

Palateless Stud Attachment Retained Denture: A Case Report

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Abstract: Fabrication of different types of overdentures is very traditional treatment modalities practicing worldwide by the prosthodontists as well as the general dentists, it is treatment of choice when patients come to clinic with two or three remaining teeth in their mouth. Over dentures main function is to preserve the residual ridge as well as give the retention to the denture in the patients mouth and also restores lost tissues and function. Tooth supported over denture is treatment of choice especially when patients want to retain their remaining teeth and that remaining teeth is period on tally sound and sufficient vertical space is available. if patients is having sever gag reflex and phonetics problem then we can go for palate less denture because it can improve the test perception, phonetics, retention and stability. Each step in making of stud attachment over denture has a significant effect on speech and patient's overall personality. This article enumerates these aspects of palate less stud attachment over denture construction and their effect on speech production.

Keywords: Denture coverage, Phonetic, over denture, Pronunciation.

1. Introduction

Phonetics was studied as early as 2, 500 years ago in ancient India, with Panini's account of the place and manner of articulation of consonants in his 5th century BC treatise on Sanskrit. The Indians who uses the consonants are according actually from Panini's classification. Speech is a very sophisticated independent and unconscious activity¹. In Indian population specially women are best known for their talk about other (neighbor and colleague etc.) so especially when you are practicing dentistry in India dental patients they always demand for good phonetics with their newly prosthesis. As we all knows that as the loss of tooth it always compromised the articulatory cavity and leads to the

altered in phonetics². Speech is produced in 4 stages respiration, phonation, articulation, and resonances. Respiration start by lungs with the help of various intercostal muscles³. Phonation occurs in the larynx (voice box) where the vocal cords are housed. This occurs with the help of various paired and unpaired muscles of larynx⁴. Articulation is with the help of Tongue, Lips, Teeth, Alveolar ridge, Soft Palate, Hard Palate, Velum/uvula. Here the movement of tongue in oral cavity is most important any hindrance in tongue movement can create in appropriate voice in the patients that is the reason when we are going to fabricate any type of prosthesis either fixed or removal we should check for this thing⁵.

Classification of Sound¹

Voiceless Speech Sounds		
FRICATIVES	Air is forced by tongue through a narrow aperture & is associated with friction.	s, sh, th, f
PIOSIVES AFFRICATIVES	Explosive release of air. A combination of the friction & explosive elements.	P, t, k Ch
Voice Speech Sounds		
VOWELS	Formed from continuous vocal cord vibrations; tongue & lip positions impart structural overtones.	a, e, i, o, u
VOICED CONSONANTS	Air produced sounds and laryngeal tone	b, d, j, m, q, r
Classification according to anatomic sound formation		
PALATOLINGUAL TONGUE & HARD PALATE	Tongue is positioned just behind the maxillary incisor teeth with the sides of tongue in contact with maxillary posterior teeth & alveolar ridge.	s
TONGUE & HARD PALATE	Tongue is placed firmly against the anterior hard palate.	t, d, n
TONGUE & SOFT PALATE	Posterior part of tongue isocclude with soft palate.	k, g, ng
LINGUODENTAL	Tip of tongue is comes between maxillary and mandibular incisors.	th
LABIODENTAL	Formed by lower lip touches the incisal edge of the maxillary anterior teeth.	f, v
BILABIAL	These sounds are formed between the lips.	b, p, m

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Many techniques have been described for successful prosthodontic management of completely and partially edentulous patients with phonetics as well as gagging problems⁷, but unfortunately only few of them are successful with research evidence base. Many researches has shown that decrease in palatal coverage enhance the phonetic efficiency and also decrease the gag reflex in female patients. Although fabrication of Palate less stud attachment overdenture is not a routine prosthodontic treatment modality, but by saving few of remaining natural teeth and fabricating a fabrication of Palate less stud attachment overdenture, it can be effectively used for treating patients with severe phonetics problems⁶.

2. Case Report

A 55 years old Female patient reported to our dental center for prosthetic evaluation. Patient had received a maxillary acrylic resin removable partial denture. she had major complaint of difficulty in wearing the prosthesis due to phonetics problem, difficulty in chewing and unsatisfactory esthetics due to poor designing of partial denture. Intraoral examination of patient maxillary arch revealed root stump w. r. t.11,12,21, 22 and deep caries w. r. t.14, 17, 24 and mandibular arch root stump w. r. t.41, 42, 43, 31, 32, 33. (Figure 1) Clinical and radiographic examination revealed that maxillary 1st premolars were periodontally sound with no mobility, no periapical pathology. And in mandibular arch both the canine were periodontally sound and no mobility. There was insufficient buccal sulcus depth bilaterally in maxillary as well as mandibular posterior region due to early loss of posterior teeth and alveolar bone loss. Patient did not want extraction of remaining maxillary and mandibular teeth and did not agree for implant supported over denture, due to poor economic and medically compromised conditions. Patient was suffering from diabetes mellitus, bronchial asthma, and had undergone cardiac surgery. She was on medication, All these conditions preclude the fabrication of Palate less stud attachment over denture for maxillary arch and stud attached mandibular over denture for the mandibular arch.

