# Transverse Incisions for Neck Dissection *

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CARCINOMAS about the face and mouth were treated by excision long before any special attention was given to the regional lymph nodes. Butlin,[2] who is often quoted in connection with benign and malignant lesions of the tongue, has listed a number of operations for carcinoma performed in the 18th and even the 17th century. The surgeons of that era, however, were concerned chiefly with methods of gaining access to the primary tumor and control of hemorrhage.

One of the first to mention an incision of the neck in connection with a tumor of the mouth was Regnoli,[11] of Pisa. In 1838, he described a T-shaped incision made under the chin for the removal of a tumor of the tongue. Lymph nodes were not mentioned. In 1880, Kocher [8] described an incision made in the side of the neck for removal of a tumor of the tongue through the floor of the mouth (Fig. 1). In connection with excision of the tongue lesion, he recommended inclusion of the proximal lymph nodes, and appears to have been the first to do so.

The publication, in 1898, of Kuttner's [9] exhaustive work on the anatomy of the lymphatics of the tongue and their relationship to the spread of cancer, was followed by a growing appreciation of the need to remove, not only the primary tumor, but also the lymph nodes which drain the area.

The importance which Halsted [7] attached to the regional lymphatics, in his operation for cancer of the breast, also had its influence. In 1905, Crile [4, 5] adopted a similar policy with respect to cancer of the head and neck. His working principle was stated as follows: "Judged by analogy and experience, the logical step is that of block dissection of the regional lymphatic system as well as the primary focus on exactly the same lines as the Halsted operation for cancer of the breast."

As neck dissection became generally accepted as a necessary part of the treatment of cancer about the face and mouth, a variety of skin incisions were introduced to provide a suitable approach to the cervical lymphatics [1, 3, 4, 6, 8, 9, 10, 12-16] (Fig. 1). Some of these are in current use, either in the original form or with modifications; others are of historical interest only. No specific incision or combination of incisions has received universal acceptance.

An approach to the cervical lymphatics, which I have used since 1947, is through transverse incisions. In common with other incisions, this approach has certain advantages and certain disadvantages; its appraisal will vary with the technical skill and surgical philosophy of those who try it.

## Transverse Incisions

As a rule, two incisions are made, one in the upper neck, the other in the lower (Fig. 2, 3). The upper incision begins approximately 2.5 cm. below and 2.5 cm. behind the tip of the mastoid process. It is carried downward and anteriorly, about 2.5 cm. below the angle of the mandible, then forward along a line approximately parallel to the lower margin of the mandible but diverging slightly from it. The incision crosses the midline at the level of the hyoid bone

