EGYPTIAN DENTAL JOURNAL
VOL. 64, 1147:1151, APRIL, 2018
I.S.S.N 0070-9484
ORAL SURGERY
www.eda-egypt.org • Codex : 252/1801

THE INCIDENCE OF SUBLEVEL IIB LYMPH NODES METASTASIS IN ORAL CAVITY SQUAMOUS CELL CARCINOMA: A PROSPECTIVE STUDY

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ABSTRACT

Purpose: Lymph node metastasis has an important influence on patient survival after oral cancer. This study aimed to evaluate the incidence of metastasis to Sublevel IIb lymph nodes in patients with squamous cell carcinoma of the oral cavity.

Materials and methods: Thirty patients with Oral Cavity Squamous Cell Carcinoma (SCC) were included in this study. They were selected from the out-patient clinic in the National Cancer Institute, Cairo University. All cases were subjected to surgical resection of the primary site with safety margin according to the standard protocol for each specific site. Functional neck dissection (ND) for neck lymph nodes and dissection for sublevel IIb lymph nodes were preformed separately. Histopathological examination of the specimens of the primary tumor sites, the neck lymph nodes and the level IIb lymph nodes was performed separately.

Results: In all thirty neck dissections, examination of the level IIb provided a negative result, except in only one case (3.3%). This case was SCC of the tongue. The metastasis at sublevel IIb in this case was observed without metastasis at levels IIa, III or IV. Neck Lymph node metastasis was found in 53.3% of the patients who underwent therapeutic neck dissection for oral SCC.

Conclusions: Based on our study we concluded that metastatic spread of oral cavity SCC to level IIb in cases of clinically positive neck (cN+) is rare.

KEYWORDS: Squamous cell carcinoma, Level IIb, Neck Dissection, Oral tumors.

INTRODUCTION

Relevant results obtained throughout the literature concerning the incidence rate of neck lymph node metastasis in patients with oral SCC were up to 53.3%. Tumor spread through lymphatic drainage is usually along well recognized lymphatic pathways [(1)].

The lymphatic pathways draining the oral cavity pile up to the cervical lymph nodes of level I, II, III, IV and V. Incidence of metastases to level VI and

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VII rarely reaches 5%. However, rare lymph nodes involvement may appear and may be the only site of disease, especially in cases of recurrence [1].

Management lymphatic spread of the neck was previously treated with the classical Radical ND. Surgeons have been trying to be more conservative in their treatment plans to minimize the resultant side effects of their surgeries. Selective neck dissection was introduced with high patient–surgeon appeal. This was followed by the functional neck dissection aiming to preserve the normal anatomy of the neck, reduce the morbidity and to keep the normal quality of life of the patients. Refinements of the mentioned techniques have been introduced which included the Supra omohyoid neck dissection and Elective neck dissection [2].

The most technically difficult area of neck dissection is around the upper internal jugular vein and the spinal accessory nerve (SAN) lymph nodes located in the posterior region of level II. This region is known as level IIb [3], supra-retro-spinal recess [4] or the sub-muscular recess (SMR) [5].

Level IIb includes the node-bearing tissue lying superficial to the fascia on the splenius capitis and levator scapulae muscles. It is bordered antero-inferiorly by the SAN, supero-laterally by the posterior belly of the digastric muscle. It is related superiorly to the skull base, and postero-laterally by the Sterno-Cleido-mastoid muscle [5].

Complications that may arise during and after level IIb dissection were mentioned in the literature. These included the SAN dysfunction with the resulting limitation of the shoulder movements and thus, causing a negative impact on the patient's quality of life [6].

To prevail over this complication, surgeons suggested avoiding the dissection of level IIb. However, a debate still remains about the incidence of metastasis to level IIb.

Despite the various published literature, the question of whether or not to dissect level IIb remains to be clarified. Thus, the aim of this study was to determine the frequency of level IIb metastasis in oral SCC by means of a prospective study in order to assess whether level IIb dissection should be performed or may be avoided in the treatment of this disease.

MATERIALS AND METHOD

Thirty patients with Oral Cavity Squamous Cell Carcinoma (SCC) were included in this study from the out-patient clinic of the National Cancer Institute, Cairo University. An ethical clearance with a written consent was taken from each patient.

