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Case Report

A Denture for Wind Instrumentalist- A Case Report

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ABSTRACT

Musicians who wear dentures often dislodge their dentures during playing of wind instrument. The problems arise for a dentist who is treating a wind instrumentalist are mainly due to the exacting functional demands on the oral and perioral structures especially the muscles of facial expression during blowing. A mutual understanding between the dentist and the musician is necessary to provide accurate diagnosis and treatment planning of specific orofacial problems. Embouchure denture is a denture which is meant for professional use and specially fabricated to meet the functional demands of oral musculature without dislodging the denture during blowing of wind instruments. In both maxillary and mandibular occlusal rims, in the posterior teeth region, a system of inclined planes is given as a retentive feature. The slopes of these inclined planes are further adjusted according to patient's need during wax trials. Purpose of this case report is to create awareness among dental practitioners, about their role in rehabilitating a completely edentulous wind instrumentalist and to describe the technique to fabricate a specially designed prosthesis for wind instrument players - "The Embouchure denture".

Keywords: embouchure denture, inclined plane, orofacial problems, wind instrumentalist.

INTRODUCTION

Music is a wonderful medicine for a troubled mind. Music can be produced by musical instruments, which are of various types. One of among them is the wind instruments. [1] Playing a wind instrument is a complex neuro- muscular task that requires increased ventilation and increased orofacial muscle activity. [2,3] To play a wind instrument, an embouchure must be formed whereby the lips, tongue and teeth are applied to the mouthpiece to act as both a seal and a funnel for the air. For those musicians who play wind instruments, orofacial problems may be detrimental to their careers. These problems may result from playing an instrument or from dental treatment. [4] The problems that may arise for a dentist who is treating a wind instrumentalist are mainly due to the exacting functional demands on the oral and perioral structures especially the muscles of facial expression during blowing. [1] For those who require complete dentures for both maxilla and mandible, the situation can be troublesome especially if the person depend on his musical ability for his livelihood. The wind musician wearing a full set of complete dentures in playing would immediately loosen, dislodge or tilt them. Under these conditions an addition set of dentures is required; one for normal use and one for professional use means for playing a wind instrument, which is called as embouchure denture. These are especially fabricated in a manner such that it prevents

any tilting or dislodgement. [5] Hence it is necessary to design a prosthesis that would aid in maintaining the functional demands of the wind instrumentalist.

CASE REPORT

A 59 year old male patient reported to the Department of Prosthodontics and Implantology of Government Dental College & Research Institute at Bangalore, Karnataka, India, with the chief complaint of loss of all the teeth since 10 years.

He was old denture wearer with the complaint of loosening of denture during playing of wind instrument. He was a wind instrumentalist, playing instrument in marriages. Intra oral examination revealed both maxillary and mandibular residual ridges were highly resorbed. Detailed case history was taken and examination done. Keeping the patient's convenience in mind, treatment plan was formulated and it was decided to rehabilitate the patient with two sets of dentures – one conventional and the other for his professional use. Procedure followed was-

1. Primary impression was made using impression compound for both maxilla and mandible and cast was poured in Plaster of Paris.
2. Custom tray was fabricated 2mm short of sulcus using polymethylmethacrylate resin. In order to record the depth of the functional sulcus, border moulding was done using low fusing green stick compound followed by final impressions which was made using Zinc oxide eugenol impression paste in both maxillary and mandibular trays. Type III dental stone was used for fabrication of master cast.
3. Elastomeric duplicating material was used to duplicate the master cast. Thus, 2 pairs of master cast were obtained, one for the conventional denture and the other for embouchure denture.
4. Denture base record was made for both pairs of master cast using auto polymerizing resin with non compression dough technique. In order to record maxillo-mandibular relationship, occlusion rims were fabricated and jaw relation record was made separately for conventional denture. For embouchure denture, bite was taken with mouth open to the position the musician uses in playing his instrument.
5. Teeth arrangement was done and wax trial for conventional complete denture was done as usual. For embouchure denture, only anterior teeth arrangement was done according to the glass plate relation for the purpose of esthetics and posteriorly, some unique retentive features were incorporated within the wax occlusion rim.
6. In the posterior teeth region of the denture, inclined planes were made as a retentive feature between the upper and lower wax rims. These inclined planes allowed for differences in both vertical and horizontal direction and simultaneously maintain contact between them during playing of instrument which will prevent either of them from being dislodged.
7. A cut of about 5-10mm was made just anterior to the posterior most margin of the upper occlusion rim in upward and forward direction as a slope.
8. For second inclined plane, a downward and forward cut of same dimension was made, such that it represents a piece of triangle hanging posteriorly in upper rim.
9. Then a third cut was made which was parallel with the first cut and a relatively smaller fourth cut was made which ended anteriorly behind the canine. The cut ends of slopes were extended to make finish the slopes.
10. Similarly, cut were given in the lower rim to make interdigitation with the upper rim. These planes appear from the side as two inverted V's with short steep posterior arms and long more gradually sloping anterior arm. [6]
11. Wax trial was done and adjustments were made according to the patient

