

Meatus obturator-a treatment of choice in managing Velopharyngeal defect-a case report

Abstract

Defects related to Velopharyngeal insufficiency has always been a critical and sensitive issue to manage as it requires rehabilitation of the palatal defect along with maintaining the integrity of speech, mastication and esthetics. The primary goal of prosthodontist in each case is to construct a prosthesis, which will restore the defect, improve. Esthetics and thereby benefit the morale of patient. In case of completely edentulous maxilla with the defect involving the hard and soft palate, Meatus obturator plays an important role by contributing to retention and stability of the prosthesis by engaging the posterior nasal undercuts. This case report describes the novel approach to fabricate Meatus obturator for a patient suffering from Velopharyngeal insufficiency.

Keywords: Meatus obturator, pharyngeal obturator, Velopharyngeal insufficiency

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Introduction

Surgical reconstruction of the maxillary/mandibular defect has always been the first choice in the closure of such defects. But, in situations where the surgical reconstruction fails rehabilitation of patients suffering from palatal defects becomes a huge challenge. This is where, when the maxillofacial prosthesis holds its stand in the confront in treating such unique cases. It is a known fact that Soft palate plays a significant role in Velopharyngeal closure mechanism.¹ The Acquired/ Congenital defects of soft palate may lead to Velopharyngeal insufficiency, which affects the functionality of the residual muscles and structures, leading to impairment of the closure with the pharynx. Velopharyngeal insufficiency induces nasal regurgitation of liquids, hypernasal speech, nasal escape, disarticulations and impaired speech intelligibility.^{2,3} Pharyngeal obturators used to close the residual palate and pharynx during speech and deglutition are a prosthetic solution for Velopharyngeal insufficiency. The prosthesis consists of a partial or complete denture base and a pharyngeal extension that will physically modify the pharyngeal airway and provide a seal between the oropharynx and the nasopharynx during function.^{4,5} Meatus obturator is indicated when entire soft palate has been lost in edentulous patients. This clinical report describes the rehabilitation of a congenital soft palatal defect with palatal meatus obturator prosthesis and restoring the physical separation between the nasopharynx and oropharynx.

Case report

A 75 year old male patient reported to the department of prosthodontics for the replacement of missing upper and lower teeth. Intra oral examination revealed a residual palatal defect (Figure 1) in the edentulous maxilla. On extraoral examination, hypernasality of the voice was observed. History suggests congenital soft palate defect along with mid line cleft palate since birth. He did not undergo surgical treatment in childhood. Treatment planned as definitive mandibular complete denture and maxillary complete denture prosthesis along with Meatus obturator to close the Velopharyngeal defect.



Figure 1 Maxillary ridge and mandibular ridge.

Diagnosis and treatment plan

Veau's Class I cleft palate defect with completely edentulous maxillary and mandibular arches. The patient refused to undergo surgical reconstruction. Therefore, it was planned to fabricate definitive mandibular complete denture and maxillary complete denture prosthesis along with meatus obturator to close the velopharyngeal defect so as to improve retention, phonetics and to prevent nasal regurgitation.

Prosthetic approach: (step by step procedure)

1. Preliminary impressions were made with irreversible hydrocolloid stock tray, which was intended to record as well as displace the soft palate superiorly.
2. On the preliminary cast wax spacer was adapted and custom tray was fabricated with auto polymerizing acrylic resin.
3. Soft palate defect was packed with gauze then Border moulding was done with low fusing modeling compound (DPI PINNACLE tracing sticks, Mumbai, India) and final impression was made with zinc oxide Eugenol paste in a conventional manner (Figure 2).
4. Master casts were poured and occlusal rims were fabricated on the recording bases. Jaw relations were recorded, teeth arrangement done. The trial arrangement was checked intraorally to evaluate

the centric relation, occlusal vertical dimension, phonetics and aesthetics.

