

THE INDICATIONS FOR A SPEECH-AID PROSTHESIS IN CLEFT PALATE HABILITATION

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Cleft lip and palate habilitation began as an individual enterprise. Development of knowledge of the nature of the defect and of the remedial measures that were helpful in fitting these handicapped to a more normal participation in community life attracted additional specialists to aid in the habilitation. The need for communication and understanding among these interested disciplines stimulated a rapid growth of cleft palate teams during the past fifteen years. The need for this concerted effort is real. The specialists comprising the cleft palate teams differ in their training and experience leading to the development of varying philosophies.

In our own group, the surgeon plays a dominant role because we believe that the reconstruction of a cleft palate is primarily a surgical challenge and an area where competent surgeons are capable of offering even more services to these handicapped than are universally practiced. Along with this philosophy, we maintain a group enterprise by professional people necessary in a complete habilitation program. In many areas of the world, trained personnel are not available to assist the cleft palate patient in all of his needs and the surgeon has been forced to devise ingenious and occasionally extensive surgical procedures.

Cleft palate surgery is not a stereotyped exercise, but a service demanding an assessment of all the factors presented by each patient and a reparative surgical plan based on proven principles. The majority of cleft palates can be reconstructed by trained surgeons to enable the patient to develop acceptable speech.

Many clefts of the hard palate can be closed by a vomer flap (Veau, Ivy) and clefts of the soft palate by median suture with a good anatomical and functional result. The wide cleft and the short palate demand additional attention. Additional length may be gained by the Dorrance or a V-Y type repositioning operation. The raw nasal surface may be covered with a skin graft (Dorrance), or nasal mucosa (Cronin), or an island flap of palatal mucosa (Millard). The incompetent palato-pharyngeal valve can be augmented by a pharyngeal flap either as a primary (Stark) or secondary procedure. The need for additional tissue in a wide cleft can be satisfied by single or double regional flaps.

Associated with these surgical advantages now available to the cleft palate patient, there has also been a need for cleft palate prostheses. The trained prosthodontist has methods at his command to assist both the surgeon and the patient. A mutual understanding and restraint develops among the specialists in a well organized team to the benefit of the patient.

INDICATIONS FOR A PROSTHESIS IN UNOPERATED PALATES

There apparently are some situations in which a prosthesis is the physical restoration of choice and this opinion should be expressed by the group charged with the habilitation of the cleft palate patient.

1. *A wide cleft with a deficient soft palate*

Some clefts of this type do not lend themselves to a surgical repair by means of local



Fig. 1, Case 1. A wide cleft of the soft and hard palate with insufficient local tissue and absence of vomer bone. This case is a candidate for prosthesis.



Fig. 2, Case 1. Prosthesis in position.

flaps. (Fig. 1, 2). We believe a prosthesis is preferable in these cases to the more time-consuming remote pedicle flaps. Many of the patients need a prosthesis to restore missing dental units and the distant tissue provides only an adynamic mass in the palate.

2. A wide cleft of the hard palate

Occasionally, and particularly in bilateral clefts, the vomer may be high and the cleft of the hard palate wide so that a surgical repair may produce a low vaulted palate. It may be possible to close the soft palate with the aid of local flaps and restore the hard palate with a prosthesis. A situation is created similar to the method once advocated by Gillies and Fry. Or the primary repair of the velum may create a more favorable spatial arrangement for subsequent surgery on the hard palate (Slaughter-Pruzansky).

3. Neuro-muscular deficit of the soft palate and pharynx

The repair of this palate would not be conducive to the development of good speech. It is difficult to create and maintain a pharyngeal flap large enough to produce competent palato-pharyngeal valving without obstructing the nasal airway in the presence of a neurogenic deficit of the critical muscles. A pharyngeal flap serves best when it is surrounded by a dynamic musculature. When this situation does not exist, the pharyn-

