RECONSTRUCTIVE CONUNDRUM

The Apical Triangle: An Overlooked Aesthetic Facial Subunit

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A patient was referred for surgical reconstruction of a left facial defect after Mohs surgery that resulted in loss of the apical triangle, more than half of the lateral superior ala, and 4 to 5 mm of the medial cheek (Figure 1). After a medial advancement flap to reconstruct the aesthetic subunit of the cheek and a paramedian forehead flap over an auricular cartilage batten graft to re-create the ala, distortion and loss of the apical triangle occurred. The overall result of the reconstruction could be considered reasonably successful, but the patient's face still did not appear completely symmetrical, particularly when attention was directed to the left apical triangle region. An inferior-medial displacement of the melolabial crease marked the distortion of this subunit (Figure 2). How would you repair this subunit?

Figure 1. Patient with Mohs defect involving ala, medial cheek, and apical triangle.

Figure 2. Two months after paramedian forehead flap reconstruction with distortion of apical triangle.

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Since their introduction in 1985,[1] consideration of nasal aesthetic subunits has guided nasofacial reconstruction to re-create the natural appearance and contour of the face. Although the apical triangle is an important facial subunit, it is infrequently mentioned in nasofacial reconstruction literature. A recent PubMed search revealed no direct references to the apical triangle.

The apical triangle subunit has other synonyms, including melonasal triangle, melonasal island, and facial isthmus.[2] The anatomic boundaries of the apical triangle subunit are shown in Figure 3. The lateral border is the superior 10 to 15 mm of the melolabial crease. The medial border is formed from the lateral ala as it inserts onto the upper lip. More difficult to appreciate is the inferior border of this triangle, which is formed by an imaginary horizontal line between the inferior edge of the ala and the melolabial crease. In 2006, Burget[3] published one of the few references to the apical triangle. He defines the subunit as "a triangular depression of hairless skin sculpted out of the upper lip that narrows as it rises superiorly alongside the alar base." He further points out that the ala and cheek never touch; rather, a narrow channel of skin approximately 3 to 4 mm wide, which he calls the nasolabial isthmus, separates them. When the apical triangle subunit is missing, the confluence of the nose, lip, and cheek appears deformed because of asymmetry with the contralateral side. Nasofacial reconstruction can result in reduction or loss of this subunit on occasion.

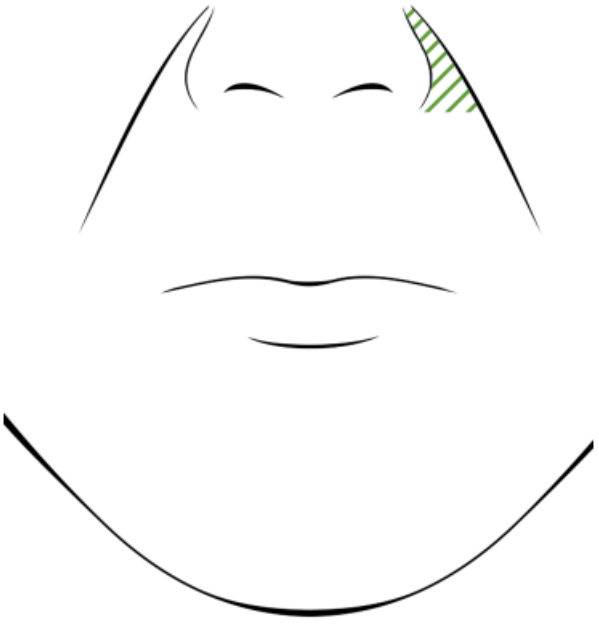

Figure 3. Anatomic boundaries of the apical triangle.

