

33. Other Surgeons Accept The Island

H A G E

ON July 16, 1959, during intermission at the Royal Opera House, Covent Garden, at the time of the Second International Congress held in London, I first had the honor of meeting the sage Jacobus Hage of Tilburg, the Netherlands. He had the unique aura of stoical courage and honorable loyalty about him which pervaded his entire life right to the bitter end, reminiscent of the original "Dutch boy" who held his finger in the hole in the dike to save his homeland from flooding.

In 1962, during one of his work trips to the Dutch West Indies, Hage consented to return home via Miami, and during his visit a palatal island flap was demonstrated. He agreed with the logic of the operation and in 1964 reported, from his Plastic and Jaw Department at St. Elizabeth Hospital, his own experience both in *Archivum Chirurgicum Neerlandicum* and at the Hamburg International Cleft Palate Congress. He presented an ingenious diagrammatic cross-section series to demonstrate the island flap action and noted:

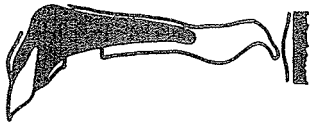
The technique as described in his articles, and the operation as I saw it performed by Millard himself, have entirely convinced me of the value of the method. . . . If lengthening procedures involve the oral side of the palate alone, no actual lengthening is obtained, since the velum also has a nasal lining that needs lengthening. Transection or merely mobilization of the nasal mucosa near the border of the hard palate does not seem to give any permanent results—not even after grafting . . . —due to subsequent con-



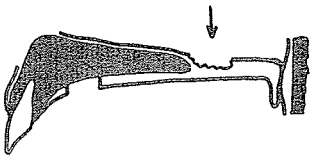
Jacobus Hage



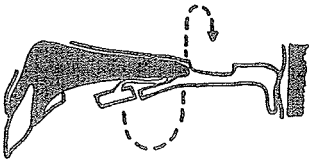
tracture. Filling the gap with a pedicle flap of the posterior pharyngeal wall seems to be a non-physiological procedure. . . . Due to its excellent vascularity and its rigidity, the island flap gives permanent and stable velum lengthening.



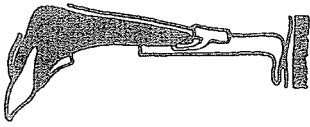
For extra lengthening, Hage suggested:



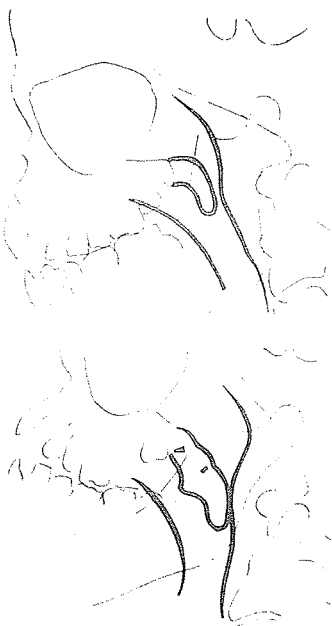
I have occasionally employed two island flaps for nasal lining, placing one transversely behind the other to fill in the gap.



Hage closed the anterior palate at 6 to 12 weeks and, using a Dorrance or Wardill-Veau-V-Y procedure, divided the nasal mucosa and inserted one or two islands at 1 year. He placed great value in a positive suction test through one nostril, with the other closed, at the end of surgery to determine the passive closing capacity of the velar valve. Hage also recorded the gain in length by means of radiopaque tracers, not only a few days postoperatively but also after three months, and published diagrams of the results in 1966 in the *British Journal of Plastic Surgery*. Three examples are shown here.



He noted:



My early results in primary lengthening of cleft soft palate (with or without a cleft anterior to it) have been so satisfactory that it seems justified to give a preliminary report. . . . Yet it will take a long time, and a large series before the final results can be evaluated in the form of improved speech, for speech is the main criterion for good soft palate surgery. . . . Not only in *wide* primary cleft palates is Millard's island flap useful, it can also be indicated in primary lengthening of a cleft soft palate. However, Millard's flap has a definite place in *secondary* lengthening procedures of the velum. It is thought that the indication for such can be based on four considerations:





1. Direct inspection—if the velum is short but the mobility is good, then this lengthening procedure is indicated.
2. Speech evaluation—by a speech therapist who finds nasality and other imperfections due to incompetent velopharyngeal closure which in turn is due to a short, and not an immobile, velum.
3. X-ray examination—to confirm previous conclusions.
4. Intelligence test—some cases are incurable due to low intelligence and other mental insufficiency which an island will not greatly aid.

If the postoperative palate with poor speech checks out on all four tests, these seem to be the cases *par excellence* for secondary lengthening with an island flap. Hage concluded:

Although the use of a pharyngeal flap is thought to be less “physiological,” there still seems to remain an indication for a pharyngoplasty, *e.g.*, in too short and/or badly moving soft palates.

In a personal letter to me in 1970, Hage suggested that the island flap possibly was not indicated during the primary surgery in the young child and should be reserved for secondary lengthening. At the time I disagreed with him, but time and Berkowitz have won out with me and I look back at Hage’s warning with humility.

One of my last communications from friend Hage was in October 1971, when he wrote:

Untreatment of cleft palates would give 100% of nasality in speech.

Primary closure of the palate now-a-days gives $\frac{2}{3}$ or 70% good speech.

A secondary operation again will cure $\frac{2}{3}$ or 70% of these unacceptable speeches. The residue of less than 10% can be satisfactory but is still a challenge for the future.

WITH PEET



During a 1965 International Congress in Bratislava, a mutual friend, Czechoslovakian professor Stefan Demjen, organized, in his clinic behind the Iron Curtain, a true Anglo-American cooperation. A patient with a short cleft palate was anesthetized, gagged and marked for an island flap. Then Eric Peet executed the Oxford V-Y technique in his usual impeccable style. Once his dissection was completed, he moved over to allow me to prepare the neurovascular bundle, cut the island free, release the nasal mucosa from the hard palate to obtain the desired lengthening and insert the island flap. Peet completed the suturing of the cleft. I could see he was pleased with the result of our teamwork and asked him his opinion. He admitted:

The island flap is a good idea and no doubt will be found of value, particularly in short incomplete clefts where our percentage of good speech results has been less.

AN ENTHUSIASTIC SWITCH

On September 28, 1961, before the American Society of Plastic and Reconstructive Surgeons in New Orleans, M. T. Edgerton presented a paper entitled "Surgical Lengthening of the Cleft Palate by Dissection of the Neurovascular Bundle." Under the subtitle "Palatoplasty techniques to lengthen mucosa on the nasal surface of the palate," he laboriously outlined everything he had been able to find in the literature by anyone or think up on his own. This was published in *Plastic and Reconstructive Surgery* in May 1962, where he again itemized the various nasal lengthening possibilities:

1. Undermining and advancement of nasal cavity mucosa
2. Anterior or midpalatal relaxing incisions in nasal floor
3. Lining epithelial inlays grafts
4. Z-plasty of margins of nasal mucosa
5. Vomer flaps
6. Anterior obturators with deliberate fistula
7. Extraoral or buccal mucosal flaps

no
island
mentioned

Absolutely no mention of the mucoperiosteal island flap was made *although* the method had been presented by me 14 months before and published five months previously. Edgerton explained that, in over 500 palatoplasties at the Johns Hopkins Hospital since 1947,

we have employed various combinations of pushback operation.

He concluded by advocating sharp dissection of the neurovascular bundles and added:

Of course, [it] may be combined effectively with Z-plasty of the nasal mucous membrane and various types of elongation techniques of the palatal flaps themselves.

He was using the Z-plasty

At the 1961 New Orleans meeting I approached Edgerton after his paper and told him of the island flap design:

Milt, you are close but not quite there. All you have to do is cut an island off, leaving it attached to the freed neurovascular bundle and use this piece of mucoperiosteum to lengthen the nasal side.

He admitted that it sounded like a good idea and promised to try it. He later asked if it were possible to cross the midline with the island.

On August 24, 1962, I wrote encouraging him again to try the island:

Dear Milt:

. . . What I am really writing you for is to encourage your use of the island flap. The more I use it the happier I am with the pushback results and in the hands of a surgeon as skillful as yourself, it would receive its ultimate effect.

urging its use!

His letter of December 12, 1962, in response indicated that finally he had followed the suggestion:

Dear Ralph:

. . . I have followed your suggestion on two or three occasions and found it really useful.

THE JOHNS HOPKINS HOSPITAL

BALTIMORE 5, MARYLAND

ALLAN C. BARNES, M. D.
GYNECOLOGIST-OBSTETRICIAN-IN-CHIEF
IVAN L. BENNETT, JR., M. D.
PATHOLOGIST-IN-CHIEF

ALFRED BLALOCK, M. D.
SURGEON-IN-CHIEF
ROBERT E. COOKE, M. D.
PEDIATRICIAN-IN-CHIEF
A. MCGENEE HARVEY, M. D.
PHYSICIAN-IN-CHIEF

A. EDWARD MAUMENEÉ, M. D.
OPHTHALMOLOGIST-IN-CHIEF
RUSSELL H. MORGAN, M. D.
RADIOLOGIST-IN-CHIEF
BENJAMIN S. KETY, M. D.
PSYCHIATRIST-IN-CHIEF

RUSSELL A. NELSON, M. D., DIRECTOR

December 12, 1962

Dr. D. Ralph Millard, Jr.
2121 Biscayne Boulevard
Miami 37, Florida

Dear Ralph:

Thank you for note calling attention to the problem of the septum for closure of a defect in children with cleft palates. Am glad to hear you continue to like the island flap with pushback surgery. I have followed your suggestion on two or three occasions and found it really useful. Incidentally, would you be good enough to send me a couple of copies of your various publications on cleft lip and palate surgery for use in the plastic library. By the way, I enjoyed your description of your visit to the West Indies very much.

Sincerely yours,

Milton T. Edgerton, M. D.

MTE:ld

see page 173

A last letter to Edgerton:

Dear Milt:

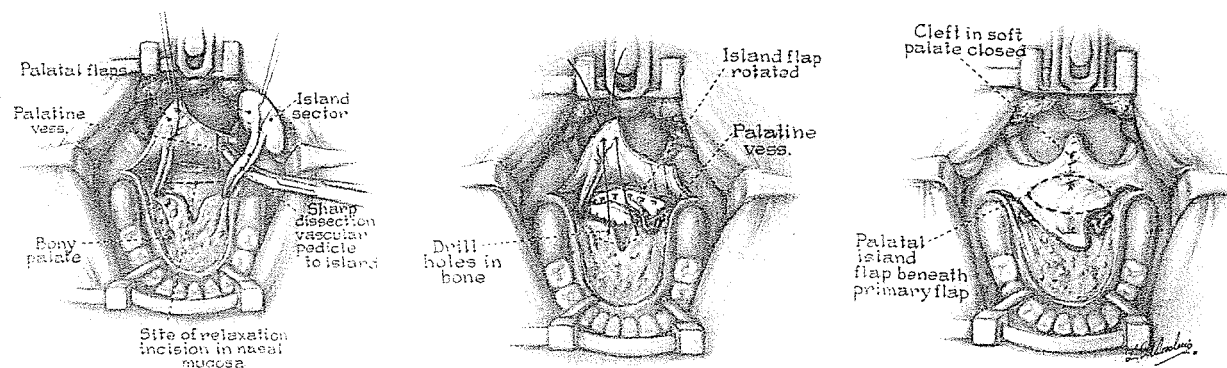
Thank you for your letter and I am pleased that you have found the island flap useful. I can now answer a question you posed to me last June. Several days ago, I did a secondary pushback on an incomplete palate which had been closed many years before. I took the mucoperiosteal flap from the anterior portion of the flap crossing the midline for about one-third of its size. There was a scar across the island. There was no difference in the color of the island and there was a bleeding edge distal to the scar. There has been no difficulty with the flap as far as I can tell since the operation and therefore, although this is only one example, it indicates that you can take a flap with at least a portion of it across the midline.

