Chin IX: Unusual Soft Tissue Problems of the Lower Face

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ABSTRACT

When the editor asked me to write something related to the chin, I (B.M.Z.) told him I would like to concentrate on the soft tissue of the perioral and chin region, something previously not presented before in this Journal specifically or anywhere. Dr. Flores and I have chosen certain soft tissue cases of the lower face, each of which presents certain dilemmas. The reconstructive methods in each case are unique, previously not shown, and represent salvage from prior failures. Case 1 shows how an interior Abbe flap can be used for ipsilateral lip reconstruction. Case 2 shows how a large upper lateral lip elemental loss can be regained from cheek and not the lower lip. Cases 3 and 4 show how to regain proper white roll bulge and symmetry by overcorrection, then exact adjustment in a second stage. Case 5 shows how a failed chin/lip reconstruction can be salvaged to regain sulcus height and aesthetic unit reconstruction. Each case depicts unique reconstructive designs to produce an aesthetic final result.

KEYWORDS: Lip reconstruction, cheek reconstruction, deep-plane cheek flap

CASE 1: PORT-WINE STAIN MACROCHEILIA OVERRESECTED—WHERE DO YOU GET TISSUE?

The first case was a 25-year-old female nurse with a history of lower-lip port-wine stain macrocheilia. An outside surgeon reduced her lip by horizontal excision of the vermillion, resulting in an irregular contour of the lower lip with incisor show on the left (Fig. 1). The commissure to commissure distance was excessive.

Problems

1. Deficiency of the vermillion on the left side of the lower lip.
2. Excess horizontal length of the lower lip.
3. Incisor show.

Reconstructive Plan

1. Restoration of the left lower-lip vermillion deficit with an ipsilateral, interior, Abbe flap transposed 90 degrees to the left.
2. Resection of excess horizontal lower lip and donor defect from Stage 1.

STAGE 1

Deficient left lower-lip vermillion was restored by transferring an anteriorly based mucomuscular flap from the central lower lip, 90 degrees toward the left into the lower wet-line. The wedge-shaped central lip flap included vermillion and muscle, extending all the way to the sulcus. A horizontal incision made behind the wet line of the left lower lip allowed for reception, augmentation, and lifting this deficient area while preserving

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Craniomaxillofac Trauma Reconstruction 2009;2:141–150. Copyright © 2009 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA. Tel: +1(212) 584-4662.

Published online: May 27, 2009.

DOI 10.1055/s-0029-1224776. ISSN 1943-3875.

Figure 1 Case 1: Preoperative view. Bumpy horizontal resection of the vermilion on the left side and residual horizontal lower-lip excess is appreciated. The prior surgeon did not address the need to reduce the commissure-to-commissure distance.

texture to the vermilion. Transposition of the central lip flap resulted in restoration of bulk to the left lower lip and a central lower cleft at the midline (Fig. 2).

STAGE 2

A double-barrel wedge resection of the central lower lip simultaneously reduced the horizontal lower-lip excess and removed the whistling deformity created by the previous operation (Fig. 3). Debulking of the excess lower-lip vermilion was also performed at this stage.

Figure 2 Case 1: Central lip flap, based anteriorly, transposed to the left, augmenting the vermilion while preserving its texture. Note the whistling deformity at the midline.

Figure 3 Case 1: A double-barrel wedge resection simultaneously corrects horizontal lower-lip excess and removes the central lip deformity.

RESULT

Contour was improved to the lower-lip vermilion, with elimination of horizontal lower-lip excess and no incisor show (Fig. 4A,B).

Port-wine vascular malformations of the lower lip cause enlargement in the horizontal and vertical planes, and they may continue to enlarge after correction. Surgical interventions must correct the tissue excess in three dimensions.¹ Failure to correct port-wine stain-induced lip expansion in the horizontal dimension left the patient with lip droop, vermilion loss, and a long lip horizontally.

In the first stage, a previously undescribed, posterior variation of the Abbe flap was used. In its classic description, Abbe flap borrows full-thickness anterior lower lip to restore upper-lip defects. In this case, a partial-thickness interior Abbe is transposed to the ipsilateral lip, creating a central lower-lip cleft. A double-barrel excision of the horizontal lip excess concurrently removed the central lip deformity.