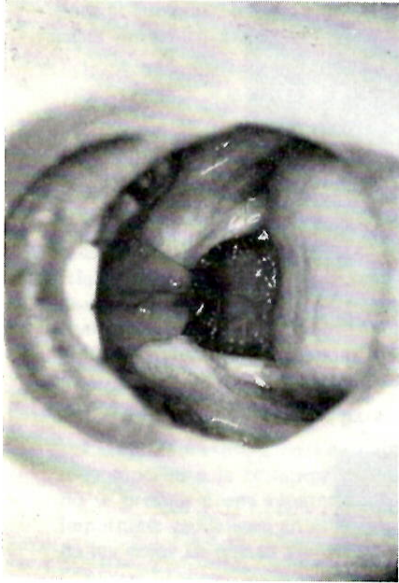


Fig. 4, Case 2. Prosthesis in position.



Fig. 6, Case 3. The presence of pseudo-hemophilia in this cleft palate patient will justify the contraindication to surgery.

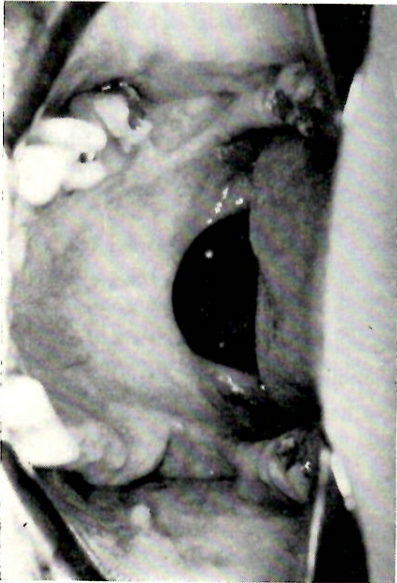


Fig. 3, Case 2. In this patient the prosthesis serves as a temporary physical modality to stimulate lateral and posterior pharyngeal wall activities before the palatal closure is attempted.



Fig. 5, Case 2. Notice the amount of mobility after six months of the insertion of the prosthesis. The palate was operated 12 months after the insertion of the prosthesis with excellent speech result.

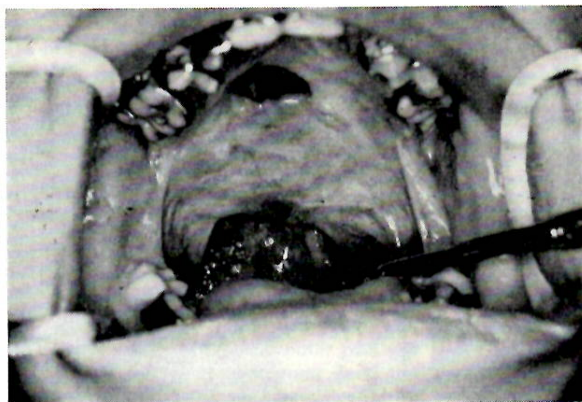


Fig. 7, Case 4. The prosthesis serves as a temporary physical modality to stimulate lateral and posterior wall activities on the lateral side of this patient's pharyngeal flap.



Fig. 8, Case 4. Notice the V shape form of the pharyngeal section of the prosthesis.

geal section of a speech-aid prosthesis may serve better in reducing nasality and nasal emission. The prosthesis can also act as a physical therapy modality providing a resistive mass for the muscles to act against (Fig. 3, 4, 5). Should muscle function improve, definitive surgical measures can then be contemplated.

4. Delayed surgery

When surgery is delayed for medical reasons or when the surgeon prefers to repair the palate at a later age (Limberg) the cleft palate may be temporarily closed with a speech-aid prosthesis (Fig. 6).

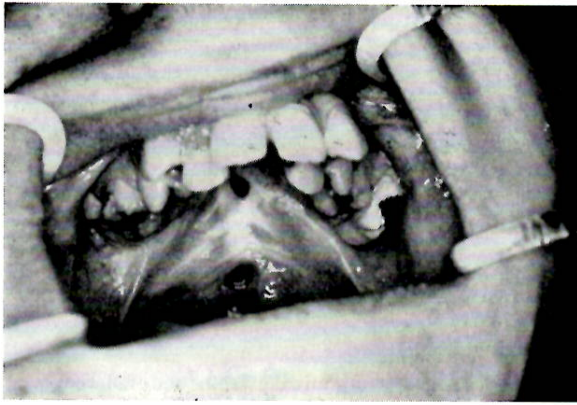


Fig. 9, Case 5. Number of surgical procedures to palate — seven. Soft palate is short, heavily scarred, has no mobility, two perforations remain in the palate.

