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Case Report

Use of a Resin bonded prosthesis in shallow anterior guidance

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ABSTRACT:
Preserving natural tooth structure is one of the main goals in preventive Prosthodontics. While conventional fixed partial denture is not considered by many a conservative approach to replace missing tooth, there are certain designs that allow a clinician to be more conservative. Resin bonded prosthesis was introduced as a no preparation FPD while today it is considered as minimal preparation FPD. This case of a young male adult, who had lost his maxillary central incisor to trauma was successfully restored with a modified resin bonded FPD. Occlusal factors, especially anterior guidance and the importance of proper and adequate overjet and overbite are discussed. Modification of design in the form of extent of wing preparation was considered mandatory since the length of the tooth allowed. This enhanced retention, which in turn will ensure longevity. The patient was followed up for one year and continues to be followed up. No failure or complication has been reported by the patient till date.
Keywords: Rochette bridge, resin cement, acid etch, bonding agents, Virginia bridge

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INTRODUCTION

While facial aesthetics may be subjective, but from a clinical point of view one needs to view facial aesthetics multidimensionally. These include biological, biomechanical and psychological.[1] premature loss of natural tooth can occur in either mixed or permanent dentition and can be due to many causes. [2-4] One of the common reason for anterior tooth loss is due to trauma which are mainly related to a fall. Once a natural tooth is lost, the space occupied by a previous tooth gets obliterated due to supraeruption of opposing teeth and migration of adjacent natural teeth. [5] Movements of natural teeth alters occlusal relations and with it also affects the type of restoration that can be given later. A single missing maxillary central incisor to be replaced with conventional fixed partial denture (FPD) has always been an ethical dilemma, [6] since preparing two teeth to replace one tooth has been considered by many as a non conservative treatment option. In earlier times, most of such cases were treated with a short cantilever prosthesis that had little regard to physiologic limits. [7,8] In other cases, maintenance of the integrity of labial surfaces of abutments was achieved by using partial veneer crowns as retainers. [9] Although advances in material sciences like the introduction of base metal alloys with a high modulus of elasticity, have paved way for prosthetic options (like implants, metal, ceramic, all ceramic, resin bonded), [10] the use of cantilever is still avoided mainly because it is supported unilaterally. [11]

Among all this, the advent of earlier designs of resin bonded prosthesis (Rochette – bridge) [12] were modified to provide clinicians an alternative conservative treatment option for single missing teeth. With advances in resin cements, more and more conservative designs were included. [13,14] While it is also true, that the failure rates of these resin bonded prosthesis is higher than conventional FPD,[15] It is also a fact that they are less catastrophic than failure of the conventional FPD.[16] This article presents a case of a young adult who had lost his maxillary central incisor due to trauma and was successfully restored with a modified resin bonded prosthesis.

CASE REPORT

A young male patient reported to the department of Prosthodontics for replacement of a missing maxillary front tooth that was lost as a result of trauma 2 years back. Patients social, medical, drug and dental history did not significantly improvise either treatment plan or the prosthesis design. Extra oral examination revealed a high lip line with slight maxillary protrusion (Fig 1 a). The maxillary lip was short in length as compared to the mandibular and was thin, thus exaggerating the impact of lips on the anterior teeth. Mandibular anterior teeth showed mild signs of crowding. The relation in occlusion showed less overjet and less overbite (Fig 1 b). Maxillary anterior teeth were flared (proclined anteriorly) (Fig 1 c) due to which there was little or no impact of anterior guidance. While two mandibular central incisors were labially inclined the larger lateral incisors were retroclined lingually (Fig 1 d). After making a preliminary impression with irreversible hydrocolloid (CA 37; Cavex, Haarlem, Holland) , diagnostic casts were mounted on a semi adjustable articulator (Artex; Girrbach Dental) and programmed as per the patients derived interocclusal records. Diagnostic casts were evaluated for all possible prosthetic options. Treatment options presented to the patient included an implant supported single crown, a conservative three unit resin bonded fixed partial denture (FPD), a non conservative three unit FPD and a spring cantilever FPD using maxillary first premolar as an abutment. The patient consented to a conservative three unit resin bonded prosthesis, motivated mainly by the advantage of the labial surface kept untouched. Treatment was started by outlining the design of the retainers on the cast. This was followed by tooth preparation on each abutment (Fig 2 a). Routine clinical and laboratory procedures for FPD were then done till the stage of metal trial. At metal trial (Fig 2 b), the clearance between the tooth and the mandibular incisors was evaluated and kept to a minimum with centric contact only on the retainers and not on the pontic. The metal framework (Wiron 99; Bego, Bremen, Germany) was then fired with porcelain (VMK-95 Metall Keramik; Vita Zahnfabrik, Bad Sackingen, Germany) and a porcelain trial was done to allow for clinical contouring of the crown. After glazing, the abutment teeth were etched and the metal framework was then cemented using a resin cement (Super Bond, C&B-Metabond, Parkell, Inc. U.S.A) (Fig 2 c). The patient was given instructions regarding oral hygiene maintenance and put on a regular follow up protocol. During future appointments, the patient exclaimed his happiness with the outcome of the prosthesis (Fig 2 d).