CASE 2: EXPANDING THE REACH OF THE DEEP-PLANE SCHRUDDE FLAP

Case 2 was a 58-year-old woman with recurrent morpheaform basal cell carcinoma excised by Mohs micrographic surgery (Fig. 5). The resulting full-thickness defect measured 3.5×2 cm and encompassed the inferomedial right cheek and superolateral aspect of the right upper-lip skin. The defect was covered with a full-thickness skin graft (FTSG) by an outside surgeon and the lining was closed primarily, leaving the patient with a "crater" deformity and a sneer (Fig. 6). The patient also complained of persistent drooling due to retraction of the right upper lip. The patient refused a lower-lip scar to reconstruct the upper lip.

Figure 4 (A) Case 1: Final result. Left lower-lip vermilion augmented and the horizontal lower-lip excess corrected. The donor site deformity was eliminated in the second operation. (B) Wedding photograph 3 years later.

Problems

1. Large upper-lip soft tissue defect extending onto the cheek with mucosal and skin deficiency.
2. Upper-lip retraction.

Reconstructive Plan

1. Deep-plane angle-rotation flap to restore the upper-lip defect (Fig. 7).

STAGE 1

The previously placed FTSG was excised, recreating the defect, and an intraoral transposition mucosal flap corrected the lining defect so the angle-rotation (Schrudde)

flap was elevated in the deep plane to cover the upper-lip defect with the cheek flap. The deep plane was used to maximize the blood flow, and therefore success of the flap, but Pribaz² has shown that a deep-plane dissection may not be required. Resection of the most medial aspect of the defect was performed by a partial-thickness wedge resection of the upper lip to reduce the medial defect size and allow the flap to move down properly (Fig. 7). The Schrudde flap³ was elevated in the subcutaneous plane below and behind the ear and in the deep plane across the face (Fig. 8). The flap rotated medially, and inferiorly covered the resulting defect. To prevent ectropion and descent of the flap, the deep dermis of the flap was attached to the periosteum of the malar eminence and the pyriform aperture.

Figure 5 Case 2: Wedge resection of medial cheek; the defect and upper lip will decrease the size of the defect and facilitate primary closure by the angle-rotation flap.

Figure 6 Case 2: Preoperative view. Contraction of the full-thickness skin graft combined with intraoral closure retracts the right upper lip, resulting in a sneer. Senior author (B.Z.) drew possible wedge resection that was not done.

Figure 7 Case 2: An angle-rotation flap is marked. This will be elevated in the deep plane over the cheek.

STAGE 2

Stage 2 entailed debulking of the Schrudde flap over nasolabial fold and along the inferomedial aspect of the incision line.

RESULT

The patient's cheek concavity was removed, her sneer was alleviated, and she no longer drooled. Scars were placed along the unit borders of the face, and there was a good color and texture match to the cheek (Figs. 9 and 10).

The Schrudde flap has the advantage of supplying a large area of cheek and neck skin to reconstruct defects of the cheek while not leaving any scars on the neck and chest, and it may be readvanced in future reconstruction, especially well noted by Joel Feldman (B. Zide, personal communication).^{2,3} The cheek and neck skin provide an ideal color and texture match for cheek defects. The resulting scars lie in the aesthetic unit borders of the cheek with the upper lip, nose, lower lid, and ear. The sub-/postauricular scar is well hidden behind the ear. The posterior auricular triangle design allows for medial rotation of the flap through primary closure of

Figure 8 Case 2: The angle-rotation flap is elevated in the subcutaneous plane below the ear and the deep plane across the face.

Figure 9 Case 2: Postoperative anterior view. An aesthetic contour has been restored to the right cheek. There is no sneer or a crater deformity. Flap support to canthal tendon and periosteum over malar prominence prevents ectropion.

the triangle defect. The fixation of the neck skin to the inferior conchal cartilage skin relieves the tension in the neck. Flap suspension to the periorbital area is critical in preventing traction of the lower lid and descent of the flap over time. The Schrudde flap was originally designed in the subcutaneous plane, but the deep plane increases its reliability.^{2,4,5} The senior author always uses the deep plane for medial suborbital and lip defects. This flap has been traditionally used to cover large defects in the lower eyelid and cheek.^{2,3} As noted before, the use of this flap to cover a defect affecting the upper lip was also described by Pribaz.² As the aesthetic junction of the cheek to upper lip is violated by this technique, the nasolabial depression can be created at the second-stage operation by debulking the area of the nasolabial fold as well as the alar-facial junction. The normal lip, just lateral to the alar-facial groove, must be flat. When advancing the cheek element medially, this flat contour must be recreated by defatting the corresponding area of the cheek flap to create a planar surface.

