Oral Carcinoma: Role of Neck Dissection in N0 Nodes
Muhammad Ance Anwer, Shakil Aqil, Maisam Abbas Onali, Uzma Tanveer

ABSTRACT: OBJECTIVE: To study the role of extent of an elective neck dissection in patients presenting with oral squamous cell carcinoma and clinically negative neck nodes. RATIONALE: With the increasing incidence of oral squamous cell carcinoma in our part of the world, different surgical modalities are being practiced to address one of its major poor prognostic factors – the cervical lymph node metastasis. The purpose of this study is to find out the extent to which the elective neck dissection can be outlined in clinically negative neck patients. An extent which provides an adequate access to the involved lymph nodes, as well as which results in minimal post-operative morbidity. STUDY DESIGN: Retrospective study. PLACE AND DURATION OF STUDY: Department of Otolaryngology – Head and Neck Surgery, Liaquat National Hospital and Medical College, Karachi, from January 1995 to December 2013. METHODOLOGY: Medical records reviewed of patients who underwent excision of primary tumor of the oral cavity primarily tongue, cheek and retromolar trigone combined with an ipsilateral neck dissection. All patients who had primary squamous cell carcinoma greater than 2 cm with clinically negative neck nodes were included in the study. Post-operative histopathology was reviewed comparing the outcome of disease metastasis to various neck levels. ETHICAL CONSIDERATION: All the records were reviewed with the permission and under the supervision of the head of the department. RESULTS: Out of 95 patients in the study, 47 were T2 tumors, 27 were T3 tumors, and 21 were T4 tumors. For T2 tumors, 19 patients (40.42%) had neck metastasis; for T3 tumors, 14 patients (51.85%); and for T4 tumors, 18 patients (85.71%) had neck metastasis on final histopathology. All histological positive nodes in the neck were from level 1 to 3 with only tongue primary showing some skip metastasis to level 4 and overall there was zero metastasis to level 5. CONCLUSION: All patients presenting with T2 or above oral carcinoma with a clinically negative neck should undergo a selective neck dissection which can be extended to include level 4 for advance stage primary tumors of the tongue. Modified radical neck dissection is not indicated due to negligible rates of level 5 involvement. Modified radical neck dissection is the most common head and neck cancer, accounting for approximately 3% of all newly diagnosed cancer cases, and the incidence is increasing due to the prevalence of cigarette smoking, alcohol drinking and betel nut chewing. Radical surgery with or without adjuvant chemo-radiation is the primary treatment of resectable oral cavity squamous cell carcinoma. Despite recent advances in surgical, radiotherapy and chemotherapy treatment protocols, the long-term survival of patients with oral cavity squamous cell carcinoma has remained almost unchanged over the past decade. These unsatisfactory results and lack of improvement are explained mainly by the finding that oral cavity squamous cell carcinoma are associated with a high probability of cervical lymph node metastasis, historically regarded as the major poor prognostic indicator. The classical approach to clinically palpable metastatic lymph nodes has been radical neck dissection. However, given a clinically negative neck, the incidence of occult lymph node metastasis in patients with squamous cell carcinoma of the oral cavity varies in terms of size, thickness and extent of the primary site. Most head and neck oncologists agree that a patient with a predicted rate of occult lymph node metastasis >15% to 20% should have either surgery or radiotherapy, rather than observation. This approach has been supported by studies that have shown histological positive nodes at levels 1 to 3 independent of the extent of neck dissection, and negligible rates of level 5 involvement. Surgical treatment of neck metastasis has evolved to provide oncologic efficacy while minimizing treatment-associated morbidity. Radical neck dissection involves not only resection of level 1 to 5 lymph nodes of the neck but also the tail of the parotid, submandibular gland, sternocleidomastoid muscle, internal jugular vein and spinal accessory nerve. It is a safe oncological surgical procedure that significantly reduces the risk of regional recurrences, however it produces significant post-operative morbidity, mainly shoulder dysfunction. The modified radical or functional neck dissection with preservation of at least 1 of the 3 components was shown to have equal oncologic efficacy and decreased morbidity when non-lymphatic structures were not grossly involved.

