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Neck management of pathological N1 oral squamous cell carcinoma: a retrospective study

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Abstract. This study was performed to compare the effects of neck dissection procedures on the prognosis of patients with pathological N1 (pN1) oral squamous cell carcinoma (OSCC), analyse factors affecting the prognosis, and provide a neck management strategy for clinical N1 (cN1) oral cancer. The study patients were divided into two groups according to the neck dissection: a selective neck dissection (SND) group (n = 85) and a radical or modified radical neck dissection (RND/MRND) group (n = 22). There was no statistically significant difference in recurrence rates at local, regional, and distant sites between the SND and RND/MRND groups. The 5-year overall survival was 68.3% for SND and 65.2% for RND/MRND patients (P = 0.590), while the 5-year disease-specific survival was 70.4% for SND and 75.7% for RND/MRND patients (P = 0.715). Histological grade and postoperative radiotherapy were independent predictors of the outcome for SND patients. For histological grade II/III cases, 5-year overall survival (P = 0.004) and disease-specific survival (P = 0.002) outcomes differed significantly between patients treated with and without postoperative radiotherapy, with worse survival for patients not treated with radiotherapy. Therefore, SND appears appropriate for cN1 OSCC patients, and postoperative radiotherapy is recommended for those with histological grade II or III tumours.

Keywords: Oral squamous cell carcinoma; Neck dissection; Survival rate; Lymphatic metastasis; Radiotherapy; Histology.

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Oral cancer is the most common malignant tumour in the oral and maxillofacial region, and approximately 90% is oral squamous cell carcinoma (OSCC).[1,2] Cervical lymph node metastasis is one of the most common biological features of OSCC and is the main factor that affects the prognosis of patients.[3,4] The traditional view is that a therapeutic neck dissection should be performed for patients with neck metastasis confirmed by clinical evaluation or pathological examination (cN+/pN+). Therapeutic neck dissection mainly includes radical neck dissection (RND) or modified radical neck dissection (MRND).[5] An elective neck dissection (END) should be performed in patients with a clinically node-negative neck (cN0), in whom there is a high risk of occult metastasis; the main procedure in such cases is the selective neck dissection (SND).[6] Cervical lymph node metastasis of OSCC mainly occurs at levels I–III, thus cN0 patients

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are usually treated with a supraomohyoid neck dissection.[7]

In recent years, with the rapid development of functional surgery, the preservation of function and patient quality of life have become important treatment goals.[8] Therefore, the indications for SND have gradually been expanded. Previous reports have shown that SND can achieve a good prognosis in OSCC patients with single cervical lymph node metastasis that has a maximum diameter of ≤ 3 cm (cN1).[9] However, most studies have had some limitations, such as a small sample size or short follow-up time, and there have been no prospective studies.[10,11] Therefore, the use of SND for neck treatment in cN1 patients remains controversial.

The aims of this study were to analyse the effects of different neck dissections (RND/MRND or SND) on the prognosis of OSCC patients with pathological N1 nodal stage, analyse the factors affecting the prognosis of these patients, and summarize the neck treatments used in cN1 patients.

Materials and methods

Patients

The cases of a series of OSCC patients with pathologically confirmed neck metastasis (pN1), who were treated in the Department of Oral and Maxillofacial Surgery at Peking University School and Hospital of Stomatology between 2012 and 2016, were reviewed. Clinical information, including the primary tumour site, TNM staging, pathological grade, and type of neck dissection, as well as other demographic and clinical data, were retrieved from the electronic medical records system of the hospital. A total of 107 patients were enrolled. The following patient inclusion criteria were applied: (1) pathologically confirmed primary pN1 squamous cell carcinoma (SCC) of the oral cavity; (2) definitive surgery with neck dissection without previous surgical treatment; (3) no preoperative chemotherapy or radiotherapy. The patient exclusion criteria were as follows: (1) SCC originating from oropharyngeal sites; (2) surgical or adjunctive therapy before surgery.

The type of neck dissection performed was decided by an experienced chief surgeon. Postoperative radiotherapy (PORT) was recommended, although some patients refused additional treatment. In all cases, the primary tumour site was treated by radical resection aimed at 1.5-cm margins. The margins were confirmed by frozen section analysis intraoperatively and paraffin section analysis postoperatively to ensure that they were negative. The clinical nodal stage was determined using clinical signs, physical examination, and imaging techniques, such as enhanced computed tomography (CT). The pathological nodal stage was established based on lymph node metastasis, as determined by the Pathology Department. All patients were staged according to the eighth edition of the American Joint Committee on Cancer (AJCC) TNM staging system (2017).[12,13] Follow-up evaluations were conducted with physical examination

Table 1. Clinical and pathological characteristics of the 107 study patients with pN1 OSCC.