Then Edgerton in 1965, writing in the December *Plastic and Reconstructive Surgery*:

Over the past 5 years, the Plastic Service at Johns Hopkins Hospital has employed two surgical operations for obtaining velopharyngeal closure in patients with defective palates. . . . One of these operations (the island flap push-back) is being used with increasing frequency by the author for all types of congenital clefts.

I was disappointed in him when I read this 1965 claim - not even a mention of my many personal communications!

He represented the technique of the island flap used in the usual nasal lengthening, offering nothing new except lovely drawings by the Johns Hopkins University artist.



The absurdity of this 1965 claim is highlighted by the facts presented. Two days after Christmas 1965, when I first read his article in the December *Plastic and Reconstructive Surgery*, I flew to Philadelphia, took the train to Harrisburg and spent several hours with Dr. Ivy going over my records and correspondence. A stopover in Philadelphia gave me a chance to repeat the discussion with Peter Randall. Later gentle Ivy advised that, rather than publish my (scorching) Letter to the Editor, it would be better to have Edgerton write a letter of apology. His belated acknowledgment in 1966, ending with “the credit for the first description of this technique belongs to Dr. Ralph Millard,” never quite covered the issue as there was never any question of priority. His retrograde inference of independent conception of an island for nasal lengthening is disclaimed. Independent conception can and often does happen to all of us, but in *this instance*, it so happens that the records disprove the claim.

VILAR-SANCHO ALTET

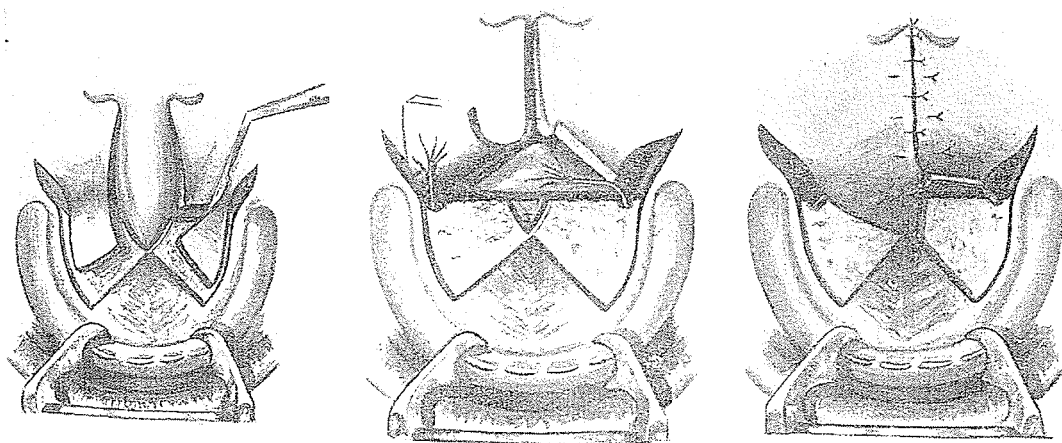
The vigorous Beneto Vilar-Sancho Altet of Madrid, Spain, spends several months each year in submarine archeology, exploring shipwrecks on the bottom of the Mediterranean Sea, diving from Ibiza, the smallest of the Balearic Islands. He has reclaimed from the sea parts of hulls, anchors and many double-handled am-



Beneto Vilar-Sancho



phorae from the ruins of Roman and Carthaginian ships dating back as far as the second century B.C. His wife, Pilar, always dives with him so, as he says, "to stand guard against the sirens." This off-island diving has kept him in shape to do a multitude of Spanish palatal island flaps. His first publication in 1966 varied the design by leaving a large triangle of mucoperiosteum anteriorly over the incisive foramen and cutting off one entire palate mucoperiosteal flap as the island, instead of using the lopsided V-Y posterior advancement. He presented a movie on the island flap in 1967 during the International Congress in Rome.



In 1971 Vilar-Sancho wrote:

We have carved out about 175 island flaps of which about half were in secondary palate repairs.

What we like best about this operation is how easy it is to carry out, the considerable lengthening obtained, together with the versatility of the use of this island flap.

What we like least is the possibility, although remote, of losing the island flap, which leaves us a very difficult problem to solve.

DIJKSTRA

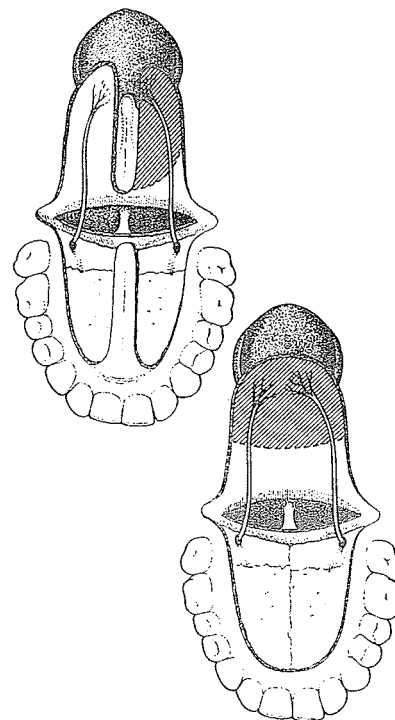
R. Dijkstra of Zwolle, a cross-country skater and a trainee of Hage, in 1969 wrote in the *British Journal of Plastic Surgery* of using an island flap as a secondary lengthening maneuver. He suggested calling the procedure a "release" rather than a "push-back," and his diagrams demonstrated use of unipedicle and bipedicle islands. He reported:

The lengthening achieved was found to be permanent in the majority of cases, but the effective lengthening was limited to a maximum of approximately 10 mm.

It was Dijkstra's impression that the results were better than those previously obtained with simple pharyngeal flaps . . . [but] the method is not universally applicable. . . . Lengthening is obviously of no avail in the paralysed palate, and probably not in the congenitally short palate. Also island flaps are not advisable in the badly scarred and collapsed hard palate, for technical reasons.

In 1977 Dijkstra stated that he no longer uses the island flap, preferring the superiorly based pharyngeal flap advanced so the tip closes the nasal defect. He outlined his reasons:

1. I consider the pharyngeal wall a more expendable donor site than the palatal vault.
2. The operation is easier to perform.
3. Apart from the palatal lengthening (which I agree is essential), this operation provides for a certain narrowing of the pharynx.
4. The island-sandwich is rather bulky and often seems to effect some descent of the palate.



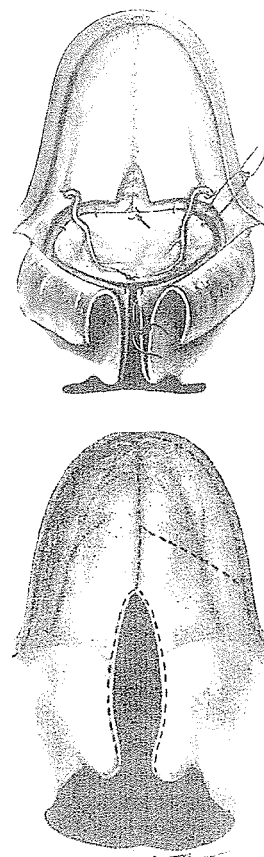
The Sandwich might

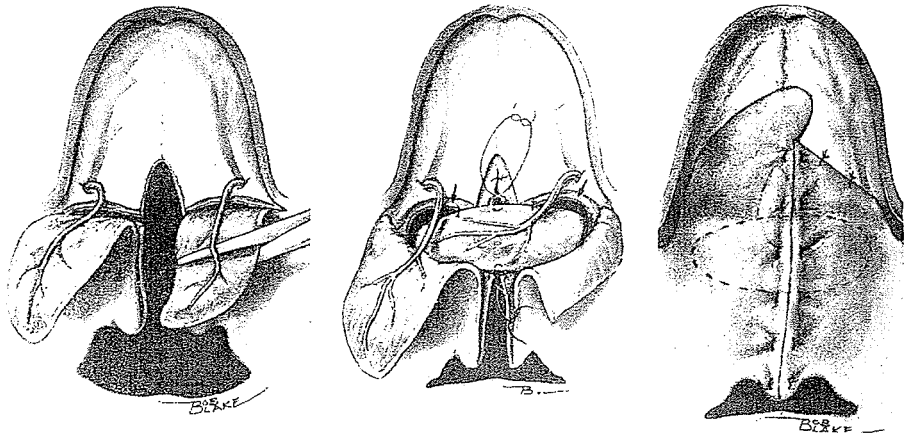
GEORGIADE

We had the pleasure of Nick Georgiade's company on one of our Jamaican work trips in the middle 60's, during which several island flaps were used. Since then, in 1969, Georgiade, Mladick, Thorne and Massengill reported preliminary evaluation of the island flap in cleft palate repair. They used bilateral neurovascular bundles in incomplete clefts.

In complete clefts, they used a unilateral pedicle, dividing a large mucoperiosteal island at an angle which did not allow V-Y retropositioning on the oral side and thus might conceivably have reduced the possible overall lengthening. They particularly mentioned leaving a nasal mucosal cuff (arrows) along the edge of the hard palate to facilitate suturing the island flap. They made several other salient points:

In our experience, the intact untraumatized bundle provides excellent vascularization for even the largest of the island flaps. The firmness of the island helps support the repair and gives a two-layer overlapping closure in





the area of maximum tensions. . . . We have found some definite limitations with this procedure. In clefts with narrow arches and/or wide complete clefts, it is difficult to get a sufficiently wide island flap. Without a large island flap the pushback effect is limited. The width of the island flap determines the extent of the pushback and, unfortunately, no matter how *long* the island is made, its *width* is predetermined by the distance from the alveolar ridge to the cleft. The operation takes approximately thirty minutes longer than a simple pushback. In a few adult cases we have found extensive arborization of the neurovascular bundle which hinders mobilization of the vessels. In one adult case, there was a portion of a flap that was definitely compromised, possibly because of the division of the many branches during mobilization.

REICHERT

In 1969 Heinz Reichert of Stuttgart wrote:

Finally, in the palate, by using flatter and wider pieces of bone graft, we have been able to obtain a smooth vault and avoid affecting later growth. Collapse in the premolar and molar region no longer occurs. Both secondary closure of the soft palate at 3½-4 years and also later palate lengthening by Millard's island flap in short palates are made considerably easier by the existence of an intact bony palate.

