34. *Philtrum Contouring and Cupid's Bow Construction*

MANY operated lips with a bilateral cleft hang like a curtain without animation, philtrum dimple or cupid's bow. This condition is easily understood as there is no muscle in the prolabium and there is no residual of the normal cupid's bow or dimple in the bilateral cleft deformity. If the vertical length of the lip is within normal limits, the problems of the cupid's bow and philtrum dimple become priorities. In fact, if there is ever to be a bow and dimple—and a lip without them is unnatural—they must be *handmade.* If correctly designed, a cupid's bow and dimple can be created during the primary surgery. If they were not, then secondary bow and dimple formation is necessary. There are several ways of achieving this goal.

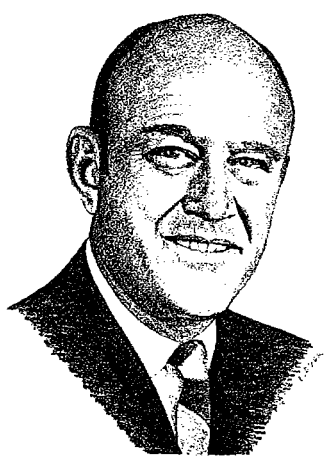
DIMPLE MAKING

Even when the bilateral scars have been placed strategically in the philtrum column positions, the lip still looks unnatural without a philtrum hollow flanked by eminences.

Gouging a philtrum

Gerald O'Connor and Mar McGregor of St. Francis Memorial Hospital, San Francisco, noted in 1958:

Obvious anatomical differences that immediately single out the operated cleft lip from the normal are:
1) The absence, or lack of development of the normal philtrum (median groove) either pre- or postoperatively.



Mar McGregor

2) The absence, lack of development or alignment of the normal prominence that is in the upper lip skin just above the junction at the vermilion border. This has been called the "white line" or "white roll" (Gillies).

They called it the *cutaneous upsweep* of the upper lip and noted that Marcks and Trevaskis claimed its presence in all cases and emphasized its importance as a landmark in alignment of the cleft lip elements.

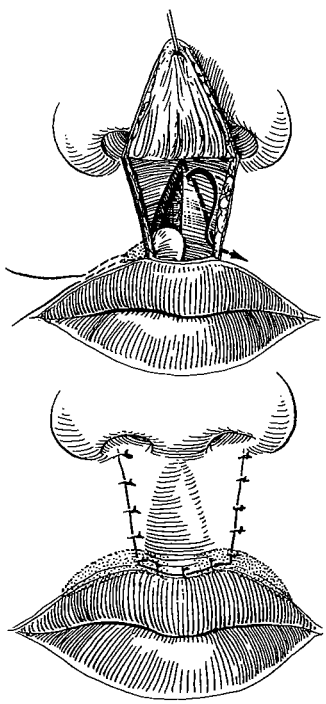
O'Connor and McGregor elaborated on the function of the philtrum:

The philtrum, besides being possibly the junction point of the two medial nasal processes, has elevated sidewalls to permit nasal secretions to run down either side of the upper lip, and the cutaneous upsweep acts like a gutter for perspiration or nasal secretions to drain away from the mouth opening. . . . The philtrum and cutaneous upsweep are also so constructed, in our opinion, to permit the many and varied motions of the lips in all directions, giving a little extra material when play is needed in the upper lip. . . . The excess material lies in sort of a reverse folded position to act as a ready reserve for all complicated lip motions and yet spring back to the norm when at rest.

a clever concept

As they pointed out:

This philtrum absence is accentuated in the double cleft lip by the prominence of the prolabium and the presence of the flattened surgical junction scars on either side of the prolabium.



To imitate the philtrum groove and cutaneous upsweep, they elevated the skin of the prolabium. A mid-vertical subcutaneous flap based inferiorly was cut and split down the middle. Each prong, when threaded laterally into a tunnel along the arch of the bow just under the mucocutaneous junction line, left a central hollow and emphasized the bilateral upsweep. The prolabial skin was sutured deep into the hollow in an attempt to maintain the groove.