		All patients, *n* (%)	Patients by neck dissection group	
		N = 107	SND, *n* (%) *n* = 85	RND/MRND, *n* (%) *n* = 22
Sex	Male	70 (65.4)	55 (64.7)	15 (68.2)
	Female	37 (34.6)	30 (35.3)	7 (31.8)
Median age (years)		55.5	55.5	53
Site	Oral tongue	45 (42.1)	37 (43.5)	8 (36.4)
	Floor of mouth	13 (12.1)	10 (11.8)	3 (13.6)
	Upper gum	6 (5.6)	3 (3.5)	3 (13.6)
	Lower gum	23 (21.5)	17 (20)	6 (27.3)
	Buccal mucosa	18 (16.8)	16 (18.8)	2 (9.1)
	Hard palate	2 (1.9)	2 (2.4)	0 (0.0)
Histological grade	Grade I	35 (32.7)	24 (28.2)	11 (50.0)
	Grade II	68 (63.6)	57 (67.1)	11 (50.0)
	Grade III	4 (3.7)	4 (4.7)	0 (0.0)
cT classification	cT1	31 (29.0)	24 (28.2)	7 (31.8)
	cT2	51 (47.7)	40 (47.1)	11 (50.0)
	cT3	5 (4.7)	5 (5.9)	0 (0.0)
	cT4a	19 (17.8)	15 (17.6)	4 (18.2)
	cT4b	1 (0.9)	1 (1.2)	0 (0.0)
cN classification	cN0	62 (57.9)	56 (65.9)	6 (27.3)
	cN1	31 (29.0)	21 (24.7)	10 (45.5)
	cN2a	0 (0.0)	0 (0.0)	0 (0.0)
	cN2b	11 (10.3)	7 (8.2)	4 (18.2)
	cN2c	3 (2.8)	1 (1.2)	2 (9.1)
pT classification	pT1	22 (20.6)	18 (21.2)	4 (18.2)
	pT2	58 (54.2)	47 (55.3)	11 (50.0)
	pT3	6 (5.6)	4 (4.7)	2 (9.1)
	pT4a	20 (18.7)	15 (17.6)	5 (22.7)
	pT4b	1 (0.9)	1 (1.2)	0 (0.0)
Postoperative radiotherapy	No	18 (16.8)	16 (18.8)	2 (9.1)
	Yes	89 (83.2)	69 (81.2)	20 (90.9)

OSCC, oral squamous cell carcinoma; RND/MRND, radical or modified radical neck dissection; SND, selective neck dissection.

Table 2. Ipsilateral and contralateral neck dissection according to type of neck dissection in 107 patients with pN1 OSCC.

Ipsilateral and contralateral neck dissection		Type of neck dissection		
		SND	MRND	RND
Ipsilateral	(n = 107)	85	18	4
Contralateral	(n = 23)	22	1	0

OSCC, oral squamous cell carcinoma; RND/MRND, radical or modified radical neck dissection; SND, selective neck dissection.

and imaging studies as mentioned above. The patients were followed up every 3 months during the first 2 years, every 6 months until 5 years, and then annually thereafter.

This retrospective study was conducted according to the principles of the Declaration of Helsinki and its subsequent revisions, and was approved by the Institutional Review Board of Peking University School and Hospital of Stomatology (Approval No. PKUSSIRB-202171210). Informed consent or an acceptable alternative was obtained from all patients before study inclusion.

Statistical analysis

The χ^2 test or Fisher's exact test was performed to compare the effects of the different neck dissection procedures on postoperative recurrence. The 5-year overall survival rate (OS) and disease-specific survival rate (DSS) were calculated by Kaplan–Meier method. A univariate analysis was performed using the log-rank test to identify factors that affected the survival rates. Variables that had prognostic potential suggested by the univariate analysis were subjected to multivariate analysis using a Cox proportional hazards regression model.

A two-tailed P-value of < 0.05 was considered to indicate statistical significance. The model was simplified using a stepwise selection method by removing variables that were negatively associated with survival or had P-values of ≥ 0.05. The statistical analyses were performed using IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, USA).

