Radical neck dissection: Oncological, aesthetic and functional approach in patients with head and neck cancer

José Francisco Gallegos-Hernández1*, José Alberto Abrego-Vázquez1 and Omar Isaías Zaleta-González2
1Department of Head and Neck Tumors; 2Surgical Oncology Specialty 7th year Resident Physician. Oncology Hospital, CMN SXXI, IMSS, Ciudad de México, Mexico

Abstract

Background: The type of cervical incision is fundamental to achieve an adequate exposure to the lymphatic levels and to be able to perform a complete neck dissection and a proper staging of the patient; incomplete dissection sub-stages and increases the risk of recurrence. The incision must also offer the lowest morbidity, without aesthetic or functional sequelae; it must combine oncological safety with adequate aesthetics, functionality, and quality of life. Material and methods: A retrospective and observational study in which we evaluate the transverse cervical incision by knowing the number of dissected lymph nodes and complications rate associated to the incision. Results: Forty patients, 35 with squamous cell carcinoma metastasis and 5 with melanoma metastasis. The average of dissected lymph nodes was 25. A single incision allowed the dissection of the five ganglion levels; it was not necessary to convert the incision or make vertical enlargements; the cosmetic result was satisfactory in all patients, there were no significant complications. Conclusion: The transverse cervical incision allows access to the five cervical levels, in the present series the average of dissected lymph nodes was enough to consider the complete procedure. The aesthetic result was satisfactory, and there were no significant complications associated.


Correspondence: *J.F. Gallegos-Hernández
E-mail: jfgalh61@gmail.com

Date of reception: 25-06-2018
Date of acceptance: 11-07-2018
Available online: 30-05-2019

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Introduction

Neck dissection remains the only procedure for adequate staging of patients with head and neck cancer. It was described by George Crile and popularized by Hayes Martin and, ever since, it has undergone modifications in terms of extent (dissected levels), radicalness (non-nodal structures inclusion or not) and approach (type of incision).

Regarding its extent, we can say that, currently, there is enough evidence to perform selective procedures (eliminating only nodal levels at risk of metastasis), based on the tumor site and cervical lymph node staging. As for radicalness, the preservation of the three non-nodal structures that gave radical dissection its name (sternocleidomastoid muscle, internal jugular vein and spinal accessory nerve) is known not to decrease regional oncological control. Classical radical dissection, as described by G. Crile in 1906, is currently performed in approximately 10% of patients with upper Aero-digestive tract cancer, since conservative modifications are almost systematically carried out. These modifications have considerably reduced the morbidity the procedure used to entail (decreased shoulder range of motion, winged scapula, cervical collapse and esthetic deficit). The relationship between oncological effectiveness and quality of life is now, more than ever, important, and an approach (incision) that is both esthetic and functional as well as oncologically effective is therefore required.

Regardless of its extent and radicalness, neck dissection should always be carried out in a “fascial” form, avoiding independent lymph node elimination. Fascial neck dissection allows the entire lymph node chain en bloc resection together with the jugulocarotid sheath, and is fundamental for achieving at-risk or metastatic nodal levels adequate dissection and for decreasing postoperative complications and drainage times.

Since its initial description, neck dissection has undergone changes in its technique, thus improving patient evolution, and the same has happened with the type of incision. Currently, it is essential for an incision that enables complete fascial neck dissection with minimal morbidity and with satisfactory esthetic and functional results to be offered.

Transverse cervical incision allows leaving minimal traces in the neck and accessing the five nodal levels avoiding esthetical-functional sequelae associated with other types of incisions, especially the combined ones (vertical and horizontal incision), such as the Sebileau-Carrega-type (Figs. 1 and 2).

The purpose of this article is to show our experience with this type of incision, single cervical transverse incision performed in patients undergoing neck dissection for neoplasms originating in different sites of the head and neck area.

Material and Methods

Retrospective, observational analysis of patients undergoing neck dissection via unilateral or bilateral single cervical transverse incision.
In all patients, the incision was performed following the middle cervical skin fold, with vertices on the anterior border of the trapezius and the midline of the neck at the level of the thyroid cartilage notch (Fig. 3).

When level IA dissection was required, the incision was extended from 2 to 3 cm towards the other side of the neck, a procedure called extended transverse incision; when bilateral neck dissection was required, this incision was extended up to the anterior border of the contralateral trapezius muscle (bilateral transverse incision).

All levels were identified with specific markers at the time of surgery and were thus referred, forming a single block (fascial dissection), to pathology (Fig. 4).

The number of dissected lymph nodes was assessed in the pathology report, with complete dissection being considered if at least 25 lymph nodes had been dissected.

All patients had a closed drainage placed at the conclusion of the intervention. The number of drainages depended on specific characteristics of each patient’s neck and the extent of dissection.

The suture of the wound was carried out in two planes (platysma and skin). Patients who had undergone reconstruction with free or pedicled flaps were not included.

