

27. *Incomplete Unilateral Cleft Lip Rotation-Advancement Detail*

SCALPELS

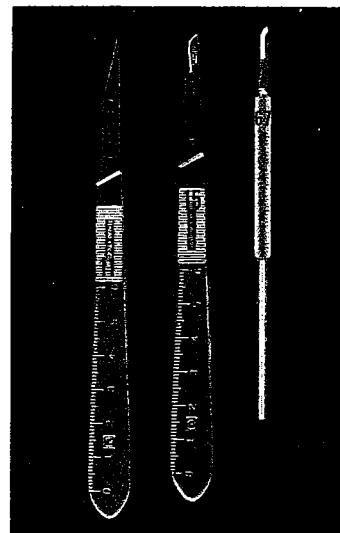
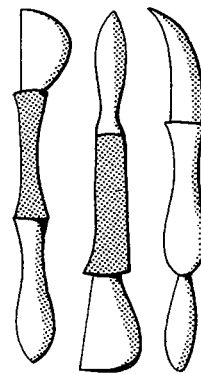
A sculptured stone tablet found at the site of the temple of Asclepius near the Acropolis at Athens dates back to about 300 B.C. The shape of the blades depicted by the ancients is not unlike the Bard-Parker and Beaver today. Hippocrates alluded to these "bellied" scalpels, and Galen called them bellied surgical knives from the Greek word meaning "like the breast of a woman." These scalpels were of steel, for, as Galen remarked,

The best quality of steel yielded a knife which neither blunted nor bent or chipped.

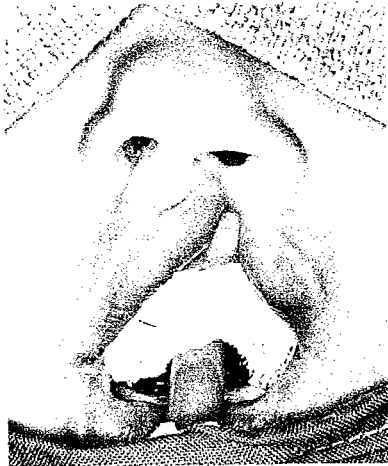
Today I use the small #67 Beaver blade because of its maneuverability to score the skin to dermis along the marked curved incisions. A #15 Bard-Parker is used to incise along the upper labial sulcus and to free the lip elements from the maxilla. A #11 Bard-Parker blade is used to stab along the initial superficial incision through the full thickness of lip when the rotation and advancement flaps are actually cut.

I. O. U. 'S

The basic rotation-advancement principle still stands while refinements and extensions have facilitated its execution. The final design with all the possible present variations synthesized into a master plan reflects many recent influences which are acknowl-



edged consecutively, alphabetically and appreciatively—Berkeley-BerkowitzBurstonCollitoCulffaraGilliesalwaysHoldsworth-HortonMiryMirMuirO'ConnorOnizukaPoolPitanguy-PruzanskiRandallReynoldsSawhneyScrimshawWalker-Williams.



*Estimate
by eye
then
check with
Calipers
or
Vice Versa!*

MEASURING

The unilateral cleft has a normal side which presents a challenging comparison and sets the standard, but it also provides an ideal pattern to be simulated. Use it as a guide, measure it and be directed by it in the plan of surgery.

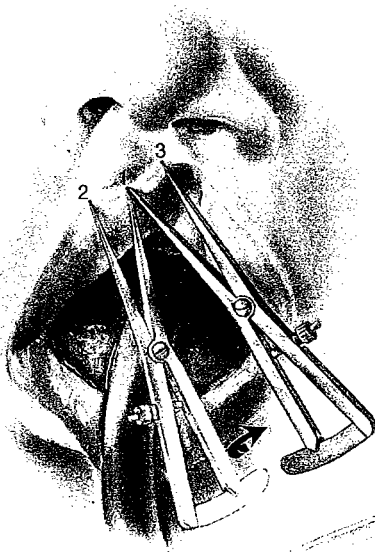
Dot-mark the center of the cupid's bow on the mucocutaneous junction ridge 1 and then the peak on the non-cleft side 2. The distance between these two points, 1 and 2, is usually about 4 mm. and will set the site of the bow peak on the cleft side of the medial element 3. This siting can be done with calipers or a practiced eye.

The vertical distance from the alar base on the normal side 4 to the height of the non-cleft peak of the bow 2 gives the distance that must be matched ultimately on the cleft side from its alar base 10 to its bow peak 8. This is usually around 10 mm.

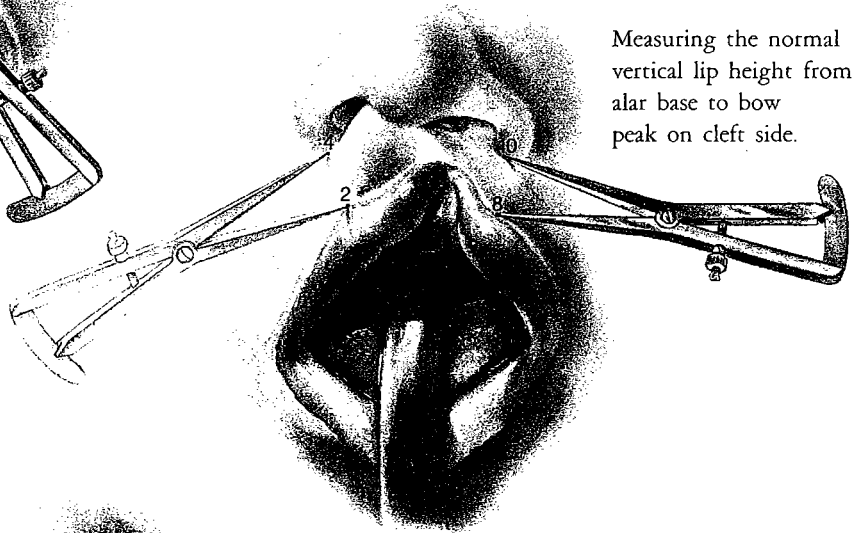
Measure the distance from the peak of the bow on the non-cleft side 2 to the commissure on the non-cleft side 6, which is usually about 20 mm. Mark the same distance on the cleft side from the commissure 7 to a point along the mucocutaneous junction ridge of the lateral lip element to be the matching peak on the cleft side 8. This measurement is done with slight spreading of the cleft element as it is bunched because of contracture with lack of muscle continuity across the cleft. Point 3 should eventually approximate point 8 to create the cleft bow peak.