Recently Mar McGregor, nicknamed "Fearless" by his residents because of his willingness to take on any problem, was asked how he felt about his philtrum operation today. He reminisced that they had done four of these procedures and had been encouraged by the results over a period of about a year, after which, for one

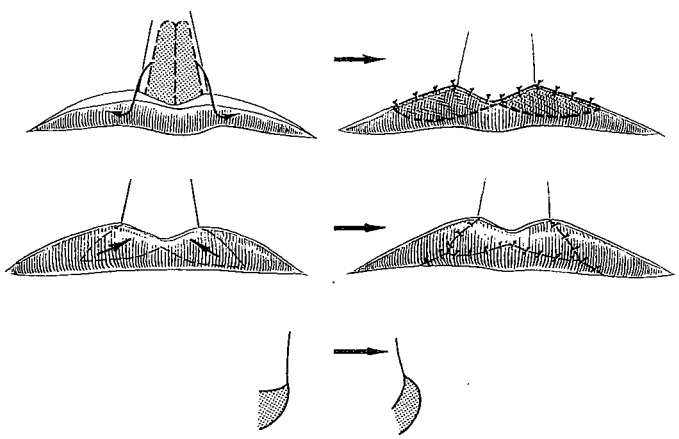
reason or another, the patients were lost to follow-up. Thus their ingenious and original preliminary report, now 15 years without photographic records, suggests that O'Connor and McGregor combined the economy of the Scots in its conception with a bit of the blarney of the Irish thereafter. In spite of the ingenious design for shifting philtrum tissue, nature tends to smooth out man-made depressions in the upper lip, which always have been and continue to be as elusive as leprechauns.

where the dimples went?

Alps and valleys

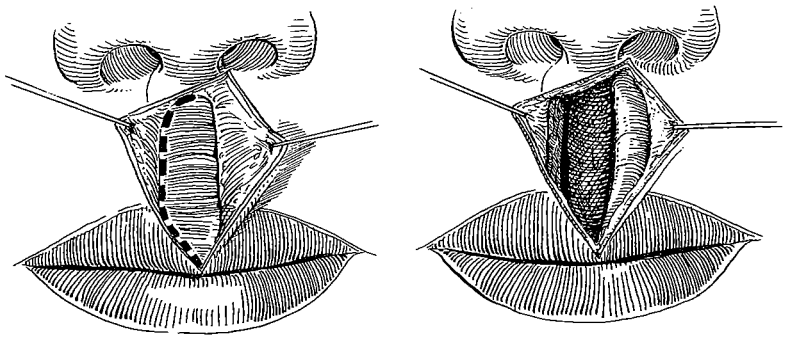
At the Rome International Congress in 1967, Austrian Otto Neuner of Berne University Dental Institute, Switzerland, presented some impressively artistic secondary corrections of bilateral clefts. One of the methods he described was remarkably similar to that of O'Connor and McGregor. He transposed two inferiorly based subcutaneous flaps from the mid-vertical to the lateral-horizontal position to create a philtrum hollow and the elevations of a cupid's bow curve. The case he presented had photographic evidence of a dimple. To this he added bilateral V-Y vermilion advancements to accentuate the red lip eversion and the central tubercle of the bow.

Otto Neuner

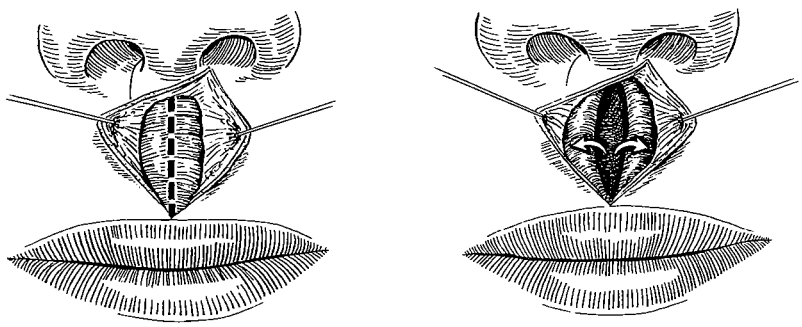


The roll-over

There is also a possible application in the bilateral cleft lip of Onizuka's 1971 unilateral philtrum roll-over flap.