All patients underwent neck dissection; none of them underwent isolated lymph node dissection, nodulectomies, adenectomies or tumorectomies.

**Results**

Forty patients, 25 men and 15 women, with a mean age of 52 years, were included; 35 had been diagnosed with metastasis from squamous cell carcinoma originated in mucous membranes of the head and neck area, and five with skin melanoma originated in the cervicofacial skin.

The sites of the primary tumor in patients with squamous cell carcinoma metastases were the oral cavity in 22 and the oropharynx in eight, whereas in five the primary tumor was unknown.

Twenty patients underwent anterolateral neck dissection, which comprises levels I to IV, while in 11 the dissection was complete (levels I to V) and in nine the dissection was from levels I to III or supraomohyoid. Level IIB dissection or retropinal recess was included in all patients.

In 28 patients, the dissection was elective (no palpable lymph nodes) and in 12 it was therapeutic, with palpable or ultrasound-visible metastases; the procedure was performed as rescue (after radiotherapy failure) in eight patients and in 32 it was carried out as first-line treatment.
The mean number of dissected lymph nodes was 35; the type of dissection that less lymph nodes obtained was supraomohyoid dissection, with a mean of 25. Only in one patient with supraomohyoid dissection (2.5%) was the procedure considered insufficient, since only eight lymph nodes were dissected, all without metastasis.

As for post-dissection sequelae, four patients had paresis of the facial nerve lower branch (11%), which was temporary in three and permanent in one. Three patients had cranial nerve XI sequelae, with the sequel being definitive in both. Two subjects had metastasis to the retrospinal recess and one had the complication with no metastasis to level IIB triangle.

No patient had major complications (hematoma, bleeding, ventilatory difficulty, flap necrosis, cervical abscesses or wound dehiscence) or had to be re-operated. One patient (2.5%) experienced wound infection, which was resolved with systemic antibiotic therapy without the need for reoperation.

Discussion

Radical neck dissection is the standard surgical procedure to achieve an adequate staging of patients with lymph node metastases to the neck or at risk of having them\(^5,6\). It allows adequate classification of patients in risk groups and decreases the rate of cervical recurrence\(^7\).

To be effective and meet its purposes, the procedure requires adequate exposure of the surgical field, which in turn allows dissecting all nodal levels of the neck if necessary.

The cervical incision required to achieve the purposes of neck dissection should also allow irrigation of the cervical flaps to avoid ischemia, maintain an adequate relationship with the yugulocarotid axis and limit exposure in case of wound dehiscence. In addition, it should facilitate the possibility to include the primary tumor site in the resection if necessary, be compatible with reconstructive procedures, allow correct separation of stomas (mainly tracheotomy) and allow adequate cervical function with an appropriate esthetic result\(^8\).

Although approaches that combine horizontal and vertical incisions offer considerable exposure at all nodal levels of the neck, they compromise not only neck esthetics and function, but also facilitate the formation of skin contractures and keloid scars and, given that there is a “trifurcation” area, these approaches increase the risk of necrosis where the three flaps are brought together.

Perhaps the most widely used incision combining a vertical with a horizontal axis is the Sebileau-Carregga-type incision, or “Y incision”. The intersection of the horizontal and vertical portions usually remains in the carotid bulb, and therefore any wound complication may involve vascular axis exposure, with the consequent risk.

On the other hand, double horizontal incisions of the Mc Fee type compromise flap irrigation, especially to the intermediate dermal bridge. The Paul André or “hockey stick” or “J incision”, which is the most commonly used, has a vertical portion that opposes the Langer lines and facilitates the formation of keloid tissue or dermal contracture\(^8\).

Evidently, all of them offer an adequate surgical exposure of all cervical levels and facilitate fascial neck dissection; however, their drawback is the esthetic outcome and functional sequelae.

It is necessary to achieve a balance between an adequate oncological approach and esthetic and functional outcomes with minimal sequelae and complications\(^8\).

The relationship between dissected and metastatic lymph nodes, or “lymph node density ratio”, is a prognostic factor with independent value in patients with head and neck cancer. It is very important that during neck dissection the procedure is carried out in the form of a fascial dissection, in order to obtain the largest number of dissected lymph nodes and reduce the possibility of regional recurrence; the fewer the number of dissected lymph nodes and the larger the number of metastatic lymph nodes, the poorer the patient prognosis\(^10\). In the present series, transverse incision allowed us obtaining a satisfactory number of dissected lymph nodes.
nodes, which is why it can be considered an oncologically safe approach.

The transverse incision offers a satisfactory combination of lymph node dissection in terms of the number of dissected lymph nodes and cervical levels with an adequate esthetic result (Fig. 5); it allows an approach to all cervical levels and offers a minimal risk of flap necrosis even in patients with a history of radiotherapy.

It can be bilaterally used both for supraomohyoid dissection and for complete unilateral or bilateral dissection.

Acknowledgements

To artist Natalie Gallegos García for her drawing of the cervical transverse incision.

References