VII. Secondary Surgery
BY definition this secondary section is devoted to the losers who, for one reason or another, temporarily have to be placed in the minus column. To avoid having such a calamity happen to a patient in the first place, and to correct it when it does in the second, calls for us to take a hard line.

As the renowned Notre Dame football team suffered loss after loss over several years, a frantic search was begun for another winning coach like the legendary Knute Rockne. The University of Notre Dame, the U.S.A. mecca for Catholic students, after both coach and soul searching, decided in a businesslike manner to sign aggressive Ara Parsegian, an unlikely French-Armenian Presbyterian, as head coach. They announced to him with very little ceremony,

We are behind you 100 percent—win or tie!

And Parsegian did succeed, placing Notre Dame back in the winning column and reviving the victory spirit at South Bend. Then, on the way to an undefeated season, the team suffered an upset defeat by Purdue University. Coach Parsegian, overworked and in semi-collapse, admitted himself to the hospital for a “recovery period,” fully aware that the University Athletic Advisory Committee was meeting simultaneously to decide his fate. He waited anxiously. Finally, a telegram from the committee arrived:

We wish you a speedy recovery by a vote of 4 to 3.

Parsegian, after a number of “secondary corrections,” finally
achieved his desired result. Notre Dame University defeated the University of Alabama in the 1973 Sugar Bowl. His team was in the number one spot in the nation.

Cleft surgery is far more than a game. The stakes are higher and winning is vital, as a loss is a disaster. A most disturbing fact persists: Try as hard as we may, we still cannot quite win them all. But we have to keep trying!

It is the hope of all cleft surgeons that the initial surgery will be so effective that no further correction will be necessary. As noted by Muir and Bodenham of Great Britain for Gibson’s 1966 Modern Trends in Plastic Surgery,

There is evidence, however, that primary cases treated by the more advanced techniques of today—for example, rotation advancement . . . will need less major surgery than previous generation cases.

Certainly as the primary surgery improves, the secondary work is reduced until it amounts to no more than minor revisions.

Many pages have been devoted to why and how to plan the primary procedures and if these are understood and executed with skill befitting a plastic surgeon, that should be the end of it. Unfortunately, there are still patients who have been operated on without benefit of modern developments. Either their surgery was executed too many years ago or it was done more recently by untrained surgeons.

Secondary surgical correction of cleft deformities is a whole new ball game, but the rules that govern the primary operation also hold secondarily: Know the normal, find it and place it in normal position, throw away nothing until it is proved useless, borrow from an area of excess to correct an area of need only when it can be afforded, do not get shackled in routine but look at each case individually and when surgery, growth or lack of growth has been responsible for loss of tissue, then replace lost tissue with similar tissue in kind.

It is vital that the first failure not throw the surgeon into panic, so that his second effort is neither irrational nor repetitious of the previous error. If the secondary surgeon could be guided by such simple, sound dicta as

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Never make the same mistake twice.
Two wrongs do not make a right.
When in doubt, don’t!

the tertiary surgeon would have little or nothing to do.

**THE ORDER OF LINEUP**

Secondary corrections must be subdivided into so many categories that it is difficult to know what to put where! There are corrections dealing with the lip and those dealing with the nose and some dealing of necessity with both at the same time. What is indicated for a unilateral deformity is not always ideal or must be modified for a bilateral problem. There are general methods that can be adapted specifically to the common result seen after certain standard primary lip operations. All this overlapping makes some repetition unavoidable.

Of course, when the fundamental principles of the surgery were wrong, the faults will be glaring. But even with sound principles there is always the possibility of human error of hand and eye, and all scars just do not heal equally well. Areas of secondary error in the lip vary with the primary methods but are most common in the scarring, the muscle approximation, the contour, the landmark preservation and alignment and free border symmetry.
40. Secondary Corrections of Lip Scars

When scars have been placed across normal lines, they produce an unnatural effect. Even when of fine quality they still strike a discord. At rest with a flat light they may be passable, but in the action of muscle contraction and against various angles of light they become grossly accentuated.

Scars under tension spread. In the lip not only does this spread produce wide stripes of discoloration but in the male the absence of hair emphasizes the discrepancy. When scars are placed along natural lines and the tension of closure has been reduced and supported at the subcutaneous and muscle level, there should be less need for scar revision.

STALL FOR TIME

As Sir Harold Gillies once said,

*Time, although the plastic surgeon's most trenchant critic, is also his greatest ally.*

He later simplified this idea to,

Never do today what can honourably be put off till tomorrow.

It takes time for scars to achieve their optimum healing—six months and more. During the early weeks and months after surgery, the fibroblastic contracture can wreak havoc with our work, causing discouragement and even panic. The inexperienced surgeon may be pressed into early reoperation. Patience will allow healing to solve the problem more effectively and less traumati-
cally. This sequence of events has been demonstrated repeatedly in the primary cases.

TEENAGE REACTION

Experience has shown that from the age of about 8 to 18 years surgery is followed by exaggerated reaction with longer periods of scar erythema and hypertrophy. More than ever patience is important because if the surgery was executed correctly and the teenager is given the chance, the scar will eventually soften, smooth and fade. Make certain to tell him so.

INEXCUSABLE STITCH MARKS

Unforgivable and often uncorrectable are the hideous broad stitch marks flanking the lip scar like ties along a railroad track. These telltale marks are the result of widely placed retention sutures used to counteract the tension that adequate, careful undermining and muscle approximation by deep sutureing should have alleviated. True, they are rarely seen any more but when encountered are a nightmare. Fine skin sutures must be placed close to the edges, must not be tightened and must be removed within two to four days. To ignore these fundamentals of wound closure is to be responsible eventually for some surgeon’s facing the horrible stitch mark dilemma, which has no acceptable solution. The total area is too wide for simple excision, and sandpaper abrasion cannot smooth deeply enough.

Jack Penn’s individual diamond excision of each “crosshatch” scar carried out in a double saw-toothed series, the defect being closed by a shift of the opposing edges until they mesh, may improve the scars, but the zigzagging across normal lines is far from ideal. Besides, in such a confined area the shift might distort the mucocutaneous border unless a discrepancy was already present.

Another secondary procedure aimed specifically at stitch marks and ending up with the same general zigzag scar was presented by Onizuka of Japan in 1971. He marked a Borges W-plasty.
excision of the vertical scar of the lip, with the upper inter-
digitation similar to the rotation-advancement maneuver. He
created a philtrum groove and then approximated the series of
interdigitations after quite a wide resection of skin and scar.

These various interdigitations are all in the same saw-tooth
scar family as Morestin's multiple Z-plasties, Hazrati's compound
right-angle Z-plasty and Borges' W-plasty. Considering this
general principle as a possible approach to the cleft lip scar, I
challenged skin scar expert Albert Borges, the perspicacious
Cuban, to send me from Falls Church, Virginia, the photos of
a secondary cleft lip case in which he had used a series of his
W-plasties. What a pleasure to receive this candid and refreshing
response:

The W-plasty is not indicated in the revision of postoperative cleft lip scars
for two main reasons. The excision of skin which is required in the W-plasty
 technique would further increase the already high transverse tension of the
repaired upper lip frequently seen in many cases. Following a W-plasty
on a wrongly indicated vertical lip scar, each segment of the zigzag scar
lies almost perpendicular to the normally vertical relaxed skin tension line
of the lip. This should give a poor esthetic result since scars that cross
the R S T L direction are notoriously unesthetic as compared to those
that follow it.

A W A V Y  L I N E

In 1973 at the Copenhagen Congress Gerhard Pfeifer, who has
followed Schuchardt as chief of Nordwestdeutsche Keiferklinik,
University of Hamburg, offered his wave-line scar closure. He
had developed it over the past eight years, using it in 200 primary
clefts and 200 secondary clefts. He diagramed his design prior
to the suturing as

Parallel, symmetrical and differently curved wave lines,
explaining,

The variable system consists of a few basic types of semicircular skin
incisions which can be adapted to the requirement of each individual
case... . The resultant scars are vertical or curved in form... . all bilateral
clefts can be closed in the same operation.
Pfeifer mobilizes and approximates the orbicularis oris muscle fibers during his wave-line skin closure.

DOUBLE-BREASTED VEST
SCAR REVISION

The double-breasted vest scar revision, first presented in 1970, has been found of value in certain cleft lip scars. Of the many factors that adversely influence the character and width of a scar, tension is probably the prime offender. Smiling and crying are constantly pulling on the lip, which inevitably under this tugging has to spread its scar. Then the young teenager, just at the time for secondary revisions, tends to react more angrily to everything, including his wound, heaping fibrous tissue into the zone of the healing. In areas of no tension, a hairline scar is not unusual, so if the tension can be taken up “underground,” the edge-to-edge scar should have less “tension reason” to spread.

In lips that have a vertical straight-line or curving scar which has broadened or is ugly, and especially when the lip conformity is flat on the scar side with lack of philtrum column, the double-breasted vest is indicated.

First the lines of incision are marked (1). Then the epithelium is dissected from the lip scar, leaving the dermis intact (2).

Along one side of the scar an incision is made through the dermis into the subcutaneous tissue. Then this edge is undermined on the bias laterally with a scalpel, somewhat more than the width of the scar (broken line) (3).

The dermal scar, still attached to the opposite side, is undermined as a thin sheet until just before the level of the opposite side is reached, at which point the undermining dips deeper (broken line) (4). Along the point where the denuded dermis joins the normal skin, a nick incision on the bias is made to a conservative depth but deep enough to create a matching edge for level apposition with the skin thickness of the opposite edge (5).

The scar sheet, attached to the freed edge of one side, is pulled across and under the opposite edge until their two skin edges
almost overlap. Then the scar tether is sutured with 4-0 Mersilene to create the first-line under-buttoning, taking up all the tension of the closure (6). The advancement of this sheet of scar can be increased by rolling it on itself, and in the process it not only relieves tension but forms a mound similar to the missing philtrum column (7). With all the tension taken up at the subcutaneous level, a subcuticular suture of the relaxed skin edges can achieve an outside buttoning, or fine interrupted sutures can be used (8). Any stretch of the scar at the underpinning is hidden. The adhesions of the dermal imbrication should ensure against the exertion of any tension on the actual visible skin scar.
**Simplicity Often Sufficient**

Of course, most of the time scar excision need not be so fancy, particularly when the scar runs along natural lines. Simple, clean perpendicular excision of the scar, freeing and careful approximation of the muscles and accurate skin apposition can eventually produce an almost invisible union.

**Hiding The Scars in the Mustache**

When the lip scars and cross-hatching stitch marks are such that excision is impossible and abrasion ineffectual, at least in the male it is possible to let the hair grow and excise special portions of the scars to effect a balanced mustache. This principle obtained a reasonably good result (below) but the central and left area seemed more bald than the right. A hair-bearing free graft from the bushy eyebrow was transplanted and is so swashbuckling that the left brow may be called upon for the right mustache.

![Image of a person's face with and without a mustache]

**Abrasion**

When the lip scars are too many or too scattered for effective excision, they may be improved by abrasion with sanding. If the scars are reasonably good but show some minor irregularities which cannot be benefited greatly by further excisions, often they can be smoothed by abrasion. This is but a final scar-polishing
It can be done along with other minor revisions, such as a V-Y vermilion roll-down and normal alar base and cleft side alar rim excisions as shown.
41. Discrepancies in Muscle Continuity and Philtrum Contour

SECONDARY MUSCLE DEFORMITY

The importance of accurate and complete muscle approximation across the cleft cannot be stressed enough. As noted by Pennisi and Fara, most cleft lip closures do not correct the alignment of the orbicularis oris muscle fibers, so that often vertically oriented fibers are sutured side to side. Then, as Pickrell has suggested, there is dysplasia of the orbicularis oris muscle itself, which can be responsible for later appearance of flatness in contour after surgery. In fact, there is often a discrepancy in muscle body in the actual edge of the lip element on the cleft side and a true attenuation with grooving horizontally of the upper portion of this element just below the alar base. This relative thinness is accentuated by an unnatural muscle bulge below and lateral to it. Thus, it is important that the surgeon expose good muscle structure on each side of the cleft and bring these together with authoritative suturing.

Merrill Climo of Falls Church, Virginia, as an alert resident at New York Hospital–Cornell Medical Center, repeatedly observed a diastasis of the orbicularis oris muscle in older patients returning to the cleft palate clinic. In 1968, before the New York Academy of Medicine, he proposed that if the surgeon does not succeed in his primary procedure, whether it be improper muscle apposition, dehiscence or gradual attenuation, an orbicularis diastasis occurs. For this defect he advised scar excision, reorientation of the orbicularis fibers and secondary suturing with the nasal spine as the suspension point. Climo was awarded the first
J. P. Webster award for best resident’s paper, and in 1969 this work was published in the _Cleft Palate Journal_. His chief, Herbert Conway, pleased with the simplicity and effectiveness of this approach, presented him with a trip to Italy. There he served as a teaching fellow at the Catholic University under Professor Litterio Maggiore who himself was inundated with secondary cleft lip cases from Sicily.

**SECONDARY CAMOUFLAGE**

The ambling but astute George Crikelier of Presbyterian Hospital, renowned for his devoted work in accident and burn prevention, was content to treat secondarily, rather than prevent primarily, the cleft side flatness after lip closure.

Cosman and he noted,

> In forms of lip repair that fail to respect the philtrum, a flattening of the area beneath the nostril and extending down to the vermilion is to be noted . . . the result of the absence of the normal philtrum eminence on the cleft-side. Comparison between the cleft and normal sides makes the difference even more striking.

This flattening need not be blamed on the primary operation. As already noted, there is often a deficiency of contour in the lateral lip element above the muscle bulge which when incorporated into the closure will retain a flatness. Rather than discard this valuable tissue, it is better to bolster it. Cosman and Crikelier advocate a dermolipomatous graft:

> Medially based turnover flaps of muscle and fibrous tissue from the lateral lip and rolled on themselves along the philtrum line did not produce satisfactory results. . . . The use of a dermal fat graft to create a philtrum eminence . . . and its placement via the incision in the nostril floor while rotating the ala seemed apropos.

This is a worthwhile secondary procedure.

**A SWEDISH SCARRED MUSCLE SLING**

Others have found interesting secondary uses of parts of the lip scar. For instance, the father of Swedish plastic surgery, Alan
Ragnell of Stockholm, suave and as sly as a fox, had his early training in England. As Gillies once said,

I was flattered by Alan's devoted attendance to my surgery until I discovered he was courting my theatre sister on the side. What's more he took her back to Sweden with him and married her!

In 1946, with the same clever efficiency, Ragnell, concerned about the creeping alar base in unilateral clefts, excised the lip skin scar including the nasal floor and a dart at the columella base. He then cut a vertical flap of muscle and scar, based it medially and superiorly and used it as a sling to pull in and support the alar base, which was itself advanced into a dart in the columella base. Of course, a tertiary advantage of this sling now becomes apparent as it could be used simultaneously to fill any deficiency in the upper portion of the lip if its course to the alar base were directed accurately.

As another example of his crafty efficiency, Ragnell, living on one island not far from another, had a wire strung between them. To save launching a boat daily he suspended a 60-foot net from the wire, which he hauled in twice a day along with several delicious one-pound perch fresh out of Scandinavian waters. Now retired in sunny Sicily, from his picturesque spot in Taormina on top of that shear rock cliff covered with purple bougainvillea and with Mt. Etna at his back, he can look with contentment upon a vast expanse of teal Mediterranean sea. He can also reflect with pride on plastic surgery in Sweden, and the world-renowned cleft lip and palate centers at the Universities of Göteborg, Stockholm, Uppsala and Umea.
MUSCLE READJUSTMENT

It is becoming more and more apparent that mere suturing of the muscles is not really enough, nor is the grafting of dermis. Dissection and positioning of the muscle fibers into a more transverse direction are essential. This procedure creates muscle defects which, in addition to the original congenital deficiencies, require the shifting of excess tissue. Muscle edge flaps transposed across the cleft can be inserted into tunnels in the deficient zones for contour and functional balance. These muscle flaps have been described in the primary cleft lip closure but can be employed as secondary procedures.

A COMMON DISCREPANCY IN EARLY ROTATION-ADVANCEMENT

The common secondary deformity in the orbicularis oris muscle shows up as a subcutaneous cleft or diastasis allowing distortions in the lip during puckering and whistling. At rest, a muscle bulge presents in the lateral lip element with a contour deficiency appearing between this bulge and the alar base. It is treated by de-epithelialization of the vertical lip scar, which is then elevated as a dermomuscular scar flap based superiorly. This provides access to the lateral muscle, which is dissected free from its skin and mucosa in the area of the bulge, released from above and brought down and stretched across for better end-to-end muscle fiber approximation. There is then an empty space left above in the lateral element into which the dermomuscular scar flap can be transposed.

Here is an example in which the unilateral incomplete cleft had been rotated and advanced without refinements at the age of three months in 1957. The balance of the cupid's bow and philtrum dimple were acceptable. At age two years the slight
deficiency inherent originally in the upper part of the lateral advancement flap was noticeable.

By 16 years it was emphasized by the ridge of the upper part of the rotation scar. The upper, crinkled and ridged portion of the scar was de-epithelialized, and a flap was taken of the deeper tissue in this area including scar, dermis and muscle. With its base above, this flap was transposed across into a tunnel under the depressed area. A small wedge from the “normal” wider alar base was also de-epithelialized and used for extra filler. The muscle was reapproximated across the cleft with 4-0 Mersilene.

Even a three-quarter view from the cleft side now shows a natural philtrum hollow and bow and in no way impedes his life or his prowess in football at defensive back.

PHILTRUM DIMPLE—PRESERVATION OR EXCAVATION

One of the practical difficulties in the construction of the philtrum hollow is the paradox the surgeon faces in trying for solid muscle continuity and, at the same time, gouging or removing a central portion of this muscle to create a dimple. Both are desirable, but the dilemma is to gain one without losing the other.
Although the medial component of a unilateral cleft lip has a philtrum dimple, a column and two-thirds of a cupid’s bow, when these landmarks are ignored and destroyed during the primary surgery, the final result is a lip with no dimple and no bow.

Gerald Brown O’Connor of San Francisco had enough of the fight of the Irish in him to win his boxing stripes at the University of California, to hang in there as a student with Gillies at his caustic prime and to try to correct one of cleft lip’s most difficult deformities.

O’Connor, with McGregor, designed a method of creating a dimple in the prolabium of bilateral clefts and modified it to re-create a philtrum dimple in unilateral clefts. Through the old Blair-Brown incision, which, of course, did away with any dimple or bow, the skin of the center of the lip was undermined. A vertical flap of muscle tissue based inferiorly was gouged out of this area, split into two flaps and transposed bilaterally in tunnels along the mucocutaneous junction line. Tissue was thus shifted from the vertical center to the lateral horizontal plane in an attempt to create a philtrum hollow. There is a tendency for the lateral lip muscle pull to smooth out these excavations unless the skin in the area is well thinned, of sufficient amount to drape easily into the hollow and fixed with permanent buried sutures.
Oriental Dimple and Column

Takuya Onizuka of Showa University, Tokyo, creates both a philtrum dimple and a column in secondary cases in which they have been destroyed. He advocates a W-plasty excision of the vertical scar or a positioning of the cupid's bow and alar base with the rotation-advancement principle. In combination with this he turns a roll-over flap of muscle tissue out of the central philtrum position with its pedicle on the vermilion and curls it on itself to form a philtrum column prominence. The maneuver is sound as it takes tissue from where it is actually not wanted and puts it where it is needed.

Dimpled Abbe

Then there is the shield-shaped midline Abbe flap, which can transpose the lower lip groove into dead-center philtrum dimple position of the upper lip. There will be much more on this later.
42. Discrepancies in the Cupid’s Bow, Vermilion Free Border and Sulcus

CUPID’S BOW MAKING

All components of the normal free border of the upper lip are shaped like a cupid’s bow flowing in a double upward arc with a central downward curve. The mucocutaneous junction line follows this form and is ridged enough to pick up a light reflex earning it the title of “white roll.” It comes to a downward point in the midline. The free border vermilion of the lip flows along the cupid’s bow line arching on each side but swelling in the midline into a tubercle. Any discrepancies in this sensuous arrangement are not only abnormal but eye-catching.

SKIN ENCROACHMENT OF VERMILION

An incomplete cleft was closed in Puerto Rico at two months of age with a reasonable result except residual skin still violated the vermilion. Excision of the ectopic epithelium and interdigitation at the mucocutaneous ridge at least erased obvious objections.
DEFORMITIES OF THE MUCOCUTANEOUS LINE

The most minor mucosal peaking may be actually a visual illusion as the red of the skin scar runs into the red of the vermillion. A slight spread of the scar at the junction gives the effect of a contracture peak without the actual presence of one. As prophylaxis for this illusion, a white roll skin flap interdigititation was designed to be used primarily in lip closure. The same principle has proved to be of benefit in secondary corrections and has found new advocates, as stated by Hogan and Converse:

A small flap of lateral or medial tissue 2 mm. wide, including the white line as described by Millard, may be incorporated at the mucocutaneous junction to break the vertical scar.

Here is a seven-year-old boy who seems to have had some type of rotation-advancement but ended up with a minor mucocutaneous ridge interruption. This was corrected simply with a white roll Z-plasty and several other minor labial and nasal adjustments.

WHITE ROLL FREE GRAFTS

When the mucocutaneous white roll ridge has not been interdigititated and there is no excess skin available to create one, it can be grafted. If all other aspects are in good alignment, a 1.5 X 2 mm. free skin graft can be let in across the vertical scar to give the effect of a continuous mucocutaneous ridge.
In this incomplete cleft no white roll interdigitation was used during the rotation-advancement, as can be seen in the early postoperative healing phase, and by one year the mucocutaneous ridge discrepancy had spread and was noticeable. At age one and a half years a white roll free graft of arm skin was used to bridge the ridge. At five years the result was promising, and at 13½ years the mucocutaneous ridge revealed effective continuity across the scar.

Here is a case with a greater loss of mucocutaneous ridge which is quite deforming. It is easy to reconstruct the sequence of events that led to this loss. Some type of LeMesurier quadrilateral flap was used for the primary procedure, and after the cleft side lengthened, causing flattening of the bow arc on that side, a unilateral elliptical excision of skin and mucocutaneous ridge was used in an attempt to lift this side of the bow back into the lip.
In addition to scar excisions, a reconstruction of almost the entire right cleft side mucocutaneous ridge was accomplished with a long slender free graft from the palest area in the postauricular region. It required one revision and did serve reasonably well, but the whiteness of volar arm skin probably should be preferred for this graft.

**Z-PLASTY**

Odd, small *true* interruptions of the mucocutaneous line can be corrected by whatever trick serves the purpose. If, as in this case, the bigger Tennison Z-plasty has not been totally effective and mucosa has been left insinuating itself across the mucocutaneous ridge into lip skin, a tiny Z is one way to correct the discrepancy as two "wrongs" make a *lesser* right.

**UNILATERAL GILLIES**

If the skin has encroached upon the mucosa, excision of the excess skin and the lifting of the mucosa to the correct level may be of benefit. This, in principle, is the basis of the old Gillies
cupid's bow operation and is the classic procedure for many mucocutaneous line discrepancies.

