



Original Article

# Assessment of level IIB lymph nodes in oral cancer - Should we spare or care?

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## ABSTRACT

**Objectives:** The extent of neck dissection over the years has evolved from a radical neck dissection to a super-selective neck dissection with an attempt to achieve a balance between oncological safety and acceptable morbidity. There is an ongoing debate concerning dissection of level IIB in both node negative and positive patients, primarily due to the low incidence of metastasis in this region and possible spinal accessory nerve injury. In this study, we intended to find the rate of metastasis to level IIB nodes in patients who were treated with neck dissection for oral cancers.

**Material and Methods:** Patients with squamous cell carcinoma of the oral cavity who underwent neck dissection were analyzed. Patients with clinically node negative (cN0) disease underwent selective neck dissection (SND), whereas patients with clinically node positive (cN+) disease underwent modified radical neck dissection (MRND).

**Results:** Out of the total 34 patients, 12 patients underwent MRND and 22 patients underwent SND. In the MRND group, three patients (25%) had positive level IIB nodes. The median number of IIB nodes removed was two and the median number of positive IIB nodes was one. In the SND group, the median number of IIB nodes removed was three and none of the patients had positive level IIB node.

**Conclusion:** In oral cancer with cN+, routine dissection of level IIB nodes has both therapeutic and prognostic values. Whereas, in patients with cN0, routine dissection of level IIB nodes can be omitted. Further large volume studies are needed on cN0 disease.

**Keywords:** Oral cancer, Level IIB nodes, Selective neck dissection

## INTRODUCTION

Oral cancer is one of the most common cancers in the world, accounting for 3,77,713 new cases and 1,77,757 deaths in 2020.<sup>[1]</sup> In India, it is the second most common cancer, accounting for 1,35,929 new cases and 75,290 deaths in 2020.<sup>[1]</sup>

The cancer of the oral cavity has a high propensity to disseminate along the lymphatics to cervical lymph nodes and patients with higher metastatic nodal burden have poor survival.<sup>[2-4]</sup> Presence of lymph node metastasis and extranodal spread are found to be independent predictors of survival.<sup>[3,4]</sup>

In the past, radical neck dissection was the standard surgical procedure to manage metastatic lymph nodes in oral cancer.<sup>[5]</sup> However, recognizing that increased morbidity was clearly associated with the increasing extent of neck dissections,

attempts have been made to decrease the extent to achieve a balance between oncological safety and acceptable morbidity.<sup>[5,6]</sup> Due to the increased morbidity, radical neck dissections are now performed only on patients with large metastatic nodes with extranodal extension into the non-lymphatic structures.<sup>[6,7]</sup> Subsequently, modified radical neck dissection (MRND) or functional neck dissection (FND) with preservation of major anatomical structures was introduced and performed.<sup>[8]</sup> Later, selective neck dissection (SND) rather than MRND was performed in patients who presented with clinically node negative (cN0) disease.<sup>[9]</sup> In spite of such gradual establishment of protocol for treating neck nodes in oral cancer patients, there is an ongoing debate concerning dissection of level IIB in both node negative and positive patients, primarily due to the low incidence of metastasis in this region and possible injury to the spinal accessory nerve (SAN).<sup>[5,6]</sup>

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The SAN splits level II into sublevels IIA and IIB.<sup>[10]</sup> Level IIB which is also known as “submuscular recess,” is bounded anteromedially by the SAN, superiorly by the skull base, inferiorly by an imaginary plane defined by the hyoid bone, and posteriorly by the posterior border of the sternocleidomastoid muscle.<sup>[5]</sup> Hence, to adequately remove the level IIB lymph node group, traction and elevation of the SAN is often inevitable.

At present, there are no standard guidelines to recommend or oppose the performance of super-selective neck dissection in which level IIB nodes were preserved. Hence, in this study, we intended to find the rate of metastasis to level IIB nodes in patients who were undergoing neck dissection for oral cancers.

## MATERIAL AND METHODS

The present prospective study included patients with squamous cell carcinoma of the oral cavity who were treated by surgery with neck dissection from November 2021 to April 2022 at our institution. Patients with recurrent cancer, second primary cancer, or past history of surgery or radiation to the head and neck region were excluded from the study.