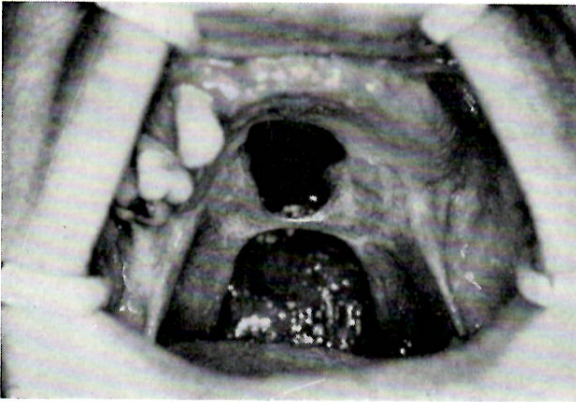


Fig. 10, Case 6. Large perforation of the palate still exists after three surgical procedures. This patient is a candidate for a prosthesis.



Fig. 11, Case 7. Number of palatal operations — 20. Result, a low vaulted, contracted, scarred and incompetent palate.

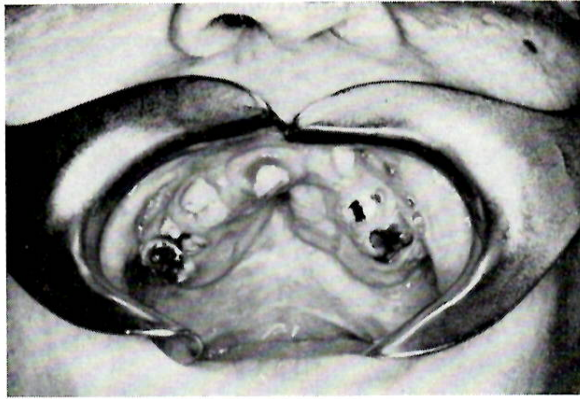


Fig. 12, Case 8. Partially erupted teeth, missing teeth and failure of normal vertical and lateral growth and development of the maxilla are often seen in cleft palate patients. This 19-year-old postoperative cleft lip and palate subject had the above anomalies which gave her a profile of a patient without any dentition. The soft palate lengths and mobilities were satisfactory. Her chewing ability was poor. No occlusal contact was made between the maxillary and mandibular teeth. After gingivectomies and crowning of the remaining teeth a full denture prosthesis supported by the natural teeth was constructed.

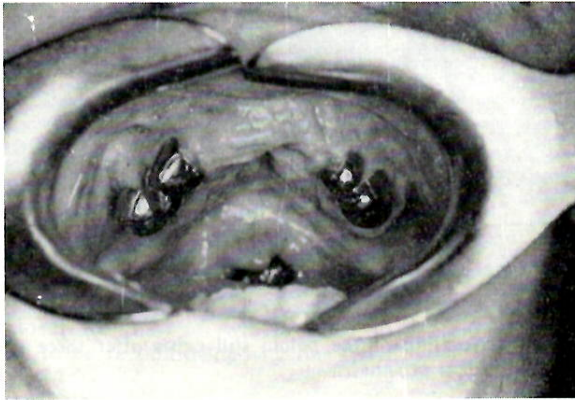


Fig. 13, Case 8. Several teeth were removed and remaining teeth were crowned.