In the original unilateral cleft lip, two-thirds of a cupid's bow, one column and the dimple are present, and if they are preserved, all is well. If the primary surgery ignored and destroyed the landmarks, then secondary reconstruction is indicated.

**UNILATERAL CUPID'S BOW**

When a unilateral mucosal peak has appeared in a lip that is otherwise satisfactory but that has no residual of the original cupid's bow, a half bow can be created by a hemi-Gillies operation. This maneuver has been improved over the original design. The triangular skin excisions should be marked just above the mucocutaneous junction line so to preserve this landmark. Then, the usual unilateral full-thickness skin excision and muscle notching with the lift of the vermilion will construct the other half of a cupid's bow.

This 14-year-old Cuban girl had had a Z-plasty closure of her lip cleft with severe asymmetry of the two arcs of her cupid's bow. The possibility for improvement of the Z was limited, but a modified Gillies unilateral cupid's bow operation was used. Excision of an elongated triangle of skin and muscle parallel to but above and preserving the mucocutaneous ridge on the cleft side achieved better balance.
DEFORMITIES OF THE VERMILION FREE BORDER

Vermilion free border defects occur in unilateral and bilateral clefts. The common unilateral discrepancy usually appears on the side of the cleft, exaggerated by an overabundance on the normal side. This calls for correction of the cleft side shortness, but do not overlook the value of reducing the normal side in selected cases.

Lack of symmetrical fullness of the free border vermilion can be corrected by the usual V-Y roll-down of mucosa from the posterior aspect of the lip. This is a subtle procedure and seldom requires as extensive an advancement as shown in textbooks or in these diagrams. One stitch in the stem of the Y is usually sufficient.

AN EXTRA FILLER

An adjunct to the mucosal V-Y can be used to give more vermilion fullness. A V flap of posterior mucosa is incised and dissected down to the free border edge. Then subcutaneous tissue flaps from the sides of the donor area can be cut and transposed 90 degrees to crisscross each other arm to arm under the V roll. In certain cases only one subcutaneous flap is needed to "fill the chink" under the V-Y roll-down. The mucosal V flap is then advanced down and out and the donor area closed in a Y, usually with no more than one suture placed in the advancement stem of the Y.

This boy had a rotation-advancement closure by Bernard Morgan in Jacksonville with an excellent result. Only a cleft
side vermilion deficiency was noticeable. A posterior mucosal V-Y roll-down, utilizing one subcutaneous side flap, was transposed under the roll to round out the vermilion free border.

Certain surgeons in special circumstances find a Z-plasty in this area effective. At least, it is one more way to treat the defect.

One of Claude Dufourmentel’s corrective lip designs synchronizes the two Z’s. One Z deals with the skin scar and shortness while the other fills out the vermilion notch.
For this same general discrepancy J. G. Ginestet of Paris designed more radical posterior mucosal transposition flaps taken from various locations. One was designed to be taken horizontally from the normal side along the same axis as the defect, which required a turn of 180 degrees.

Another was designed vertically so that its transposition required only a 90-degree turn.

DEFORMITY OF THE UPPER LABIAL SULCUS

Gillies, Barrett Brown and many others through the years have used relaxing incisions along the alveolar margin for the advancement of lip tissue.

WIDER ADVANCEMENT

Correction of free border deficiency by radical local labial soft tissue shifting as allowed by buccal sulcus incisions and wide
undermining was presented in September 1972 by O'Connor, McGregor, Murphy and Tolleth of San Francisco. They recommended this action in old cleft lips with lack of mass on the cleft side, inadequate contour of lower middle face, excessive thinness of vermilion and scar contracture between mucosa and gingiva with tethering of the upper lip and the "whistling deformity." It was also noted that anterior oronasal fistulae are more easily repaired with large, well-vascularized mucosal flaps.

Their description of the procedure is as follows:

An incision is made in either buccal sulcus, 6.0 to 7.0 millimeters from the reflection and carried posteriorly on either side to the region of the first or second molar. . . . A downward curve [back-cut] of the incision for 1.0 centimeter will allow greater advancement. Wide undermining over the maxillae can be carried out, avoiding the infraorbital nerve. . . . With gentle traction, the mucosal flaps can be advanced medially. Deep sutures of gut are placed. Depending on the problem, a variable amount of mucosa can be made available to improve the width of the vermilion, correct contracture or solve fistula problems.

The senior author, Gerald O'Connor, a "wild Irishman," Catholic and elder surgeon, who accepted all the complications and problem cases in the Bay area, earned and enjoyed the affectionate title given him by the younger men of "Father O'Connor." He was a special friend, not only because of his early training with Gillies and his boxing exploits in and out of the ring. For a short time near the end of World War II I served under his command at Mare Island Naval Hospital and at his kind suggestion was set to assist with his private surgery at St. Francis Memorial Hospital on our day off. Then came V-J Day, and as I had previously requested sea duty, the Navy sent me off to Tennessee.

In 1972 Gerry O'Connor wrote asking a personal opinion of his method of facial soft tissue advancement in clefts. Unfortunately, he passed away a month after its presentation, but I am anxious to report now having found his approach most beneficial in the indications cited.
FREE GRAFTS

When the normal free border is excessive, it will require an elliptical excision to balance the opposite side. If the normal side is excessive and the cleft side deficient, the excised piece of mucosa from the normal side can be inserted as a free graft into a horizontal releasing posterior incision on the cleft side and avoid a 180-degree turn. The excess from the free border can also be denuded of its mucosa and the remaining subcutaneous-muscle graft threaded into a submucosal tunnel along the attenuated border to fill out the discrepancy or accentuate the tubercle.

CORRECTING SPECIFIC METHODS

Every method has, in some degree, its pitfalls, its fundamental flaws and its characteristic secondary deformities. It is important, however, to realize that some of the secondary deformities being presented would not have occurred if the method had been executed correctly and with skill. In other words, the method is not always entirely to blame for the result. Yet, it seems fair to state that repeated occurrence of a specific minor secondary deformity calls for modifications in the primary design, and recurrence of deformities requiring extensive secondary surgery commands abolition of the method.
43. Secondary Correction of a Straight-Line Closure

The most common secondary deformity of a straight-line closure is vertical contracture of this line with peaking of the vermilion and notching of the free border. A popular method of correcting a straight-line lip scar was for many years a diamond-shaped excision which, upon closure of the opposing angles, increased the vertical length of the lip while narrowing the width. This principle was popularized by Rose and later Thompson and occasionally is used in some clinics even today.

For instance, at Johns Hopkins Hospital about 1944, John Staige Davis, one of America’s pioneer plastic surgeons, straight as a ramrod, although in his 80’s, was preparing to do a secondary cleft lip procedure on a 13-year-old girl. Lamont of California recalls:

I had long ago learned how to be a good observer. I had spent a couple of years in St. Louis before World War II. . . . Dr. Davis sat at the head of the patient and made the appropriate markings with gentian violet. The incisions on each side of the scar were to be a modified diamond, which was supposed to lengthen the distance between the base of the nose and the vermilion. . . . As Dr. Davis prepared to lower the blade of the scalpel toward the lip, his intention tremor became apparent and suddenly he stopped and turned over his shoulder and asked, “Dr. Lamont, what would you do for this case?” “Dr. Davis, I have been observing your preoperative measurements, Sir, and whatever it is you plan to do I hope that someday I am able to do it half as well.” He turned back to his surgery, the tremor disappeared as his scalpel made a precise incision down the lip, and the operation had begun. It was during the suturing that he again turned toward me and asked, “Do you have any plans for lunch?”
Z-PLASTIES AND OTHER TRANSPOSITIONS

A more popular method of dealing with this contracture today involves excision of the vertical scar and the use of some kind of Z-plasty. This solves the problem of the straight-line contracture and shortness of vertical height but at the cost of an unnatural scar crisscrossing normal lines of the lip. There was a time when such violation of principle was acceptable, but the sophistication of this surgery has progressed.

GINESTET

The dynamic and forthright Jean Gustave Ginestet, founder of the maxillofacial center in Foch Hospital, was a pioneer in secondary deformities of clefts.

For a more severe peaking contracture, referred to as the "chapeau de gendarme" deformity, Ginestet advocated an oblique flap based inferiorly to be transposed into the defect along the mucocutaneous line after the vermilion retraction has been released. When the cupid's bow has been destroyed, this procedure offers a possible means of contracture correction, but beware of creating a long lip.
Another dexterous maxillofacial surgeon of l'Hôpital Foch, Paris, is L. C. Merville, who has carried on the secondary cleft work of Ginestet. He has the skill to handle delicate instruments and the ability to develop corrective procedures. In 1966 he described the sliding of full-thickness lip flaps in the form of a Z for correction of a straight-line contracture and shortness of the lip. To facilitate his advancements and to remove subalar scarring, he used circumalar crescent excisions. Although an improvement over the original primary scarring in the case demonstrated, in principle this approach produces an unnatural zigzag and possibly even excessive vertical lip lengthening.

TRAUNER

In 1955 in Stockholm, Richard Trauner presented a secondary transposition he termed a Z-plasty of interchanging flaps at the entrance of the nose for reoperation of unilateral clefts. This enabled him
to draw the lateral end of the alar wing upwards if it lies too far downwards . . . lengthen the lip at the line of the cleft on its upper border, lengthening at the same time the columella on the side of the cleft and narrowing the entrance of the nostril.

This approach was used first as a secondary procedure and then primarily by Trauner and copied by others.
Claude Dufourmentel of l'Hôpital St.-Louis, tall and aristocratic with the air of an English gentleman, a second-generation plastic surgeon and the 1975 host-president of the International Congress in Paris, has long been interested in “harelip sequelae.” In 1974 he forwarded a report of a case illustrating his rendition of the principle of medial transposition of a lateral vertical flap. As he kindly explained in English,

Of course, this has to be adapted to each case and combined with several other technical procedures.

The principle is an asymmetric Z plasty which lengthens the distance between the apex of the nose and the lip, on the cleft side, and shortens the transverse width of the nasal threshold. The lateral vertical flap, cut on the external side of the scar is shifted into the opening of the horizontal incision of the naso-labial angle.
Thus the foot of the ala nasi is elevated and rotated inwards and no contraction of a vertical scar of the floor of the nostril can develop.

Z-plasties across the natural lines are contraindicated unless scars are already present. Each case must be considered from its specific aspects. Of course, the transpositions of Trauner, Marcks, Wynn and Dufourmentel are high in the lip and therefore less noticeable. In the straight-line scar, whether the mucosal peaking be moderate or severe because of vertical shortening, if there is still sufficient cupid's bow present, the rotation-advancement principle will serve better as a secondary maneuver.

A SECONDARY LeMESURIER

Straight-line closures in which the cupid's bow has been destroyed partially may offer the best opportunity for the use of the Hagedorn-LeMesurier principle. The cupid's bow is gone, so now the construction of an artificial one is justified. In most cases, however, the design of a LeMesurier as a secondary procedure would call for too much additional excision of tissue and too much tightening of the free border of the lip. Yet, in certain cases, probably incomplete clefts originally, there is still a relaxed full-bodied upper lip which can afford a LeMesurier operation and will be benefited by it.

In this specific case, operated on in 1956, there was enough cupid's bow vestige left for use of the rotation-advancement principle as a secondary procedure. Yet the transverse retention stitch mark scar transgressing the potential column line on the
cleft side required excision, and this then created a natural LeMesurier design which produced an artificial cupid's bow and a reasonably natural result.

In 1968 J. L. Grignon of Paris improved the standard LeMesurier procedure for secondary corrections of unilateral clefts by adding an exaggerated alar advance which he clings to with bulldog tenacity. He refers to his combination as a double locking transposition of a quadrilateral flap with an external rim as in the LeMesurier, for the inferior part of the lip... disinsertion and forcible rolling up of the ala nasi, with a locking into the sub-columnar notch, for the nasal region and the region below the nose... The results obtained, going back over a period of 7 years... and after a study of a series of 125 operations, have been judged sufficiently interesting...

A SECONDARY TENNISON

Although many surgeons probably use the Tennison procedure for secondary correction of the lip, publications on this seem to have been sparse. Leave it to the Russians, even if they do not call it that...
In 1966 M. V. Mukhin and A. P. Agroskina, of the Stomatology Department of the Kirov Military Medical Academy, Leningrad, noted,

After cheiloplasty carried out in children at an early age for congenital clefts, some inaccuracies... though little perceptible in the first years, become increasingly conspicuous in a child of eight or ten. Such deformities develop even after completely successful cheiloplasty.

They prefer a one-stage operation for repair of upper lip, columella and ala nasi, and their general design seems to consist in modifications of Trauner and Marcks' secondary flap for the nose and Tennison's for the lip.

SECONDARY ROTATION-ADVANCEMENT

Crude straight-line cleft lip closures without finesse often leave the natural landmarks of the cupid's bow. In that event use of the rotation-advancement principle can be effective. In 1960 I noted the availability of this principle secondarily:

When a cleft has been closed previously by the crudest paring of the edges without destruction of the cupid's bow component the result may be inferior but is amendable by the rotation-advancement principle. A more radical paring of the edges will have destroyed the natural vermilion portion of the cupid's bow leaving the dimple and skin curves present but askew. Here repositioning of this element may be achieved by scar excision, rotation and advancement. ... In fancier methods where all vestige of the cupid's bow has been ravaged then the advancement portion of the ... principle is still available for nasal correction. Gillies more than once has expressed his approval of the rotation-advancement principle in secondary cleft lip correction stressing its value in the nasal distortion.
This eight-year-old girl from Panama had a straight-line closure in infancy, healing with what seemed to be little more than a preliminary adhesion. Scar excision was followed by rotation with a back-cut and advancement of flap c into the columella. The alar base was freed from the lateral advancement flap and from the maxilla and flap l was inserted into the vestibular defect. The cleft side alar cartilage was lifted and sutured onto the septum. Mucosa, muscle and skin closure of the lip was standard.

This 19-year-old girl from Ecuador had excision of her straight-line scar and a rotation-advancement of her lip. She also had a cleft lip rhinoplasty and Silastic sponge implants under her alar base and in her chin.
This cleft was closed primarily in Ecuador in a straight line which widely scarred the skin, partially ruined the cupid’s bow and flattened the dimple.

Secondary nasal procedures used included columella lengthening on the cleft side along with alar cartilage lift with nylon suture to the septum, alar base advancement across the nostril sill, denudation of alar rim web and transposition of this flap into the weakened area in the tip. Secondary partial lip scar excision followed by rotation and advancement did give better balance but did not achieve the result of which a primary rotation-advancement is capable.
This patient is reported to have had a wide complete cleft which partially separated after a simple straight-line closure. The width of the primary scarring and stitch marks magnified the problem, making complete eradication of all scars quite impossible. Partial scar excision with rotation and advancement of the lip improved the nasal base, the lip conformity and the cupid's bow.

Here is a standard use of the rotation-advancement principle carried out by University of Miami resident Richard Greminger, following what seems to have been an inadequate straight-line closure in Cuba but with minimal scarring.
INTERNATIONAL CONFIRMATION

Among several surgeons who have pointed out the value of secondary rotation-advancement were the French surgeon Mer-ville in 1962, Pitanguy of Rio in 1963 and Rees and Converse in 1966. Also in 1966, Muir and Bodenham in Modern Trends in Plastic Surgery noted,

If the primary operation was simple, these cases can often be improved by applying the Millard rotation advancement technique, thus swinging the alar base into normal position and, at the same time, lengthening the columella on the cleft side.

In 1966 Onizuka of Tokyo, when discussing revision of cleft lip secondary deformities, said,

Millard's technique can give good results if adequate tissue is available in the upper lip.

He advocated rotation-advancement plus the Tennison inferior triangular flap

(a) When scar is wide and irregular. (b) If there is paucity of tissue in the lower portion of the upper lip. (c) When the height of the upper lip is too short.

In 1968 Canadian Saul Hoffman with Wesser, Calostypis and Bernard Simon of New York's Mt. Sinai Hospital endorsed the rotation-advancement principle in secondary unilateral cleft lip deformities. They described the ideal case:

The philtral scar on the cleft side is short and the cupid's bow is pulled up toward the nostril. The nostril floor is wide and the ala is displaced laterally and downwards. . . . This is the ideal indication for its use, but, as we have demonstrated, other primary repairs have not precluded this type of secondary correction.
In describing their use of rotation and advancement, they stressed its advantages as to conservation of tissue in face of already existing deficiency, absence of rigid adherence to preoperative measurements due to the variability of the cases and proper realignment of the orbicularis oris muscle to eliminate distortion frequently seen during lip function.

In 1969 Wilkie of Vancouver referred to

... the recent availability of the Millard cleft lip operation, which can be used with as excellent results in secondary cleft lip deformities as in primary repairs.

It was Tessier's feeling in 1969 that

The Veau and Brown procedures, all linear, are easily transformed into a Millard or Petit. To the contrary, the Tennison and even more so the LeMesurier, with their imbricated incisions, can hardly even undergo later correction.

In January 1970 Henrik Borchgrevink of Oslo indicated his pleasure with the application of rotation-advancement in secondary unilateral deformities. He makes several important points in the *Cleft Palate Journal*:

Further, the key stitch can provide a considerable straightening of the columella and reshaping of the nostril, especially if one does, simultaneously, a little work to the deviating anterior septum and a Z-plasty inside the ala. . . . I feel that the muscle closure in lip repair, especially the key stitch, should be done with non-absorbable sutures: I always use supramid.
[The drawings] show how the rotation-advancement operation ... in my opinion and experience, can provide a soft tissue platform for the cleft-side alar base almost eliminating the disadvantage of the cleft side bony defect. This, together with the reduction of the columella deviation, tends to counteract the tilting of the nose.

This is Borchgrevink’s graphic comparison of the secondary lip and nose to a quaint little cottage sitting askew on a Norwegian slope threatening to topple into the fjord, which, after rotation and advancement, sits straight, safe and sound.

In 1971, Igor A. Kozin wrote in Acta Chirurgiae Plasticae,

Since 1965 the modification of Millard or a Z-plasty has been used at the surgical department of the Moscow Scientific Institute of Cosmetology for correction of the residual deformity in the upper lip after linear cheiloplasty.

Then, in a kind personal note in 1973, Kozin added,
I have operated on more than 200 adults with secondary deformities of the lip using your method with several additions. Results of the operation in most cases have been pleasing.

The more radical the straight-line closure, however, the more destruction there is of natural landmarks, especially the cupid's bow. Of course, the effectiveness of the rotation-advancement as a secondary procedure is reduced. Yet, even when the straight-line closure has destroyed a portion or all of the bow, the rotation-advancement principle can still be of some value in reducing the wide nasal floor and aligning the flared alar base. The natural cupid's bow can never be resurrected, but it can be simulated by the Gillies cupid's bow operation.

**TIGHT LIP**

Of course, radical paring of the cleft edges, as in so many early straight-line designs, not only destroyed the cupid's bow but created a side-to-side tightness which compared unfavorably with the conformation of the lower lip. A case having this result deserves the introduction of new tissue in the form of the lip-switch flap.
SECONDARY CORRECTION OF TRIANGULAR AND QUADRILATERAL FLAP METHODS

FIRST Z

As pointed out by Borges, New Zealander H. P. Pickerill was the first to apply the Z-plasty principle to the linear scar of cleft lip. Pickerill was one of the colonials serving under Gillies at Sidcup during World War I, and this is not his only first. In 1924 he wrote:

I devised what I have called the “zig zag” or “triangular flaps” method. This gave such satisfactory results that I have employed it subsequently in practically every civilian case of harelip baby or adult which has come under my care.

THE VERY INFERIOR TRIANGULAR FLAP

In lips closed primarily with the Mirault-Blair-Brown-McDowell triangular flap, which is placed as low as possible along the inferior edge of the medial element, the cupid’s bow has been destroyed. The vermilion tubercle invariably is situated to the cleft side of the midline where the mucosal interdigitation has been performed.

To correct the unnatural vermilion free border, a horizontal ellipse can be excised from the off-center bulge and a small V-Y posterior roll-down of vermilion will create a midline tubercle.
The absence of a cupid’s bow is eye-catching and deserves correction. The modified cupid’s bow operation can be used to create the effect of an artificial bow and can be employed unilaterally or bilaterally.

SECONDARY ROTATION-ADVANCEMENT

Because of the loss of the cupid’s bow, the rotation-advancement method is not usually indicated in secondary correction of a Blair-Brown result. It does have some advantages to offer, but the end result shows only moderate improvement, as demonstrated by the following case.

This patient was first seen at age 19 years after two operations which ended up with a Blair-Brown type of closure; it was more of a straight line than usual. It was tight along the transverse axis, and the unilateral nasal deformity was typical. Although the cupid’s bow had been destroyed long ago and was only painted with lipstick, a scar excision with rotation-advancement closure achieved nasal base improvement and tightening of the lip in the upper portion with relative relaxation in the lower part.
A follow-up 13 years later revealed maintenance of the labial and nasal improvement and a slightly better scar position, but as the cupid’s bow had been discarded primarily, there was still no evidence of one.

An eight-year-old boy from North Carolina with a Mirault-Blair type of lip closure had developed a long lip on the cleft side with an asymmetrical cupid’s bow and tubercle. A rotation-advancement procedure in the upper portion of the lip and a one-sided cupid’s bow at the mucocutaneous ridge achieved better labial and nasal balance.

It has always been surprising to me how many of these Blair-Brown cases end up eventually with a relatively tight upper lip. Evidently, the lateral triangular flap has been advanced so far across the medial lip element that not only is the cupid’s bow vestige destroyed but in a large percentage of complete clefts, and even in incomplete clefts, the free border of the upper lip is short of tissue, tight and overpowered by the relatively protuberant lower lip. Here the lip-switch flap can be used to advantage both to relieve the upper lip tightness and reduce the lower lip protuberance and to create the central semblance of a philtrum and a cupid’s bow.

Here is an example of an inferior triangular flap of the Blair-Brown type after 27 years which might be considered reasonably good if lack of a cupid’s bow and philtrum is of no concern. The skin scar, mucocutaneous junction join and vermillion “whistling” deformity needed minor revisions. A diamond-shaped excision of the skin scar, an interdigitation of the white roll flap and a posterior V-Y of central mucosa seemed to improve the discrepancies.
Yet the "blah" effect of a lip without its artistic curves, hollows and columns may one day motivate the patient to a small, shield-shaped Abbe. His lower lip, although not protuberant, can accommodate the philtrum needed. This case has not had its Abbe yet but others have and examples will be presented in Chapter 46.

THE LeMESURIER DISCREPANCIES

Probably the most common deformities of the LeMesurier operation are those associated with asymmetry of the cupid's bow. If the operation has been designed correctly, the artificial cupid's bow will be balanced and in the center of the lip. If not, it must be readjusted until it is. This could mean anything from excision of a full-thickness wedge to lift and equalize the bow to opening up the entire lip and revising the flaps so that when they are reassembled there is balance.

The LeMesurier method is constantly accused of causing an associated deformity, the vertically long lip on the cleft side. Many authors have complained about this, and its correction requires reduction of the height of the quadrilateral flap by horizontal excisions the exact amount of the extra length.

Of course, the excisions must vary according to the case and in these examples several adjuncts including the white roll flap were used. Whatever tricks are tried, however, once the philtrum
column line has been violated, the scarring will never be natural.

