FREQUENCY OF METASTASES AT THE AREA OF THE SUPRARETROSPINAL (LEVEL IIB) LYMPH NODE IN LARYNGEAL CANCER

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Abstract: Background. Neck dissection is the surgical gold standard for the treatment of patients with cervical lymphatic spread. The purpose of this study was to determine the presence of metastases in the supraretrospinal (level IIB) nodal group and the necessity of routine dissection of level IIB during neck dissection, in patients with squamous cell carcinoma of the larynx.

Methods. Over a 4-year period (between January 2000 and June 2004), the records of patients undergoing laryngectomy and neck dissection were retrospectively evaluated. The numbers of the lymph node and carcinoma metastases at level IIB were recorded. The American Joint Committee on Cancer tumor-node-metastasis classification system was used to classify the primary tumor and neck, and the Memorial Sloan-Kettering Cancer Center classification was used to classify the cervical lymphatic chain.

Results. Sixty-three patients with 98 neck dissections were included in the study. Two patients (3.17%) had subglottic lesions, 19 patients (30.15%) had glottic lesions, and 42 patients (66.66%) had supraglottic lesions. In total, 673 lymph nodes were dissected from level II, and 340 were dissected from level IIB. The 11 supraretrospinal lymph nodes of the 340 dissected nodes demonstrated histologic evidence of metastases (3.23%). Six patients (9.52%; 6/63) had metastases at level IIB, and 2 of them also had synchronous metastases at the contralateral level IIB. The patients without palpable lymph nodes at the neck had no metastases at level IIB.

Conclusion. Our results showed that, if the level IIA shows positive metastatic changes, perioperative pathologic examination by frozen section that includes level IIB could be an alternative approach. This area may not be routinely dissected during the surgical management of laryngeal carcinoma with no palpable lymph nodes. ©2007 Wiley Periodicals, Inc. Head Neck 29: 1111–1114, 2007

Keywords: neck dissection; supraretrospinal recess; larynx carcinoma; level IIB; metastases

As with other head and neck neoplasms, metastatic nodal disease is the most important prognostic factor for laryngeal cancers. In head and neck cancers with clinically proven N0 and N1 neck, selective neck dissection is performed by protecting the spinal accessory nerve, sternocleidomastoid muscle, and internal jugular vein. Lateral neck dissection is a kind of selective neck dissection performed in laryngeal cancer; it involves selectively removing the nodal groups with the highest risk of developing metastatic disease at levels II, III, and IV. The area among the spinal accessory nerve, digastric muscle, and sternocleidomastoid muscle at the posterior is called level IIB, and other parts of level II bordered by the spinal accessory nerve at the superior is known as level IIA. Dissecting level IIB is techni-
cally difficult because of its deep location and close relationship to important structures, namely, the spinal accessory nerve, internal jugular vein, arteria carotis interna, and occipital artery. The most frequently injured structure is the spinal accessory nerve. This complication, which depends on nerve tension during the operation, is not rare. In cases of extended operation time, the risk of complications arises while working on this narrow and deep area. Level IIB rarely shows metastatic changes in patients with an N- positive neck. In patients with an N0 neck, metastases at level IIB is not expected. The purpose of this study was to analyze whether or not the dissection of the level IIB is necessary by investigating the numbers and properties of the metastases in all patients with laryngeal cancer who underwent laryngectomy with neck dissection.

MATERIALS AND METHODS

Over a 4-year period, between the dates of January 2000 and June 2004, all patients undergoing laryngectomy with unilateral or bilateral neck dissection were included in the study and examined retrospectively. The patients with proven squamous cell carcinoma of larynx were included in the study. The cases with no information of the areas of the lymph nodes and histopathologic examination of level IIB were excluded from the study. The American Joint Committee on Cancer tumor-node-metastasis classification system was used to classify primary tumor of the neck, and the Memorial Sloan-Kettering Cancer Center classification was used to classify the cervical lymphatic chain.

