

## Review

# Current surgical management of metastases in the neck from mucosal squamous cell carcinoma of the head and neck

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## Abstract

Neck dissection, which is an important method of treatment for metastases from mucosal (and other) squamous cell carcinomas (SCC) of the head and neck, is also useful for staging disease. Since its inception it has changed from a radical to a more conservative procedure, and vital structures are preserved wherever possible. Refinements in methods of imaging to assess involvement in the neck have encouraged alternative approaches that can improve outcomes and reduce morbidity. We look at the reported evidence for the surgical management of metastases in the neck from mucosal SCC.

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**Keywords:** Head and neck squamous cell carcinoma; Neck dissection; Neck metastases; Clinically positive neck; Clinically negative neck; Sentinel lymph node biopsy

## Introduction

It is well known that evidence of metastases in the neck is an important prognostic factor in patients with mucosal squamous cell carcinomas (SCC) of the head and neck. They can reduce survival by 50%, and regional failure can arise when their treatment is inadequate.<sup>1</sup> There is a long-standing principle that the characteristics of the primary tumour (including site and various pathological prognostic indicators) should be used to guide treatment of the neck, but this may not always be the case. Radical neck dissection, which was first introduced

in the late 19th century and for many years was the main treatment for metastases in the neck,<sup>2</sup> was modified in the 1950s with preservation of non-lymphatic structures such as the internal jugular vein, muscles, and the nerves associated with function. In the 1980s, selective neck dissection (SND), in which non-lymphatic structures were preserved and only the cervical lymph nodes most likely to contain metastases were removed, was established.<sup>3</sup> However, despite its more conservative approach, SND is associated with a degree of morbidity, in particular shoulder dysfunction, and more recently, super-selective neck dissection (SSND), which is limited to 2 levels, has been advocated, and an increasing body of evidence suggests that it is more favourable if used in the proper setting.<sup>4</sup>

The current classification and terminology for neck dissection was introduced in 1991 by a committee of the American Head and Neck Society and the American Academy of Otolaryngology - Head and Neck Surgery. The terminology was

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Table 1  
Classifications of neck dissection.

2002 classification <sup>5</sup> (American Head and Neck Society and Committee for Head and Neck Surgery and Oncology; American Academy of Otolaryngology- Head and Neck Surgery)	2008 classification <sup>6</sup> (American Head and Neck Society and Committee for Head and Neck Surgery and Oncology; American Academy of Otolaryngology- Head and Neck Surgery)	2011 classification proposed by Ferlito et al <sup>7</sup>
Radical neck dissection	Classification and terminology did not change but new recommendations were made regarding boundaries between levels I and II and levels III, IV and VI; terminology of the superior mediastinal nodes (level VII); and method of submitting specimens for analysis	Any neck dissection is designated ND. Level from which lymph nodes are removed, or the sublevels or non-lymphatic structures, or both, are shown in parentheses
Modified radical neck dissection	No change	No change
Selective neck dissection	No change	No change
Extended neck dissection	No change	No change

updated in 2002 and 2008 (Table 1),<sup>5,6</sup> and in the last update, lymph nodes in the neck were grouped in levels. Recently, Ferlito et al proposed a new classification for neck dissection in which all types are classified as ND. The non-lymphatic structures and levels are indicated in parentheses unlike the other methods in which the non-lymphatic structures are not recorded.<sup>7</sup>

#### *SCC of the oral cavity in patients with no sign of metastases in the neck (N0)*

Occult metastases have been reported in between 20% and 44% of patients with SCC of the oral cavity and no sign of metastases in the neck.<sup>8–10</sup> It is generally agreed that elective neck dissection is indicated in those with clinically N0 oral SCC when the risk of occult metastases exceeds 15% - 20%, but in most cases it may not be necessary. Observation, which reserves neck dissection for salvage of regional recurrence, is one alternative,<sup>11</sup> but the quality of the initial and follow-up examination of the neck, and the postoperative assessment are vitally important. This study compared observation (n=234) with neck dissection (n=51) in 285 patients with clinically N0 necks after initial investigation with ultrasound-guided fine needle aspiration cytology (FNAC) to detect occult metastases. In the observation group 27.8% developed metastases, and most required radical neck dissection and adjuvant radiotherapy. However, 5-year disease-specific and overall survival rates were almost the same as those for elective neck dissection.

Although elective neck dissection may cause less morbidity than radical neck dissection, most patients with clinically N0 necks do not have occult metastases. Therefore, the need to identify those who do and who could be offered less radical, early, elective treatment is clear.<sup>11</sup> It is also important to recognise that although ultrasound-guided FNAC has high diagnostic sensitivity and specificity, some surgeons now also do sentinel lymph node biopsy (SLNB).

A common prognostic indicator of an increased risk of occult metastases is the thickness of the primary tumour. Leusink et al found that occult lymph node metastases were

more likely when the tumour was more than 4 mm thick.<sup>12</sup> However, tumours with different thicknesses can result in occult metastases, and other factors such as vascular and perineural invasion are also implicated. A radical or modified radical neck dissection is not necessary in patients with clinically N0 necks, as comparable results have been obtained with SND (with adjuvant radiotherapy if indicated histopathologically). Levels I, IIa, and III are at highest risk for metastases, so they should be included in the dissection. While metastases to level IIb are rare in tumours anterior to the first molar teeth, nodes at this level may be involved in 22% of patients who have metastatic disease in the level IIa nodes.<sup>12</sup> Surgeons should therefore consider whether to include this level in the neck dissection and in planned post-operative radiotherapy.

It is not clear whether level IV should be included in patients with clinically N0 necks because although the incidence of metastases is low in this level, a proportion seem to skip to levels III and IV.<sup>13</sup> However, in patients with SCC of the tongue it is important to appreciate that in some cases level IV is not the only site in the neck that is affected. It is likely that the level IV skip metastases found in the original study by Woolgar et al actually arose in level III, and there is now good evidence to avoid level IV in patients with cN0 oral SCC.<sup>14</sup> There is general consensus that level V is rarely involved.<sup>15</sup> In a retrospective analysis of 35 patients with tumours at various stages, Godden et al compared elective neck dissection (n = 18) with observation (n = 17).<sup>16</sup> The time taken for recurrence to develop was the same in both groups. In 27 patients, the primary tumour was more than 5 mm thick.

Recurrence, particularly at level II confirms that meticulous dissection is needed in this area and that tumour thickness must be considered when planning the treatment of patients with clinically N0 necks.<sup>16</sup>

#### *Laryngeal SCC in patients with N0 necks*

As a result of their different embryological origins, the supra-glottic, glottic, and subglottic components drain through

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