An even better double roll-over also follows Onizuka's philtrum adaptation of the great general principle of taking tissue from where it is not wanted and moving it to where it is needed.



A chondrocutaneous philtrum

Innovative Edward Schmid of Stuttgart, Germany, stated in 1963:

Edward Schmid

So far, none of the attempts to reconstruct an absent philtrum have given a satisfactory result. . . . Lexer, in particular, practiced philtral imitation. . . . In patients with bilateral cleft formation, in whom no after-development of the philtrum can occur . . . our solution is to take suitable cutaneocartilaginous fragments from the ear and transplant these as composite grafts into the upper lip. . . . Permanent trough-shaped grooves are obtained, which are bordered by lateral elevations corresponding to the sides of the philtrum. . . . Owing to the support given by the cartilage it is possible to stretch lips which are slightly shortened in the center.

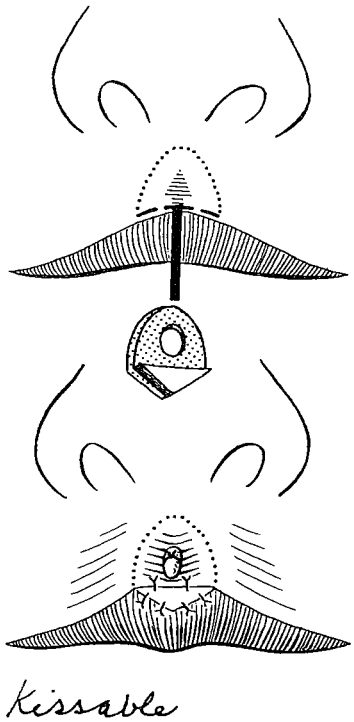
Schmid used composite auricular grafts with the central portion of the cartilage thinned or perforated to aid in philtrum hollow construction. When the entire skin of the philtrum was scarred, the entire philtrum was replaced by the composite graft.

A commoner and more intriguing application of this principle involved use of a philtrum-shaped auricular cartilage perforated in the center and carrying with it only the amount of skin necessary to create the tip of the philtral bow. As described by Schmid:

In the zone of the philtrum the vermilion is separated from the lip and a tunnel is made in the latter. The cartilage fragment without skin can now be introduced into the subcutaneous space, while the skin attached to the cartilage is sutured between the lip and the vermilion, which was retracted downwards.

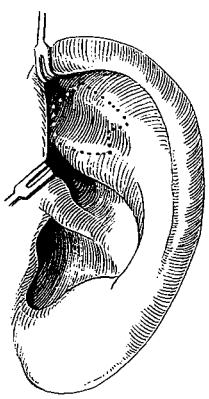
Pieces of cartilage in the lip have never been particularly enticing to me, but Schmid faced the problem head on:

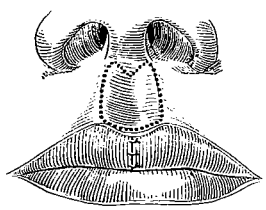
I have been asked whether such implantations of cartilage did not impair the patient's sensitivity, e.g. during kissing. I have asked my patients this and their answers have reassured me.



Other stiff upper lips

Neuner of Berne confirmed, in Rome in 1967, the value of Schmid's auricular cartilage graft in the formation of a philtrum hollow. He advocated use of the cartilage with a preformed hollow from the scaphoid fossa of the ear inserted through a mid-vertical mucosal incision.





