

Intraoperative assessment of the node-negative neck with frozen section biopsy

Ulku Tuncer, MD, Suleyman Ozdemir, MD, Levent Soylu, MD, Lutfi B. Aydogan, MD, Aysun Uguz, MD,

ABSTRACT

الأهداف: كانت مسألة تقييم ومعالجة العقد اللمفاوية العنقية السالبة سريريا ذات جدل واسع في المرض الخبيث للعنق والرأس. اقترح المؤلفون إجراء عملية تسليخ العنق الاختياري وتشجيع العنق الاختياري ومن ثم المتابعة المنتظمة للعينة بتوجيه الموجات فوق الصوتية كخيار علاجي. وتهدف هذه الدراسة إلى تحديد دقة التقييم داخل العملية الجراحية لعقد العنق السالبة باستعمال عينة من قطعة مجمدة.

الطريقة: تمت مراجعة حالة 60 مريضاً (9 إناث و51 ذكراً) والذين خضعوا لـ 88 عملية تسليخ العنق الاختياري نتيجة الإصابة بورم سرطاني حرشفي في الرأس والعنق وذلك في كلية الطب بجامعة كوكوروا، في الفترة ما بين يناير 2003م إلى ديسمبر 2006م.

النتائج: من بين 88 حالة، 22 حالة (25%) صنفت على مرحلة العقد العنقية السالبة، وأظهرت وجود انتشار في المرض بعد التقييم المرضي النهائي. وفي 16 حالة من بين 22 حالة، أظهرت نتيجة الفحص بالعينة لقطعة مجمدة وجود انتشار للمرض وتقرر تغيير العملية الجراحية إلى تسليخ شامل للعنق. في ستة حالات أخرى، تم اعتبار عينات العقد اللمفاوية سالبة عند تحليل القطعة المجمدة، وتبين أن المرض منتشر في تقارير فحص الأنسجة والأمراض النهائية. لم يكن هنالك نتائج خاطئة أو إيجابية. كان التقييم الإيجابي والتنبيئي 100%. كانت حساسية تقييم العقد اللمفاوية 73% وكانت قيمة التنبؤ السلبي 91%.

خاتمة: يبدو أن التقييم داخل العملية للعقد اللمفاوية العنقية باستعمال عينة القطعة المجمدة يطور دقة تحديد مرحلة المرض، وقد ينوع إستراتيجية العلاج داخل العملية.

Objective: To determine the accuracy of intraoperative assessment of the node-negative (N0) neck with frozen-section biopsy.

Methods: In our study, 60 patients (9 women and 51 men) who underwent 88 elective neck dissections with head and neck squamous cell carcinoma, in the Department of Otorhinolaryngology Medical

Faculty, Cukurova University, Adana, Turkey, from January 2003 to December 2006, were reviewed retrospectively.

Results: Of the 88 clinically preoperatively staged N0 necks, 22 necks (25%) were shown subsequently to have metastatic disease after final pathological assessment. In 16 out of 22 cases, frozen-section biopsy revealed metastatic disease, and surgery was changed to a modified comprehensive neck dissection. In another 6 cases, the sampled lymph nodes were considered negative at frozen-section analysis, and metastatic disease was found in the final histopathologic reports. There was no false-positive result. The specificity and positive predictive values were both 100%. The sensitivity of intraoperative lymph node assessment was 73%, and the negative predictive value was 91%.

Conclusion: Intraoperative assessment of the N0 neck with frozen-section biopsy seems to improve the accuracy of staging and may alter the intraoperative treatment strategy.

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From the Departments of Otorhinolaryngology (Tuncer, Soylu, Aydogan) and Pathology (Uguz), Medical Faculty, Cukurova University, and the Department of Otorhinolaryngology (Ozdemir), Adana Numune Education and Research, Adana, Turkey.