There are other reconstructive options available for large defects of the upper lip. If greater than 50% of

Figure 10 Case 2: The restoration of contour to the cheek can be best appreciated in this three-quarter view.

Figure 11 Case 3: Preoperative view. The vermilion has been advanced into the lower-lip skin, disrupting the white roll and crossing into another unit.

the upper-lip subunit is missing, the entire subunit may be replaced by a large Abbe flap templated from the normal side as described by Burget and Menick.⁶ Alternatively, a V-Y flap of nasolabial tissue, as described by Yotsuyanagi et al, may be templated from the normal upper lip and advanced into the defect, reconstructing the subunit in its entirety.⁷ The Yotsuyanagi method requires an intact facial artery, which was not present in this patient.

CASES 3 AND 4: PRECISE RECONSTRUCTION OF THE WHITE-ROLL

Case 3

Case 3 was a 23-year-old woman who presented after substance loss of the lower-lip vermilion/skin junction by a dog bite. The original lesion located on the subunit border was closed primarily, advancing the vermilion beyond the border of the white roll (Fig. 11).

Figure 12 Case 3: Preauricular skin graft is inset slightly into the vermilion to compensate for future contraction and to provide dermis for the white roll.

Figure 13 Case 3: Excess skin graft has been de-epithelialized and the vermilion advanced inferiorly to reconstruct the white roll exactly.

Problems

1. Obliteration of the white roll.
2. Advancement of the vermilion onto the lower-lip skin.

Reconstructive Plan

1. Reconstruction of the vermilion/lower-lip skin border exactly with a skin graft.

STAGE 1

Excision of the scarred area created a 3×1 -cm defect. A slightly oversized full-thickness preauricular skin graft was inset by basting and suture (no bolster) of 4-0 Vicryl Rapide (Ethicon, Somerville, NJ) and 5-0 Vicryl Rapide. The inset of the skin graft encroached slightly onto the inferior vermilion to compensate for future contraction of the graft (Fig. 12).

STAGE 2

After 4 months, excess skin graft in the area of the vermilion was de-epithelialized to form the white roll bump and the vermilion advanced over the dermis of the graft to form the white roll precisely (Fig. 13). Dermabrasion of the graft edges is planned.

RESULT

We achieved restoration of balance to the lower lip by precise reconstruction of the white roll.

Case 4

Case 4 was a 17-year-old woman, who sustained an electrical burn to her left upper and lower lip and

Figure 14 Case 4: Preoperative view. There is a deficiency of the left upper-lip vermilion. In the left lower lip, there is a disruption of the white roll and the vermilion extends into the lower-lip skin. There is a contracture at the left commissure.

commissure as a child. She had previously undergone reparative surgery to her lip with minimal improvement.

Problems (Fig. 14)

1. Deficiency of upper-lip vermilion lateral to left Cupid's peak.
2. Left lower-lip white roll disrupted.
3. Left lower-lip vermilion extending into rounded commissure.
4. Contracture of left commissure.
5. Tethering of the mucosa posterior to the left commissure.

Reconstructive Plan

1. Composite graft from right lower lip to left upper lip to equilibrate the vermilion.
2. Excision of excess left upper-lip skin.
3. Two-stage left lower-lip white roll reconstruction with an FTSG graft.
4. Excision of scarred mucosa and commissure release followed by local flap reconstruction.

STAGE 1 (FIG. 15)

After scar removal, composite graft of mucosa and submucosa from the right lower lip was placed into the deficient left upper lip through an incision at the wet line. The left upper-lip border was moved superiorly by excision of poor upper-lip skin, based on a template taken from the right upper lip. The scarred left lower lip was excised, and a slightly oversized FTSG was taken from the preauricular area and inset into the defect. The skin graft extended slightly onto the area of the vermilion to compensate for future contraction of the skin graft (Fig. 16). The scarred intraoral mucosa was excised, and the resulting defect was closed with local mucosal flaps.

