

Review Article

Selective lateral neck dissection for laryngeal cancer in the clinically negative neck: is it justified?

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Abstract

Selective lateral neck dissection is a recently-introduced surgical procedure for the treatment of cervical lymph nodes believed to be at risk of metastasis from primary malignant neoplasms of the upper respiratory and digestive tracts. Its value in the management of the clinically negative neck in cancer of the larynx is discussed.

Key words: Laryngeal neoplasms; Lymph nodes; Neck, surgery

Since its description by Crile in 1906, radical or classical neck dissection has been the unquestioned standard surgical approach in patients with cervical metastases in the neck. This procedure entails the removal of the cervical lymph nodes on levels I through V (Figure 1), including the spinal accessory nerve, the internal jugular vein and the sternocleidomastoid muscle.

During the sixties, Suarez (1963) at the University of Córdoba, Argentina and Ballantyne (cf. Byers, 1993) at the University of Texas-M.D. Anderson Hospital and Tumor Institute of Houston separately developed a conservative neck dissection procedure that maintained the radical removal of the cancer. Using these two similar techniques, the aponeurotic compartments of the neck were removed, preserving the sternocleidomastoid muscle, the internal jugular vein and the accessory nerve. Suarez (1963) introduced the terms 'vaciamiento ganglionar funcional', or 'de principio' or 'profiláctico' or 'electivo' and Bocca and his staff popularized this surgical treatment (Bocca *et al.*, 1980; Calearo and Teatini, 1983; Bocca *et al.*, 1984).

Over the years, several changes have been suggested for standard radical neck dissection and these surgical procedures have been defined by the American Academy of Otolaryngology – Head and Neck Surgery (Robbins *et al.*, 1991) as modified radical neck dissection type I (in which only one neck structure is preserved, i.e. the spinal accessory nerve), type II (in which two neck structures are preserved, i.e. the spinal accessory nerve and the internal jugular vein) and type III (in which all three

neck structures, the spinal accessory nerve, the internal jugular vein, and the sternocleidomastoid muscle are preserved). This last procedure is also called functional neck dissection, elective neck dissection, prophylactic neck dissection, conservative neck dissection, conservation neck dissection, complete functional neck dissection, Suarez neck dissection, Bocca neck dissection, precautional neck dissection, fascial neck dissection and so on, with the removal of the cervical lymph nodes at levels I, II, III, IV and V. The efficacy of this procedure seems to equate to that of radical neck dissection (Bocca, 1991).

More recently, the concept of limited or selective neck dissection, which consists in removing only the lymph nodes considered at risk of metastasis, has been applied – especially in the clinically negative neck. At present, this surgical procedure is being used more and more in patients at risk of occult metastases from primary malignant tumours of the upper respiratory and digestive tracts and these surgical procedures have become standard practice at several institutions (Spiro *et al.*, 1993; Houck and Medina, 1995; Ambrosch *et al.*, 1996; Pellitteri *et al.*, 1997; Pitman *et al.*, 1997; Clayman and Frank, 1998).

There are, therefore, essentially three main anatomical types of neck dissection, i.e. comprehensive, selective and extended neck dissection, and their various subtypes (see Table I). The assessment of a clinically negative neck poses problems because there are no absolute parameters emerging from clinical examination and/or diagnostic imaging such as magnetic resonance (MRI) and computed tomo-