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Address correspondence and reprint request to: Dr. Suleyman Ozdemir, Department of Otorhinolaryngology, Adana Numune Education and Research Hospital, Adana, 01100 Turkey. Tel. +90 (322) 2260331. E-mail: drsozdemir@gmail.com

Assessment and management of the clinically node-negative (N0) neck has been a controversial issue in head and neck malignancy. Within the head and neck literature, authors have proposed elective neck dissection, elective neck irradiation, and regular follow-up with intermittent ultrasound-guided biopsy as treatment options.¹ Selective neck dissection is advocated for patients with N0 necks when the expected incidence

of occult metastatic disease is more than 20%.¹ During the neck dissection, suspected lymph nodes may be sent for intraoperative histological assessment by frozen-section. If the results are positive, the operation can be converted to the modified comprehensive neck dissection.² Previous studies assessing the reliability of frozen-section of the N0 neck have met with different results.²⁻⁶ The purpose of this study is to determine the accuracy of intraoperative assessment of the N0 neck with frozen-section biopsy.

Methods. In Cukurova University Medical Faculty, Department of Otorhinolaryngology, Adana, Turkey, 88 elective neck dissections in 60 patients with head and neck squamous cell carcinoma who had clinically and radiologically staged N0, from January 2003 to December 2006, were reviewed retrospectively. The patients who underwent neck dissection and had clinically and radiologically N0 neck before this operation included to the study. The patients who had N(+) neck did not include. Ethical approval was taken from the ethical committee of Cukurova University. Node-negative neck was defined as the absence of detectable adenopathy and was assessed in all cases with preoperative palpation and CT. During surgery, the most suspicious and largest node/nodes within the tumor's primary nodal drainage level area were sent for frozen-section examination. The technique that was used in the frozen-section examination of the sampled node was performed with a standard preparation with hematoxylin and eosin staining. If the subclinical metastasis were found, a modified comprehensive neck dissection was performed. Neck dissections were oriented with label placement on the respective lymph node levels within specimens. The results of lymph node sampling were compared with the final histopathologic reports. We assessed the accuracy of frozen section by calculating sensitivity, specificity, and positive and negative predictive values. We used SPSS (Statistical Package for Social Sciences) for Windows version 13.0.

Results. The study group contained 60 patients (9 women and 51 men) who underwent 88 elective neck dissections. The mean age was 54 years (age range, 38-74 years). The primary sites of tumors are shown in **Table 1**. Of the 88 clinically preoperatively staged N0 necks, 22 necks (25%) were shown subsequently to have metastatic disease after final pathological assessment. **Table 2** demonstrates the primary sites in these 22 patients, the lymph node level of biopsy, the results of frozen-section examination, the neck dissection levels that were positive for metastatic disease, and the type of neck dissections. In 16 out of 22 cases, frozen-section biopsy revealed metastatic disease, and surgery was changed to a modified comprehensive neck

dissection. In another 6 cases, the sampled lymph nodes were considered negative at frozen-section analysis, and metastatic disease was found in the final histopathologic reports. Selective neck dissections were performed in N0 necks that were found negative for metastatic disease at frozen-section examination. Results of frozen-section biopsy correlated with the results of neck dissection in 82 of 88 specimens (93%). In reviewing our false-

Table 1 - Primary tumor sites.

| Sites | n |
|---------------------|----|
| Larynx | 42 |
| Oral cavity | 11 |
| Hypopharynx | 2 |
| Parotid gland | 2 |
| Submandibular gland | 2 |
| Auricula | 1 |

Table 2 - Results of frozen-biopsy and permanent sections of the pathologically positive node-negative necks.

| Patient | Primary site | SLN Level | Frozen biopsy | Meatastasis positive node level | ND Type |
|---------|--------------|--------------|---------------|---------------------------------|---------|
| 1 | Larynx | III | Positive | III | MRND |
| 2 | Oral cavity | I | Negative | III | SOND |
| 3 | Parotid | Preauricular | Positive | Preauricular | MRND |
| 4 | Larynx | III | Positive | III | MRND |
| 5 | Hypopharynx | III | Positive | II, III, IV, V | RND |
| 6 | Larynx | III | Negative | II | LND |
| 7 | Oral cavity | II | Negative | I, II, III | SOND |
| 8 | Larynx | II | Positive | II, V | MRND |
| 9 | Larynx | II | Positive | II | MRND |
| 10 | Oral cavity | I | Positive | I | MRND |
| 11 | Larynx | II | Negative | II, III | LND |
| 12 | Larynx | II | Negative | II | LND |
| 13 | Larynx | II | Positive | II | MRND |
| 14 | Parotid | II | Positive | II | RND |
| 15 | Oral cavity | I | Positive | I | MRND |
| 16 | Larynx | III | Positive | III | MRND |
| 17 | Larynx | III | Positive | III | MRND |
| 18 | Larynx | II | Positive | II | MRND |
| 19 | Larynx | IV | Positive | IV | RND |
| 20 | Larynx | II | Positive | II | MRND |
| 21 | Larynx | II | Positive | II | MRND |
| 22 | Larynx | II | Negative | II | LND |