5. To record the defect area functionally, low fusing modeling compound (DPI PINNACLE tracing sticks, Mumbai, India) was added on the posterior aspect of the trial denture, and patient was asked to perform the circular movements side to side, bend his head forward and back, speak, and swallow till the material was made to flow and record the posterior nasal conchae as well as to record the physiologic activity of the pharyngeal muscles (Figure 3).
6. Relief holes were placed along the midpalatal raphe region and wash impression was made with vinylpolysiloxane (Reprosil regular body) elastomeric impression material (Figure 4). Second master model was fabricated with die stone (Figure 5).
7. Defect part was duplicated and Heat cure clear Acrylic shim was fabricated on it and which was eventually trimmed and polished and repositioned into the second master model (Figure 6). In order to reduce the weight of the meatus obturator polished surface of the acrylic shim was filled with crystals of the salt and over which a sheet of wax was covered and sealed. Pharyngeal extension along with trial denture was processed using compression moulding technique. Once the dentures were retrieved from the flasks a small vent was created over the polished surface of the pharyngeal extension to dissolve the salt crystals and the vent was sealed with auto polymerizing resin. Thus the meatus obturator fabricated was light in weight aiding in better speech resonance.
8. The maxillary and mandibular dentures were trimmed, finished and polished (Figure 7).
9. Two nasal vent openings were placed in the superior third of the anterior surface and angled downward at a 45-degree angle to the posterior surface. The downward angulation of the vents minimized the chance of regurgitation of food and liquid into the nose during swallowing. Further, the vents facilitated the comfortable and easy Definitive prostheses were delivered to the patient after making necessary adjustments done and patient recalled after 24 hours for final adjustments (Figure 8). Continuous recall visits for 1 year was done and patient was kept under observation.
10. Patient was very satisfied with the function and he was happy with the speech.



Figure 2 Final impressions.



Figure 3 Border moulding of pharyngeal region and functional impression of pharyngeal region.



Figure 4 Functional impression of pharyngeal region.



Figure 5 Master Cast.



Figure 6 Acrylic shim fabrication.



Figure 7 Waxup of master cast.



Figure 8 Completed prosthesis with naso pharyngeal bulb.

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Discussion

Prosthetic management of the completely edentulous patient with cleft palate is a challenging situation for the prosthodontist. In the present case, congenital anomaly of soft palate was untreated for a long time moreover, age factor and socioeconomic status of the patient limits the surgical closure of the defect. Finally Prosthetic rehabilitation with meatus obturator prosthesis was the best treatments plan. Congenital soft palate defects result in the formation of opening between the oro pharynx and naso pharynx. These defects are inconvenient to the patient because of oro-nasal communication which often interferes with important functions like speech, swallowing, deglutition, and mastication. The main objectives of Meatus obturator prosthesis was to improve the quality of speech and permit comfortable swallowing, an obturator must effectively separate the nose from the mouth, thus prevent food and fluid regurgitation.^{4,6} Meatus obturator prosthesis was selected as best treatment modality for the patient due to the absence of mobile soft palate in the midline and also vertical path of insertion of meatus obturator was attained easily due to absence of undercut in the premaxillary area.^{7,8} Completely edentulous patients

with cleft palate always experiences increased weight of the prosthesis which compromises the retention and also lack of support due to the absence of the natural teeth. Reduction in the weight of the obturator is attained by hollowing the prosthesis which improves the retention and stability and also increases the patient comfort. Closed hollow bulb obturator was preferred in the present case over the open hollow bulb to avoid pooling of moisture while extending superiorly into the defect and also to reduce the air space.^{9,10}

Conclusion

In situations, with completely edentulous maxilla involving Velopharyngeal insufficiency Meatus obturator imparts better retention and stability of the prosthesis, permits comfortable breathing, restores the functions of the mastication and prevents regurgitation of fluids through the nose. It can be considered as a valuable treatment alternative to the surgical option in cases with completely edentulous patients with cleft palate defect.

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None.

Conflicts of interest

The author declares that there is no conflict of interest.

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