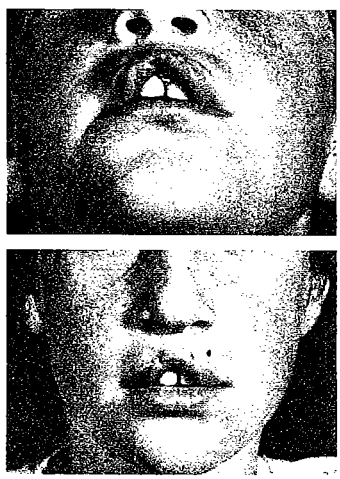
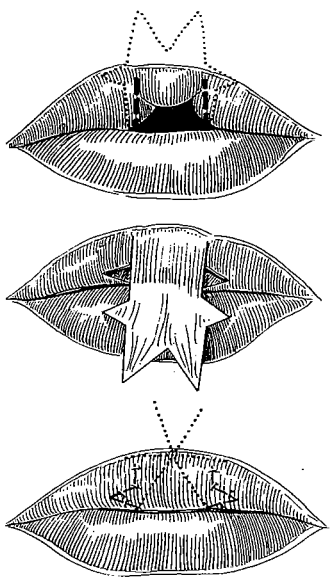
35. *Deformities of the Free Border Vermilion in Bilateral Clefts*

THE WHISTLING DEFORMITY



THE most common defect of the free border in bilateral clefts is the whistling deformity. This unattractive central deficiency, often seen as a postoperative sequela, spoils the effect of an otherwise satisfactory closure, for one tends to see the *hole* and not the doughnut! Of course, its occurrence is easily avoidable if the primary lip surgery is planned correctly and the prolabium vermilion is not called upon to constitute the center of the lip alone. A myriad of methods have been used to correct this secondary deformity.

A MYRIAD OF METHODS



A fancy vertical V-Y

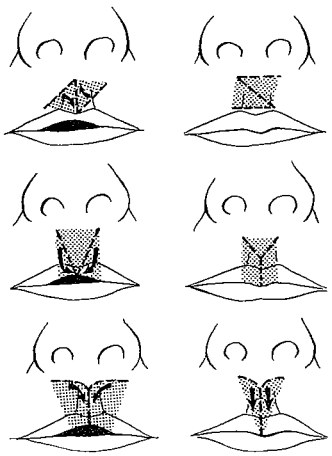
In 1957 George Crikelair and M. J. Hickey of Columbia-Presbyterian Medical Center noted that in bilateral clefts when the lateral segments have simply been approximated to the prolabium the central segment is often lacking in vermilion fullness, presenting a dark hole in which the upper central incisors are visible. They suggested a V-Y advancement with lateral extensions from the posterior buccolabial line of the prolabium to fill out the "whistle deformity."

Dave Robinson

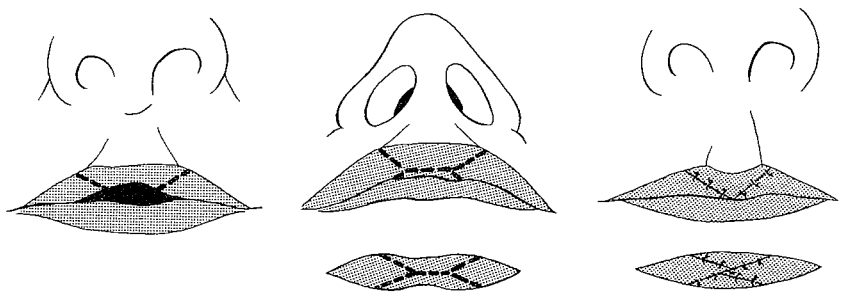
Double horizontal V-Y's

Tall and gentlemanly Dave Robinson, with Lynn Ketchum and Frank Masters from the plastic stronghold in the center of the corn belt of Kansas, admitted that after conservative simple side-to-side closure of a bilateral cleft lip when the prolabial vermilion is left as the center of the red border:

> For the first few years, the prolabial vermilion is too high—but it does assume a more normal position in 5 to 10 years. In spite of the claims that it will usually assume the same level and the same degree of fullness, this progression does not always happen. Thus the "whistling deformity" occurs.



For this deformity they reviewed the central advancement of posterior upper lip mucosa by a Z, a V-Y or a double rotation. They even mentioned a free composite graft from the lower lip. Then they plowed them all under and came up with a horizontal double V-Y in the free vermilion border of the lip which shifts the lateral mucosal redundancy into a central four-flap tubercle.