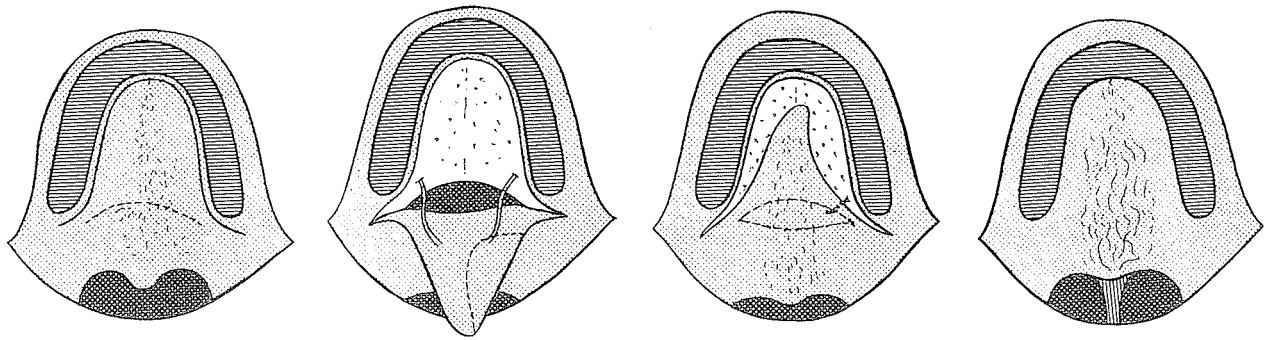


Daniel Marchac

MARCHAC

The suave and talented Daniel Marchac of the Children's Hospital, Paris, was a Maytag Fellow in Miami in 1966. In 1970, in *Vie Médicale*, he outlined the various procedures being used to augment the velopharyngeal sphincter. In this paper he expressed his

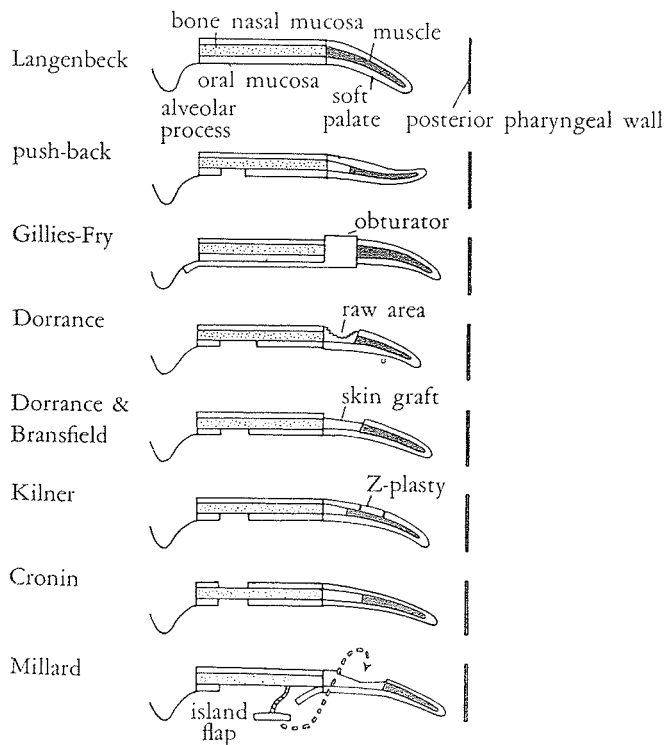
approval of the island flap in primary and secondary velar lengthening. His diagrams of the secondary procedure are of interest.

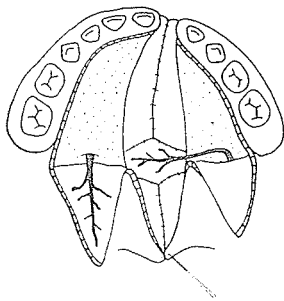
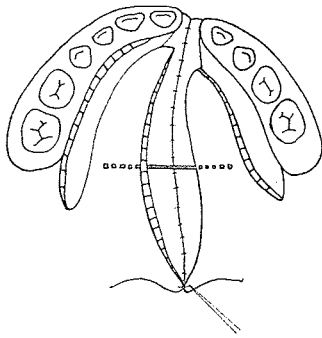
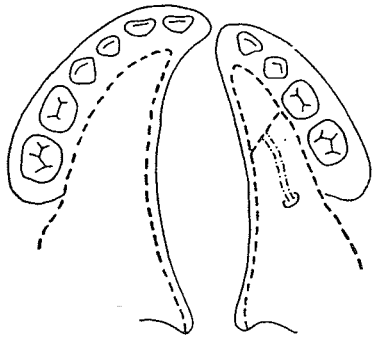


During a 1977 visit to Miami, he confirmed his continued use of the island flap principle in secondary cases.

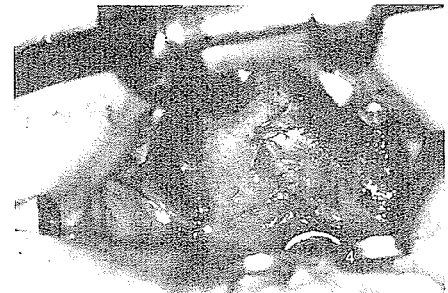
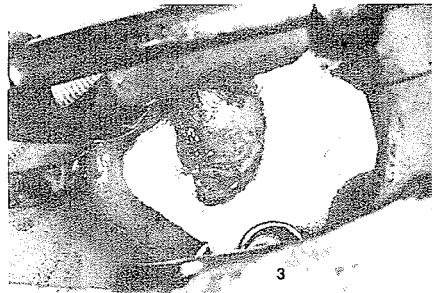
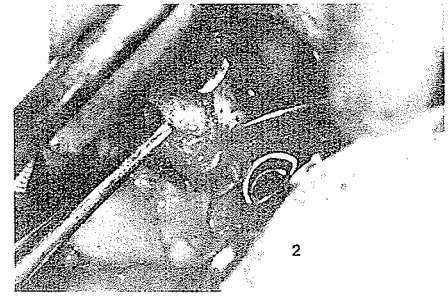
TAKAHASHI

In 1970 the energetic Shojiro Takahashi of the Tokyo Dental College, who had also observed the island flap pushback procedure in Miami, published in the *Japanese Journal of Oral Surgery* a complete cross-section list of palate-lengthening procedures and, I am relieved to say, in Japanese diplomacy at its best, included the Cronin method. His diagrams of his rendition of the island flap lengthening were presented.





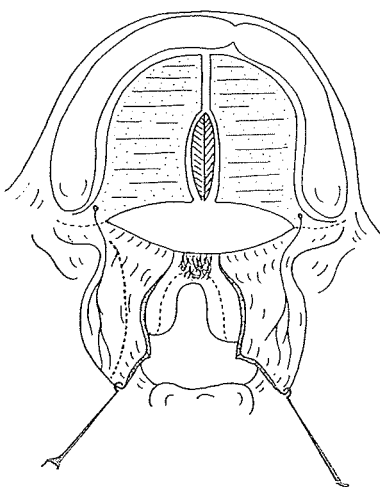
In 1972 he kindly forwarded me photographs of his use of the island flap nasal lining during a pushback, showing (1) nasal lining defect after release, (2) dissection of neurovascular bundles, (3) island flap, (4) completed operation.



In 1977 he wrote:

The island flap method is excellent, but it leaves rather large raw surfaces in the hard palate. I have used the island flap method in about thirty cases. Recently we have been using it on wide or short cleft palate, and in adult patients.

NOORDHOFF

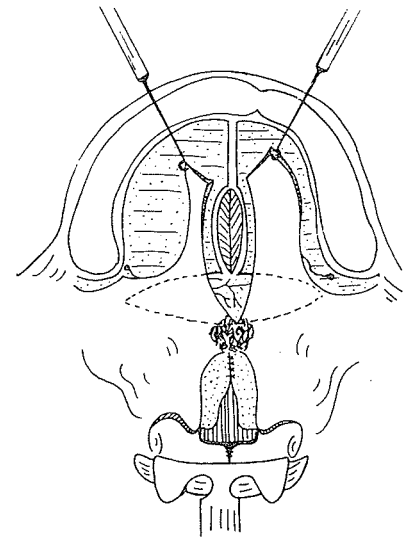


In 1970, in *Plastic and Reconstructive Surgery*, M. Samuel Noordhoff of Taipei, Taiwan, reported successful treatment of five difficult secondary palate cases which had had previous surgical procedures resulting in complete or partial dehiscence, scarring, velopharyngeal incompetence and unintelligible speech. He combined a pushback procedure with an island flap and a pharyngeal flap. Elevating two mucoperiosteal flaps, he took an elliptical island from the lateral aspect of the better one. Freeing the soft palate from the hard palate by dividing the nasal mucosa and scar presented a defect into which he turned the island flap.

The island was attached to the edge of the hard palate by sutures through drill holes.

In 1977 Noordhoff reaffirmed:

The island pedicle flap is extremely useful in severely scarred, short, tight palates where previous surgery has resulted in a cleft palate disaster. In these cases I use a push-back palatoplasty with island pedicle flap and inferiorly based pharyngeal flap. The island pedicle flap allows a release of the tight, scarred palate posteriorly. An effective release is not possible by a simple push-back procedure and the island pedicle provides the means to do it. These patients need 1 to 2 years before they can develop normal speech. Blood loss is frequently severe. The results have been extremely encouraging. This week a 1½ year postoperative patient came in who has developed normal speech from unintelligibility. I do not have statistics on this as we are in the process of calling in old patients.



To relieve side-to-side tension in closure of the soft palate, Noordhoff followed my suggestion of turning up the edges of the cleft for oral closure and introduced a superiorly based pharyngeal flap for nasal closure in four of the cases. His conclusions were logical:

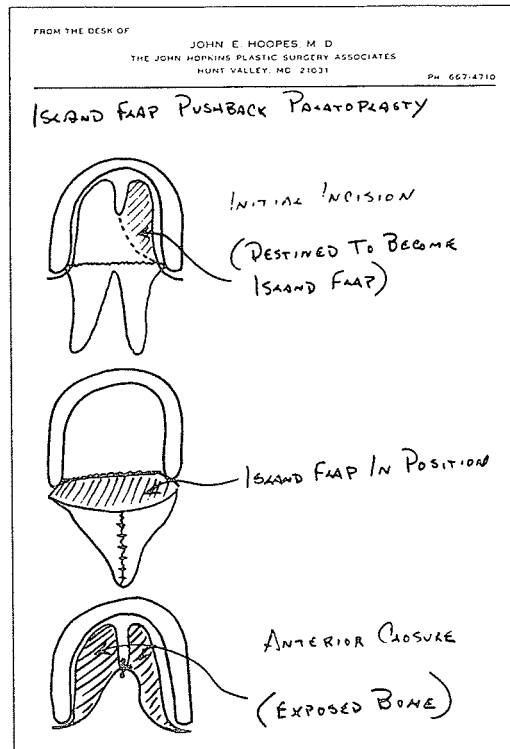
Changing lines of stress from scar contractures is a consideration in all aspects of plastic surgery—an example being the Z-plasty. Such a concept is also applicable in scarred palates. The release of scar contracture posterior to the palatine bone, with interpositioning of the mucoperiosteal island flap, changes the direction of the lines of tension—possibly resulting in gradual reabsorption of collagen and softening of the palate. The pharyngeal flap contributes to decreased lateral tension, as well as narrowing the velopharyngeal space.

The softening and increased mobility of the palate seem to take a considerable amount of time—at least one year. The improvement in speech is gradual in these patients. . . . The combined operation used in these is not recommended for all secondary operations for velopharyngeal incompetence. More simple procedures, such as the pharyngeal flap, may be all that is indicated when there is good palate mobility and lateral movement.

