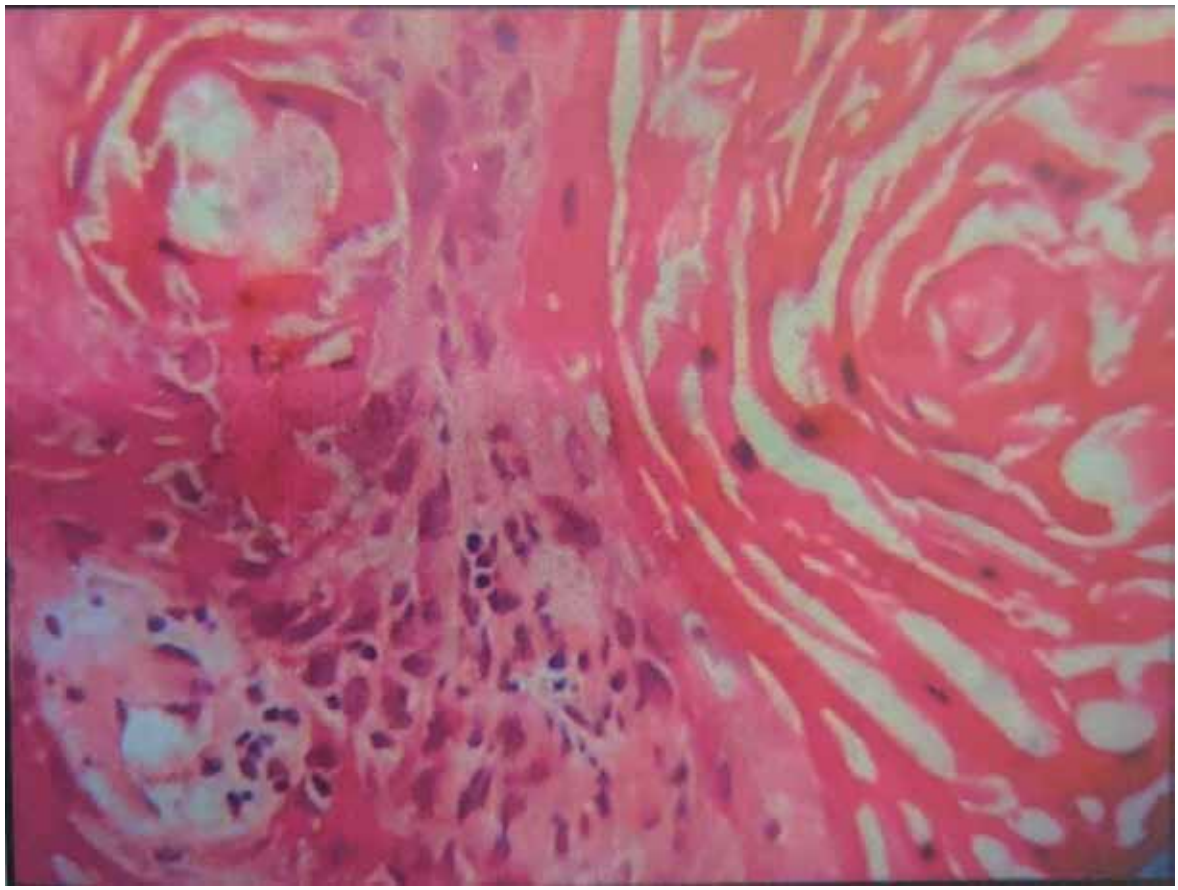

Fig. 2: 40x view of metastasis of WDSCC in lymphnode on FS

Discussion[19-22]

The word "Cancer" derived from a greek word "KARKINOS". According to WHO, cancer is a generic term for large group of diseases characterized by growth of abnormal cells beyond their usual boundaries which can invade other parts or spread to other organs. World is moving towards various non-communicable diseases (modern epidemics) of which cancer is most common cause of mortality in developed countries. Environment and lifestyle play an important role in causing cancers. These days addiction among young population is rising resulting to advance stage disease at an early age. This study intends to access the usefulness of frozen section for the decision of neck dissection management in oral cancer patient with nodal status as N0of neck.

Manni et al.[19] conducted a study in 57 patients with oral squamous cell carcinoma out of which 10 cases were detected as metastasis disease. The initial plan was SOND. After the study they concluded that frozen section biopsy of lymph node suspected to be metastatic during SOND proves a valid staging procedure.

Hoogen et al.[20] also performed a retrospective analysis in 57 patients with an average age of 59 years, performed SOND as an initial treatment in all cases. Amongst them 10 cases showed positive metastasis in lymph node.

Manni and Hoogen et al have suggested SOND as an appropriate staging procedure to manage cases of oral SCC with N0 neck. In the present study, out of 102 cases frozen section examination detected lymph node metastasis in 42 cases. This finding is in concordance with the study done by ***Rassekh et al.***[21]

Chaturvedi et al.[22] in their study on 877 patients used frozen sections to detect intraoperatively and were able to detect 188 cases for metastasis. In studies done by Manniet, Hoogan et al and Chaturvedi et al, the plan of management changed from SOND to MRND in 10, 10 and 188 cases respectively.

In the present study, also the cases which were found in level I, II and III were dissected upto level V i.e. MRND. Out of 102, 42 cases underwent such conversion of dissection of SOND to MRND in the present study which is similar to above mentioned studies.

Conclusion

In clinically N0 nodes of a oral squamous cell carcinoma patients the initial surgical plan preferred is Supra omohyoid neck dissection, however if neck nodes (level I to level III) are found positive for metastasis on FS during surgery then the SOND could get modified as a RND/MRND .

Thus, Frozen section play a major role in the decision on surgery of oral cancer patients, is a easy,possible and life saving technique.

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