Level IIB Neck Dissection in Oral Cavity Cancers- When Should One Address it..?

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Abstract Nodal metastases is the most important prognostic marker for oral cavity cancers. Nodal dissection at level IIB risks damage to the spinal accessory nerve. We aim to study positivity of level IIB lymph nodes in oral cancers. In this non-randomized prospective observational study, 65 patients of oral cavity cancers were evaluated. Appropriate surgery for primary tumour and neck dissection were undertaken. All patients underwent level II b dissection. Out of 67 neck dissections (27 elective and 40 therapeutic), 7 patients had level IIB positive for metastases (10.44 %) with no isolated or contralateral metastases at level IIB and direct correlation with level IIA nodes. There was no statistical association of level IIB positivity with stage or site of primary. Level IIB dissection can be avoided in N0 necks. For therapeutic neck dissections, Level IIB should be cleared if there are positive nodes at level IIA.

Keywords Level IIB · Neck dissection · Oral cavity cancers

Synopsis: This study means to ascertain the need for dissection of level IIB lymph nodes in oral cavity cancers.

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Introduction

Lymph node metastasis is the most important prognostic marker in oral cavity cancers [1]. The survival rates drop down by 50 % with the appearance of lymph nodal metastases.

The level II lymph nodes are the first echelon nodes for the oral cavity, oropharynx, nasopharynx, hypopharynx, and supraglottic larynx. This level of cervical lymph nodes is further subdivided into level IIA and IIB by the spinal accessory nerve [2]. Level IIA lymph nodes are situated anteromedial to the nerve while level IIB lies postero-laterally. Level IIB lymph nodes lie in an anatomical space called the “submuscular recess of Suen and Goepfert”. (Fig. 1).

It is bound anteromedially by spinal accessory N, superiorly by posterior belly of digastric, posterolaterally by sternocleidomastoid and the bed is formed by levator scapula and splenius capitis.

Ever since Crile described the radical neck dissection in 1906 [3] surgeons have devised more and more functionally conservative and yet oncologically safe neck dissections [4]. The aim of these selective neck dissections was to ensure clearance and loco-regional control and reducing morbidity. Selective neck dissections have since then become acceptable standard of care for node negative as well as node positive necks. The structure at concern during dissection of level IIB is the spinal accessory nerve [5, 6]. Adequate clearance of level IIB lymph nodes requires some retraction of the spinal accessory nerve. This may lead to neuropraxia and consequent shoulder problems ranging from a difficulty at over-head abduction to a frozen shoulder [7]. Similarly the routine dissection of level V has been questioned for patients with no clinical or radiological evidence of metastases at that nodal station to protect from injury to the spinal accessory nerve and its antecedent morbidity [8].

Fig. 1 Level IIb nodal tissue in the submuscular recess

Electromyographic evidence suggests that only transient functional deterioration of the SAN occurs when sublevel IIB is left undissected during selective neck dissection [9]. Hence, in view of the morbidity that will be incurred by the patient, it would be advisable to address the level IIb lymph nodes only when warranted.

There is unfortunately not enough Indian literature pertaining to need for level IIb dissection. Thus, to help answer this much disputed question of “IIb or not IIb” we embarked upon a prospective cross sectional observational study of oral cavity cancer patients. This study was proposed to determine the positivity of level IIb lymph nodes in neck dissections done for patients suffering from oral cavity cancers and help us reach some conclusion regarding the necessity of level IIb clearance in elective as well as therapeutic dissections in these patients.

Materials and Methods

This was a non-randomized prospective observational study where 65 patients suffering from oral cavity cancers were evaluated and analysed over 2011–2012.

Patients presenting with biopsy proven squamous cell carcinomas of the oral cavity were included in the study. Patients not willing to participate in the study and patients who are unfit for surgery were not included in the study.

All subjects underwent a thorough history taking and a complete clinical examination. TNM staging was used to stage these tumours. Necessary investigations were done as & when necessary. These included pathological investigations such as FNAC, biopsy, etc. and radiological investigations such as USG, CT, MRI, etc.

Appropriate surgical procedure for the primary tumour and the neck dissections as warranted were undertaken. All

Fig. 2 Distribution of patient population based on the site of primary

patients underwent level II b neck dissection. Specimen of the primary tumour, neck dissection and Level IIa and IIb nodes were processed separately and subjected to histopathological examination.

Incidence & relative frequency of various outcomes/parameters under study are expressed as percentages or proportions. Statistical analysis was performed using a commercially available computer software package (SPSS) version 20. Fisher’s exact test was used and ‘*p*’ values were calculated.

Results

All 65 patients with biopsy proven squamous cell carcinoma of the oral cavity underwent TNM staging. According to the T staging, 25 patients were stage T4, 20 patients were T2, 18 of them were T3 and only 2 patients belong to T1.