HOOPES

John E. Hoopes of Johns Hopkins Hospital, Baltimore, has been using the island flap to line the nasal side of the pushback

operation since 1965. These are diagrams of his rendition of the island flap.



Convinced of the importance in speech results of the final position of the levator sling postoperatively, Hoopes wrote me in 1977:

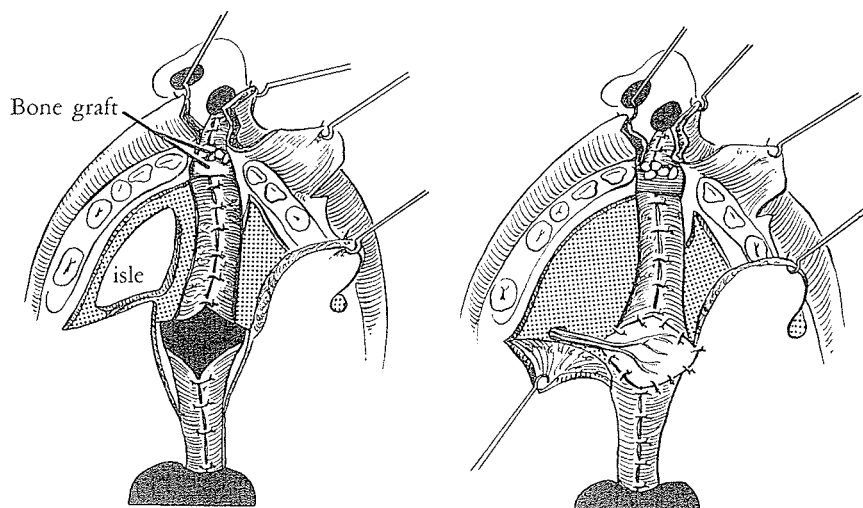
It has been my feeling that the island flap pushback palatoplasty is the only procedure which results in significant retro-displacement of the levator sling. I have, therefore, in my personal series utilized (almost exclusively) the island flap pushback for repair of cleft palate. Needless to say, I was distressed by the data in the recent paper published by Drs. Luce, McClinton, and myself. It is imperative now that I extract from the data those island flap pushback procedures performed only by myself—in that I, personally, have had no postoperative fistulae, and my patients have not (inordinately) required secondary pharyngeal flaps. In spite of the data, I continue to utilize the island flap pushback—simply because I have no other procedure available to me which significantly retro-displaces the levator sling.

I must admit that Hoopes' reasoning seems sound, and any further data he uproots will be of interest.

DAVIES

David Davies of Capetown, South Africa, since 1964 has resorted to total closure of the entire cleft of the lip, alveolus, hard and soft palate in one stage at about 3½ months. In 1971 he noted:

The lip is repaired with a Z-plasty, the alveolar defect [bone] grafted, and an extensive pushback done with the use of a Millard island flap.

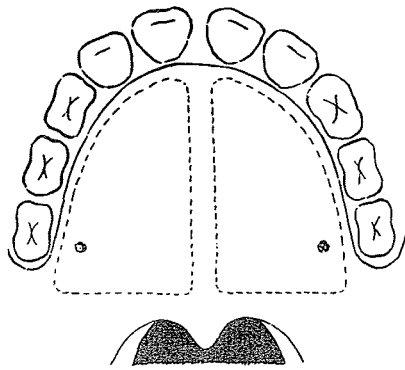


He has the impression that the longer, more mobile palate is giving better speech results. He does not agree with orthodontists' objections to an island flap causing a large raw area and the resultant scarring causing collapse. The raw area epithelializes for him in two to three weeks. No decrease in vault space has been noted in any of the cases.

Since 1973 H. Wolfgang Løsken of Pietermaritzburg, South Africa, trained by Davies in Capetown and as a Maytag Fellow in Miami, has also been carrying out the total cleft closure according to the Davies plan, including the island flap. His one improvement is the use of the rotation-advancement lip closure.

"SANDWICH" FLAPS

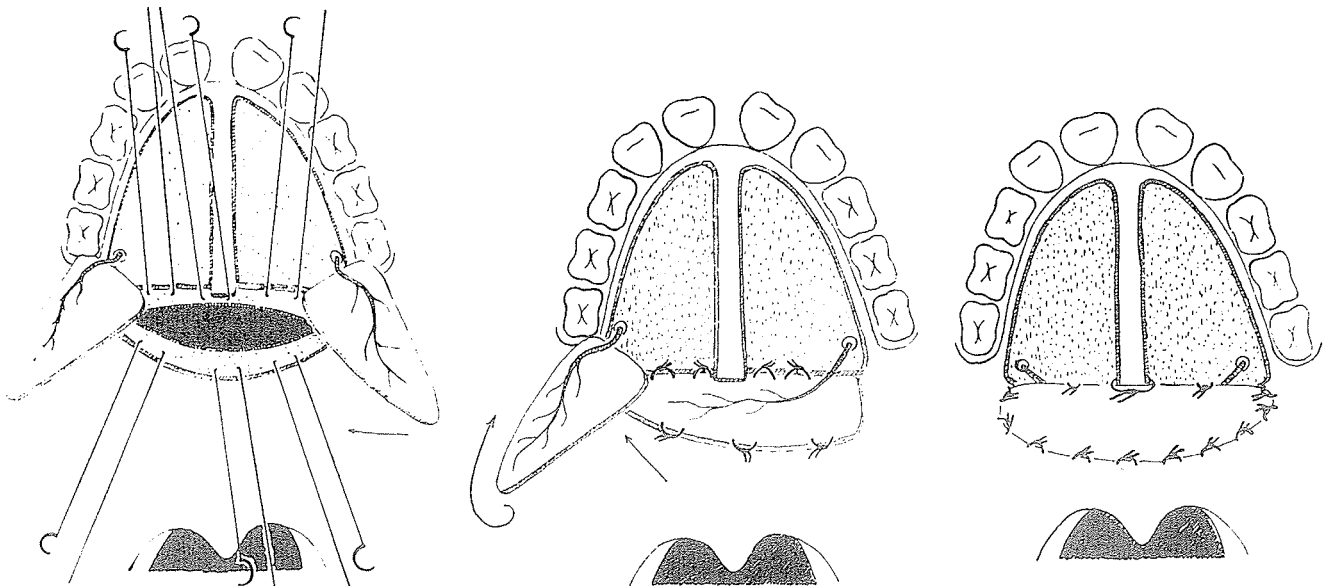
In 1967, in the *British Journal of Oral Surgery*, F. T. Moore and J. Kenneth Chong of Queen Victoria Hospital, East Grinstead, Sussex, England, noted, much as I had five years before, the



consequences of dividing the nasal mucosa during the Veau-Wardill V-Y repositioning of the palate.

The raw area on the nasal aspect of the junction of the hard and soft palate heals by secondary intention, scars and contracts as it heals, thereby reducing the gain in length of the soft palate to negligible proportions.

They presented their modification of the island flap principle and dismissed my previous work (1962, 1963) as “small elliptical island flaps taken from the anterior hard palate.” Moore and Chong advocated taking almost the entire mucoperiosteum on each side based on a neurovascular bundle. After dividing the soft palate from the hard palate by a through-and-through incision,



they inserted the two islands into the defect in double-decker style, one for nasal lining and the other for oral cover. Likening this to a “sandwich,” they predicted permanent lengthening equal to half the maximal width of the hard palate. They reported 40 such cases “with 8 requiring Moore’s lateral pharyngoplasty” in addition.

Actually, my first paper in 1962 described small flaps, but the paper in 1963 showed the anterior *half* of the hard palate being carried on bilateral bundles, which maneuver gets every bit as much into the lining as the straight sandwich. In 1966 I described two larger flaps, one placed transversely in the nasal side and one longitudinally in the oral side—“double-decker” in

principle as a crisscrossed "sandwich." This approach actually, in addition to nasal lengthening, achieved side-to-side release not possible with the straight sandwich.

In 1973 J. P. Bennett, while still at the Queen Victoria Hospital, reported a follow-up on F. T. Moore's cases and the present procedure at East Grinstead:

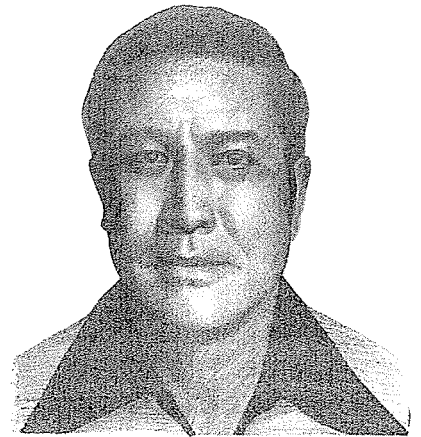
The sandwich pushback is the first procedure wherever possible. If, after an adequate period of speech therapy, nasal escape is still present and further improvement from surgery can be expected, a lateral pharyngoplasty is carried out. Only a few patients do not achieve normal, or at least acceptable, speech following these two procedures and in such cases, it has been recently found that a Rosenthal pharyngoplasty can produce further improvement.

Out of 80 patients reviewed, 42 had gained normal or acceptable speech. Of the 33 cleft palate patients treated by sandwich pushback and lateral pharyngoplasty, 17 had achieved normal or acceptable speech. Of 6 patients treated by all three operations, 3 had achieved normal speech.

Of special interest were 25 patients suffering from suprabulbar paresis, out of which 14 achieved normal or acceptable speech. More important may be the fact that the troublesome problem of dribbling saliva in these patients was relieved following the sandwich pushback, probably because the palate lengthening improved the act of swallowing.

J. Kenneth Chong, born in Malaysia, was trained in medicine at Oxford University and St. Bartholomew's Hospital, London, and in plastic surgery at East Grinstead. In spite of having suffered burns of his hands, treated with skin grafts, he has superior manual dexterity. Like a bumblebee carrying pollen from garden to garden, Chong, after his flight from Sussex to Pennsylvania in 1967, soon had the "sandwich" blossoming in Philadelphia. In 1973 Culf, Chong and Cramer of Temple University presented the method at the Duke Cleft Palate Symposium, noting:

The most ideal situation for this type of operation was in those patients who demonstrated a short but mobile and supple soft palate without significant scarring and a velopharyngeal defect of less than 1 cm. The relative width



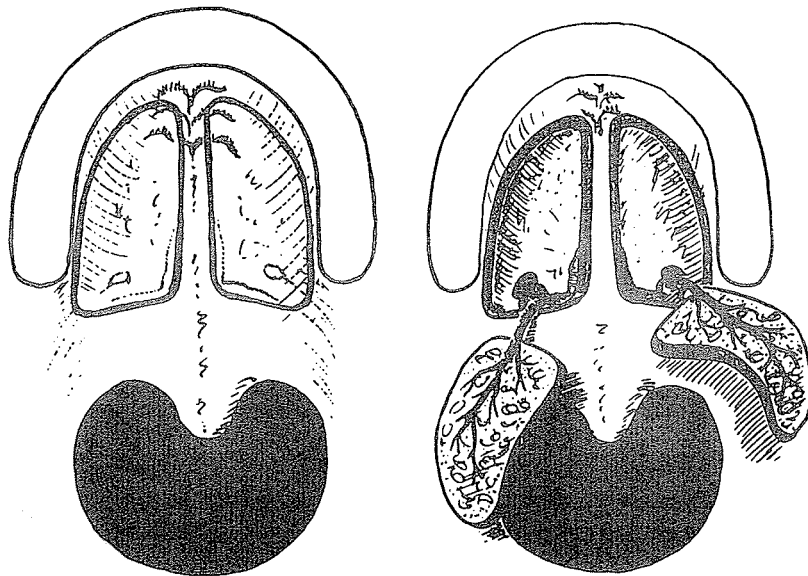
Kenneth Chong

These cases are ideal for the simpler island flap too, of course!

and length of the hard palate was a decisive factor in determining whether this particular procedure would be carried out. If the hard palate was narrow, either because of scarring, a particular patient's anatomy, or previous incisions in less than ideal positions . . . another type of operation would be done. . . . As one can see from these criteria, the ideal candidates were those with submucous clefts or patients who had had previous palatoplasty with short mobile, minimally scarred palates and hypernasal speech.

