

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service

Available Online at: www.ijdsir.com

Volume – 2, Issue – 4, July – August - 2019, Page No. : 34 - 39

Resin Bonded Fixed Prosthesis a Conservative Approach to Replace Missing Teeth in the Aesthetic Zone – A Clinical Case Report

¹Dr Nazish Baig, Professor and PG Guide in Dept of Prosthodontics CSMSS Dental College, Aurangabad
²Dr Yusuf Shaikh, 2nd Year PG Student Dept of Prosthodontics CSMSS dental College, Aurangabad
³Dr Babita Yashwanti, HOD and Professor in Dept of Prosthodontics CSMSS Dental College, Aurangabad
Corresponding Author: Dr Yusuf Shaikh, 2nd Year PG Student Dept of Prosthodontics CSMSS dental College, Aurangabad
Aurangabad

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Restoring the missing central incisors in the maxillary jaw is one of the most difficult esthetic challenges in dentistry. A space in the maxillary anterior region of the dental arch can produce a psychological impact on the young patient. Resin bonded bridges are highly effective treatment option in these situations to restore the oral function and aesthetics and result in high levels of patient satisfaction. Maryland bridges are the type of resin bonded bridge with certain advantages over conventional dental prosthesis such as minimal removal of the tooth structure, minimal potential for pulpal trauma, supra gingival margin preparation and reduced time and cost. Maryland bridges are cemented to the abutment tooth using electrolytic etching of the metal surface to retain the metal framework. After etching of the metal, the bond is stronger between the tooth surface and the prosthesis. Bridge retention has been enhanced by the development of resin cements which bond chemically to both the tooth surface and the metal alloy. However, there are certain limitations of resin bonded prosthesis such as short clinical crowns, long edentulous spans, restored or damaged abutments, parafunctional habits, deep bite and compromised enamel hyperplasia.

Keywords: Resin bonded fixed partial denture, Maryland Bridge, Missing central incisor.

Introduction

There are various treatment options available for the replacement of the missing mandibular anterior incisors such as implant, removable partial denture and fixed partial denture. Removable partial denture may cause the bone resorption and attending of the interdental papillaein long term use however it can be used as interim prosthesis for initial esthetics. Conventional bridge requires adequate amount of tooth preparation of all the surfaces of the abutment tooth which may leadto the pulpal trauma and hypersensitivity in young adult patients. Dueto the presence of large pulp chambers and unavailability of such cementoenamel, a more conservative and less invasive resin bonded prosthesis may be an alternative treatment alternative for such conditions toreplace the missing tooth as well as preserve the remaining alveolar ridge and so Resin bonded or resin retained bridges tissue. (RBBs/RRBs) are a type of fixed dental prostheses that need a minimum amount of tooth preparation. They are bonded directly to the tooth structure with the help of the resin cement provided the preparation is restricted to the

enamel surface only. Theese restorations primarily depend on theres in cement for its retention. Based on the mode of retention of the prosthesis and resin there are various forms have been developed such as mechanical retention, micro mechanical retention, macroscopic mechanical retention and chemical retention. These restoration sewer first described in the 1973 when the natural extracted tooth of the patient was cemented directly to the etched enamel surface with composite resin for a limited time period to provide esthetics. Rochette Bridge was designed by Rochette for periodontal splinting of the mandibular anterior teeth [1]. However, due to the bulky there are various treatment options available for the replacement of the missing maxillary anterior incisors such as implant, removable partial denture and fixed partial denture. Removable partial denture may cause the bone resorption and flattening of the interdentally papillae in long term use however it can be used as interim prosthesis for initial esthetics. Conventional bridge requires adequate amount of tooth preparation of all the surfaces of the abutment tooth which may lead to the pulpal trauma and hypersensitivity in young adult patients. Due to the presence of large pulp chambers and unavailability of sufficient enamel, a more conservative and less invasive resin bonded prosthesis may be an alternative treatment alternative for such conditions to replace the missing tooth as well as preserve the remaining alveolar ridge and soft tissue. Resin bonded or resin retained bridges (RBBs/RRBs) are minimally invasive fixed prosthesis which rely on resin cements for retention. These restorations were first described in the 1970s and since this time they have evolved significantly. The first type of RBB was the Rochette Bridge, which relied on the retention generated by resin cement tags through a characteristic perforated metal retainer1.However, longevity of this type of restoration was limited and in an

the metal retainer to enhance micromechanical retention were developed2. The term 'Maryland Bridge' resulted from the development of a type of electrochemical etching at the University of Maryland. More recently bridge retention has been enhanced by the development of resin cements which bond chemically to both the tooth surface and the metal alloy. Despite this recognized advantage, the role of RBBs as definitive restorations remains somewhat controversial due to a lack of long term prospective data regarding success. The majority of information is based on the results of longitudinal studies, many of which have been poorly controlled, used a variety of cements and preparation techniques making it difficult to isolate factors affecting outcome.3Trauma to the anterior teeth is not uncommon, and one study reported that out of 2,100 children (aged 8-14 years) surveyed for teeth fractured due to trauma, 60.74% were aged between 11 and 14 with 13.8% cases involving incisors.4With the significant advances dentistry has made, it is possible to save and restore such traumatized teeth using composites, crowns and post and core. But there are certain cases in which extraction is unavoidable, leaving us with an esthetic and functional dilemma for the adolescent patient. For such cases, a Maryland Bridge may prove to be an ideal option, as the case has been.