Thirty four patients had primary tumour in the tongue, 29 were cancers of the gingivobuccal sulcus-alveolus complex and 2 had tumours at the floor of the mouth. (Fig. 2).

Similarly, 25 patients had N0 neck node status. Out of the 40 patients who presented with nodal metastases on clinical examination, 18 patients were N1, 20 were N2 and the remaining 2 patients had N3 nodal status. This resulted in 27 elective and 40 therapeutic neck dissections (2 patients had tumours at the midline and required bilateral neck dissection). (Table 1).

Out of the 67 neck dissections, seven patients had positive lymph nodes at level IIb which amounts to 10.44 % positivity. (Table 2).

The site of the primary for these patients was the tongue in 4 patients and the gingivobuccal sulcus (GBS)- alveolus complex in 3 patients. (Table 3).

There was no statistical association of positivity of level IIb with the stage of primary (*p* value- 0.956) or the site of the

Table 1 Distribution of procedures according to elective vs. therapeutic neck dissection

Type of neck dissection	Number	Percentage
Elective neck dissection	27	40.29
Therapeutic neck dissection	40	59.70

Table 2 Positivity of metastases in Level IIb Lymph nodes

Level IIb metastases	No. of dissections	Percentage
Negative	60	89.55
Positive	7	10.44
Total	67	100

primary (p value-0.862). Also, the prevalence of metastases at level IIb was 0 % in clinically N0 necks, i.e. in elective neck dissections. The prevalence of nodal positivity was 14.89 % in clinically N+ neck, i.e. therapeutic neck dissections. There was no isolated or contralateral metastases at level IIb.

In each of the seven patients, where level IIb lymph nodes were positive, level IIa lymph nodes were also positive for metastases. Thus, there was very strong statistical association between positivity of level IIa and level IIb metastases.

Over a median follow-up of 26.5 months, no patient had regional failure at level IIb.

Discussion

The high risk of occult nodal metastases in oral cavity tumours warrants an attention to the treatment of the neck [10, 11]. The extent of elective and therapeutic neck dissections still however remains a contentious issue [12, 13]. The major morbidity circumvented in modified neck dissections is the preservation of spinal accessory nerve function. This ensures prevention of shoulder dysfunction. Clearance of nodal level IIb in a supra-omohyoid neck dissection poses maximum risk. The incidence of nodal metastases to level IIb is extremely low, more so in a clinico-radiologically node negative neck [14]. With technological advances and greater knowledge of the biology and behaviour of squamous cell carcinomas of the oral cavity and their nodal metastases, efforts to perform less morbid neck dissection surgeries have gained acceptance in practice. Hence, it would certainly reduce the surgical morbidity when level IIb lymph nodes dissection is

undertaken only when warranted. This question would only be solved by a prospective study.

In our study, we found that the positivity at level IIb for N0 necks and N+ necks was 0 % and 14.89% respectively. There was no instance of isolated or contralateral metastases at level IIb. This was in accordance with results of other authors [15, 16, 17] Palleri et al. in their prospective study of 50 patients found a positivity at level IIb in 3.9 % oral cavity cancers with contralateral (0.9 %) and isolated (0.3 %) metastases being extremely rare.

Lim et al. studied 74 patients with node negative necks and found 5.4 % positivity at level IIb with primaries always being the tongue cancer and no isolated metastases reported [16]. Our study too showed increased propensity for tongue tumours to metastasize to level IIb. This might be attributed to the rich lymphatics in the tongue. However, the numbers were inadequate to reach statistically significant correlations. Another useful and interesting observation was that in each and every of the seven patients with level IIb positivity, the level IIa lymph nodes were also positive.

Thus, it can be inferred that incidence of positivity of level IIb lymph nodes is low in node negative disease. Level IIa positivity is a good predictor of positive level IIb metastases.

The limitation of our study is that we have not objectively documented the morbidity of level IIb clearance, in particular shoulder dysfunction since it was not the primary or secondary objective of the study.

Conclusion

To conclude, on the basis of our study of 65 patients, we found the overall prevalence of level IIb nodal positivity as 10.44 %. Also, there was no isolated or contralateral metastases. We were able to conclude that level IIb dissection can be avoided in N0 neck node status, i.e. in elective neck dissections to avoid an additional morbidity to the patient. However, for a therapeutic neck dissection, level IIb clearance should always be done if there are positive lymph nodes at level IIa clinically, or intra-operatively on frozen section.

Table 3 Site and stage of primary where level IIb lymph nodes were positive for metastases

Site of primary	Stage of disease	TNM stage
Tongue	T3N2bM0	IV
Tongue	T3N1M0	III
Tongue	T3N1M0	III
Tongue	T3N0M0	III
GBS-alveolus	T4N0M0	IV
GBS- alveolus	T4aN2cM0	IV
GBS-alveolus	T4aN2cM0	IV

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