More recently, at the University of Kansas, the surgeons have been treating whistling deformities with flaps described by Kapetansky.

Donald Kapetansky

The pit and the pendulum

In 1971 enthusiastic Donald Kapetansky of Detroit noted:

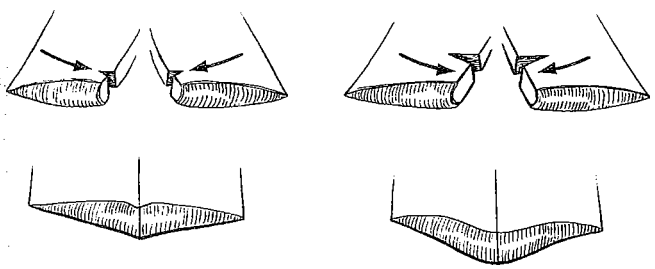
> When the prolabium has not been augmented with lateral vermilion flaps in the primary repair, an abundance of tissue is usually apparent in both sides of the upper lip. The problem is one of secondary transfer of this tissue. The usual flaps do not permit the necessary mobility, but island flaps are mobile and avoid the need to twist the tissues or stage the repair.

He designed two vertical pendulums composed of vermilion,

muscle and coronary vessels. The anterior plane of dissection divided the lip coronally with about one-third of the orbicularis oris muscle mass in front of it; the posterior plane was behind the labial vessels. A transverse incision uniting these two provided a space into which the pendulums could swing together, filling the whistling deformity.

His result was impressive, but the magnitude of the muscle splitting of the "pit and the pendulum" method has the slightest suggestion of a plan by Poe.

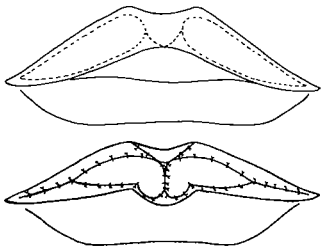
Three years later, with a total of 24 cases, Kapetansky had made a few interesting modifications which he presented in the April 1974 *Cleft Palate Journal.* He now cuts his pendulums full-thickness muscle in their medial portion and split-thickness laterally. With back-cuts into his pendulum pedicles he achieves medial lengthening to form a central tubercle and notes that if the back-cut is placed low and short, the tubercle will be small, while if it is high and deep, the tubercle becomes larger.



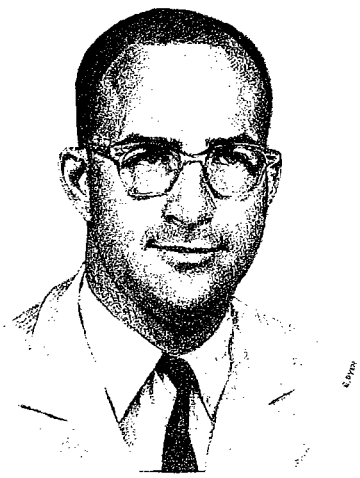
To create a pit between his pendulums, Kapetansky sutures the central prolabium dermis to the muscle pedicles. His immediate results are dramatic but seem slightly better than the later results, as in most dimpling procedures.

It is also worthy of note that Kapetansky has such faith in this secondary procedure that he is happy with simple side-to-side

closure in his primary bilateral clefts at one week, accepting lack of muscle continuity, short columella, flared alae and whistling deformity. Then at five years he plans to swing the pendulums and, later, to lengthen the columella.



Juri, Juri and de Antueno of Buenos Aires in 1975 suggested a modification of the Kapetansky technique that used another approach to increasing central lip fullness. They advocated that the Kapetansky flaps be "fitted together downwards in the shape of an 'L' to make up the center of the tubercle."



Marvin Arons

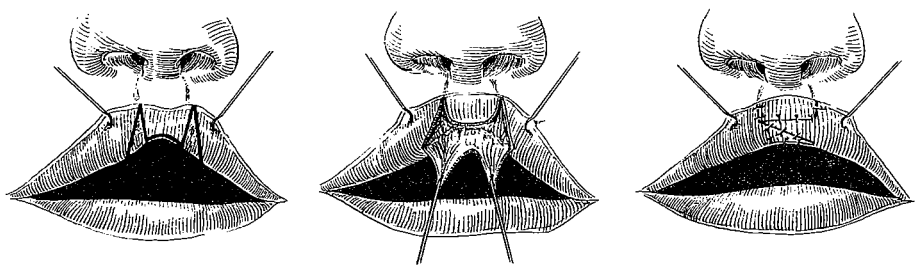
and by Blair in 1930

Double transpositions

Marvin S. Arons, of Yale University, also designed a correction of the whistling deformity. As it is intriguing to review the background of those who later contribute, here are his 1974 reminiscences:

> As a general surgical resident at Duke, I first saw the cleft lips repaired in a textbook technical fashion. My first experience was with Truman Blocker of the University of Texas while he was still active in the operating room. It was what I called the "twenty minute free hand repair of a cleft lip." I believe that he represented to me the art—as well as the science—of plastic surgery. I learned from him the importance of rolling in the ala, utilizing the skin below to restore the floor of the nose as a lateral based flap brought medial. We all called this the "Blocker flap." I'm sure Dr. Blocker did not realize that the Collis procedure was reported in 1868.

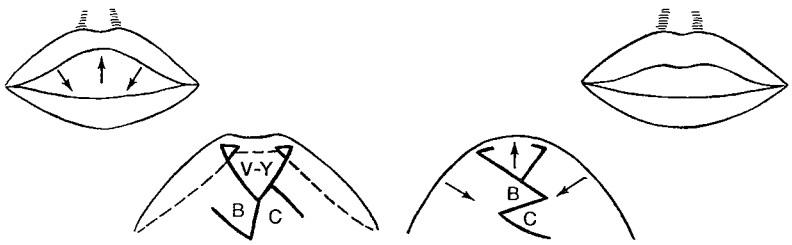
In 1971, for the central vermilion deficiency in bilateral clefts, Arons designed a secondary Z. He hinged small bilateral inverted V flaps of mucosa and scar down on either side of the whistling deformity. The central segment was elevated and flapped forward into a roll. The lateral V flaps were then interdigitated horizontally behind the central flap.



V-Y-Z

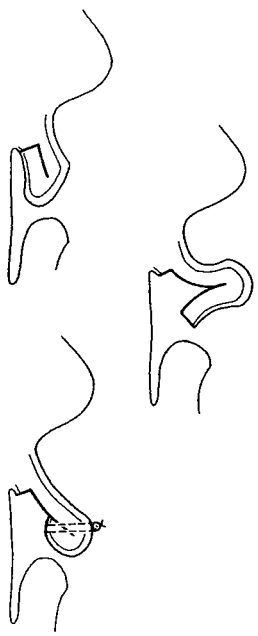
In 1969 Shugo Soeda, of Tokyo University Hospital, added a Z-plasty to the V-Y posterior mucosal advancement. As he explained:

> V-Y-Z plasty is combined V-Y plasty and Z-plasty for advancement of the wide V-shaped flap and preventing postoperative retreat of that flap. This technique is applied for secondary revision of the thin prolabial vermilion, produced as the postoperative deformity after primary repair or Abbe flap repair of the bilateral cleft.



This rather complicated action does have a double advantage of lowering the short central segment while lifting the long lateral edges, but it must be rare that the middle segment is short enough to require this many flaps.

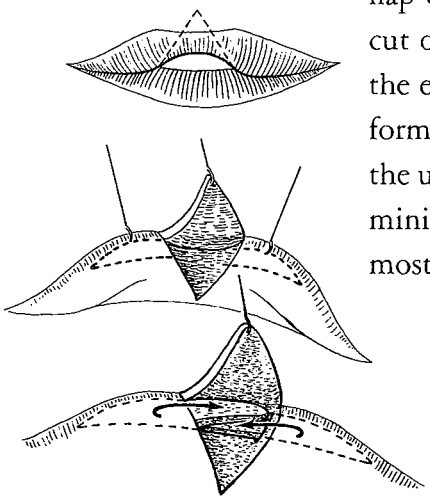
A drop down



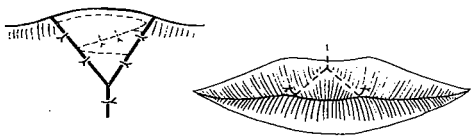
Humorous Hugh Johnson of Rockford, Illinois, simplified his treatment of the whistling deformity by turning the posterior lip mucosa down like the back flap in a pair of red long johns and holding it rather adroitly with a stay suture over cotton. This maneuver presupposes that there is posterior mucosa in the first place, that the inevitable overgrowth of injured mucosa *is* inevitable and that the rather large posterior raw area will heal without contracture. Too many ifs for most cases, but for the one he presented with a minor "whistle" there was permanent improvement.