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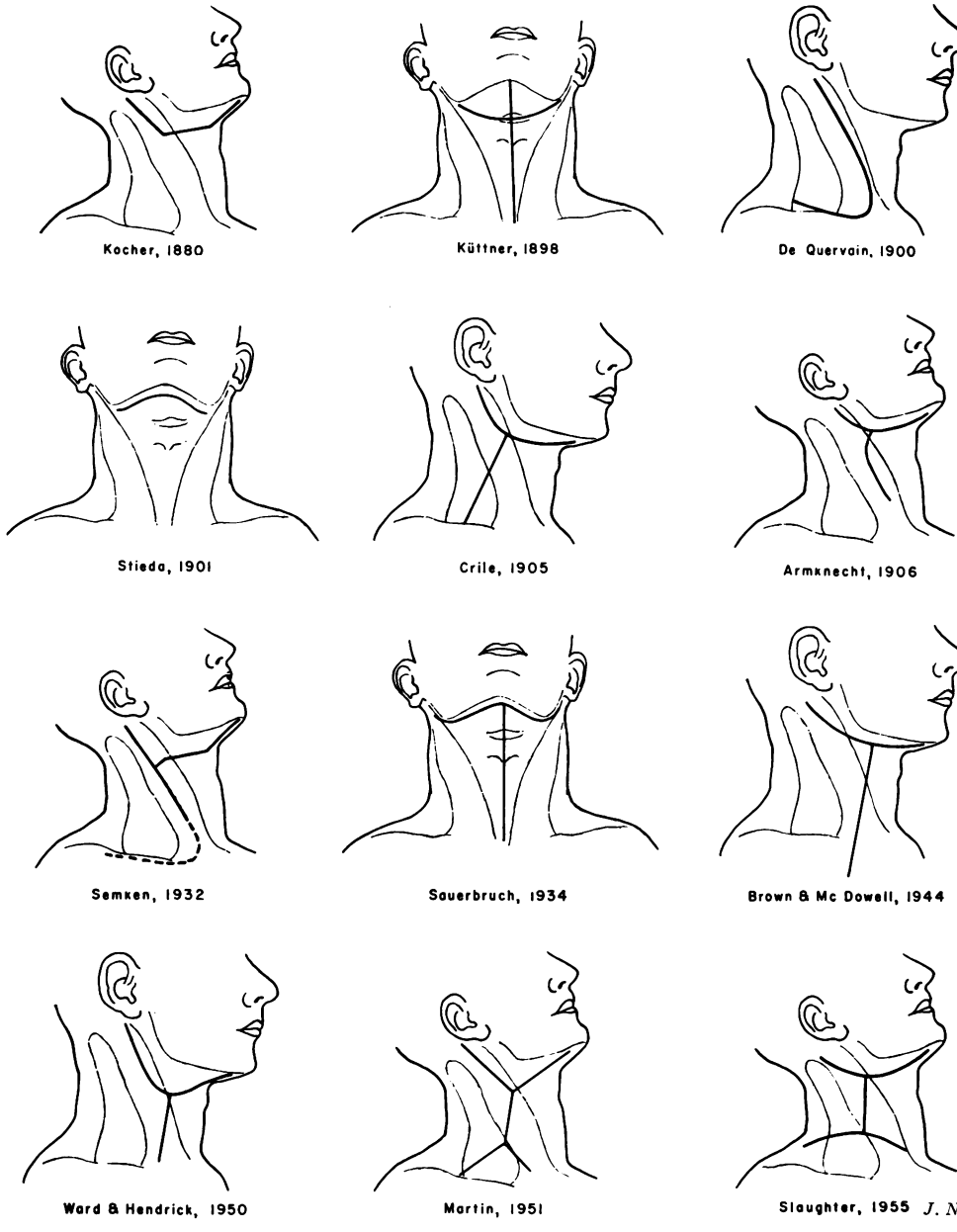


FIG. 1. Incisions which have been introduced for partial or complete lymph node dissection. Kocher's incision was designed primarily for the removal of the tongue through the floor of the mouth. The local lymph-node dissection appears to have been incidental, at least in the beginning. Crile's incision is designed for complete neck dissection and has found wide acceptance. There have been many modifications of the original incision.

Martin's double-trifurcate incision provides wide exposure of the operative field and is the preferred incision in many clinics. Semken's incision is adaptable to dissection of the anterior triangle alone, or to complete neck dissection. The portion of the incision shown in solid line is adequate for dissection of the submental and anterior cervical triangles. For dissection of the posterior triangle, the incision is extended along the course of the dotted line.

and ends on the opposite side of the neck approximately at the point where the intermediate tendon of the digastric muscle passes over the hyoid bone.

The lower incision is made approximately 3.5 cm. above the clavicle and parallel to it. Anteriorly, the incision extends over the medial border of the sternocleidomastoid muscle; posteriorly, it ends about 2.5 cm. beyond the anterior margin of the trapezius muscle. In depth, both the upper and lower incisions extend through the platysma, but not deeper.