Specific details of their rendition of the double-decker sandwich island flaps are of interest:

They are designed so that the lateral incision is made 2 to 3 mm. from the dental-gingival margin, and, on making the medial incision, a 3 mm. midline mucoperiosteal strip is left in situ. This medial strip serves two purposes. It decreases the possibility of reopening of the previously repaired cleft. Second, it assists with closure of the flap donor site by proliferation of mucosal cells.



The island flaps are developed as described often before, but these authors seem to feel the need for extra freedom:

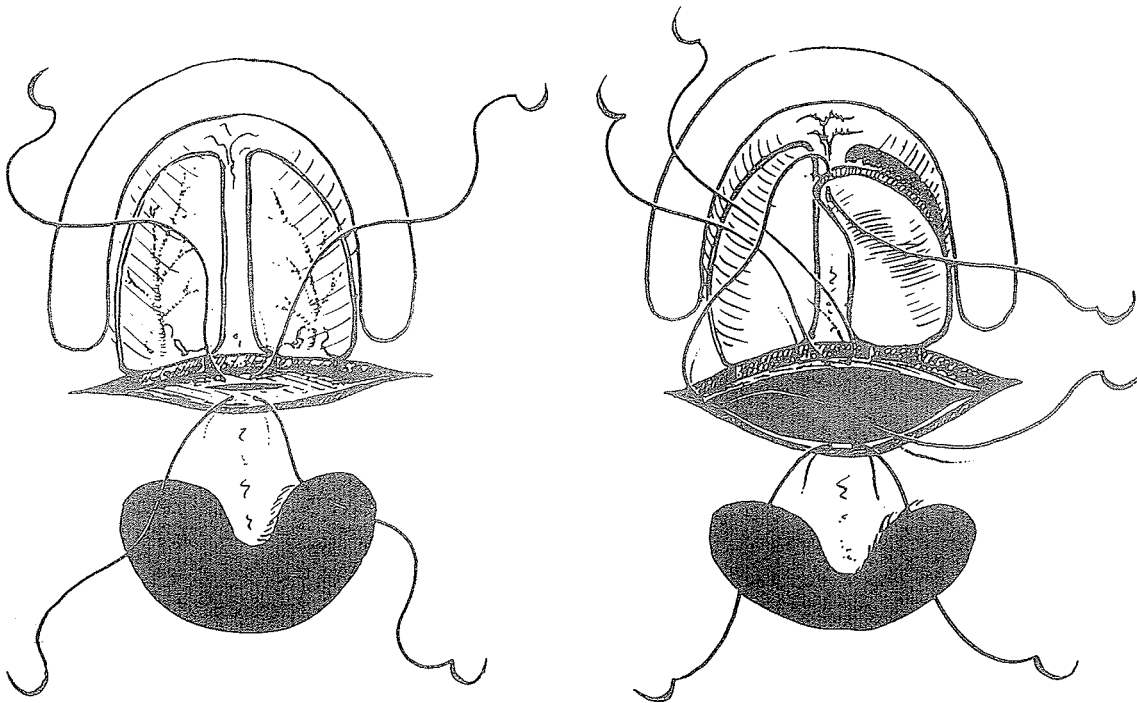
An ostectomy of the posterior medial portion of the canal is then done to allow retrodisplacement and mobility of the neurovascular bundle. After the ostectomy, further gentle mobilization of the vessels is carried out so that in changing the axis of the flap from longitudinal to a transverse one, the pedicle will not kink.

Of course, it is the unnecessarily wide, blunt, distal end of their island and the short stalk of their bundle that makes this maneuver awkward and difficult, requiring foraminal osteotomy. Even the three C's admit danger with osteotomy, a danger I experienced in my first case. They warn:

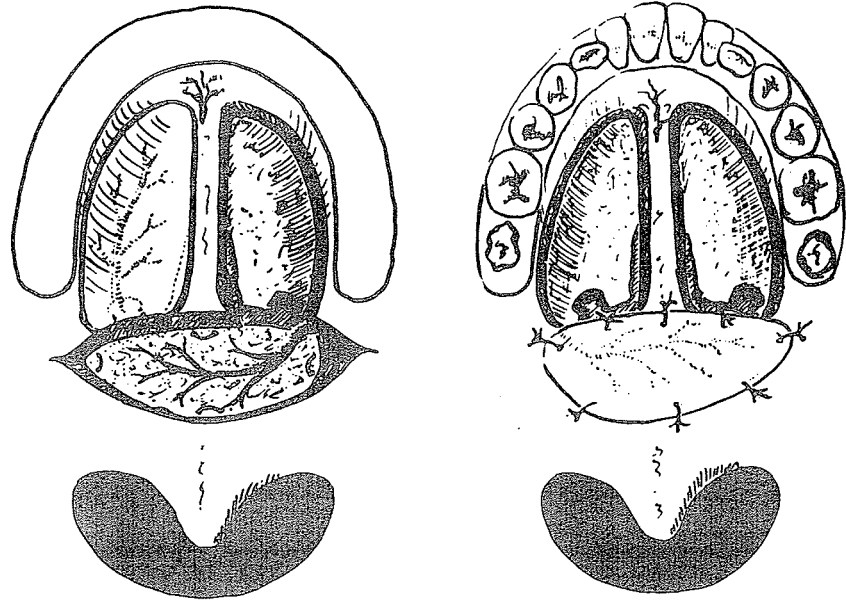
*Culf
Chong
Cramer*

It is usually preferable to do the osteotomy prior to making the posterior cut (between the hard and soft palate), so that if the vessel is injured in this maneuver, a different plan can be carried out.

They then extend their posterior incision across the central intact strip and, gaining control of the nasal mucosa with sutures, make a through-and-through incision dividing the soft palate from the hard palate about 3 mm. posterior to the bony edge. They noted:

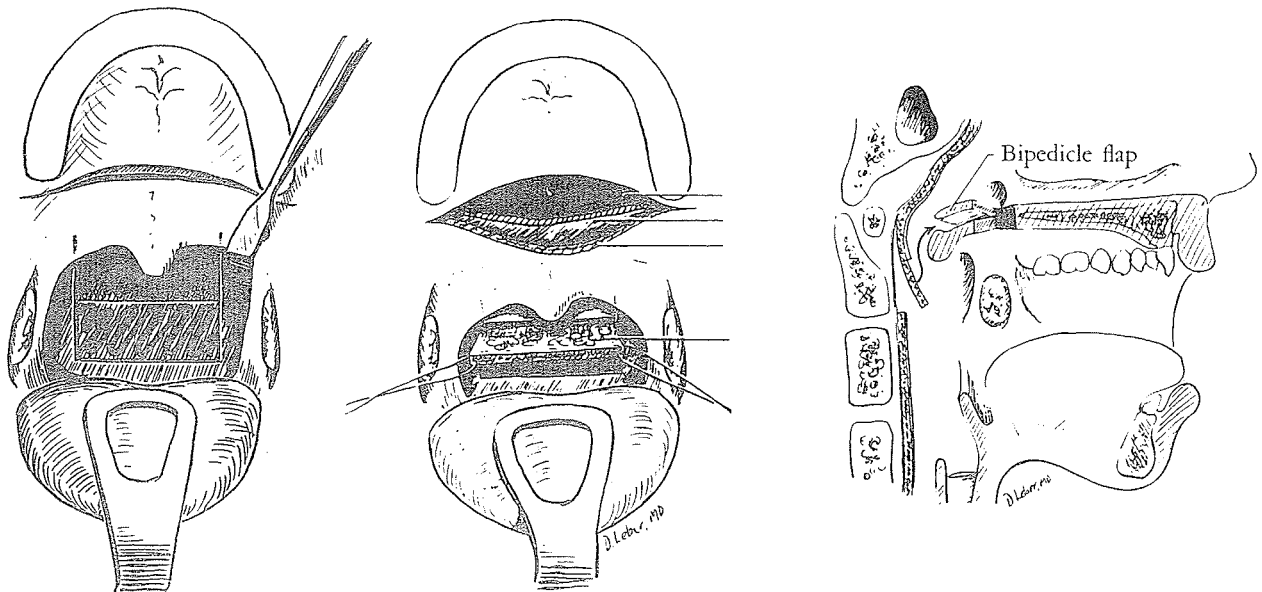


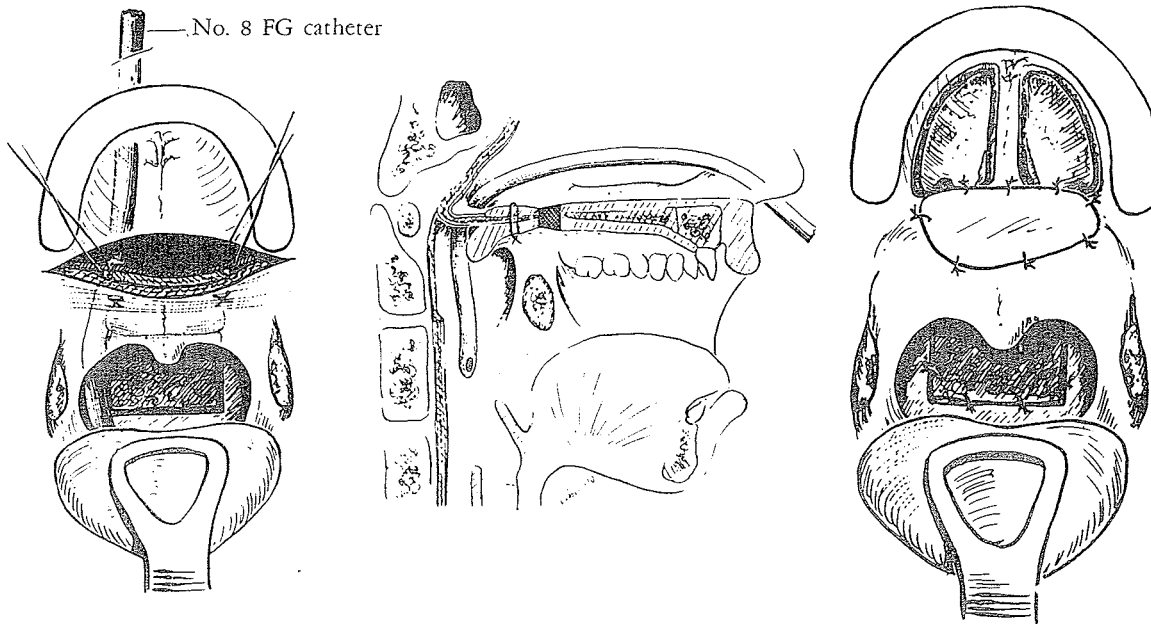
It is important to carry this incision well laterally to ensure complete transection of the levator aponeurosis and nasal mucosa. The dissection is then continued laterally and posteriorly, including the insertion of the tensor palatini if necessary. Blunt dissection progresses until the soft palate has been adequately pushed back and stays there without traction. . . . Therefore the width of the island flaps should be equal to the width of the defect.



