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The postero-lateral cervical flap

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Abstract

THE role of regional flaps in the repair of oral defects is discussed, and the flaps most commonly used described. An undelayed postero-lateral flap offers a useful alternative for the repair of oral defects.

Introduction

In the last decade or two operations for head and neck cancer have been characterized increasingly by the use of regional flaps for the replacement of large tissue defects. In particular, resections of the framework and contents of the oral cavity lend themselves to reconstructive techniques using regional flaps, and in some centres transposition of a flap has come to be regarded as an essential and routine part of every major operation for the resection of oral carcinoma.

One cannot help but wonder, in view of the age and poor health of some of the patients undergoing this form of surgery, to what extent such wholesale use of flaps is beneficial or indeed necessary. Perhaps the time has come to try and appraise the value of flaps in the context of oral repairs, and to compare the advantages and disadvantages of the more popular flaps in current use. The postero-lateral cervical flap provides a useful and attractive alternative for the repair of oral defects, and a description of this flap with its merits and liabilities follows further on.

Prior to the introduction of flaps, repair was achieved by the approximation of mucosal edges in such a way that the remaining oral structures were stretched and distorted. The tension produced by such approximation, when combined with devitalization of tissues resulting from previous radiotherapy led to wound breakdown and fistula formation. The ensuing scarring produced a rigid tethering of tissues which placed a serious restriction on the movement of intra-oral structures. The end functional result in regard to speech and deglutition, after this type of repair, left a great deal to be desired, and undoubtedly aroused interest in the use of flaps as a replacement of oral tissue defects. The choice of individual flaps was dictated by a number of factors such as the size of the defect to be bridged, the availability of tissue for replacement, its blood supply, and whether the flap itself created additional cosmetic or functional deficits.

It soon became apparent that one very important asset common to flaps transposed into the mouth was that of inducing rapid healing in the absence of infection. Presumably, the adequacy of the blood supply and

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the obviation of tension are the operative factors in preventing wound breakdown, which is all too common when irradiated tissues are approximated under tension.

Soon after the introduction of flaps, their role in lessening the speech impediment of glossectomy became more widely appreciated. It was recognized that the presence of a flap alongside the remaining tongue stump allows the latter to lie in an undistorted position. It is this probably, rather than any increased mobility conferred on the tongue remnant by the flap, which is responsible for lessening the speech impediment. For undoubtedly with the passage of time, the elasticity of the flap diminishes with underlying scarring and tongue mobility becomes somewhat restricted, and yet curiously the quality of speech may well be maintained or even enhanced.

However, in the absence of reliable methods of appraisal, it is difficult to judge precisely in any given case the extent to which a flap has lessened a speech impediment, especially when it is recognized that variables such as intelligence, determination and perseverance may contribute to the final outcome. One should perhaps mention that the enthusiasm with which flaps were at first greeted has been tempered by the realization that to the patient any departure from normal, no matter how trivial, is an imperfection to be resented.

Regarding deglutition, the evidence suggests that any benefit provided by intra-oral flap transposition is minimal. Certainly in the writer's opinion, deglutition does not seem to be any less difficult when flaps are used. Furthermore, there is a tendency for food particles to lodge and stagnate in the sulcus formed by a flap alongside the tongue, particularly when this is deep.

More recently, the value of flaps in providing cover for mandibular implants, both artificial and autogenous, has come to be appreciated. There is little doubt that extrusion of implants occurs much less frequently when cover in the form of a flap is provided, especially if insertion of the implant is delayed until such time as healing between the flap and the adjacent mucosa has taken place.

Types of flap available for use inside the mouth

Mucosal flaps mobilized from within the mouth are very rarely used. They are disappointing on three counts; namely, their limited surface area, their relative lack of manoeuvrability, and the tendency to flap necrosis. Tongue flaps on the other hand offer a much larger bulk of tissue for transposition, are safer from the point of view of blood supply and handle very flexibly. The restriction on articulation imposed by this type of flap constitutes the chief objection to its more frequent use.

Cutaneous flaps are by far the most commonly used flaps for oral repair. The donor sites available for this purpose are the forehead, the anterior chest wall and the neck. The forehead flap is probably the most widely used and with good reason. It offers a large surface area for the

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resurfacing of intra-oral defects, and it can be transposed if necessary on a very narrow pedicle, to include little more than a strip of skin with the underlying superficial temporal vessels. The mobility provided by its long narrow pedicle make it easy to transpose into the mouth. It is sturdy and, provided care has been taken not to injure its vessels, it is unlikely to perish. The elevated position of the stoma through which the flap enters the mouth, makes egress of mouth contents unlikely. The main disadvantage of the forehead flap is the unsightly appearance of the split-grafted donor site which is shiny, featureless and often sunken.

The delto-pectoral flap offers a vast surface area of elastic skin for use within the mouth, and its blood supply is such that it very rarely necroses. It is most useful for resurfacing central arch defects, but its dependent position and weight are features which predispose to leakage of saliva on the one hand, and flap separation from the oral tissues on the other.

Cervical flaps are most commonly mobilized from the lateral and posterior aspects of the neck. They may on occasion incorporate underlying muscle such as the sternomastoid. They do not enjoy the same measure of popularity as the forehead and deltopectoral flaps, and the reason for this is twofold. In the past surgeons were reluctant to commit skin overlying a radical neck dissection to distant sites, as resurfacing of the neck had then to be accomplished either by a split skin graft, an unattractive method of cover, or by advancing full thickness skin from an adjacent site which added further to the operation. Secondly, cervical flaps have a reputation for tip necrosis if moved without prior delay, but delay reduces the flap's elasticity and prolongs the duration of hospitalization.