### Exposure of Operative Fields

*Anterior Triangle.*—The exposure of the anterior and submental triangles is usually begun at the superior margin of the upper incision and is conducted at the level of the deep surface of the platysma, which is included in the flap. The dissection is extended upward to a level about 2 cm. above the lower margin of the mandible, uncovering the entire submental triangle, the lower pole of the parotid gland and the insertion of the sternocleidomastoid muscle.

Exposure of the lower part of the anterior triangle is then begun at the inferior margin of the upper cervical incision and conducted downward. In the anterior direction, the dissection should be carried to a line slightly beyond the superior belly of the omohyoid muscle and parallel to it. Posteriorly, the dissection should extend about 2.5 cm. beyond the anterior margin of the trapezius muscle. Inferiorly, the deep surface of the platysma should be followed downward as far as possible, usually a few centimeters below the level where the central tendon of the omohyoid muscle passes under the sternocleidomastoid muscle.

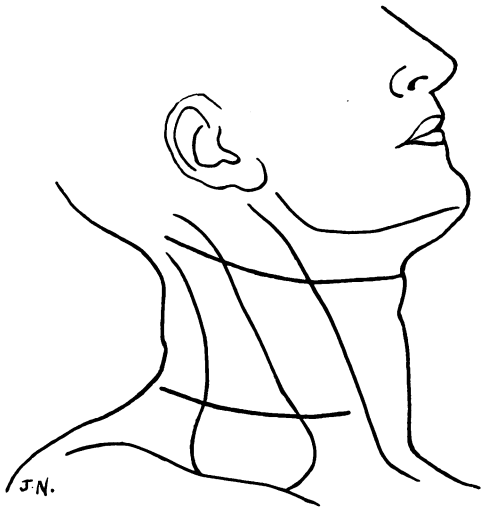


FIG. 2. Lateral view of upper and lower transverse incisions through which complete neck dissection may be performed. The upper incision, alone, is adequate for dissection of the submental and anterior cervical triangles.

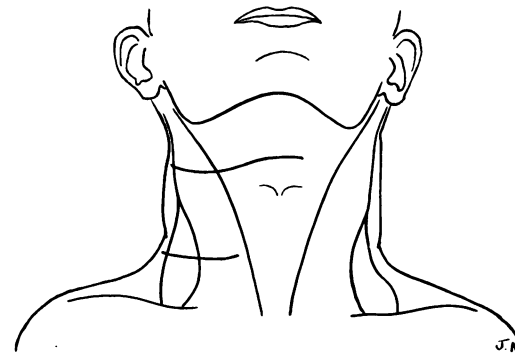


FIG. 3. Anterior view of incisions. The upper neck incision is carried across the midline to permit exposure of the submental triangle.

If dissection of only the anterior cervical and submental triangles is planned, the dissection outlined will provide adequate exposure (Fig. 4).

*Posterior Triangle.*—If dissection of the posterior cervical triangle also is contemplated, the upper and lower margins of the lower (supraclavicular) incision are dissected up from the underlying structures, also at the level of the deep surface of the platysma. As dissection of the upper margin proceeds, the field of dissection already established over the anterior triangle is entered and the strip of skin and platysma lying between the upper and lower neck incisions becomes a double-pedicled flap with the anterior pedicle lying along the course of the superior belly of the omohyoid muscle and the posterior pedicle attached along the course of the anterior margin of

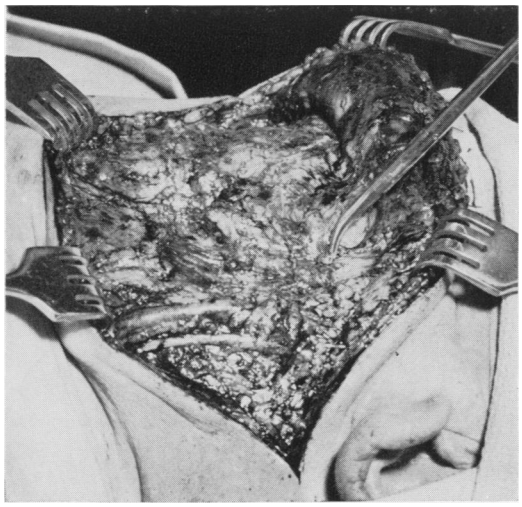

FIG. 4. Photograph taken at operation showing ample exposure of submental and anterior triangles through upper neck incision. The hemostat points to the angle of the mandible.