After intentional root canal treatment of abutments, they were prepared with tapered round, and reduced it up to the gingival level. And we did root canal treatment to all the remaining grossly decayed teeth and submerged it and restored with GIC (figure 2) (glass ionomer cement) (Hy - bond Glasionomer CX, Shofu INC, Japan). A stock tray was selected, which covers the abutments and anterior part of hard palate, was selected and impression was made with putty (Aquasil soft putty/regular set, Dentsply, Germany) and light body (Aquasil LV, Dentsply, Germany) of polyvinyl siloxane elastomeric impression material, by double step putty wash technique. The impression was poured into the die material (Ultrarock, Kalabhai Karson Pvt. Ltd., Mumbai, India) to obtain cast. custom acrylic resin tray was fabricated on the cast for the both maxilla and mandible. After adjusting the custom tray, single step border molding was done with medium body polyvinyl siloxane (Reprosil, Dentsply, Germany) and secondary impression was made with light body (Aquasil LV, Dentsply, Germany). Master cast was obtained by pouring the secondary impression into type IV gypsum product - die

stone (Ultrarock, Kalabhai Karson Pvt. Ltd., Mumbai, India). Trial denture base was fabricated over master cast with chemically cured acrylic resins (Rapid Repair acrylic resin. DPI, Mumbai, India) after applying separating media (Separating liquid, DPI, Mumbai, India) over master cast. Occlusion rims were fabricated over trial denture base. Jaw relation was recorded in patients mouth after facebow and then it was transfer to the semi adjustable articulator (Hanau wide view). Artificial teeth were selected and arranged on the record base for a trial denture arrangement and evaluated intraorally for phonetics, esthetics, occlusal vertical dimension and centric relation. After wax up, the denture was processed in heat cure acrylic resin (Lucitone 199 denture base material, Dentsply, Germany), finishing and polishing done and patient was called for insertion. On the day of insertion post space was prepared with root canal preparation drills (figure 3) and Stud attachment cemented with resin cement (Relyx Ultimate 3M ESPEIndia) on the abutment teeth for maxillary and mandibular arch, (Figure 4) metal housing was attached on intaglio surface of denture base (figure 5) on both the dentures. O Rings was attached with stud attachment and both the denture was inserted followed by occlusal adjustment (Figure6) and Figure 5 shows tissue surface of the palate less stud attachment overdenture. The patient was scheduled for follow - up visits every 3 months and reported no complaints during 1 year of follow - up.

3. Discussion

A palate less denture technique for the management of phonetics as well as gagging patients has been 1st described by Booth⁸ and it is well documented that thickness and coverage of palate by denture surface affect the speech of the patients and many authors and Rothman (1961) observed that the action of lips, tongue, teeth and soft palate in production of speech was related to denture construction⁹. G. schierano et al (2001) conclusion thickening the resin palatal vault was wider. A 2 - mm thickening of the resin palatal vault caused 4.33 mm further lowering of the mandible during the pronunciation of the consonant sound 'S'¹⁰.

Conventional palateless denture has less retention and stability and sometimes it has been seen that this in stability also create phonetics problems as well as also act as triggering factors for gag reflex. Saving few remaining periodontally sound natural teeth and fabricating palate less overdenture has better retention and stability than removable complete dentures. Fabricating of stud attachment overdenture, further increase the stability and retention by the frictional contact between the coping's assembly and denture base. Stud attachment over denture is a good alternative treatment modality for prosthodontic management of patients with phonetics and severe gag reflex and large inoperable maxillary torus (with few remaining natural teeth), because of its improved retention, stability, better chewing efficiency and also decrease in alveolar bone resorption, because of the presence of periodontal ligament. It is very much comfortable to patient because of the less palatal coverage, better heat, cold and taste perception which is not possible in case of conventional complete denture because, acrylic denture base is a poor conductor of heat.

Stability phonetics and chewing efficiency is further enhanced by a well - balanced non - interfering occlusion.

4. Conclusion

Palate less stud retained over denture is definitive a benefit for patients having phonetics and sever gag reflex with a history of unsuccessful denture wearing and for patients. When we go for stud retained over denture the there are many advantages over conventional tooth supported over dentures like it gives more retention, stability comfort even we remove the palatal part of the denture base stability is not compromised so, in this case we make it palate less so that patients can feel hot and cold sensation to the food, light weight prosthesis, no encouragement of tongue movement and no triggering of gag reflex. When patients come to clinic with few remaining teeth in mouth and problems with phonetics as well as severe gag reflex with prosthesis then we can go for palate less stud retained over dentures. It will give better retention, stability, phonetics, esthetic and chewing efficiency than conventional palate less dentures.

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Figure 1: Intra oral photograph



Figure 2: Teeth restored with GIC



Figure 3: Stud attachment with root canal preparation drills



Figure 4: Stud attachment cemented with resin cement



Figure 5: Metal housing with retention cap incorporated into the denture



Figure 6: Definitive prosthesis