And again

Recently Converse has described a similar correction of this drooping lateral portion of the lip on the cleft side.

QUADRILATERAL FOUNTAINHEAD

Farkas and Lindsay of the Toronto Hospital for Sick Children, the birthplace of the LeMesurier method, took issue with this accusation of cleft side elongation. They studied 70 adult unilateral cleft lip and palate patients treated by the LeMesurier lip closure and reported:

The vertical length of the medial part of the upper lip in unilateral cleft lip and palate patients was similar to that of the controls. The average lateral vertical length of the lateral part of the upper lip, on the operated side, did not differ significantly from the average vertical length on the unoperated side. We disagree with some authors who have said that the
quadrangular flap usually creates too long a lip [Clifford and Pool, Trauner and Trauner] and this asymmetry is exaggerated by further growth and development [Bauer and Wang]. Our findings are similar to those of Williams.

These comments prove again that any method done correctly will show only the faults inherent in its design and need not be blamed for the operator's mistakes of mismeasurement and misalignment.

Although when correctly executed the LeMesurier quadrilateral flap could produce a symmetrical cupid's bow, it did so at the sacrifice of half of the normal bow and the philtrum dimple, producing a rather flat unanimated lip. Of course, a common complaint with all the earlier methods was the lack of simultaneous nasal correction, which necessitated further excision of tissue primarily or later secondary procedures.

If the LeMesurier lip ends up tight in side-to-side dimension and is severely flat in relation to the lower lip, then again a midline lip-switch flap may be required to release the tightness and bring relative balance to the upper and lower lips. Examples will be shown in Chapter 46.

SECONDARY CORRECTION OF THE TENNISON RESULT

If the Tennison operation has been judged, marked and executed accurately, the cupid's bow has been salvaged and only the zigzag of scars across the philtrum column on the cleft side is eye-catching. If the scars heal well, the result should be reasonably
pleasing. If not, the patient and the surgeon are in trouble, and scar excision and careful closure may be of some benefit.

Here is a Tennison-type procedure carried out by a skilled and experienced Boston surgeon who got the very best available out of the method. The scar is a Z, but it healed well and flattened the lip only slightly. The additional vermilion free border Z-plasty was less pleasing.

No matter what the method, if the vermilion is interdigitated in the anterior visible position, an irregular off-center cleft side excess "blob" often results, requiring later revision. This vermilion excess was trimmed and the midline deficiency filled out with a small V-Y at the same time the palate was pushed back and maintained with an island flap.

If the measuring has been off even a couple of millimeters, the ingenuity of the surgeon is taxed almost beyond reason. Certain corrections may be possible, but, in general, "the egg has been scrambled" and "all the King’s men cannot put Humpty-Dumpty together again." The same thing is true of all members of the zigzag family of lip closures, Z-plasties, interdigitations and double interdigitations.
For instance, take this Z-plasty which has placed the cupid’s bow in symmetrical position but has encroached upon the cleft side element so much that there is a one-sided “whistling deformity” and a severe transverse shortness of the lip as measured from the height of the bow to the commissure on the cleft side.

It is interesting to see this deformity with the Tennison approach when so many cry about its possibility in rotation-advancement and state preference for the Z because of it! Correction here will be indeed difficult. Note also that the flare of the ala has not been corrected simultaneously.

Again, if the upper lip is tight and flat, release with a midline philtrum-shaped lip-switch flap may work wonders. There is an interesting case in Chapter 46 to demonstrate this.

**INTERDIGITATIONS CAN BE STICKY**

As Musgrave pointed out:

If the surgeon who must perform a secondary repair had his choice of primary methods to correct, he would not choose to perform a secondary operation on the LeMesurier or Trauner or Tennison or similar procedures where quadrilateral or triangular flaps have been inserted into the medial side of the cleft and the scars are so difficult to revise. The Rose or Millard operations are easier to deal with secondarily.

I agree with this stand and have a case to prove it. Although the Tennison-type Z-plasty had symmetrized the cupid’s bow, the zigzag scar was eye-catching and difficult to correct. Careful revision of the scar twice was without improvement. Finally, even after reducing the amount of the Z to nearer a straight line and
using part of this skin as a "white roll" flap to interdigitate across the mucocutaneous ridge, only a slight improvement was obtained.

V. M. Hogan and J. M. Converse of New York University School of Medicine, in a rather insignificant little paragraph in Grabb, Rosenstein and Bzoch's book of 1971, probably gave the rotation-advancement its greatest secondary testimonial:

If the deformity is not minimal—for example, when there is a total imbalance of the medial and lateral lip elements about the cleft scar—then the previous quadrilateral flap or triangular flap repair is ignored and the Millard technique is utilized.
I might not have gone quite that far, but then they just might have something! In fact, there is a case in which I did try to scrap the interdigitation with a secondary rotation-advancement. Such an approach requires excision of more tissue than most lips can afford. The result shows moderate improvement but at least the alar base drift was improved, the cupid's bow placed in balanced position and the scar maneuvered into the philtrum column line; in time, it might be quite unnoticeable.
45. Secondary Lip Correction
After Rotation and Advancement

NOT ENOUGH ROTATION

The most common complaint by surgeons using the rotation-advancement method has been shortness of the vertical height of the lip along the scar. This can occur temporarily in a carefully planned and well-executed case. Yet, within six months, the contracture will relax and the cupid’s bow will settle into a balanced position. If this is not what happens, then either the primary rotation or the paring of the cleft edge of the lateral segment (or both) was inadequate. If the fault was in the lack of rotation, the rotation was not extended far enough across under the base of the columella and probably the back-cut was not used. In such cases there need be no panic as no landmarks or “bridges have been burned.” Merely excise the total scar and re-rotate with a back-cut and then pare the lateral segment to match the rotation edge. Be careful not to shorten the distance more than a millimeter or two from the peak of the bow on the cleft side to the commissure as compared to the normal side.

Hogan and Converse state:

Correction of the lip repaired by the Millard technique, when the lip proves too short, may simply require the repetition of the operation with more attention to those details of the technique which can lengthen the lip such as separation of the vermilion from the lip on the lateral flap to increase the vertical distance of the lateral segment.

Of course, the surgeon’s best chance is at the first operation, but here are a couple of secondary examples.

This patient had had an attempted rotation-advancement in
infancy in New Jersey and at four years of age revealed inadequate rotation and advancement.

On re-rotation and advancement, a scar muscle flap was inserted high into the lateral element, iliac cancellous bone was grafted to the maxilla under the alar base, the alar base tip was denuded and sutured to the septum and alar rim revision was accomplished.

This four-and-a-half-year-old girl was born with a unilateral cleft of the lip. At four months of age the lip cleft was closed in New York with what was reported to be a rotation-advancement method. Inadequate rotation resulted in a straight-line scar and its contracture. At least the landmarks were present. Scar excision was followed by extension of the rotation with a backcut, advancement of flap c into the columella, mucocutaneous white roll ridge interdigitation, alar web excision and excision of mucous pits of the lower lip.
NOT ENOUGH ADVANCEMENT

An Oriental boy from a Caribbean island who, after a rotation-advancement procedure, revealed adequate rotation but insufficient advancement.

Scar excision, unilateral columella lengthening, independent alar base and lateral lip advancement and trimming of the vermillion free border produced a more natural result.

This type of secondary drift of the alar base finally stimulated the procedure of suturing the denuded tip of the alar base to the septum.

TOO MUCH ROTATION

If the rotation has been too extensive, again total scar excision will allow the medial element to be de-rotated partially and sutured in correct position. The vertical height of the lateral
element then may have to be reduced to match the rotation edge. This maneuver can be done by a horizontal excision of the required amount of lip just under the nasal base.

In all my rotation-advancement cases only one is recalled that was actually rotated a little too far. At two and a half years, this patient presented about 2 mm. over-rotation, and at three and a half years the discrepancy persisted. A deep transverse elliptical excision of skin, scar and subcutaneous tissue along the lip join with the nostril sill and alar base achieved a long-range lift of the mucocutaneous border, as seen at age seven years.

It is better to excise a scar that is already present and pull up rather than have a little easier lift but at the cost of a scar along the upper edge of the mucocutaneous ridge or, worse, remove the ridge itself.

**LATERAL ELEMENT TOO LONG**

Another possible problem can occur if the lateral lip element is left too long in the vertical dimension. This is far more likely in incomplete clefts.

An incomplete cleft without severe discrepancy in the height of the bow peaks on the non-cleft side presented a long, full-bodied lateral lip element. During the rotation-advancement closure the cleft side nostril floor–alar base was cut as a flap. After denudation of its medial tip, the flap was advanced across and sutured to the septum, maintaining excellent permanent alar
base position. During the primary procedure the robust lateral element was pared sparingly and turned out to be too long.

Two and a half years after primary surgery, the rotation scar was excised for access to the lateral muscle bulge, and the muscle was freed on both sides. A high transverse elliptical excision of skin, scar and muscle just along the lateral lip join with the nostril sill and alar base allowed the entire lateral lip component, including the muscle, to be lifted into slightly better symmetry. The excess vermilion along the free border was trimmed to balance the normal side.

In my own primary cases, there has never had to be a total secondary scar excision with a de-rotation or re-rotation, but one of the dividends of this approach is that such is always possible.
RADICAL PARING OF LATERAL ELEMENT

It is important not to pare too far laterally along the lateral lip element. Here is a rotation-advancement, seen in our clinic recently, which was pared too far, resulting in shortening of the distance from the bow peak to the commissure on the cleft side along with purse-string tightening of the free border of the upper lip accompanied by relative protrusion of the lower lip.

Radical paring can happen with any method but is not necessary in rotation-advancement. It should be avoided by careful measurements as it is rather difficult to correct.

IN ARTISTIC SCAR PLACEMENT

If the surgeon does not understand the artistic plan of the rotation, he may cut his rotation incision too straight or too oblique, thus placing the scar of union in an unattractive, unnatural position. This is the surgeon's fault, but the correction is not so easy. Such placement is better avoided than corrected.

Another danger in rotation is failure to ascend to the base of the columella. If one cuts across too low in the lip, a great advantage of this method is lost, and scars are placed in far more noticeable positions.

It is also important that the circumalar incision of the advancement flap hug or slightly infringe upon the alar base so that the scar lies in the normal nasal alar crease.

Onizuka, in 1966, after many hundreds of rotation-advancements, diagramed simple excisions for correction of minor scar
deformities that seemed to occur postoperatively for him. The most common error was located in the area of flap c, which acted as a trapdoor when used in the lip.

Of course, when flap c is shifted into the columella, as is now advocated, it is less likely to cause these problems.

**Making the Lip Too Long**

Misunderstanding previous descriptions of the rotation incision, and in an effort to achieve enough vertical height, some surgeons have extended the rotation, not as a true rotation with a cut-back, but straight across the columella base and into the philtrum column on the normal side. This extension will give two secondary deformities. First, it will spoil the balanced effect of the philtrum because the scar on the cleft side does not correspond to the normal side and meet in the midline at the columella base but instead overrides the cleft side with an unnatural oblique scar. Second, and even more distorting, is the true lengthening in vertical height of the entire lip beyond what is normal for this lip.

Correction requires, again, total scar excision and de-rotation and de-advancement, with a suturing together of the incision that transgressed into the normal side. After this draw-back, the cut-back is used to gain unilateral length and the lateral segment is freshened to match this length.

If the total vertical height of the upper lip is the only deformity noticeable, the lip can be shortened by a transverse full-thickness excision of lip along its join with the nose where
scars are already present and can be camouflaged in the natural nasal creases. The only other way to shorten the lip is by a modified Gillies cupid’s bow procedure, but if the bow and free border are relatively normal, this approach is too radical. When there is no bow present, there is more justification as some symmetrical bow is better than no bow.

**A RELATIVELY TIGHT UPPER LIP**

It has been noted repeatedly that most of the standard primary lip operations can end up with a tight upper lip in relation to the protuberant lower lip. When the discrepancy between the two lips is noticeable, the possibility of a lip-switch flap must be entertained. Straight-line and Blair-Brown triangular flap closures, in my experience, produce the greatest number of tight upper lips requiring lip-switch flaps. A tight upper lip occurs occasionally in a LeMesurier or a Tennison, but the need for a lip-switch here is far less. I have not yet found a lip-switch flap necessary after rotation-advancement, but why some lips are tight and others not is still a mystery and the possibility always exists. *The lip-switch is the flap of last resort.*

**OTHER SECONDARIES**

My personal secondary corrections have involved a myriad of minor revisions including partial scar excisions, midline vermilion tubercle increase or reduction and other revisions of the redundant or deficient vermilion free border. These have been noted again and again in the unilateral cleft case histories, and constantly the primary design was modified to stack the odds against their recurrence.

**MUSCLE DISCREPANCIES**

As already pointed out, not only does the lateral lip element have an abnormal bulge of its muscle but the fibers run parallel to the cleft edge, sweeping up toward the nasal ala. The muscle,
however, is often attenuated in the area just below its join with the alar base. As this area is vital in rotation-advancement, correction of the discrepancy during the primary operation has been developed and described. If that has not been accomplished initially, then secondary correction, although more difficult, is still indicated and has been discussed in Chapter 41.

Here is a case in which the original cleft deformity must have had a lateral element with a hypertrophic muscle bulge and a muscle and contour deficiency above it. Rotation-advancement in Wisconsin positioned the cupid’s bow, but no provisions were made for primary correction of lateral lip contour. As the alar base required further secondary medial advancement, this provided an incision which gave access for skin undermining, the turning of a thinning flap from the muscle bulge up into the area of depression with a mutual leveling of contours.
Here is a relatively early case, reported in *Plastic and Reconstructive Surgery* in January 1964, in which advancement of the deficient lateral lip element into the rotation gap presented, postoperatively, attenuation of the cleft side vermilion free border and slight contraction of the skin scar with a lift of the bow peak on the cleft side. As the vertical skin length had been fashioned correctly, time released the scar pull and balanced the bow but the vermilion attenuation persisted.

First, a bilateral mucosal advancement from the upper sulcus gained some improvement, but a tertiary V-Y roll-down of posterior mucosa was necessary to achieve free border symmetry.
This three-year-old Cuban boy first had an adhesion to see whether any improvement would follow such late action. As expected, the change was minimal, so eight months later a rotation-advancement procedure was carried out which resulted in slight cleft side vermilion deficiency. A simple secondary wide V-Y posterior mucosal flap rolled out the free border into reasonable symmetry. Final nasal correction awaits maturity.

ENHANCING THE TUBERCLE

In some instances the vermilion free border is well balanced on both sides but the midline tubercle is deficient. Then the mucosa, just superior and posterior to where the tubercle should be, is advanced down in V-Y fashion to produce a fullness.
Experience with the rotation-advancement method and study of consistent minor secondary problems over the years have caused the incorporation of refinements, extensions and now improvements in the detail of the primary surgery in order to bypass subsequent secondary disparities. Consequently, they are appearing less and less.

TIMING AND SECONDARY SURGERY

In incomplete lip clefts, minor revisions can be completed at six months or preferably at one year after primary rotation-advancement. In complete clefts, secondary revision of the lip and nose can be accomplished during the hard palate closure at about 18 months, and any obvious further revisions should be completed before school at about five to six years. The final corrective nasal surgery should be postponed until about 16 years of age, and the last lip touch-up work, of course, can be carried out at this time.
46. Shaping and Positioning the Lip-Switch Flap in Unilateral Clefts

Although the need for a lip-switch flap is more common in bilateral clefts and was originally described by Robert Abbe of New York specifically for this condition, it also has value in unilateral secondary deformities. The lip-switch principle will be presented in Volume II on bilateral clefts, but its specific application in unilateral clefts is discussed here.

The shaping and the positioning of the Abbe flap are so closely interrelated that the surgeon should know where it is going before he tries to decide the shape to cut it.

Most surgeons, however, cut the Abbe flap to fill the defect they envision in the upper lip. Since the majority see it as a triangle, the usual shape of the flap has been a pie-wedge inserted unilaterally after excision of the scar. Some surgeons have seen the defect differently, and consequently some bizarre shapes have evolved.

Odd-Shaped Abbe Flaps

An Abbe flap can be used for more than release of side-to-side tension or restoration of a philtrum. In 1963 a case with unilateral upper lip radiation scarring but attenuation of the entire vermilion free border inspired a three-pronged variation in the shape of the Abbe flap. The lower lip possessed comparatively voluminous vermilion, so an Abbe flap was designed with horizontal projections of vermilion taken not only to reduce the lower lip but to bolster the thin upper lip from behind. This
fleur-de-lis-shaped flap was rotated on the coronary vessel, achieving the correction desired, and in 1964 I published the case in *Plastic and Reconstructive Surgery*.

Intrigued with the possibilities of other odd-shaped Abbe flaps, I reasoned that the Abbe could be cut in an asymmetrical skin pattern to correct a unilateral shortness at the same time it achieves release of tightness.

At Kingston Public Hospital, Jamaica, about 1963, a tight unilateral cleft lip with extensive crosshatch scarring required excision of much lip on one side. It was thought that if a small releasing incision was made on the medial side of the defect an asymmetrical Abbe flap sporting a corresponding unilateral triangular projection might create a cupid’s bow in the spirit of LeMesurier. The pedicle was divided after my departure from the island, and the patient never returned to register her happiness or displeasure.

Although this specific patterned Abbe is a utilitarian space filler to replace missing tissue in specific areas, it has so little artistry in its patchwork effect that I became disenchanted, particularly because about this time the value of the central Abbe as a philtrum became clear. Usually unilateral local lengthening can be achieved during the midline splitting of the upper lip without the addition of side flaps. However, some secondary cleft deformities are so grossly scarred that the multi-pronged Abbe as a one-shot corrective measure has appeal.
Genrikh Vladislavovich Kruchinskiy, professor at Byelorussian Institute for Physician Training and a prolific writer, in 1969 while at the Moscow Clinic of Stomatological and Reconstructive Surgery ingeniously extended the principle of the double-axis Abbe in 15 cases and presented one. He wrote:

Especially in patients with repeated surgery for congenital clefts of the upper lip and palate, the lip is often extremely sunken, diminished not only in the transverse direction but conspicuously shortened as well . . . is often accompanied by narrowing of the nostril on the side of the former cleft . . . .

To make possible a simultaneous enlargement of the upper lip in both transverse and longitudinal direction it was proposed to cut out from the medial part of the lower lip . . . a wedge-shaped flap of skin, muscle and mucosa which had three opposite, transversely oriented tips . . . Before cutting the flap it was necessary to measure accurately the size of the defect of the upper lip . . . . The basic mass of the flap was cut out in its entire thickness together with the mucosa, the lateral wedges comprised of skin and partially of muscle of the lower lip. The wedges on both sides of the basic flap were cut at different levels to a premeditated plan . . . . The wedge-shaped flap . . . was rotated 180° and the upper lip was cut in its entire thickness along the old scar . . . two horizontal non-penetrating incisions were carried out on both halves of the lip corresponding with the length and level distribution of the additional skin wedges on the wedge-shaped flap . . . . Observations confirmed that wound across the red was later on replaced by a scar pulling inward. It was usually possible to avoid this pull if the incision line in the red was broken . . . after 10-12 days the nutrient "pedicle" was cut off.
When the nostril was narrow on one side, Kruchinskiy directed the medial tip of the main flap into the nostril:

If the nose vestibule was narrowed, the nostril was cut through and, in order to form the nose vestibule, the flap was cut a little longer in the area of the chin.

Closure of his donor area varied with the pattern of the flap.

One cannot but be impressed by the intriguing designs of these flaps, suggestive of atypical stars cut by a special Soviet sickle. It is even possible to conjecture that Kruchinskiy enjoys his series of the world's most unusual Abbes much as he does his collection of rare and valuable stamps and postmarks.

**UNILATERAL POSITIONING OF THE ABBE FLAP**

For years expediency of flap placement has held more enchantment for the surgeon than the artistry of the lip construction. If the defect was in the left of the upper lip, the flap was simply taken from the left side of the lower lip and that was that. In fact, Hogan and Converse seemed to make good sense when they said,

The Abbe flap should come from a portion of the lower lip which corresponds to the defect in the upper.

Robert Chase of Stanford, accepting this premise, turns to higher mathematics and calculates his donor area according to the projected strategic position of the pedicle when the flap has
been transposed. This solution would be brilliant if the first premise were true.

Ian McGregor comes closer, but not for the reasons I think are of prime importance. He said in his Scottish brogue,

It is usual to make the flap symmetrical about the midline of the lower lip. . . . Of course there is no theoretical reason why the flap need be made in the middle of the lower lip, but it does make it easier to match the thickness of its red margin when the two sides of the lower lip are being sutured together.

General acceptance of the automatic off-center positioning of the Abbe flap among the high echelon of plastic surgeons was further confirmed by Paul Tessier of Paris, who as late as 1969 wrote in *Annals de Chirurgie Plastique,*

With the bilateral, the result of the Abbe is better than with the unilateral, since the flap is midline and simulates a philtrum (even the scars give this illusion), and because it restores the appearance of a cupid's bow. On the other hand, with the unilateral, the symmetry of the lip remains mediocre.

A unilaterally placed Abbe flap, of course, will release tightness and form an adequate lip but without the slightest hint of artistry and with no construction of natural conformity; even after multiple minor revisions, including a cupid's bow procedure, it still probably will not create a curvacious lip.
A UNILATERAL BUT ASKEW POSITIONING

When there has been excision of the natural cupid's bow during the cleft edge freshening for a straight-line or a Blair-Brown closure, some tightening of the upper lip will take place, especially along the free border. Such a case is benefited by the introduction of a composite flap from the lower lip.

The off-center insertion of the flap seemed logical on account of the unilateral position of the original scar. Yet observation of cases treated in this manner had been universally disappointing. In one tight upper lip, described in the January 1964 British Journal of Plastic Surgery, the unilateral scar was excised and the medial lip component rotated, with the releasing incision extending under the columella base. The tail of the lower lip flap was transposed into the rotation gap and the vermilion border of the flap set at an angle to simulate the missing half of the cupid's bow. As often happens with midline lower lip flaps, there was a dimple, which is coveted for a midline position but abhorred off-center. Midline subcutaneous tissue and muscle were excised, and the skin was held for a time in depressed position by sutures tied over a piece of rubber.

The early result looked quite promising, but eventually, on account of the equal length of the two sides of the Abbe flap, the bow effect straightened out. If the lateral side of the Abbe could be made shorter than the medial to give a bow peak heist, the result would be better. The final result was an improvement, but the surgery was too complex to be practical. Nevertheless, I prefer this setting of the Abbe flap slightly askew to balance out the effect of a cupid's bow rather than use all or half of the Gillies cupid's bow procedure.
Whenever an Abbe flap is introduced unilaterally, the results will be unnatural. A method of camouflaging the off-center insertion of the lip-switch flap is the one-sided use of the Gillies cupid’s bow operation. Gillies used this principle for multiple problems. In 1963 the dour and diligent Ian McGregor of the Royal Infirmary, Glasgow, Scotland, specifically advocated unilateral insertion of the lower lip flap and secondary correction in this manner:

Usually half of a cupid’s bow is present on the normal side of the lip and a cupid’s bow type operation is then required to match the line of the flap with that of the remainder of the lip.