Figure 15 Case 4: Stage 1 operative markings. The left upper-lip skin scar will be excised and the vermilion moved superiorly to be even with right side. These markings are based on the normal right-upper lip. A composite graft of right lower-lip mucosa and submucosa will be transferred to the deficient left upper-lip wet line. The left lower-lip scar will be excised, and a slightly oversized full-thickness skin graft placed into the defect. The commissure is opened and intraoral mucosa advanced.

STAGE 2

Excess composite flap to the left upper lip was reduced. Excess FTSG was de-epithelialized superiorly, and the vermilion was advanced, reconstructing the white roll exactly (Figs. 17 and 18).

Discrepancies of 1 mm in the white roll are observable in conversational distance. The most accurate way to use a skin graft to reconstruct the white roll seems to be this simple, two-staged technique. With this technique, the surgeon does not worry about contraction. The defect is recreated and a slightly oversized FTSG taken from the preauricular area is inset into the area of the vermilion. For defects of the lip, grafts from the preauricular area or the superolateral forehead provide better color and texture match than the neck or

Figure 16 After stage 1, the white roll was correct in the upper lip. There was excess vermilion there. The scar had been replaced with an oversized graft, and the commissure shape on the left was correct.

Figure 17 Case 4: Stage 2 operative markings. The left upper-lip composite graft will be debulked of excess volume. The excess left lower-lip full-thickness skin graft will be de-epithelialized and the vermilion advanced over the exposed dermis. The lines mark future dermabrasion.

postauricular skin. After a period of at least 4 months, contraction seems completed. In the second stage, excess skin graft is de-epithelialized (for white roll) and the vermilion advanced over the skin graft to reconstruct the white roll in its precise location. Dermabrasion may be used in a third stage to blend the borders of the skin graft with the surrounding skin.

CASE 5: GUNSHOT LOSS TO LIP AND CHIN

Case 5 was 23-year-old male with a history of a gunshot wound to the central mandible previously reconstructed with a fibula and radial forearm free flap. Prosthetic lower dentition with implant was also placed. Although the patient did have successful bony reconstruction, his soft tissue coverage had several inadequacies (Figs. 19–21).

Figure 18 Case 4: Postoperative result. The border of the upper lip appears symmetrical, and proper volume has been restored to the left upper lip. The white roll of the left lower lip has been reconstructed in its exact location. Dermabrasion is planned.

Figure 19 Case 5: Preoperative anterior view. Note labial incompetence and incisor show and patchwork effect on chin.

Problems

1. Scarred lower gingivobuccal sulcus resulting in labial incompetence: excessive lower incisor show and persistent drooling, requiring him to wear a bib.
2. No labiomental sulcus (Fig. 20).
3. Lack of a chin prominence (Fig. 21).
4. Subunits of the lower lip and chin disrupted by a patchwork appearance (Fig. 19).
5. Scarring on the neck and chin from prior flaps.
6. Inadequate vermilion.

Reconstructive Plan

1. Restoration of the sulcus lining with a thrice delayed extraoral to intraoral turnover flap from the lower-lip skin.
2. Formation of a labiomental sulcus.
3. Decreased bulking of the chin pad with advanced de-epithelialized submental tissue.

Figure 20 Case 5: Preoperative anterior view of the scarred gingivobuccal sulcus and implants into fibula.

Figure 21 Case 5: Preoperative lateral view. Note the lack of labiomental sulcus, poor chin projection, and scar in wrong direction on neck.

4. Resurfacing the lower-lip skin with a second radial forearm flap.
5. Restoration of vermillion bulk with a tongue flap.

STAGE 1

To transpose extraoral tissue for lining to the inside of the mouth, a full-thickness separation of the vermillion and lower lip was made from commissure to commissure (Fig. 22). The incision provided access to the deficient intraoral lining while still respecting the subunit border of the vermillion and lower lip. The raw surface of the composite bipedicle flap of vermillion, orbicularis oris, and mucosa was temporarily covered with Biobrane (UDL Laboratories, Rockford, IL). The superior cut edge of the lower-lip skin was sutured to the scarred intraoral sulcus.