One island flap is flipped over and transposed as nasal lining, and the second island flap is transposed over it as oral cover.

Culf, Chong and Cramer presented the combination of double hemi-palatal island flaps and a wide superiorly based pharyngeal flap. The distal end of the pharyngeal flap was denuded of mucosa and threaded through a submucosal tunnel in the velum. Lateral ports were ensured with No. 8 FG catheters.

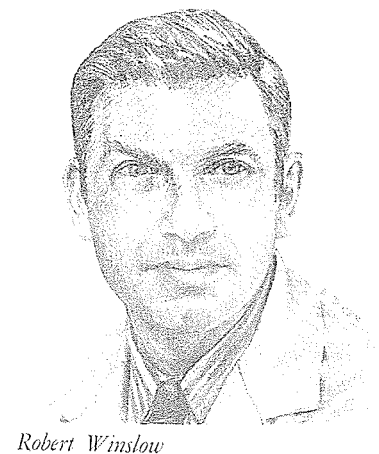




They also noted the possibility of combining one hemi-palatal flap with a cheek island flap when the double palate islands were not available.

Robert B. Winslow, trained in island flaps at Temple University by Cramer and Chong, reported in 1974, with Bradley, Warren and Bevin of the University of North Carolina:

Bilateral island "sandwich" flap combined with a superiorly-based pharyngeal flap is an operation designed to restore V P competence. The efficacy of this operation was determined by measurements of V P competence and these results were correlated with observed speech changes. It appears that this operation is safe and reliable as a means of reducing V P sphincter size, restoring V P competence, and favorably modifying the associated articulation-voice quality problems.



Robert Winslow

They made some comments about the island on the oral side which could be observed postoperatively:

Although we cannot supply documentation now, in every case we have noted an increase in the length of the palate during the postoperative recovery period. It appears that what was originally an elliptical island in the soft palate slowly becomes circular or even rhomboidal. The long axis (transverse) shortens and the short axis (antero-posterior) increases. Theoretically, this may be due to scar contraction with the longer scar contracting more and forcing the "islands" to change their shape in a manner that lengthens the palate. In addition, contraction of the pharyngeal flap might "pull" the palate posteriorly.

AN EMPTY SANDWICH?

The sandwich principle, although it offers permanent lengthening, is probably overrated. First, it takes almost all the mucoperiosteum covering the hard palate, a loss that in the young, growing patient cannot be tolerated. In the adult, there should be no trouble. Two elliptical flaps—and they should be elliptical to fit the defect and not blunt-ended—one on top of the other, will interrupt the scar contracture, but with far more scarring. I much prefer to take the anterior half of the mucoperiosteum on bilateral bundles, which gives as big a flap for the nasal lining release, and, without cutting a second island, merely slide backward the intact distal half of the mucoperiosteum and attach it to the edge of the hard palate. Remember, the transverse release of the soft palate from the hard palate must stop at the most lateral edge of the hard palate on each side; thus the amount of possible pushback is limited. The attainable amount of pushback can be achieved just as well with the bipedicle island, or a simple larger island as with the sandwich and with less double-decker theatrics and scarring in its wake.

OTHER OPINIONS

Many surgeons favoring other techniques have noted the value of the island flap. In 1972 David Sullivan of Spokane, who uses the two lateral pharyngeal flaps, did admit:

I have found your turned-over island flap of palate mucoperiosteum most helpful in closing the defect on the nasal aspect.

Hector Marino of Buenos Aires wrote in 1972:

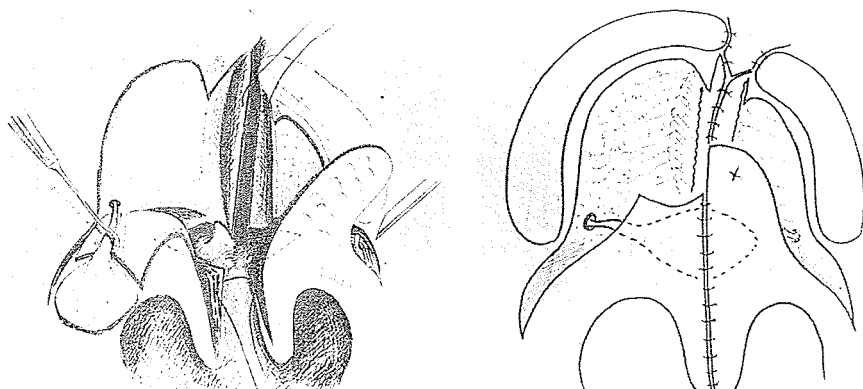
As for the island flap, I must say that I was the first to demonstrate it in Buenos Aires, during surgical sessions held in the Instituto de Quemados for the Latin American Congress. I am totally pro it as it is the soundest method to prevent the nasal contraction of the pushed palate. Besides, the dissection of the palatine arteries has ended all the trouble caused by the stretching of them or the Limberg demolition of the canal. The only drawback in my particular case is that, as I have the doubtful privilege of operating many secondary cases, I have seldom an unscarred mucoperios-

teum in the anterior part of the palate. Finally, I think one cannot speak of a preference between the island and a pharyngeal flap. Both have precise indications and, in certain cases, may complement each other in a very happy way.

Amén!

Sebastian Rosasco of Buenos Aires wrote in 1976:

We would like to clarify that the number of island flaps operated by us is 162. Our results have been very satisfactory; we have applied your island flap procedure, together with the mobilization of other flaps, in one step, as shown in the diagrams of a complete cleft.



We consider of real importance: (a) the closing in one step because it reduces the percentage of wound disruptions, and (b) at an early age, 18-24 months old, because of difficulties with closure, plus the pathological speech patterns are more difficult to correct when closure is performed at an older age. However, our enthusiasm has been diminished recently by a publication of Ralph Blocksma. . . . They have observed that this trouble of the development of the maxillae is evident in the 10 years follow-up, and is common to other procedures that dissect the mucoperiosteum of the hard palate. . . . Have you had trouble with the developing of the maxillae in follow-up of more than 10 years? At what age have you done the dissection of larger mucoperiosteal flaps of the hard palate?

*yes!
wait until
5 years!*

In 1974 Demjen wrote:

In Millard's island flap procedure, . . . the posterior flaps or flap remain without benefit of blood and nerve supply from the posterior neurovascular bundle. This procedure is gaining popularity around the world. Yet there were no reports of complications in healing or necrosis of the posterior flaps and no observations of atrophy of the soft palate or disturbance of the growth of the maxilla attributable to this step of the surgical procedure.

INNES

In 1974 in the President's Address at the meeting of the Royal Society of Medicine, F. L. F. Innes of Norwich expressed enthusiastic approval of the island flap in lengthening the palate during a pushback operation. In the 1976 *Proceedings* he stated:

The Kilner-Wardill operation on the palate does not elongate the palate very much because the nasal mucoperiosteum does not stretch sufficiently. . . . Division of the nasal layer without filling in the gap is no answer because of the high incidence of breakdown of the repair with a one-layer closure and because of the scarring which inevitably occurs on the exposed nasal surface of the buccal flaps, impeding the movements of the palate as well as causing shortening. A brilliant solution to this problem has been presented to us by Ralph Millard (1963). The Millard island flap is a triangular piece of mucoperiosteum, isolated from the anterior end of one of the "V" flaps of the Kilner-Wardill operation except for its stalk of posterior palatine vessels. This very mobile piece of tissue can be turned over easily, with its epithelial surface uppermost, into the gap after dividing the nasal layer. It elongates the soft palate in a most remarkable fashion. The Millard island flap is in my opinion the greatest advance of recent times in the surgery of the cleft palate. I have used this flap occasionally in the primary repair operation performed at the age of one year, when it looked as if the soft palate would be grossly deficient, but it need not be introduced as a routine in the primary operation for the simple reason that the Kilner-Wardill operation itself is sufficient. The Millard island flap is, however, the greatest possible assistance when the soft palate is deficient, as it is, for example, in the submucous cleft palate. The procedure is in my experience without any faults. It is safe and efficient, and it is an elegant application of the principles of plastic surgery. The division of the nasal layer should be radical, carried well out to each side, and the Millard island should be of generous dimensions so as to fill the gap without tension. . . . For some time, I have been doing the two procedures—the Millard island flap and the Hynes pharyngoplasty—at the same operation and I can recommend the combined procedure with confidence as perfectly feasible. It has produced results which are far better than I have previously obtained. . . . If the Millard island flap operation on the palate and the Hynes pharyngoplasty are to succeed there must of course be unimpaired movements of both the palate and the pharyngeal wall. If the movements are deficient, the result of surgery will be less than hoped for. . . . Both procedures appeal to me because they enhance the mechanism of closure of the isthmus in a natural fashion. Pharyngeal flap operations, whether based above or below, are unnatural. To have to use them is, in my opinion, an admission of defeat. I do, however, perform a

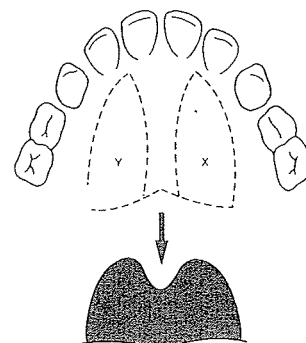
I agree!

pharyngeal flap operation if I am confronted with a palate which does not move properly or if the combined operation which I have mentioned fails, as it does occasionally, to provide an efficient mechanism. Most of my failures are due to poor or inconsistent palatal elevation. For these cases one must accept that the palate has to be tethered to the pharynx by a pharyngeal flap.

STELLMACH

At the Sixth International Congress held in Paris in 1975, Rudolf Stellmach of Berlin stated:

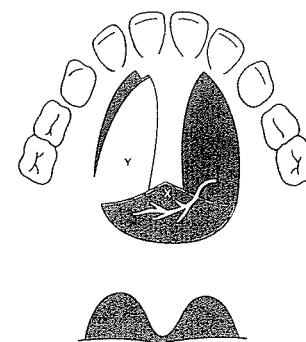
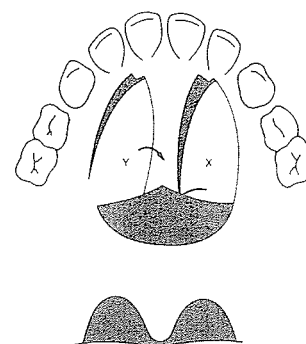
There is no problem to lengthen the oral side by the use of the V-Y technique and setback of the pedicle flaps. But it is rather difficult to lengthen the nasal side as much. Most promising so far is the dissection of nasal pedicle flaps according to Cronin or the use of the island flap proposed by Millard.



