Therapeutic Neck Dissection in Oral Squamous Cell Carcinoma: Is Selective Neck Dissection the Way Ahead?

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ABSTRACT

Background

Selective neck dissection in multimodality treatment protocols is slowly being accepted for the management of N+ neck in many centers. This is because the functional disability is lower than modified radical neck dissection.

Objective

This study compares the regional recurrence rates between patients who underwent selective neck dissection and patients underwent comprehensive neck dissection for node positive oral squamous cell carcinoma.

Method

A retrospective study comparing patients with node positive oral squamous cell carcinoma who underwent either selective neck dissection or comprehensive neck dissection between August 2011 and January 2014 was done, with a mean follow up period of 12 months. Regional failures were assessed to whether they were isolated neck failures or associated with a local or distant failure.

Result

A total of 131 neck dissections were performed which included 93 selective neck dissections and 38 comprehensive neck dissections. A total of 17 patients developed regional recurrence, of which 11 patients had ipsilateral neck recurrence. Of the 11 patients with ipsilateral neck recurrence one patient also had contralateral neck nodes and in two patients there was associated distant metastasis.

Conclusion

Selective neck dissection for management of node positive neck disease is based on sound scientific principles and a randomised controlled trial comparing it with modified radical neck dissection would probably give the answer regarding the optimal procedure for these patients.

KEY WORDS

Lymph node dissection, oral cancer, radical neck dissection, squamous cell carcinoma

INTRODUCTION

Lymph node metastasis is an important prognostic indicator in squamous cell carcinoma of the head and neck region.[1] Various studies have shown that survival rates decrease by 50% when there are positive nodes in the neck.[2] Lymph node metastasis in oral cancers follow a predictable pattern to level I-III.[3] Lack of superiority of the radical neck dissection compared to modified neck dissection in terms of oncologic safety and efficacy have resulted in the widespread acceptance of modified neck dissection for the treatment of the N+ neck.[4,5] Selective neck dissection was a further evolution in conservatism from modified radical neck dissections and was based on studies demonstrating a selective pattern of spread of lymph node metastasis from the site of the primary tumour into the neck.[3] Selective neck dissection has established itself as the procedure of choice in the prophylactic management of N0 neck.

Recent studies by various authors have looked at selective neck dissection in selected cases of N+ necks.[6-8] This approach is logical as equivalent disease control is seen when this surgery is done for clinically N0 with pathologically node positive patients undergoing selective neck dissection (SND). In a study comparing shoulder dysfunction, radical (51%) and functional neck dissections (34%) had worse functional outcomes compared to selective neck dissection (7%).[9]

The primary objective of the study was to compare the regional recurrence rates between patients undergoing selective neck dissection (SND) and patients undergoing a more comprehensive neck dissection (CND) for node positive oral squamous cell carcinoma (OSCC).

METHODS

A retrospective analysis was carried out comparing patients with node positive OSCC who underwent either selective neck dissection or comprehensive neck dissection (CND) (n=102) with a mean follow up period of 12 months.

The study population was constituted by patients with oral cavity cancer who had undergone treatment with curative intent at a tertiary level cancer centre, Tata Medical Center, Kolkata, India between August 2011 and January 2014 (n=284), was prospectively collected in an electronic database.

All patients were staged by clinical and radiological examination. All patients of oral cavity cancer who were staged clinically or radiologically as node positive (N+) were included in the study. Patients who were pathologically node negative were excluded from the study. A total of 131 neck dissections were done in 102 patients. Of the 131 neck dissections 93 were selective neck dissections and 38 underwent comprehensive neck dissections.

Nodal status was a predictor variable and the ipsilateral regional recurrence was the primary outcome variable. Regional failures were assessed to whether they were isolated neck failures or associated with a local or distant failure. In situations where there was an associated failure in the primary site, they were considered as failures in control of primary disease and not a failure of the neck dissection procedure. Ipsilateral regional failure outside the operated field was considered as failure of adequacy of the neck dissection procedure. The patterns of neck failure were classified as ipsilateral regional recurrence and a contralateral out of field regional recurrence. Demographic details of the patients: age, sex, p Stage were noted. Histopathological factors (perineural invasion, lymphovascular invasion, size of tumour, depth of invasion, margins, pNstage) were also recorded. Type of adjuvant treatment if given, was also noted. All patients received adjuvant radiotherapy as per standard institutional protocols. Adjuvant chemoradiation was given in patients with close or positive margins or with extranodal extension. These variables were analysed in relation to the ipsilateral recurrence rate. All patients were followed up with regular office consultations documenting history, physical examination and imaging studies if deemed necessary. All cases of suspected recurrence were confirmed by histopathologic examination. Patient status at last follow up was documented as: 1) no evidence of disease, 2) local disease, 3) regional failure, 4) distant failure, 5) combination of failure, 6) died of disease, or 7) died of other causes.