Results

Patient demographic characteristics and neck management

A total of 107 patients were included in the study; 70 were male and 37 were female. The median age of the patients at the time of diagnosis was 55.5 years (range 36–82 years). The follow-up period ranged from 1 to 108 months, with a median time of 63 months. A summary of the clinical and pathological characteristics of the 107 patients is presented in Table 1.

All 107 OSCC patients received a neck dissection (107 ipsilateral, 23 contralateral) at the same time as the initial surgery. A bilateral neck dissection (n = 23) was performed when the primary SCC crossed the midline. Regarding the types of ipsilateral neck dissection performed, 73 patients received SND (I–III), 12 patients received SND (I–IV), 18 patients received MRND, and four patients received RND. Concerning the 23 patients who received treatment of the contralateral neck, 18 received SND (I–III), four received SND (I–IV), and one received MRND (Table 2). Among the 107 patients with pN1 OSCC, one (OSCC of the oral tongue) had level IV metastasis and four (two with OSCC of the oral tongue and two with OSCC of the floor of the mouth) had level V metastasis. Moreover, among the 23 patients who underwent a bilateral neck dissection, only one (OSCC of the oral tongue) had contralateral lymphatic metastasis (Table 3).

Recurrence and survival rates

During follow-up, 24 of the 85 patients (28.2%) treated with SND presented with local recurrence, 15 patients (17.6%) presented with regional recurrence, and four patients (4.7%) presented with distant metastasis. On comparison with the RND/MRND group, no statistically significant difference in the rates of local recurrence, regional recurrence, or distant metastasis was demonstrated ($P > 0.05$) (Table 4). Of the 15 SND group patients who presented with regional recurrence, three had recurrence in the dissected levels, 11 had recurrence in levels outside the previous neck dissection, and one had recurrence in both.

On analysis of the 89 patients who underwent both neck dissection and PORT, there was also no statistically significant difference in the rates of local recurrence, regional recurrence, or distant metastasis between the SND and RND/MRND groups, which ruled out possible interference from PORT ($P > 0.05$) (Table 5).

Table 3. Positive lymph node levels in 107 patients with pN1 OSCC.

	Lymph node level	Total 107 Necks[a]	SND 85 Necks[a]	RND/MRND 22 Necks[a]
Ipsilateral	I	68	57	11
	II	27	21	6
	III	6	5	1
	IV	1	1	0
	V	4	0	4
Contralateral	I	1	1	0
	II	0	0	0
	III	0	0	0
	IV	0	0	0
	V	0	0	0

OSCC, oral squamous cell carcinoma; RND/MRND, radical or modified radical neck dissection; SND, selective neck dissection.
[a]Number of positive necks.

Table 4. Recurrences in 107 patients with pN1 OSCC.

		Type of neck dissection		*P*-value[a]
		SND	RND/MRND	
Number of patients		85	22	
Postoperative recurrence, *n* (%)	Local recurrence	24 (28.2)	9 (40.9)	0.251
	Regional recurrence	15 (17.6)	6 (27.3)	0.368
	Distant metastasis	4 (4.7)	3 (13.6)	0.151

OSCC, oral squamous cell carcinoma; RND/MRND, radical or modified radical neck dissection; SND, selective neck dissection.
[a]χ^2 test or Fisher's exact test.

Table 5. Recurrences in 89 patients with pN1 OSCC who received postoperative radiotherapy.

		Type of neck dissection		*P*-value[a]
		SND	RND/MRND	
Number of patients		69	20	
Postoperative recurrence, *n* (%)	Local recurrence	17 (24.6)	7 (35)	0.358
	Regional recurrence	11 (15.9)	5 (25)	0.342
	Distant metastasis	3 (4.3)	2 (10)	0.313

OSCC, oral squamous cell carcinoma; RND/MRND, radical or modified radical neck dissection; SND, selective neck dissection.
[a]χ^2 test or Fisher's exact test.

Overall, 29 of the 107 patients (27.1%) died of OSCC and five (4.7%) died from other causes. The 5-year OS rate was 68.3% for SND patients and 65.2% for RND/MRND patients ($P = 0.590$) during follow-up (median follow-up time of 63 months, range 1–108 months). Similarly, the 5-year DSS rate was 70.4% for SND patients and 75.7% for RND/MRND patients ($P = 0.715$) (Table 6, Fig. 1).