In this case, the original Mohs defect was repaired using a medial cheek advancement flap according to aesthetic subunit principles. The cheek advancement was designed with a curved incision that started from the midpoint of the wound on the cheek and then came inferiorly into the melolabial crease down to a point just adjacent to the oral commissure. This cheek flap was undermined in the subcutaneous plane, advanced, and rotated medially toward the junction point of the cheek and alar subunits. The rotation advancement of this cheek tissue medially filled the defect in the area of the apical triangle but did not re-create the borders of the apical triangle well. An auricular cartilage batten graft was also placed to preserve nostril shape and patency, and a paramedian forehead flap (PMFF) was used to replace the ala subunit. When the patient returned to surgery 3 weeks later for division and inset of the PMFF, distortion of the apical triangle was noted. Also, the cheek had more soft tissue volume than the apical triangle, which increased the asymmetry of the obliterated apical triangle with the unoperated side.

Other methods can be used during the primary reconstruction that may help prevent distortion or complete loss of the apical triangle subunit. For example, an island pedicle flap from the adjacent upper lip could be advanced superiorly to fill the apical triangle subunit. Another option is an inferior advancement flap from the nearby upper lip along with a back-cut. These procedures run the risk of future upper lip asymmetry but should be considered along with the method described here. It is critical that the dermatologic surgeon be aware that the apical triangle—as an aesthetic subunit in its own right—is missing in order to select the appropriate method of repair.

The senior author has developed a simple, reproducible technique to re-create the apical triangle subunit. This two-stage surgical technique is technically straightforward and can be performed as a simple in-office procedure under local anesthesia. The first stage involves obliteration of the misplaced melolabial crease (the lateral border of the apical triangle) using a compound Z-plasty. In the second stage of the repair, a plastic bolster is custom-fabricated based on the shape of the contralateral (unaffected) apical triangle. This plastic bolster is suture-fixated transcutaneously and left in place for approximately 1 week. The benefit of this plastic bolster is to maintain the concavity of the reconstructed apical triangle while allowing a natural rise and curve of the tissues of the adjacent medial cheek. This article will describe this simple two-stage surgical technique to re-create the apical triangle.

The Procedure

Almost always, the distorted apical triangle is marked by inferior and medial displacement of the lateral border of the subunit: the superior portion of the melolabial crease. Thus, the goal of the reconstruction is to re-create a melolabial crease that is repositioned superiorly and laterally. This process requires two stages.

In stage I, the malpositioned melolabial crease is obliterated using a compound Z-plasty of three or four individual Z-plasties. These Z-plasties consist of skin and dermis only and are executed in the subcutaneous fat plane. Once the triangles of skin are interpolated, the melolabial crease is obliterated (Figure 4A and B). In this first stage, no other scar or tissue is excised. An additional benefit of compound Z-plasties is scar lengthening in the superior/inferior direction to counteract forces of cicatricial scar contracture. The authors have not yet seen a resultant cicatrix or distortion after this first stage. Sometimes, there is expected scar firmness or pincushion edema, both of which can be reduced with dilute intrascar triamcinolone injections.[4]

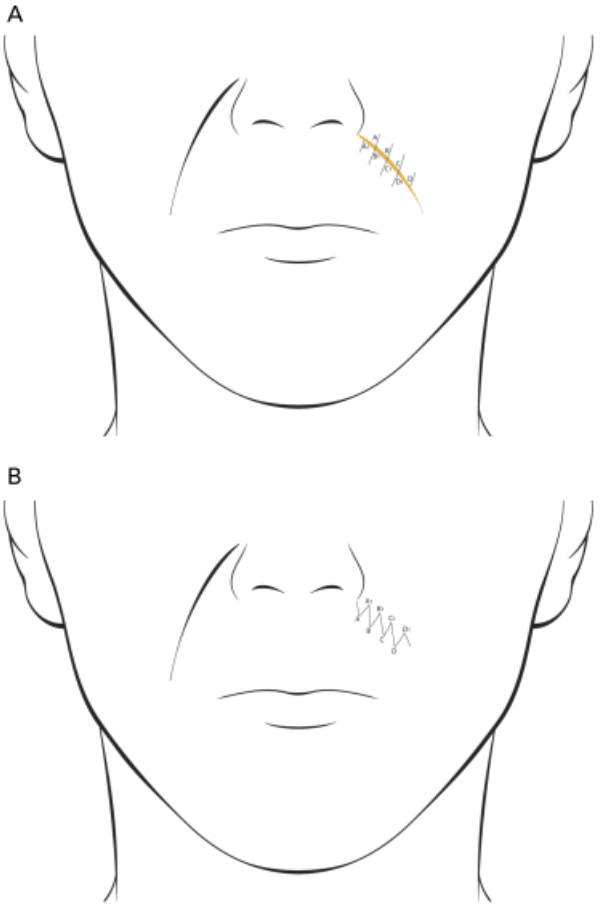

Figure 4. (A) Design of serial Z-plasties. (B) After interposition of four serial Z-plasties.

