

## 37. *Superior Versus Inferior Base*

THE debate over the merits of the inferior versus the superior base of a posterior pharyngeal flap has been violent and will continue to rage, even to the point of hyponasality. Schoenborn started with an inferior base but later switched to the superior one. The two Irishmen Conway and Moran, who were always fighting over something, took opposite sides on the base of a pharyngeal flap, Conway preferring the inferior base, claiming it was easier to develop and attach, while Moran championed the superior base, boasting fewer middle ear complications and easier control of postoperative bleeding. Before and since, surgeons have lined up on one side or the other. In general, the inferior base is considered easier to attach, while the superior base is touted as giving a larger flap more effective in speech improvement.

Then there are those surgeons, like Skoog, who feel that the position of the base makes no difference. In a 1965 retrospective study of 82 patients (49 flaps superiorly based, 33 inferiorly based), Skoog found it difficult to tell which was which. In 1970 M. Hamlen of Toronto reported a retrospective study of 91 patients with pharyngeal flaps (64 superiorly based and 27 inferiorly based). He was unable to demonstrate any significant difference in short- or long-term results. According to Yules and Chase:

More centers seem to be switching to superiorly based flaps—especially in difficult cases.

Fára and Vele noted in 1972:

Two autopsies, six biopsies and 154 electromyographies were the basis for a biological assessment of primary pharyngeal flaps, both superior- and inferior-based. It was determined that the inferior-based flap preserved its muscle content in a better state than did the superior-based flap, the latter demonstrating a greater degree of muscle atrophy and fibrosis. Nevertheless, the superior-based flap provided for far superior dynamic palato-pharyngeal closure than did the inferior-based flap, provided the patient has a functional nasopharyngeal musculature.

In 1972 Whitaker, Randall, Graham, Hamilton and Winchester of Philadelphia compared superiorly and inferiorly based posterior pharyngeal flaps. Seventeen superiorly based flaps were placed high on the nasal side of the soft palate. Eighteen inferiorly based flaps were inserted on the oral side, well up into the muscular part of the palate with a turnover flap of mucosa to line the raw side. A randomized evaluation of 35 patients with velopharyngeal incompetence, who had posterior pharyngeal flaps applied during 1966 through 1971, revealed 17 percent with residual "slight" incompetence but 97 percent with normal speech or with "slight" distortions. The authors stated:

There were no significant differences between superiorly and inferiorly based flaps in postoperative speech, hearing acuity, short and long term complications or length of hospital stay. Sex of the individual and extent of the cleft also did not affect the outcome. From this data it would appear that anatomic or technical considerations are therefore the only relevant factors in deciding on whether to do a superiorly or inferiorly based posterior pharyngeal flap.

In 1973 Randall, for Grabb and Smith, stated:

*inferiorly  
based flap  
limited by  
adenoids!*

*The inferiorly based posterior pharyngeal flap* is constructed more easily than the superiorly based flap. It has the advantages of acting somewhat as a sounding board to direct the airstream into the mouth, it may well be located at a level where the greatest amount of lateral pharyngeal wall motion takes place, its construction does not require opening the soft palate repair, and it lends itself well to secondary procedures which may be needed to make the lateral openings larger or smaller.

*The superiorly based posterior pharyngeal flap*, on the other hand, can be raised in greater length and can bridge a larger gap. . . . Its base is located nearer the usual site of velopharyngeal closure, and as it contracts it tends to

pull the palate in this direction. To attach such a flap usually requires reopening the soft palate repair. . . . It is often difficult, even on x-ray examination, to tell the difference between superiorly and inferiorly based flaps, as each tends to approach the same point during the healing process. . . . Accordingly, my preference is usually for the inferiorly based flap, and particularly if exposure is difficult, if the patient is in poor condition, or if the palate is so mobile. . . . On the other hand, if the space to be bridged is great, a superiorly based flap must be used, or the palate would have to be lengthened at the same operation.

In 1976, at the American Cleft Palate Association meeting in San Francisco, P. Randall, with Whitaker, Noone and Jones, "rehashed" this old argument under the title "The Case for the Inferiorly Based Posterior Pharyngeal Flap." They did note that as the use of the inferiorly based flap is easier, exposure more satisfactory and time of operation shorter, it was preferred

in patients with jaw deformities such as those with Treacher Collins syndrome or with Pierre Robin anomaly . . . also . . . poor operative risks . . . and poorly nourished.

Randall gave the bottom line:

If there is no demonstrable difference and some reasons pro or con, then why throw one of them away?

In 1975 Ralph Blocksma, with Leuz and Mellerstig, of Grand Rapids, Michigan, reported conservative closure of the palate with the use of mucoperiosteal flaps. The palate was closed at 18 to 24 months with a modified von Langenbeck procedure. The hard palate closure is delayed until 5 years of age. These authors reported 100 conservative closures and admitted:

Pharyngeal flaps were required in 49 of them, but these flaps caused few problems.

They expressed preference for broad, superiorly based pharyngeal flaps and obtained a large area of attachment on the nasal side of the soft palate, leaving virtually no raw area.

In 1977 Bengt Nylén of Stockholm stated his preference for the superiorly based flap, citing more tissue available and safer hemostasis as the donor area is in view and can be controlled under direct vision postoperatively, if necessary.

## IMPORTANCE OF THE LEVEL OF THE BASE

Whether the base was superior or inferior did not seem to matter as much as the height of the actual base itself.