the trapezius muscle. During the subsequent dissection, of either the anterior or posterior cervical triangle, this flap can be displaced upward or downward quite easily according to the need of working space (Fig. 5–7).

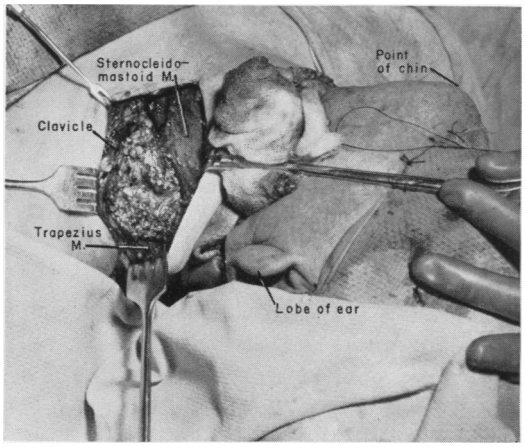


FIG. 5. Photograph showing exposure of contents of posterior cervical triangle through lower cervical incision. Working space is gained at the apex of the triangle by upward retraction of the mobile double pedicled flap of skin and platysma lying between the upper and lower incisions.

Dissection of the anterior triangle has been completed, with the exception of a posterior inferior pedicle, which connects its contents with those of the posterior cervical triangle. The mass of fat and lymph nodes from the anterior triangle are wrapped in gauze to prevent contact dissemination.

FIG. 6. Dissection of the posterior triangle has been partially completed and the contents of the anterior triangle, connected by a pedicle to the posterior, are about to be passed under the sternocleidomastoid muscle.

The inferior margin of the lower-neck incision is dissected downward to the clavicle, following the deep surface of the platysma. The anterior limit of exposure is the sternocleidomastoid muscle; the posterior limit is the margin of the trapezius muscle; and the inferior limit is the clavicle. Exposure is now sufficient to permit complete dissection of the posterior triangle (Fig. 5).

With the freeing of skin, fat and platysma over the anterior and posterior cervical triangles completed, the entire area becomes accessible for any of the usual types of neck dissection. The ease with which the dissection is accomplished depends, to a considerable extent, upon whether the neck is long or short, lean or fat.

*Wound Closure.*—After the neck dissection has been completed (Fig. 8), the wounds are closed, preferably in two layers. The platysma, where it exists, is approximated with fine plain gut interrupted sutures, and the skin is closed with interrupted silk (Fig. 9). Drainage is provided by small rubber dam drain of the Penrose type, or by a small catheter to which gentle suction is applied.

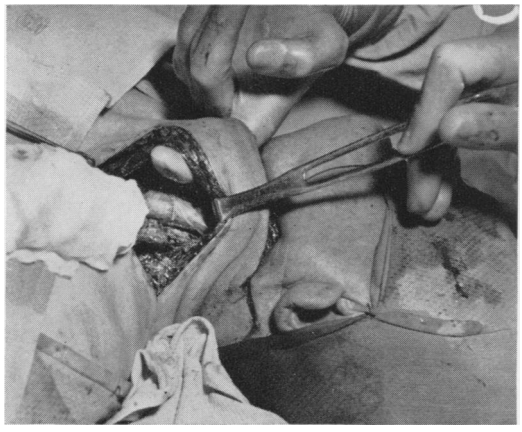

FIG. 7. The mass of fat and lymph nodes from the anterior triangle, enclosed in gauze, now lies below the sternocleidomastoid muscle in continuity with the contents of the posterior cervical triangle. The internal jugular vein is seen in the center of the wound.