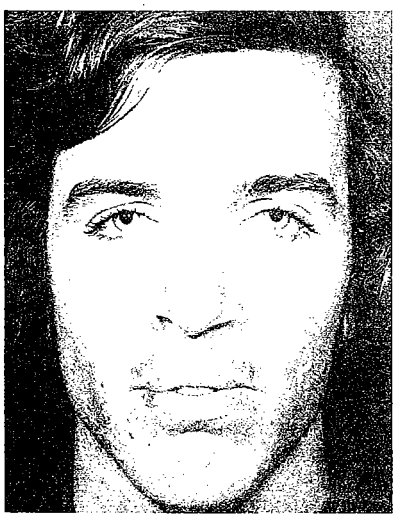
Turning a chink in V-Y for a tubercle

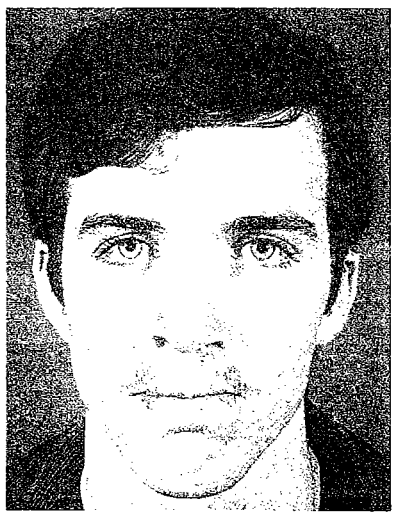
In my experience, advancing the free border in the central whistling deformity with a posterior mucosal V-Y can be augmented by a combination of details. Mark and cut the V slightly



wider than the free border vermilion discrepancy. Dissect the V flap down to its base along the inferior border of the lip. Then cut one or two small vertical subcutaneous or muscle flaps from the excesses on each side and transpose them beneath the flap to form a filler under the roll. The muscles are approximated across the upper defect, but the downward advancement of the V can be minimal, producing only enough stem in the Y for one or at most two closely placed sutures.







Redundancies

A very common secondary deformity of the vermilion free border is an excess bulge here or there. With an eye for a symmetrical cupid's bow curve of the free border, the surgeon must trim the redundancy by marking and sculpturing with scissors. Sidney Wynn facilitates accuracy and hemostasis in his removal of redundant vermilion of the free border with a series of Allis clamps pinching a welt of the excess. Then he cuts with scissors along the compressed teeth marks of the Allis clamps. According to Albert Borges, this transverse reduction and contouring of free border

vermilion redundancy can best be accomplished with a W-plastic type excision. The extensible zigzag scar is very good cosmetically, producing elasticity in and out of a smile.

A relative whistling deformity

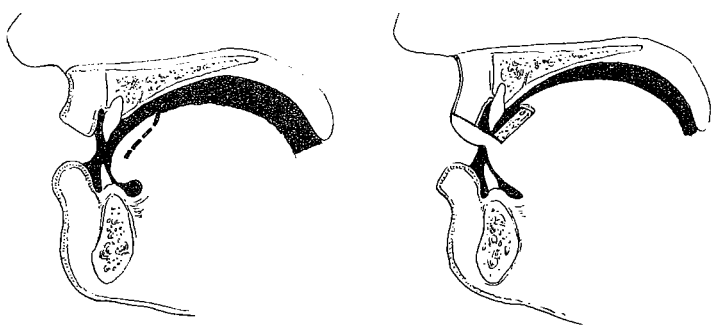
When the central portion of the vermilion is adequate but there is a relative excess of the lateral vermilion segments, there may be an apparent whistling deformity. It can be corrected simply by reduction of the sides without disturbance of the center. In this case transverse free border excisions of the overhanging vermilion, more on her right than her left, produced a central tubercle and the natural vermilion curves of the cupid's bow.

From tip of tongue

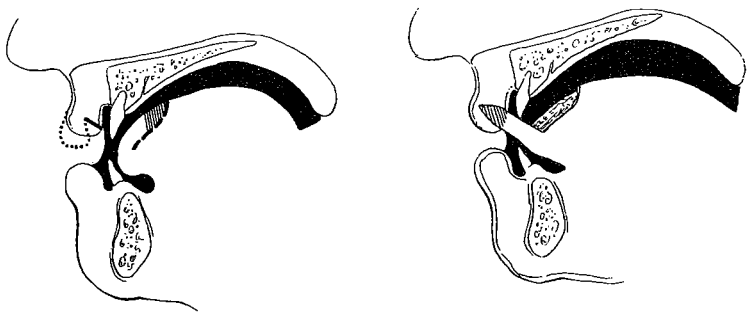
Another source of pink mucosa for constructing the deficient vermilion of a cleft lip is the tip of the tongue, as described by José Guerrero-Santos of Guadalajara in 1964:

> We obtained a lingual flap in one single unit and after a vermilion shave of the upper lip, we sutured the flap in place and resected the pedicle 2 weeks later.