He emphasized:

The line of the cupid’s bow is made in the usual way but instead of merely excising skin, the excision is carried deeply, including muscle down to mucosa. This enables the whole wedge of red margin to be brought up, moving like a door on the hinge of mucosa.

There are two modifications that can improve this operation. First, the white skin roll ridge should be preserved and the incision for lifting the vermilion placed parallel with but just above it. Second, the elliptical excision of skin and muscle should not actually be cut off but only denuded of epithelium, cut as a flap with its base medial and transposed as a dermomuscular flap into a tunnel along the line of the missing philtrum column.
MIDLINE ABBE IN
UNILATERAL CLEFTS

Irritated into midline action

Utter unhappiness with off-center Abbe flaps stimulated my closer observation of the areas involved. Again, landmarks eventually crystallized the obvious direction of action. It was noted that quite often there is a semblance of a dimple or groove in the midline of the lower lip, and it was further noted that when the lip-switch flap was cut narrow this dimple seemed to become more obvious and persisted after transplantation. Its persistence made the flap unsuitable for unilateral duty but increased its value as a natural-looking midline philtrum. Thus, the spell was broken for me of the long-accepted off-center placement for all lip-switch flaps in unilateral clefts and it was suggested that the previous unilateral scar be ignored and the tight lip be split in the midline so that the dimpled flap can have a central inset.

It is also important that the tail of the flap, when switched, be inset all the way up to the base of the columella, philtrum-like. If it is inset only partway, it will look like exactly what it is: a stuck-on flap.

And so early in 1962, ignoring the unilateral cleft scars, I inserted several philtrum-shaped Abbe flaps into the midline of lips that were slightly tight, particularly along the inferior free border because of Brown-McDowell inferior triangular flap primary closure.

The midline Abbe flap results were encouraging, with relief of tightness, achievement of lip balance, creation of a philtrum and often a dimple and a rather surprising improvement in the untouched unilateral lip scar. Of course, this scar revision after the insertion of a tension-releasing flap offered an even better prognosis as seen.

Midline placement of both flaps and grafts was described in detail and demonstrated by the above pair of cases in the article "Composite Lip Flaps and Grafts in Secondary Deformities," which was submitted to the British Journal of Plastic Surgery in
The patient returned 10 years later happy with her Abbe but requesting minor revision of her unilateral scar.
April 1963 but not published until January 1964. Subsequently, it came to my attention that in their book *The Essentials of Plastic Surgery*, which was published sometime in 1963, Peet and Patterson devote a short paragraph to this subject without photographs of results:

Some unilateral cases also require additional tissue in the upper lip to restore normal lip relationship. In these subjects it has proved best to divide the upper lip in the midline and not through the lateral scar line. The end result is a centrally placed flap with two vertical scars on the cleft side. Some months after the transfer, the narrow strip of skin between the two scars may, if necessary, be excised and the gap closed after adequate superficial skin undermining. This is the best way of producing a symmetrical upper lip.

As Peet preferred a straight-line closure of unilateral lip clefts, it is likely that he often had occasion to use an Abbe flap as a secondary procedure. This is not a popular method in this country, so there is little occasion to see straight-line closures and rare occasion to switch a lower lip flap into them. In the latter operation, the flap should be inserted in the midline.

**Others concur with midline position**

Professor J. Lachard of Marseilles also prefers the median placement of the Abbe flap in unilateral clefts. This fact was brought to my attention by the excellent 1970 medical thesis "*Traitement Chirurgical des Séquelles du Bec-de-lièvre,*" by Raymond Gola, an astute young oral surgeon of Marseilles.

Recently, other surgeons have joined the bandwagon of the *midline Abbe in unilateral clefts*. In 1970, Schuh, Crikelair and Cosman reviewed 50 Abbe flaps used between 1940 and 1965 at the College of Physicians and Surgeons, Columbia University, New York, and concluded:

A majority of the problems have been associated with asymmetrical lateral placement which draws attention to the most minor irregularity. Many difficulties would be eliminated if all flaps could be placed centrally.

By 1970 Onizuka was also using a midline Abbe in unilateral clefts. He showed various unilateral scar revisions followed by
vertical midline division of the upper lip and insertion of a small philtrum-shaped Abbe flap.

Hogan and Converse in 1971 devoted pages to the midline placement of the Abbe, repeating many of the points originally brought out in my first paper. They showed one early unfinished postoperative result.

A bull's-eye for Blair-Brown

The secondary cases that I began to find with tight upper lips had most often had a Blair-Brown triangular flap closure primarily. In these a small midline Abbe flap transposed from the middle of the lower lip has been a bull’s-eye. Another aspect of the Blair-Brown result that lends itself specifically to a midline Abbe is the smooth convex “rainbow arch” of the mucocutaneous border without any remnant of a cupid’s bow double curve. The typical asymmetry of the vermilion free border can be corrected prior to, during or after insertion of the Abbe flap.
Shaping the flap

The actual shape of the normal philtrum with its central dimple, if marked along each crest of the philtrum column and along the mucocutaneous junction line of the cupid’s bow, is a slender shield of King Arthur’s court sitting upside down. To simulate the normal philtrum, the lower lip flap should also, when possible, be reasonably slender and similarly shield-shaped. Unfortunately, the lower lip does not have the central skin peak of the upper lip bow, but there is a trick that will suggest this effect. Cut the flap narrower at the vermilion border so that it measures the transverse width of a normal bow from peak to peak. The flap’s midline point between the two lateral lip elements will be strongly suggestive of the cupid’s bow.

Speaking of dimples

The advantage of taking the shield-shaped Abbe flap from the center of the lower lip is to incorporate its normal midline groove and transport it to re-create the midline philtrum dimple of the upper lip. For example, although the accommodating dimple in this case was never required, as the rotation-advancement method preserved the upper lip philtrum, it was certainly present and available.

Reducing the pedicle

The transposition of the lip flap 180 degrees out of the lower lip and its insertion almost completely into the upper lip is facilitated by the least amount of pedicle. The pedicle can quite easily be reduced to a slim band of posterior, superior mucosa of the free border including the labial coronary vessels and a few protective fibers of the orbicularis oris muscle. In fact, this unit is, in essence, an island flap.

Role of white roll

Several surgeons have asked about using the white roll flap for bilateral mucocutaneous interdigitation during Abbe flap insertion. Of course, it is a possibility and can always be called upon secondarily. Personally, I have not found it necessary as primary
alignment can be extremely accurate, particularly if all apposing mucocutaneous white rolls of the upper lip and Abbe flap are stab-marked with a needle dipped in methylene blue before the incisions are made.

Improving old scars
By mere introduction of the lower lip tissue, the upper lip is released. This relaxation often simultaneously improves the previous cleft scar. If not, it can subsequently be revised with optimism now that the upper lip tightness is less. Abrasion may give the polishing touch.

It may be argued that a centralized Abbe flap adds two extra scars to the upper lip and one in the lower. Right, but if the operation is done with precision so that the scars are reasonably unnoticeable, the gain in normal conformity is more than worth the price of scars.

Donor closure
The slender shield shape of the lower lip flap offers a double dividend because the narrower the flap, the less the lower lip suffers distortion. Even when the upper lip is quite tight and the lower lip excessively protuberant, a slender flap is doubly effective as it relieves one while tightening the other. The shield-shaped donor area is closed with slight lengthening to offset any tendency toward straight-line contracture. A Z-plasty of the lower lip closure is as unnatural as any other scar criss-crossing natural lines. If the flap was long enough to cause the donor scar to extend from the lip well down into the chin, a straight-line closure is still the best primary bet. If the scar pulls a web at the lip-chin junction, then a small Z-plasty, as suggested by Ian McGregor, may be of value, but only as a secondary procedure.

Return of function
Investigators have reported that sensory, sympathetic and motor reinnervation of the flap occurs, requiring from nine months to two years.
Lights, camera, action

It would seem that the best way to explain my preferred method of shield-shaping and midline-placing of a lip-switch Abbe flap in a suitable secondary unilateral cleft lip is to do one and back it with cases. So here goes!

The nasal correction has been completed. The upper lip with its unilateral almost straight-line scar has no cupid’s bow, no dimple, no philtrum column on the cleft side and is relatively flat and tight as compared to the slightly protuberant lower lip. A perfect situation for a small shield-shaped Abbe flap placed in the midline. There is less danger if the Abbe flap is done under local anesthesia.
Upper lip release shows eversion. Lower lip dimple to become philtrum.

Mark shield-shaped Abbe flap size of ideal philtrum, not size of upper defect.

Scoring the skin.

Dividing the free side of the flap.

Position of main coronary vessel noted.

Hemostasis obtained.

Cutting the flap free.

Crossing the opposite mucocutaneous junction.

Reducing the pedicle almost to the vessel.

Swinging the flap.

Mucosal closure of donor area.

Muscle closure with Mersilene.
Division of the pedicle

Eight to ten days later, the pedicle is divided under local anesthesia as an office procedure. In the series of Abbe flaps shown in this volume, the average time of pedicle division was 11 days. Actually nine days is sufficient and safe, but when a weekend was involved, the division was delayed a day or two with plus and minus advantages.
MIDLINE ABBES I HAVE KNOWN

Postoperative results—Mirault-Blair-Brown-McDowell closure

It is not always possible to distinguish a Mirault-Blair from a Brown-McDowell except that in the latter the inferior triangular flap is smaller and the results are better. Cases that come to secondary correction consistently have the angled, unnatural scar with its straight-line extension directly into the floor of the nose. The mucocutaneous ridge is usually interrupted and makes a single arc with no evidence of a cupid's bow, philtrum or dimple. The vermilion free border has a cleft side bulge and no midline tubercle. The lower portion of the upper lip is tight, exaggerating the relative protrusion of the lower lip. There is the asymmetrical nasal distortion.
Improvement in the nose caused lack of lip landmarks to become more objectionable.
This Georgia boy had an angled scar and tightness along the inferior border of the upper lip, no cupid’s bow or philtrum and a flaring ala.

Result after Blair-Brown type lip closure.
2-26-69. Midline 2 X 1 cm. shield-shaped Abbe flap. Division of pedicle after 10 days. Lip revision to follow.

This 12-year old boy had a characteristic scar, relatively tight upper lip lacking natural landmarks and a typical cleft lip nose.

Result after Blair-Brown type lip closure.
6-8-72. CL rhinoplasty.
12-11-72. Midline 1.4 cm. shield-shaped Abbe flap. Division of pedicle after 9 days.

Cleft lip rhinoplasty and midline Abbe flap, in spite of minor discrepancies, achieved balance, function and a pleasant quality.
The patient was first seen at 10 months of age presenting typical unnatural angled scar, loss of cupid's bow, philtrum and dimple, tightness along the free border of the upper lip with relative protrusion of the lower lip, wide nostril floor and flaring ala. At one year of age, a rotation-advancement revision of the upper scar with medial advancement of the alar base improved relations. The tightening action of the upper portion of the lip reduced the relative purse-stringing along the lower border. The early destruction of such landmarks as the cupid's bow and philtrum was still objectionable at 14 years so a midline Abbe flap was inserted to create a philtrum.
This 36-year-old man had a slightly tight upper lip with a single mucocutaneous arc and no residual cupid's bow, philtrum or dimple.

Result after Blair-Brown type lip closure.
CL rhinoplastry, alar cartilage lift to septum.
Midline shield-shaped Abbe flap.
Division of pedicle after 10 days.

Before Abbe 3 days after pedicle division 2 years later

This 27-year-old journalist and musician had his lip closed at one month of age in 1946 in Indiana when the Blair-Brown procedure was popular. Excerpts from the patient's letter to me are self-explanatory:

My primary operation has left a number of irregularities and conspicuous scars of the lip. I have a tight upper lip of abnormal appearance which is unbalanced and unshapely with an excessively full lower lip, an irregular left nostril and an extremely deviated nasal septum. My upper lip will probably require reopening and the Abbe flap may be necessary.

I realize that there are a number of different adjustments possible and some of them are not easy, but if performed correctly they should improve the appearance tremendously.

This operation is likely to be a momentous, once-in-a-lifetime event for me even though I can't expect perfection.

The patient arrived with the previously described secondary unilateral deformity of his lip and nose and in addition revealed protruding ears, a receding chin and a prematurely receding hairline sprinkled with healing hair grafts.
The first surgery included a Silastic sponge implant to the chin and a cleft lip rhinoplasty, including reduction of the normal alar cartilage, piggy-back onlay graft of this cartilage to the cleft side, bridge lowering, bilateral osteotomy, submucous resection (SMR) and alar base advancement. Two months later a bilateral otoplasty and midline Abbe flap were done.

Result after Blair-Brown type lip closure.

Midline shield-shaped 1.7 cm. Abbe flap.
Division of pedicle after 10 days.

3 days after pedicle division

5 months postoperative
This 12-year-old girl’s unilateral cleft had been closed by Ferris Smith of Grand Rapids, who as a pioneer did his own thing in cleft lip. It is difficult to type the method used, but it was probably a variation of the Mirault-Blair operation. Then, as Smith worked with Gillies at Sidcup during World War I, he must have been influenced to use the Gillies cupid’s bow procedure in an attempt to re-create the cupid’s bow lost during the primary surgery. This secondary procedure destroyed, with irreversible scarring, the mucocutaneous junction, justifying in this case Barrett Brown’s criticism of the method.

At age 13, normal alar cartilage was reduced and the cleft side alar cartilage lifted and fixed with a nylon suture to the septal bridge. At age 14, all lip scars were abraded. At age 17, reduction rhinoplasty, SMR, two septal cartilage struts inserted in the columella for nasal tip support and alar marginal sculpturing gave some further improvement.
This teenage girl with slight tightness of the upper lip and relative protrusion of the lower lip expressed particular consciousness of her lip scar. On closer study it was noted that the interruption of the mucocutaneous white roll ridge, the lack of a cupid’s bow, philtrum and dimple, along with the relative tightness, rather than the scar, branded this lip abnormal.

It was decided that, although the patient was concerned about her one scar, release of tension and improvement in conformity with the creation of a cupid’s bow and philtrum would justify the addition of three more scars!
Cleft lip rhinoplasty reduced normal alar cartilage, lowered hump, narrowed nasal bones with osteotomy, released vestibular lining with Z-plasty, bolstered cleft side alar cartilage with onlay graft from normal side and denuded tip of alar base flap sutured to septum. An SMR was done, and two septal cartilage struts were inserted into the columella to support the tip. This set the stage for an Abbe flap.
This patient had Brown-McDowell type lip closure at two months of age in Cuba, resulting at eight years in a tight lip without landmarks.

A 21-year-old Australian girl who had had closure of a unilateral cleft lip in infancy is shown at a stage in her reconstruction.

Result after Brown-McDowell type lip closure.
8-23-73. Scar revision, mucocutaneous adjustments, midline 1.5 cm. shield-shaped Abbe flap.
Division of pedicle after 13 days.

Comment. Conformity more important than scars. Lower lip revision to follow.
When first seen in Miami, she had improved but still had a relatively tight upper lip, absence of landmarks and the asymmetry of a cleft lip nose.

At age 21 both nose and lip were corrected at the same time. Cleft lip rhinoplasty involved reduction of normal alar cartilage, septal shortening, rotation of cleft side alar base and SMR with cartilage struts into the columella to support the tip. A midline Abbe flap was inserted into the center of the upper lip.

10 years

7-24-64. At 10 years. Scar revision, alar base and rim revisions, midline shield-shaped 1.5 cm. long Abbe flap. Division of pedicle after 13 days.
6-17-70. At age 16. CL rhinoplasty with alar lift and septal strut in columnella to tip.

6-16-72. Mandibular osteotomy for class III malocclusion by University of Miami Professor S. Kline.

*Comment.* Scar excision at same time as the Abbe flap is unusual but seemed successful. Note new balance of the upper and lower lips with creation of a cupid’s bow, philtrum and dimple. It is interesting that function of the lip is good except at the site of the original cleft closure, where the muscle fiber arrangement is still slightly askew.

20 years
This boy, one of twins, was born with a unilateral cleft while his twin had a bilateral cleft. A primary inferior triangular flap closure resulted in a central vermilion notch with a flattened lip lacking a cupid's bow, philtrum or dimple.

Result after Brown-McDowell type lip closure.

At 7 years. Midline shield-shaped Abbe flap. Division of pedicle after 9 days.

Postoperative Hagedorn-LeMesurier result
The quadrilateral flap method presents an unnatural scar line, the lip has no evidence of a philtrum or dimple and, in some cases, the method fails to create a cupid's bow. The inferior border of the upper lip may be tight and compare unfavorably with the protuberant lower lip. There is the usual asymmetrical distortion of the cleft lip nose.
This 18-year-old Cuban girl had a tight upper lip lacking natural landmarks and an asymmetrical cleft lip nose. At age 19, cleft lip rhinoplasty reduced normal alar cartilage, lifted the cleft side alar cartilage to the septum with nylon suture, reduced normal alar base and rotated flaring alar base. SMR supplied cartilage struts which were inserted in columella to support the tip, and Silastic sponge was implanted beneath alar base.

The lack of the natural landmarks of cupid's bow, philtrum and dimple prompted a lip-switch flap which seemed to put the lip at rest in this 27-year old man.
This 15-year-old girl had a LeMesurier primary lip closure resulting in a lack of natural landmarks and contour of the lip and asymmetrical distortion of the nose. A cleft lip rhinoplasty included normal alar cartilage reduction, lift of cleft side alar cartilage to septum, transposition of flaring alar base and reduction of the normal alar base. Then the Abbe flap was switched.

Result after LeMesurier type lip closure.

At 16 years. Midline shield-shaped 1.5 cm. Abbe flap.
Division of pedicle after 10 days.

Result after LeMesurier type lip closure.

6-12-63. At 13 years midline shield-shaped Abbe flap.
Division of pedicle after 13 days.
9-11-63. CL rhinoplasty, hump removal, septal shortening, bilateral osteotomy, SMR and septal strut in columella to tip.
At age 43 the upper lip was split in the midline and a shield-shaped Abbe flap inserted. Division of pedicle after 10 days.

This 42-year-old woman had her lip closed primarily in Chicago and later revised with a secondary LeMesurier procedure. The lip was slightly tight in transverse dimension, comparing unfavorably with the lower lip. In spite of the secondary quadrilateral flap, the mucocutaneous ridge spanned in a single arc with no suggestion of a cupid's bow, and, of course, there was no philtrum or dimple.

Insertion of an Abbe flap released the upper lip which improved its relationship with the lower. It also created a philtrum with dimple. Puckering of the orbicularis oris musculature of the upper lip seven months after operation revealed balanced wrinkling on either side of a quiet but natural central philtrum.

A Z-PLASTY PROBLEM

Z-plasty closures seldom require an Abbe flap, but when they do there can be problems. Here is an example:

This 17-year-old boy had had a type of Mirault-Blair closure in infancy and some sort of Z added to it later which resulted in the worst of both. He had a tight lower portion of the upper lip, unnatural scars zigzagging everywhere, no natural landmarks and a typical asymmetrical cleft lip nose.
Insertion of an Abbe flap produced a natural-looking dimpled philtrum, but there was still something wrong! After repeated observation, it was realized that the lip Z-plasty had strangely disarranged the hair-bearing areas.

Less than a year after the Abbe flap operation a reverse Z-plasty redistributed the hair-bearing and non-hair-bearing areas without lengthening the lip. An expendable area of non-hair-bearing lip skin was used as a free skin graft to construct a mucocutaneous white roll ridge across a flattened interruption of the ridge.
A CASE OF SPECIAL INTEREST

This patient was born in Fairmont, West Virginia, on 9-10-44 with an incomplete cleft of the lip, and his pediatrician sent him straight to V. P. Blair in St. Louis. Blair, whom the mother remembers as being kind and charming, employed his inferior triangular flap. Ten years later J. B. Brown did a lip revision and the mother recalls how impressed she was with Brown who, when attending a convention, took the time to see her son. He told them that the boy should wait until he was 29 or 30 years old to have further work, and that it should be his own decision.

In 1974, at age 29, the patient revealed slight relative protrusion of the mandible and some asymmetry of the nose, and an inferior triangular flap constricting the free border of the lip, causing tightness.

This is one of the rare times that it has been possible to excise secondarily almost the entire cleft scar and intervening tissue, and keep the Abbe in philtrum position. This was possible probably because the original cleft was incomplete.
47. Anatomy of the Secondary Deformity of the Unilateral Cleft Lip Nose

THE asymmetrical nasal deformity of unilateral cleft lip is notorious for its subtle resistance to surgical correction. It is très difficile, engorroso, eine teufliche sache, a sticky wicket or just damned difficult! The inherent nasal discrepancy of cover, support, lining and platform almost tempts the surgeon, like a tailor facing an extensive alteration, to scrap the misfit and start again. Fortunately the surgeon need not be quite so drastic. Mere perusal of the literature reveals a staggering variety of attempts at correction of the cleft lip nose and, as noted by Musgrave, there is no simple panacea.

ORIGIN OF THE NASAL DEFORMITY

A majority of surgeons have always considered that the basis of the cleft lip nasal deformity is a secondary manifestation of a divided orbicularis oris muscle and a deficiency in the maxillary platform. Stenstrom and Oberg even pulled and jerked on cadaver noses to prove that this action duplicated the cleft lip deformity. In 1948 in Professor Kilner's clinic at Alton, England, as already mentioned, I saw a 12-year-old boy with no history of cleft lip. He did have the slight unilateral skin ridge of a "congenital scar" but no disturbance of the main orbicularis oris or the maxilla. He had a typical moderate degree of cleft lip nasal deformity, including septal deviation, dislocation of the alar cartilage at the tip with slumping and overhang of the alar rim and deficiency in the nostril floor with a slight flare of his alar base. At the time I was shocked because it was obvious that
the existence of a lip cleft had not been responsible for this nasal distortion.

Since then I have seen several similar cases, but of course many others have noted the existence of the typical cleft lip nose without an apparent cleft lip. In 1968 Boo-Chai and Tange, in Chinese and Japanese, reported five such cases, and since the alar cartilage was normal in size and shape but displaced, they surmised:

It is, therefore, unlikely that the condition is due to an intrinsic defect within the alar cartilage.

Other observers, such as Rees and Tulenko, consider the mesodermal inhibition-deficiency theory compatible with the occurrence of this anomaly, but specifically applied to the cartilages of the nose.

**Nasal Deformity Persists After Lip Closure**

All cleft lip methods prior to the rotation-advancement made little attempt simultaneously either to lengthen the cleft side columella or to correct the alar flare. Thus nasal measurements of late results of the LeMesurier method should rank about equal to those of the other standard procedures.

Farkas and Lindsay in 1971 studied adult Canadian unilateral cleft lip patients after a LeMesurier closure and reported:

The length of the columella in unilateral cleft lip and palate patients is significantly shorter on the cleft side than on the non-cleft side and is significantly shorter on the cleft side than in normals. The non-operated side of the columella was almost the same length in patients as in controls.

