



COMPARATIVE ANALYSIS OF CONVENTIONAL AND MODIFIED NECK INCISIONS IN MANAGEMENT OF HEAD AND NECK CARCINOMAS- A LITERATURE REVIEW

Oncology

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ABSTRACT

One of the significant prognostic factor for survival in squamous cell carcinoma (SCC) of oral cavity is the presence or absence of a cervical metastasis. The choice of neck incision should be such that it allows adequate access for good nodal clearance with minimal morbidity and acceptable aesthetics. The purpose of this article was to review the literature of conventional and modified neck incisions used in neck dissections and their advantage in contributing a better quality of life in management of head and neck cancer.

KEYWORDS

Neck incision, neck dissection, cosmesis

INTRODUCTION

Neck dissection have become the standard of care in the treatment of carcinoma of head and neck at earliest stage due to the high percentage of node metastasis.¹ The status of cervical lymph nodes is the single most important prognostic factor in the treatment of patients with carcinoma of head and neck. Neck dissection has evolved into a variety of surgical procedures for excision of regional lymph nodes since its introduction in the 19th century, when surgeons first became aware that cancers of the head and neck metastasized to the cervical lymph nodes. Radical neck dissection, which circumscribe the surgical removal of neck metastases enclosed between superficial and deep fascial layers of the neck was first described by George Washington Crile in 1906 but since then many modifications in surgical procedures and flap design have been documented.² Nowadays, many conservative approaches are advocated for preservation of Spinal Accessory Nerve (SAN), Sternocleidomastoid Muscle (SCM), Internal Jugular Vein (IJV). A neck incision should permit the maximum exposure of the underlying structures with protection of the major vessels, viability of the skin flaps, good healing potential and an acceptable cosmetic result to minimize postoperative complications.³ Most commonly used incisions include Schobinger's and its modifications, Y, T, H or double Y types, which offer good exposure of the neck and can also be combined with the resection of primary lesion in the head and neck. In this short review, we have discussed the conventional and modified neck incisions used in neck dissections and their advantage in contributing a better quality of life.

DISCUSSION

A variety of incision lines are suggested for neck dissection. As stated by Gavilan and Herranz⁴, accessibility of all the levels of neck lymphatics is probably the most vital aspect of the planning of an incision. The choice of incision design selection should be such that it allows adequate access for good nodal clearance with minimal morbidity and acceptable aesthetics. Some of the most commonly used incisions includes utility flaps, Schobinger flaps, MacFee, T-shaped, Y-shaped, double Y-, single, and double transverse incisions and their modifications.

Modified Schobinger's incision is the most common incision used for neck dissection. Placement of incision should be based on surgical principles, the anatomy of neck and not just mere surgeon preference. This will prevent complications like wound dehiscence, flap necrosis and aesthetics affecting the overall prognosis and survival. It has the advantage of adequate exposure and the incision can be easily extended anteriorly as lip splitting incision in order to expose the primary oral cavity tumor.⁴ Although raising parts of the flap lengthens the operation time, it provides excellent access to the surgical field.⁵

The Lahey's lateral utility incision is commonly used in post irradiated neck as it has the advantage of not forming a three-point junction and prevents wound dehiscence as well as carotid blowout.⁶ Transverse cervical neck incision would suffice for supra omohyoid neck dissections. Post operatively negative suction drains are put for an average period of 3–5 days and patient needs hospital admission for an

average period of 7 days. Planning for post-operative radiotherapy is done according to the histopathology report and the stage of disease. In any head and neck surgery, the postoperative result basically depends upon not compromising resection at the cost of cosmesis. Other considerations are skin characteristics and involvement, unilateral versus bilateral procedures, location of nodal disease and type of dissection, pre- and postoperative radiation, previous surgery, need for flap reconstruction and tracheostomy.⁷

MacFee in 1951 suggested a more cosmetic approach with parallel transverse incisions.⁸ In this approach, two horizontal skin incisions are made in the submandibular and supraclavicular region of the neck. The upper horizontal incision is made on the upper cervical area from the tip of mastoid process and continuing below the angle of mandible up to the submental. The lower horizontal incision is above the clavicle and parallel to it. Between these two incisions a bipedicle flap is raised.⁹ Macfee incision showed the optimal results in terms of wound healing and cosmesis of scar by eliminating the three-point exposure line. The Macfee incision also requires the least time during wound closure, thus compensating for the longest time required to raise it. Also with excessive traction on the skin flaps, bruising and damage to skin edges can be cumbersome.^{5,10}