By 1969 he had modified his tongue-tip flap. When the vermilion was scarred, he replaced it with a tongue flap.

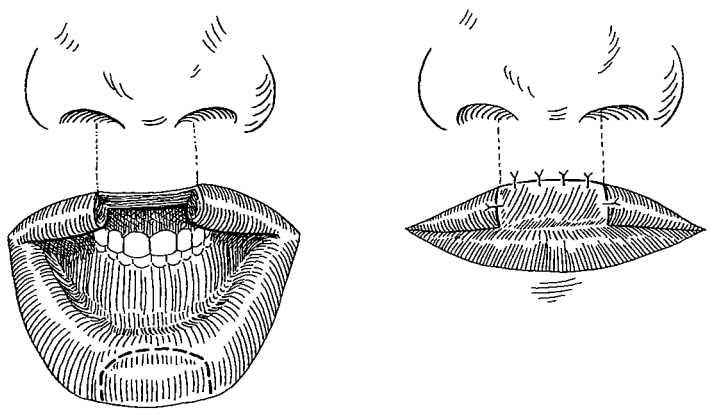


When the vermilion was unscarred but deficient in bulk, presenting the whistling deformity, he denuded the tip of the tongue-tip flap and buried it in the lip. After three weeks, the flap was divided, keeping as much tongue mucosa as was necessary to correct the deficiency.

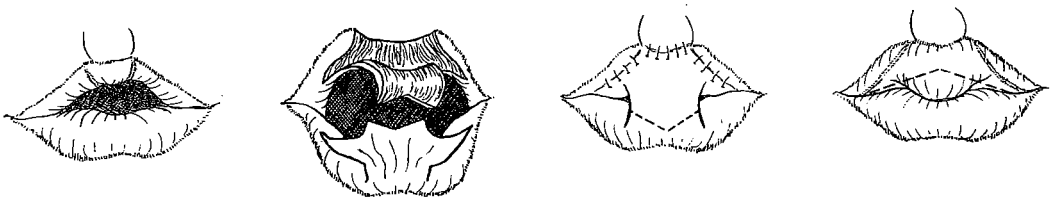


From opposite lip

Vermilion flaps from the lower lip are available and have been used for defects of the upper lip. They are all possible solutions to the whistling deformity. Lexer used a relatively wide flap from the inside of the free border of the lower lip which he turned out and attached directly to the center of the upper lip. This flap he divided after an inset of two weeks.



In 1973, Hans Tschopp of Basel, Switzerland presented an embellishment of the Lexer lower lip mucosal flap which sported lateral extensions.



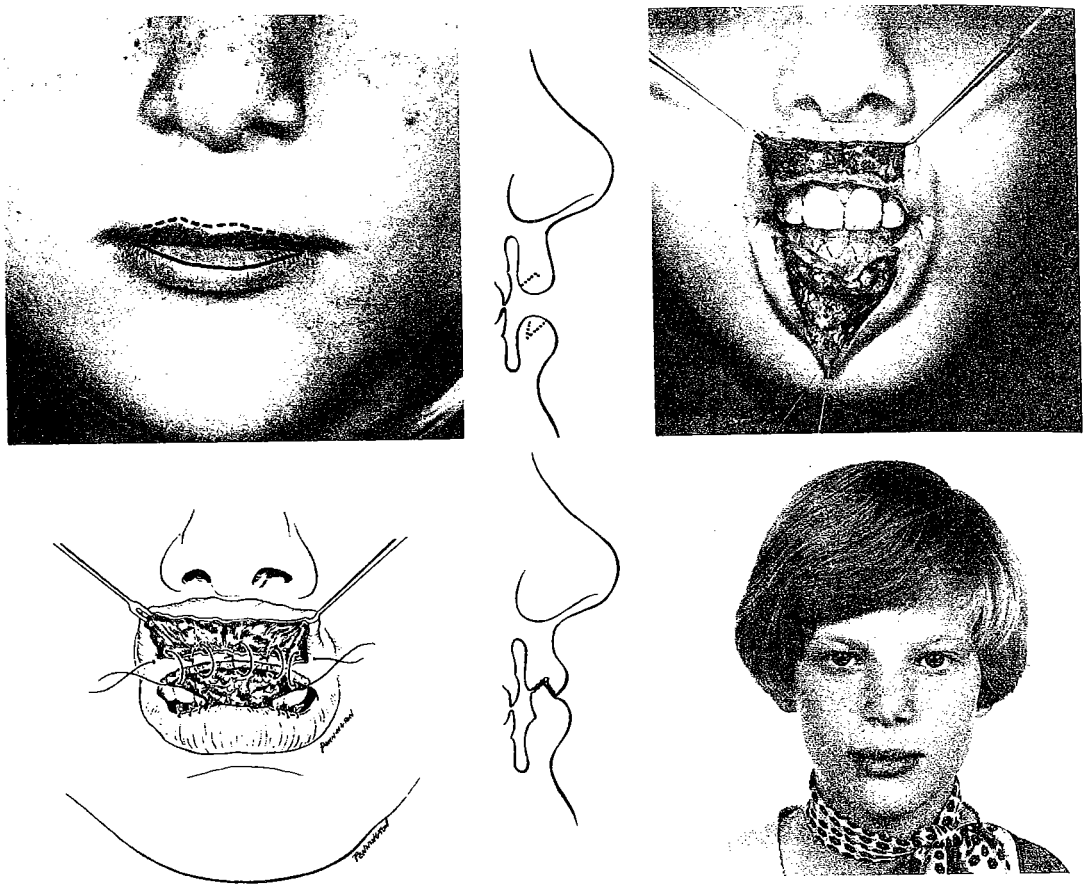
His design was similar in principle to the mucosal portion of my 1964 fleur-de-lis lip flap presented at the end of this chapter and the reverse of a flap used in the following case.