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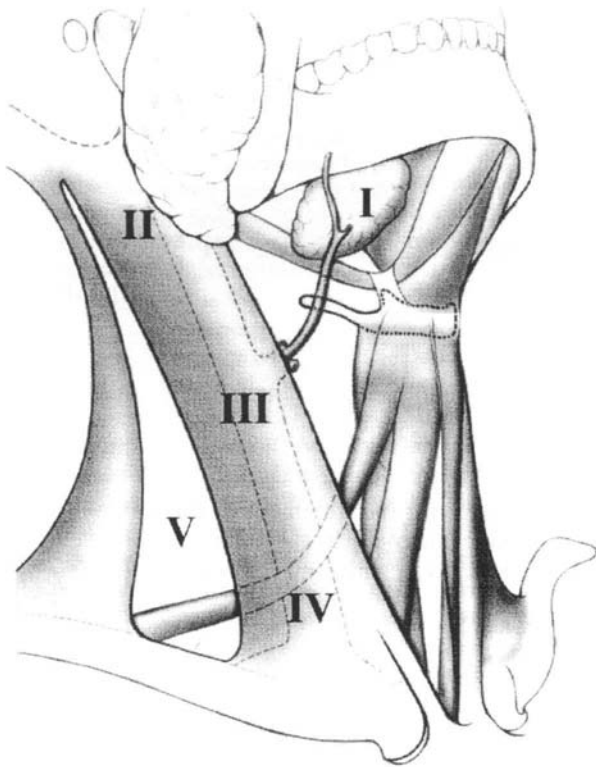


FIG. 1

Schematic diagram of the neck showing levels of lymph node groups (from Ferlito, A., Silver, C. E. (1996) Neck dissection. In *Surgery for Cancer of the Larynx and Related Structures* (Silver, C. E., Ferlito, A., eds.) W. B. Saunders Company, Philadelphia, p 302).

graphy (CT) to establish whether it is genuinely negative. The management of the clinically negative neck in patients with squamous cell carcinoma of the larynx is still controversial. Treatment strategies range from watchful waiting to elective neck dissection or even elective neck irradiation. Recently,

there has been a considerable amount of evidence that selective neck dissection is also appropriate (Pellitteri *et al.*, 1997; Pitman *et al.*, 1997; Clayman and Frank, 1998).

Complete functional neck dissection, including all the cervical nodal levels (I–V) should not be performed for cancer of the larynx because the nodes on levels I and V are not really at risk of metastatic spread. The inclusion of level I in radical and modified neck dissections is questionable for the treatment of cancer of the larynx and hypopharynx. In a recent review on this subject, Ferlito and Rinaldo (1998) concluded that, unless there is clear evidence of spread, including the level I triangles in the neck dissection is unwarranted since these nodes are not really at risk. There is, therefore, an important role for bilateral selective neck dissection in patients with T₂–T₄ cancers involving the supraglottic larynx, considering the high probability of occult metastases (Pillsbury and Clark, 1997). Conversely this surgical approach does not seem necessary in true subglottic cancers, regardless of the stage, considering the low incidence of metastases to levels II–IV. T₃–T₄ glottic cancer warrants selective lateral neck dissection on the ipsilateral side (Johnson, 1994). The inclusion of level V in elective neck dissection is also open to question, considering the outcome of recent studies on functional neck dissection specimens from patients with cancer of the larynx. The lymph nodes of the posterior triangle (level V) are seldom involved in these patients (Davidson *et al.*, 1993; Gallo *et al.*, 1996; Nicolai *et al.*, 1998). Ambrosch *et al.* (1996) mentioned that Steiner advocates performing limited (selective) neck dissection, only clearing levels II and III, for cancer of the larynx. We suggest including level IV in the surgical specimen, too, since extending the operation to include level IV does not appreciably increase operating time and morbidity.

