

# Prosthetics as a Diagnostic Aid in Pharyngeal Flap Surgery

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The multidimensional or team approach to the management of the cleft palate patient undoubtedly has been an important factor in the increased effectiveness of treatment procedures. A significant outgrowth of this coordinated effort has been the opportunity for increased communication among the various disciplines. This more frequent contact has widened the horizon of each clinician and has developed a greater understanding of the facets and interactions of these therapies. In turn, it has been found that the techniques of one specialty may sometimes be applied to problems in the area of another specialty. Thus the uses of certain clinical procedures have emerged in new forms.

In particular, surgery and prosthetics have progressed from the intransigence of extremists toward a more productive relationship conducive to optimum patient care. This mutual assistance can be especially effective when secondary surgical procedures on the palate are contemplated.

In the past few years pharyngeal flap procedures have been used increasingly in those patients requiring additional velopharyngeal valving. As with most techniques in general use, certain limitations and questions develop. The indications and contra-indications for pharyngeal flaps are decisive in most instances. However, there are borderline cases in which the potential benefit of additional valving must be assessed in the light of certain anatomical, physiological, and psycho-social inadequacies. In such situations the prosthodontist can sometimes contribute to the surgical decision by developing a temporary prosthetic device in order to produce obturation in the velopharyngeal area. This, in effect, can permit clinical evaluation of the possible improvement in voice quality which might be expected from the pharyngeal flap operation per se.

## Indications

At the University of California Cleft Palate Clinic, these diagnostic aids were utilized in 14 patients who manifested some form of velopharyngeal incompetence. In these particular patients, pharyngeal flaps were contemplated.

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plated with some reservation. Such an approach might be indicated in the following circumstances:

a. Patients whose age, health, or previous surgical experience make the prognosis questionable.

b. Patients whose soft palate and/or pharyngeal musculature has very limited, if any, mobility. In the Clinic, evaluation of the results of pharyngeal flap procedures has indicated that improvement in speech is most apparent in those patients who pre-operatively exhibited appreciable palatal and/or pharyngeal wall mobility.

c. Patients whose soft palates have mobility but are thin, scarred, or extremely short. These inadequacies may reduce the potential effectiveness of the pharyngeal flap procedure.

d. Patients with limited intelligence levels. It has been the experience of the University of California plastic surgery team, headed by Dr. Harry M. Blackfield, that these patients often have difficulty in tolerating anesthetics and may regress developmentally. In addition, they may heal poorly following surgery. Finally, their limited capabilities seem to restrict potential improvement to a minimal level.

e. Patients who are unwilling to undergo surgery without some indication of improvement which may be expected in voice quality. This group also includes affected children whose parents are reluctant to permit surgery.

f. Patients who have had pharyngeal flap surgery which resulted in insufficient closure due to the anatomical and physiological conditions in the particular individual. The surgical team may have suggested a trial appliance in order to ascertain the effect of additional obturation. In cases in which the obturation produces significant improvement and further surgery is not indicated, a permanent obturator may be placed on both sides of the flap. This extension may then be made an integral part of the patient's existing denture.

g. Patients whose palatal and pharyngeal musculature has been affected by bulbar poliomyelitis. Temporary obturation may indicate the potential effectiveness of the pharyngeal flap procedure in these instances.

h. Patients whose voice quality is acceptable in controlled conditions, such as in a speech class, but who in spontaneous or connected speech exhibit rhinolalia. Often these individuals have had prolonged periods of intensive speech therapy. Cinefluorographic examination may demonstrate a "near-closure" on certain sounds, but not on others. Apparently speech therapy has reached a plateau which cannot be transcended.

Experience indicates that in these above-enumerated cases a temporary prosthetic speech appliance can be of diagnostic value. As compared to surgery, one of the advantages of a prosthetic device is the fact that it can be removed and discarded, should it prove ineffective. However, construction of the conventional speech appliance is a time-consuming and expensive procedure, and the practicability for temporary use only is economi-

cally questionable. Therefore, simple and inexpensive appliances are constructed which are worn by the patient for only a short period of time for diagnostic purposes.

### Technique

Usually an appointment of approximately two hours is used for the entire procedure. The results are recorded cinefluorographically and/or on tape and are evaluated by the plastic surgeon, speech pathologist, and prosthodontist.

These appliances can be constructed by several methods. The palatal and velar sections are varied, dependent upon the given oral conditions. If the patient wears a removable appliance or retainer, this is used as the vehicle for the obturator. When no appliance is worn, the palatal section can be constructed from one of the rapidly self-curing plastic materials.

If the soft palate is relatively short, an impression is made for construction of the palatal and velar segments by adding a baseplate extension to a stock tray. The soft palate is then traversed by means of a plastic extension or by two wires of 22 to 26 gauge, dependent on the oral structures. The plastic extension or wires are constructed on the model and adjusted in the mouth. The two wires are bent superiorly to the approximate level of normal closure of the velopharyngeal port.

The obturator is adapted by the usual technique, using dental compound materials followed by a low-fusing mouth temperature wax. During this procedure, topical anesthetics and mild sedatives may be used when deemed necessary.

For patients with palates of relatively normal length, the two following procedures may be used.

The first method is a variation of the technique reported by Gibbons and Bloomer (2). An attempt is made to displace the soft palate superiorly by means of compound added to the acrylic velar section. However, without the heavy clasping which is omitted to save time and reduce expense, retention of the appliance has proved difficult. To compensate for the lack of clasping, bite blocks are added to elevate the soft palate when the patient closes into occlusal guides. However, the open bite together with the articulatory distortions induced by the appliance preclude evaluation of the potential speech improvement. Hence this technique was considered unacceptable as a one-appointment quick diagnostic aid for the purpose stated.

In the second approach, the technique described by Fletcher, *et al.* (1) is employed. The contour and position of the two wires and the pre-shaped bulb are developed from intraoral measurements and lateral cephalometric films. They are then attached to the palatal section, which has been previously constructed from the routine impression.

Because these temporary appliances are not worn by the patient sufficiently long to permit adjustment to the changed palatal contour, they usu-

ally produce articulatory defects. These transitory deviations must be discounted in evaluating the change in voice quality. If the evaluation of the speech indicates that the additional valving effects an appreciable improvement in speech, then in most cases a pharyngeal flap procedure is planned by the surgeon. However, there are instances in which the demonstrable improvement is not sufficient to warrant surgery because of the aforementioned limitations presented by the patient. In these individuals, prosthetic treatment may be instituted and a permanent speech appliance constructed.

### Summary

The decision regarding pharyngeal flap surgery can usually be made by conventional diagnostic methods. In borderline circumstances, however, the prosthodontist may be of assistance in the treatment plan by constructing a relatively simple and inexpensive appliance which serves as one more tool in the diagnostic armamentarium.

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### References

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