Here is an eleven-year-old girl who had had a LeMesurier lip closure in Missouri with a reasonable result except for soft tissue flatness of the upper lip when compared to relative protrusion of the

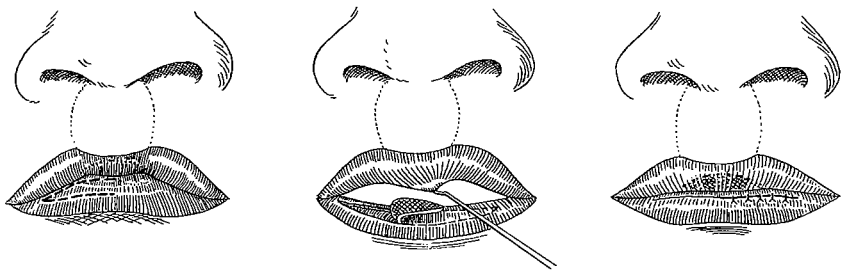
upper lip suggested the use of a reverse Lexer type lower lip mucosal flap.

At age 14 years under local anesthesia a transverse posterior incision above the free border of the upper lip released the vermilion. Then a wide mucosa and orbicularis oris muscle flap based inferiorly was cut on the lower lip and let into the upper lip defect. Andrew Klein inquired if my fleur-de-lis flap could be used here. Realizing that such a modification of a flat flap would achieve final inset of the lateral wings and produce larger portals for breathing and feeding, I did just that, with excellent take of the entire flap.

Ten days later the pedicle was divided, the spurting coronary vessel cauterized, the donor area in the lower lip closed, and the flap inset completely in the upper lip.



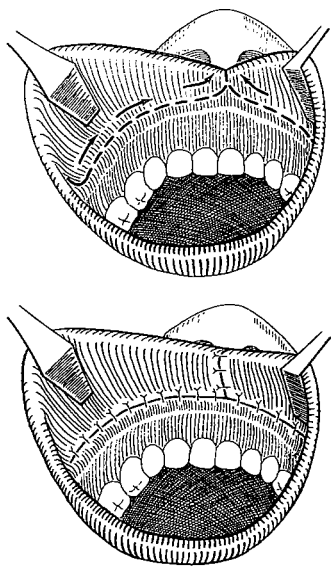
Gillies, in the two world wars, used flaps from the vermilion of the lower lip for defects in the upper lip. He even tubed the pedicle of one of these mucosal flaps, but in most instances he transposed them 180 degrees without delay.