Owsley and Blackfield in 1965, Skoog in 1965, and Weber, Chase and Jobe in 1970 all emphasized the importance of maintaining the upward-posterior vector of motion of the soft palate when attaching a pharyngeal flap. The low pharyngeal flap, attached at the posterior margin of the soft palate, produces traction in an inferior or straight posterior direction and may actually restrict normal palate elevation. In 1977, at a Cleft Palate Symposium in Chicago, John Owsley recalled that in the 60's a review of 21 posterior pharyngeal flaps revealed four good speech results. The contracture of the flap and the donor area had ended with inferiorly or superiorly based flaps looking the same and showing the same downward tethering. Thus, he raised his wide flap, based higher, to an optimal position well above Passavant's pad and advanced it to the hard palate and mended levator muscles with improvement in speech to 50 percent normal and 30 percent acceptable.

## DIRECTIONS OF CONTRACTURE

Although I use both inferior and superior bases, my preference has always been for the superior base. There seems to be a better donor area in infants and children with less problem of adenoid tissue. There is more natural flow of the flap to the superior nasal surface of the velum. I do not find it necessary to open the soft palate. Any contracture of whatever raw surface remains on the underbelly of the flap will tend to lift the palate up toward the normal speech contact point in the pharynx, rather than drag it downward.

## DONOR AREA CONTRACTURE

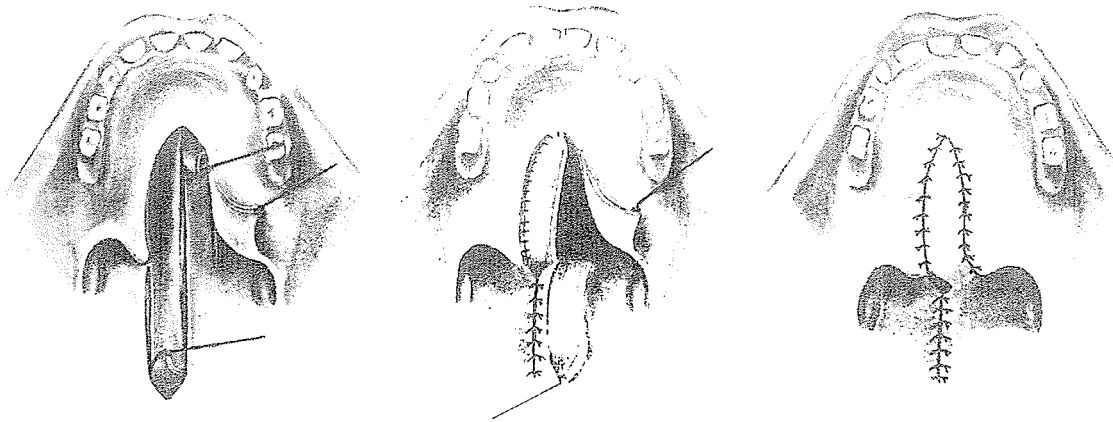
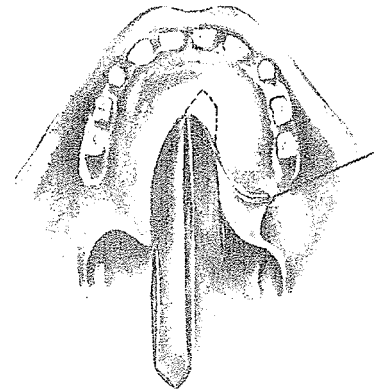
Of course, the donor area also influences the eventual position of the base of the flap. Most surgeons close the pharyngeal donor area for hemostasis, and most initial donor area closures open and

heal by granulation and scar contracture. It is interesting that the contracture of the donor area pulls in the opposite direction to the raw area of the flap but in a lesser degree. The donor area scar pulls upward with an inferiorly based flap and downward with a superiorly based flap.



### BOTH BASES

In compromise or in spite, in 1961 I designed a procedure using both superiorly and inferiorly based flaps simultaneously. The reasoning was basic. In wide clefts the insertion of a pharyngeal flap in the nasal or oral side relieves the tension of closure in only one plane. The overall tightness of a waistcoat buttoned over an obese belly will show little relief with but one good gusset in either the covering cloth or the lining if the other maintains its original dimension. Thus a vertical Z of two flaps was advocated to provide both cover and lining of a wedge to be inserted into the cleft to reduce the side-to-side tightness ordinarily present after closure of wide clefts. An important factor in this double design called for both bases to be set at the same point of potential contact between the velum and the pharyngeal wall at the time of levator action.



Thus, a vertical incision in the midline of the posterior pharyngeal wall allowed a flap to be taken on either side of it with both bases placed side by side at the midpoint, which in turn was set at the potential velar contact point during action of the levator muscle. The flap with a superior base was turned over for

nasal lining and the flap with an inferior base, composed of mucosa and varying degrees of adenoid tissue dissected with care, supplied cover on the oral side. This double flap method was used in two boys, 6 and 9 years of age, who had minimal adenoid tissue.

Since the development of the island flap, there has not been a need for this rather complicated procedure. Yet if the method were to be used today, the flaps which were originally narrower than necessary would be taken somewhat wider. In fact, Kapetansky's later modification of the double flap principle with the flap bases turned more laterally in the hope of preserving at least one nerve is preferred.