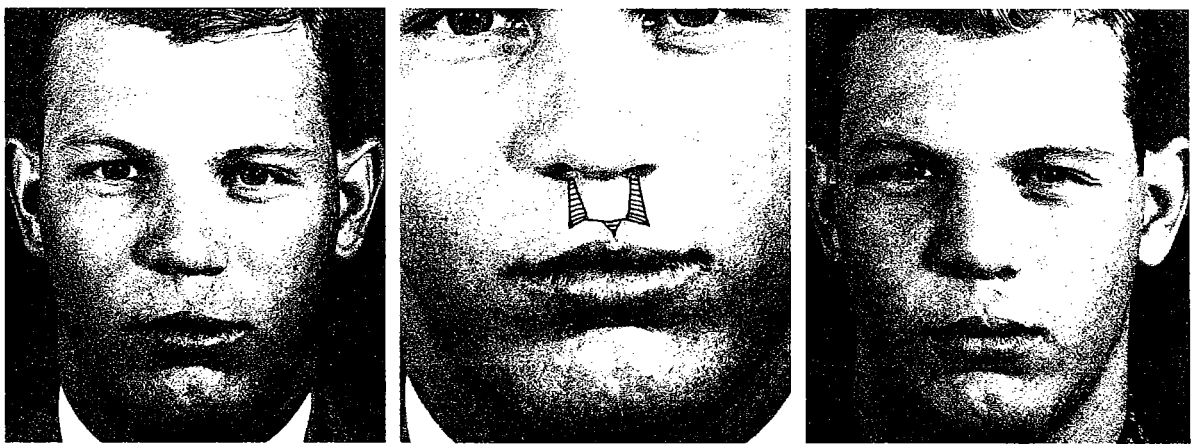
CUPID'S BOW IN BILATERAL CLEFTS

In the original bilateral cleft, there is no vestige of a cupid's bow, and only by shaping the prolabium and even its inferior border

and possibly bringing in lateral vermilion flaps, or vermilion flaps ridged with a mucocutaneous "white roll" ridge, can a semblance of a bow be created. If this procedure has not been done primarily, there are ways and means of secondary bow construction.

Transforming Blair-Brown into Hagedorn-LeMesurier

When triangular flaps from the lateral lip segments have been slid toward each other below the inferior edge of the prolabium to touch tip to tip as in the Blair-Brown method, often a single mucocutaneous arc is created with the suggestion of a central vermilion whistling deformity. The advantage of the Hagedorn-LeMesurier method was that it created an artificial cupid's bow. Thus, by turning the triangular flaps with additional excisions into quadrilateral flaps, wider at their medial ends, the semblance of a cupid's bow is achieved even with a midline tubercle.

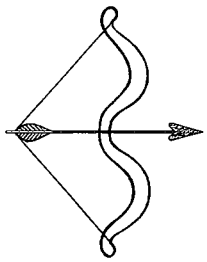


3 weeks postoperative

The unnatural position of the skin scars, of course, is more noticeable three weeks after surgery but will forever detract in some degree from the ultimate result.

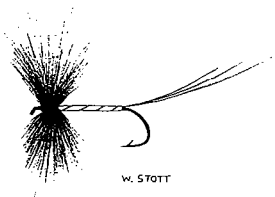
Gillies' cupid's bow operation

Another secondary method of creating an artificial cupid's bow was ingeniously designed by Sir Harold Gillies in 1932. This was, incidentally, the one of his artistic procedures that propelled me to cross the Atlantic for study with him. I went to learn of philtrums and of cupid's bows but in the process was also taught of trouts' tricks, "Of shoes—and ships—and sealing-wax—Of cabbages—and kings."

