

A CASE REPORT

A novel technique to prevent tongue thrusting habit with a modified acrylic prosthesis – A case report

Ajila Theresita. F^a, Alex Mathews Muruppel^b, Joephin Soundar^c, Aarti Rajambigai^d

ABSTRACT

Oral habits could be deleterious if not treated at the earliest. This case report highlights the management of tongue thrusting habit in a 45 year old patient, with a novel interim removable prosthesis to address this issue. This was done so as to correct the posture of the tongue and minimize further consequences of the persisting habit. This will enable the patient to receive a fixed prosthesis later on with increased longevity of the prosthesis. The case exemplifies the effectiveness of an interim prosthesis design in overcoming the deleterious effects of tongue thrusting habit, thus resulting in improved prognosis of the fixed prosthesis to be placed later on.

Key words: denture design, dental prosthesis, partial denture, temporary dental restoration.

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INTRODUCTION

An oral habit is defined as a frequent or constant practice or acquired tendency, which has been fixed by frequent repetition – Butterworth (1961),¹ Thumb sucking and tongue thrusting are the most frequently observed oral habits. Tulley et al² defined tongue thrust as the forward movement of the tongue tip between the teeth to meet the lower lip during deglutition and in sounds of speech, so that the tongue becomes interdental. Hanson et al³ suggested that tongue thrust is merely retention of the infantile suckling mechanism called the retained infantile swallow. The other possible etiologies for tongue thrust could be macroglossia, constricted dental arches, and acquired (learned) behavioural changes, upper respiratory tract infections such as mouth breathing, chronic tonsillitis and functional adaptability due to missing maxillary anteriors.

The continuous and gentle pressure exerted by the tongue against the anterior teeth can have very significant and deleterious consequences.⁴ Therefore modification of the tongue behavior is thus likely to improve the stability of corrected anterior open bites. Tongue bead appliance provides a mechanical barrier and induces a change in the resting position of the tongue and thus prevents the consequences of tongue thrusting.⁵ This case report explains the deleterious effects of tongue thrusting in a 45 year old patient which could be a hindrance to the prognosis of the fixed prosthesis and therein describes the management of tongue thrusting with a habit breaking appliance incorporated into a removable partial denture to correct the tongue posture and minimize further significant effects of open bite, so that the patient could receive a fixed prosthesis later on with increased longevity of the prosthesis.

^a Postgraduate, Department of Prosthodontics, Rajas Dental College and Hospital, Tirunelveli, Tamilnadu

^b Principal and Head of Department of Implantology, Rajas Dental College and Hospital, Tirunelveli, Tamilnadu

^c Associate Professor, Department of Prosthodontics, Rajas Dental College and Hospital, Tirunelveli, Tamilnadu

^d Head of the Department of Prosthodontics, Rajas Dental College and Hospital, Tirunelveli, Tamilnadu

CLINICAL REPORT

A 45 year old male patient presented to the Institute's Department of Prosthodontics with a chief complaint of missing upper front teeth. Clinical examination revealed loss of maxillary central incisors due to chronic periodontitis and mobile mandibular anteriors suggesting an anterior traumatic bite (Fig: 1). During functional examination, the tongue thrust forward during swallowing with good intercuspation of the posterior teeth (Fig: 2). On the basis of the tongue thrusting rating scale proposed by Arslan et al⁶ (Table 1), the patient was classified under score 2. There was bone loss visible in the edentulous site and the mesial side of the lateral incisors (Fig:3). It was then decided to eliminate the etiology of the traumatic occlusion along with the interim prosthetic replacement of the missing teeth. Maxillary and mandibular impressions were taken with irreversible hydrocolloid material and a diagnostic cast was made (Fig: 4). After which, bite registration was taken and try in verification was carried out. Denture processing was carried out under compression moulding technique and the final denture was then trimmed and polished. Once the maxillary denture was created, small acrylic beads, 4 in number, of size 3 mm was placed about 3mm behind the maxillary incisors, at the position of the incisive papilla with the help of 21 mm stainless steel wire⁷ (Fig: 5). It was then secured in position using self-cure acrylic and placed in a pressure pot for 10 minutes. Denture insertion was then done (Fig: 6). The patient was clearly instructed to voluntarily place his tongue at the position of the acrylic beads when he swallows (Fig: 7). The patient was also made aware about the difficulty in pronunciation that he may face for a week or so. The patient was then recalled for check-up every month and his tongue position and swallowing pattern was evaluated. After a follow up of 3 months, there was discernible change in the tongue thrust rating scale from step 2 to step 1.⁶ After a further follow up of 3 months and further reduction in the tongue thrust rating scale, the patient is to be considered and evaluated to receive implant supported fixed prosthesis in the maxillary anterior region.