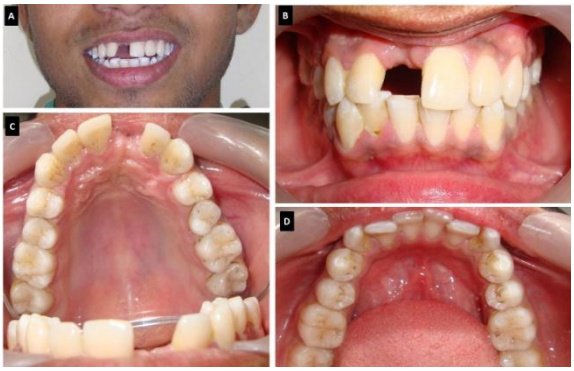

Figure 1: (a) Extra oral view of the patient showing the amount of exposure of incisor teeth (b) Intraoral view showing the relation in occlusion (c) occlusal view showing the arch form of the maxillary arch (d) mandibular anterior teeth with crowding

Figure 2: (a) tooth preparation for resin bonded bridge (b) metal framework trial (c) porcelain trial (d) final cementation using resin cement

DISCUSSION

A case of a kennedy class 3 partial edentulous situation, involving missing maxillary central incisor has been presented in this article. The unique feature of this rehabilitation is the use of a modified resin bonded prosthesis in a canine protected occlusion where despite decreases overjet the restoration achieved success. The main reason for the success being the limited over bite. In case the overbite was more, the results could have been different. Previous studies have shown the importance of anterior guidance in the designing of restorations like post core crowns, all ceramics, [17] resin bonded prosthesis, [18], and other conventional FPD designs. It has also been stated that sensitive designs like resin bonded prosthesis requires more discrete and adept occlusal evaluations. [14] This is the reason why in this case we had a detailed clinical dynamic examination of occlusion, the findings of which were further substantiated by diagnostic mounted on a programmed semi adjustable articulator. As can be seen the length of the maxillary central incisor is long, while there was also crowding of mandibular anteriors. This required either lower teeth to be first corrected orthodontically, which could have deferred current treatment indefinitely, while tooth loss was impairing esthetics and considered to be an emergency. Since the existing size of the abutment was long, the conventional design for resin bonded prosthesis was modified in this case in terms of extent. Cervically, the margins of the wings were

placed 2 mm supragingivally while the incisal margins were kept 2 mm short of incisal edge. On either abutment, the lower incisors were touching the metal framework and not the natural tooth. This was done to avoid cement failure as indicated in various studies. [14,19] For such prosthesis, it is also important to choose the right cement. Currently there are three options which include resin cement, adhesive cement, self etching adhesive cement and resin modified glass ionomer cement. Most of the resin cements bond mechanochemically to the natural tooth but show variable performances with base metal alloys. [20,21]
While earlier resin bonded prosthesis was reported to have higher failures, advances in design, metal and tooth etching, and introduction of resin cements have reduced such failures. Resin bonded FPD is not only a viable alternative to anterior missing tooth, but also can be done in the posterior edentulous spaces.

CONCLUSION

Resin bonded prosthesis or any of its modifications can successfully serve as an FPD provided occlusal conditions allow long term stability. An anterior guidance that does not exert lateral forces on the points are key to achieve such success. Therefore, it is advised to evaluate occlusion in both static and dynamic conditions during clinical examination of the patient.

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CONFLICT OF INTEREST

Nil

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