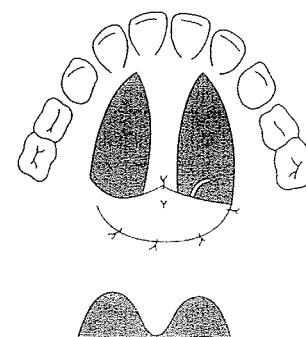
RINTALA

Aarne Rintala of the Finnish Red Cross Hospital, Helsinki, wrote in 1976:

The diagram of our modification possibly needs some explanation. The pushback is achieved by a transverse incision and the island is inserted on the nasal side as big as possible. On the donor area, between this and the other flap to the oral side, we leave a narrow strip of oral mucosa attached to the periosteum reaching down to the border between the hard and soft palate. The flap to the oral side to cover the nasal flap is cut as big as possible, even bigger than the first one, and rotated down to cover the defect in the soft palate. In this way, I am trying to put the most tension transversely in order to avoid secondary shrinkage of the lengthened soft palate. The anterior middle edge of this oral flap is sutured tightly with one stitch to the narrow mucoperiosteal strip left in place in the midline of the hard palate. This is done because otherwise the edge of the oral flap will have a tendency to protrude downwards into the mouth as a hanging flap, probably because of its size and the rotation.



As far as I can remember, we have not lost a single flap. Neither can I remember now any other major complications. The method has been very successful in closing fistulas, in these rare cases where it has been used. The primary lengthening of the palate has been on the average 10-15 mm. There has been some secondary shrinkage, but not very much. It looks like the palate would be permanently lengthened in practically every case.



In 1977 in Toronto, at the Third International Congress, Aarne E. Rintala and S. L. Rantala reported having used their modified island flap operation on 57 secondary palate cases (4 to 27 years of age) with persistent nasality and unsatisfactory speech with a nasopharyngeal gap not exceeding 12 mm. at phonation, as estimated by lateral radiography. Results: 90 percent achieved 1 cm. or more length. There was noticeable decrease in nasality in 68 percent with no change in 30 percent. Lateral radiography in phonation of sss revealed lengthening of the palate in 63 percent. The authors noted:

Preoperatively no velopharyngeal closure could be observed in any of the patients. Postoperatively definite, or probable but not constant closure was detected in over 50 percent. The general quality of spontaneous speech was estimated good in 58 percent, and there was considerable improvement in 51 percent. . . . Summarizing, the island flap as a secondary procedure seems to improve the speech in a majority of patients, but relatively seldom results in complete disappearance of nasality, and fully normal speech. . . . Probably the island flap as a secondary procedure should be reserved to selected cases with a tight but mobile velum, slight nasality and a nasopharyngeal gap not exceeding 5 mm. at phonation. An advantage of the method is that it is no "final" operation, and if the result should not be satisfactory, a pharyngeal flap can still improve speech.

M A I S E L S

In 1976, more than 10 years after he had been a Maytag Fellow in Miami, the sound David Maisels wrote of his interim experience with the island flap. He had assisted me on numerous cases in which this technique was used and therefore I was interested in his report.

I employ the fairly standard V to Y pushback with Veau flaps. When I first returned from Miami, I was using an island flap virtually routinely in all cases, but as time has gone on, I find myself doing so less frequently. I think the main reason for this was that I had one or two cases in whom I got such a marked pushback that the anterior palate repair was left unsupported by an oral layer, and in one case I had a fistula here, which of course was not very easy to repair, because most of the good tissue had been pushed back. I have found that as I become more radical in my deep pterygoid dissections and hamular fractures, as outlined by Braithwaite, there are fewer and fewer cases

me too!

not necessary

Right!

in which I am forced to use an island at the primary operation. I still use it from time to time in secondary repairs in order to obtain more length and in those primary cases with the typical V-shaped cleft where I just cannot get a decent closure by the standard methods.

FURNAS

David Furnas of the University of California in Irvine is an articulate, humorous and ingenious surgeon who received some of his early training with Conway where pharyngeal flaps were popular. Nevertheless, I gambled on his versatility and asked him if he had any experience with the island flap. As he has a clever way with words, they are included verbatim:

I have had some experience with palate lengthening with your island flaps, and feel that it is an elegant procedure. My experience has diminished in recent years because I have been doing primary pharyngeal flaps at the time of my palate repair. . . . An island flap *dramatically* rescued me in a patient several years ago. I was supervising Harlan Wald, and the case was a primary pharyngeal flap in a one-year-old child. When the flap was sutured into place, the suture line showed unmistakable signs of tension. Despite much discussion, cogent comments on how wounds relax as they remodel, and assurances from the first-year resident that everything would be all right (particularly his weary ischii), the tension was unchanged after ten minutes of collagen remodeling. Then the elegant maneuvers of the island flap came to mind (much like the coconut palms of a Pacific atoll might heave into view of a drifting, shipwrecked seaman). In a few minutes the island was in place, serving as a bridge between the posterior nasal layer of the palate, and the anterior layer of the pharyngeal flap. The tension in the flap, and the operating room, was completely dispelled. The patient has perfect toddler's speech now.

If this surgeon ever tires of flaps, he can make it as a writer!

PERSONAL OBSERVERS

Palate surgeons have not yet taken to the island flap as much as I would have hoped. There seems to be an inherent hesitancy to attempt to dissect an island. It evidently is a "see one, do one" procedure, for most surgeons who have observed the operation are pleased with the ease of execution and return home to use the procedure. Of course, only those who have observed firsthand the



Robert Ivy

use of an island flap in a pushback operation are in a position to give a clear opinion of the approach. Thus comments from surgeons who have been invited to observe one or two examples of the surgery are pertinent. Hage, Takahashi, Georgiade, Maisels and Marchac have watched and then gone on to do the procedure routinely. A very special guest to observe the island flap was Robert H. Ivy.

Ever since Ivy, as editor, accepted my first rather atypical paper, "Plastic Peregrinations," for publication in *Plastic and Reconstructive Surgery*, we had been friends. In his later retired years, he accepted several visiting professorships at the University of Miami, and in 1972, during one of these, he was invited to observe an island flap pushback. This is a simple procedure often accomplished in 45 minutes. After the surgery we went over to the adjacent blackboard to diagram in review the specific steps taken in that case. Then I turned to Ivy, who although humble, unassuming, diplomatic and extremely knowledgeable was above all else honest, and asked him what he thought of the operation. He answered in typical, straightforward, simple prose:

The best thing you could do. . . . Got it all over the pharyngeal flap in my opinion.

Peter Holm of Copenhagen, after observing an island flap pushback operation on May 17, 1974 stated:

Most plastic surgeons doing palate surgery claim they do a pushback operation—I have seen a lot of palate surgery but no pushback until today, my own surgery included. So much about the pushback itself—another question is how often a pushback is needed.

THE DIEFFENBACHS

With his father professor of philosophy at Königsberg and his mother the daughter of the eminent German poet Ludwig Gottfried Kosegarten, Johann Friedrich Dieffenbach, the famous cleft palate pioneer born in 1792, is the taproot of this family tree. When Kenneth Dieffenbach, now a New Orleans plastic surgeon, came to Miami on a Maytag Fellowship, he acknowledged being a sixth-generation descendant of the first Dieffen-

bach in America, the family sharing a grandfather with the celebrated surgeon, eight generations back. Kenneth's great-great-grandfather was the first native pipe organ builder in America, and Kenneth still plays one of his organs. As a third-year clerk at Germantown Hospital, he watched Hans May do the first cleft palate surgery he had ever seen, following the operation with May's Second Edition lying open on the windowsill. Frustrated by an inconsistency in a drawing in the book, Dieffenbach trailed May to the dictation room, with the book under his arm, for an explanation. There was an error in the drawing, prompting May to ask his name, and when he got "Dieffenbach" in reply, he quietly opened the book to the dedication to Johann F. Dieffenbach. Dieffenbach then began a nomadic training in palate with Marcks, Latham, Cannon and finally Hoffman in New Orleans, where as chief resident on the LSU service he got to do his first cleft palate pushback. He recalled:

Bill Pollock of the Tulane Service, working next door, peered in momentarily with the question . . . : how was I going to cover the nasal surface of the soft palate defect? I realized that I had not even released the nasal side, much less lined it. With this burning provocation, the next pushback received an island flap, taking one and one-half hours, with no difficulty and in fact, with surprising ease. My only reservation was in regard to the aura of fear and cautioned restraint expressed by others about the technical application of the flap.

After residency, he took postgraduate training with Converse in New York and a Maytag Fellowship in Miami. As he said:

Fresh with functional velar results of Hogan's lateral ports, I landed in Miami to see how the fearsome island flap was done "at home."

After scrubbing on an island flap pushback, he gave this response, but one must remember his background for generations has been philosophy, medicine, music and poetry!

Watching the 290th Miami island flap absolved any hesitations I still had. After smooth scalpel dissection of the neurovascular pedicle had freed the island in no time at all, it was demonstrated with acrobatic ease that this nomadic flap could be plugged anywhere in the hard or soft palate. Tucked behind the hard palate on its back, it left the uvula curled gently against the pharynx when all was done.

MAILLARD

Gaston F. Maillard of Lausanne, Switzerland, a 1976 Maytag Fellow, observed an island flap palatal pushback and was asked for his reaction to the procedure as his previous training with Dufourmental, Tessier, Clodius, Meyer and a stint at Canniesburn, Glasgow, Scotland, had been exceptional. This is what he wrote:

As a European trained in traditional schools, V-Y retropositioning and posterior pharyngeal flaps, I have to say you have to see it to believe it! In fact, it is difficult to imagine that by releasing the lining from the hard palate free edge, the most important defect lies on the nasal side. The oral is easily closed by the usual pushback. After having seen it, I am now convinced that, compared to the pharyngeal flap, it is a more physiological way to achieve the closure. On the other hand, it is a truly exciting plastic procedure: a double axial pattern island flap turned upside down at 90 degrees.

CARNEIRO

In early 1978 a bipedicle island flap was used to lengthen the nasal lining during a pushback in a 24-year-old Cuban girl who had had a von Langenbeck operation in childhood. Ronaldo dos Santos Carneiro of Porto Alegre, Brazil, a Maytag Fellow, expressed enthusiasm for the procedure. I asked him why.

I trained in Allentown, Pennsylvania, where one attending surgeon did Langenbecks and the other two did V-Y pushbacks and all feared a breakdown at the join of the hard and soft palate where often only one-layer closure is possible.

The island flap impressed me because of the ease of dissecting the neurovascular pedicles, ease of maneuvering the island into the nasal defect, and the amount of lengthening obtained. Also, the most troublesome area at the junction of the hard and soft palate received the best closure. The pharyngeal flap is not the only weapon against palate shortness.

WILLIAMS

It is interesting that Sidney Williams of Kingston, Jamaica, who trained with Braithwaite in Newcastle for four years from 1960 to

1964, explained in 1978 his infatuation for the past 10 years with the island flap:

In wide clefts with the Braithwaite approach, I had difficulty getting and maintaining a closure at the junction of the hard and soft palate. The island flap made this easy so I have used it many times.

CUBICCIOTTI

Gildo Cubicciotti of Naples, Italy, had been observing in Miami about two months. After the sixth pushback-island flap, he exclaimed at lunch in the Jackson Memorial Cafeteria one day in 1978, in mild excitement:

The first thing I'm going to do when I get back to Italy is an island flap in a palate!