All patients who presented with oral cancer in the study period underwent clinical examination and appropriate imaging was done. Patients who had clinical or radiological suspicion of metastatic lymph nodes underwent fine needle aspiration cytology. Apart from surgery for primary tumor, patients with cancer of the oral tongue who presented with cN0 underwent extended supraomohyoid neck dissection (removal of levels I, II, III, and IV nodes). Whereas, patients with oral cancer in subsites other than the tongue with cN0 underwent supraomohyoid neck dissection (removal of level I, II, and III nodes). Patients who presented with clinical positive nodes (cN+) underwent MRND.

While performing neck dissection, level IIB nodes along with the surrounding fibro-fatty tissue were removed with caution in all these patients by careful retraction of SAN. The level IIB nodes were marked and sent as a separate specimen for histopathological analysis, whereas the other levels of nodes were sent together as a separate specimen.

From the histopathological report, the characteristics of the primary tumor along with the total number of nodes removed, total number of positive nodes, number of IIB nodes removed, number of positive IIB nodes, and extranodal extension were analyzed.

Adjuvant radiation therapy was given for patients who had a tumor of size more than 4 cm, depth of invasion more than 10 mm, lymphovascular space invasion, perineural invasion, close resection margin, or positive lymph nodes

in histopathological examination. Adjuvant chemoradiation was given for patients who had positive resection margin or extranodal extension.

## RESULTS

A total of 34 patients who underwent neck dissection during the study period were eligible for the study. Out of the 34 patients, 12 patients had cN+ and were treated with MRND. The remaining 22 patients had cN0 and were treated with SND [Table 1].

Among patients who were treated with MRND, six patients (50%) had pT4a disease, eight patients (66.7%) had moderately differentiated tumor, five patients (41.7%) had lymphovascular space invasion and four patients (33.3%) had perineural invasion. The mean depth of invasion is 10.5 mm.

All the patients who underwent MRND had histopathologically proven positive lymph nodes and two patients had extranodal extension. The median total number of nodes removed was 17.5 and the median total number of positive nodes was 2.5. Out of the 12 patients, three patients (25%) had positive level IIB nodes and none of them had isolated positive level IIB nodes. The median number of IIB nodes removed was two and the median number of positive IIB nodes was one [Table 2].

Among patients who were treated with SND, 12 patients (54.5%) had pT2 disease, 13 patients (59.1%) had moderately differentiated tumor, five patients (22.7%) had lymphovascular space invasion, and three patients (13.6%) had perineural invasion. The mean depth of invasion is 7.9 mm.

Out of the 22 patients who underwent SND, four patients (18.2%) had histopathologically proven positive lymph nodes and none of them had extranodal extension. The median total number of nodes removed was 14 and the median total number of positive nodes was one. The median number of IIB nodes removed was three and none of the patients had positive level IIB nodes.

## DISCUSSION

Adequate management of neck lymph nodes is an essential part of successful treatment in the management of oral cancer patients. If the lymph nodes are not managed appropriately, the prognosis and survival of the patients are poor, even if the primary tumor is controlled.<sup>[11,12]</sup> Even if the status of the neck is clinically negative, neck nodes should be evaluated due to the incidence of occult metastasis that ranges between 20% and 30%.<sup>[12]</sup> At present, MRND is practiced widely for cN+ disease and prophylactic SND is practiced widely for cN0 disease due to the fact that neck dissection still remains the most accurate method of neck staging, thereby guiding adjuvant treatment and predicting the outcome.<sup>[2,13-15]</sup>

**Table 1:** Pathological features in clinical node positive patients.

Pathological features	Tongue	Buccal mucosa	Floor of mouth	Alveolus	Retromolar trigone	Total
Number of patients	5	3	2	1	1	12
pT stage						
T2	1	0	0	0	0	1
T3	2	2	0	0	1	5
T4a	2	1	2	1	0	6
Differentiation						
Well	2	1	0	0	0	3
Moderate	3	2	1	1	1	8
Poor	0	0	1	0	0	1
Mean depth of invasion	11 mm	8 mm	14	11 mm	8 mm	10.5 mm
Lymphovascular space invasion	2	1	1	1	0	5
Perineural invasion	2	1	0	1	0	4
pN stage						
N1	2	1	0	0	1	4
N2a	0	0	1	0	0	1
N2b	2	2	1	1	0	6
N3b	1	0	0	0	0	1
Median total number of nodes removed	18	17	19	17	14	17.5
Median total number of positive nodes	2	3	2.5	3	1	2.5
Median number of IIB nodes removed	2	2	2.5	3	2	2
Median number of IIB nodes positive	1	0	1	1	0	1
Number of patients with positive IIB nodes	1	0	1	1	0	3
Extranodal extension	1	0	1	0	0	2