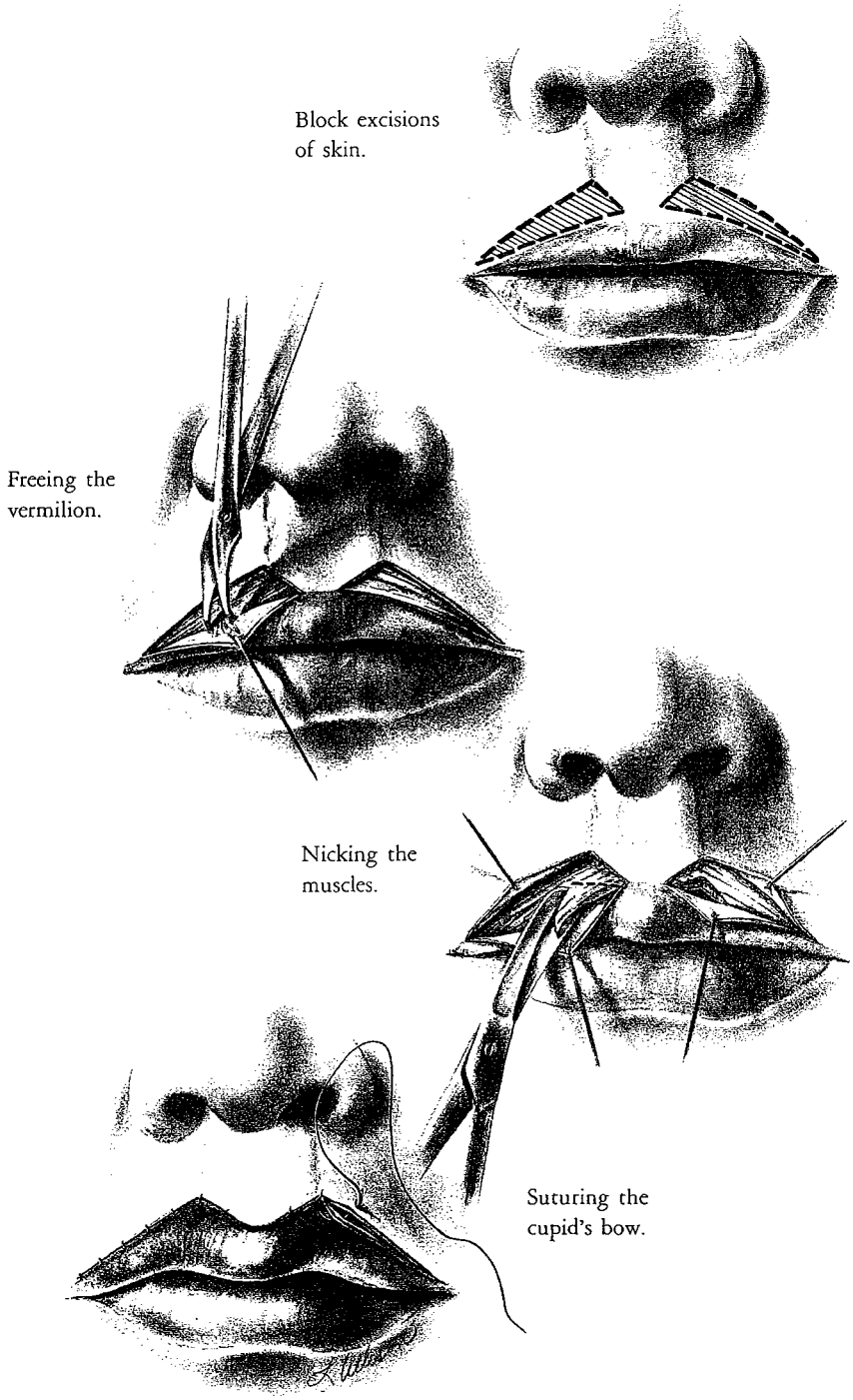


painting by his friend, Bernard Adams

It was said that Gillies was one of the top six fly-fishermen in England. One day he and I were strolling along his stretch of the river Test in the mayfly season. My mind was on the lip section of our book. I realized that when the mucocutaneous line curves without any peaks but the lip is loose with no reason to insert an Abbe flap, the Gillies cupid's bow procedure can be useful. I tried to draw him out on this subject, but he simply countered by picking a hook out of a tobacco tin and with green floss silk tied a fly of brown cock's hackle and flue for wings and tail, identical to the pale watery olive mayflies hovering over the quiet river that afternoon. Only after a catch was Sir Harold willing to return to the cupid's bow, and then and there we composed a few lines for our 1957 *Principles and Art:*



First estimate by measurement from the alar base the desired lift, mark the elliptical skin areas and excise them. Then undermine the lip mucosa from its muscle except at the central point, which is to remain fixed. Nick the tight muscle bands at the centre of each "bow," or perhaps even excise a small triangle, which will increase the side-to-side length of the lip. As the fresh vermilion edge is advanced up into its new position, the central point tilts forward.


Block excisions of skin.
Freeing the vermilion.
Nicking the muscles.
Suturing the cupid's bow.

This was an operation Barrett Brown attacked with vigor, saying,

Only God can make a cupid's bow!

and then elaborating,

It is thought that the resultant scars of these operations, in some instances, may be more deforming than the absence of the "bow."