MARKING THE ROTATION

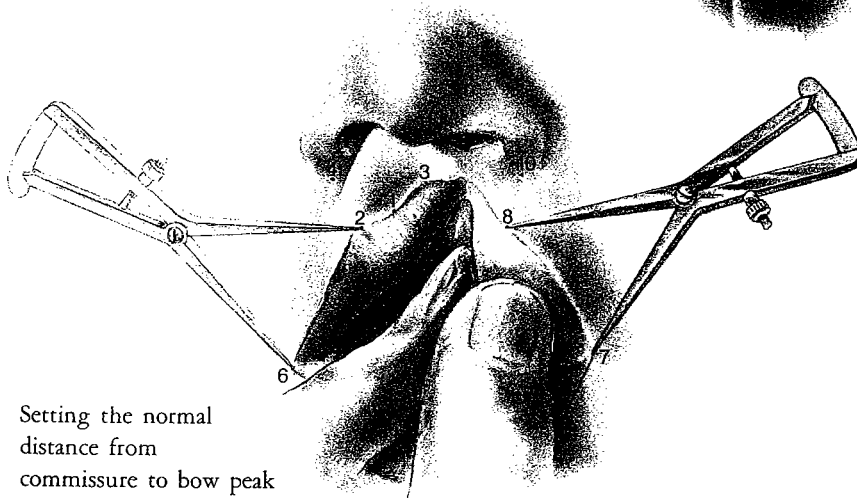
Now that all peaks of the future cupid's bow have been indicated, the next step is to mark the rotation incision. Start at point 3, the potential bow peak on the cleft side, and skirt the



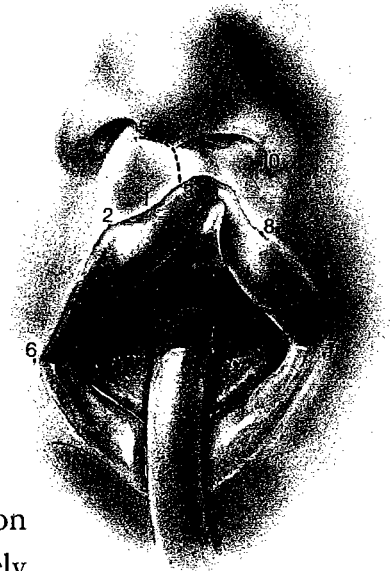
Point spotting the peaks of the bow.



Measuring the normal vertical lip height from alar base to bow peak on cleft side.



Setting the normal distance from commissure to bow peak on the cleft side.



Marking the rotation.

edge up to the base of the columella. At this point the incision mark curves medially across between base and lip but definitely hugging the columella and extending past the midline of its base almost as far as the philtrum column on the normal side but *no* farther. The final extent of the rotation curve is point 5. Always keep in sight and mind, as the rotation incision is

positioned and shaped, that it must balance in symmetry as near as possible the line of the opposite normal philtrum column.

MARKING THE ADVANCEMENT

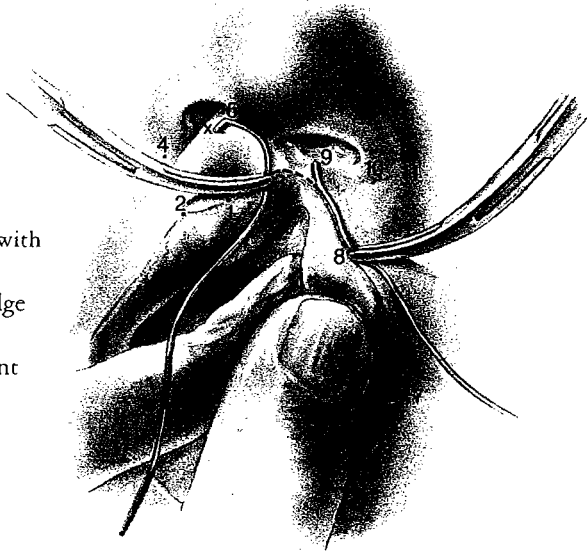
There are four important points to be determined in the creation of advancement flap B. These will vary according to the amount of usable Simonart's bridge band. This, in turn, depends on the condition and conformity of its skin and the amount of subcutaneous tissue and muscle in it.

The first point has already been marked tentatively at 8, a distance from the commissure to the potential peak of the bow on the cleft side as compared to the normal. At least this gives the surgeon an idea of how much legitimate running room he has down the lateral lip element. Digression past the designated point 8 is rarely necessary and should be limited to 2 mm. at most. The position of point 8 is verified further by checking that the distance from 10 to 8 is equal to the distance from 4 to 2.

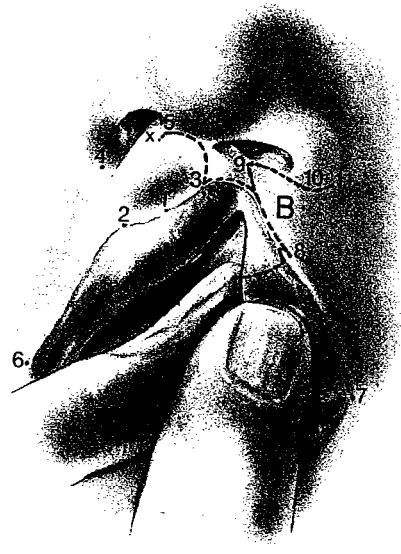
The next dot mark is placed at the most medial point possible in usable Simonart's band 9, which will serve as the leading point of the advancement flap. One way to determine the position of point 9 after evaluation of the usable tissue in Simonart's band is to use a heavy wire. With the normal distance from the commissure to the potential peak of the bow on the lateral element set at 8, the distance from 8 to 9 will provide the edge of the advancement flap. This edge must match the rotation edge plus the back-cut, or $3 \text{ to } 5 + x = 8 \text{ to } 9$. A piece of wire held at 3, bent to 5 and kinked to x, when straightened out and placed along the lateral edge beginning at 8, will indicate point 9 reasonably accurately.