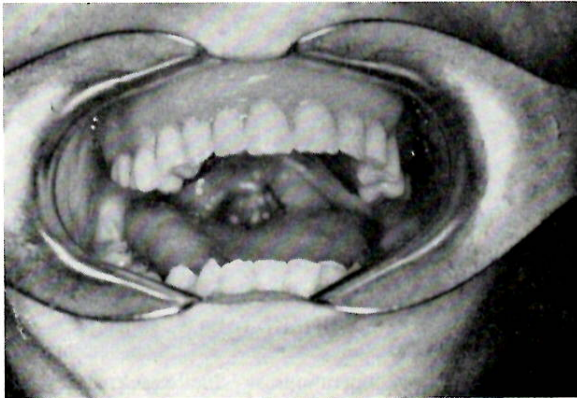


Fig. 14, Case 8. Prosthesis in position.

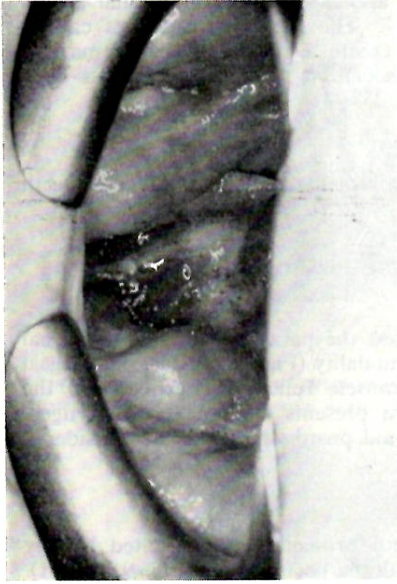


Fig. 17, Case 9. Edentulous cleft palate patients can be treated very satisfactorily with prosthesis by the prosthodontist with adequate experience and training in the cleft palate field.

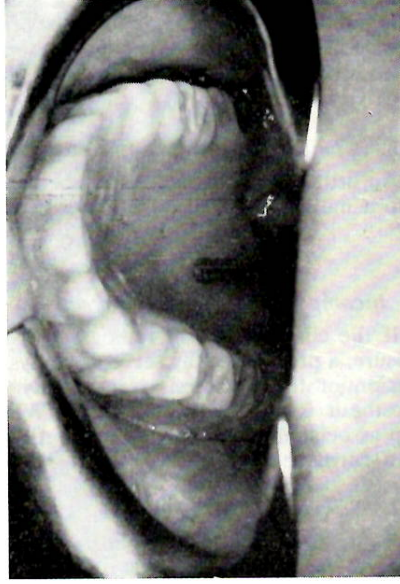


Fig. 18, Case 9. Prosthesis in position.

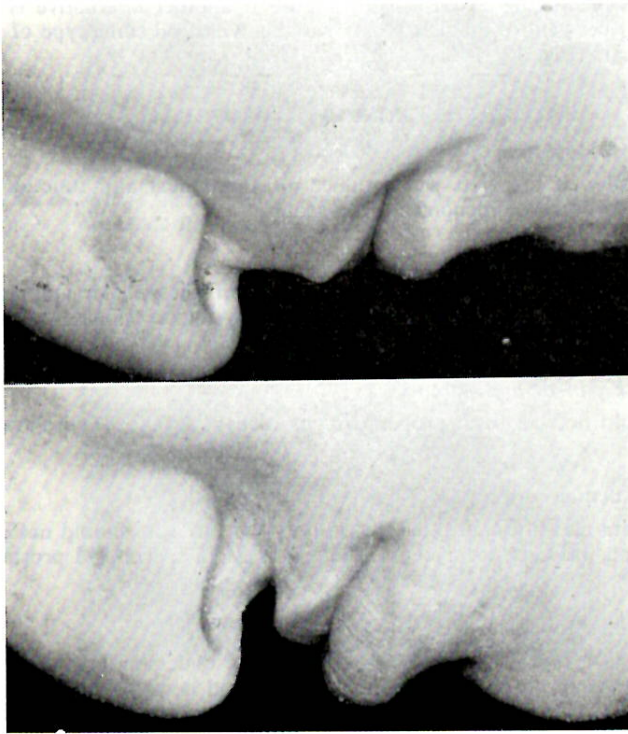


Fig. 15

Fig. 15, Case 8. Before profile without prosthesis.

Fig. 16

Fig. 16, Case 8. After profile with prosthesis which also acts as a plumper.