Meticulous Musgrave echoed this same feeling decades later:

Note the artificial appearance of this "manufactured" cupid's bow.

Gerhard Pfeifer of Hamburg expressed German resistance to the operation:

I do not think we ought to use excisions at the vermilion border, after Gillies, since even the finest suture cannot improve the natural border of labial red and white.

It is quite true that when this method is executed inartistically the unnaturalness created cancels out any assets accrued. Yet there are several possible modifications to *refine* the *design.*

Preserve the mucocutaneous ridge

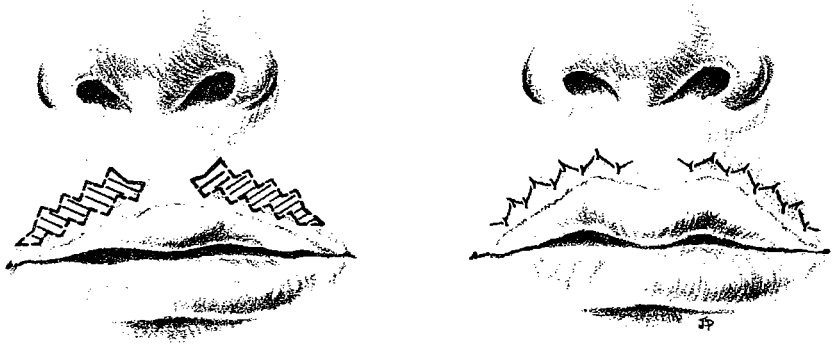
The original procedure can create a semblance of a bow with improvement in certain cases. As the normal white roll of the mucocutaneous junction was destroyed in Gillies' plan, the results consequently present in the lip area a false-face effect. Thus, to counteract Brown's, Musgrave's and Pfeifer's criticism, it is suggested that the white roll of the mucocutaneous junction be spared, as has been shown in secondary unilateral cleft corrections, and the excisional lift be carried out just above it, preserving the skin ridge of the mucocutaneous junction to reflect a highlight along the white roll.

Albert Borges

INCORPORATING THE "W"?

Albert Facundo Borges, the czar of scars, formerly of Havana University and now of Falls Church, Virginia, wrote an excellent W-to-Z atlas entitled *Elective Incisions and Scar Revisions*. He advocated that transverse excisions of the lip be made as W-plastic–type scars and further insisted that this principle is applicable to the skin excisions in the cupid's bow operation. Even when the excisions are carried out above the salvaged mucocutaneous "white roll" ridge, Borges claims the W-plastic maneuver will give a superior end result. In 1977 he wrote:

Your modification of Gillies' procedure in which the mucocutaneous ridge is preserved is an ingenious one and will get a great improvement. The correction of displaced anatomical landmarks supersedes in cosmetic improvement any deleterious effect created by the presence of a scar. The unfavorable, or not, result of a transverse scar on the lip should be judged, not only with the patient's lips in repose, but specially with the patient smiling or talking. Although I have not performed the following W-plastic technique to correct asymmetry of the two arcs of cupid's bow secondary to cleft lip repair, I have performed it for post-traumatic drooping as seen in Figure 8-10 of my book on scars. The schematic representation of the technique is enclosed. Note how the widest triangles correspond to that segment (medial third) where one desires the greatest excision of tissue, thus the greatest upward pull. The lowermost angles of the W-excision reaches to, but does not transect the mucocutaneous ridge. The excision should not be any higher, since this would require a greater width of the W-plastic tissue excision. Too



wide an excision could create dog ears at the ends of the excision which would require vertical fusiform excision of tissue for its correction. The end result would be an elastic concertina-like transverse scar on the lip that would not hinder the normal laugh of the patient, nor would it make the patient stop laughing. This scar would be composed of "almost" vertical TL very small scars. This scar WILL BE superior in theory and in practice than any transverse long scar running against the RSTL.