**Table 2:** Pathological features in clinical node negative patients.

Pathological features	Tongue	Buccal mucosa	Floor of mouth	Alveolus	Retromolar trigone	Total
Number of patients	13	7	1	0	1	22
pT stage						
T2	6	4	1	0	1	12
T3	5	3	0	0	0	8
T4a	2	0	0	0	0	2
Differentiation						
Well	5	3	0	0	0	8
Moderate	7	4	1	0	1	13
Poor	1	0	0	0	0	1
Mean depth of invasion	8 mm	8 mm	7 mm	-	6 mm	7.9 mm
Lymphovascular space invasion	3	2	0	0	0	5
Perineural invasion	2	1	0	0	0	3
pN stage						
N0	9	6	1	0	1	17
N1	2	1	0	0	0	3
N2a	0	0	0	0	0	0
N2b	1	0	0	0	0	1
N3b	0	0	0	0	0	0
Median total number of nodes removed	14	13	14	-	13	14
Median total number of positive nodes	1	1	0	-	0	1
Median number of IIB nodes removed	3	3	2	-	3	3
Median number of IIB nodes positive	0	0	0	-	0	0
Number of patients with positive IIB nodes	0	0	0	0	0	0
Extranodal extension	0	0	0	0	0	0

In a review of the literature, many previous studies have made it clear that the pattern of cervical nodal spread in oral cancer patients follows a somewhat predictable and orderly pathway.<sup>[2,16,17]</sup> Subsequently, the extent of neck dissection, which primarily depends on the tumor subsite and pattern of nodal spread, has gradually become circumscribed to cervical levels I, II, and III even in cN+.<sup>[5,18]</sup>

SND enables us to reduce the morbidity of neck dissection while maintaining the same oncological results, especially in cN0.<sup>[12]</sup> The most common morbidity associated with SND is SAN injury and related shoulder dysfunction, which ranges from 31% to 75%.<sup>[12,19,20]</sup> Dysfunction of the SAN is usually caused by segmental devascularization and traction injury that can occur during clearance of level IIB lymph nodes.<sup>[12]</sup> However, these shoulder morbidities recover within 1 year with active physiotherapy and no difference in quality of life is observed.<sup>[2]</sup>

According to Manola et al, the rate of metastasis to level IIB in oral cancer with cN+ neck was 33.3% and none of the patients in the study had isolated level IIB metastasis.<sup>[21]</sup> Similar to this, in the present study, 25% of patients with cN+ disease had metastasis to level IIB nodes and none of the patients had isolated level IIB node metastasis. Hence, we hypothesized that routine dissection of level IIB nodes in patients with cN+ neck not only has prognostic value but also has therapeutic value.

As per the data obtained from literature, many studies have shown that the incidence of occult metastasis to level IIB nodes in oral cancer with cN0 neck ranged from 4% to 6%.<sup>[5,22-24]</sup> Also, the incidence of isolated level IIB node metastasis in cN0 neck was negligible or even zero.<sup>[5,12,23]</sup> In the present study, none of the patients with cN0 disease had metastasis in level IIB node. Since the sample size of the present study is low, from the results of this study, a concrete hypothesis cannot be arrived at regarding dissection of level IIB nodes in cN0 patients.

## CONCLUSION

In patients with squamous cell carcinoma of the oral cavity with cN+ disease, routine dissection of level IIB nodes has both therapeutic and prognostic values. Whereas, in patients with cN0 disease, routine dissection of level IIB nodes can be omitted. Since the sample size is limited in the present study, further large volume studies are essential to confirm the role of routine level IIB node dissection in oral cancer with cN0 disease.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

## Conflicts of interest

None.

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