All patients underwent treatment at the institute after obtaining prior informed consent. Data was prospectively collected and retrospectively analysed. The manuscript and analysis was passed through the institutional ethical review board which reviewed both ethical and scientific aspects and provided approval.

Patients of oral cavity cancer who underwent curative intent treatment for oral cavity cancer at the study centre were included. Patients who were staged as Node positive (N+) and underwent either SND or CND were included. Patients who underwent either unilateral or bilateral selective neck dissection or underwent unilateral comprehensive neck dissection or ipsilateral comprehensive neck dissection with contralateral selective neck dissection were also included in the study. Non-squamous histology, clinical and pathological N0 disease and neck not addressed by surgery were excluded from the study. All patients were operated as per the institutional protocol and were discussed in the tumour board.

The mean follow up period was 12 months. The relation between variables were analysed by summarising the data in 2 x 2 tables and analysis was done using the chi-square test. A p-value of less than 0.05 was considered significant. Calculations were made using SPSS 17.0 (SPSS, Inc, Chicago, IL).

RESULTS

Of a total of 284 patients who underwent curative intent treatment during the study period, 102 patients met the study criteria. The demographic, clinical and pathological details of the patient sample are listed.(Table 1)

Table 1. Demographics of node positive oral cavity patients

Variable	Patients
Sample size	102
Age (yr), mean ± SD	52.7 ± 12.3
Subsite	
Tongue	47
Buccal mucosa	29
Alveolus	17
Retromolar trigone	7
Others	2
Clinical tumour classification	
T1	8
T2	31
T3	21
T4	42
Clinical nodal classification	
N0	37
N1	32
N2a	5
N2b	23
N2c	5
Pathological nodal classification	
N1	41
N2a	2
N2b	47
N2c	8
N3	4
Tumour depth (mm)	
Mean	3.46
Surgical margins	
Close or positive	25
Not involved	77
Adjuvant treatment	
Chemoradiation	63
Radiation	36
Observation	3

Ipsilateral neck dissection was performed in 102 patients and 29 patients underwent bilateral neck dissection. A total of 131 neck dissections were performed which included 93 selective neck dissections and 38 comprehensive neck dissections. Of the 102 patients, 65 patients were clinically node positive.

Six patients underwent adjuvant treatment at other centres in the country and details of the treatment were not available for analysis. Patients received an average total dose of 62.3 Gy. Among the selective neck dissections 18 patients underwent adjuvant radiation to 54 Gy and 62 patients to 60 Gy and above. Among the comprehensive neck dissections three patients underwent radiation to 54 Gy and 30 patients received radiotherapy to 60 Gy and above. Involved levels and primary draining areas were treated to a higher dose.

Table 2. Failure pattern of Neck Dissections

Variable	SND	CND	p-value
Sample size	93	38	
Treatment failure	35	18	0.303
Regional failure	10	7	
Site of neck failure			
Ipsilateral	7	4	
Contralateral	3	2	0.236
Distant metastasis	8	1	

SND: Selective Neck Dissection; CND: Comprehensive Neck Dissection

Table 3. Level of Neck Nodal Failure

Variable	SND	CND
Nodal levels		
I	2, 1(CL)	1, 1(CL)
II	6	3
III	1	1(CL)
IV	1(CL)	1(CL)
V	1, 1(CL)	-

No patients failing in each level; CL-Contralateral; Ipsilateral if not mentioned

A total of 17 patients developed regional recurrence, of which 11 patients had ipsilateral neck recurrence. Of the 11 patients with ipsilateral neck recurrence one patient also had contralateral neck nodes and in two patients there was associated distant metastasis. A total of 6 patients had contralateral neck nodes.(Table 2,3)

The patient status at last follow up is mentioned in Table 4.