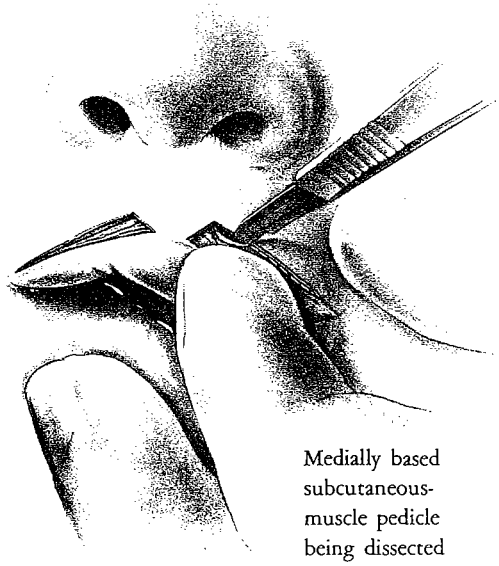
This may be true but here the scar skirts the mucocutaneous ridge and I personally prefer to keep the scar parallel to the curve of the ridge line rather than try to "W" it just above the ridge along the entire width of the lip.

A further improvement in this operation is suggested. The bilateral triangular or elliptical skin excisions should not be removed in the usual manner, and the notches should not be cut out of the free edge of the orbicularis oris muscle. Instead, the skin triangles should be de-epithelialized and then incised as dermomuscular flaps based at the center of the bow. If subcutaneous tunnels very close to the skin are dissected along the ideal philtrum column lines toward the base of the columella, the dermomuscular flaps can be tugged into these tunnels with pull-out sutures. This operation will now create a cupid's bow with a mucocutaneous ridge, a central tubercle and philtrum columns with a central dimple.

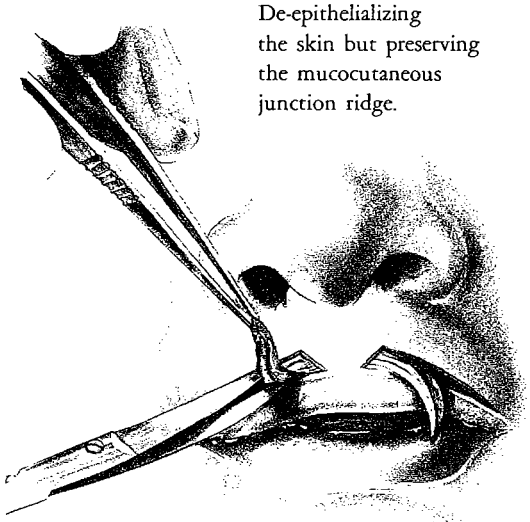
Such an operation, as always, is available for shortening a long lip, but these refinements make it possible simultaneously to fashion a more natural cupid's bow and to contour philtrum character. By the relative rise of the overlay principle, the philtrum columns and hollow can be achieved without the necessity of dividing by gouging the midline muscle union across the lip!

Again, if the primary cleft operation was executed correctly, there will be no need for such shenanigans. This is but a secondary procedure of last resort refined to make the most of a flat situation.

De-epithelializing the skin but preserving the mucocutaneous junction ridge.

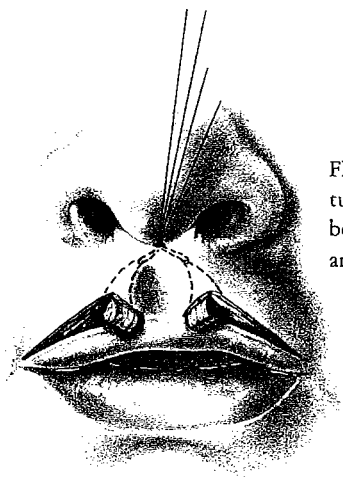


Medially based subcutaneous-muscle pedicle being dissected

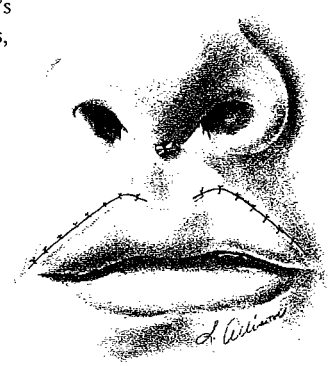


and elevated as flaps.

Philtrum column tunnel dissected.



Flaps being pulled into tunnels to create cupid's bow, philtrum columns, and dimple.



this modification has real possibilities!