I warned:

Do not do the island flap pushback before 4 to 5 years, and only in cases with good mobility and about 1.5 cm. gap between velum and pharyngeal wall.

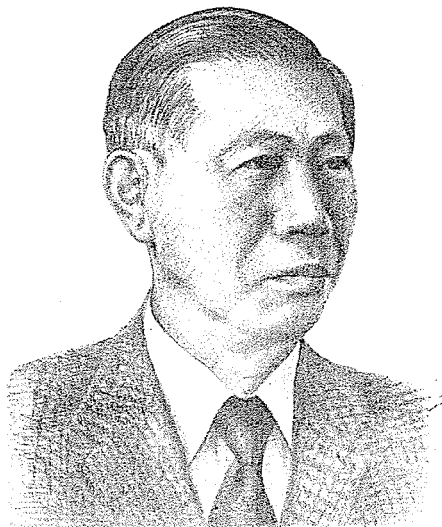
EVEN IN THE HORSE'S MOUTH

Closing the cleft palate in the horse has been difficult (Kendrick, 1950; Batstone, 1966; Stickle, Gable and Braden, 1973). In 1975 R. S. Jones, D. O. Maisels, J. J. De Geurs and B. B. J. Lovius of Liverpool described cleft palate closure in three horses, facilitating the difficult exposure by mandibular symphysiotomy. They noted:

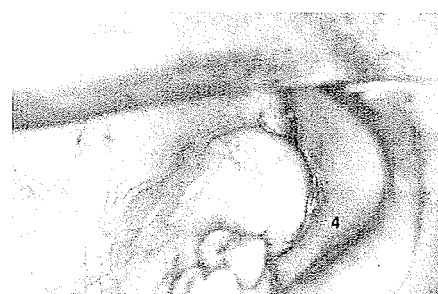
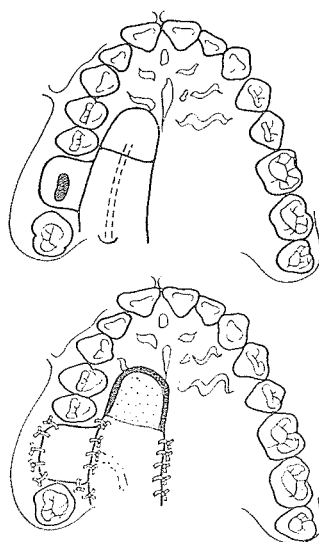
While simple paring and suturing will enable one to close clefts affecting the soft palate only, more extensive defects reaching forward into the hard palate demand more sophisticated procedures. These include raising flaps of mucoperiosteum from the hard palate to permit closure of the oral layer, while repair of the nasal layer requires mobilization of the mucosa, use of flaps from the vomer and occasionally even island flaps of oral mucosa as well (Millard 1962).

ALSO USEFUL AGAINST FISTULAE

In 1972 S. Takahashi of Tokyo sent photographic records of his use of the island flap for an oroantral fistula, showing: (1) closure of the antral side, (2) dissection of bundle, (3) completed operation, (4) result two months postoperatively.

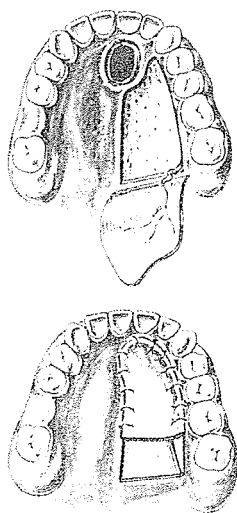


Sbojiro Takahasbi

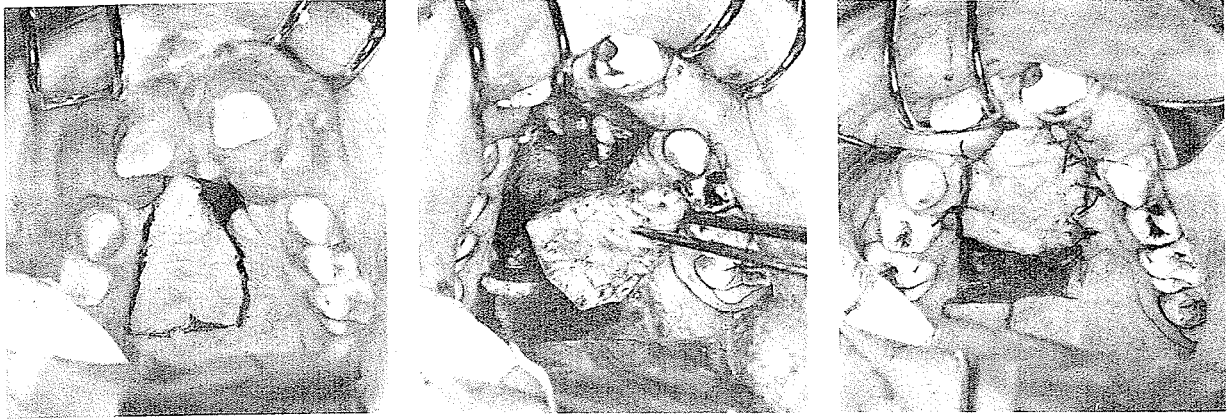


In 1977 Takahashi wrote:

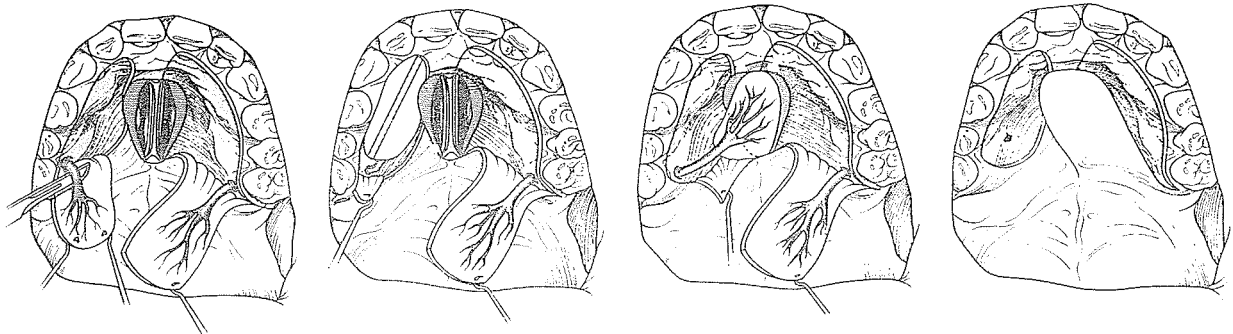
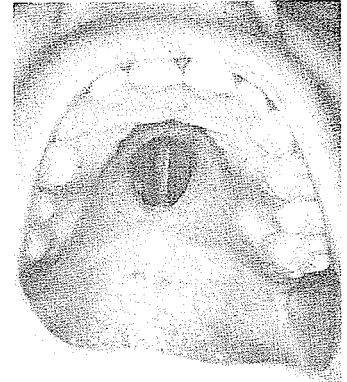
The island flap of the palate is still used to close oroantral perforations in our clinic. Raw surface in the hard palate is smaller with the island flap than with the usual palatal flap method and the folding occurs at the lesser curvature of the palatal flap.



In one of his sections in the 1973 German book of clefts edited by Schuchardt, Steinhardt and Schwenzer, Werner Widmaier of Stuttgart presented diagrams of the use of the muco-periosteal island flap by forward advancement for closure of an anterior central hard palate fistula. There was minimal local tissue available otherwise for occluding this hole. Excellent photographs of a representative case demonstrated the effectiveness of the principle clearly.



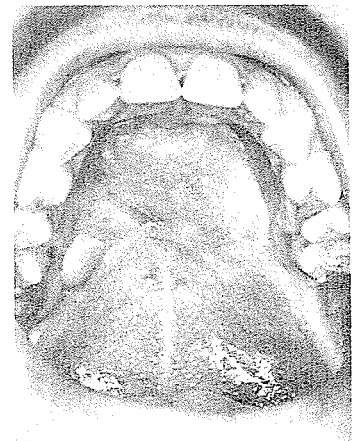
In 1974 in the *British Journal of Plastic Surgery*, D. C. Herbert of Liverpool presented a variation in the use of the island flap for the closure of a hard palate fistula measuring 3.0 cm. by 2.3 cm. An island flap was taken from the right side and an oblique furrow made on its buccal aspect in order to present a raw surface to the vomer. A mucoperiosteal flap from the left side was used for the second-layer closure.

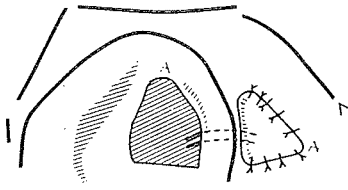


Herbert noted:

It might be possible to close even larger fistulas by using mucoperiosteal island flaps from both sides of the fistula and placing them side by side in the nasal layer. Cover could be provided by a free graft or a tongue flap. In this way, it might be possible to close fistulas which involve as much as two-thirds of the area of the hard palate.

In 1974 in the *British Journal of Oral Surgery*, D. Henderson of Canniesburn Hospital, Glasgow, designed an interesting modification in the use of the island flap principle in closure of lateral oroantral fistulae.





If the fistula is placed further laterally, and therefore at a higher level in the buccal sulcus, the margin of the island will no longer coincide with the periphery of the excised fistula, and an intermediate bridge of mucosa will remain along the alveolar crest. In these circumstances, excision of the intervening bridge would result in unnecessary loss of tissue. Instead, it should be raised from the underlying bone (if necessary, a little of the bone itself can be removed) to allow the island to be tunneled underneath the mucoperiosteum to appear in the buccal defect. Provided the original distal margin of the flap is undermined, the total periphery of the island can be gently drawn underneath the mucosal bridge and sutured round its circumference to the edges of the fistula. The bony funnel in which the greater palatine artery lies after its emergence from the greater palatine foramen may be enlarged laterally to increase the degree of upward and lateral movement of the nutrient pedicle, thus avoiding any threatening tension on the artery. This technique makes available a considerable hunk of well-nourished tissue for closure of the fistula without reducing the depth of the sulcus and without creating a bulge of soft tissue in the palate. After secondary epithelialization of the palatal defect, a very normal denture-bearing area is obtained. This may commend the method in some edentulous cases in preference to the traditional buccal advancement and palatal rotational flaps.



Fritz von Brosch

FIRST PALATE ISLAND FLAP

Now comes the punch line! In 1977 a reference by Worthington called attention to a German paper which, after translation, revealed that as early as 1939 Fritz von Brosch of Hamburg, a general surgeon who had become interested in oral surgery, described a mucoperiosteal flap based on a greater palatine neurovascular bundle, which he used for oral closure of "perforations in the area of alveolar +5 and +6." This flap was condemned by Fröhlich in 1948 because of "extensive isolation of the vessels" with "the peril of thrombosis and the danger of manipulation" only withstood by larger vessels. Such criticism frightened other surgeons away from accepting the method. In 1950 Brosch defended this mobilized palatal flap based on a neurovascular pedicle, explaining that it could rotate in a wide radius without the usual kinks and wrinkles of a standard mucoperiosteal flap and could be stretched to greater length to reach alveolar fistulae

inaccessible to the standard flap. It is true that Brosch did not turn the flap over or use it for nasal lengthening in cleft palate, but he was the first to use the island flap principle in the palate area!