The third dot mark has been set at the midpoint of the alar base 10. The fourth point will be set at the end of the upper lateral alar base incision after it has curved sufficiently around the alar base 11. The amount of circumalar release depends on the degree of rotation necessary to place the flaring cleft side

Matching with wire the rotation edge to the advancement edge.



Marking the advancement flap incisions along the edge and around the alar base.



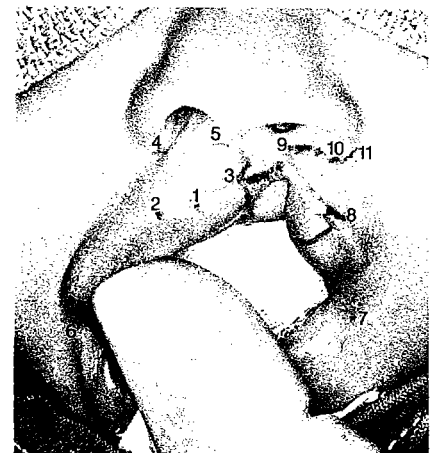
alar base into balanced symmetry with the normal side. When the lateral cleft lip element is severely deficient, the circumalar incision can be raised to include a small amount of the actual alar base in the lip flap B, thus increasing the size of the flap to adequate proportion. This addition is required more often in complete clefts. Another rare occurrence in incomplete clefts is to have the cleft side slightly longer vertically, requiring a slender transverse wedge excision from its upper edge to allow the desired lift with the advancement.

Shortening a long vertical lateral lip element with a high transverse wedge excision



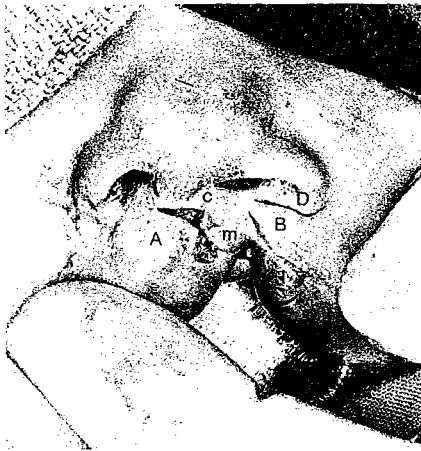
The actual final position of each of the four points, 8, 9, 10 and 11, is determined by a "cut as you go" policy. Rough estimates are easy, but the final placement of each of these points is interdependent on the other two, and the last millimeter of revision may have to wait until some of the key sutures have been set.

The "unneeded" attenuated center portion of incomplete clefts between the rotation flap A and the advancement flap B is flap c and *some extra tissue*. This segment of tissue will be isolated by the rotation and advancement incisions and will be left attached to the columella as in the original flap c design. Care must be taken, however, not to interrupt, during the medial and



lateral undermining, the mucosal attachments of this central segment to the alveolus. Any skin, subcutaneous tissue, muscle and mucosa that is not used in the tip of advancement flap B or the body of flap c can be used to line any raw areas in the lateral nasal vestibule and alveolar sulcus and at the same time should offer extra contour when the cleft alveolus is deficient. In actual practice the "extra tissue" will be mostly mucosa.

NO STRICT ORDER OF ACTION



Once the rotation and advancement flaps have been measured and marked, they are *scored*. After this the order of incision making is not important. Usually the rotation is cut first, but in incomplete clefts with sufficiency of tissue the creation of lateral flap B is not quite so dependent on the positioning of flap A. Thus, in the case being used for demonstration the advancement flap was stabbed out even before the rotation incision was completed. Freeing of flaps A and B from the maxilla can be achieved either before or after the flaps are actually cut. Again it depends on the case.

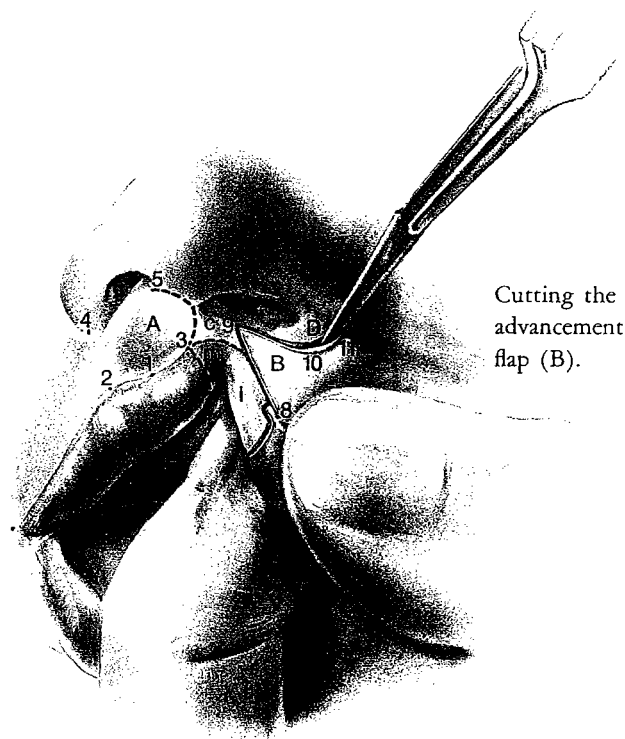
CUTTING THE ADVANCEMENT FLAP

Advancement flap B has been incised into dermis with a #67 Beaver blade from point 8 to 9 to 10. Now the flap is completely severed through and through along these lines with a #11 blade leaning on the bias to include as much muscle and mucosa in flap B as possible. The extension of the labial-alar incision from 10 on farther around the alar base to 11 depends on the amount of medial rotation desirable for each specific alar base and creates flap D. Along the same principle, the amount of Simonart's band retained in the tip of the advancement flap B is determined by how much is *needed* against how much is *usable*.