The nape of neck flap popularized by Conley (1976) provides a large surface area for repair but its base, which lies roughly between the mastoid process and the midline of the neck posteriorly, limits its manoeuvrability and it is therefore much less useful for transposition into the mouth. Its main use therefore is in the repair of forward surface defects of the neck. Failure to delay this flap frequently leads to loss of its distal segment.

The lateral cervical flap, which is based between the angle of the mandible and a point close to the midline of the neck posteriorly, covers both the posterior triangle and part of the anterior triangle of the neck. In Conley's opinion the upper hair-bearing part precludes its use in the mouth in males. Transposition forwards necessitates substantial cover for the carotid arterial tree.

In the writer's opinion cutaneous flaps are valuable in the repair of large oral defects from the point of view both of encouraging rapid healing and of lessening speech impediments. The disadvantages of the forehead and delto-pectoral flaps have prompted a second look at cervical skin flaps and their potential for resurfacing oral defects. A flap which can best be described as a cross between a nape and a lateral cervical flap has been designed and successfully used for intra-oral repair in thirteen out of sixteen patients. It is referred to as the postero-lateral cervical flap.

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The postero-lateral cervical flap

The flap is based superiorly on a line joining the angle of the mandible with a point between the mastoid process and the mid-line of the back of the neck. This latter point must be sufficiently posterior to include the occipital artery in the base, and, with the posterior auricular artery and the branches of the external carotid artery which perforate the parotid gland, the flap is endowed with a rich blood supply. For this reason it need not be delayed. The upper third curves backwards and downwards against the skin tension lines thus making this part of the flap relatively inelastic. The middle third of the flap inclines vertically downwards and the lower third curves forwards and downwards and includes the skin over the trapezius and the lateral part of the posterior triangle of the neck (Fig. 1 and Fig. 2). This skin is elastic and therefore ideal for use inside the mouth. The ratio of length to breadth must not exceed 2:1 and because the flap is curved there is a danger that this ratio may be exceeded, particularly in regard to the posterior limb of the flap. This limb should start just within the hair line and follow the latter almost to the midline posteriorly before curving downwards and forwards. The anterior limb mirrors the curvature of the posterior limb.

The flap is introduced into the mouth through an oro-stome at the angle of the mandible. The masseter muscle should be elevated off the lower part of the ascending ramus of the mandible to permit free passage of the flap into the mouth. With the flap sutured in place inside the mouth the upper anterior corner is sometimes bunched up into a dog ear just outside the oro-stome.

The donor site may be covered with a split skin graft or by skin advanced upwards from the upper anterior chest wall. When the pedicle of the flap is divided and returned to the donor site three to four weeks later,

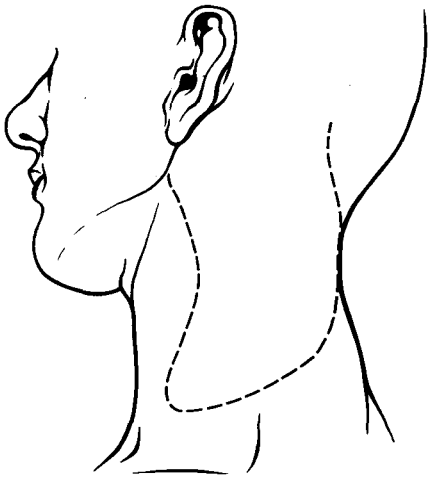


FIG. 1

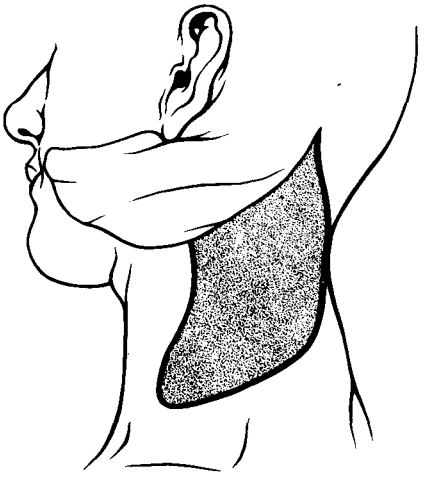


FIG. 2

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the oro-stome is closed in two layers and the dog ear opened up to allow the pedicle to fall back into its original position.

Comment

Apart from the advantage of being able to use the flap undelayed, it has the merit of a donor site which is relatively inconspicuous, being partly hidden by the hair in the female and partially concealed by the collar in the male. Oral defects extending from the angle of the mandible to the midline anteriorly can be covered by this flap, the elasticity of the distal supra-clavicular skin being an asset in this respect. There are two possible disadvantages. Firstly, the middle third of the posterior limb of the flap, being close to the midline of the back of the neck, makes the raising of this part of the flap somewhat awkward. Secondly, the spinal accessory nerve lies very close to the undersurface of the distal third of the flap and great care must therefore be taken not to injure it.

The flap has been used undelayed in sixteen patients, eight of whom were irradiated. In three patients, all irradiated, the distal part of the flap perished.

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CONLEY, J. (1976) Regional Flaps of the Head and Neck. W. B. Saunders Company, California.

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