5. *Expansion prosthesis to improve spatial relations*

An expansion prosthesis may be used to restore and maintain more normal spatial relations of the maxillary segments prior to surgery. The maxillary segments can be gradually separated by an expansion prosthesis to create a space for the premaxilla, or to stabilize the parts in a normal position in association with an autogenous bone graft.

6. *Combined prosthesis and orthodontic appliance*

An orthodontic appliance may be combined with a prosthesis to move malposed teeth into a more favorable alignment.

INDICATIONS FOR A PROSTHESIS IN OPERATED PALATES

1. *Incompetent palato-pharyngeal mechanism*

If the clinical and cineradiographic analyses suggest the patient is near a functional closure, a prosthesis may serve as a physical therapy modality (Fig. 7, 8). The pharyngeal section of the prosthesis is gradually reduced as muscle function improves and the prosthesis is eventually discarded. When the patient presents a large velo-pharyngeal gap associated with a neurogenic deficit, the speech-aid prosthesis should be considered as a permanent service.

2. *Surgical failures*

A prosthesis should be considered when a patient presents a low vaulted heavily scarred, contracted palate or one with a large or multiple perforations (Fig. 9, 10, 11). Plastic surgeons today are not confronted with so many failures in cleft palate surgery because of the rapid progress made in surgery during the past twenty-five years. The trained surgeon can now predict with greater accuracy the possible success or failure of an operation and is inclined to avoid a likely failure if another alternative is available. Approximately sixty per cent of all cleft palate patients will need some type of prosthesis by the age of 30 years (Fig. 12, 16).

CONTRA-INDICATIONS TO A PROSTHESIS

1. *A surgical repair is feasible*

If a surgical closure of the cleft will produce an anatomical and functional repair, that is the method to be recommended by the group.

2. *Mental retardation*

A retarded patient is not a good candidate for a prosthesis. An appliance needs reasonable personal care and a retarded individual may not be capable of proper self care.

3. *Uncooperative patient and parents*

A prosthesis would not be given proper care in such a situation and should not be suggested.

4. *Uncontrolled dental caries*

If caries is rampant and not controlled, a prosthesis of any sort should not be recommended. Edentulism, itself, is not a contra-indication for a speech aid prosthesis (Fig. 17, 18).

5. *Lack of a trained prosthodontist*

The construction of a functional prosthesis demands an understanding of the problem without which a satisfactory appliance cannot be built and it would be better to resort to surgical ingenuity where experienced prosthetic help is unavailable.

It is the expressed opinion of this Clinic that a surgical repair of a cleft of the palate is far superior to restoration by means of a prosthesis. We also recognize that all patients do not lend themselves to a functional repair and so we believe that a prosthesis constitutes an important modality in the multi-disciplinary approach to cleft palate habilitation. Some of the cases for which a prosthesis is suggested are as follows:

1. A wide cleft of the palate with a deficiency of the soft palate.
2. A wide cleft of the hard palate with a high vomer.
3. A neuro-muscular deficit. A sphincteric velo-pharyngeal action may not be attained even with a pharyngoplasty if the deficit is marked.
4. Surgical failures.

The authors do not subscribe to the use of remote extra-oral flaps in cleft palate surgery because a prosthesis seems to be more considerate. We are of the opinion that cancer being related to such a prosthesis is quite remote. There has been no evidence of increased hearing loss in our patients wearing a prosthesis. A prosthesis should not be used in a patient not competent to care for the prosthesis or maintain proper hygiene.

Resumen

Indicaciones de una prótesis para facilitar el lenguaje en la rehabilitación de la fisura palatina

La opinión expresa de esta Clínica es que la reparación quirúrgica de la fisura palatina es muy superior a la restauración mediante prótesis. También admitimos que todos los pacientes no se prestan a una reparación funcional, por lo que creemos que la prótesis constituye una importante modalidad en el acceso multidisciplinario de la habilitación palatosquísica. Algunos de los casos en que se plantea la prótesis son los siguientes:

1. Una amplia fisura palatina con una deficiencia del paladar blando asociada a una nasofaringe relativamente amplia.
2. Una amplia fisura del paladar blando con vómer alto.
3. Un déficit neuromuscular. La acción esfinteriana velofaríngea no puede alcanzarse ni aun con faringoplastia si el déficit es marcado.
4. Fallos quirúrgicos.