The type of neck dissection was selected in accordance with the rules provided herein. If a patient with supraglottic tumor had an N0 neck, the treatment had to include the neck because of the high rate of occult metastases. If the treatment of choice was surgery for the primary tumor, then the neck was treated surgically. The N0 necks treated by selective neck dissection including level II, III, and IV.

The patients with an N1 neck were treated by selective (lateral) neck dissection if the tumor was small and the lymph node was not fixed to the surrounding soft tissue. More aggressive neck dissections including radical neck dissection were performed according to the localization and magnitude of the disease.

RESULTS

Sixty-three patients with 98 neck dissections were included in the study. Only 1 patient was a woman (1.58%). Two patients had subglottic lesions (3.17%), 19 had glottic lesions (30.15%), and 42 had supraglottic (66.67%) lesions. Twenty-one of 63 patients had an N0 neck (33.33%), 17 of 63 patients had an N1 neck (26.98%), and 25 of 63 patients had an N2 neck (39.68%). Fifty-eight of 98 neck dissections were lateral and functional (type III modified radical), and 40 of the 98 neck dissections were radical and modified radical (type 1 and 2 modified radical). In total, 673 lymph nodes were dissected from level II. Three hundred forty of them were in level IIB, and metastases were found in 11 lymph nodes (3.23%). Six patients (9.52%) had metastases at level IIB, and 2 of them also showed metastatic changes at the contralateral level IIB. The 2 of 6 patients had metastatic changes in level IIB with no other metastatic lymph nodes in their neck (Table 1). The number of metastatic lymph nodes at the level II
was 37 (5.49%). It was determined that metastases developed in patients with T3 and T4 supraglottic lesions, except for 1 patient with a T4N1 subglottic lesion. Of the patients with histopathologically proven metastases in the neck, 5 of them preoperatively had an N2 neck and 1 preoperatively had an N1 neck clinically. The patients with an N0 neck on preoperative evaluation had no metastases in their neck.

**DISCUSSION**

Head and neck squamous cell carcinoma readily metastasizes to adjacent cervical lymph nodes. In laryngeal cancers, lateral neck dissection has recently become a preferred treatment method in the N0 and N1 neck. Levels I and V are not included in lateral neck dissection; the lymphatic fat tissue on the posterior cervical chain apex is dissected. For this area, generally accepted nomenclature has not yet been established. In various publications, the lymph nodes in this region are known junctional lymph nodes, upper posterior lymph nodes, upper spinal accessory nodes, supraspinal nodes, supraretrospinal recess lymph nodes, and level IIB lymph nodes.

Level IIB drains the skin of the head and neck, the nasal cavity, and nasopharynx; these lymph nodes drain into the jugular and spinal accessory nodes. Level IIB does not drain the oral cavity, oropharynx, larynx, or hypopharynx. In head and neck cancers, a lower incidence of metastases in the posterior cervical area has been determined, but few publications mention the frequency of metastases at level IIB. To date, only 1 study on laryngeal cancers investigates the metastases to level IIB. It is believed that the metastases seen at level IIB are formed by way of retrograde lymph node flow, which forms as a result of the obstruction by the metastases on the other lymphatic chains and the failure of the valves of the lymph vessels.

In our study, all but 1 metastasis at level IIB were in patients with supraglottic T3N2c and T4N2c, T4N2b tumors. Even in late-stage glottic tumors, metastases at level IIB are rare. Kraus et al analyzed level IIB node metastases in a selected group of patients who underwent supraomohyoid neck dissections, and the frequency of the metastases at level IIB was 2.1%. Chone et al recognized the frequency of the metastases as 6.5% in a group of 51 patients with all types of head and neck cancers, and Silverman et al also recognized the frequency as 4.4% in a similar group. All these results were obtained from head and neck cancers instead of laryngeal cancers. Koybasioglu et al found no level IIB metastases in 74 neck dissections performed on 49 patients with laryngeal cancer. In this study, 53 lateral neck dissections, 2 radical neck dissections, and 19 modified radical neck dissections were performed on 29 patients with an N0 neck, on 17 patients with an N1 neck, and on 3 patients with an N2 neck. In our series, which included only patients with squamous cell carcinoma of the larynx, metastatic lymph nodes were found in 8 neck dissections (8.58%) on 6 patients (9.52%) at level IIB (Table 1). Fifty-eight lateral and functional neck dissections, 40 radical and type 1 and 2 modified radical neck dissections, were performed. Two patients with metastases only at level IIB had T4N1 subglottic and T4NIIIB supraglottic late-stage tumors. In 21 patients with an N0 neck, no metastases were seen at level IIB. While 21 of our patients had an N0 neck, 17 and 25 of them had

