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ORAL REHABILITATION OF A GERIATRIC PATIENT WITH VELOPHARYNGEAL INSUFFICIENCY: A CASE REPORT

Afeera Khan✉, Afsheen Akhtar, Tayyaba Saleem

Department of Prosthodontics, Islamabad Medical and Dental College, Islamabad- Pakistan

Address for correspondence:

Afeera Khan

Department of Prosthodontics, Islamabad Medical and Dental College, Islamabad- Pakistan

E-mail:

afeera.14@iideas.edu.pk

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ABSTRACT

The defect in the Velopharyngeal (VP) valve leads to problems in speech and swallowing. Such defects can be managed either by surgical means or palatal obturator. Fabrication of obturator in edentulous patients presents many challenges like lack of retention and support leading to functional compromise of a prosthesis. This case report describes the rehabilitation of a geriatric patient who was surgically treated for mucoepidermoid carcinoma of the hard and soft palate. After surgery, the patient complained of nasal regurgitation of food and hypernasal speech. A wrought wire in a zigzag shape was used to attach the pharyngeal obturator to the maxillary overdenture for better retention and support of the prosthesis.

Keywords: Denture; Mucoepidermoid Carcinoma; Mouth Rehabilitation; Mastication; Palatal Obturator; Soft Palate; Velopharyngeal Insufficiency.

INTRODUCTION

The Velopharyngeal (VP) mechanism is a normal physiological phenomenon that separates the oral cavity from the nasal cavity during speaking and swallowing.¹ VP dysfunctions have been categorized as either VP insufficiency, caused by structural abnormalities in the soft palate, or VP incompetency, caused by damage to the VP valve due to neurological impairment.²

Such defects pose an impact on the quality of life of an individual in terms of mental as well as physical form due to nasal regurgitation of food and hypernasal speech.³ These defects can be managed either by surgical reconstruction or with maxillofacial prosthesis i.e. pharyngeal obturator, for patients with limitations or unwillingness to undergo surgery.^{3,4}

The retention, support, and stability of a pharyngeal obturator is a primary challenge when rehabilitating such patients. This case report describes the prosthodontic rehabilitation of a geriatric patient who had undergone surgery for mucoepidermoid carcinoma of the hard and soft palate. The patient's VP valve defect was addressed with a maxillary overdenture and pharyngeal obturator.

CASE REPORT

A 75-year-old male patient reported to the prosthodontic department with complaints of nasal regurgi-

tation of food, incomprehensible speech, and difficulty in chewing after surgical excision of mucoepidermoid carcinoma of the oropharynx. After excision, the patient wore a surgical plate for 8 months but was unhappy with the prosthesis as it was loose and hindered comfortable swallowing.

On general physical and extra-oral examination, the patient was alert & conscious with no other significant clinical findings. He had a 4x4 cm surgical defect on the left side of the hard palate involving the uvula, indicating velopharyngeal insufficiency (figure 4). In the maxilla, residual ridge was Atwood order V, grossly carious teeth #11,12,13,16,21,22,23, and a labial undercut. In the mandible, the residual ridge was Atwood order IV posteriorly and Order V anteriorly, gingival recession around teeth #35 and #43, generalized inflamed marginal gingiva with bleeding on probing, and 3mm pocket depths as shown in figures 1a and 1b.

The patient's surgical plate was made of heat cure acrylic which was relined with tissue conditioner, plaque deposits, and overall under extended borders and also not covering palatal defect.

Based on history and examination, two treatment options were given for the maxilla i.e.; Implant-supported or tooth-supported overdenture with a pharyngeal obturator. The patient opted for later to avoid further surgical procedures and financial burden. For mandible tooth supported overdenture was planned.



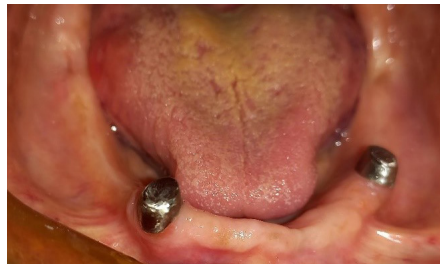
Figure 1a: Intra-oral features



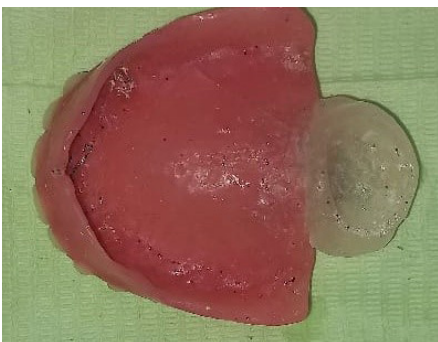
Figure 1b: Radiographic findings



Figures 2a and 2b. Wrought wire In a zig-zag shape is attached to the distal part of the surgical plate to hold the impression compound soft line and preliminary impression.



Figures 3a and 3b: Soft palate defect and metal copings on abutments



Figures 4a and 4b: Extraoral and intra-oral photographs of hollow obturator bulb in clear acrylic.

After evaluation of diagnostic casts, and clinical and radiographic examination it was

decided to extract teeth with poor prognosis i.e. #12,14,23,26,28,48 and remain-

ing teeth #11,13,22,24,35 and 43 were planned for endodontic treatment followed by metal copings on #13,24,35,43 while #11,#22 were reduced to gum level. To reduce the leverage forces on the dentures lingualised occlusal scheme was planned for better stability and function.