TABLE I
TERMINOLOGY OF CURRENT CLASSIFICATION OF THE NECK DISSECTION

Type of neck dissection	Lymph node levels removed	Structures preserved
<i>Comprehensive</i>		
Radical	I, II, III, IV, V	None
Modified radical		
Type 1	I, II, III, IV, V	SAN
Type 2	I, II, III, IV, V	SAN, IJV
Type 3	I, II, III, IV, V	SAN, IJV, SCM
<i>Selective</i>		
Suprahyoid	I, II	SAN, IJV, SCM
Supraomohyoid	I, II, III	SAN, IJV, SCM
Expanded supraomohyoid	I, II, III, IV	SAN, IJV, SCM
Postero-lateral	II, III, IV, V, suboccipital and retroauricular nodes	SAN, IJV, SCM
Lateral	II, III, IV	SAN, IJV, SCM
Anterior	VI	SAN, IJV, SCM
Antero-lateral	II, III, IV, VI	SAN, IJV, SCM
<i>Extended neck dissection</i>	I, II, III, IV, V and one or more additional lymph node groups (such as the paratracheal nodes or anterior compartment lymph nodes)	None and structures that are not routinely removed by radical neck dissection (such as the carotid artery, the hypoglossal nerve, the vagus nerve) are removed

SAN: Spinal accessory nerve; IJV: Internal jugular vein; SCM: Sternocleidomastoid muscle

Lateral neck dissection, as Medina recently pointed out (in press), consists in removing the tissue containing lymph nodes in the lateral compartment of the neck, underlying the sternocleidomastoid muscle. This procedure does not only involve the *en bloc* removal of the upper, middle and lower jugular lymph nodes (levels II, III and IV) – as the terms jugular or interjugular dissection would suggest. It extends beyond the level of the internal jugular vein, up to the posterior border of the sternocleidomastoid muscle; the posterior extent is marked by the cutaneous branches of the cervical plexus (Medina, in press). Spiro *et al.* (1993) suggest routinely transecting the omohyoid muscle during this procedure, but Ferlito and Silver (1996) believe that this muscle can be preserved. Retraction of the sternocleidomastoid muscle permits adequate dissection. The anatomical limits of the various selective neck dissection procedures may vary from one institution to another and from one surgeon to another, irrespective of any well-defined guidelines (Clayman and Frank, 1998).

Selective neck dissection should be undertaken by experienced surgeons, since the final results may depend largely on their expertise and judgement (Clayman and Frank, 1998). Goepfert (cf. Stainer and Hommerich, 1993) believes that this surgical procedure is a demanding task for every head and neck surgeon, and it has become obvious that if surgeons are not performing this procedure regularly, it may be better to proceed with a comprehensive neck dissection.

Recently, in a study performed at the University of Oklahoma, the recurrence rate in the neck following selective lateral neck dissection was 0 per cent when the resected lymph nodes were histologically negative (primary controlled, two-year follow-up) (Houck and Medina, 1995). The pattern of recurrence strongly suggests that some patients had a lateral selective dissection that was less than complete (Spiro *et al.*, 1993).

If it is performed carefully, selective lateral neck dissection is appropriate for patients with cancer of the larynx. Bailey (1998) believes that there is sufficient evidence to support the concept of a therapeutic equivalence between selective neck dissection and modified radical neck dissection. Besides, selective neck dissection provides extremely important information for staging procedures, subsequent treatment planning, and patient counselling based on prognosis. Selective neck dissection is as effective as radical neck dissection for staging the N₀ neck (Pitman *et al.*, 1997).

Clayman and Frank (1998) recently discussed the efficacy of selective neck dissection for the elective treatment of the clinically negative neck in patients with squamous cell carcinoma of the upper respiratory and digestive tracts: they believe that this surgical treatment is as effective as modified radical neck dissection.

We are convinced that only the lymph nodes believed to be at risk should be removed, not all the nodes in the neck. If the clinician opts for the surgical

removal of the N₀ neck, he must consider how extensive the lymph node dissection should be. Selective lateral neck dissection is justified in squamous cell carcinoma of the larynx, although many surgeons continue to advocate modified radical neck dissection for the surgical management of the neck. Careful selection of patients for lateral selective neck dissection can optimize cure rates as well as functional and cosmetic results. The combined goal of minimizing morbidity and avoiding overtreatment may be achieved by using selective lateral neck dissection in patients with laryngeal cancer and a clinically negative neck. The type of neck dissection should be tailored according to the site of origin, size and histological type of the tumour, as well as the status of the lymph nodes.

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