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Limited neck dissection: is it enough in early oral tongue cancer? Retrospective study

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ABSTRACT

Background: The objective of the present study was to analyze the outcome of clinically node-negative early oral tongue cancer after selective neck dissection (SND) versus conventional neck dissection (CND).
Methods: A total of 116 patients of early oral tongue cancer underwent neck dissection either SND or CND between 1st January 2013 to 31st December 2016 at Government Royapettah Hospital, Chennai, a tertiary level cancer center. For patients with pN0 after SND had no further procedure while for those with cN1 disease, CND was done as a standard procedure. Comparison between the cN0 nodes to pN1 conversion rates in SND group with cN1 to pN0 rates in CND group was done along with the morbidity rates. The clinicopathological parameters along with intraoperative and postoperative parameter relevant to recurrence were analyzed by univariant and multivariant analysis and both the groups were compared by Chi-square test (SPSS version 26.0).
Results: In the SND group, pN1 were 2/53 (3.77%) and in the CND group pN1 was 11/63 (17.46%). Mean Nodal retrieval in SND group was 18.96 nodes and in CND group 22.90 nodes per case. Regional nodal recurrences in the SND group were 8/53 (15.81%) and in the CND group was 9/63 (14.28%). Our study shows no significant statistical difference between nodal recurrences in CND and SND group.
Conclusions: Our study data suggests that for cN1 patients, SND may be optimal and early tongue cancer patients with cN0 could be candidates for an SND instead of CND.

Keywords: Selective neck dissection, Comprehensive neck dissection, Clinically nonpalpable neck node, Clinically palpable neck node, Pathological negative node, Pathological positive node

INTRODUCTION

Metastatic spread to cervical lymph nodes is the most important prognostic factor in patients of early oral tongue squamous cell carcinoma (SCC) in the absence of distant metastases.[1] Considering the impact of neck nodal metastasis on prognosis, the selection of adequate treatment is critical to prevent and decrease nodal recurrence in the neck. Comprehensive neck dissection (CND) was the traditional surgical management of the clinically positive neck for many years until the MRND was developed in the 1960s which gradually replaced the CND in pathological negative node (pN0).[2]

For long, CND was considered the only surgical options for the management of clinically positive necks (cN+) in patients with tongue cancer.[3] However not all the palpable or radiologically detectable nodes are pathologically positive and neither every neck level is involved in some cases of a clinically positive neck. Hence, CND may, in fact, be an overtreatment in many cases. Based on this same principle SND became acceptable for the elective treatment of clinically nonpalpable neck node (cN0) necks and further could apply in the cases of cN+ necks.[4]

METHODS

A total 116 patients of early oral tongue SCC (T1, T2/N0, N1) who underwent neck dissection between 1st January 2013 to 31st December 2016, over a period of 3 years at Government Royapettah Hospital, Chennai, a tertiary level cancer center were reviewed retrospectively.

Inclusion criterio

All patients with oral tongue cancer clinically staged as (T1/T2/and N0/N1). Only SCC of oral tongue were included in the study.

Exclusion criterio

Patient with second primary malignancy. Palpable metastases at level IV or V. Large volume (>3 cm), multiple lymph nodes at multiple levels, other than expected first echelon. Gross extra nodal extension. Distant metastatic disease and previous neck irradiation for malignancy were excluded from the study.

All the selected patients underwent either selective neck dissection (SND) (level I, II, III/IV nodes) or CND modified radial neck dissection (MRND I/MRND III). If frozen section was done and it was found to be pathological positive node (pN1), CND was proceeded with. Patients were followed for average two years and nodal recurrence noted either on ipsilateral or contralateral site. Follow-up information was obtained from medical records, clinic visits, or correspondence with the patient or the patient's relatives. The parameters analyzed were age <50 years and >50 years, gender, performance status ECOG I, II and nodal status were included. The clinicopathological parameters like morphology of lesion (ulceroproliferative, ulcero-infilterative, proliferative, infiltrative), grade of the tumor (grade 1, 2, 3), subsite of tumor lateral, dorsal, ventral surface of the tongue, substance abuse like tobacco, alcohol, smoking noted. Type of neck dissection (CND or SND) and number of nodes retrieved, intraoperative and post-operative complications noted.

The patients with cN0 subjected to SND, while patients with clinically palpable neck node (cN1), CND were done as a standard procedure. All pN1 patients were treated with adjuvant radiotherapy, irrespective of whether SND or CND is done. The end point was defined as the first nodal recurrence on either side of the neck regardless of whether it was dissected with SND or CND within two years of primary surgery. Nodal recurrences were proven histologically. The clinicopathological parameters along with intraoperative and postoperative parameter relevant to recurrence were analyzed univariant and multivariant analysis and both the groups were compared by Chi-square test (SPSS software version 26.0). Disease control rates were averaged for each group, and mean rates were compared within groups stratified with respect to the type of surgery and pN-classification.