It would seem that Leslie G. Farkas, once of Charles University, Prague, and now of the University of Toronto, has been very busy making morphological measurements of normal and cleft lip and nose anatomy since his transplantation to the Western world. He has done this work in cooperation with William K. Lindsay, and their studies have been quoted regularly. Using anthropometric techniques, they compared 70 adults after
LeMesurier unilateral cleft lip closure in childhood with 100 normal Canadian adults. They reported an interesting and possibly unexpected finding:

It was surprising to find that the so-called "normal" side of the face in patients with unilateral cleft lips/palates was always narrower, in many cases abnormally narrower. ... The "abnormally" developed non-cleft side in the patient with a unilateral cleft lip/palate might suggest that the anomaly influenced the development of the face equally on both sides. The work of Fraser and Pashayan suggests that, in a certain number of cases, this is a familial trait.

This certainly suggests that there is more to this anomaly than was dreamt of in our study of just the lip or just the nose or just anything!

PATHOLOGICAL ANATOMY OF THE NOSE

Before we can treat pathological anatomy intelligently, we have to know exactly what we have. In 1949 William Huffman and Dean Lierle of the University of Iowa Hospitals studied the "pathologic anatomy of the unilateral hare-lip nose." Since no case presented all deformities equally, a complete composite diagram was charted. They noted: (1) nasal tip deflection, (2) cleft alar cartilage dome retroplaced, (3) obtuse angle between medial and lateral crus of alar cartilage, (4) inward buckling of ala, (5) absence of ala-facial groove with alar attachment to face at an obtuse angle, (6) real or apparent deficiency of bony development, (7) overly wide dorsal extremity of naris, (8) a naris circumference greater than that of its fellow, (9) more dorsal position of entire naris, (10) shorter columella on cleft
side, (11) medial alar crus inferiorly placed in the columella, (12) columella slanted obliquely with the dorsal portion of the septum dislocated off the nasal spine and presenting in the normal nostril with the anterior septal tip leaning over the cleft. The entire tip of a unilateral cleft lip nose is often dependent, but more worthy of attention is that the cleft half is even more dependent than the normal half. To this list Berkeley has added the bow-string contracture of the interior of the nostril extending from its apex along the upper border of the lower lateral cartilage to the margin of the pyriform sinus.

I would like to emphasize a common deformity. The normal alar crease discontinues when meeting the bulge of the normal alar cartilage, but in the cleft lip nasal distortion, the crease is unopposed and continues forward across the impotent alar cartilage even to the alar rim, with evidence of kinking and nicking.

As in all unilateral deformities there is the exasperating aspect of asymmetry. Possibly the most distracting asymmetry is the vertical axis of the normal nostril as opposed to the transverse axis of the cleft side nostril.

In its more extreme form the unilateral nasal deformity presents all of the above-mentioned pathology but in exaggeration. The excessive length of the cleft side of the nose produces a
twisted hemi-hook which all but rests upon the lip. This slump is so severe that the nostril is not only lying in a horizontal axis but is squashed into flattened obscurity.

MAN-MADE DEFORMITIES

In addition to inadequate correction there can be exaggerated over-correction, resulting in odd man-made deformities. For instance, bitter experience with persistent lateral alar drift probably provoked the over-closure of this contracted nostril.

TWO-FACED ASPECT

The deviation of the anterior septum leaning over the cleft does not support the nasal tip, and since the attenuated, flattened cleft side alar cartilage has never risen to its balanced perch beside its mate at the tip, there is a slump of the entire cleft side of the nose, presenting a hemi-hook. In fact, the left and right profiles look so unalike, they appear to be two different faces.
The normal side of the nose stands as a flaunting challenge to the abnormal side, forcing a constant comparison. At the same time, however, it presents a model by which the deformed side can be fashioned.

When the original deformity has *not* been treated directly except for some medial advancement of the alar base during primary closure, then there will *not* be much improvement with age as reflected in the residual secondary deformity.
A basic deformity in the unilateral cleft lip nose is the deviation of the septum which actually leans over the cleft. This is accompanied by anterior dislocation of the septum from the vomerine groove and presentation, along with the displaced nasal spine, into the normal nostril and nasal floor.

Myron Metzenbaum of Cleveland, Ohio, was an amateur sculptor who used his artistic talent in his otolaryngological surgery. In 1929 he wrote a paper, “Replacement of the Lower End of the Dislocated Septal Cartilage Versus Submucous Resection of the Dislocated End of the Septal Cartilage,” in which he summarized the advantages of correcting the lower end of the dislocated and deviated septal cartilage in unilateral cleft lip nose. The lower end of the septum will be brought into a straight line, the columella supported, the depressed nasal tip raised and the airways rendered patent and equal.

As noted by Holdsworth in 1970:

When seen in adolescence, one constant deformity is deviation of the bridge away from the cleft. Though less than in childhood, it is a stigma, and calls for straightening. Some (Steffensen, 1947; Hogemann, 1965) will operate on the septum in childhood, but most surgeons prefer to wait until much of the facial growth has taken place.

One person, probably more than any other, has pioneered in early septal correction. J. P. Reidy began this work as early as 1948 and in 1968 did a follow-up study of eight cases of excision of the vomer at the time of palate closure around one year of age or less. He found these cases to be free of nasal obstruc-
tion, and the external nasal bridge was central and symmetrical within normal limits, but he noted:

There is no doubt therefore that partial excision of the vomer at so early an age (1 year) does contribute to maxillary recession. . . . Finally, it would appear that the vomer is essential for general nasal growth and for downward and forward growth of maxillae up to seven years.

Reidy summarized:

The typical secondary nasal deformity in the unilateral cleft of lip and palate becomes more apparent at 7–8 years. There is partial obstruction due to lateral displacement of the inferior border of the nasal septum by the projecting maxillary ridge formed from the vomer. In the unilateral complete cleft, the forward maxillary part of the vomer is attached to one side only. The abnormal position and the partial maxillary attachment exert abnormal stress on premaxilla and on growth of nasal bony bridge.

Nasal obstruction is frequently present at 7–8 years in cases of repaired unilateral cleft lip and palate and merits surgery (partial submucous resection and straightening of bony bridge) to relieve nasal obstruction.

He diagramed the effect of removal of whole bony spur.

Reidy’s clinical findings were confirmed by the research of B. G. Sarnat of California, who did experimental studies of growth of the snout in young rabbits. He found that dislocation of the cartilaginous nasal septum did not grossly affect snout growth, but resection of the cartilaginous nasal septum produced both severe and striking snout growth arrest.

In 1974 Harold McComb of Perth reemphasized the importance of septal cartilage realignment in the unilateral cleft lip nose. Concerned about growth, he postpones the correction until the age of 17 or 18 years. At that time he frees the inferior septum from the vomer, scores it on the concave side, dissects a pocket over the nasal spine area behind the columella and positions the distal end of the septum into the midline. Fixation is obtained by passing a wire through the distal septum down into the upper sulcus and hooking it over a wire eyelet on the opposite upper canine tooth and maintaining it for four weeks.

Bill Berkeley of Charlotte, North Carolina, who is renowned for his primary nasal correction, during his early experience advocated primary septal correction. More recently he has indi-
There is a clever septal trick, suggested by Ross Musgrave of the University of Pittsburgh and presented in Melbourne in 1971, that might be of use in specific cases when the nose is too long and the nasal floor on the cleft side is slightly depressed. He shortens the nose by shearing a narrow flap of the distal septum, cutting it from above down with its base maintained at the nasal spine area. This cartilage flap, shorn of mucosa, is turned 90 degrees and threaded under the nasal floor of the depressed cleft side to give additional support.

cated a willingness to postpone the septal work until the tissues are fully grown and easier to manipulate.

This is also my feeling. The septum of the infant is friable and easily injured but is not so easily dissected or effectively corrected. If all other nasal components are positioned as near normal as possible primarily, the septum can be straightened at the time of corrective rhinoplasty along with nasal bone osteotomies (at about 16 years of age). If there was no previous septal surgery, there will be minimal scarring, which now facilitates the important final correction. A submucous resection, leaving the usual L-shaped scaffold for support, will obtain enough cartilage to make the several $0.5 \times 3$ cm. struts needed for tip support. The remaining front of the L can be freed from its dislocated position, centralized and fixed with a nylon suture. The displaced nasal spine is best resected. Such a procedure was done for this 30-year-old woman: a submucous resection, correction of the anterior limb of the L and insertion of a septal cartilage strut in the columella from spine to tip. Other illustrations and examples will appear in Chapter 53.

ANTERIOR SEPTAL FLAP

There is a clever septal trick, suggested by Ross Musgrave of the University of Pittsburgh and presented in Melbourne in 1971, that might be of use in specific cases when the nose is too long and the nasal floor on the cleft side is slightly depressed. He shortens the nose by shearing a narrow flap of the distal septum, cutting it from above down with its base maintained at the nasal spine area. This cartilage flap, shorn of mucosa, is turned 90 degrees and threaded under the nasal floor of the depressed cleft side to give additional support.
49. Cleft Half Rotation by External Tip Incisions and Excisions

True to the principle of placing the normal into normal position, a number of surgeons have advocated variations of medial and upward rotation of the slumped composite half of a nose, including skin, subcutaneous tissue, cartilage and mucosa as one component, and advancing the flared alar base into the wake of the rotation. This was bold surgery since it necessitated external nasal incisions.

Erickson in 1885 devised a secondary nasal correction of the unilateral cleft lip nose which used a columella splitting incision that extended to the nasal tip. With the aid of sutures, he slid the down side upward and aided the whole maneuver with a triangular excision of skin and possibly scar from the floor of the nose on the cleft side near the base of the columella. This evidently was the original application of a general principle that later had many followers with almost as many modifications.

Blair

The homespun wisdom of Blair shines through the literature repeatedly and the more brightly when the dates are noted. In 1925 Blair admitted:

At first glance, the correction of the spread nostril would seem somewhat simple; but after some years of more persistent effort with very indifferent results, I concluded that it was not as easy as it seems.

Blair’s basic approach to all problems probably explains his greatness as a pioneer. He concluded:
Until I came to appreciate that no change in the direction of the long axis of the nostril, rather than the real or apparent increase in the width of the floor was the key to the deformity, and until means were taken to correct this rotation of the axis, the operative results fell short of what they have since. To correct the condition, the columella was split in the midline, the cut swinging outward along the line of the junction of the floor of the nostril with the lip, and the whole nostril with its broad ala was rotated into a more normal position.

Blair’s design for primary nasal correction in unilateral lip clefts with rotation of half the columella was included in his 1930 article with Barrett Brown.

J. Eastman Sheehan approached the cleft lip nose correction in a manner similar to that of Blair. This flamboyant showman of plastic surgery, born in Dublin but practicing in New York, seemed to have a penchant for joining wars. He eventually was recipient of both the French and the Belgian Legion of Honor, Order of the British Empire, Military Cross of Spain after joining Franco for a time and the New York Police Department Legion of Honor. He served under Gillies at Sidcup during part of World War I and evidently also participated in World War II, if there is any authenticity to the story Lamont once heard while dining with Jack Tough at a quaint restaurant close by Lord Lister Hospital in Glasgow:

J. Eastman Sheehan had been a friend of Sir Winston Churchill, and had been brought into Scotland by submarine during the war to carry out some type of hush hush mission.

Neither did Sheehan shirk the battle of the cleft lip nose, for in 1925, he agreed with Blair’s concern about

... the long axis of the nostril rather than the width of the nostril floor.

He resorted to rather drastic measures, as he described, to accomplish his purpose:

An incision is made around the ala and deepened to the bone. With a blunt scissors the tissues by which the ala adheres to the bone are separated
from the bone, and on both sides of the incision. The incision is now carried across the floor of the nose; then upward, splitting the columella. An excision is made from the tissues over the nostril of the affected side to admit the apex of the nostril to be drawn up level with its mate. A V-shaped excision from the floor of the nostril to reduce the width facilitates approximating the ala to the philtrum. The freed tissues of the ala and columella are now swung around, the aperture is conformed to the one on the other side and the base of the ala is established in its new position.

Ivy in 1932 diagramed the Blair rotation adapted to the primary nasal correction at the time of lip closure. In 1961 Royster readvocated the Blair procedure in primary nasal correction.

Earl Padgett, one of the early students of Blair, in his 1948 book with Kathryn Stephenson, described his modification of Blair's hemi-rotation in the unilateral cleft lip nose.
In 1930 King George V bestowed knighthood upon H. D. Gillies for his World War I reconstructive work. By 1932 Sir Harold Delf Gillies, the first knight of plastic surgery, was already writing, with T. P. Kilner in *The Lancet*, on an aspect of civilian plastic surgery, the flat ala in cleft lip:

Hitherto this has proved a stumbling block to all surgeons. Optimism in this connection, however, is justified, for the structural defects underlying the deformity are gradually being made clear and accurate diagnosis is therefore becoming possible. *Cure seldom anticipates diagnosis*, but is usually *quick to follow it*. Except from a viewpoint directly below the nostrils, one to which patients are seldom subjected except for the preparation of surgical textbook illustrations, the nostrils can be made to appear symmetrical.

Gillies and Kilner pointed directly to the deviation of the septum and the underdevelopment of the maxilla as fundamental causes of the nasal deformity. They described septal correction and nasal bone osteotomies and then turned directly to the alar cartilages:

The distorted alar cartilage must be mobilized in order to allow it to slide forward into symmetry with its fellow, and it must be fixed in this new position by suture. When the distortion is mild in degree, incisions may be entirely intranasal.

This involved freeing the skin from the alar cartilage to allow better position and then fixing it with mattress sutures to the opposite cartilage through the medial crura. For more severe deformity a more radical shifting was designed:

In severe cases an incision must be made in the midline of the columella, separating one mesial crus from the other, and carried forwards into the tip of the nose curving towards the normal side. It is sometimes necessary to prolong the incision backwards, carrying it around the out-turned extremity of the mesial crus and coming out into the vestibule. In all cases the intranasal incision through membranous septum and arching around the skin of the vestibule, must be made in addition. The mesial crus, having been thus freed, is slid forwards into correct position and held there by skin sutures in addition to mesial crura mattress sutures. It is to be noted
that the sliding forward of the half columella in this manner in unilateral cases is comparable to the sliding forward of the whole columella in bilateral cases. In cases in which the half columella has been advanced, care must be taken to free the alar base from the maxilla—in order to free the alar base still further it may be necessary to carry the incision into the alar groove. A deep catgut suture now approximates the deep tissues of the alar base to the tissue covering the septum and nasal spine. The defect left on the outer wall must be covered by either a Thiersch graft or a small transposed flap usually found to be available in the floor of the nose.

**SCHJELDERUP**

The precise Halfdan Schjelderup of Bergen, Norway, a devoted student of Gillies, in 1963 reported his satisfaction with the Gillies hemi-columellar shift after 13 years experience and 90 cases. Shifting the long skin edge of the cleft side along the short edge of the sound side produced an excess at the upper extremity of the incision which was accommodated by a crescent excision of dorsal nasal skin curving toward the normal side of the tip. In less severe cases the excess pig’s ear of the shift was removed as a triangle in the tip just above the alar arch. Schjelderup wrote in 1963:
Forrest Young of the University of Rochester also preferred the principle of hemi-nasal rotation in unilateral clefts. He was a plastic surgery maverick with a mustache and a rambling gait, reminiscent of Charlie Chaplin. Young loved to play the violin better than others liked to listen to him. One of his house officers recalls the winter of 1946, when the snow in Rochester was over 100 inches deep and the doctors got snowed in at the resident staff quarters and all had to listen to the screech of his violin for three days! Eventually Young became bored with plastic surgery, which for him was mostly reconstructive work, and eventually retired to California and went back to general surgery. In 1949, well after all strains of the snowstorm had faded, he published his version of a Blair-Gillies approach utilizing the

I once asked Sir Harold Gillies why he had not followed up this idea which in my hands had proved to be so useful. The reply was that he did not like making a scar on the nose. Although... in my experience this scar in the majority of cases is almost insignificant... I still try to avoid it if possible...

In 1969 Tessier approved the hemi-nasal rotation principle when he wrote:

Gillies and Kilner have described an admirable procedure which has been taken up by Schjelderup and which can still be further simplified by preventing continuity between the labial and columellar incisions.

Y O U N G

Forrest Young of the University of Rochester also preferred the principle of hemi-nasal rotation in unilateral clefts. He was a plastic surgery maverick with a mustache and a rambling gait, reminiscent of Charlie Chaplin. Young loved to play the violin better than others liked to listen to him. One of his house officers recalls the winter of 1946, when the snow in Rochester was over 100 inches deep and the doctors got snowed in at the resident staff quarters and all had to listen to the screech of his violin for three days! Eventually Young became bored with plastic surgery, which for him was mostly reconstructive work, and eventually retired to California and went back to general surgery. In 1949, well after all strains of the snowstorm had faded, he published his version of a Blair-Gillies approach utilizing the
same medial and upward rotation of the short half of the colu­mella and separately, into the wake of this shift, advancing the flared alar base. Execution of this action in one combined sweep, as Blair suggested, seems more logical unless the nostril floor is not well constructed. In that case Young’s two-step action, like that of Gillies, could correct the floor discrepancy in the process.

EXTERNAL CRESCENT EXCISION

In 1931 the incredible German, Jacques Joseph, father of modern rhinoplasty and pioneer in intranasal incisions, indicated the difficulty of the unilateral cleft lip nose by advocating, obviously in desperation, a contradictory midline columellar incision extending over the dome of the lower lateral cartilage in a curvi­linear fashion. Joseph resorted directly to excision of an ellipse of skin, subcutaneous tissue and mucous membrane from above one dome in order to elevate the forward roll of the lateral alar cartilage. This was a bold solution at the upper extremity of the incision, being used previously for hemi-rotations of the slumped side in order to allow adequate shifting and to equalize the pig’s ear discrepancy.
CRIKELAIR

George Crikelair, with Ju and Symonds of Presbyterian Hospital and the College of Physicians and Surgeons, Columbia University, in 1959 concurred with Joseph’s skin excision:

If there is marked abnormality, if the skin over the ala is thick and in great excess, or if an intranasal approach has been unsuccessful, then Joseph’s method may be quite reliable. . . . The obvious objectionable feature to this approach to the "drooping ala" is the external scar. However, in all cases, the scar has been an even, soft, fine line, neither depressed nor elevated and has not been objected to by the patients, their families, or by the surgeons.

DINGMAN

In 1960 Reed Dingman, Chief of Plastic Surgery at the University of Michigan, published a paper on mandibular ostectomy for secondary deformities in the cleft lip palate syndrome. The overall results were quite dramatic, but Berkeley’s jealous eye spotted the symmetry of the noses. As Berkeley subsequently wrote in 1971:

Although not mentioned in the paper, the nasal deformities were corrected according to the Joseph technique. Personal discussion with Dingman revealed that the curvilinear incision was at a level between the upper and lower lateral cartilages and extended into the mucous membrane fold in the interior of the nose. An ellipse of skin, and sometimes an even larger ellipse of mucous membrane was removed.

COMBINING THE COLUMELLA SHIFT WITH THE CRESCENT EXCISION

Evidently Kilner continued to use the Gillies alar shift operation but modified it by adding the Joseph crescent excision to facilitate the shifting of the ala in a circular and upward direction. He taught this to Peet, and in 1963 Peet and Patterson diagramed the modification with the tip portion of the incision.
curving over to the cleft side and including an elliptical excision of dorsal nasal skin.

**WILKIE**

In 1969 astute Theodore Wilkie of Vancouver revisited the alar shift operation, pointing out the possible reason for its fading into obscurity. He blamed the medical artist for carrying

... the upper end of the skin incision across the nose tip to the non-cleft side, so that many surgeons were no doubt led astray...

and repeated it that way as did Barsky, Kahn and Simon in 1964 and Denecke and Meyer in 1967. Yet the original surgeons had designed it as diagramed, for in their text they stated plainly:

... and carried forwards into the tip of the nose curving towards the normal side.

I think I see the impish Puck in Gillies curving the incision away from the expected into the normal. It must have galled Kilner, for he informed Wilkie in 1961 of his regret at never having published his change. In fact, it is unfortunate for all of us that Kilner wrote so little.

Intriguing points made by Wilkie were that the corrected design does erase the "hare look nose" and that
Millard's operation is founded on the identical plastic principle as is Gillies and Kilner's alar shift, rotation of the medial component and advancement of the lateral component, utilizing all the tissues and placing them in their proper positions, with a minimum of interference with anatomical landmarks. It is a natural corollary that the two procedures can be combined in certain patients who need correction of both nose and lip deformities.

Wilkie forwarded this example of his combined operation on an 18-year-old student nurse with a cleft lip nasal deformity with a microform lip cleft which he published in January 1969 in the *British Journal of Plastic Surgery*.

Of course, the true hang-up for many surgeons, including myself, is, as admitted by Wilkie:

Against the procedure is the fact that an incision is made on the visible portion of the nasal tip.
Wilkie, like others who use the external tip incisions, argues:

The improvement of form has more than compensated for the presence of a surface scar, which in any case usually fades nicely.

It is interesting that J. Manuel Velasquez and Fernando Ortiz-Monasterio of Mexico City more recently have begun using this similar combined approach. They advocate primary simultaneous hemi-rotation of the nose through an external incision and rotation-advancement of the lip adding Guerrero-Santos' denuded vermilion flap. They find the nasal scar unnoticeable but admit that two years is too soon to evaluate any effect on nasal growth.

BERKELEY

It would seem to me that Berkeley has put his heart and mind into cleft lip nose, and his 1971 article in Grabb, Rosenstein and Bzoch's book is the best yet written on the subject. As he admitted, Royster in 1961, with the Blair-type secondary correction, set him off in this direction, and he has now gone into orbit on the subject and from "up there" has combined what he sees as the best of all worlds:

To correct the lateral displacement, the entire ala is mobilized beginning in the midline of the columella and extending across the floor of the nostril at the junction of the floor of the nose and the lip, according to the technique introduced by Blair. A triangle of tissue is excised in the nasolabial region to adjust the long and short sides of the incision. As the cartilaginous septum is almost always displaced toward the normal side, it must be straightened. . . . As the nasal spine is usually present in the floor of the normal nostril, it becomes necessary to resect the nasal spine. . . . A submucous dissection is accomplished through the midline columellar incision. Vertical, parallel, partial-thickness cuts on the concave side of the exposed cartilage allow the cartilage to be brought to the midline without rebound action.
Thus has Berkeley combined Blair with Metzenbaum’s septal straightening influenced by the cartilage work of Gibson and Fry. To this he added the method of Joseph:

When the cleft lip-nose deformity is severe, with a wide-set ala and extensive forward rolling, a combination of the Blair and Joseph techniques is indicated.

This, in fact, is the same as the description by Peet and Patterson of Kilner’s design. Berkeley notes the importance of other corrective rhinoplastic procedures and winds it all up with the same defensive conclusion:

The commonest objection that has been raised to the technique involving the external incision over the dome of the nasal tip is the resulting scar. This wound does mature in time without significant scar, so that it has not been necessary to resort to dermabrasion.

Even Berkeley admits that there are degrees of deformity which require variation in the extent of surgery. When there is severe distortion and the method chosen does not adequately place normal into normal position, the inadequate attempt has been well tagged by Berkeley as “another incident on the road to frustration.”