Step 0	No tongue thrust. The tongue tip rests on the lingual part of the dentoalveolar area
Step 1	Mild tongue thrust. The tongue is positioned between teeth
Step 2	Moderate tongue thrust. The tongue is positioned between lips
Step 3	Severe tongue thrust. The tongue is positioned out of the mouth

Table 1: The tongue thrust rating scale^[6]:



Figure 1: Intraoral view demonstrating the Tongue Thrusting habit



Figure 2: Intraoral view of Maxillary arch



Figure 3: Radiographic evaluation



Figure 4: Diagnostic Cast



Figure 5: Final denture with acrylic beads attached



Figure 6: Intraoral view of the denture



Figure 7: Corrected tongue posture using acrylic beads

DISCUSSION

In the present case, the patient reported chiefly for the rehabilitation of the missing maxillary anteriors. However on examination, tongue thrusting habit was visually evident with the tongue placed between the maxillary and mandibular anterior teeth during swallowing. The habit was found to have a devastating effect to the periodontium of the maxillary and mandibular anteriors, compromising their prognosis and even leading to tooth loss in the maxillary anterior region in relation to 11 and 21. Hence, the aim of the treatment was primarily to train the tongue to rest in its normal superior position with its tip touching the cingulum of the maxillary incisors. From counselling to appliance therapy, numerous treatment modalities have been reported in the literature. In this case, we planned to counsel the patient first, but as there was no appreciable regression in the tongue thrusting habit, we then planned to give an interim removable appliance,⁷ which was intended to break the habit and accord special consideration to the speech problem and esthetics. Palatal cribs, either removable or fixed are the first line of choice for treating the tongue thrusting habit⁸. A study by Massler et al⁹ reported that crib rake type of appliances have a punitive approach, which is intended as a punishment rather than a positive reinforcement approach. Thus, a positive reinforcing approach as tongue beads was used in the presented case report. The beads of the appliance are based on the principles of positive reinforcement which works through a counterconditioning response to the original conditioned stimulus for tongue thrusting.¹⁰ However, the designing of the bead should be such that it should be in the region of the rugae or 3mm behind the incisive papilla, so as to train the tongue to maintain an ideal posture. The patient was evaluated without prosthesis after 6 months and found to have a significant reduction in the Arslan's tongue thrust rating scale from step 2 to step 1.⁶

The patient is consequently planned to receive implant supported fixed prosthesis in the maxillary anterior region, since this interim removable myofunctional appliance has helped to correct the tongue posture. Furthermore it has prevented further deleterious effects on the periodontium of the maxillary and mandibular anteriors and thus

improved the prognosis of the fixed prosthesis placed in the maxillary anterior region.

CONCLUSION

The maxillary removable partial denture with palatal beads was found to be a simple and efficient interim treatment modality for the correction of tongue thrusting habit in adults who are in the need of a future fixed prosthesis. Such a treatment modality could be a viable and effective prevention strategy for the preservation of the remaining teeth, and thus improve the overall prognosis of the future prosthesis.

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Corresponding Author: Dr. Alex Mathews Muruppel MDS., FPFA. Principal and Head of Department of Implantology, Rajas Dental College and Hospital, Tirunelveli, Tamilnadu - 627105.
E-mail: principal@rajasdentalcollege.edu.in , Ph.No.: 91+94469 12294

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