Institutional ethics committee approval was obtained prior to the study.

RESULTS

A total of 116 patients underwent SND or CND mean age was 52.01 years and median age of 53 years (range 25 to 80). There were 79 males (68.10%) and 37 females (31.89%). Substance abuse was noted in 70 patients (60.34%). The type of lesion was ulcero proliferative in 70 patients (60.34%), ulcero infiltrative in 24 (20.68%), ulcerated in 18 (15.51%), proliferative in 2 (1.72%) and verrucous in 2 patients (1.72%). None of the clinicopathological variables was found to be significant for nodal recurrences in both arms. The type of surgery according to the stage, number of nodes retrieved, pathological nodal staging, the pattern of nodal recurrence (Tables 1, 2), follow up duration in years (Figure 1), progression-free survival in months (Figure 2) are shown in the indicated figures.

Table 1: pathological nodal staging in SND and CND.

Pathological nodal staging	Type of surgery						P-value
	SND		CND		Total		
	N	%	N	%	N	%	
pN0	51	96.2	52	82.53	103	88.79	0.0283
pN1	2	3.78	11	17.47	13	11.21	
Total	53	100.0	63	100.0	116	100.0	

Table 2: Comparison between CND and SND.

	SND	CND
Clinical staging	T2N0	T2N1
Type of neck dissection	53	63
No of nodes retrieved (mean)	18.96	22.90
PN0/1	N0-51 (96.34%); N1-2 (3.77%)	N0- 52 (82.53%); N1- 11 (17.47%)
Recurrence	Nodal 15.81%; (I/L)-7; (C/L)-1	Nodal 14.28%; (I/L)-3; C/L-6

cN1to pN0 conversion (82.5 %) was high, questioning the role of CND for all cN1. Recurrence rates (SND-15.8% and CND- 14.3%) were almost equal in both arms, implying SND may be equally efficacious. Morbidity rates were significantly high in CND arm.

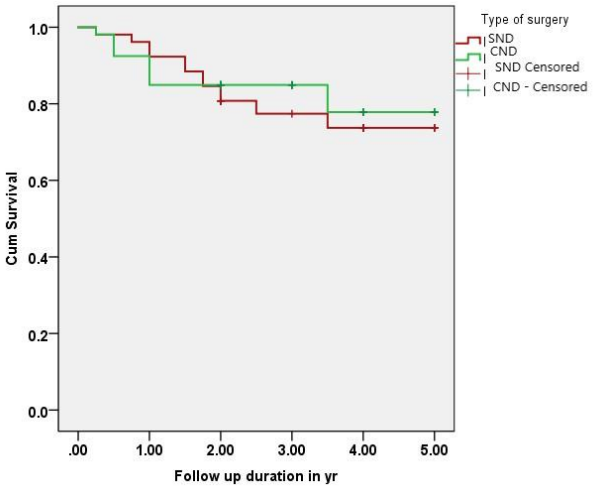

Figure 1: Follow up duration.

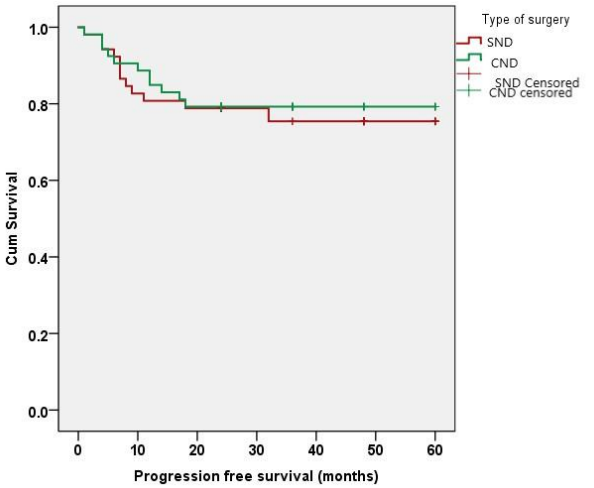

Figure 2: Progression free survival.

DISCUSSION

In 1906, Dr. Crile first described the RND (CND), which later became the standard of care for lymph node metastases.[5] The superficial and deep cervical fascia with its enclosed lymph nodes (levels I to V) were removed in continuity with the sternocleidomastoid muscle (SCM), the omohyoid muscle, the internal jugular vein (IJV) and external jugular vein (EJV), SAN and the submandibular gland.

RND is indicated when there are multiple clinically obvious cervical lymph node metastases, particularly when they involve the lower neck and are found to surround or adherent to the SAN and when multiple matted nodes are present in the superior aspect of the neck.