In preparation for Bill Berkeley’s visit to Miami, a unilateral cleft which had had a straight-line closure was readjusted with a rotation-advancement procedure, positioning the alar base in symmetrical position. Special attention was directed toward leaving the remaining secondary nasal deformity intact.
In 1971 Berkeley used the hemi-rotation of Joseph through a columella-splitting incision which extended up over the nasal tip curving around in the alar crease. No excisions were made, but the tissues were slid, lifted and sutured in more normal position.

The resulting conformity was good; the scar was quite visible when observed directly but by no means objectionable and hardly discernible in photographs.
A GRAPHIC EXPLANATION

Alexander Limberg of the Post-Graduate School of Medicine, Leningrad, in 1966 in *Modern Trends in Plastic Surgery* explained just what is happening to the skin surface during the hemi-rotation. With seemingly complicated sketches of models, he quite simply described the process of bringing together edges of angled incisions with coordinated movements of lateral shift and rotation of flaps, resulting in the closing and opening of angles. When a skin angle is closed, a standing cone or "pig's ear" is created, and when opened, a lying cone or wrinkle forms. Limberg then charted graphic application of this action in the hemi-rotation of the nose with evidence favoring the shifting toward closure of an angle on the cleft side nasal tip to form a rising cone rather than crescent excision of that cone. He accompanied his diagrams with this legend:

Pre- and post-operative stages of rotation-advancement of one half of the columella to correct the depressed ala deformity secondary to a harelip; the wound edges are equalized by excision of a triangular area from the lip scar.

TO SCAR OR NOT TO SCAR?

There is no question but that the total upward rotation and lift of the entire slumped half of the unilateral cleft lip nose as a composite unit is the easiest to perform and the truest to the principle of moving normal into normal position. To achieve this action effectively, the rotating incision must extend over the tip of the nose, resulting in a scar which usually heals well. When one pits improvement in contour against a good scar, there is a real temptation. Yet, if we reflect a moment on the scar, it may reflect back an oracle. At best the scar will be a line or a crease, but it may be discolored or show slight humping in contour or it may be smooth and shiny, catching and reflecting light. There are, at this time, these undeniable facts about scar: it is unpredictable, unnatural and, therefore, undesirable. Although Peacock predicts control of scar by 1980, until that time, in most unilateral cleft lip noses, I pass up the external tip scar and continue to search for an equally effective undercover method.
50. Intranasal and Marginal Incisions for Correction of Nasal Tip, Alar Rim and Base

INCISIONS FOR CARTILAGE SHIFTING

Some surgeons have tried for the same effect of upper rotation of the slumped half but, to avoid the external tip scar, have resorted to marginal and intranasal incisions for exposure of the alar cartilages. This is an attempt to achieve the corrective action by independent maneuvers without moving the entire half of the nose as a composite unit.

MARGINAL FLYING BIRDS AND BATS

Erich

There is another direct exposure to the tip cartilages with more subtle external scarring. The quiet, reserved and dignified John B. Erich, who started in Gordon New’s first group of plastic surgery residents at the Mayo Clinic, in 1953 described a unilateral cleft lip nose correction through a “listing sea gull” incision. He then independently divided the medial crus of the cleft side alar cartilage and lifted it into balance with the opposite side and sutured it there. The excess alar rim skin on the cleft side was tailored, which leveled the “list of the gull.”

After 40 years Erich is still a most dextrous surgeon but remains as conservative as ever, seldom changing his techniques.
and never appearing at meetings. In 1974 he reported still using the cleft lip nose technique exactly as originally described. However, he admitted that the value of this approach is limited in situations where there is a short columella.

**Figi**

Fred A. Figi, also at the Mayo Clinic, in 1952 designed a flying baby bird incision across the upper columella with extensions in the vestibule under the alar arches which actually hid the scars better than the standard "flying bird incision." This approach never became popular but has advantages.

**Stenstrom**

Sten Stenstrom, of the University of Umea, Sweden, with Oberg, pulled a unilateral deformity in a number of cadaver noses to show that the basic pathogenesis of the cleft lip nose is the pull of the lateral facial muscles unopposed by an intact orbicularis oris. In 1961 they concluded that through a modified Rethi "flying bird" incision, similar to Erich, the slumped alar cartilage should be freed and sutured to its opposite medial crus and to its own upper lateral cartilage. They admitted that in certain underdeveloped alar cartilages it was necessary to transplant a small cartilage taken from the normal ala in the Musgrave spirit to "redress the balance between the two." In 1975 Stenstrom added a tiny skin incision high on the dorsum through which to lift the alar cartilage with multiple suture loops.

**Gelbke**

Heinze Gelbke of Gottingen, Germany, in 1956 used a similar transverse "flying bird" or "bat" incision across the tip with the point of the V extending down into the columella. This presented excellent exposure of the deformed alar cartilage, which he sutured up to the normal side. The skin closure advanced the V to a Y out of the columella into the tip, with bilateral "pig's ears" perking up at the sides of the tip, requiring triangular excisions and more external scarring. Since facial dueling scars were a mark of honor in old Germany, this approach may have been found more acceptable there than elsewhere.
McIndoe

In 1938 the adroit New Zealander, Archibald McIndoe, while still in association with Gillies in London, evidently became disenchanted with the external scars of the hemi-rotation that Gillies and Kilner were using. He turned to intranasal incisions and started the shift in the opposite direction, clockwise for a left cleft and counterclockwise for a right, with parallel vestibular incisions that formed a chondromucosal bucket-handle flap, which when freed could be advanced upward and medially. McIndoe sutured the apex of his strap to the normal cartilage of the opposite side in a lateral to medial action.

In principle, this approach promises advantages, but its maintenance of a lateral tethering probably explains why in practice the ultimate results were less than dramatic.

Potter

Big John Potter, quiet and sincere student and friend of Wardill in Newcastle-upon-Tyne, continued the cleft work in Stockton-on-Tees. In 1954 he discussed the unilateral cleft nose deformity:

... the height of the medial (columellar) crus on the affected side is lower than the normal side. The lateral crus on this side, therefore, joins the medial crus at a lower level, compared to the normal side and passing laterally forms a lower flatter arch on this side. ... It has been frequently
noted during the operations when the cartilages are exposed, that the height of the medial crus is $\frac{1}{4}$ inch lower on the affected side. The lower flatter arch formed by the lateral part of the alar cartilage is the cause of the unilateral flattened nostril. The lateral part of the alar cartilage is frequently distorted into the lumen of the nose, the outer surface of the cartilage, which is normally immediately beneath the skin, is rotated inwards towards the nasal cavity. It there presents as a ridge, covered by nasal mucosa and causes varying degrees of obstruction to the nasal airflow.

To obtain a balanced nasal tip the cartilage must be put into its correct position to balance with its fellow of the opposite side.

On this basis Potter designed an operation in which he elevated the skin of the columella and extended the vestibular incisions to expose the entire alar cartilages. He then freed up the entire lower lateral cartilage laterally on the cleft side and advanced it medially, suturing it to its normal mate and closing the lateral defect intranasally in a V-Y fashion. He reports today that he is still happy with the results of this procedure.

This principle is sound, and although it does not offer the complete answer to the problem, it offers advantages which have been used in modified form by many surgeons and included as one component in the total nasal correction approach used by numerous other surgeons.

**Merville**

In 1961 L. C. Merville of Foch Hospital, Paris, presented at the Seventeenth French Congress of Stomatology, his marginal incisional exposure for the cleft lip nose. Complete freeing of the lateral wing of the cleft side alar cartilage facilitated its lift and
suture to the opposite side under direct vision. The nostril was then splinted with an endonasal prosthesis for three months. Merville kindly forwarded to me this example published in *Revue de Stomatologie*, 1962.
Rees

The suave Thomas Rees of New York University, with Converse in 1966 added an addendum to McIndoe and his synchronous lip-nose repair. A Potter-type chondromucosal flap was elevated, the cartilage scored on its superior surface and the entire flap advanced medially and sutured to its mate. The lateral vestibular defect was not closed in V-Y fashion, as proposed by Potter, but additional tissue as a full-thickness retroauricular skin graft or composite chondrocutaneous graft was added with the aid of a stent mold for one week and splinted several weeks later with an acrylic mold.

Takahashi

In 1963, at the International Congress in Washington, Takahashi and Yamazaki of Jikei University in Tokyo made a complicated study of the cleft lip nose, concluding:

It is necessary to raise, curve and rotate the lower lateral cartilage in an antero-medial direction, as well as to lengthen and lift the medial crus antero-medially.

They outlined their surgery, which included wide undermining along the margin of the pyriform fossa, wide exposure of upper and lower cartilages through incision along the margin of the columella and anterior rim of the nares, freeing the nasal skin up to the root of the nose and freeing of the medial crus on the deformed side from the septum. The lower cartilage of the deformed side is repositioned and fixed to the upper cartilage, and the adjacent parts of the medial and lateral crura of both sides are approximated and sutured to each other.
A somewhat similar approach was described by the late Jun-Ichi Uchida of Tokyo in 1971, with freeing of the cleft side alar cartilage through a transcolumellar incision. An incision through the foot of the medial crus and between the alar and upper lateral cartilages along with undermining from the skin achieved sufficient freedom of the alar cartilage so that it could be lifted equal to the normal side and fixed with sutures. The shortness of the plica vestibularis along the rear wall of the vestibule was relieved with a double Z-plasty. Reduction of the wide nasal floor with a skin excision completed his nasal correction except for surgery of septal deviation several months later.

Reynolds and Horton

Those suffering the concern about skin scars must have found the method described by the Virginians appealing. Charlie Horton, of Norfolk, modified the alar lift operation, and in 1965 he and Reynolds published their design. Access was obtained by intercartilaginous incisions in the vestibule along the dotted lines. Portions of the upper and lower cartilages were reduced somewhat as indicated by the cross-hatching. To lift and rotate the cleft side alar cartilage, a 4-0 chromic catgut suture was placed in its upper medial tip and then across and through the anterior medial tip of the normal upper lateral cartilage as indicated by the arrow. Tying this suture lifts the involved side into more normal position:

After the fixation suture is in place, if the airway is compromised by webbing or deficient mucous membrane, the redundant inferior tip of the
abnormal upper lateral cartilage, with its lining is not discarded but is inserted into a relaxing incision in the lower lateral cartilage.

Variations of this general design have enjoyed some popularity. At least there is no gamble on the happy healing of external nasal scars. Interested in senior author John Reynolds' current thoughts on this method, I wrote him in 1973 in Chattanooga, Tennessee. He answered,

Initially, Charlie and I were not satisfied with the results we were obtaining by former methods. . . . At that time, we were working essentially with young adults in the Navy and there were literally dozens of young boys walking around with a nicely repaired cleft lip and a flat unsightly nose. However, since 1967, I have not seen near the volume of this type of problem and have done perhaps no more than six or seven. . . . However, I can state that,

1) Yes, I am still using this procedure and am satisfied with it.
2) I still consider it one of many procedures that can be used, depending on the specific problem.
3) I am not as opposed to an external incision (transverse, and at the base of the columella) to gain direct access to the cartilages, as I was when this original article was written.

Spira

Diligent Melvin Spira, with Baron Hardy and Frank Gerow of Baylor Medical College, Houston, in 1970 combined a nasal quinella. They used a modified Erich-Figi “flying bird” incision, suspension sutures of 4-0 Mersilene from the slumped alar cartilage and the upper lateral cartilage where it abuts the nasal bone on the same side, alar base retention suture to the septum and dissection of a pocket under the alar base over the maxillary hypoplasia for the insertion of an appropriately tailored implant of “soft silicone rubber, silicone gel, cartilage or bone.”
Here is an interesting step-by-step series of photographs of a case by Spira.

**MID-COLUMELLA INCISION**

Recently Gustavo Colon and Mel Abend of Tulane University advocated, along with the usual septal correction, normal alar cartilage reduction and onlay alar cartilage graft to the cleft side, a midline vertical columella incision with exposure of both domes of the lower lateral cartilages. The lateral crus of the cleft side alar cartilage is completely freed from lining and skin and is lifted and sutured to the remaining portion of the opposite normal dome.
LATERAL VESTIBULAR LINING SHORTAGE

In the original cleft deformity, the ala arches across the cleft, and the alar base is attached to the usually deficient cleft-side maxilla in flared and retroposed position. If, during the cleft closure, there is no release of the alar base from the maxilla or, if released, no extra lining is introduced, then there results a secondary deformity, described by Berkeley as a bowstring contracture of the interior of the nostril extending from the tip along the upper border of the lower lateral cartilage to the margin of the pyriform opening. Berkeley prescribes a primary Z-plasty for this discrepancy. This lateral shortness of vestibular lining is best corrected by the introduction of lateral vermilion paring of flap L during the primary lip operation. If this has not been done, then take your pick from the horde of secondary procedures. There is Uchida’s double vestibular Z, O’Connor’s or Borchgrevink’s single Z, Potter’s or Matthews’ V-Y and Rees’ free graft.

SPLITTING AND SHIFTING PORTIONS OF THE ALAR CARTILAGES

Numerous surgeons have devoted much time and thought to ways of splitting and shifting portions of the cleft side alar cartilage in an attempt to correct the asymmetry by lifting the freed limb. Almost as many have tried turning portions of the normal alar cartilage over to build up the slumped side. Few, if any, of these methods have stood the test of time because the alar cartilages, certainly on the attenuated cleft side and even on the normal side, do not have the stiffness or body to lift and support the unilaterally flattened tip. Graham Humby of England, in The Lancet in 1938, described paring off the upper portion of the normal alar cartilage a flap which he swung over the cleft side cartilage to give additional contour.

Arthur Barsky of New York in 1938 split off the upper half of the cleft side alar cartilage and transposed it with a lift up
along the nasal bridge, fixing it with sutures. Both this and the Humby procedures, when studied as diagrams, have appeal and are tried by each new generation. I had a swing at it but was disappointed. These methods have never become popular and, in my experience, just do not get the job done, except possibly in a minor deformity.

DIVIDING AND TURNING UP ALAR CARTILAGES

Varaztad Kazanjian of Boston in 1939 prescribed treatment for the unilateral cleft lip nose with its distorted flat nostril and bent nose. He, like others, advocated septal resection, nasal bone osteotomies, hump removal and cartilage grafts for general harmonious contour. He then stated:

The most important step is the correction of the distortion of the nostril itself. . . . A curved incision freeing the wing of the nostril from the base of the nose . . . [is made and] a vestibular incision is now made bilaterally along the anterior border of each of the lower lateral cartilages . . . [and] is carried vertically down through the lower border of the septum. The skin over the tip and lateral cartilages and nasal bones is undermined . . . the tip of the septum and median crus are exposed.

The inferiorly placed lower lateral cartilage was carefully dissected from the septum, and both cartilages were trimmed and sutured together at an even level. If the nasal tip was broad, a pointed tip was constructed by cutting through each crest of the alar cartilages about 5 to 10 mm. from the median plane, dissecting these cartilage flaps from their mucosal lining and joining them together with catgut sutures. Advancement of the alar base was facilitated by triangular skin wedge excision of the lip side of the nasolabial junction. Here Kazanjian followed Blair and Joseph, in principle, with an external excision which he described thus:

Excision of a semilunar piece of skin, about 3 mm. above the margin of the nostril is the most satisfactory method. The external scar on the tip of the nose is not conspicuous.
Louis T. Byars, one of the Big B's of St. Louis, an A.O.A. and Regent of the American College of Surgeons, was a skilled, ambidextrous technician with a well-organized mind and a soft voice. Although better known for his work in hypospadias and parotid tumors, during the 40’s “Bill” Byars also did a lot of noses. In 1947, he proposed utilizing the columella portion of the underdeveloped alar cartilage on the cleft side to restore symmetry of the nasal tip. It was divided near the foot of the medial crus and lifted up to overlap the opposite alar dome.

In 1952, Gillies suggested that the alar cartilage on the cleft side can be shaped, scored and lifted, and the normal alar cartilage reduced.

... so that when the depressed ala is brought up and sutured to it, the two will ride evenly together on top of the septal crest. At the same time the flared alar base can be moved in by reducing the wide nasal floor. One method is to transpose the alar base and the nasal floor as a Z plasty. . . . In late reconstructions when the nasal bridge is deviated the septum is freed from its vomerine groove and an osteotomy performed through the frontal process of the maxilla so that the entire nose swings around straight on the face.

Sidney Wynn of Milwaukee in 1974 modified the Humby principle of turning the upper half of the normal alar cartilage under the upper lateral but over the cleft side alar cartilage in an attempt to achieve nasal tip symmetry.
Dennis Whitlow, while still a resident, and John Constable of burn fame, from the Massachusetts General Hospital, wrote a paper on secondary unilateral cleft nose, a subject on which even the experienced hesitate to editorialize. In 1973 they published a design which on paper or to the inexperienced might have appeal. They refer to:

An upsilon-shaped incision (T) with its base in the anterior part of the columella and the limbs gently curving out over the alar domes.

Editor McDowell placed one of his notorious notes in their margin which recalled,

This incision is not totally unlike the “bat-wing incision” used a few decades ago. It was discarded because the resulting scar was objectionable in some cases.

Whitlow and Constable, through this incision, dissect and criss-cross cartilage flaps cut from the upper two-thirds of the lateral crura with their bases at the domes. Since the exposure is not adequate for permanent buried sutures, external pull-out stitches are used and maintained for two weeks.

Anyone who has had much experience with shifting deficient alar cartilage knows it is friable and not very effective either for lifting, support or contour. Even Whitlow and Constable noted:
Should the base of the flap be weakened at this narrow point, a non-absorbable mattress suture can be placed to reinforce the point of divergence.

They reported 10 cases, with photographic records of only one, which still required secondary nasal correction.

Harold McComb of Princess Margaret Hospital, Perth, Western Australia, in 1974 reemphasized the importance of the excess unilateral length of the nose on the cleft side and advocated shortening this side without external skin excisions. He uses intranasal bucket-handle strap flaps for exposure and excision of mucosa along with portions of the upper lateral and alar cartilages. By not dividing the upper lateral cartilage on the cleft side from the septum, support is retained for alar cartilage lift. He does not bury his lifting suture but depends on mattress sutures brought out through the dorsal skin and tied over a bolus for five days. McComb also advocates Humby’s trick of turning the lateral crus of the normal alar cartilage to overlap the deformed cleft cartilage. To this he adds septal straightening, nasal bone osteotomies and alar base positioning, and he presents respectable results with this regimen.

SIMPLE MARGINAL EXCISION AND INCISION

There have been other surgeons who have been content to treat specific aspects of the total nasal deformity, and often these procedures have involved marginal incisions.

Ombredanne

Ombredanne of Paris in 1921 described nostril rim excision to correct the cleft lip nose overhang.

Gillies

In addition to their hemi-rotation of the columella with advancement of the alar base, Gillies and Kilner in 1932 offered other suggestions for the unilateral cleft lip nose:

There often remains an excess of nostril margin and lining which renders the result still imperfect. This can be corrected by excision of an ellipse...
of the free margin of the cartilage . . . and lining, the broadest part of this excision is near the junction of the two crura . . . when the defect is closed, the suture line lies inside the nostril . . . An unsightly kink in the nostril margin, caused by excess of lining, may be treated by excision of an elliptical area of vestibular skin at right angles to the margin and with its upper angle high up in the vestibule. The outside skin is not touched. Closure of the defect by sutures produces a pleasantly rounded nostril. This little operation is similar to that described by Ferris Smith for the treatment of collapsed ala.

**Kilner**

The technique of crescent excision of lining under the alar web and in-rolling the alar skin margin was used by Kilner routinely and even became known as the "Kilner roll." This procedure is based on the premise that there is excess lining which actually is incorrect. There is a primary deficit of lining with possibly a slight relative excess of external skin. Although I have used a modified form of this approach, excising a crescent of external marginal skin, with reasonable success in many cases, a better plan has been evolved and will be described.

**Brown**

Brown and McDowell in 1941 suggested a nostril rim incision to remove any forward roll of the lower margin of the deformed alar cartilage, and they combined this with the reduction of the normal alar cartilage.

**Straith's Z-Plasty**

Claire LeRoy Straith of Detroit did thousands of corrective rhinoplasties during his career and was completely at home with the nose. He organized the operation into steps one to ten and took an average of 20 minutes per nose, but his record for a reduction rhinoplasty and submucous resection of the septum was seven minutes!

In 1946 the indefatigable Straith described a Z-plasty of the alar web for the purpose of elongating the nasal columella. A piece of preserved cartilage was inserted into the area of flatness at the tip. It was typical of this efficient surgeon to design a simple, quick solution to a complicated problem. Although his
aspirations were often realized, the results with this approach often had a slightly unnatural effect.

COMPOSITE EXCISION

Hoyt DeKleine of Buffalo in 1955 advocated marginal excision of skin and cartilage along the rim of the slumped ala together with advancement of the alar base.

MARGINAL OVERLAPPING

A Portuguese Bonaparte of plastic surgery, Ivo Pitanguy, short but powerful in stature, stands like the Sugarloaf of his city of Rio de Janeiro. He was once described by Simona Morini for *Vogue* as:

A brief neck supporting a round, proud head with huge black eyes that extend almost to his sideburns . . . reminding one of nineteenth-century German lithographs of Brazilian Indians.

In 1967 he approached the unilateral cleft lip nose at its alar margin. The characteristically flattened edge of the deformed nostril was abraded with a sanding machine over an elliptical area. Then an incision was made along the superior limit of the
freshened area and a pocket dissected under the skin over the alar cartilage. The undermined alar margin overlapped the denuded area, which combined a lifting with a bolstering on the cleft side. When the cleft side alar cartilage was smaller, cartilage resected from the normal side was used as an onlay graft for additional contour as prescribed by Musgrave.

INFOLDING THE RIM

In 1973 Rodolphe Meyer of Lausanne refined the method of infolding the alar web in a modification of the method of Petrali. Avoiding an external incision but gaining access through a marginal incision, he thins the skin of this area, removing subcutaneous tissue and cartilage to facilitate infolding the edge to raise the margin of the nostril. A small Z-plasty is placed at each extremity of the marginal incision, and the vestibular lining is completed when necessary with a composite graft from the ear. Both the infolding and the graft are fixed with mattress sutures over a plate.
Meyer forwarded an example in 1974 of an extremely scarred unilateral cleft lip nose which had been corrected in a child by inrolling the margin and adding an auricular composite graft for extra lining and support, which he explained is barely visible as a "white corner" in the final photograph.

ALAR RIM TRANSPOSITION OR FREE GRAFT

The omnipresent Onizuka of Tokyo, constantly reappearing out of the blue in his relentless attack against the unilateral cleft, suggests kamikaze courage. In 1972 he advocated transfer of the excess alar rim web but this time to the underdeveloped medial crus area of the columella base on the cleft side to bolster its contour. He proposed a transposition flap from rim to sill as first choice. Yet he realized that after the flap takes a 140-degree shift, there may be either an objectionable "pig's ear" at the turn or the pedicle may have been cut dangerously narrow. He admitted making the flap into a composite graft on occasion and published a good case example.
POSITIONING THE ALAR BASE

Not only do the nasal tip and columella show secondary deformities, but the alar base, beginning in flared position, unless effectively corrected primarily will remain flared. The most common method of dealing with this problem has been inartistic excision of tissue at the entrance of the nostril. Several more sophisticated methods have been developed.

