

A new method of resurfacing the lip

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Summary—The whole lip can be resurfaced with sensate musculo-mucosal flaps taken from the cheeks. These flaps can be combined with major resection of the whole lip curtain. The return of sensation is of particular benefit to elderly patients who make up the greatest number of patients in the series.

Vermilionectomy is widely accepted as a prophylactic operation for the removal of diffuse dysplastic changes on the lip. It may be combined with wedge resection of the lip for small carcinomas and with a variable amount of muscle (in depth) along the lip. The method of repair described in this paper adds to the other methods of repair and can be "tailored" to replace the variable requirements of resection for different clinical situations.

Prior to 1983 the senior author (C. Rayner) used simple paired mucosal flaps from the cheeks. The viability of these flaps was erratic, although satisfactory results were sometimes obtained. In order to improve reliability, a small amount of muscle was included in the proximal 1 cm of the pedicle. Three cases were treated in this way.

It was soon realised, however, that a strip of underlying muscle could safely be left along the whole length of the mucosal flap and that it was technically easier to raise a musculo-mucosal flap off the cheek fat than it was to raise the mucosa alone from the underlying muscle. It was also hoped that mucosal viability might be enhanced by the inclusion of muscle along the whole length of the flap.

Material and methods

Twelve patients have had lower lip reconstruction with buccal musculo-mucosal flaps. This report concerns itself *only* with the restoration of lip cover; function and sensation.

Operative technique

The operation can be undertaken under local anaesthetic if necessary (*i.e.* if the patient is a poor anaesthetic risk). The vermilion is resected as

clinical circumstances dictate and can include the white roll and shaving of lip muscle (McGregor, 1966). If clinically acceptable, 2 or 3 mm of mucosa at the angle of the lip can be spared.

The flap is designed (Fig. 1) after the opening of the parotid duct has been identified. (The parotid can be milked to produce a flow of saliva.) The flap is based at the angle of the mouth; the distal end is just below the parotid duct and the upper margin is drawn to join these points. The lower margin is drawn 1 cm below and parallel to the upper. At this time, the cheek mucosa is being retracted and the surgeon's finger is pressing on the exterior of the cheek—the mucosa is, therefore, somewhat stretched at right angles to the long axis of the flap and care must be taken to allow for this in the flap design. Paired flaps of sufficient length to cover half



Fig. 1

Figure 1—Design of the flap. The lower edge of the flap joins the posterior excision line of the lip vermilion. The upper edge of the flap stops 1 cm short of the vermilion excision, *i.e.* there is an intact mucosal bridge.

the lip are then raised in the plane between cheek muscle and fat. The flaps need to be transferred through approximately 120° to lie on the lower lip where they are sutured into position (Fig. 2). The

secondary defect closes easily in the occlusal line and this should be done before the lip is covered with the flaps. Care must be taken when suturing the flaps not to overstretch them (allow for swelling)