Much ado about almost nothing

This may seem like a whole circus parade of methods for a problem worthy of only a "peep show," but actually each one has merit and in a certain case could be the best. The important point in the entire show is that the whistling deformity should no longer occur in the first place, and if the primary surgery is well designed *it damn well won't!*

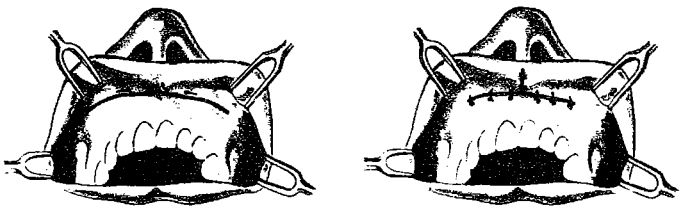
A MORE CONTINUOUS VERMILION FREE BORDER DEFICIENCY



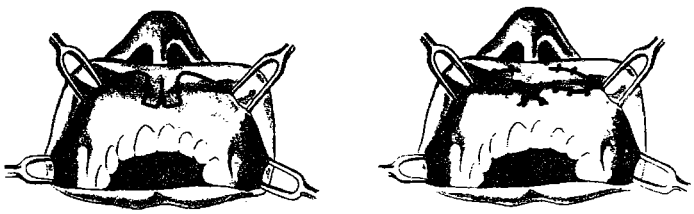
The wide medial advancement of the upper labial tissues after extensive freeing from the maxilla and "back-cutting" the mucosa at the extremities of the incision was advocated also in bilateral clefts in 1973 by O'Connor, McGregor, Murphy and Tolleth. This radical action does give more body and eversion to the free border vermilion of the upper lip and does so without visible scars.

Since 1965 the artistic Otto Neuner, oral surgeon of the Berne University Dental Institute, has reported fascination in secondary cleft deformities. In 1969 and 1971 he published three designs for everting the deficient upper lip vermilion in bilateral clefts.

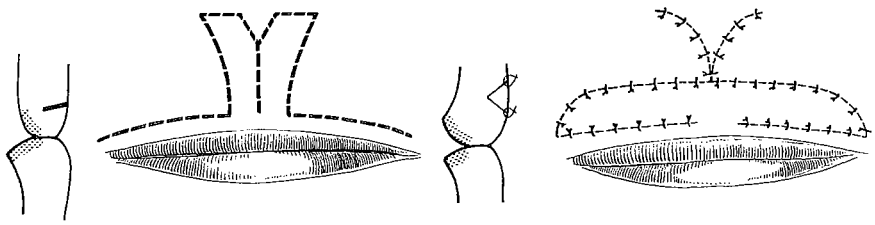
One approach was similar in principle but less radical in execution than that described later by O'Connor. He referred to it as a "vestibulum-flap-shifting-plasty to protrude the vermilion," and, as with the O'Connor method, it was equally applicable in unilateral and bilateral clefts.



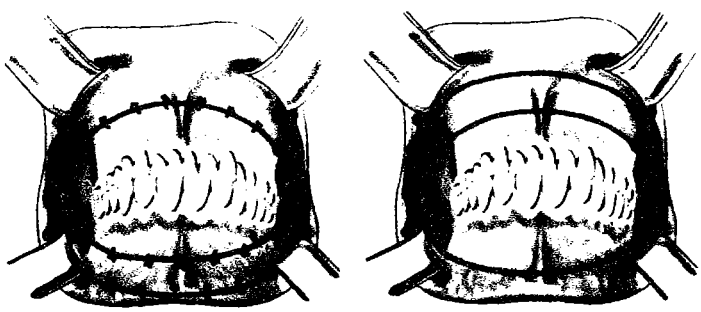
Another Neuner method took two mid-vertical mucosal flaps and transposed them bilaterally after release by horizontal posterior incisions. This approach, of course, supposed that there is enough mucosa in the scarred vertical axis of the posterior upper lip to supply rather grand horizontal needs.



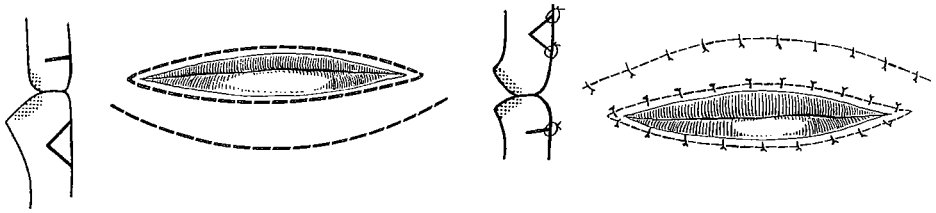
It has also been diagrammed this way:



The third method looked to the lower lip for its mucosa. When the upper lip does not have sufficient mucosa to spare, Neuner advocated transposing a horizontal bipedicled mucosal strap flap from the lower lip. This strip of mucosa is let into a posterior releasing incision placed in continuity around the commissures with the upper incisions of the strap. The action not only everts the deficient free vermilion border of the upper lip but reduces redundance of the lower lip.