All cases were subjected to surgical resection of the primary site with safety margin according to the standard protocol for each specific site. Functional neck dissection for neck lymph nodes and dissection for sublevel IIb lymph nodes were preformed separately.

Inclusion criteria:

All the selected patients had no previous treatment of the primary oral SCC lesions. They were classified under T1 to T4, N+ squamous cell carcinoma of the oral cavity.

All ages and both sexes were included in this study. Patients were with good general condition in order to tolerate major surgical procedure under general anesthesia.

Exclusion criteria:

Patients with distant metastasis were excluded from this study. Also, patients with history of neck dissection, radiotherapy in the head and neck region or with a history of previous surgeries in the mandible region were considered ineligible.

Surgical procedure:

Following confirmation of the diagnosis by incisional biopsy from the primary tumor site and

histopathologic analysis, all cases were subjected to resection of the primary tumor site with surrounding safety margin (1-2 cm peripheral and deep margins) and this was considered as the first specimen (Specimen 1).

Functional neck dissection or Supra Omohyoid neck dissection was then performed depending on the primary tumor size, location, clinical presentation and cervical lymph node involvement. (Specimen 2)

At that moment, dissection for the sublevel IIb lymph nodes was performed (Specimen 3).

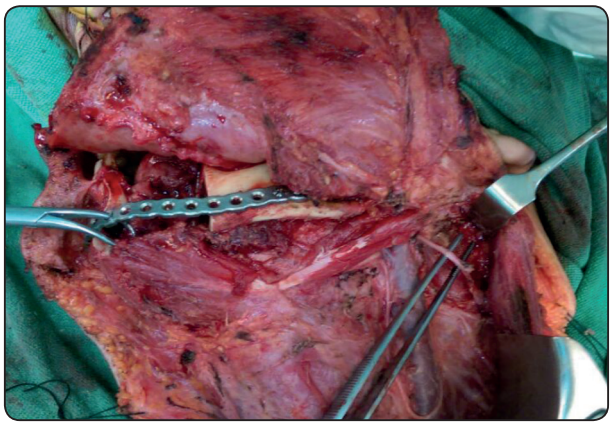

Fig. (1) A photograph showing the spinal accessory nerve which divides level II into level IIa (anterior to SAN) and level IIb (posterior to SAN)

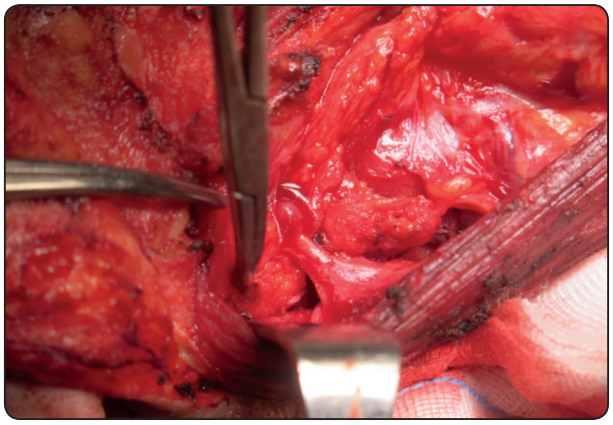

Fig. (2) A photograph showing fibro-fatty tissue of level IIb containing the lymph nodes.

RESULTS

Thirty patients were included in this study with 30 neck dissections, 13 males (43.3%) and 17 females (56.7%). The age of the patients ranged from 32-78 years with a mean of 53.7 years.

The tumor sites included the tongue in 11 patients 36.7%, mandibular alveolar margin in 5 patients 16.7%, buccal mucosa in 6 patients 20.0%, lip in 4 patients 13.3%, and maxillary alveolar margin in 4 patients 13.3%.

Histopathological examination of the level IIb proved positive in only 1 case (3.3%); the case was SCC of the tongue. The metastasis at sublevel IIb in this case was observed without metastasis at levels IIa, III or IV. All the other cases were negative.

Neck lymph node metastasis was found in 53.3% of the patients who underwent therapeutic neck dissection for oral SCC.