Collis swung lateral lip skin into the floor of the nose, which achieved some alar base correction. Blair utilized a similar principle as have others.

Trauner, of Graz, in an extension of the Collis flap, achieved alar base positioning with his vertical lateral lip flap transposition across the base of the columella. Mustardé exaggerated Trauner’s approach by carrying the flap completely across the columella base well into the opposite side in an attempt to tie the ala and prevent lateral drifting.

Grignon, of Paris, devotes the major part of his energy toward disinsertion and forcible rolling up of the ala nasi, with a locking into a sub-columnar notch for satisfactory positioning and fixation of the ala nasi and the nasal wall.

The original design of the rotation-advancement principle had, as one of its prime advantages, the medial advancement of the alar base. The same action was found effective as a secondary procedure. Here is a case in which a secondary rotation-advancement corrected the lip, straightened the columella and advanced the alar base almost enough. An alar rim excision achieved reasonable nostril symmetry.
The occasional less than perfect medial advancement of the alar base or its secondary lateral drift precipitated other alar base maneuvers to “bring about and secure this flapping jib.”

At the Rome Congress in 1967 and in the 1968 extensions of rotation-advancement, I advocated a circumalar incision and advancement of this alar flap on top of the lip flap in an advancement on an advancement. Although it achieved excellent alar base positioning, this correction was not always maintained perfectly. Thus, a further modification was added to the primary surgery to tie the alar base in once and for all.

When sufficient alar base is present, its distal end is denuded and advanced under the side of the columella to the septum at the nasal spine and fixed. Otherwise, a subcutaneous pedicle is dissected in continuity with the alar base and advanced in the same manner. If the alar base is too thick, it can be thinned by cutting a subcutaneous flap out of it and its sides sutured together for a slimmer base. The subcutaneous flap, still attached to the distal alar base, is used as a tether, which can be advanced subcutaneously under the side of the columella and fixed with nonabsorbable suture to the septum at the nasal spine.

Of course, these same tricks are available and effective for secondary alar flare when primary alar base positioning has been inadequate.

A POSSIBLE BACKFIRE

In the rotation-advancement procedure, there is always a chance of a novice advancing the alar base too far. It is even conceivable that an old pro can get a nostril too narrow in the incomplete cleft with an almost normal width of nostril on the cleft side.

BACKWARD ADVANCEMENT

When the alar base had been advanced too far medially, the nostril size is reduced to a comparatively constricted opening. A reverse action is in order. A V-Y of the alar base will correct the constriction and open the airway. The eager and energetic E. N. T. surgeon, Richard Farrior of Tampa, published 60 pages
on secondary cleft lip nose correction in *Laryngoscope* 1962 with a great part devoted to shifting the alar bases medially. Evidently a few got shifted too far in, resulting in an abnormally narrow nostril. These must have stimulated Farrior to design his V-Y lateral advancement of the alar base, which quite effectively reopened the nostril as demonstrated by his diagrams and one of his secondary cleft lip rhinoplastics.

FREE COMPOSITE GRAFTS

Another effective method of opening a comparatively small nostril is the use of a free composite graft from the helix rim. Still another possibility is a modification of the 1954 trick of Max Pegram of Beverly Hills, California, who advocated alar base composite free grafts to lengthen a congenitally short columella. When the normal nostril is quite wide, Pegram's principle could reduce the normal side and free graft the composite wedge into a releasing incision at the base of the narrow side. This would serve two purposes with one graft, provided the constriction was not too great.
51. Cartilage Grafts

The cleft side alar cartilage is notoriously "weak-kneed" and even when shifted into normal position does not possess the body and character to stand up against the depressed dorsal skin mold. Consequently, surgeons have turned to additional onlay and strut cartilage grafts.

In 1932 Gillies and Kilner recognized the need for a supporting graft of cartilage in the nasal tip. Barrett Brown preferred preserved L-shaped costal cartilage for nasal bridge and tip support and later used cadaver cartilage preserved in merthiolate. Ed Lamont of Hollywood, California, in 1945 suggested severing the cleft-side alar cartilage at the arch and dissecting the lateral crus to let it slide and then introduced a piece of alar cartilage from the opposite side into the gap. Lamont also advocated rib necrocartilage preserved in formalin and merthiolate for nasal bridge and columella struts. He reported 62 cases with such cartilage, some of which still appeared intact and responsible after as long as three years.

For severe alar slump Gillies, by 1952, had transferred his preference to onlay grafting:

When the deformed alar cartilage is too flimsy to support the nostril arch, it prolapses across the nares. . . . It seems a better principle to reinforce the flimsy cartilage with an additional piece overriding it. Dissect a tunnel under the nasal skin but over the sagging alar cartilage and insert a relatively long strip of autogenous auricular or even ox cartilage, which as a bow-spring arches from a little pocket at the base of the ala to the nasal tip. . . . Needless to say the general improvements in the nose, such as removal of an objectionable hump, will improve the ultimate result. Do not forget the value of shortening the whole nose in cleft lip.
In 1960 Ross Musgrave, artist, actor and sports aficionado, with his chief, Milton Dupertuis of the University of Pittsburgh School of Medicine, wrote a classic on the cleft lip nose. They proposed taking a large part of the superior and lateral portion of the bulbous alar cartilage on the so-called normal side and using it as an onlay graft on the cleft side. This was carried out through a rim incision along the margin of the involved side allowing excision of any excess skin and cartilage on that side. In Melbourne in 1971, Musgrave, dressed in his usual Esquire attire, gave details of the latest fashion in technique of his onlay plan:

It is now almost routine to excise completely the cartilage of the lateral alar crus on the uncleft side, even extending this excision into the alar dome. This tissue is subsequently used as a two-layered "life-boat" cartilage graft holding this in its previously marked location by a mattress suture of 4-0 chromic catgut tied over a ball of cotton.

This tiering of the alar cartilage has become popular and has been copied in various ways.

COSMAN

From 1961 to 1964 Bard Cosman, at St. Albans Naval Hospital and later with Crikelair at Columbia-Presbyterian Medical Center, reported a series of 26 cases, receiving multiple independent maneuvers to correct the unilateral cleft lip nasal deformity. Not once was reference made to Crikelair's earlier advocation of the
Joseph dorsal external skin excision. Possibly the stigmata of the scar turned the tide. Or was it the indifferent results? In their 1965 paper they outlined a series of interesting procedures, which included septal straightening with a dorsally hinged septal flap, excision of the dome of the normal alar cartilage, total excision of the lateral crus of the cleft-side alar cartilage, free grafting in piggyback fashion of the alar cartilages to the cleft-side alar dome, alar base rotations and excisions and cleft-side alar rim excisions. Total excision of the cleft-side alar cartilage was justified by them because onlay grafting or dissection and lifting seemed to do . . . nothing to remove the buckle in the middle of the depressed S-shaped abnormal ala . . . and a pronounced tendency for recurrence of this defect seemed to exist. . . .

They even went so far as to suggest cautiously:

The application of these measures in children can produce striking results but further time must pass before the permanence and the consequences of this early success can be judged.

ANOTHER QUINELLA

Victor Spina of Brazil in 1968 described what he considers a winning quinella in the unilateral cleft lip nose. He combined the marginal alar web excision which I described in 1960, Potter's V-Y advancement of the chondromucosal flap of the vestibule, scoring of the cartilage in the medial portion as proposed by Rees and Converse, bolstering of this cartilage in its lateral portion with an onlay graft from the normal ala as advocated by Musgrave and a Weir half-moon excision of the alar base with a V-Y medial advancement.

ALAR BASE SUPPORT

In 1964 I noted that even after successful rotation-advancement, there could be relative asymmetry in the position of the nasal floor and alar base:
This seems due primarily to a lack of bone in the supporting platform which allows the lip to fall in and the nose to tilt.

A secondary refinement was suggested for certain cases, with acknowledgment to Schmid, Johanson and Schuchardt:

A partial remedy for this problem is the addition of new bone and the method used is a slight variation of that described by Brauer, Cronin and Reaves. The bone of the maxilla on each side of the cleft is exposed by turning mucoperiosteal flaps in to line the nasal side. Then an autogenous rib graft is strutted across the alveolar gap with bone to bone approximation . . . it also balances the nasal tripod and gives the lip and its vermillion the support it needs for symmetry.

Thus, it was slightly puzzling to me when after six priorities had been given up to 1964, Jack Longacre, with Halak, Munick, Johnson and Chunekamrai in 1966, reported "A new approach to correction of nasal deformity following cleft lip repair" using split rib grafts under the alar base.

In 1969 Igor Kozin, of the Moscow Research Institute of Cosmetology, described his combination of corrective procedures for unilateral nasal deformity at the time of secondary rotation-advancement correction of the lip. He reported having operated on 121 noses with all patients over 15 years of age, and the case he published was impressive.

Using what he referred to as a modified Pauer incision in the shape of a bird along the free edge of both nostrils, he freed up the flattened alar cartilage. With the aid of an S-shaped septal incision, he straightened the anterior portion and fixed it between the normal alar cartilage arch and the advanced flattened arch from the cleft side with "kapon mattress sutures." Kozin also placed homologous cartilage grafts in two strategic positions. One was used to fill the lateral defect after medial advancement of the alar cartilage. The second was a craftsmanlike half-cone with a step he described in 1971 as:

The shape of a narrow and bent triangle with a notch at its base facing forward and downward with its apex facing backwards.

He advocated its insertion into a tunnel under the alar base to build up
the insufficiently developed pyriform aperture and alveolar process of the maxilla.

In 1972 Kozin repeated this general plan in three rare cases of unilateral cleft lip nose without cleft lip. His interpretation is interesting:

The rare deformity of the nose as in unilateral congenital cleft of the upper lip, but without any sign of cleft in that lip, explains how such a deformity may develop even after successful primary cheiloplasty.

This is why most patients who had a successful cheiloplasty performed in their childhood, require surgical correction of the nose at an adult age.

**UPRIGHT SEPTAL GRAFTS**

In 1964, after another plea for primary correction of the nose as occurs spontaneously with the rotation-advancement lip closure, I described a secondary nasal procedure which has been effective in certain cases:

When the rotation-advancement approach has not been used primarily and the nose reaches maturity with the original classical cleft characteristics then the correction is more difficult and calls for a five-point plan. (1) The anterior septum can be freed, weakened, shifted and fixed into the midline. (2) A modified rotation-advancement can correct the columella shortness and slant and, at the same time, reposition the alar base and
narrow the nostril floor. Usually an elliptical excision of the wide nostril floor is sufficient. (3) Three-fourths of the normal alar cartilage is used as a free onlay graft to bolster the flat side and is inserted through (4) the alar web excision. (5) Because of the poor quality of the flattened alar cartilage on the cleft side and the need for actual thrust in the tip support, a septal cartilage strut has been found most effective.

Septal cartilage removed during the usual submucous resection is cut into two long (3 cm. × 3 mm.), slender strips. Through a stab at the base of the columella on the flat side a narrow pocket is dissected just under the skin anterior to the medial crus up over the alar arch. The inferior blind end of the cul de sac presents a dependable platform for the thrust of the strut. When one or two septal strips are forced into the pocket the spring of the cartilage lifts the slump out of the alar arch. The combination of septal correction, nasal floor excision, alar web excision, alar cartilage onlay graft and septal cartilage strut is preferred to methods requiring external incisions such as the unilateral columella-tip advancement or the external excision of Joseph.

Reduction rhinoplasty. Of course, in addition to these specific actions to correct the asymmetric deformity, any unattractive aspect of the nose whether hump, hook, length or width deserves the service of osteotomy and septal shortening. Any or all aspects of reduction rhinoplasty are available and should be used to shape the cleft lip nose to its best potential.

Two septal struts

A nine-year-old boy with a reasonable LeMesurier lip closure, presenting the usual secondary nasal deformity, had medial advancement of his alar base and excision of his alar rim web. Then, at 16 years, three-quarters of the normal alar cartilage was resected and grafted as an onlay over the cleft alar cartilage. A submucous resection opened the airway and procured enough septal cartilage to shape two struts to be inserted into the columnella. One was inserted exactly vertical as central tip support,
the second was longer shunting under the slumped cleft side for extra support.

In fact, there are cases, such as these shown in profile from the cleft side, in which the reduction rhinoplasty will play as important a part in the final improvement as did the alar lift, alar base advancement and septal cartilage strut to the tip.

Yet, it is the combination of reduction rhinoplasty and specific cleft lip nasal procedures plus lip correction that produces the best results.

Here are four cases demonstrating this combined action which were published in *Plastic and Reconstructive Surgery* in August 1964.
This young woman had a reduction rhinoplasty plus an alar web excision, septal cartilage strut to tip in columella pocket, alar wedge excision on normal side and small midline Abbe flap.

This 63-year-old woman suffered with this secondary deformity until alar web excision, alar cartilage onlay graft, nasal floor reduction, septal cartilage strut through columella pocket to cleft-side nasal tip and lip revision were carried out.
A Jamaican boy with tight upper lip and difficult nasal deformity was corrected with osteotomy, septal shortening, alar web excision, alar cartilage onlay graft to cleft side, alar base positioning, septal cartilage strut through columella pocket curving under cleft side ala to support tip and midline Abbe flap.
This young woman had a reduction rhinoplasty with bridge shaping, osteotomy, three-quarter normal alar cartilage used as onlay graft to cleft side through alar rim incision, septal cartilage strut in columella pocket to support slumped tip and a small midline Abbe flap.

Muir and Bodenham, for Gibson's *Modern Trends in Plastic Surgery*, gave this septal cartilage strut approach a vote of confidence:

Ear cartilage often lacks the necessary rigidity to have the desired effect, and the Millard (1964) septal cartilage graft is stiffer and preferable. . . .

The method has been modified, is still found of value and will be described in detail.

In 1969 Paul Tessier spoke of his sagittally split septal graft:

Even in favorable cases, it is always worthwhile to assure the projection of the point with a solid support.

In this regard, septal cartilage is irreplaceable. For the last three years, the "fleur de lys" graft which fills out the domes has given us results quite superior to those obtained previously. This bilateral graft is preferable to the unilateral graft since the normal side suffers from the shortness and retraction of the cleft side.

**ANOTHER EFFECTIVE COMBINATION**

For the unilateral cleft lip nose, Neuner also combines several procedures in his striving for correction. He splits the tail of
a one-sided forked flap, which is transposed as nostril sill, being interdigitated with the tip of the alar base. To this he added a Potter V-Y of intranasal mucosa and cartilage, scoring of the deformed alar cartilage dome and suturing of the medial crura. As an extra crutch, he used the nasal hump as a strut inserted into the columna to support the unilateral slump of the alar dome, similar in principle but different in angle to my septal cartilage graft.

GorEY’S GULL WING GRAFT

In 1972 artistic Mark Gorney, with Edward Falces of St. Francis Hospital, San Francisco, presented the gull wing auricular conchal graft for nasal tip support. The first cases were done at Children’s Medical Relief International, Saigon, in 1970.

In 1973 Gorney noted:

Sometimes one is faced with the fact that whatever you do to a post-cleft nasal deformity, by whatever technique, falls short of the ideal. We feel that this happens for two reasons:

1. There is not only a deformity of shape and position of the alar cartilage; there is not enough of it.

2. Most techniques for repair are based on the principle of suspension and do not take into account gravity and growth. One can overcome these objections by adding what is missing and providing structural support to the nasal tip simultaneously. One also substitutes and repairs with nearly ideal material—imitating exactly the normal anatomy. We have found no better way of adding “thrust” to the nasal tip to bring it above the level of the dorsum, and to give the missing fullness on the abnormal side in unilateral cases.
Gorney makes an incision inside the helical rim around the antitragus and stops short of the tragus, but he admits the cartilage graft can also be taken through a posterior incision. He takes a cartilage graft shaped like a jai alai basket with the lowest conchal cupped portion to be the alar lift; he uses the left ear for a right unilateral cleft lip nasal deformity, or vice versa.

Here is one of Gorney's cases in which the auricular half gull wing graft was used during the primary rotation-advancement closure of the lip.
Another unilateral half gull wing or jai alai basket graft was used as a tip support during a secondary lip correction.

This example of Gorney's gull wing graft, even in half proportion, is really flying high, with his alar base advance, alar rim revision and unilateral auricular cartilage tip lift. Mark's early result is dramatic.
EARLIER NASAL CORRECTION

In this personal case, the alar rim in the original deformity was so severely creased that even after rotation-advancement lip closure and minor nasal correction, the residual knock-kneed posture was still unacceptable. Rather than wait until 16 years for a septal cartilage strut, at 9 years a half gull wing *auricular graft* was inserted from the upper columella around the sharp angled alar arch to round out the curve and improve the tip contour on the flat side. Advancement of the alar base completed the nasal revision. An early photo was taken before he returned to Puerto Rico.
Norbert Schwenzer, of the University of Tubingen, West Germany, uses rib cartilage for his extra support. In 1973, considering the total deformity as one unit, he advocated simultaneous nasal and labial correction and presented several cases, one of which had had a nasal correction and a unilateral placement of an Abbe flap. He noted his preference of Rethi’s 1929 decortication technique for “open reduction” of the cleft lip nose, agreeing with Sercer and Mundnich that this incision affords a clear view and thus justifies the disadvantage of visible scars. From this exposure, he sutures the alar cartilages together and the slumped alar cartilage to the upper lateral (triangular) cartilage. Schwenzer uses Cottle’s septal correction, Trauner’s one-sided columella lengthening, Ragnell’s scarred muscle flap and Straith’s alar rim Z-plasty. In severe deformities, he states:

Very often parts of the cartilaginous structure must be replaced. The required material is either autologous rib cartilage, especially where osteoplasty must necessarily be done, or otherwise a homologous preserved rib cartilage. The preservation is done in cialite, an organic compound of mercury. The cartilage implant serves as a partial or total replacement of alar cartilage, for re-lining nasal dorsum or for improvement of the tip.

**BEWARE THE FOREIGN BODY STRUT**

Beware the use of stiff foreign body struts, such as Silastic, in the columella as a royal road to tip lift and support. If well covered, they may serve as quiet contour bolsterers, but when they are called upon to do work, look out! In general, the pocket is too superficial, but more important, there is the danger of perforation when the strut has a lifting work load. Sooner or later the strut will pierce its way through the skin of the nasal tip.
52. Combined Nasal and Labial Unilateral Cleft Corrections

The simultaneous correction of secondary labial and nasal deformities had been done by surgeons for many years. Gillies and Barron taught me this combined approach in 1948. George Pap of Frenchay Hospital, Bristol, England, advocated the combination of rhinoplasty, septal correction and lip revision in 1955.

Anglo-American

Sir Archibald McIndoe of London and East Grinstead and Tom Rees of New York, two of the smoothest operators ever in plastic surgery, combined forces in 1959 on the synchronization of lip and nose correction of secondary cleft deformities. They outlined the steps:

1. Complete "take-down" of the scarred lip with excision of all scar tissue.
2. The preparation of flaps for a satisfactory lip repair.
3. A nasal reduction with shortening of the nose if necessary, removal of bony and cartilaginous hump and infracture of the nasal bones.
4. Remodeling of the nasal tip by total bilateral mobilization and symmetrical realignment of the distorted alar cartilages.
5. Submucous resection of the distorted septum, if this is necessary, to centralize the nose or clear the airways.
6. Dental extraction of hopelessly involved teeth.

**BRAZILIAN**

Pitanguy of Rio, a bold surgeon flanked by his capable adjutants, executes his daily operative schedule like a Napoleonic campaign and probably does more cases a year than any other plastic surgeon. It would be logical for him to combine the labial and nasal correction in a secondary operation. In 1963 he described his combined approach with the lip skin incisions utilizing the rotation-advancement principle, including even the use of flap c for the nostril sill construction. Then, with the aid of alar base incisions and a membranous septal incision to lift the
columella along with a cleft-side paramarginal incision, an "open ceiling" exposure facilitated the freeing, shifting and suturing of the alar cartilages together for an improved nasal tip contour.

**SW I S S**

A colorful, diagramatic nasal textbook, *Plastische Operationen am Kopf und Hals*, published in 1964, was co-authored by H. J. Denecke, an otolaryngologist in Heidelberg, and Rodolphe Meyer, a plastic surgeon in Lausanne. As I wrote in reviewing the book for *Surgery, Gynecology and Obstetrics*:

From the natural rivalry of these two specialties it might be conjectured that this successful union was due to, rather than in spite of, the distance between Heidelberg and Lausanne.

In Meyer's section there appear some wild but intriguing combinations of labial and nasal secondary corrections. As agile
as Rudy may be, he could never cut a path like these on one of his Alpine ski slopes, but in cleft lip and nose secondary work, problems faced are stranger than fiction, and variation in the corrective design must face up to each idiosyncrasy. Of course, the results will be no better than the principles of the methods used.

FRENCH

Paul Tessier of Paris, with Delbet, Pastoriza and Aiaich, in 1969 advocated a synchronized, simplified Schjelderup unilateral nasal correction along with a lip revision and small Z-plasty. If the lip was tight from side to side, then he augmented the lip with a unilateral Abbe flap inserted into the scar excision at the same time.

SWISS

In 1971 Neuner of Berne described a combined correction of the lip and nose along the forked flap principle. He improved the lip scar by raising a unilateral forked flap and split its tail. The membranous septal incision, which was used to facilitate
advancement of the fork, was continued up and all the way around the vestibule, ending behind the alar base and turning the latter into a flap. Then, with a rotary motion, the cleft-side alar cartilage was elevated and sutured to the normal cartilage as the fork advanced out of the lip into the columella and nasal floor with its split tail encompassing the point of the alar base flap.

**U. S. ARMY ISSUE**

Another combination of secondary nasal and labial correction was described in 1971 by Norman Hugo, then of Michael Reese Hospital, now at Northwestern University, and Colonel Wilfred Tumbusch of Brooke General Hospital. First they placed onlay rib grafts under the alar base to the maxillary defect of the cleft. Then the old lip scar was picked up as a unilateral prong of a forked flap which was incised first horizontally and then anteriorly up the middle of the columella and posteriorly in the membranous septum. This developed a long flap which could be advanced into the columella toward the nasal tip, with any excess of the distal scarred flap being excised. This exposure allowed dissection and suturing of the cleft alar cartilage to the normal. The alar base was advanced medially. Hugo and Tumbusch stated:

Closure of the defect symmetrizes the nostril floors and the incision heals to resemble the cicatrix of a Millard cleft lip repair.

They admit less-good results with secondary cases in which excessive scarring has been created in the columella base area and in the vestibular lining of the lateral alar region.
At least their nasal scarring is limited to the mid-columella and does not extend over the nasal tip.

**BACK IN TEXAS**

There are obvious advantages to a simultaneous nasal and labial correction, since one helps the other. Gillies enjoyed performing these procedures, and in my early days, I must admit, I was rather pleased with such extensive taking apart and reassembling. It does not always work out for the best. Once, in 1951, as a resident at Jefferson Davis Hospital, Houston, due to limited main operating room time, I had finagled the use of a small minor surgery outpatient room well out of the way of hospital traffic. Only a snooping nurse ever wandered by, and a lot of work was being done. One day I was operating on an adult male daredevil clown from the Shamrock Hotel water show, who had a unilateral cleft lip with the typical secondary nasal deformity. His lip had been opened wide and his columella elevated, with excellent exposure for nasal correction. The osteotomies were being done, and it was a little more bloody than usual, but I was alone and working along quite happily.