Factors affecting the prognosis of the 85 patients who underwent SND

On univariate analysis of the 85 patients with pN1 OSCC who underwent SND, histological grade III was found to be associated with lower OS ($P < 0.001$) and DSS ($P < 0.001$) (Table 7). The final stepwise selection in the Cox proportional hazards regression model revealed significantly worse OS ($P < 0.001$) and DSS ($P < 0.001$) outcomes in patients with histological grade III (reference category histological grade I) (Table 8). PORT was found to be associated with improved DSS in the univariate analysis ($P = 0.033$) (Table 7) and also in the multivariate Cox hazards regression analysis ($P = 0.042$) (Table 8).

In the multivariate Cox hazards regression analysis to determine whether PORT influenced postoperative 5-year survival in the 85 SND patients according to the pathological grade, 5-year OS ($P = 0.004$) and 5-year DSS ($P = 0.002$) in histological grade II/III cases was found to differ significantly between the SND group patients treated with and without PORT, with worse survival for those not treated with PORT (Table 9).

Discussion

Cervical lymph node metastasis is one of the most common biological features of OSCC and affects the prognosis of patients.[3] More recently, the neck management of cN1 patients has become controversial, because many studies have reported that SND (I–III) can be applied in cN1 patients with the same prognosis as RND/MRND.[9] An advantage of SND is a faster postoperative recovery because of the less extensive trauma and reduced complications of neck and shoulder function when compared with RND/MRND.[14] This retrospective study showed no statistically significant difference in the prognosis among patients with pN1 OSCC treated with different neck dissection: SND or RND/MRND. Therefore, it appears appropriate to perform SND (I–III) for cN1 OSCC.

Table 6. Five-year survival in 107 OSCC patients with pathological N1 nodal stage.

		Type of neck dissection		*P*-value[a]
		SND	RND/MRND	
Number of patients		85	22	
Five-year survival	OS (%)	68.3	65.2	0.590
	DSS (%)	70.4	75.7	0.715

DSS, disease-specific survival; OSCC, oral squamous cell carcinoma; OS, overall survival; RND/MRND, radical or modified radical neck dissection; SND, selective neck dissection.
[a]χ^2 test.