INTRODUCTION: Oral cavity squamous cell carcinoma is the most common head and neck cancer, accounting for approximately 3% of all newly diagnosed cancer cases, and the incidence is increasing due to the prevalence of cigarette smoking, alcohol drinking and betel nut chewing. Radical surgery with or without adjuvant chemo-radiation is the primary treatment of resectable oral cavity squamous cell carcinoma. But, despite recent advances in surgical, radiotherapy and chemotherapy treatment protocols, the long-term survival of patients with oral cavity squamous cell carcinoma has remained almost unchanged over the past decade. These unsatisfactory results and lack of improvement are explained mainly by the finding that oral cavity squamous cell carcinoma are associated with a high probability of cervical lymph node metastasis, historically regarded as the major poor prognostic indicator. The classical approach to clinically palpable metastatic lymph nodes has been radical neck dissection. However, given a clinically negative neck, the incidence of occult lymph node metastasis in patients with squamous cell carcinoma of the oral cavity varies in terms of size, thickness and extent of the primary site. Most head and neck oncologists agree that a patient with a predicted rate of occult lymph node metastasis >15% to 20% should have either surgery or radiotherapy, rather than observation. This approach has been supported by studies that have shown histological positive nodes at levels 1 to 3 independent of the extent of neck dissection, and negligible rates of level 5 involvement. Surgical treatment of neck metastasis has evolved to provide oncologic efficacy while minimizing treatment-associated morbidity. Radical neck dissection involves not only resection of level 1 to 5 lymph nodes of the neck but also the tail of the parotid, submandibular gland, sternocleidomastoid muscle, internal jugular vein and spinal accessory nerve. It is a safe oncological surgical procedure that significantly reduces the risk of regional recurrences, however it produces significant post-operative morbidity, mainly shoulder dysfunction. The modified radical or functional neck dissection with preservation of at least 1 of the 3 components was shown to have equal oncologic efficacy and decreased morbidity when non-lymphatic structures were not grossly involved.
with squamous cell carcinoma. Greater understanding of the specific lymphatic spread of upper aerodigestive tract squamous cell carcinoma has allowed development of a therapeutic procedure termed selective neck dissection in which only lymph nodes at greatest risk of metastasis are resected. Supporting this approach, is good prognosis even with clinically a single ipsilateral neck level 1 or 2 (N1) metastasis. In South East Asia, oral cancer is mainly due to use of betel nut and chewable tobacco (gutka) and these cancers tends to be more aggressive at the primary site. The approach to treat the neck when clinically negative in such tumors is still not clear and, therefore surgeons are subjecting patients to various forms of treatment ranging from selective supra-omohyoid to functional and radical neck dissections with variable outcomes. In our region, treating occult neck node metastasis continues to be a matter of debate.

**METHODOLOGY:** It is a retrospective study. We have reviewed medical records of patients treated for oral squamous cell carcinoma with an elective neck dissection by one consultant surgeon at the department of Otolaryngology – Head and Neck Surgery, Liaquat National Hospital and Medical College, Karachi, from January 1995 to December 2013. Inclusion criteria included patients who had primary tumor greater than 2 cm i.e. T2, T3, T4 with N0 neck clinically. The neck was documented to be carefully palpated, however, difficult in patients who were obese or had thick, short necks. In cases where clinically the neck was negative, but the CT scan report showed nodes with central necrosis or evidence of metastasis were excluded. A total of 102 charts were reviewed, 1 patient had a non-squamous cell carcinoma on final histopathology and was excluded, and complete details of 6 patients could not be retrieved from the charts and were also excluded leaving a total of 95 patients in the study. All surgeries were performed by the same consultant surgeon. Specimens were sent to the histopathology department at the same institution and post-operative histopathology was reviewed and compared. Data was entered into a proforma with variables regarding basic patient details as well as the primary site and size of the tumor, surgery performed and pathological grading with neck node positivity. Categorical features were summarized with frequency counts and percentages. Data was analyzed by tabulating the variables and comparing the final neck node status with the primary tumor.

