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Brief Communication

Study of Sentinel Lymph Node in Oral Squamous Cell Carcinoma

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Abstract

Background: Study of Sentinel Lymph Node (SNL) in clinically N0/ N1 stage helps to select the patients for neck dissection. Objective of this study is Pathological evaluation of Sentinel lymph node in oral squamous cell carcinoma. ***Materials and Methods:*** Retrospective study of Sentinel lymph node in 28 cases of oral squamous cell carcinoma with N0 (6 cases) and N1 (22 cases) was undertaken. SLN were studied using imprint cytology (18 cases), haematoxylin and Eosin (H&E) staining (28 cases), serial step sectioning (SSS) at the interval of 50 microns with H&E staining and Immunohistochemistry using pancytokeratin AE1/AE2 antibody. ***Results:*** on detail pathological study SLN showed metastasis in 11 out of 28 cases. On histopathological correlation imprint cytology showed metastasis in 3 cases but in 2 cases there is false negativity. On histopathological correlation sensitivity, specificity and negative predictive value of imprint cytology is 60%, 100% and 87% respectively. Initial H&E section showed macrometastasis in 7 cases. Additionally SSS and immunohistochemistry demonstrated isolated tumour cells in 4 cases. ***Conclusion:*** Imprint cytology is less effective in identifying metastasis. Histopathology & Immunohistochemistry are required to identify micrometastasis & isolated tumour cells.

Key words: Imprint cytology, Metastasis, Oral cancer, Sentinel lymph node.

Introduction

Head and neck cancers are one of the most common cancers in India [1,2]. Out of these, oral cavity forms the most common site for squamous cell carcinoma. When there is cervical node involvement, survival rate decreases by 50% and possibility for distant metastasis increases [3,4,5]. Accurate identification of subclinical regional metastasis is one of the goals of cancer treatment. Clinical examination, radiological imaging and ultrasound guided FNAC were used to detect cervical metastasis. These studies lack the sensitivity and specificity desired to confidently recommend a programme of clinical observation for patients with clinically negative status of neck nodes (stage N0)[6,7,8]. Pathological examination of cervical lymph nodes following elective neck dissection is the most precise method available for determining the presence of lymph node metastasis. But the policy of elective neck dissection exposes more than 50% of stage N0 patients to lymphadenectomy that may not be necessary.

Sentinel Lymph Node (SLN) is the first draining lymph node from a tumour. Few studies have shown that study of Sentinel Lymph Node in clinically N0/ N1 stage helps to select the patients for neck dissection[9,10,11]. In this retrospective study, SLNs were studied using different methods of pathological evaluation to determine their relative efficacy.

Materials and methods

Sentinel lymph node in 28 cases of oral squamous cell carcinoma with clinical N0 (6 cases) and N1 (22 cases) status were retrospectively evaluated. Per operatively 5 ml of Methylene blue dye was injected into the primary tumour. Lymph node that picked up the blue dye was sent separately for imprint cytology and subsequent detailed pathological examination.

SLN were evaluated for metastasis using imprint cytology (18 cases), H&E staining (28 cases).

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In lymph nodes that appeared negative following H&E examination, they were subjected for serial step sectioned (SSS) at the interval of 50 microns with H & E staining and examined. Immunohistochemistry using pancytokeratin AE1/AE2 antibody (Biogenix . USA) was also studied (28 cases). Metastasis is classified into Macro metastasis (> 2.0 mm), Micro metastasis (>0.2mm to< 2.0 mm), and isolated tumour cells (< 0.2 mm or <200 cells).

Results

Study group had 3 males and 25 females with male to female ratio of 1:8.3 and the mean age was 54 years (range 35 to 80 years). The clinical stage of primary tumour was T1 in 2 (7.1%) patients, T2 in 9(32.1%), T3 in 4 (14.2%) and T4 in 13 (46.4%) cases. The site of primary squamous cell carcinoma was left buccal mucosa in 15 patients (54%), right buccal mucosa in 7(25%), lower alveolus 4(14%) and tongue in 2(7%) patients.

On routine histopathological evaluation, SLN showed metastasis in 7 out of 28 cases (Table 1). Out of 18 cases where imprint cytology was available, 5 cases showed metastasis on histopathology. However, on imprint cytology only 3 cases out of these 5 cases showed metastasis (Fig .1). On histopathological correlation, sensitivity, specificity and negative predictive value of imprint cytology was 60%, 100%, and 87% respectively.

Initial H&E section showed macro metastasis in 7 cases (Fig .2). Additionally SSS and immunohistochemistry demonstrated isolated tumour cells in 4 cases (Fig .3). On careful examination of lymph nodes beyond SLN, only one case showed lymph node metastasis with negative SLN. After pathological evaluation of SLN, 2 of 6 patients (33%) were upstaged from N0 to N1 status and 14 of 22 (64%) cases were down staged from N1 to N0.