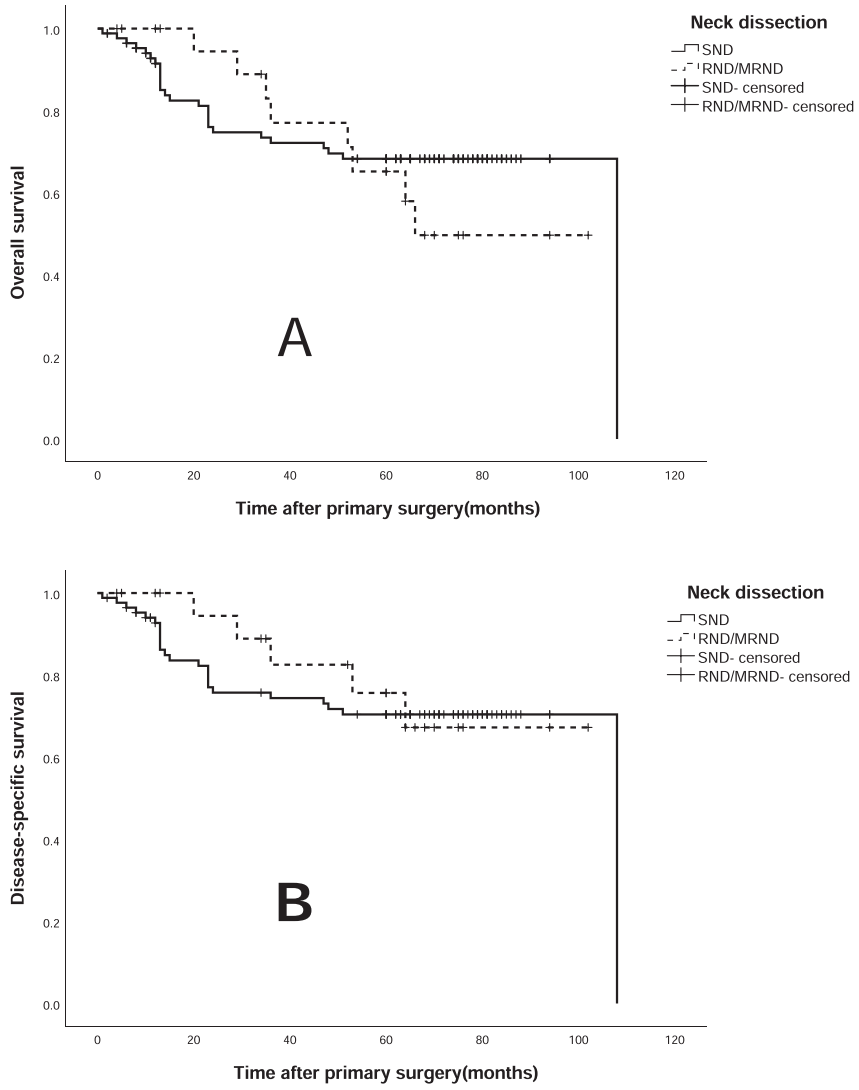

Fig. 1. Kaplan–Meier survival estimates according to neck management: (A) 5-year overall survival, and (B) 5-year disease-specific survival. SND, selective neck dissection; RND/MRND, radical or modified radical neck dissection.

Previous retrospective studies have confirmed that single cervical lymph node metastasis in OSCC mainly occurs at levels I–III, which provides a theoretical basis for SND (I–III) as a reasonable neck treatment for cN1 OSCC.[15–17] Shah[15] performed a retrospective study on 1119 patients with head and neck SCC who were treated with RND. The results showed that cervical lymph node metastasis was mainly concentrated within levels I–III, with a lower metastasis rate of 20% and 4% in levels IV and V, respectively. Moreover, of 776 patients with pN+ , only 3.7% had level IV and V lymph node metastasis. In a study on 553 OSCC patients, Pantvaidya et al.[16] found that 91% of positive lymph nodes were located at levels I–III, and metastases at levels IV and V were rare (4.7% and 3.3%, respectively). Patel et al.[17] performed a pathological examination on neck dissection specimens from 30 OSCC patients. The results showed that the cervical lymph node metastasis rates at levels I, II, III, IV, and V were 50%, 28.6%, 12%, 7%, and 2.4%, respectively. In the present study on patients with pN1 OSCC, only one patient had level IV metastasis and four had level V metastases. Moreover, only one case of contralateral lymphatic metastasis was observed among the patients who underwent a bilateral neck dissection (23 patients), indicating that unilateral SND (I–III) is appropriate for pN1 OSCC patients with primary lesions not crossing the midline. Klingelhöffer et al.[18] conducted a cohort study involving 146 patients with unilateral SCC of the tongue not crossing the midline. Lymph node metastases were diagnosed in 50 patients (34.2%), but only two (1.1%) had contralateral lymph node metastases. Bilateral neck dissection showed no advantage regarding nodal relapse-free and overall survival when compared with unilateral neck dissection, irrespective of the initial N or T stage ($P = 0.606$).

There is ongoing controversy regarding the incidence of level IV metastases in oral tongue carcinoma. A systematic review on the prevalence of metastasis and involvement of level IV and V in OSCC showed many reports recommending level IV dissection in oral tongue carcinoma, possibly due to the tendency for early metastasis in tongue cancer.[19] A possible reason may be that the tongue possesses an extensive lymphatic network. The results of a meta-analysis demonstrated low rates of skip metastasis to neck level IV in OSCC patients, with an overall involvement rate of 2.53% and skip metastasis rate of 0.50%.[20] Another recent systematic review indicated that in patients with cN0 oral tongue carcinoma, the rate of level IV involvement is less than 3%.[21] In the present study, nine patients with SCC of the tongue or floor of the mouth underwent SND (I–IV), but only one had level IV metastasis. A strong correlation between site and level IV metastasis is unclear.

Previous studies have shown no statistically significant difference in postoperative neck recurrence rate or survival rate between N1 patients treated with SND and those treated with RND/MRND, which indicates that SND can remove 'risky lymph nodes' and preserve function without increasing the risk of control failure.[11,22–26] López et al.[22] confirmed that SND is an effective and safe surgical approach for patients with cN1 head and neck SCC, and SND can replace RND/MRND without compromising oncological outcomes. In a retrospective study of 68 cN1 necks, Yanai et al.[11] found that the regional control rate was 81.3% with SND and 83.0% with RND ($P = 0.72$), and the DSS rates were 81.3% and 80.0%, respectively ($P = 0.94$). In a series of 54 cN1–cN2a OSCC patients who underwent primary surgery combined with neck dissection, Shin et al.[23] found that the 2-year DSS rate was 71.8% in the RND group and 69.2% in the SND

Table 7. Univariate analysis to determine the factors that influenced postoperative 5-year survival in the 85 patients treated with SND.