**RESULTS:** A total of 95 patients were enrolled in this study. The age range was from 26 to 86 (mean 56). Of these, 58 were male (61.05%) and 37 were female (38.94%). Out of these 95 patients, the tongue primary was seen in 47 patients (49.47%); cheek primary in 41 patients (43.15%); and primary in retromolar trigone in 7 patients (7.36%) (Table 1). In patients with tongue primary, all included cases had tumor originating along the lateral border with none showing extension across the midline. The patients underwent an ipsilateral neck dissection in each case. Frozen sections were sent during surgery if there was suspicion of neck nodal extension.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENDER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>58 patients</td>
<td>61.05</td>
</tr>
<tr>
<td>Female</td>
<td>37 patients</td>
<td>38.94</td>
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<tr>
<td>SITE</td>
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<td></td>
</tr>
<tr>
<td>TONGUE</td>
<td>47 (total)</td>
<td>49.47</td>
</tr>
<tr>
<td>T2</td>
<td>32</td>
<td>33.68</td>
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<tr>
<td>T3</td>
<td>10</td>
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</tr>
<tr>
<td>T4</td>
<td>5</td>
<td>5.26</td>
</tr>
<tr>
<td>CHEEK</td>
<td>41 (total)</td>
<td>43.15</td>
</tr>
<tr>
<td>T2</td>
<td>14</td>
<td>14.73</td>
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<tr>
<td>T3</td>
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</tr>
<tr>
<td>T4</td>
<td>15</td>
<td>15.78</td>
</tr>
<tr>
<td>RETROMOLAR</td>
<td>7 (total)</td>
<td>7.36</td>
</tr>
<tr>
<td>T2</td>
<td>1</td>
<td>1.05</td>
</tr>
<tr>
<td>T3</td>
<td>5</td>
<td>5.26</td>
</tr>
<tr>
<td>T4</td>
<td>1</td>
<td>1.05</td>
</tr>
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**Table 1:** Demographic data, and primary site and size of tumor.

<table>
<thead>
<tr>
<th>Variables (site)</th>
<th>Frequency (positive node)</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>TONGUE</td>
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<td>40.42</td>
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<tr>
<td>Level 1</td>
<td>12</td>
<td>25.53</td>
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<td>Level 2</td>
<td>9</td>
<td>19.14</td>
</tr>
<tr>
<td>Level 3</td>
<td>8</td>
<td>17.02</td>
</tr>
<tr>
<td>Level 4</td>
<td>3</td>
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<tr>
<td>Level 5</td>
<td>0</td>
<td>0</td>
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<tr>
<td>CHEEK</td>
<td>18</td>
<td>39.02</td>
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<tr>
<td>Level 1</td>
<td>10</td>
<td>24.39</td>
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<tr>
<td>Level 2</td>
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<td>14.63</td>
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<tr>
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<td>RETROMOLAR</td>
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<td>100</td>
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<tr>
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<td>50</td>
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<td>Level 4</td>
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<tr>
<td>Level 5</td>
<td>0</td>
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</tbody>
</table>

**Table 2:** Final histopathological grading with neck node positivity.

Of the 32 patients having T2 tongue tumor, 28 underwent supra-omohyoid neck dissection and 4 underwent modified radical neck dissection. Out of 10 patients having T3 tongue tumor, 6 underwent modified neck dissection while the remaining 4 had selective neck dissection. All 5 patients having T4 tongue tumor underwent modified radical neck dissection. It was observed that in patients with T2 tongue tumor only 7 out of 32 patients had positive neck node status in final histopathology while the remaining 4 had selective neck dissection. All 5 patients with T4 tongue tumor revealed positive nodal metastasis on final histopathology. It was noted here that patients with advanced tongue tumor did reveal some skip metastasis to include level 4, but none at level 5 (Table 2). There were 41 patients who presented with a cheek primary and a clinically negative neck. Lip was not involved in any of the cases documented. Out of these, 14 were T2 of which 12 underwent supra-omohyoid neck dissection and 2 underwent a modified radical neck dissection. There were 12 patients who had a T3 primary lesion of which 5 had supra-omohyoid neck dissection and 7 underwent a modified radical neck dissection. All 15 patients with T4 tumor had a modified radical neck dissection. On final histopathology, 16 out of 41 patients had tumor metastasis in neck nodes. Here no skip
metastasis was appreciated to level 4, and neither did
the patients with a cheek tumor irrespective of the stage
have any nodal metastasis to level 5 (Table 2). The
patients with a primary in the retromolar trigone were
only 7 in number of which only the one staged T2
underwent a supraomohyoid neck dissection. Rest of the
patient all had a modified radical neck dissection. On
final histopathology, again the T2 primary was the only
one consistent with the clinically negative neck. The T3
and T4 tumors revealed positivity for nodal metastasis,
but remarkably none to either level 4 or 5. (Table 2)
Overall, in our patients with oral cancer there were 47
patients with T2 tumors, 27 with T3 tumors and 21 with
T4 tumors. Of these, 19 of the T2 tumors revealed nodal
metastasis (40.42%), 14 of the T3 tumors (51.85%) had
positive necks whereas 18 patients with T4 tumors
(85.71%) had cancer metastasizing to the neck.