TABLE (1) A table showing the statistically insignificant association between the presence of nodal metastases at level IIb and the different anatomical sites. (p=0.81)

Site	Number of patients	Percentage of site (%)	Level IIB incidence
Buccal Mucosa	6	20%	0/6
Tongue	11	36.7%	1/11(9%)
Lip	4	13.3 %	0/4
Maxilla	4	13.3 %	0/4
Mandible	5	16.7 %	0/5
Total	30	100 %	1/30 (3.3%)

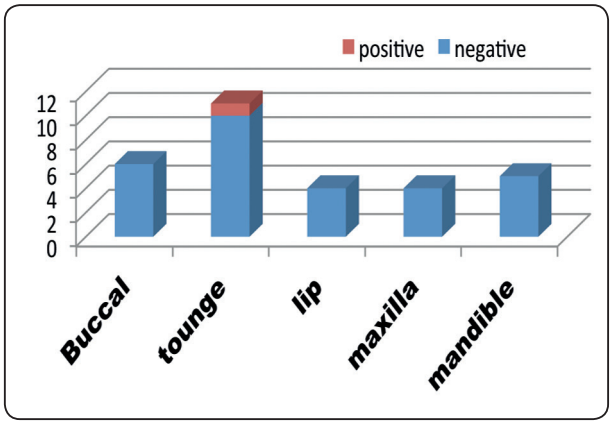

Fig. (3) A bar chart showing the incidence of positive level IIb in each site.

DISCUSSION

Carcinoma of the oral cavity is optimally treated by surgical resection and is usually associated with clinical neck metastasis in one third of the cases. Cervical lymph node metastasis remains the chief factor in the prognosis of the head and neck cancer patients. The impact of metastasis to Level IIb on the management of oral SCC had not been fully addressed in the literature [7].

Studies acknowledged that the lymphatic spread patterns from various primary cancer sites vary greatly, and it is hard to anticipate the incidence of metastasis in a heterogeneous group of patients of different primary sites [8]. This was apparent in the study by **Chone *et al*** [9] in which the analysis of 51 patients having various carcinomas of the upper aero-digestive tract revealed the metastatic spread in the sub-muscular recess in only 4 out of 62 neck dissections.

On the other hand, our study group was homogeneous in terms of location. All tumors were located in the oral cavity, and they tend to exhibit a typical pattern of spread, mainly to levels I, II, and III which came in agreement with ***Shah JP et al*** [10].

In this study, only one case (3.3%) was recorded with sublevel IIb metastasis without the spread at levels IIa, III or IV. This came in accordance with **Lim *et al*** [11] who reported the presence of level IIb nodal metastasis in only four (5.4%) out of 74 cases of oral SCC. They concluded that sublevel IIb lymph node metastasis was rare, and nodal recurrence after Supraomohyoid ND for SCC of the oral cavity was uncommon. Moreover, in a recent study, **Lea *et al*** [12] confirmed that with a resulted incidence of level IIb nodal metastasis up to 10.4% in their study.

Elsheikh *et al* [13] detected level IIb metastasis in 5 of 23 patients with primary tumors located in the tongue. Accordingly, they stated that level IIb should be included in the neck dissection in cases of tongue cancer.

Similarly, the only level IIb metastasis case found in the current study was also observed in a patient with tongue cancer. However, due to the fact that our sample included 11 tongue carcinomas, the occurrence of metastasis in this subgroup of oral cavity carcinomas was not statistically significant in relation to all different anatomical sites.

Similar to our study, **Maher and Hoffman**[14] found sublevel IIb lymph node metastases in 4 (5.6%) of 71 patients with primary oral SCC. Three of which were found in patients with tongue carcinomas, and one in a patient with retromolar trigone cancer. Moreover, **Pantvaidya *et al*** [15] detected similar findings where tongue cancers (5%) and cancers of the retromolar trigone (6.2%) appeared to have the highest incidence of metastasis to level IIb.

In contrast to **Elsheikh *et al*** [13], based on our findings, we suggest that it may be unnecessary to include level IIb lymph nodes for all people with oral SCC when performing therapeutic neck dissection in cN+ cases. This is due to the resulted low incidence of level IIb nodal metastases in oral SCC, and also in order to avoid the disadvantage of the consequent postoperative shoulder disability.

However, the high metastatic rate in patients with positive neck nodes clinically, and bearing in mind that the optimal time to tackle these nodes is at the time of initial treatment, the inclusion of level

IIb nodes is recommended in the elective dissection whenever the tongue is the primary cancer site [16-17].