Stage II is performed approximately 14 to 21 days later. The contralateral melolabial crease is studied closely, and a line is drawn on the affected side precisely where the new melolabial crease should be. An incision is made on this line down to subcutaneous fat. This incision is connected to the previous compound Z-plasty, which is why the procedure is best performed in a staged fashion. A small amount of subcutaneous fat and any thickened deeper scar tissue are removed medial to this incision, restoring a slightly concave contour to the new apical triangle. The incision is closed with a running 5-0 fast-absorbing catgut suture.

A plastic bolster is cut to replicate the anatomical shape of the apical triangle exactly to the upper lip, alar base, and contralateral melolabial crease (Figure

Figure 5. Yellow outlines show design of custom-cut plastic splint (based on template from right side) that helps to re-approximate the natural anatomical boundaries of the apical triangle. Blue dashes represent line where incision was placed to reposition the melolabial crease.

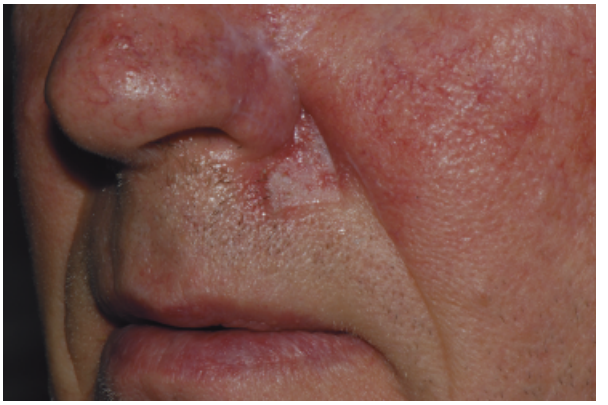

Figure 6. Immediately after removal of splint, the amount of tissue compression is readily apparent.

5). The bolster is sewn in place transcutaneously with three or four 4-0 nylon sutures. Knots on the field are tied loosely to allow for postoperative edema. The tissue under the bolster will be the reconstructed apical triangle. The bolster also allows the tissues lateral to the newly formed melolabial crease to maintain a natural rise back to normal cheek contour. The bolster is left in place for 8 days. Even short-term soft tissue compression can have a lasting effect. The pioneering surgeon, Dr. Gary Burget has commented on the role that short-term compression can play in soft tissue modeling: "… quilting sutures to prevent hematoma and ensure contact of the flap and its newly contoured bed. These quilting sutures are removed 48 to 72 hours later to avoid suture marks in the skin."[5] Although the compression is short in this technique, the contour will persist for years. Once the bolster is removed, the amount of soft tissue compression is easily seen (Figure 6).

This technique helps create a natural transition between these facial areas and a normal-appearing melolabial fold (Figure 7). The senior author has used this technique multiple times and has observed long-term preservation of three-dimensional contour without the need for intrascar injections of triamcinolone acetonide after stage II.

Conundrum Keys

- The apical triangle is an important aesthetic facial subunit.
- Distortion of the apical triangle after wound repair leads to facial asymmetry.
- Forces of scar contraction usually result in inferior and medial displacement of the lateral border of the apical triangle.
- Correction of apical triangle distortion can be easily achieved using a two-stage procedure that can be performed in the office setting.

Figure 7. Final reconstruction with anatomical boundaries of apical triangle restored.

- In stage I, the misplaced melolabial crease is obliterated using a compound Z-plasty.
- In stage II, the use of the plastic compression bolster is crucial to restoring normal three-dimensional facial contour.

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