Table 4. Status at last follow up

Patient status at last follow up	No. of patients (n=102)
No evidence of disease	49
Local disease	6
Regional failure	13
Distant failure	12
Combination of failure	10
Died of disease	38
Died of other causes	7

DISCUSSION

Accurate diagnosis and adequate treatment of neck node metastasis is essential for disease management and prevention of disease recurrence.[10] Procedures which are less radical and have lesser perioperative and postoperative morbidity are being increasingly favoured as long as they do not negatively impact disease control.[7] The feasibility of selective neck dissection (SND) in oral squamous cell carcinoma is based on prior extensive studies on the lymphatic drainage pathways and propensity of nodal metastasis at different levels.[3]

Oral squamous cell carcinoma spreads to levels I through III and rarely to levels IV and V in the absence of a concurrent involvement of level I through III. In the clinically positive neck, the reported risk of metastasis is 9 to 20% for level IV and only 2 to 4% for level V and in almost all cases of level V

involvement, other levels were involved in addition to level V.[3] This evidence forms the basis for selective neck dissection from level I through III in node negative necks and levels I through IV in node positive necks. This the next logical step from modified radical neck dissection in the management of node positive neck. In the absence of factors affecting normal lymphatic flow in the neck this surgery is a rational option to the more radical neck dissection which results in a poorer functional and aesthetic outcome.[7]

In the series published by Traynor et al. 29 patients underwent 36 selective neck dissections with a 4% regional recurrence rate.[6] In the series published by Andersen on 106 cases, the regional recurrence rate reported was 9%.[7] Chepeha et al. reported a regional recurrence rate of 6% among 26 cases included in this study.[11] In another series of 28 patients with node positive HNSCC the reported regional recurrence rate was 11.8%.[12] All these series are small retrospective series of patients and include patients of all sites of HNSCC. In an analysis of oral squamous cell carcinoma cases, there was no significant difference in regional recurrence between patients who underwent selective and comprehensive neck dissection.[13] Schiff et al. in their series of 45 cases of clinically node positive oral squamous cell carcinoma treated with selective neck dissection noted a 11.1% regional recurrence rate.[14] In a retrospective study published from India involving 37 patients with oral squamous cell carcinoma, the overall regional recurrence rate was documented at 11%.[15]

We therefore looked at our experience of selective neck dissection versus comprehensive neck dissection in the management of oral squamous cell carcinoma. The purpose of the study was to evaluate the oncological efficacy of selective neck dissection in the management of node positive oral squamous cell carcinoma. In the period of three years, a total of 284 cases of oral squamous cell carcinoma were seen with 102 patients who had pathological node positive disease. Of the 102 patients, 65 had clinically node positive disease. Selective neck dissection was preferred in all cases of clinically node negative disease and also in most cases with clinically node positive disease.

Comprehensive neck dissection including all V levels of the neck was preferred over selective neck dissection in cases with increased nodal burden, clinically or radiologically perceived nodal metastasis in level IV and V and in cases requiring clearance of non-lymphatic structures for facilitating reconstruction using pectoralis major myocutaneous flap.

The overall regional recurrence rate after selective neck dissection was 12.1% in the present series. This is in agreement with reported series.[12,14,15] There was no significant difference in the regional recurrence rate between procedures irrespective of a choice between CND and SND (p=0.236). Of the 93 SNDs done there was only one failure in level V (1.07%). The failure was associated with distant metastasis, precluding any attempt at salvage. All except one of the 14 ipsilateral regional recurrences occurred within the treated field. Of the 102 patients five failed in the contralateral neck. A contralateral neck failure could be due to aberrant nodal metastasis or failure to address contralateral nodes in disease approaching the midline.

Our study was a retrospective study and is hence subject to selection bias. At analysis, we compared the necks rather than the patient as a whole. Follow up, limited to a median of 309 days was a deterrent to effective comparisons of survival results between our patients. These would have been more robust endpoints comparing efficacy of procedures employed equivalently for addressing the neck in oral squamous cell carcinomas.

CONCLUSION

The use of selective neck dissection for management of node positive neck disease is based on sound scientific principles. Our study shows that there is no significant difference in the regional recurrence rates between selective and comprehensive neck dissection in the management of the node positive neck. This study is however limited by number and bias of a retrospective design and hence we cannot recommend an optimal procedure to patients with node positive oral squamous cell carcinoma. A randomised controlled trial comparing selective neck dissection with modified radical neck dissection in the treatment of node positive neck would probably give the answer regarding the optimal procedure for these patients.

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