Variations of the Transposition Flap for Facial Reconstruction after Mohs Micrographic Surgery of the Basal Cell Carcinoma

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Background: The transposition flap is one of the most useful methods of facial reconstruction after Mohs micrographic surgery of the basal cell carcinoma, but occasionally some variations are needed.

Objective: We present our experience with several variations of the transposition flap to overcome the disadvantages of classic rhomboid flaps.

Methods: We performed the Webster 30-degree angle flap on the lower eyelid, the double 30-degree angle flap on the temple area and the nasolabial flap on the ala nasi.

Results: These variations of the transposition flap gave no complications such as ectropion, tissue distortion, protrusion, or trapdoor deformity.

Conclusion: The variations of the transposition flap in our cases might be of help in selecting the ideal method in facial reconstruction. (Ann Dermatol 7:(2) 134~137, 1995)

Key Words: Double 30-degree angle flap, Mohs micrographic surgery, Nasolabial flap, Transposition flap, Webster 30-degree angle flap.

The transposition flap is one of the most useful methods of reconstructing the facial defect after Mohs micrographic surgery. The principle behind the transposition flap is borrowing the skin laxity from the donor site and giving it to the defect site. If designed properly, it may be almost tension free. But the classic rhomboid flap often has some disadvantages, the dog ear deformity and tension of the unwanted site or tissue distortion. So we present our experiences with the variations of the transposition flap that overcome such disadvantages.

MATERIALS AND METHODS

Materials

Three patients who received Mohs micrographic surgery due to the basal cell carcinoma of the face were included in this study. The first patient was a 39-year-old male with a lesion on the right lower eyelid, the second patient, a 48-year-old male with a lesion on the right temple area and the third patient, a 58-year-old female with a lesion on the right ala nasi. The patients are summarized in Table 1.

Methods

1) Webster 30-degree angle flap (Case 1)

The Webster 30-degree angle flap was applied to reconstruct the skin defect of the lower eyelid. The size of the defect was 3.0 × 2.0 cm. The upper angle of the defect site (angle A) was designed to be 60 degrees as in the Limberg flap, and on the opposite side of the defect, an M-plasty was designed with a 30-degree angle to shorten the scar line. The lengths of line AB and line A'B' were the same, and the angle of the donor flap (angle A) which would be apposed to angle A was 30 degrees, the half of angle A (Fig. 1). The flap was marked using gentian violet on the skin in consideration of the relaxed skin tension line (Fig. 2). After incision had been done, hemostasis was done mediculously. The donor flap was transposed,
Table 1. The summary of the patients

<table>
<thead>
<tr>
<th>Sex/Age</th>
<th>Diagnosis</th>
<th>Duration</th>
<th>Site</th>
<th>MMS**(stage)</th>
<th>Tumor Size(cm)</th>
<th>Defect Size(cm)</th>
<th>Flap</th>
</tr>
</thead>
<tbody>
<tr>
<td>M/39</td>
<td>Basal cell Ca.*</td>
<td>5years</td>
<td>Right lower eyelid</td>
<td>3stage</td>
<td>0.6 × 0.9</td>
<td>2.0 × 3.0</td>
<td>Webster 30-degree angle flap</td>
</tr>
<tr>
<td>M/48</td>
<td>Basal cell Ca.*</td>
<td>10years</td>
<td>Right temple</td>
<td>3stage</td>
<td>1.3 × 1.7</td>
<td>3.0 × 3.5</td>
<td>Double 30-degree angle flap</td>
</tr>
<tr>
<td>F/59</td>
<td>Basal cell Ca.*</td>
<td>1.5years</td>
<td>Right ala nasi</td>
<td>3stage</td>
<td>1.1 × 0.9</td>
<td>1.7 × 2.5</td>
<td>Nasolabial flap</td>
</tr>
</tbody>
</table>

*Ca. : carcinoma **MMS. : Mohs micrographic surerg

Fig. 1. The design of Webster 30-degree angle flap (Case 1).

and the donor defect site was sutured first to relieve flap tension, and then the flap was sutured into its recipient site, pulling the adjacent skin toward the recipient site because the size of the donor flap was half that of the recipient site.