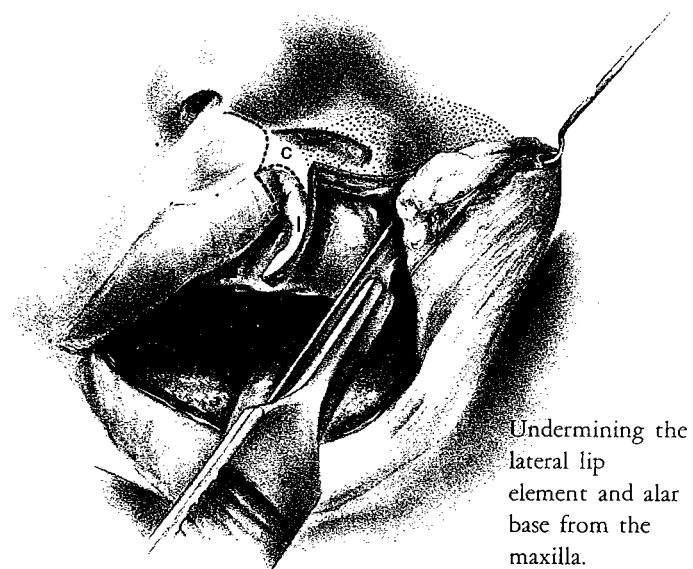
LATERAL UNDERMINING

An incision with the #15 B.-P. blade high in the upper labial sulcus of the lateral lip element frees the soft tissue attachments to the maxilla.

In incomplete clefts, the amount of lateral undermining varies, but freeing up to the infraorbital foramen may be required. This decision is determined by manipulating the lip element to see when it moves freely into its destined position across the cleft without resentment. Any final restrictions can be felt along the sulcus with the finger and released with the scalpel.



Cutting the advancement flap (B).

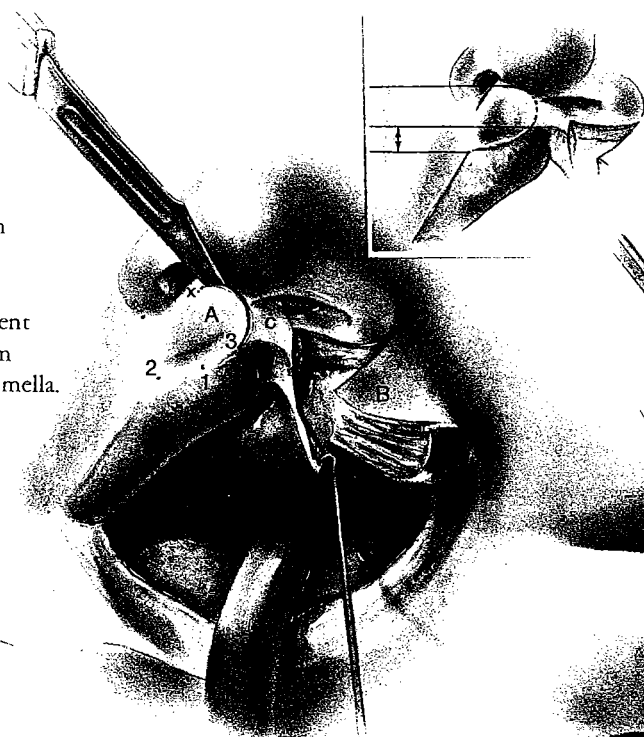


Undermining the lateral lip element and alar base from the maxilla.

CUTTING THE ROTATION

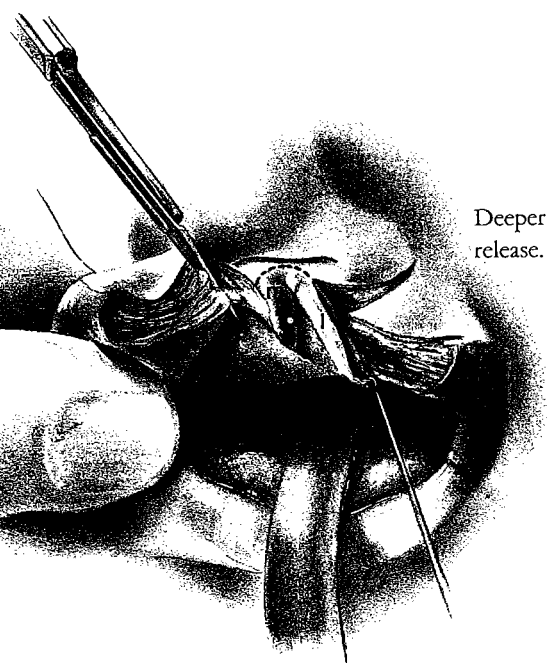
It is well to remember that the *difference* in the distance from the mid-base of the columella to the two peaks of the bow on the non-cleft element indicates exactly the amount of cupid's bow displacement and, consequently, must determine the amount of rotation and back-cut necessary to place it into a balanced position.

Rotation
incision
dividing
lip element
(A) from
the columella.

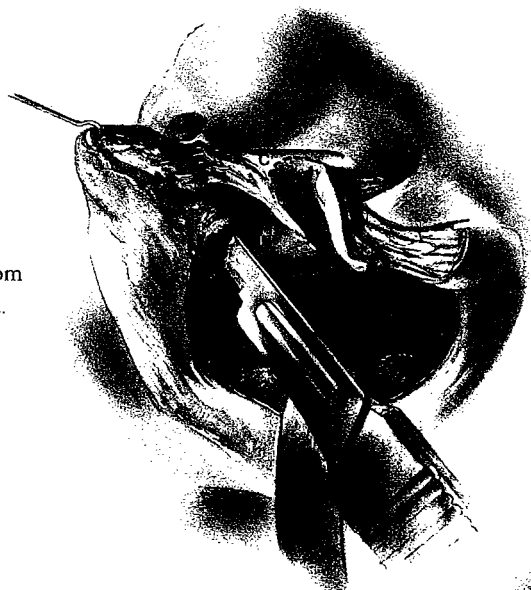


The difference in
the heights of the
bow peaks.

Deeper
release.



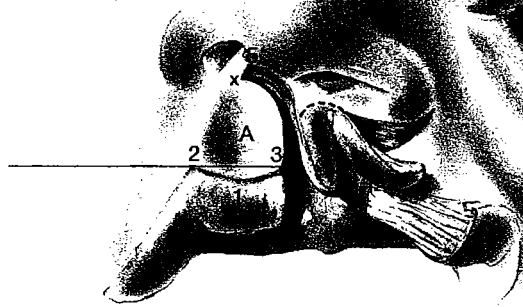
Freeing
medial
element from
the maxilla.



Back-cut
for final
bit of
release.



Cupid's bow peak is
now in normal
symmetrical position.



