

Sentinel Lymph Node Biopsy in the Staging of Oral Cancer

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Sentinel lymph node biopsy (SNB) is a technique under investigation for the staging of the regional lymph nodes in patients with squamous cell carcinoma of the oral cavity. SNB offers the potential of improving the accuracy of regional staging and reducing the morbidity of elective node dissection in patients without metastases. Thus, the use of SNB might significantly advance the treatment of oral cancer. SNB is generally accepted for the staging of melanoma and breast cancer and has shown encouraging preliminary data for the staging of oral cancer. Acceptance of SNB in the staging of oral cancer requires careful consideration of the technique and a critical review of the studies that tested the accuracy of SNB for primary tumors of the oral cavity. Therefore, the rationale, diagnostic efficacy, and remaining obstacles for SNB in the staging of oral cancer are discussed.

Rationale for sentinel lymph node biopsy in oral cancer

Effective management of patients with squamous cell carcinoma of the oral cavity depends on accurate staging to determine the prognosis and to select appropriate therapeutic strategies. The stage of disease depends highly on the status of the regional cervical lymph nodes at risk for metastasis from the primary tumor. Cervical metastasis is the single most important prognostic factor in

patients with oral cancer, with the presence of nodal spread decreasing the 5-year disease-free survival rate by approximately 50% [1–3]. Moreover, the recent advances in multimodal therapy have been reached by appropriately selecting patients with regional disease for radiation therapy [4,5] and chemoradiation [6,7]. Further advances in adjuvant and neoadjuvant therapy can be expected to rely even more on identifying the patients who are most likely to benefit from new strategies. Thus, achieving the goals in management of oral cancer requires accurately determining the progression of disease by staging the regional lymphatics.

Although clinically evident cervical metastases are found at presentation in approximately 30% of patients, occult metastasis occurs in 20% to 30% of patients with oral cancer who have no clinical evidence of regional disease [8]. This disparity between clinical and pathologic lymph node staging was underscored by a study of 266 patients with squamous cell carcinoma of the oral tongue who underwent primary surgery at the University of Texas M. D. Anderson Cancer Center [9]. Pathologic evidence of regional metastasis was found in 34% of clinically N0 patients; moreover, extracapsular spread was present in nearly 20% of those upstaged. Selecting the best management options for these patients requires accurately identifying subclinical cervical metastases. The accuracy of the currently available means of evaluating the neck before treatment is limited, however. In the detection of nodal disease, imaging techniques, including ultrasonography, CT, MRI, and positron emission tomography, lack

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the sensitivity and specificity necessary to guide treatment decisions in patients staged clinically as N0. As a result of imprecision in the staging of patients before treatment, inappropriately selected management of the clinically N0 neck can result in morbidity and mortality.

The management options for the clinically N0 neck include (1) selective neck dissection with the rationale of regional staging and elective treatment, (2) irradiation of the neck as elective treatment, and (3) clinical follow-up with therapeutic neck dissection or irradiation reserved for patients who develop detectable disease. Elective neck dissection is warranted in patients with a 15% to 20% or greater risk of occult metastasis based on features of the primary tumor (Fig. 1). At The University of Texas M. D. Anderson Cancer Center, patients with oral cancer undergo selective dissection of the clinically N0 neck if they have primary tumors greater than 2 cm in diameter or a depth of invasion of more than 4 mm or if their primary tumor has pathologic features associated with metastasis, such as perineural or

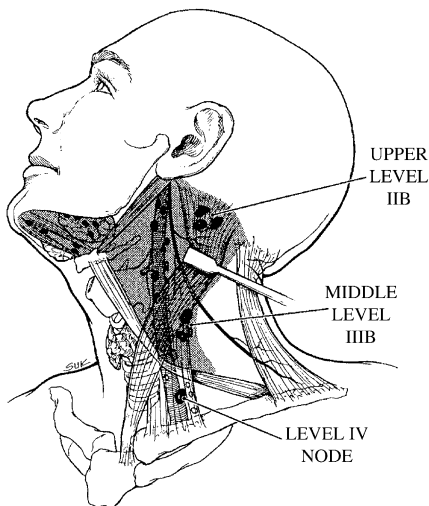


Fig. 1. The usual extent of selective neck dissection (supraomohyoid neck dissection) for oral cancer, including levels I, II, and III (shaded). For primary tumors of the oral tongue, selective neck dissection is extended to level IV to include additional nodes at risk. For primary tumors involving the floor of the mouth, ventral surface of the tongue, or midline of the tongue, bilateral selective neck dissection is performed to include lymph nodes at risk on both sides of the neck. (From Byers RM, Weber RS, Andrews T, et al. Frequency and therapeutic implications of "skip metastases" in the neck from squamous carcinoma of the oral tongue. *Head Neck* 1997;19:15; with permission.)

lymphovascular invasion [10]. The benefits of elective neck dissection are realized when disease is found on pathologic evaluation of the specimen and include the early removal of metastatic disease and more accurate staging information on which to base adjuvant radiation therapy. In up to 65% to 75% of patients, however, no disease is found, and the morbidity associated with neck dissection is unjustified. Likewise, elective irradiation of the neck overtreats most patients, and even worse, it provides no staging information on which to estimate prognosis or guide further management. Moreover, few treatment alternatives are left in those who develop second primary tumors. Watchful waiting may allow disease to present at a more advanced stage in the neck, making salvage treatment more difficult [11,12]. Thus, more precise staging before treatment is requisite to prevent the consequences of inappropriately selected management strategies for the clinically N0 neck in oral cancer.

The need for optimal management of regional nodes at risk for metastasis from other cancers led to a search for more accurate and less invasive approaches of staging. As a result, SNB has become an accepted staging tool in the management of melanoma and breast cancer. The procedure accurately stages the regional lymphatics based on the status of the first-echelon nodes in the lymphatic basin draining the primary tumor site while limiting morbidity caused by unnecessary lymph node dissection. The potential of SNB to stage head and neck malignancies, including oral cancer, is currently under investigation. Successful application of the procedure would bring a major advance to the staging and management of oral cancer.

Premise for staging oral cancer with sentinel lymph node biopsy

The potential use of SNB for the staging of oral cancer developed from the success of the procedure in malignant melanoma and breast cancer. SNB has improved the accuracy of staging while reducing the morbidity caused by unnecessary lymphadenectomy in these cancers. As a result, SNB has been investigated in the staging of other cancers, including upper gastrointestinal, lung, urogenital, and colorectal carcinomas. In parallel, the procedure has been studied in the staging of squamous cell carcinoma of various sites in the head and neck, including the oral cavity.

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