2) Double 30-degree angle flap (case 2)

To repair the 3.5 × 3.0 cm-sized defect of the temple area, a double 30-degree angle flap was designed using gentian violet (Fig. 4). The forehead and the cheek side of the defect were used for the flap donor in consideration of the relaxed skin tension line. Each flap was designed to be 30 degrees at the edge and to point in opposite directions with the defect in the center. After the incision was done, hemostasis was done. Then the two flaps were transposed centrally to fill the defect site together. The first key suture was done in the donor areas of both 30-degree angle flaps to force the flaps into the defect site. The next sutures were done between the two flaps to align them in the new position. And then the flaps were sutured to the recipient site.

Fig. 2. The Webster 30-degree angle flap was designed on the right lower eyelid (Case 1).

Fig. 3. Complications such as ectropion were not observed on the postoperative 40th day (Case 1).
3) Nasolabial flap (Case 3)

To reconstruct the 2.5 × 1.7 cm-sized defect on the ala nasi, the cheek skin adjacent to the nasolabial fold was used as donor. The Nasolabial flap was designed along the nasolabial fold to hide the scar line (Fig. 6). The Burow’s triangle was excised from the superior edge of the defect on the lateral side wall of the nose with its apex pointing toward the inner canthus to eliminate redundant skin at the point of rotation. The donor site and the entire surgical defect margin was undermined and the subcutaneous fat of the donor flap was thinned. Then the flap was transposed to the recipient site and sutured without tension.

RESULTS

The Webster 30-degree angle flap in case 1 could prevent ectropion (Fig. 3) and it was useful for this lower eyelid repair. No tension or tissue distortion resulted with the double 30-degree angle flap in case 2 (Fig. 5), so it was suitable for this large wound in a plastical area such as the temple area that had the difficulty of being closed with a single flap. In case 3, the nasolabial flap provided a good contour, color and texture match with no deformity in a single stage procedure (Fig. 7) for the repair of the defect on the ala nasi.

DISCUSSION

The transposition flap is widely used in reconstruction of facial defects. It borrows from the
excess available skin to fill the defect. The texture and color match is excellent because it uses the skin adjacent to the defect site.

One of the commonly used transposition flaps is the rhomboid or Limberg flap. This flap is designed so that the recipient site is rhomboid in shape with the angle of 60 degrees and the donor flap is also of exactly the same size and shape. Its use has been extensive ever since Limberg described it in 1966. However, it often has some disadvantages such as, closure of 60-degree angulation may produce compressive forces that result in significant protrusions (dog ear deformity) and it may result in some tension in the donor closure site and tissue distortion, and the same size of the resection site is needed as a donor flap.

The Webster 30-degree angle flap is a kind of modified Limberg flap. The differences are that the one angle which becomes the axis of flap rotation is 30 degrees and the size of donor flap is half that of the recipient. The rest of the defect is filled by second movement of loose tissue around the primary surgical defect, so that the tension in the donor defect closure site is reduced whereas the tension in the recipient site is somewhat increased. Because the flap angle is 30 degrees, any protrusion which can be seen in the Limberg flap is not observed in the donor defect closure site and the flap rotation angle. This flap can be used on almost any area of the body, if loose skin of just half the size of the primary surgical defect is available. The disadvantages of this flap are complexity of design and longer scar line, the latter being solved by the M-plasty.

The double 30-degree angle flap is used for the reconstruction of the defect in inelastic areas like the temple as in this case. The tension is shared by two areas in this flap, making the repair easier. And this flap is more preferable than the classic rhomboid flap for the large defects. But it has the disadvantage of leaving many sharply angular scar lines, thus limiting its use to the above indications, that is, the reconstruction of the defects in the inelastic areas and of the large defects.

The nasolabial flap is the one major flap that could repair the defects of the nose. The defect of the nose is reconstructed by using the excess skin of the cheek. The donor defect closure line coincides with the nasolabial fold, so the scar line can usually be hidden. But several problems may develop such as trapdoor deformity, tissue protrusion, obliteration of the natural concavity, and alar distortion. Thus we excised a Burow's triangle at the superior margin of the defect in order to minimize tissue protrusion, undermined the donor and surgical defect margin, and thinned the subcutaneous fat of the donor flap in order to minimize trapdoor deformity. Nevertheless, when the trapdoor deformity develops, triamcinolon acetonide suspension should be intralesionally injected, and occasionally surgical intervention such as excision of the contracted flap and replacement with a full thickness skin graft is needed.

We hope that our experience is of help to other dermatologists in selecting the ideal surgical repair method of the defect after cutaneous tumor removal.

REFERENCES