The rotation incision will lower the non-cleft element, flap A with cupid's bow, one philtrum column and dimple into normal position and release a portion as flap c to rise up for columella and nostril sill duty. The marked curve of the rotation incision has been cut through skin to dermis with a #67 Beaver blade and now is severed completely with the stabbing action of a #11 B.-P. blade through full thickness of lip to release flap A from its superior nasal attachments. Again the blade is tilted on the bias to retain as much muscle and subcutaneous tissue as possible in flap A. The descent of A is then tested to see whether points 2 and 3 are on a direct horizontal line, which would position the cupid's bow in perfect symmetry.

MEDIAL UNDERMINING

The next maneuver is the freeing of the medial lip element from the maxilla by an incision at the height of its upper labial sulcus. The amount of undermining is usually less than on the lateral side and need be no more than will let this element rotate easily. This undermining can have been completed earlier to facilitate the rotation or postponed until after the rotation incision.

BACK-CUT

Even after the rotation incision and the undermining, the position of A usually will be found a little short of perfection. With flap A tugged slightly toward normal position, the tip of a #11 is used to stick-cut at point 5 the back-cut, which speeds up the rotation. One to 2 mm. of back-cut in the skin obliquely down with slightly more release of the muscle will complete the necessary rotation for normal positioning of flap A. A back-cut of as much as 3 mm. is needed only in odd cases. As the back-cut lowers the scar in the lip, it should be used sparingly and only when needed.



USING THE SCRAPS

The "extra tissue" now has been isolated to a section which was once posterior and edge mucosa of Simonart's band along with whatever muscle and skin were not carved off for more important duties in flaps B and c. It is based on its mucosal attachments to the alveolus and can be used to line the sulcus and cover raw alveolus preferably on the cleft side. In incomplete clefts this flap is usually kept in one piece with its medial m and lateral l extensions as shown and is eventually sutured to cover the raw alveolus and to preserve a deeper labial sulcus.

FLAP c AND EXTRA TISSUE

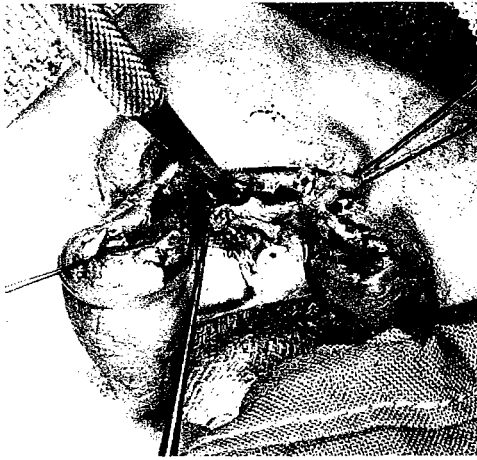


The rotation and advancement incisions isolated flap c and the remaining portion of this central segment. A generous estimate of the needs for flap c in columella lengthening as well as columella base and nostril sill construction should allow the cutting of flap c free from its lateral attachments. Flap c will be composed mostly of skin for anterior and cleft side columella. The extra mucosal scraps have been trimmed free from flap c.

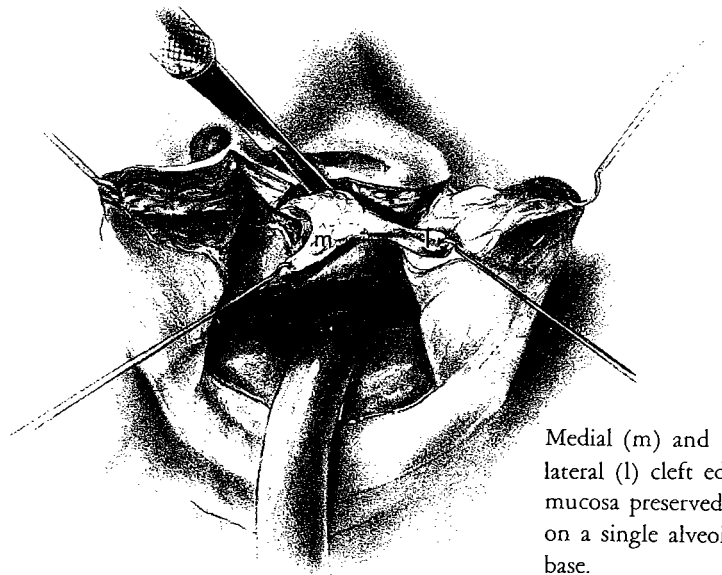
Flap c is attached now to the cleft side of the columella and is continuous with the nostril floor. It is further released by dissection from the maxilla with scalpel and dental scaler.

FREEING THE MEDIAL CRURA

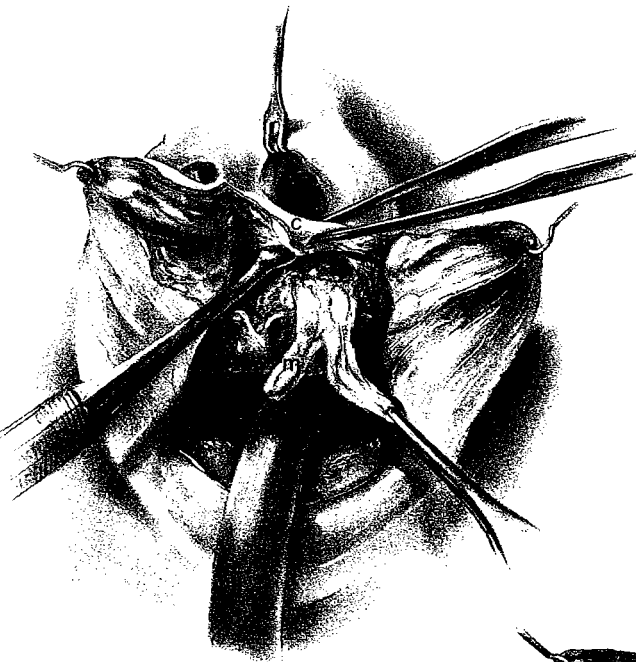
Through this exposure scissor dissection between the crura will facilitate upward shifting of the cleft side of the columella as flap c is fed into the columella as a one-sided forked flap. This increases the columella length on the short side by 2 to 4 mm. and creates a fullness at the columella base to balance the normal side. If the columella is very short, further facilitation of advancement of flap c by a posterior membranous septal incision may be necessary. This is less often needed in incomplete clefts.