DISCUSSION: Most tumors in oral cavity subsites
have a comparably high propensity to metastasize to
regional lymph nodes in the neck. Currently, the neck
is staged by palpation and various imaging techniques,
including ultrasound, computed tomography (CT), and
magnetic resonance imaging (MRI), which are more
accurate than palpation alone. But, up to one-third of
nodal metastasis in patients with oral squamous cell
carcinoma are smaller than 3 mm, which is a detection
threshold that limits the sensitivity of available imaging
techniques. This low sensitivity of currently available
diagnostic modalities is a problem, because a high
proportion (<30%) of lymph node metastasis is left
undetected in this population. These metastasis will
develop into overt neck disease during follow-up. The
controversy revolving around selecting patients for an
elective neck dissection focuses mainly on four issues –
the need for elective treatment, selection of patients
requiring this intervention, the type of intervention to
be used, and the benefit of any such intervention to the
disease outcome. Three management options exist so far
for N0 patients who are determined to be at significant
risk of occult metastasis. First is clinical observation
(watch and wait policy), which reserves neck dissection
for those patients who develop regional metastasis
subsequent to treatment of the primary tumor. Elective
neck irradiation comes second and it delivers a
tumoricidal dose of radiation to the cervical lymphatics.
Elective neck dissection is the third option. Patients who
develop regional metastasis during a program of clinical
observation are estimated to be 50 to 59%.
Regional recurrence rates after treatment of clinically N0
patients are 2.0 to 8.0% for elective neck irradiation and 2.0% to
11.0% for elective neck dissection. Now the choice
between selecting between these two modalities of
treatment is factored on important differences, including
the length of time required for treatment, the comparative
cost of treatments, and the increased morbidity associated
with post-irradiation surgery if later required.
In principle, the indication of neck dissection in oral
cancer is a problem of risk-benefit evaluation between
the probability of neck metastasis, the probability of
complications associated with neck dissection and the
possible prognostic influence of late diagnosis of
metastasis during follow-up. The problem could be solved
if it were possible to predict the risk of neck metastasis.
However, this type of prediction has been difficult to
introduce and apply in clinical practice. Davidson et
al estimated the accuracy of supra-omohyoid neck
dissection in detecting regional metastasis to be 98%
with a sensitivity of 95% and specificity of 100%, making
it currently the best modality for detecting cervical
metastasis. Our study does have limitations. The
retrospective design makes it susceptible to the
limitations of such analysis. There was also some
heterogeneity of treatment approach. Given the relatively
aggressive nature of malignant disease, surgeons should
always use their clinical judgment when deciding to be
more or less selective in a neck dissection and adjust
accordingly after considering the individual case, the
patient’s expected tolerance of surgical morbidity, and
the aggressiveness of the tumor. This surgical series
includes advanced stage disease which was offered post-
operative chemotherapy plus radiotherapy for treatment
of positive margins, extracapsular spread, and multiple
positive lymph nodes.

CONCLUSION: This study is an observation of patients
undergoing selective and modified radical neck dissection
in oral cancers with clinically negative neck. We have
noted that in patients with advanced, node-negative,
oral squamous cell cancer, the rate of occult metastasis
is alarmingly high, yet a supra-omohyoid or selective
neck dissection is adequate and inclusion of level 5 neck
nodes has not shown any advantage in terms of finding
micrometastasis. As mentioned earlier, a small number
of skip metastasis to level 4 is from primary tumors of
the tongue mainly. This, however, does not take into
account the final outcome i.e. recurrence or disease-free
survival.

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