Variables		Number of patients	Five-year survival			
			OS (%)	*P*-value[a]	DSS (%)	*P*-value[a]
Total		85	68.3		70.4	
Sex	Male	55	65.8	0.599	69.1	0.820
	Female	30	72.5		72.5	
Site	Oral tongue	37	64.2	0.788	64.2	0.770
	Floor of mouth	10	60		68.6	
	Upper gingiva	3	100		100	
	Lower gingiva	17	69.7		74.3	
	Buccal mucosa	16	78.6		78.6	
	Hard palate	2	50		50	
Histological grade	Grade I	24	81.1	< 0.001*	81.1	< 0.001*
	Grade II	57	66.8		69.7	
	Grade III	4	25		25	
cT classification	cT1	24	81.7	0.411	86.5	0.192
	cT2	40	58.5		58.5	
	cT3	5	60		60	
	cT4	16	75		80.4	
cN classification	cN0	56	67.6	0.478	70.7	0.453
	cN1	21	61.8		61.8	
	cN2	8	87.5		87.5	
pT classification	pT1	18	76.7	0.805	82.2	0.602
	pT2	47	66.3		66.3	
	pT3	4	50		50	
	pT4	16	68.8		74	
Level of lymph node involvement	I	58	72.0	0.488	75.2	0.327
	II	21	63.7		63.7	
	III/IV	6	50		50	
Postoperative radiotherapy	No	16	50.8	0.061	50.8	0.033*
	Yes	69	72.1		74.8	

DSS, disease-specific survival; OS, overall survival; SND, selective neck dissection.
[a]Log-rank test.
*$P < 0.05$.

group, and the difference was not statistically significant ($P = 0.823$). Similar to DSS, the 2-year neck control rate also did not differ significantly between the groups (RND 88.0% vs SND 84.0%, $P = 0.719$). Likewise, in a previous retrospective study, the cN + (cN1–cN2b) group showed no statistically significant difference in 3-year DSS rate between the RND and SND groups ($P > 0.05$).[24] Schiff et al.[25] and Patel et al.[26] showed similar results in their retrospective studies. In the present study, no statistically significant difference in postoperative neck recurrence rate or survival rate was observed between pN1 patients treated with SND and those treated with RND/MRND.

This retrospective study showed histological grade and PORT to be two independent predictors of the prognosis of patients with pN1 OSCC in both univariate analysis and multivariate analysis.

The clinical staging combined with histological features may be used to better predict tumour progression and to establish more suitable treatment plans. Kademani et al.[27] performed a retrospective study to highlight the importance of histological grade as an independent factor for predicting survival in OSCC patients. Thomas et al.[28] claimed a strong association between histological grade and survival in OSCC patients, and a high histological grade in early stage oral cavity cancer was associated with poorer survival and carried independent prognostic value. Through follow-up of 45 OSCC patients, Jing et al.[29] found a significant difference in recurrence rate among histological grades ($P = 0.038$) and established an association between lymph node involvement and poorly differentiated tumours. The World Health Organization (WHO) grading system has been adopted in the Pathology Department of Peking University School and Hospital of Stomatology;

Table 8. Multivariate Cox hazards regression model to determine the factors that influenced postoperative 5-year survival in 85 patients with SND.

Variable		OS			DSS		
		HR	95% CI	*P*-value	HR	95% CI	*P*-value
Histological grade	Grade I	Ref.					
	Grade II	1.80	0.61–5.32	0.287	1.60	0.54–4.79	0.400
	Grade III	75.27	9.75–581.18	< 0.001 *	68.48	8.91–526.25	< 0.001*
Postoperative radiotherapy	Yes	Ref.					
	No	2.24	0.94–5.39	0.071	2.52	1.04–6.15	0.042*

CI, confidence interval; DSS, disease-specific survival; HR, hazard ratio; OS, overall survival; SND, selective neck dissection.
*$P < 0.05$.

Table 9. Multivariate Cox hazards regression model to examine whether postoperative radiotherapy influenced postoperative 5-year survival in 85 patients with SND grouped by pathological grade.