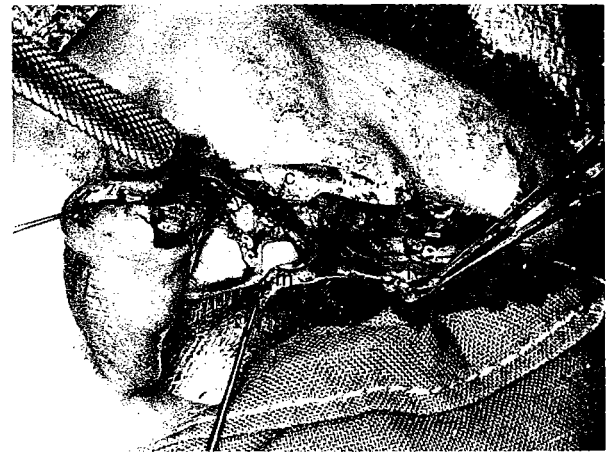
Salvaging the "in between" tissue.



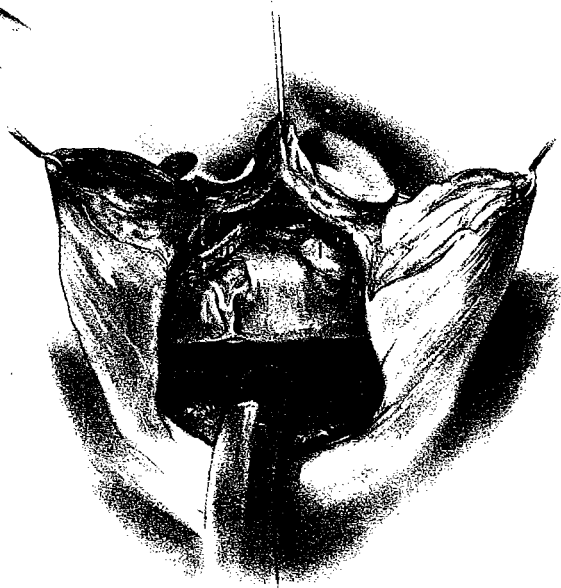
Medial (m) and lateral (l) cleft edge mucosa preserved on a single alveolar base.



Subperiosteal dissection around the pyriform opening to free flap c, nasal floor and alar base for medial rotation.



T-shaped mucosal scrap sutured over raw alveolus to preserve the sulcus.



ALAR BASE FLAP

The freeing of the alar base flap D separately from the advancement flap B is the maneuver that will allow positioning of the alar base correctly without tendency to lateral drifting. As the alar base D is freed from the maxilla in the incomplete cleft, the dissection is carried around the pyriform opening with a dental scaler type of sharp elevator. Then as flap c is continuous with the nasal floor, which in turn is continuous with flap D, this entire contingent is whirled in a revolving motion around the nostril (clockwise in left clefts and anticlockwise in right clefts). Thus is flap c fed into the columella as the nasal floor moves into the columella base area and the alar base shifts medially into a position balanced with the normal side. The subcutaneous bulk retained in the most medial portion of the alar base flap B is now picked up with a white Prolene 4-0 suture (Ethicon # 8603) or Mersilene 4-0 (Ethicon # 765). This suture is passed under flap c to catch the septum at the nasal spine. When tied, the suture advances alar base flap B into symmetry with the normal side and prevents later lateral drift.

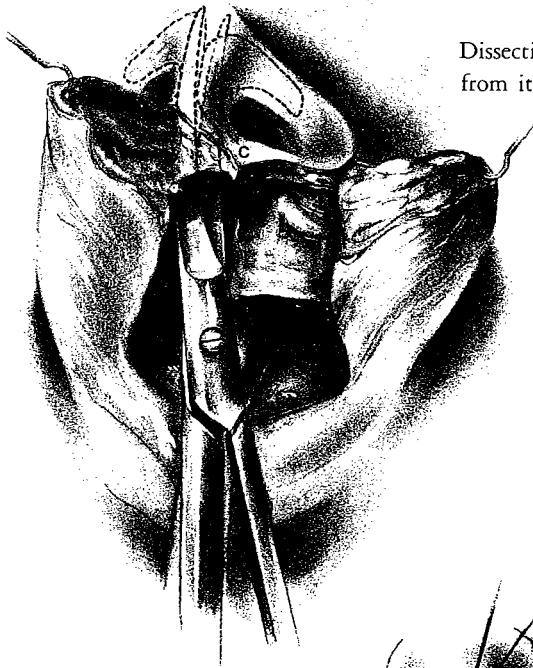
If in the original deformity the nasal floor was nearly normal, then it should be *kept intact* to *counteract* any narrowing that medial advancement of the lateral lip flap and alar base may cause.

ALTERNATIVES

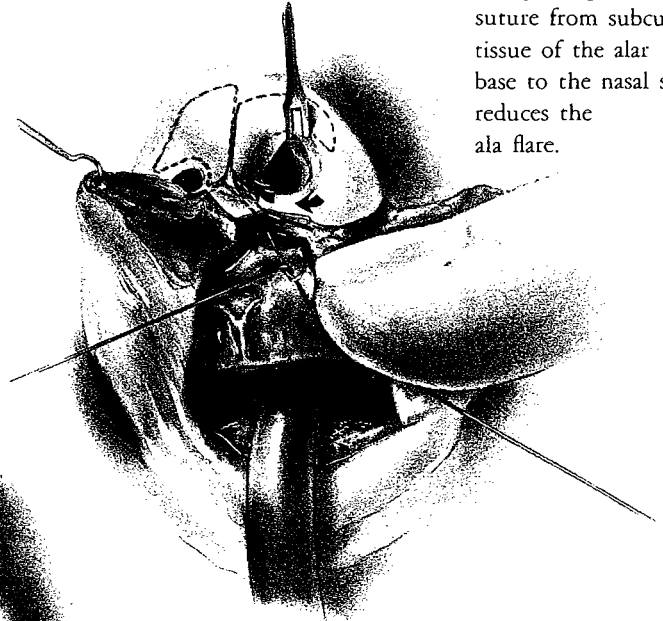
If the nasal floor is still too wide, a wedge excision may be required, or the amount estimated for excision can be merely denuded of epithelium, divided from flap c but left attached to the alar base and advanced medially by sutures to the septum under the edge of flap c.