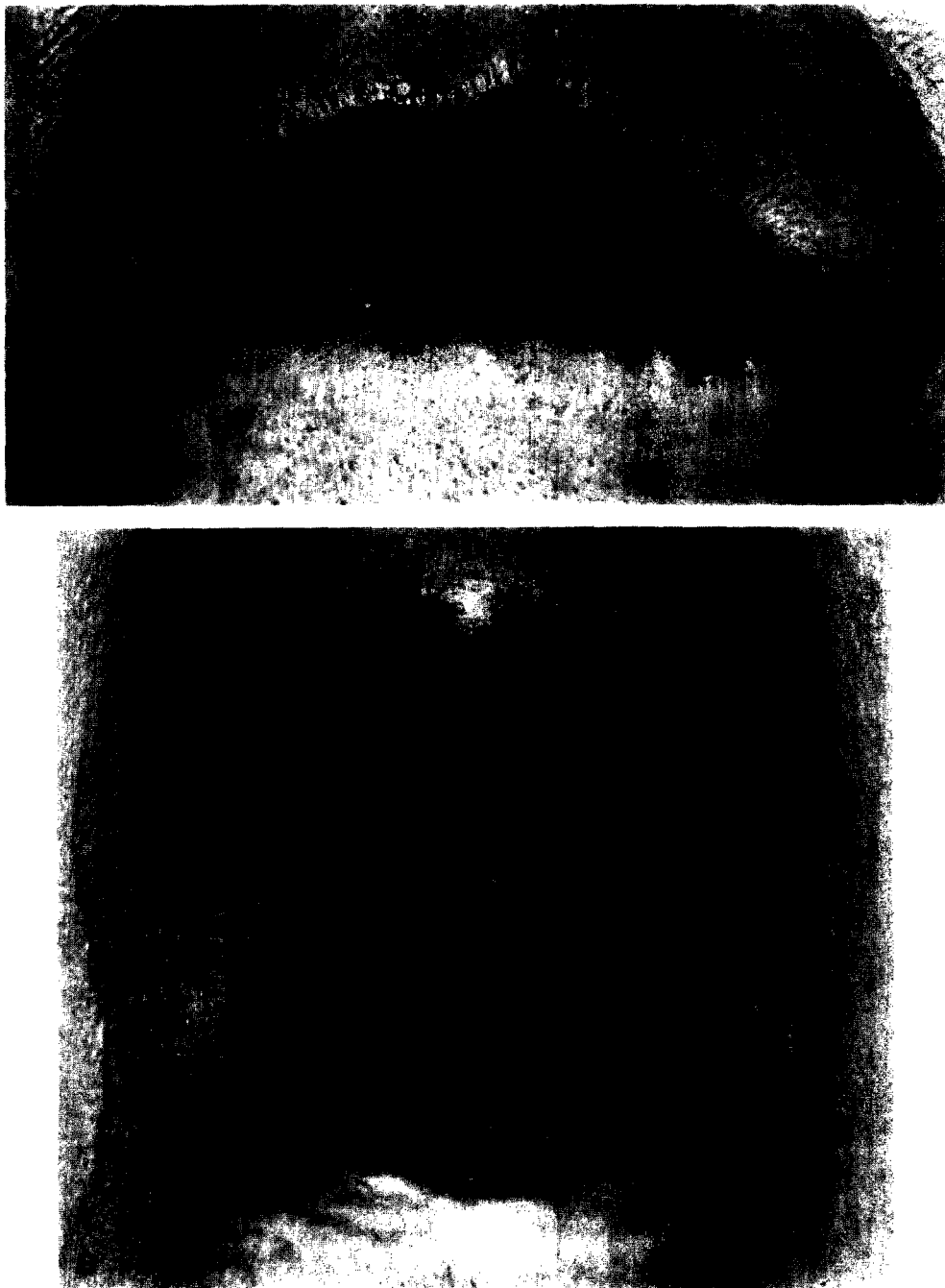


Fig. 2

Figure 2—(A) Flaps sutured into position. (B) Healed at 3 months (same patient as Figure 1).

and vertical mattress sutures can be used which pick up the submucosa at the cut edge and do not enter the substance of the flap.

Anatomical and histological studies

A cadaver dissection of the mouth/cheek area was undertaken.

In two patients small slivers of buccal mucosa and underlying muscle were obtained at operation from the edge of the cheek defect after the flaps were raised. The specimens were pinned out and prepared—(a) stretched as far as possible, (b) totally retracted, (c) intermediate tension. The specimens were stained with H & E.

Results

Healing. Seven lips healed in an uncomplicated fashion. Three patients suffered small areas of central loss of lip, two of which were easily corrected with minor adjustments. One did not require correction. Two more had minor notching.

Sensation. Three patients tested for sensation on the mid-lateral aspects of the lip had tactile awareness on the first postoperative day. At two weeks others were noted to have recovered sufficient sensation to identify touch and some temperature discrimination. None suffered from secondary trauma.

No patients suffered from drooling once healing was complete.

Anatomical dissection. A small artery arising from



Fig. 3

Figure 3—Vessel at angle of mouth. This vessel lies close to the fat/muscle junction at this point.

the angle of the mouth which entered the muscle in an upward oblique direction, equivalent to the long axis of the flap, was identified. We had previously noted this vessel at operation (Fig. 3). Within the cheek substance there is a complex vascular plexus between branches of the facial and maxillary arteries. We believe the vessel we have noted to be a communication between the buccal artery (second part of the maxillary artery) and the inferior labial artery (facial artery).

Histology. The oral mucosa was seen to rest on an areolar layer approximately the same thickness as the mucosa itself. This is a highly vascular layer with corkscrew-shaped vessels running vertically between muscle and mucosa (Fig. 4A). A number of glandular structures lie in this layer and also in intimate contact with the basal layer of the mucosa. The junction between the basal layer of mucosa and areolar tissue is irregular even when the specimen is forcibly stretched out (Fig. 4B).

Discussion

Resurfacing of the lower lip by mucosal advancement from the inferior labial sulcus may result in a thin lip with dysfunction related to the need to stretch the mucosa against and over the pliable soft tissues of the lip. It can only be used in simple shaving procedures. Prolonged lip numbness and secondary trauma are common. The pedicled tongue flap (Bakamjian, 1964) is a two stage procedure that gives an excellent static lip but again prolonged numbness may be a problem and transverse compliance of the mouth may be reduced. The new technique can be easily tailored to give bulk to the lower lip and can be combined with more extensive lip resection.