The procedure has also been diagrammed this way:



Abbe stay home

Neuner feels that one of the advantages of these mucosal maneuvers is the fact that they can be done without the use of an Abbe flap. This is a commendable point. It is, however, important not to overemphasize the attitude of "use anything to avoid a lip-switch flap" because the Abbe has far more to offer than mere mucosa.

For instance, sometimes the upper lip vermilion is thin while the lower lip is voluminous, and, at the same time, there is transverse tightness or a vertical skin scar which, when excised, will produce side-to-side tightness. In this case the lip fleur-de-lis Abbe flap can be a winner.

Fleur-de-lis

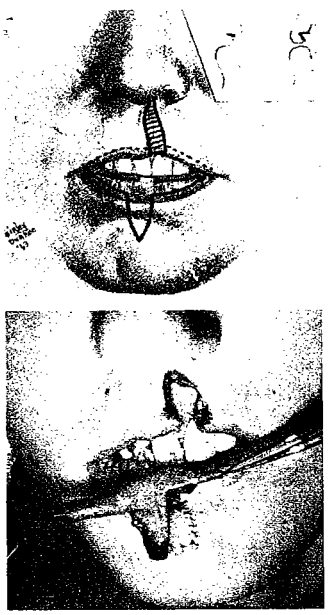
The lip-switch flap can be specifically designed to fill out the free border vermilion of a tight lip which has a thin red edge. The conception of the fleur-de-lis lip flap was developed only after three consultations with a bizarre case over a period of one year beginning in 1962. Yet the dividend derived from this prolonged and tenacious campaign to fit the pattern of procedure to the specific idiosyncracy of the defect was dramatically rewarding. It was published in *Plastic and Reconstructive Surgery,* July 1964.

A 29-year-old female at first sight presented an upper lip with slight shortness in vertical length producing a notch which exposed teeth and appeared to be a postoperative unilateral cleft lip deformity. The impulse to use a routine Abbe flap was almost as conditioned for me as salivation at the sound of a bell for Pavlov's dog. But the history revealed that a hemangioma of the upper lip had been treated in infancy with radon seeds. The sclerosing process had shriveled the skin into an atrophic scar with areas of depigmentation and hyperpigmentation involving

the left philtrum column and skin 1 cm. laterally. On closer examination, the full effect of the interstitial radiation became

more apparent. The central two-thirds of the upper lip revealed a generalized lack of development with a thinness particularly of the vermilion, which contrasted unfavorably with the pouting voluminous vermilion of the lower lip.

My thoughts persistently ran a one-track rut straight for the routine Abbe flap. Yet to transpose a portion of the thick lower lip into the thin upper would have been as uncraftsmanlike as repairing a hole in a bed sheet with a patch of puffy eiderdown. As I was obviously not on the right track, rather than proceed at full speed or even jump the track, it seemed wiser to slow down until coming on to a suitable sidetrack. After a year of off-and-on meditation, the solution became clear: two sidetracks! The severe excess of lower lip vermilion demanded reduction. If the usual composite lip-switch flap were taken with lateral vermilion extensions, the lower lip would be reduced effectively in three dimensions, and these mucosal wings could be used to bolster the free border of the entire upper lip.



A vertical excision of the upper lip scar preserved the philtrum dimple and two-thirds of the cupid's bow. The lower lip fleur-de-lis was cut to pattern retaining the usual small coronary vessel pedicle posteriorly. The mucosal extensions had to be taken anterior to the main coronary vessel. Horizontal relaxing inci-

sions in the mucosa of the upper lip just posterior and superior to the free border let its thin vermilion flap down. The three-armed flap was cartwheeled 180 degrees and inserted into the upper lip defect with the lateral extensions fitting behind into relaxing slits to maintain the improved plumpness of the upper lip. The pedicle was divided at two weeks and the new lip relationship was so exciting that a reduction rhinoplasty became mandatory.

Considering the possibility of a Cinderella story for this patient, I asked her if she was married. She replied that she was and smilingly asked, "Why?" "Oh, I just thought how easy it would be for you now," I told her. Several years later after a follow-up visit she said rather hesitantly, "Doctor, do you remember you once asked if I were married? Well, it was not successful, but now I have remarried and we are very happy!"

Of course, this lip fleur-de-lis flap variation can be of value in certain postoperative cleft lip deformities, especially bilateral, when the lower lip vermilion is voluptuous and the entire upper lip shows only a thin red line.