FINAL EDGE ADJUSTMENTS

In order that the scar of union imitate the opposite normal philtrum column, the convexity of the rotation edge is maintained. The convexity of the advancement edge is corrected with



Dissecting the slumped medial crus from its inferior attachments.



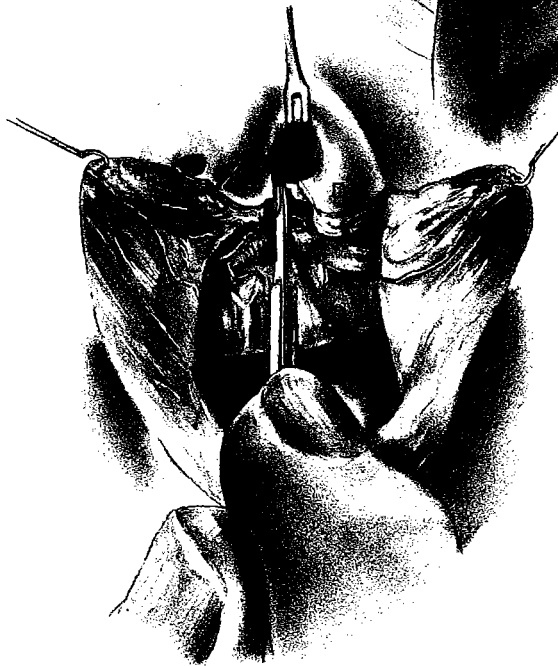
Tying the prolene suture from subcutaneous tissue of the alar base to the nasal spine reduces the ala flare.

Advancement of flap c into the columella.



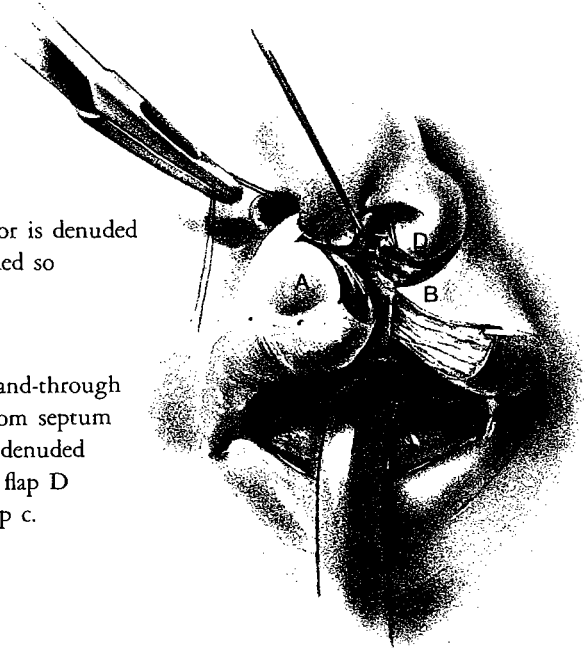
If nasal floor is still too wide then a wedge excision is necessary

or

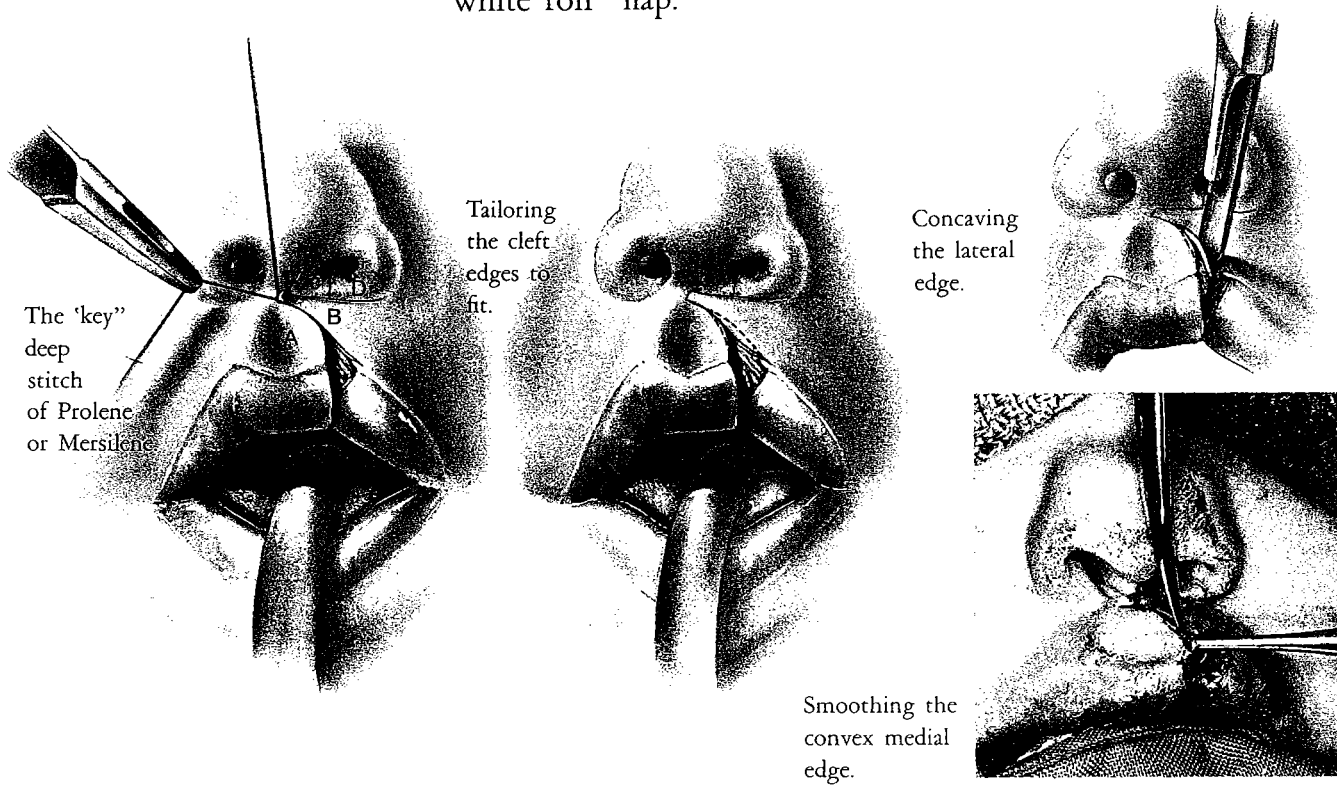


Nasal floor is denuded and divided so

through-and-through suture from septum can pull denuded alar base flap D under flap c.



a broken line marked on the skin and trimmed to a gentle *concavity* to fit the matching edge. Then the dermis and mucosa are freed from the lip muscle on each side 1 to 2 mm. to prepare for accurate approximation. The key stitch, placing the point of the advancement flap B into the rotation gap, facilitates the tailoring of the edges. This is the time for cutting the little "white roll" flap.