*Wound Healing.*—In approximately 50 consecutive neck dissections done through tranverse incisions, there has been no ischemic sloughing of wound edges nor of the central double-pedicled flap. In a recent case of carcinoma of the tongue, excised in continuity with the cervical lymph nodes, there was severe infection and separation of about half of the lower neck incision, but no loss of tissue.

## Discussion

It is probable that the incisions now most commonly used are those described by Crile, Semken and Martin (Fig. 1), including a variety of modifications. Each of the three incisions gives good exposure of the operative field which, of course, is the consideration of primary importance. A matter of secondary, but none the less of real importance to the patient, is his appearance after the operation is finished. The elation which follows riddance of his disease may be dampened to some extent if the patient is left with embarrassing deformities and scars which make him reluctant to appear in public. His disfigurement may become not only a social and esthetic handicap but also may interfere seriously with his ability to secure employment.

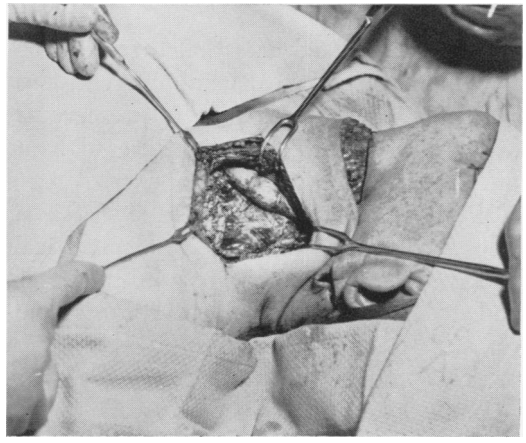

FIG. 8. Dissection of both the anterior and posterior triangles has been completed. Note mobility of the strip of skin and platysma lying as a double pedicled flap between upper and lower cervical incisions. The internal jugular vein is seen in the posterior triangle.

It hardly can be said that any price is too great for the cure of cancer, but the cost, as measured in deformity and disability, should not be greater than is necessary. Our concentration on therapeutic achievement may sometimes cause us to be insufficiently mindful of the problems we create for the patient who has been treated successfully for cancer but left seriously dis-

FIG. 9. Incisions closed. A small Penrose drain protrudes from the lower incision. Subsequent healing was by primary union with minimal distortion and inconspicuous scars.

figured. It is indeed true that there can be no compromise with cancer, but it is also true that much can be done to preserve or restore the patient's appearance without compromising the prospect of cure.

With respect to wound healing, it is a well recognized principle that vertical (longitudinal) skin incisions in the neck tend to heal with excessive fibrosis and contracture, and the resulting scars frequently stand out prominently as unsightly cicatricial cords. It is likewise well known that slightly oblique or transverse incisions usually heal with minimal scarring. Whether the scars following neck dissection lie vertically or transversely is unimportant so far as the cure of cancer is concerned, but it makes an appreciable difference in the subsequent appearance of the patient.

It was recognition of this fact that led to the trial of transverse incisions as an approach to the cervical lymph nodes. Hope was entertained that the exposure, though more difficult, would prove adequate and that the cervical scars would be less conspicuous.

## Summary

1. Transverse incisions for cervical lymph node dissection are described and illustrated.

2. The method of uncovering the field of dissection is presented in some detail; the actual lymph-node dissection is not elaborately discussed.

3. Transverse incisions are adaptable to any of the usual methods of neck dissection.

4. There are no crossing or converging of incisions and no angles, with questionable blood supply, are created.

5. Neck dissection through transverse incisions is more difficult and requires more time, but better wound healing reduces postoperative dressings and other time-consuming care.

6. The scars following transverse incisions lie approximately parallel to the normal skin creases and are relatively inconspicuous.

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