Variable			OS			DSS		
Histological grade	Postoperative radiotherapy	Number of patients	HR	95% CI	*P*-value	HR	95% CI	*P*-value
II/III	Yes	50	Ref.					
	No	11	3.84	1.53–9.65	0.004*	4.47	1.73–11.52	0.002*
I	Yes	19	Ref.					
	No	5	0.034	0–943.94	0.517	0.034	0–943.94	0.517

CI, confidence interval; DSS, disease-specific survival; HR, hazard ratio; OS, overall survival; SND, selective neck dissection.
*$P < 0.05$.

this system classifies tumours into grades I–III according to their epithelial differentiation (well, moderately, and poorly differentiated) based on the degree of keratinization, cellular and nuclear pleomorphism, and mitotic activity.[30] Lindenblatt et al.[31] evaluated the prognosis of 53 OSCC patients through a retrospective study and found that the WHO grading system showed statistically significant associations with recurrence ($P = 0.043$) and disease-free survival ($P = 0.031$, log-rank test). Lin et al.[32] reported that grade III tumours were associated with decreased recurrence-free survival (hazard ratio 1.973, 95% confidence interval 1.167–3.336) when compared with grade I/II tumours in a large cohort of 2535 OSCC patients from Changhua Christian Hospital. No significant differences were detected between grade I and II tumours, which is similar to the findings of the present study.

This retrospective study showed PORT to be significantly associated with DSS in both the univariate analysis and multivariate analysis, which indicates that PORT is also an independent predictor of the prognosis in pN1 patients. At the study hospital, patients who do not receive PORT tend to be older and more likely to suffer from co-morbidities. Thus, a negative pre-selection might have biased the survival analyses and limited the validity of OS as an outcome. Although the positive effect of PORT for patients with advanced OSCC has been verified substantially, the recommendation of PORT in intermediate-risk OSCC cases, such as pN1 without extracapsular spread, has been inconsistent in previous studies. A meta-analysis failed to clarify the effectiveness of PORT in pN1 OSCC patients, reporting a lack of significance and high heterogeneity of the outcome data, and stated that it was not possible to provide general treatment recommendations.[33] A prospective study claimed that PORT was associated with improved OS, DSS, and regional recurrence-free survival in pT1–2 pN1 oral cancer and should be recommended.[34] Chen et al.[35] found that PORT was associated with improved survival in patients with pN1 OSCC, especially in those younger than 70 years of age and in those with pT2 disease. Liang et al.[36] performed a meta-analysis on selective versus comprehensive neck dissection in cN+ OSCC patients and concluded that cN+ OSCC patients treated with SND combined with PORT and those treated with MRND/RND had comparable clinical outcomes for regional recurrence, OS, and DSS. However, the Clinical Practice Guideline of the American Society of Clinical Oncology (ASCO)[37] does not recommend PORT in pN1 cases with no further histological risk factors, such as perineural invasion or lymphovascular invasion. Therefore, prospective clinical trials are needed to address the current controversy regarding the application of PORT in pN1 cases.

This study found a significant correlation between histological grade and PORT. In the pN1 OSCC patients with histological grade II/III, PORT was observed to improve the survival rates. This suggests that histological grade may complement the TNM staging system and allow the surgeon to provide more appropriate therapy for patients. Very few studies have explored the connection between histological grade and PORT.

This study has several limitations. First, the data were collected from a single medical centre, thus the results may differ from those obtained in other geographical regions. Second, the outcome evaluation indexes did not include disease-free survival, because no accurate time at which the patients were diagnosed with a first recurrence could be determined, due to the limitations of the retrospective study design. Third, there may be some bias in the number and level of dissected lymph nodes.

In conclusion, the results of this retrospective study showed no statistically significant difference in the prognosis among patients with pN1 oral squamous cell carcinoma treated with the different neck dissections: SND or RND/MRND. Histological grade and postoperative radiotherapy were found to be independent predictors of the prognosis in these pN1 patients. In patients with histological grade II/III oral squamous cell carcinoma, postoperative radiotherapy may improve the survival rate. Therefore, it appears appropriate to perform SND (I–III) for cN1 oral squamous cell carcinoma and to perform postoperative radiotherapy when the histological grade is II or III. The conclusions of this study require further validation in prospective studies.

Ethical approval

Ethical approval was obtained from the Biomedical Institutional Review Board of Peking University School and Hospital of Stomatology (PKUSS-IRB-202171210).

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None.

Competing interests

None.

Patient consent

This retrospective study obtained oral informed consent from the patients or their legal representative. An exemption from the need for signed informed consent was obtained.

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