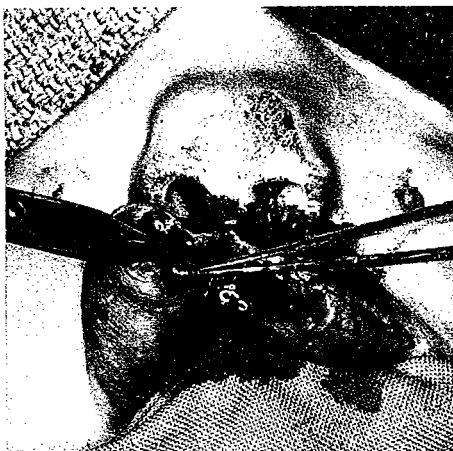
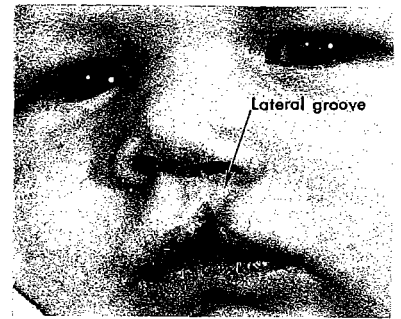


MUSCLE EDGE FLAPS

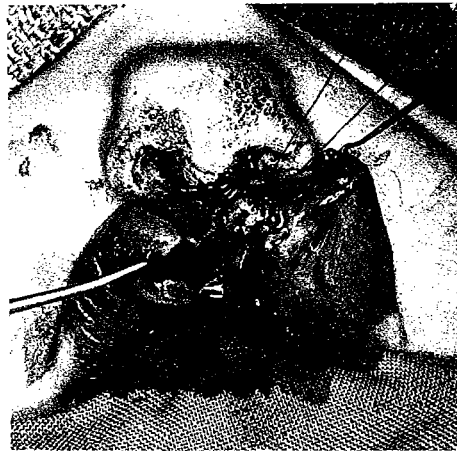
With flaps A, B, c, D and the white roll all cut, the rearrangement of tissues with final revisions begins. Use of muscle flaps for interdigitation across the cleft into the opposite side depends on the muscle bulk, or lack thereof, of the two main elements, flaps A and B. If the medial element A is deficient in its free border edge and the lateral element B has sufficient muscle bulk (this is rare), then a muscle flap from the lateral element can be inserted into the inferior edge of the medial element. The more usual condition is a muscle bulk in the medial element serving as a "springboard" to prevent good A-to-B approximation. This can be taken as a muscle flap based below and inserted into the subcutaneous tissue of the lateral side free

border to increase its bulk and fill out the deficiency of its visible vermilion. These muscle flaps are threaded into tunnels with pull-through sutures for accurate positioning and retention.

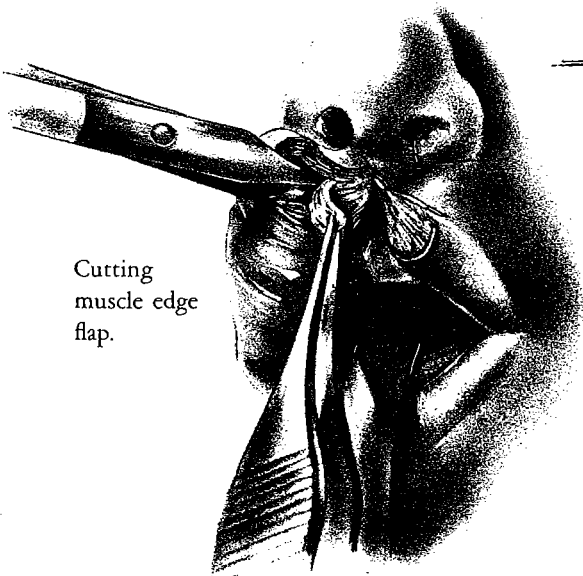
Should the tip of the advancement flap be thin, the muscle flap cut from the edge excess of the lateral flap can be turned under to bolster the deficiency. Another possibility is the transposition of a superiorly based flap, obtained from the medial edge, under the thin advancing tip of the lateral flap or rather into a *pocket* actually dissected into the advancement flap at its deficient or grooved area. Often the bulk of flaps A and B is sufficient, and these fancy muscle adjuncts are not required. Just remember they can be available if needed.



Cutting medial muscle edge flap.



Flap sutured under thin portion of lateral flap.



Cutting muscle edge flap.



Transposition of muscle flap into pocket under deficient zone of lateral flap.



Grooved area filled to present smooth contour.

MORE RADICAL LATERAL MUSCLE POSITIONING

It is becoming apparent that the most physiological approach to the muscle of the lateral element is radical dissection to position its oblique fibers in a more horizontal direction. When there is an abnormal bulge of this muscle with thinning above causing almost a groove between the hump of muscle and the nostril sill, wide undermining of the muscle from both skin and mucosa and a back-cut release of the muscle will allow its fibers to come down for end-on apposition with the rotated fibers of the non-cleft side. This will leave a muscle gap above, which then will require any muscle flap available from the opposite edge to fill the defect. The details of these refinements will be shown in the description for closure of complete clefts.

WHITE ROLL FLAP

At point 8 the mucocutaneous junction ridge or white roll is well differentiated and can be cut free ready for interdigitation across the cleft. The notch for its insertion in the mucocutaneous junction ridge on the non-cleft side can be created by an incision when the rotation is a millimeter short or usually by a millimeter block excision for perfect fitting. This excision or incision to receive the white roll flap should *not* be made early because during the suturing of the rest of the lip the split will spread into oblivion. Rather it is postponed until the very end when the white roll flap is lying over its destination. Only then should the recipient bed be split and filled.

The tissues are now ready for the final suturing . . .