Los autores no subscriben el empleo de colgajos extraorales distantes en la cirugía de la fisura palatina, ya que parece más aconsejable una prótesis. Creen también que la relación del cáncer con tal prótesis es muy remota. No existen pruebas de pérdida creciente de la audición en nuestros pacientes que usan prótesis. La prótesis no deberá usarse en enfermos incapaces de cuidarla y mantener la adecuada higiene.

Zusammenfassung

Die Indikationen für eine Prothese zur Erleichterung des Sprechens bei der Behandlung der Gaumenspalte

In dieser Klinik ist man der entschiedenen Meinung, daß die chirurgische Korrektur der Gaumenspalte der Behandlung mittels einer Prothese bei weitem vorzuziehen ist. Doch sind die Verfasser sich auch klar darüber, daß sich nicht alle Patienten für eine funktionelle Korrektur eignen; daher glauben sie, daß eine Prothese unter den verschiedenartigen Verfahren zur Gaumenspaltenkorrektur eine wichtige Modalität darstellt. Einige der Fälle, für die eine Prothese vorgeschlagen wird:

1. Breite Gaumenspalte mit Defekt des weichen Gaumens in Verbindung mit relativ großem Nasopharynx.
2. Breite Spalte des harten Gaumens mit hohem Pflugscharbein.
3. Neuromuskulärer Defekt. Wenn der Defekt ausgeprägt ist, kann nicht einmal durch Pharyngoplastik eine sphinkterartige velopharyngeale Funktion erzielt werden.
4. Mißglückte Operationen.

Die Verwendung entfernter extraoraler Lappen empfehlen die Verfasser bei Gaumenspaltenoperationen nicht, denn eine Prothese ist eine vorsichtigeren Maßnahme. Übrigens sind sie der Ansicht, daß Krebs mit solchen Prothesen nichts zu tun hat. Es gibt auch keine Beweise dafür, daß sich das Gehör von Patienten, die eine solche Prothese tragen, zunehmend verschlechtert. Eine Prothese soll nicht von einem Patienten getragen werden, der nicht imstande ist, sie zu pflegen und die entsprechenden hygienischen Forderungen zu erfüllen. Ein Expansionstyp der Prothese wird zur Stellungskorrektur verschobener Maxillarsegmente sowie vor und bei autogenen Knochentransplantationen in die Alveole verwendet.

Résumé

Les indications d'une prothèse pour aider la phonation dans le traitement de la division palatine

D'après l'expérience de cette clinique, l'uranoplastie est de loin supérieure à une restauration par prothèse. Nous reconnaissons aussi, que tous les malades ne se prêtent pas à une réparation fonctionnelle, de sorte que nous croyons qu'une prothèse constitue une modalité importante dans les multiples façons d'aborder le traitement de la division palatine. Quelques-uns des cas pour lesquels on propose une prothèse sont les suivants:

1. Une large division du palais avec une déficience du voile, associées à un nasopharynx relativement grand.
2. Une large division du palais dur avec un vomer élevé.
3. Une déficience neuro-musculaire. Si celle-ci est marquée, une action sphinctérienne du vélo-pharynx ne peut pas être obtenue, même avec une pharyngo-plastie.
4. Les échecs de la chirurgie.

Les auteurs ne souscrivent pas à l'utilisation dans la chirurgie du palais de lambeaux extra-oraux à distance, parce qu'une prothèse semble plus judicieuse. Ils sont aussi d'avis, que le développement d'un cancer en relation avec une telle prothèse est très peu probable. Il n'y a pas eu de preuve d'une augmentation de la surdité chez nos malades portant une prothèse. Il ne faudrait pas en utiliser chez des sujets inaptes à la porter ou à la maintenir dans une hygiène correcte.

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