**Table 1. Patients with level IIB metastases.**

<table>
<thead>
<tr>
<th>Patient no.</th>
<th>Type of neck dissection</th>
<th>Lesion type</th>
<th>T classification</th>
<th>N classification</th>
<th>Differentiation</th>
<th>IIB</th>
<th>IIB</th>
<th>IIA</th>
<th>IIA</th>
<th>III</th>
<th>IV</th>
<th>V</th>
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<tbody>
<tr>
<td>1</td>
<td>Radical</td>
<td>Supraglottic</td>
<td>3</td>
<td>2c</td>
<td>Moderate</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>Radical</td>
<td>Supraglottic</td>
<td>3</td>
<td>2c</td>
<td>Moderate</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
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<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3</td>
<td>Lateral</td>
<td>Supraglottic</td>
<td>3</td>
<td>2c</td>
<td>Moderate</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>1</td>
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<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>4</td>
<td>Radical</td>
<td>Supraglottic</td>
<td>4</td>
<td>2b</td>
<td>Poor</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>–</td>
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<td>–</td>
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</tr>
<tr>
<td>5</td>
<td>Lateral</td>
<td>Supraglottic</td>
<td>4</td>
<td>2c</td>
<td>Poor</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>12</td>
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<td>10</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
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<td>Subglottic</td>
<td>4</td>
<td>2c</td>
<td>Poor</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>–</td>
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</tr>
</tbody>
</table>

Abbreviations: LN, lymph node; Met, metastases; ND, neck dissection.
N1 and N2 necks, respectively. Carlos et al\textsuperscript{5} demonstrated that in head and neck cancers, metastatic changes of the level II affected level IIB. In the clinically positive neck, 7.3 times more metastases involve level IIB. Metastases to level IIB are only possible when metastases exist at the other levels. Neck metastases in late-stage disease increase the possibility that metastases will exist at level IIB. The high frequency of carcinoma metastases in our series may have been due to more patients having N2 neck disease. The absence of metastases in level IIB in patients with an N0 neck supports our belief. It is not possible to compare the frequencies of metastases because of the lack of published series investigating the frequency of metastases at level IIB in patients with laryngeal cancers. Koybasioglu et al\textsuperscript{12} found no metastatic lymph nodes at level IIB in patients with the same conditions as in our series. In our study, the patients with later-stage neck disease had more metastases at level IIB. While Koybasioglu et al had performed radical and modified radical neck dissections on 21 patients, we performed 40 radical and type 1 modified radical neck dissections in our series. Twenty-five patients had N2 necks in our series compared with 3 patients with N2 necks in the study mentioned earlier. Further prospective studies with larger series investigating frequency of the metastases at level IIB are needed.

CONCLUSION

The dissection of level IIB is more difficult and requires more time than the dissection of other levels during lateral neck dissection. In laryngeal cancers, although metastasis at level IIB is rare, level IIB should be routinely dissected, especially in cases of supraglottic tumors with N1 or more advanced neck disease. The findings of this study strongly support routine level IIB dissection in lateral neck dissection, which is not necessary in N0 necks. If the level IIA shows positive metastatic changes, perioperative pathologic examination by frozen section that includes level IIB could be an alternative approach.

REFERENCES