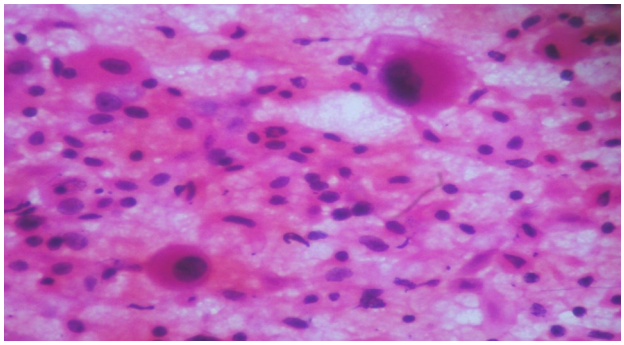

Fig:1 – Imprint cytology showing malignant squamous cells (H&E)

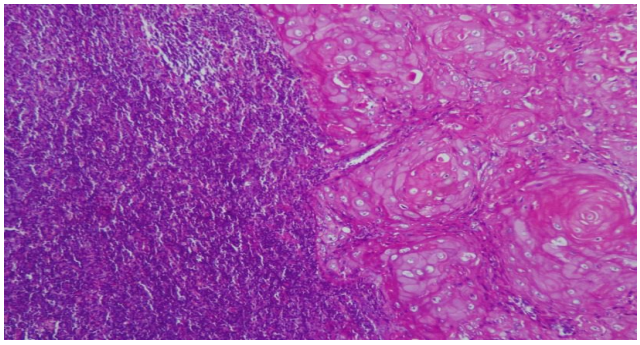

Fig:2 – SLN showing macrometastasis of squamous cells (H&E)

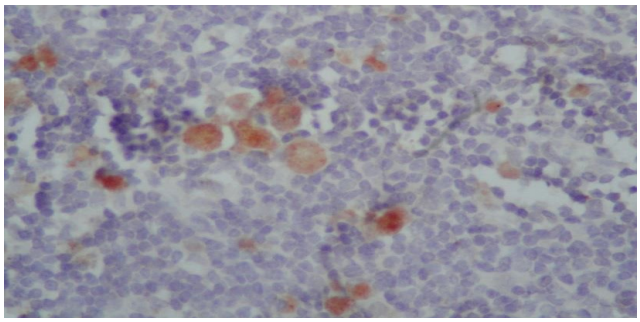

Fig:3 – Isolated tumour cells demonstrated by pancytokeratin antibody

Case No.	Imprint cytology	Histopathology	SSS with IHC
1	+	+	NA
2	-	-	-
3	-	-	-
4	-	-	-
5	NA	+	NA
6	+	+	NA
7	-	-	-
8	-	+	NA
9	-	-	-
10	+	+	NA
11	NA	-	-
12	NA	-	+
13	-	-	+
14	-	-	-
15	-	-	-
16	-	-	+
17	-	-	-
18	-	-	-
19	NA	-	-
20	NA	-	+
21	_	+	NA
22	-	-	-
23	-	-	-
24	NA	-	-
25	NA	-	-
26	NA	-	-
27	NA	-	-
28	NA	+	NA

(NA- Not Available, + metastasis present, - metastasis absent)

Table:1- Cytohistopathological correlation of sentinel lymph node in oral squamous cell carcinoma.

Discussion

Currently study of SLN is routinely used in the management of breast cancer, colon cancers, and cutaneous malignant melanomas [12, 13, 14].SLN biopsy in head & neck cancer is not standard of care and is practiced only in few centers[15]. The complex drainage pattern of head and neck region and proximity of lymph node to injection site raised concerns that SLN may not be accurate in head and neck cancer. In 1992 Mortan et al introduced intraoperative mapping with blue dye as a method to identify SLN[16]. Alex and Krag proposed lymphscintigraphy and hand held gamma probe to identify SLN[17]. Multicentric trial data showed that blue dye and radiocolloid (Tc99) with gamma probe is superior to blue dye alone for detecting SLN. Intraoperative frozen section & imprint cytology was not found to be effective in identifying occult metastasis [18]. Terada et al study concluded that multislice frozen section analysis is superior to imprint cytology in intraoperative diagnosis of SLN biopsy. They found that sensitivity of multislice frozen section is 90.9% as compared to 27.3% in imprint cytology[19]. In our study only 60% cases showed positivity on imprint cytology.

In a study performed by Trivedi et al. SSS upstaged the disease by 10% and sensitivity and negative predictive value of SSS with hematoxylin – eosin stain were 90% and 97% respectively. Serial step sections & IHC using pancytokeratin antibody enhances the detection rate (10-19%) of metastasis [18, 20]. Similarly, in our study SSS & IHC additionally demonstrated metastasis in 4 patients. The significance of micrometastasis and isolated tumour cell is to large extent not known. In a study, the outcome of 14 micrometastasis patients was similar to those without cervical node metastasis. However larger studies with long term follow up is required for any firm conclusion.

In the literature, 20-35% patients had no palpable lymph nodes but had occult metastasis on pathological evaluation of SLN[9, 21]. In our study 2 out of 6 (N0) patients (33%) showed occult metastasis upstaging the nodal status to N1. It has been demonstrated that SLN in excess of 20mm may be histologically reactive hyperplasia without metastasis [22]. In our study, 14 of 22 patients (64%) were down staged from N1 to N0. SLN in these patients showed reactive hyperplasia without any metastasis. Skip metastasis in which the disease will bypass levels I and/or II and go directly to level III or IV is described in oral cancers. The prevalence of skip metastasis has been reported to be as high as 16%[23]. In our study one patient showed skip metastasis in level III lymph node which was diagnosed only on cytokeratin immunohistochemistry. Imprint cytology is not effective in identifying metastasis. Histopathology with serial step sectioning & Immunohistochemistry are required to identify micro metastasis & isolated tumour cells in SLN negative patients. SLN study appears to be accurately predicting presence of metastasis and prevents morbidity of unnecessary neck dissection in clinically N0/N1 patients.

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