Lahey in 1940 first described hockey stick incision. The difference in Hockey stick incision (HSI) and Reverse hockey stick incision (RHSI) is based on difference in skin flaps. HSI allows elevation of a superiorly based single cervical flap and reversed HSI allows for an inferiorly based flap.³ Omura et al. compared the hockey stick and reversed hockey stick incision. They suggested a skin incision with the longitudinal portion running from the mastoid process downward, 1–2 cm behind the anterior border of the trapezius muscle, curving gently at the acromioclavicular junction to the transverse incision approximately 1 cm below the clavicular margin. This incision showed good results.¹² The Double-Y incision of Hayes-Martin is also popular for functional and selective neck dissection. A chin extension may be used when the removal of the primary tumor requires an intraoral approach. A well-known disadvantage of this incision is the compromise blood supply to the skin flap, especially in the two crossings of the incision. Thus, the vertical arm of the incision should be placed posterior to the carotid artery. The cosmetic result is improved by giving the vertical arm a slightly S-shaped curve.⁴ Attie suggested a transverse incision for radical neck dissection for nonthyroid cancer several years later. In his experience, if the incision is extended sufficiently, the submandibular triangle is readily accessible.¹¹ A single transverse incision extending from the anterior border of the trapezius muscle at the level of the cricoid cartilage is often used for total thyroidectomy and comprehensive neck dissection and provides excellent cosmesis and exposure. This is facilitated by the fact that level I is usually not involved. Occasionally, however, even an extended incision fails to provide sufficient access. The vascularization of skin flaps is random in pattern, and its viability is supported by the vascularization of the platysma muscle as the skin is raised in a subplatysmal plane. However, if bilateral conservative neck dissections are planned, the viability of the flap should be secured by not extending the lower border of the skin flap caudal to the

supraclavicular area and by preserving the facial and the occipital arteries. Moreover, in unilateral neck dissections, another incision design should be chosen such if defects have to be repaired at the base of the flap, as oral tumors have invaded the skin, or if the skin or the platysma muscle adherent to underlying lymph nodes has to be removed. Transverse neck incisions such as the MacFee incision do not offer a similar quality of overview of the operating field, and the extensive use of retractors can cause marginal ischemia.^{11,12} Moreover, the scars of these transverse incisions are visible and are not as easily covered. Dancey and Srivastava suggested placing the longitudinal portion of the incision behind the anterior border of the trapezius muscle, whereas the transverse portion is placed 2 cm below the clavicle. 2 patients out of 16 developed marginal skin necrosis but otherwise results were satisfactory¹³. A study was conducted on 18 patients to evaluate both aesthetics and access of an incision which was placed in a low skin crease in the neck extending to the mastoid process laterally and crossing the midline by 2–3 cm below the thyroid cartilage to the opposite side. It provides good access with an acceptable aesthetic outcome and heals with minimal contracture of the scar. Extension across the midline obviates the need for a vertical incision superiorly to access the contralateral node in the neck. There were no cases of wound breakdown or infection. There was no record of any difficulty in accessing all levels of the neck through the incision.¹⁴

CONCLUSION:

Management of cervical lymph nodes becomes a vitality important component of the overall treatment strategy for patients with cancers of the head and neck. Choice of neck incisions is necessary for good wound healing, disease free survival thus affecting overall prognosis. Hence a thorough knowledge of neck incisions can be used to its advantage and increase its feasibility of usage. The modified, Schobinger incision, modified Macfee incision and reverse hockey-stick incision can all thus be used to obtain adequate exposure of the lymphatics. The first preference should be adequate clearance in case of surgical resections but when cosmesis is of utmost importance then the Macfee incision, reverse hockey-stick incision and single transverse incision are the incisions which can yield better esthetic as well as surgical outcome. Hence the choice of neck incisions should be based on basic oncological principles thereby contributing a better quality of life.

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