CASE REPORT

Complete denture with pharyngeal bulb prosthesis

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SUMMARY

Velopharyngeal dysfunction is the inability of the soft palate to affect complete seal with the posterior or lateral pharyngeal walls. Rehabilitation of these patients with palatal defects is challenging for both surgical and prosthetic fields of dentistry. The development of sophisticated surgical techniques and procedures has greatly enhanced the rehabilitation of congenital or acquired palatal defects. However, some of these patients may present oral or systemic factors contraindicating surgical intervention. In addition, since total elimination of these defects surgically has not yet become a reality, there exists a patient population for whom non-surgical rehabilitation must be approached with the help of prosthesis and such prosthesis must restore the basic functions of mastication, deglutition and speech production. Here a non-surgical approach of rehabilitation of such defect is presented in the form of a case report of pharyngeal bulb prosthesis given for a patient with a soft palate defect.

BACKGROUND

Rehabilitation of velopharyngeal incompetence in patients with palatal defects is challenging for both surgical and prosthetic fields of dentistry. The development of sophisticated surgical techniques and procedures has greatly enhanced the confidence level and social acceptance of congenital or acquired palatal defect patients. However, some of these patients may present oral or systemic factors contraindicating surgical intervention. In addition, total elimination of such defects surgically has not yet become a reality; there exists a patient population for whom rehabilitation must be approached with the help of prosthesis.

CASE PRESENTATION

A 74-year-old completely edentulous male patient with velopharyngeal insufficiency owing to surgical excision of pleomorphic adenoma was referred to the department of prosthodontics (figure 1) with speech difficulty, hyper nasality and nasal reflux. Upon intraoral examination the defect size measured 1.5 cm×2 cm in diameter. It was found that the alveolar ridge, vestibular sulci and shape of the palate were suitable for a conventional complete denture or implant supported over denture. Owing to financial constraints the patient refused implant supported over denture treatment option, which was proposed for increasing the retention and stability of the prostheses. Hence conventional complete denture prosthesis with a pharyngeal bulb was considered to be the treatment of choice for this patient.

Figure 1 Intraoral view with soft palate defect.

INVESTIGATIONS

Before starting the procedure the patient was sent to a speech pathologist. A perceptual analysis rating scale¹ was administered for this patient to analyse his speech and pretreatment scores were recorded. Then at 1 month follow-up time the patient was referred again for perceptual analysis rating scale scoring by the speech pathologist. A marked improvement in the scores was obtained (table 1).

PERCEPTUAL ANALYSIS RATING SCALE**Articulation**

- ▶ 0 Normal
- ▶ 1 Mild misarticulation
- ▶ 2 Moderate misarticulation
- ▶ 3 Severe misarticulation

Resonance

- ▶ 0 Hyponasal resonances
- ▶ 1 Normal
- ▶ 2 Mild hypernasal resonance
- ▶ 3 Moderate hypernasal resonance
- ▶ 4 Severe hypernasal resonance

Nasal air emission

- ▶ 0 No nasal emission
- ▶ 1 Mild nasal air emission
- ▶ 2 Moderate nasal air emission
- ▶ 3 Severe nasal air emissions

Speech intelligibility

- ▶ 1 Intelligible
- ▶ 2 Listeners attention needed
- ▶ 3 Occasional repetitions of words required
- ▶ 4 Repetitions
- ▶ 5 Isolated words understood
- ▶ 6 Occasionally understood by others
- ▶ 7 Unintelligible

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Table 1 Comparison of speech outcome pretreatment and post-treatment

Speech outcome	Pretreatment	Post-treatment (after 1 month)
Articulation	Score-2	Score-1
Resonance	Score-2	Score-2
Nasal air emission	Score-3	Score-1
Speech intelligibility	Score-5	Score-1

TREATMENT

Conventional complete denture prostheses were fabricated using contemporary technique of complete denture fabrication. Thereafter, functional impression of the soft palate defect area was made using low fusing impression compound (figure 2). The patient was asked to move his head in a circular manner from side to side, to extend his head as far forward and backward as possible and to say 'ah' and swallow.² A 1 mm round orthodontic wire was attached to the posterior part of the upper prosthesis, this helped hold the compound in position during functional moulding. The final impression was made using medium viscosity polyvinyl siloxane impression material (figure 3). A denture with functional impression of the defect was seated on the master cast, and the defect area was added to the posterior part of the master cast to get a final cast for processing of the pharyngeal bulb (figure 4).

The acrylic pharyngeal bulb was processed from heat polymerising acrylic resin (figure 5). Definitive prostheses were delivered to the patient after making necessary adjustments (figure 6).

OUTCOME AND FOLLOW-UP

The patient was asked to drink water in the upward head position. No nasal reflux was observed indicating adequate velopharyngeal closure. Hyper nasality was reduced and the speech was noticeably improved. The patient was trained in oral hygiene and instructed in the specific care for the new prostheses. The patient was followed up at the first week and 1 month after the insertion of the prostheses. The patient was satisfied with the use of the prosthesis and also expressed his social and psychological satisfaction.

DISCUSSION

Prosthetic rehabilitation of the patients suffering from velopharyngeal deficits with obturator prostheses varies according to the location and nature of the defect or deficiency.³⁻⁶ There are

Figure 2 Functional impression of the soft palate defect area was made using green modelling plastic impression compound.

Figure 3 Final impression was made using medium viscosity vinyl polysiloxane impression material.

differences between obturator prostheses constructed for patients with developmental or congenital malformations of the soft palate, as compared with those constructed for patients with acquired defects.⁴⁻⁶ However, the objectives of the obturator are to provide the capability for the control of the nasal emission, inappropriate nasal resonance during speech and to prevent the leakage of material into the nasal passage during deglutition.^{3 7}

Achieving an effective retention by conventional prostheses for the edentulous patients with both hard and soft palate defects is very difficult, if not impossible.^{4 8 9} This is especially because of the weight of the prosthesis and the inability to obtain a border seal.¹⁰ Moreover, a complete denture may be contraindicated in the patients with irregular palate anatomy, shallow vestibular sulci or lower muscle attachments. Therefore, dental implants have great importance for such patients.¹¹ Since

Figure 4 Final cast showing soft palate defect.

Figure 5 Acrylic pharyngeal bulb attached to denture by 1 mm stainless steel wire.

in this case there was no hard palate defect, retention of conventional denture was not a problem. The only problem presented was during functioning of the soft palate.

The success of the soft palate defect prosthesis depends on the functional adaptation of the impression material.²⁻⁴ In the current case, modelling plastic impression compound was used in functional contouring of the soft palatal defect. Over this monophase vinyl polysiloxane impression material was added to make the final impression after applying tray adhesive.¹² Impression wax or zinc oxide eugenol impression paste may also be added to the compound surface to make the final impression.²⁻¹⁰ However, zinc oxide eugenol sets to a brittle solid and needs to be handled carefully. Life-threatening complications may also arise in case it is broken.

Learning points

- Speech disturbance affects people socially and psychologically.
- Patients with oral or systemic factors contraindicating surgical intervention for soft palatal defect closure are chief candidates for pharyngeal bulb prosthesis.
- Prosthetic treatment is a more conservative approach without much invasive procedure and should be considered in place or as an adjuvant to complete or partial surgical reconstruction.
- The retention of the complete denture is primarily essential for successful rehabilitations using pharyngeal obturator.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

Figure 6 Intraoral view of maxillary complete denture with pharyngeal bulb prosthesis.

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