In addition, we did not find any association between clinical variables and metastases at level IIb. It would appear that T stage as well as tumor location within the oral cavity are not the only indicators of metastasis at level IIb. Therefore, a limitation of this study could be the statistical power due to the relatively small number of patients.

CONCLUSIONS

Based on our interpretation of the resulted data in our study we concluded that metastatic spread of oral cavity SCC to level IIb in cases of clinically positive neck (cN+) is rare. Metastasis at sublevel IIb can be observed without metastasis at levels IIa, III or IV in cases of tongue SCC.

RECOMMENDATION

According to the evidence to date, it is recommended to perform dissection to level IIb. Limitation of this study could be the statistical power due to the relatively small number of patients. Further studies with larger sample size should be done to further investigate the specific site of oral cavity SCC which leads to metastatic spread to level IIb.

REFERENCES

1. Moulding FJ, Roach S.C.: Unusual sites of lymph node metastasis and pitfalls intheir detection. J clin Radiolog; 59: 558, 2004.
2. Primoz Strojan, Alfio Ferlito: Indications for radiotherapy after neckdissection J Head Neck; 10, 2010.
3. Suen JY, Goepfert H. Standardization of neck dissection nomen¬clature. Head Neck Surg;10:75-7, 1987.
4. Koybasioğlu A, Uslu S, Yilmaz M, Inal E, Ileri F, Asal K. Lymphatic metastasis to the supraretrospinalrecess in laryngeal squa-mous cell carcinoma. Ann OtolRhinol Laryngol; 111:96-9, 2002.
5. Calearo CV, Teatini G. Functional neck dissection. Anatomical grounds, surgical technique, clinical observations. Ann OtolRhinol Laryngol; 92:215-22, 1983.
6. Cheng PT, Hao SP, Lin YH, Yeh AR. Objective comparison of shoulder dysfunction after three neck dissection techniques. Ann OtolRhinol Laryngol;109: 761-6, 2000.
7. Sivindian R, Kaplan MJ, Lee K: Long term result of 100 consecutive neckdissection and their implication. J otolaryng head neck surg;130:1369, 2000.
8. Woolgar JA.Histological distribution of cervical lymph node metastases from intraoral/oropharyngeal squamous cell carcinomas. Br J Oral Maxillofac Surg; 37:175-80, 1999.
9. Chone CT, Crespo AN, Rezende AS, Carvalho DS, Altema¬ni A. Neck lymph node metastases to the posterior triangle apex: evaluation of clinical and histopathological risk factors. Head Neck; 22:564-71, 2000.
10. Shah JP, Condela FC and Poddar AK: The patterns of cervical lymph NodeMetastases from squamous carcinoma of the oral cavity. Cancer inst j; 66: 109-113, 1990.
11. Lim YC, Song MH, Kim SC, Kim KM, Choi EC: Preserving level IIb lymph nodes in elective supraomohyoidneck dissection for oralcavitysquamous cell carcinoma. Arch Otolaryngol HeadNeckSurg; 130:108, 2004.
12. Lea J, Bachar G, Sawka AM, Lakra DC, Gilbert RW, Irish JC, et al. Metastases to level IIb in squamous cell carcinoma of the oral cavity: a systematic review and meta-analysis. Head Neck; 32:184-90, 2010.
13. Elsheikh MN, Mahfouz ME, Elsheikh E. Level IIb lymph nodes metastasis in elective supraomohyoid neck dissection for oral cavity squamous cell carcinoma: a molecular-based study. Laryngoscope; 115:1636-40, 2005.
14. Maher NG and Hoffman GR: Elective neck dissection for primary oral cavity squamous cell carcinoma involving the tongue should in¬clude sublevel IIb. J Oral Maxillofac Surg; 72:2333-43, 2014.
15. Pantvaidya GH, Pal P, Vaidya AD, Pai PS, D'Cruz AK: Prospective study of 583 neck dissections in oral cancers: implications for clinical practice. Head Neck; 36:1503-7, 2014.
16. Jane le at al: Metastases to level IIb in squamous cell carcinoma of the oral cavity: a systematic review and meta-analysis.2009
17. Smith R, Taylor SM, Trites JR, Smith A. Patterns of lymph node metastases to the submuscular recess. J Otolaryngol. 2007; 36:203-7.