An unexpected postoperative finding in our series was the preservation of sensation in the reconstructed lips. As this had not been anticipated, the early patients in the series were not evaluated immediately postoperatively. The buccal mucosa receives its sensory supply from the trigeminal nerve. Fibres of the trigeminal nerve join the buccal branch of the facial nerve and the final branches run with the blood supply. Stranc and Fogel (1984) suggested an objective method of assessing lip function but this is not practicable in the early postoperative days. We believe that qualitatively the sensation of the buccal mucosa has close similarities to lip sensation as the functional integrity of cheek muscle and closely



Fig. 4

Figure 4—Photomicrographs of vertical section(s) of the buccal aspect of the cheek(s). (A) Note the vertical vessel in the areolar layer. (B) Note the glands in the areolar layer and adjacent to the basal layer of mucosa, and the irregular interface between mucosa and areolar tissue. The configuration of mucosa/submucosa remains the same, irrespective of the degree of stretch.

applied mucosa would seem to require both structures to have a closely co-ordinated nerve supply. Thus it should not be a great problem for patients to interpret sensation in the reconstructed lip. All the patients in the series were over 50, some with serious respiratory problems. None was troubled

by significant drooling 1 month postoperatively and none experienced secondary trauma due to lack of feeling once healing was complete.

Once the lips are healed, the flaps comply with lip movement if the orbicularis muscle is intact. If the orbicularis has been resected (three cases with

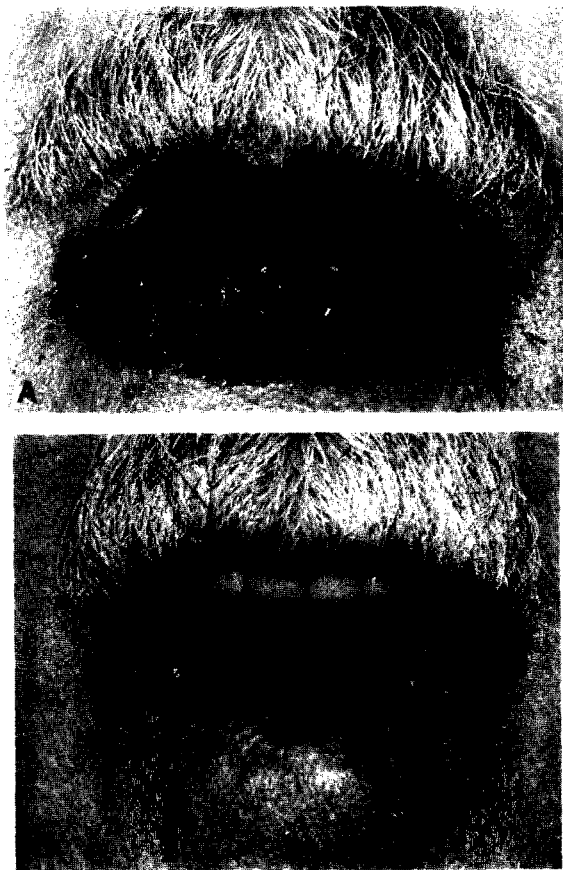


Fig. 5

Figure 5—(A) “Necrotic” lip postoperatively. (B) One month later without treatment.

half or more of the muscle removed) then scarring in the area limits lip excursion. It is therefore impossible to tell by clinical means if the muscle element of the flap retains any dynamic potential.

Is the presence of the small artery in the base of the flap critical to its survival? The histology of the mucosal/muscular junction shows a rich vertical plexiform arrangement of capillaries between the two. Anatomically the small sliver of muscle (probably part of the levator anguli oris) fuses with the muscles at the angle of the mouth.

It is probable that there is a microcirculation connecting the muscles at this point quite apart from the artery. We do not consciously look for the artery—if seen, it would be preserved for its ability to enhance the flap circulation and also because of its probable relationship to the nerve supply.

These flaps could equally well be used for repair

of the upper lip. We have not tried to use one flap for a whole lip length.

The flap described in this paper differs from other mucosal and musculo-mucosal flaps previously reported by being medially based at the angle of the mouth and transposed into position. Laterally based flaps must be advanced or rotated into position and are more complex to move.

There is a persistent tendency to drying of the lip for several months and patients must be instructed to use ointment regularly. Lip protective should be used against strong sunlight until the tendency to drying passes. It is easy to confuse surface shedding of the new lip mucosa and dried exudate with necrosis.

Three patients developed apparently necrotic areas centrally on the lip. Left alone these healed with little residual problem (Fig. 5). The configuration of the muscle/mucosa junction with many glandular elements and a vertical vascular plexus favours regeneration of the mucosa. It is well worth waiting for any apparent necrosis to separate spontaneously.

All of the patients have accepted the appearance of the lip. From an aesthetic point of view we have found that where the muscle component of the flap is thickest at the base of the flap, there is increased lip fullness near the angle. Where it is least bulky at the flap tip, the central lip may be slightly depressed. We have recently overcome this by consciously “banking up” the muscle of the flap in the centre of the lip at the time of inseting (and also by joining the two flaps obliquely at their tips).

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Paper received 28 April, 1986.
 Accepted 1 April 1987 after revision.