The principle tenet of MRND is to preserve structures not involved with cancer and additionally to remove only fat, fascia and lymph nodes. The aims of MRND-I are preservation of the SAN, when the metastatic lymph nodes grossly involved by cancer are not in close proximity to the SAN, preserving the nerve does not compromise the oncologic soundness of the operation and may prevent shoulder morbidity associated with resection of the nerve. MRND-II entails preservation of the SAN and the IJV. In MRND type III called as functional neck dissection, SAN, the IJV, and the SCM are spared.

Extended neck dissection also include structures that are not routinely removed (i.e., skin of the neck, carotid artery, levator scapulae, vagus or hypoglossal nerve) or lymph node groups that are not routinely removed (i.e., retropharyngeal, paratracheal, upper mediastinal).

SND (level I-III/IV nodes) is more limited and pertains to removal of cervical lymph nodes which are at greatest risk for nodal metastatic spread. SND is favored in the absence of clinically negative node (cN0) since the risk of having occult cervical nodal metastases is thought to exceed 15-20% and for selected clinically positive necks (mobile, 1-3 cm lymph nodes), for removing residual disease after RT when there has been excellent regression of N2 or N3 disease.[6] It can be more than MRND because of injury to accessary nerve.

In the early 1960s, Suarez observed that the lymph nodes of the neck are not located within the muscular aponeurosis of the SCM and do not form part of the adventitia of nearby blood vessels, particularly veins.[7] He also demonstrated that it was technically feasible and oncologically sound to perform a comprehensive removal of the lymph node bearing tissues of one or both sides of the neck without removing the SCM, the submandibular gland and the IJV.

In order to determine the feasibility of doing a supraomohyoid neck dissection (SOHND) in patients with carcinoma of the oral cavity who have a single clinically metastatic lymph node smaller than 6 cm (N1 and N2a), Kowalski et al studied a series of patients with cancer of the oral cavity with clinical stage N1 or N 2a cancer submitted to RND.[8] Interestingly, metastases were found in level IV lymph nodes in only one patient (0.6%), and metastases were not found in level V nodes. The authors concluded that in patients with clinical stage N1 in whom the metastasis is at level I, a SOHND (extended or not to level IV) is feasible instead of an RND.

In a histopathological study by Shah in 1990 which involved 1081 previously untreated patients who underwent 1119 elective and therapeutic classical RNDs for SCC of the upper aerodigestive tract, lymph node

levels I, II and III were found to be at greatest risk for nodal involvement from oral cavity tumors.[9] In this study, skip metastases were rare and there were very few patients with metastatic disease at level V, all of whom had gross metastases at level III or IV.

In retrospective study of Byers et al involving 517 SNDs mainly for patients cN0 or cN1, 50 patients had pathologic N1 disease (of these patients, 36 received postoperative RT and only one presented with a regional recurrence; in patients who did not receive irradiation, five of fourteen had neck failure).[10] In another large retrospective review of 296 SNDs, Spiro et al documented a regional failure rate of 6.5% in patients staged with a pathologically positive neck (most of these patients had postoperative RT).[11] A Cochrane analysis by Bessell et al found no evidence that RND increases overall survival compared to more conservative neck dissection surgery.[12]

The main reasons for choosing SND over CND in cN0 neck are better and functional outcomes. In the study reported by Feng et al, the SND group showed significantly fewer complications and faster recovery compared with the MRND group (7.3% vs 20%).[13] XI cranial nerve damage or sacrifice leading to impaired shoulder function along with persistent pain is considered to be the most morbid iatrogenic consequence of RND or MRND for the patient. It is to be noted that the function of the SAN is more likely to be preserved in SNDs compared to CND.[14]

The near absence of shoulder morbidity after radiotherapy makes SND with adjuvant radiotherapy an attractive option.[11] However, toxicities associated with the administration of RT should also be kept in mind.

The available literature may suggest the role of SND in head and neck squamous cell carcinoma patients with cN1, cN2 necks when the nodes are not fixed, no palpable metastases at level IV or V nodes are <3 cm in diameter, when there are no multiple lymph nodes at multiple levels in the neck. These observations suggest that SND may be used to effectively treat the clinically positive neck in selected patients with SCC of the early oral tongue also.

Our study shows no significant statistical difference between nodal recurrences between CND and SND group. The high number of cN1 to pN1, questions the adequacy of CND for clinically positive nodes in our study. The cN0 to pN1 conversion rate although very low did not significantly influence the nodal recurrences in the SND group. In addition, CND is associated with high post-operative morbidity and poor functional outcome.

Although not evaluated in our retrospective study, functional outcomes are the main reason for proposing SND over CND in cN0 necks. The main long-term complication of neck dissection is caused by injury to the SAN, which can result in shoulder and neck pain, weakness, loss of range of motion, and decreased shoulder-related quality of life. In a recent systematic review, the prevalence rates of shoulder pain after an SND range from 9 to 25% in the included series.[15] As expected, these rates were higher in RND (range, 10-100%) and MRND (range, 0-100).

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