"Doctor, what are you doing?"

came rather sternly from a faintly familiar voice. I looked up to see his majesty the chief, Dr. Michael DeBakey. "Oh, good afternoon, sir," I said, and then trying to get him involved, "You see, once I get the nose back together, these lip flaps will ap-
proximate so. . ." There was not a flicker of expression, and when I looked up again, he was gone. Word came down the next day through Baron Hardy that only minor surgery was to be done in minor surgery. The clown, however, healed up so well he gave up his clowning.

There are other reasons for reconsidering too much simultaneous surgery. At least for me, concentration on one main aspect well enough to get it really right is facilitated by having a minimum of distractors. Unless one operation is benefited by the simultaneous execution of another operation, I prefer to let the first one heal and return another time for the meticulous correction of a separate problem. The all-in-one shot often falls short of the mark, and its justification depends on the specific combination of deformities and the personality and aspirations of the operator.
53. My Own Secondary Correction of the Unilateral Cleft Lip Nose

It is contended that if the nose is corrected as described in the primary lip surgery, secondary nasal surgery, although probably still necessary, will be minimal. As already expressed, concentration on one major secondary problem at a time is preferred, particularly in the nose, which may require a very complicated combination of procedures. There are two exceptions to this general rule:

1. If the lip requires only minor revision, this can be carried out at the time of the rhinoplasty.

2. If by doing the lip the nasal correction is facilitated, or vice versa, then it is well to combine the procedures for the benefit of both.

Yet, a common secondary unilateral cleft lip reveals a slightly tight upper lip with no cupid's bow or philtrum and a typical unilateral nasal distortion. Although a rhinoplasty often has been combined with an Abbe flap, it is now preferable to get the nose correct first at 16 or 17 years and then a month or so later to complete the lip with an Abbe flap. If the case is seen before 16 years, then the Abbe flap can be done first.

Specific Corrective Nasal Procedures

My present formula bank for correcting the unilateral cleft lip nose is a conglomerate of many methods, some personal, others part of a potpourri with a long and distinguished title—AufrichtBarronBlairBrownFarriorGilliesHoldsworthHorton-.
Of course, the trick is picking the right combination for the specific case. Here are the corrective procedures which I have found beneficial in various combinations. (In the following descriptions each procedure is identified by a two- or three-part number code—in order, procedure, number, initials of section title and in some cases subsection number. Case summaries later in this chapter use the codes to refer back to these procedure descriptions.)

**INTRANASAL INCISIONS (1-11)**

The membranous septal incision is placed posteriorly flush with the septal cartilage to leave a columella deep enough to receive septal cartilage struts if indicated and to give direct exposure to the front of the deviated septum.

On the non-cleft side, an anterior vestibular (cartilage-splitting) incision is made three-quarters of a centimeter from the alar rim, but on the cleft side the incision is made a little higher, in relation to the cartilage, or more posteriorly but not as far up as the intercartilaginous line.

**ALAR CARTILAGES**

*Normal* (2-AC)

On the normal side, the alar cartilage is reduced markedly, leaving only a 3 mm. rim of distal cartilage intact. The resected cartilage is saved for possible onlay grafting.

*Cleft side* (3-AC)

On the cleft side, the alar cartilage is freed widely from the dorsal skin but for only a few millimeters from its mucosal lining. It is then lifted with 4-0 Mersilene sutures, one to the septal bridge and one to the opposite alar or upper lateral cartilage.
REDUCTION RHINOPLASTY (4-RR)

At this point, but before the alar lift sutures are placed, any standard corrective rhinoplastic procedures indicated can be accomplished, such as freeing the dorsal skin, removal of the hump, shortening of the septum and bilateral osteotomy.

SEPTUM (5-S)

A submucous resection of a 3 × 1 cm. piece of obstructing septal cartilage is removed and placed in a sponge moistened with saline. This cartilage can be sliced into struts later, if needed. It is important that a safe L-shaped septal cartilage skeletal support be retained. The anterior, slanted limb of the septal cartilage L is freed with a chisel from its abnormal position, its concave side is scored and its base is shifted to the midline, set and fixed with 4-0 catgut or 4-0 Mersilene suture.

ALAR BASE

Simple alar base resection is adequate if flare is minimal and nasal floor is normal (6-AB-1).
If the nasal floor is wide and the alar base is flared, they are taken as a flap and the end is denuded of epithelium so that it can be advanced medially and sutured to the periosteum at the nasal spine or to the septum if it requires this extra pull to keep it in line (6-AB-2). This action narrows the nostril and reduces the alar flare.

If the alar flare is wide but the nostril floor is nearer normal width, a subcutaneous flap is dissected from the undersurface of the alar base flap and this piece is advanced medially to the septum with resulting reduction of the alar flare (6-AB-3). The alar base skin flap then forms the nostril sill and columella base at its leisure and without tension.

If the alar base is thick, it is cut as a flap and turned up and a subcutaneous flap is carved out of its "heart," maintaining an attachment to the tip of the alar base (6-AB-4). Closure of the alar base donor area, of course, reduces its thickness. The subcutaneous flap extension is then used as the alar base tether to
the nasal spine, septum or whatever is available in the midline to maintain symmetry and prevent lateral alar drift.

**IMPLANTS UNDER ALAR BASE (7-IAB)**

Deficiency in anterior projection of the cleft side maxilla often requires some type of implant to increase the contour. Cancellous iliac bone graft onlay beneath the maxillary periosteum under the retroposed alar base is best, but specifically shaped Silastic sponge implants inserted on top of the periosteum can be reasonably effective and can be used at an early age.

**NORMAL ALAR BASE**

A wedge resection from the normal alar base is indicated in certain cases (8-NAB-1).

Free graft of alar wedge from the normal side can be used to release or lengthen the cleft side (8-NAB-2).

**ALAR RIM**

If after the rhinoplasty there is still a skin web skirting across the cleft side alar arch, it can be excised (9-AR-1).

Alar rim web cut as a flap is to be transposed along a releasing incision in the medial vestibule at the join of the septum and the sidewall to lengthen the columella slightly (9-AR-2).
It can be abraded, cut as a flap with its base medial or lateral and then transposed as extra contour in the tip or at the alar kink to round out the alar arch (9-AR-3).

It is better to save the skin of the web and use it for vestibular lining (9-AR-4). An incision is made along the desired position of the alar rim in symmetry with the normal side. The skin inferior to this incision is dissected thinly but in continuity with the vestibular lining, exposing the inferior edge of the alar cartilage. This portion of the cartilage can be trimmed off, or, better, turned over on itself to strengthen the weak area. The important thing is to get it out of the way so that the thin inferior skin-vestibular flap can be tucked up in the vestibule under the alar arch with 5-0 chromic catgut sutures. This takes excess dorsal skin back under for needed vestibular lining. The skin edges along the alar rim are sutured with 6-0 silk.
MARGINAL EXCISIONS (9-AR-5)

The entire alar margin may require strip excision to thin thick sidewalls or shorten long ones or just for marginal sculpturing.

Upper portion of alar margin excision can be saved as a flap and folded in at the height of the arch to round out a sharp ala-columella angle and narrow a thickened sidewall (9-AR-6).

ONLAY GRAFTS (10-OG)

If, during the alar rim surgery, there is still a weakness in the rim or a lack of convex contour of the cleft-side tip cartilage, then the resected portion of the normal alar cartilage can be used as a simple onlay or tiered piggyback for even greater prominence. Slivers of septal cartilage are also effective in supporting the alar rim.

SEPTAL CARTILAGE STRUTS

Finally, if indicated, a stab at the base on the lateral side of the columella allows a pocket to be dissected with sharp Joseph scissors from the nasal spine to the nasal tip (11-SCS-1). One long, slender septal cartilage strut is threaded into this pocket to give that little extra lift of which the flattened cleft lip septum is incapable. The upper end of this cartilage can be split fleur-de-lis fashion.

If the cleft slump is still a problem, a second, longer cartilage strut can be inserted on the cleft side of the previous strut, up the columella and shunted well across the midline to arch under the cleft-side ala for extra spring support (11-SCS-2).
FINAL RESULT

Some cleft lip noses do better than others—the outcome is not always predictable. Yet, as with any nose, the final result is dependent upon the difficulty of the deformity, the quality of the nasal material available, the choice of procedures, the skill of the surgeon, the patient’s healing and lady luck, not necessarily in that order!

A COMMON COMBINATION

Complete unilateral cleft lip closed in infancy. At 10 years of age the boy had nasal revision to alar base and rim and midline shield-shaped Abbe flap.
GOOD BALANCE

A Blair-Mirault type lip closure resulted in a whistling deformity, wide stitch marks and a typical cleft lip nose with all the problems, including slumping of half the tip, alar flare and transverse axis of the nostril. Revision of lip scars and a V-Y roll-down of posterior mucosa to create a vermillion tubercle added to the final improvement.

At 17 years. CL rhinoplasty.
1-II. Anterior vestibular incisions, higher on cleft side.
2-AC. Reduction of normal alar cartilage.
3-AC. Lift alar cartilage to septum (Mersilene).
4-RR. Hump excision and bilateral osteotomy.
5-S. Submucous resection, centralized front of septum.
6-AB-2. Suture denuded tip of alar base to septum.
11-SCS-1, 11-SCS-2. Two septal struts in columella, one in tip, one extended under cleft arch.
This Blair-Brown type lip closure resulted in the typical secondary lip and nose deformities.
NEAR-PERFECT SYMMETRY

This 20-year-old college girl experienced the typical inferior triangular flap lip scar, with loss of landmarks, the usual asymmetrical nasal distortion and a radon seed in the nasal tip for a hemangioma.

At 20 years. Radon seed removed. CL rhinoplasty.

1-II. Anterior vestibular incisions, higher on cleft side.
2-AC. Reduction of normal alar cartilage.
3-AC. Lift cleft alar cartilage to septum (nylon).
5-8. Submucous resection, centralized front of septum; scoring of concave side.
6-AB-2. Suture denuded tip of alar base to septum.
8-NAB. Wedge resection of normal alar base.
11-SCS-1. Septal cartilage strut in columella to support cleft side tip.

Midline Abbe flap done later.
This 17-year-old boy was extremely self-conscious about his secondary cleft lip and nose deformities. This combination of rhinoplastic procedures was successful, and a midline Abbe flap constructed a philtrum.
An 18-year-old boy with a straight-line lip closure in infancy, which had resulted in a slightly tight upper lip lacking in landmarks and the typical cleft lip nose.

ANOTHER COMBINATION

At 18 years. CL rhinoplasty.
1-II. Anterior vestibular incisions, higher on cleft side.
2-AC. Reduction of normal alar cartilage.
3-AC. Lift cleft alar cartilage to septum (nylon).
4-RR. Hump excised; septum shortened.
5-S. Submucous resection, centralized front of septum.
6-AB-2. Suture denuded tip alar base to septum.
8-NAB. Wedge resection of normal alar base.
10-OG. Septal sliver along alar rim.
11-SCS-1. Septal cartilage strut in columella to tip.

One month later. Midline shield-shaped 1.2 cm. Abbe flap.
Division of pedicle after 11 days.
At 19 years. CL rhinoplasty.
1-II. Anterior vestibular incisions, higher on cleft side.
2-AC. Redirection of normal alar cartilage.
3-AC. Lift cleft alar cartilage to septum (nylon).
4-RR. Hump excision; septum shortening; bilateral osteotomy.
6-AB-2. Suture denuded tip of alar base to septum.
7-IAB. Silastic sponge under alar base.

ALAR BASE IMPLANT

A 19-year-old Ecuadorian girl who had scar excision and secondary rotation-advancement of the lip, cleft lip rhinoplasty with Silastic sponge implants through upper labial sulcus under alar base and through lower labial sulcus to the chin.
At age 25, the patient had lip scar revision and cleft lip rhinoplasty.

At 25 years. CI rhinoplasty.
1-II. Anterior vestibular incisions, higher on cleft side.
2-AC. Reduction of normal alar cartilage.
3-AC. Lift cleft alar cartilage to seprum (nylon).
5-S. Submucous resection.
6-AB-1. Wedge resection of cleft alar base.
7-IAB. Septal cartilage under alar base.
10-OG. Septal cartilage to nasal floor and under lip scar.
11-SCS-2. Septal cartilage strut in columella to cleft-side tip.

GOOD NASAL BALANCE
This patient had primary lip surgery in Canada and a later revision in the United States, ending up with some type of interdigitation.
A COMMON COMBINATION

A Brown-McDowell type lip closure resulting in a tight lip and lack of cupid’s bow and dimple.

At age 15, the patient had an Abbe flap with division of the pedicle after 10 days, which released the lip and created a philtrum.

At age 16, a cleft lip rhinoplasty was carried out.
This 17-year-old girl had secondary nasal and labial deformities following an inferior triangular flap closure.

There was improvement, but the cleft lip septum, with its deviation, does not offer true tip support. Had a septal cartilage strut been inserted through the columella into the tip as usual, there would have been finer nasal tip projection. Lip scar revision is pending.
AN IMPROVEMENT FROM BELOW

This 16-year-old girl had a severely tight upper lip with typical unilateral cleft lip nose distortion. Cleft lip rhinoplasty was performed but she never returned for her Abbe flap.

At 16 years, CL rhinoplasty.
1-II. Anterior vestibular incisions, higher on cleft side.
2-AC. Reduction of normal alar cartilage.
3-AC. Lift cleft alar cartilage to septum (nylon).
4-RR. Bilateral osteotomy.
6-AB-2. Suture denuded tip of alar base to septum.
8-NAB. Wedge resection of normal alar base.
10-OG. Alar cartilage onlay to cleft side.
11-SCS-1. Septal cartilage strut in columella to tip.
COMBINED NASAL REDUCTION
AND CORRECTION

Original straight-line lip closure carried out in Cuba was revised in Miami at age 17 years with rotation-advancement approach by resident, Richard Beck. The nose, however, not only suffered the usual cleft lip nasal distortion, it was severely humped and also hooked, witch-like, over a receding chin.

At 19 years, CL rhinoplasty.
1-II. Anterior vestibular incisions, higher on cleft side.
2-AC. Reduction of normal alar cartilage.
3-AC. Lift cleft alar cartilage to septum (catgut).
4-RR. Hump excised; septum shortened; bilateral osteotomy.
5-S. Submucous resection.
6-AB-2. Suture denuded tip of alar base to septum.
8-NAB. Wedge resection of normal alar base.
10-OG. Alar cartilage onlay to cleft side.
11-SCS-1. Septal cartilage strut in columella to tip.

At the same time as the cleft lip rhinoplasty, a 7 cm. Silastic sponge implant was specifically cut to shape and inserted over the periosteum of the mentum through a 1 cm. incision in the lower labial sulcus.
A MODERATE REDUCTION

This 15-year-old girl had lip scar revision with rotation-advancement in the upper portion and free border trimming of the vermilion. Then, at 18 years, she had a cleft lip rhinoplasty with more emphasis on the reduction.

At 18 years. CL rhinoplasty.
1-II. Anterior vestibular incisions, higher on cleft side.
2-AC. Reduction of normal alar cartilage.
3-AC. Lift cleft alar cartilage to septum (Mersilene).
4-RR. Hump excision; septum shortening; bilateral osteotomy.
6-AB-1. Wedge resection of cleft alar base.
9-AR-1. Alar rim web excised.

15 years

18 years

718
LeMesurier cleft lip closure without nasal correction by the age of 14 years revealed no great improvement in the nose, which presented an asymmetrical and difficult problem. By 15 years, attempt at correction seemed justified.

At 15 years. CL rhinoplasty.
1-II. Anterior vestibular incisions, higher on cleft side.
2-AC. Reduction of normal alar cartilage.
3-AC. Lift cleft alar cartilage to septum (Mersilene).
4-RR. Hump excision; septum shortening, bilateral osteotomy.
5-S. Submucous resection, central-ized front of septum.
6-AB-2. Suture denuded tip of alar base to septum.
10-OG. Alar cartilage onlay graft.
11-SCS-l. Septal cartilage strut in columella to tip.
VARIATION IN APPROACH
AT ELEVEN YEARS

This 10-year-old boy had had a Tennison-type lip closure and later an Oxford V-Y palate pushback done in Thailand by Eric Peet. He presented a unilateral vermilion whistling deformity and the typical unilateral nasal distortion with flaring ala, asymmetry of alar cartilages, webbed alar rim, deviated septum presenting up front with its nasal spine in the normal nostril.

By 11 years, this boy seemed mature enough for conservative corrective surgery without disturbance of the septum. V-Y flap of posterior mucosa filled out discrepancy in vermilion free border as alar cartilage was lifted through marginal incision and de-epithelialized rim web flap was transposed.

At 12 years, tip of alar base was denuded and advanced to septum and alar rim tucking procedure was used.
AND EVEN EARLIER

This six-year-old boy had a LeMesurier lip closure in Cuba, and since no primary nasal correction had been attempted, the severe distortion remained. A modified cleft lip rhinoplasty seemed justified to clear the airway and prepare him for school.
At 8½ years. CL rhinoplasty.

6-AB-2. Upper portion of lip scar excised as flap extension of alar base, denuded and sutured to septum.

9-AR-4. Ideal alar rim position incised with dissection of skin in both directions and exposure of lower border of alar cartilage; overlapping of cartilage with sutures followed by tucking skin flap as lining to fornix of vestibule and suture of skin edge along new alar rim.

ALAR WEB TUCKING

This eight-and-a-half-year-old boy had his cleft closed by the Blair-Brown procedure. The lip was tight without landmarks, deserving a midline Abbe flap, and the flare of the alar base and web of the alar rim seemed to justify early correction.
A TRULY CONSTRICTED NOSTRIL

Result of Brown-McDowell type lip closure resulted in absence of cupid's bow, philtrum and dimple, tight upper lip, relatively protuberant lower lip and cleft-side maxillary hypoplasia.

At age 13 years.
Iliac bone grafts placed over maxilla and under cleft-side alar base.
V-Y lateral advancement of alar base on the constricted cleft side.

At age 14 years.
Midline, shield-shaped, 1.5 cm. Abbe flap.
Division of pedicle after 13 days.
The original unilateral scar and the persistently constricted cleft-side nostril remained the major problem. A modified cleft lip rhinoplasty and scar revision was done at 15 years.

Radical through-and-through release of the alar base from the lip, cheek and vestibule was filled with a composite auricular graft taken from the helix join with the lobule. The graft was unrolled with the portion of full-thickness skin being inserted into the vestibular lining defect. The other end, retained as a composite chondrocutaneous component, was added on as an extension to the end of the alar base in the nasal floor. This opened the nostril and, when the septum is straightened, will present a respectable nasal entrance. A minor reduction rhinoplasty of hump excision, septal shortening and bilateral osteotomies plus a submucous resection and use of the cartilage as a strut in the columella to support the tip has been postponed until age 16 years.
AN ODD SEQUELA

This boy, who had a complete cleft of the lip closed at nine days in West Virginia with what seems to have been a LeMesurier-type quadrilateral flap, was first seen at age 14 years. The nose is a mystery! The septum presented with the nasal spine in the normal nostril and was accompanied by the usual tilt over the cleft. Otherwise, the nasal deformity was totally atypical, with a sharp kink in the alar rim more suggestive of a cleft nostril than a cleft lip. The nostril was completely vertical, being more “up and down” even than the normal side, and the alar base not only had no flare, it went straight into the lip like a post without even the nicety of a nostril sill. Starting at age 16, three operations have been done so far in an effort to rearrange this bizarre disfigurement.
At 16 years, CL rhinoplasty.
2-AC. Reduction of normal alar cartilage.
3-AC. No lift, but scoring cleft alar cartilage to reduce kink.
4-RR. Bilateral osteotomy.
5-S. Submucous resection, centralized front of septum.
8-NAB-1. Wedge resection of normal alar base.
8-NAB-2. Alar base wedge free grafted from normal to cleft alar base.
9-AR-5. Marginal excision.
10-OG. Septal cartilage to cleft rim.
11-SCS-1. Septal cartilage strut in columella.

Six months later sidewall reduction by marginal excisions and Weir wedge resection was done.

At age 17 years unilateral chondromucosal flap from cleft side of membranous septal area was transposed to cleft-side vestibule for arch support.
At last, here is one of the first of my rotation-advancement lip closures who is now old enough for final secondary nasal correction. In 1956, in Miami, this North Carolina boy had a rotation-advancement without refinements and without primary nasal correction except alar rim web excision.

His nose persisted in its cleft side slump, so at age 17 years he returned for a cleft lip rhinoplasty.
After rhinoplasty.

After lip revision with "white roll" flap and alar base advancement.
CAMOUFLAGE O N L A Y  H I N G E  G R A F T

A 41-year-old married woman, who had had her lip closed in infancy and later a LeMesurier-type quadrilateral flap revision, resulted in a slightly tight upper lip without landmarks. The nose revealed an unbelievable deformity with such severe distortion that the usual maneuvers were bypassed.

The distortion was so great that a camouflage onlay graft of bridge and tip was necessary. Through a columella-splitting incision, a modified Gillies hinge graft was inserted, and even the nostrils straightened into reasonable symmetry.
SHORT FORK

A 12-year-old boy with a Brown-McDowell type lip closure with absence of landmarks, asymmetry of the nose and notable unilateral shortness of the columella. A midline shield-shaped Abbe flap improved the lip, but the scars of inset were slightly ridged, and the columella shortness persisted to the extent of snubbing the nasal tip.

At 12 years. Abbe flap.
Division of pedicle after 9 days.

At 14 years. Forked flap.

A modified short forked flap revised the lip scars and at the same time lengthened the columella and elevated the nasal tip.
THE CHIN TOO

It is important not to stop short of the very best that can be achieved for each case. The goal is not just the normal but an aesthetic normal.

This 18-year-old girl had had her incomplete cleft lip closed in childhood.

The patient, rendered as near normal as possible, then received that little extra bonus of a Silastic sponge implant, trimmed to shape and inserted through a lower labial sulcus stab incision to enhance her chin and soften the protuberant lower lip.

At 18 years. CL rhinoplasty.
4-RR. Septal shortening.
6-AB-I. Wedge resection of cleft alar base.

V-Y posterior mucosal roll-down to form tubercle.
Abrasion of lip scars.

19 years
If the slumped lower lateral alar cartilage on the cleft side is reasonably wide, it can be split horizontally and the distal half freed from the skin with right-angled scissors. The proximal half is freed from the skin also and from its mucosa, so that it can slide over the distal alar cartilage. Two sutures, passed through the skin within the vestibule just under the alar rim, are carried over the freed distal alar cartilage, picking up the freed proximal alar cartilage and returning by the same route. Tying these sutures draws the proximal cartilage half on top of the distal half in an effective and efficient overlap, lifting the slump and doubling the contour of the flat tip. Any excess mucosal lining can be trimmed prior to suturing.

When the alar cartilage is narrow, then, through an intercartilaginous incision, the upper lateral cartilage is freed and pulled with sutures in similar fashion to overlap the lower alar cartilage.