STAGE 2

A turnover flap from the superior segment of the forearm flap was delayed three times (partial incision, full incision, then undermining) for planned turnover into the oral

Figure 22 Case 5: Full-thickness separation of the vermillion and lower-lip skin from commissure to commissure. The lower-lip skin is sutured to the scarred gingivobuccal sulcus, creating a giant fistula.

Figure 23 Case 5: Three delayed procedures were performed to ensure viability of the turnover flap.

cavity to restore lining (Fig. 23). Interestingly, the patient had full control of the bipedicted mucosomuscular vermillion flap and could lift it at will, demonstrating good facial nerve function to the lower-lip composite flap.

STAGE 3

The vermillion was split at the lower midline, and the turnover flap was inset into the intraoral lining defect, restoring the deficient sulcus height (Fig. 24). A second radial forearm flap was used to cover the lower-lip subunit almost to its entirety (Fig. 25). The flap was slightly short at the right commissure. At this point, patchwork effect of the lower-lip chin was eliminated but the patient still lacked chin prominence and a labiomental fold and had only fair vermillion bulk.

STAGE 4 (SEVERAL PROCEDURES)

The inferior aspect of the old radial forearm flap (under the menton) was de-epithelialized and advanced under the skin overlying the pogonion to increase prominence. The sides of the forearm flap were defatted. A labiomental fold was recreated by an incision

Figure 24 Case 5: Intraoral view of the newly restored oral mucosa by the turnover flap resulting in a normal-length sulcus.

Figure 25 Case 5: Postoperative view after inset of the turnover flap and advancement of the remaining radial forearm flap to surface the lower-lip skin subunit almost to its entirety. The patient no longer exhibits incisor show. The forearm flap has been defatted on the sides.

with debulking of the area of the submental fold. Z-plasties were done on the left neck.

STAGE 5A AND B

An anteriorly based tongue flap was brought to right side to add bulk to the vermillion and was separated after 2½ weeks.

RESULT

Contour was improved, with patch appearance gone. Almost 95% of the aesthetic subunit of the lower lip was restored, with good labial competence, no drooling, no bib, and improved profile. The intraoral lining was restored, the patchwork effect of the patient's scarred lip was replaced with a smooth surface to the lower lip and chin subunit almost to its entirety, and bulk was brought into the area of a chin to restore aesthetic form. A labiomental sulcus was made through the forearm flap (Fig. 26).

Intraoral contraction is a known complication of free flap reconstruction for complex mandibular defects.⁸ Restoration of intraoral lining may be addressed with skin grafts, local flaps, or another free flap.⁸ As the patient's intraoral lining was already heavily scarred, it was not felt to be an adequate recipient site for a skin graft. Local tissue options were limited as a result of the severity of his initial blast injury and his subsequent operations. The deficient intraoral lining was replaced by an extraoral-to-intraoral flap, turned over through a full-thickness incision along the border of the lower-lip vermillion and skin. This design placed scars along the subunit borders and used the patchy lower-lip skin as the replacement for the scarred lower-lip mucosa. The preserved motor function to the lower-lip vermillion was surprising and helped keep the sulcus height correct. Several delay procedures were necessary to ensure the survival of the turnover flap. At the time

Figure 26 Case 5: Final postoperative result after creation of a labiomental crease, chin contouring, and an anteriorly based tongue flap transposed to the right lower-lip vermillion. Note normal closure. The patient no longer drools.

of inset, a second radial forearm flap was used to resurface the lower lip and chin aesthetic subunit almost to its entirety and provided bulk for subsequent contouring of the chin. A labiomental sulcus was created through the second forearm flap as previously described.

This case demonstrates that creative use of local tissue can change seemingly unsolvable problems into significant improvements. Multiple delays may be necessary to safely transpose scarred tissue as a reliable reconstructive flap. In addition to restoration of the patient's deficient gingivo-buccal sulcus, the resurfacing of the lower lip and chin subunit with unscarred skin and the creation of a labiomental sulcus as well as a chin pad improved his aesthetic outcome dramatically. Only by critically analyzing each subunit is an optimal aesthetic outcome realized.

SUMMARY

Each case in this group represents a certain aesthetic reconstructive dilemma. Methods previously described, or novel, were tailored to each patient's unique deformities. The authors hope these cases will give impetus to surgeons to try creative approaches when treating challenging soft tissue deformities of the lower face.

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