SLN - sampled lymph node, END - elective neck dissection
 RND - radical neck dissection, MRND - modified radical neck dissection
 LND - lateral neck dissection, SOND - supraomohyoid neck dissection

negative assessment, 2 of 6 false-negative cases were due to sampling error (patients 2 and 6), and there were interpretive error (due to inadequate sections) in 4 out of 22 (18%) false-negative cases (patients 7, 11, 12, and 22). The surgeon's sampling during the neck dissection was true in 20 out of 22 necks with metastatic disease, and sampling error was only 9% (2 out of 22). There was no false-positive result. The specificity and positive predictive values were both 100%. The sensitivity of intraoperative lymph node assessment was 73%, and the negative predictive value was 91%.

Discussion. It is a common practice of head and neck surgeons during elective neck dissection to assess lymph nodes by direct palpation and inspection. The most suspicious lymph node within the tumor's primary nodal drainage level area may be histologically examined by frozen-section biopsy. If the result is positive for metastatic disease, a modified comprehensive neck dissection can be performed.² Intraoperative assessment of the N0 neck with frozen-section biopsy has been previously evaluated as to whether it provides a reliable approach.²⁻⁶ Previous studies assessing the reliability of this approach have met with different results. Rassekh et al³ reported that greater accuracy in intraoperative assessment of the N0 neck could be obtained with frozen-section biopsy of suspicious lymph nodes, and thus could be the basis for simultaneous treatment selection (false-negative rate, 9.5%). Ikemura et al⁴ suggested that frozen-section diagnosis was helpful in unsettled cases regarding whether there were metastases to the cervical lymph nodes. The sensitivity and specificity of systematic use of frozen-sections in the detection of occult neck metastasis in a study by Leon et al⁵ were 76% and 100%. Conversely, Finn et al² demonstrated that the false-positive rate was 30% and the false-negative rate was 44%. The sensitivity of intraoperative lymph node assessment was 56%, and the specificity was 70% in their study.² The authors concluded that in the N0 neck, intraoperative assessment did not seem to improve the accuracy of staging. In another study, Wein et al⁶ reported that the intraoperative frozen-section assessment had no important role on the management of N0 necks. The sensitivity of intraoperative lymph node assessment was 42%, and the specificity was 100% in their study.⁶

In our study, results of frozen-section biopsy correlated with the results of neck dissection in 82 of

88 specimens (93%). Pathological assessment revealed a false-negative rate of 6.8%. There was no false-positive result. The specificity and positive predictive values were both 100%. The sensitivity of intraoperative lymph node assessment was 73%, and the negative predictive value was 91%. The Brazilian Head and Neck Cancer Study Group reported that the surgeon's evaluation during the operation was not a reliable means of diagnosis for occult metastasis (efficiency of surgeon's evaluation was 54% in their study).⁷ However in our study, the surgeons' sampling in 20 out of 22 cases confirmed to be metastatic by permanent sections, and unsuspected metastasis was present in 2 cases. The pathologist identified lymph nodes with metastatic disease in 16 of 22 cases confirmed to be metastatic by permanent sections. In these 16 cases, selective neck dissections were changed to modified comprehensive neck dissection and metastatic lymph nodes were found within adjacent levels in 2 cases (level V) by converting selective neck dissection to modified comprehensive neck dissection.

In conclusion, intraoperative assessment of the N0 neck with frozen-section biopsy seems to improve the accuracy of staging and may alter the intraoperative treatment strategy.

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