comfort during blowing of instrument. Lower anterior teeth were given to produce open bite of approximately 1mm.

12. Both conventional and embouchure denture were processed and finishing, polishing was done in conventional manner.

Fig. 1. Preparation of mould space after dewaxing procedure.

Fig. 2. Finished and polished embouchure denture.

Fig. 3 Patient before and after getting conventional denture.

Fig.4 After getting embouchure denture.

DISCUSSION

Embouchure is a French word means "to put in or to the mouth." [7] The way in which the lips and mouth are applied to mouthpiece in the blowing of a wind instrument is known as embouchure (Grove 1954). [8]

The lips are of primary importance. The orbicularis oris muscle of the mouth and the eleven set of muscles that radiate from it on each side are the chief components of the lips. These muscles, acting bilaterally, work in conjunction to produce a proper and correct relationship to the mouthpiece. If a muscle on one side is deficient, compensating action on the other side is necessary to produce the proper formation.

The act of placing the mouth to the mouthpiece is a simple one, but its implications are quite important because the embouchure controls sound production, tone, quality, articulation, and dynamics. In the formation of the embouchure, the lips act as a washer, preventing the leakage of air; the tongue, by way of its extrinsic and intrinsic muscles, acts as a valve to control the flow of air and the mouth funnels the air traveling from the lungs to the instrument and the teeth and jaws support the soft tissues. The instrument's mouthpiece is also called the embouchure. [9] Wind instrument are broadly categorized in 4 classes-

Intraoral Mouthpieces-

1. Single reed instruments – these have a single reed (of cane or plastic) ligatured to the under-surface (or lay) of the mouthpiece; e.g. clarinet, saxophone.
2. Double reed instruments – in these, the double reed constitutes the mouthpiece; e.g. oboe, bassoon.

Extra-oral Mouthpieces-

3. Flute, piccolo- These have a hole at the head of the instrument across which air is blown.
4. Brass instruments- all of these have cup shaped mouthpieces of varying sizes and shapes; e.g. -cornet, trombone, tuba.

Of these1, 2 and 3 comprise the 'woodwind' instruments [8]

There are two types of embouchures depending on the type of reed and the player. Single lip embouchure is the type of embouchure the upper or lower lip is curled over the edges of the upper or lower incisal edge respectively. Double lip embouchure is wherein the upper lip is curled inwards under upper incisors as well as lower lip curled inwards over lower incisors. Players with long upper lips often prefer double lip embouchure. [10]

Musicians who wear dentures often dislodge their dentures during playing of wind instrument. The dislodging forces during playing are unique. The intraoral wedge shape mouthpiece tends to force the upper anterior teeth upwards and forward, dislodging the back of denture. Adequate means are necessary therefore to oppose these dislodging forces. A system of inclined planes could be included between upper and lower denture which would allow for differences in vertical and horizontal relationships between the two and yet permit contact between them during playing which will prevent either from being dislodged. [6] At the setting up stage, it is necessary for the technician to mount teeth which simulate the labial, buccal, lingual and palatal, as well as occlusal, contour of the wax blocks.

It should be emphasized that the embouchure denture is not meant to be used when eating; it is intended to be used only for playing. Its construction demands much patience and a good deal of ingenuity by the dental surgeon. Furthermore, it is quite likely that a first attempt at making such a denture may not be completely successful and this need not be due entirely to the dentist's efforts. [6]

CONCLUSION

A mutual understanding between the dentist and the musician is necessary to provide accurate diagnosis and treatment planning of specific orofacial problems. [4] In case of completely edentulous oral situation of a professional wind instrumentalist, dentist need to be more

aware of the problems as well as the consequences of treatment given. Embouchure denture can help the musicians in continuing their career, if properly adjusted and fabricated according to their functional demands. However, it is unwise to promise a satisfactory result. An important reason for this is that patient must play his own part in re-adjustment of his embouchure and this may require time and patient practice. [6]

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