Informed consent was taken from the patient. A surgical plate was used as a tray for the primary impression. A 0.9 mm stainless steel wire in a zigzag manner was added on the posterior polished surface of the surgical plate to hold impression material in the defect region as shown in Figure 2a. The defect was recorded in functional form using impression compound while the patient was asked to move his head forward, backward, sideways, swallow water & say "ah ah". The remaining denture-bearing area was recorded in regular set alginate. For the lower arch, a pickup impression was taken using impression compound and alginate. Beading and boxing of impressions was done to obtain diagnostic casts using type III dental stone as shown in Figure 2b.

After taking the impression the wire was retained in the surgical plate to hold the temporary soft liner to cover the defect area till the time the definitive prosthesis was fabricated. Verbal and written Oral denture hygiene instructions were given to the patient.

For metal copings, abutments (#13,24,35,43) were reduced to a height of 2-3 mm in dome shape with chamfer cervical margins. After copings were cemented (Figures 3a and 3b), custom trays were fabricated and a secondary impression was recorded using greenstick & zinc oxide non-eugenol impression paste.

Maxillomandibular jaw relation and trial was done and overdentures were processed in heat cure acrylic. After the Insertion of dentures, a wire loop was added to the posterior polished surface of the upper overden-

ture, and a functional impression of soft palate defect was recorded with low-fusing Impression compound (type II).

Impression was boxed, poured and cast was fabricated. A hollow pharyngeal bulb was fabricated on a cast with chemically cured transparent acrylic (Figures 4a and 4b). The obturator was finished, polished, and relined with a long-term chair-side soft liner, and all the functional movements were performed again intraorally. After the insertion of maxillary overdenture with a palatal obturator, the patient was able to swallow food without nasal regurgitation and an improved speech. Oral and denture hygiene reinforcement was done.

On follow-up appointment after 1 week, the patient was evaluated for masticatory function, swallowing, and speech improvement. The patient was asked to drink water and biscuit to check the regurgitation, counting from 60-70, and words starting from "M" to check speech. These functions were significantly improved. On the second follow-up after 2 weeks, the patient complained of pain in the right side of the neck, on clinical examination there was hard swelling on this side, and was referred to his oncologist. After 03 months of follow-up, there was a recurrence of muco epidermoid carcinoma, the previous soft liner was removed as it became hard and replaced by chair side long-term soft liner.

■ DISCUSSION

This case report describes the oral rehabilitation of a geriatric patient having velopharyngeal insufficiency with a pharyngeal obturator. Size, position, and nature of VP insufficiency are important factors to be considered when designing an obturator to provide better retention and support for prosthesis.¹

Low-fusing impression compounds, im-

pression waxes, elastomeric impression materials (PVS, polyether), and zinc oxide eugenol are materials available to record the defect.¹ In this case and the case reported by Gala A, the functional impression of the defect was recorded with low fusing impression compound. It allows easy manipulation and can be reused.^{5,6}

In this patient, zinc oxide non eugenol impression paste was the material of choice to record wash impression because it is easily available, has excellent dimensional stability, and absence of severe undercuts. However, a study done by Akshayalingam M et al reported the use of light body impression material to record defect region⁷. Both materials have excellent dimensional stability.

In edentate patients with soft palate defects, obtaining retention and support of conventional complete dentures with palatal obturator is a challenge. In these cases, overdenture with attachments and metal copings on abutments may offer better retention, support, and stability.⁸ In this case, metal copings were used on abutments to provide additional retention and support with a lingualised occlusal scheme for stability.

In this case, the wrought wire was used to support the obturator portion. Different methods are available to hold the obturator bulb such as direct metal framework extension, use of hinge at the distal end, or attachment of wire in a zigzag manner.⁹ In a similar case, Akshayalingam M et al and Paul N et al, used wrought wire to hold material in the defect region for adequate VP closure.^{7,10}

To improve the seal between the oral and nasal cavity in this case report soft liner material was used similar to the study done by Khalon SS et al with the aim that the soft lining material will not only help in the closure of VP defect but also avoid the development of ulceration, provide comfort and improve confidence of patient.¹¹

Distant metastasis or local recurrences can occur years after treating mucoepidermoid carcinoma with a high recurrence rate of about 20%. To make the prosthesis easily adjustable in the case of additional excision and tissue changes due to radiation therapy, the prosthesis needs to be made in a material that can be easily relined and adjusted^{10,12}

In this case, a methyl methacrylate transparent acrylic hollow obturator was fabricated to reduce the leverage forces on the denture, making it lightweight, easy to adjust, and more durable. A study done by Paul N et al also used acrylic as it is affordable, and can be relined and adjusted easily.¹⁰

One of the limitations in this case is the high recurrence rate of mucoepidermoid carcinoma and the deteriorating health of the patient, wrought wire, instead of cobalt chromium, was used to hold the acrylic bulb in the defect so that any future modification required can be easily done.

■ CONCLUSION

The main emphasis of management of patients with mucoepidermoid carcinoma should be an improvement in quality of life by preventing the regurgitation of food and water through the nose, clarity in speech, and mastication, One of the most suitable treatment options in such patients is pharyngeal obturator which is conservative with minimum complications, cost-effective, fast and provides improved quality of life in terms of mastication and speech. Limitation of conventional complete dentures is compromised stability with the pharyngeal obturator, which can be overcome by implant-supported overdenture or tooth-supported overdenture. In this case, the remaining teeth were preserved and used as an overdenture denture abutment as it provided better retention and stability to the pharyngeal obturator. The wrought wire was used for easy modification in case further modifications are required.

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Author's Contribution

AK conceived the idea and wrote the manuscript. AA and TS contributed in write up of the manuscript. Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All authors made substantial intellectual contributions to the study.

Conflict of Interest

Authors declared no conflict of interest

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None

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.