effort to address this, methods of altering the surface of

Materials and methods

A 20 years old male patient reported with the chief complaint of missing anterior teeth in the maxillary anterior region and need for aesthetic restoration of the same with fixed dental prosthesis. The patient gave the history of extraction due to trauma of maxillary central incisor one year back. His expectations were reasonable and his psychological profile was good. Intra oral examination revealed missing maxillary central incisors with a slight buccal defect in the gingiva in the anterior

region (Figure 1). After considering the patient's wishes and the clinical situation, the options of removable partial denture, fixed partial denture and implant were eliminated. Also clinical on and radiographic examination, the teeth demonstrated gingival margins much coronal to the cement-enamel junctions, and large pulp chambers. A conservative and minimally invasive adhesive bridge was planned to restore the missing maxillary central incisor. Diagnostic impressions were made and mounted on (Bioart) articulator using facebow transfer record (Figure 2). Diagnostic wax up was performed to achieve the final outcome of the fixed restoration (Figure 3)

After completing oral prophylaxis, tooth preparation for both 11 and 22 was done following the standard technique. Lingual preparation ended 2 mm from the incisal edge and a light chamfer finish line was prepared 1 mm supragingivally (Figure 4).

Impression procedures were carried out with addition silicone (Figure 5) and sent to the laboratory. A metal framework with 'wings' extending onto the preparations was fabricated with non-precious alloy. Metal try in of the frame work showed minimum interferences. Shade selection was done using Vita 3-D Master shade guide. The trial fitting of the prosthesis was done and then esthetics mastication and speech were evaluated (Figure 6). The laboratory technician was instructed to keep the metal wings of the prosthesis off the incisal third to prevent darkening of the tooth because of the inhibition of light transmission. The fitting surfaces of the 'wings' were sandblasted with alumina 250 microns to create micromechanical retentive surfaces for the cement. The restoration was cemented in place using universal selfetch resin cement following the standard protocol (Figures 7 & 8). The occlusion was verified in centric and eccentric mandibular positions and it was make sure that there was

no interferences . Post cementation instructions were given and patient was followed up at regular intervals (Figure 9).



Figure 1: Pre-operative photograph



Figure 2: Facebow record

© 2019 IJDSIR, All Rights Reserved



Figure 3: Diagnostic Mock-up



Figure 4: Tooth Preparation with 11 & 22



Figure 5: Impression made with addition silicon



Figure 6: Coping trial



Figure 8: Cementation of final prosthesis-Facial view



Figure 8: Cementation of final prosthesis-palatal view

Page **J**



Figure 9: Post-operative photograph Discussion

Restoration of missing teeth aims to improve oral function, aesthetics and restore occlusal stability. However, intervention should be considered carefully as in some cases it may be detrimental to the remaining dentition.5,6,7General factors such as the health, age of the patient, their expectations, local factors related to dental health and the missing tooth itself need to be taken into account. The common complications associated with resin-bonded prosthesis are debonding (21%), tooth discoloration (18%) and caries (7%)8.Overall survival rate has been computed as being 77% after 10 years of service.Conversely, it is also true that rebonding or reconstruction of the metal frame after dislodgement increased the survival rate to 87% after 8 years under risk9. Excellent results are achieved in patients with small edentulous spans bounded by sound teeth, having an adequate crown height and width. The most common technical reason for RBB failure is debonding3.Although authors have reported that debonding does not appear to affect patient satisfaction 10,14 and there is usually limited Other technical problems which may necessitate remake of the bridge include structural damage and shade match deterioration which can be a result of natural tooth discoloration or porcelain changes.Resin bonded bridges with multiple abutments are more likely to debond due to the differential movement of abutment teeth, especially where occlusal contact involves the natural tooth surface. In these cases occlusal force leads to the tooth and the retainer being driven apart causing failure of the cement lute10. Where two abutment teeth have been used it is unlikely that both retainers will debond simultaneously. When only one retainer fails, the bridge is likely to remain in situ promoting the development of caries beneath the failed retainer.11,12,13Careful case selection, judicious design planning, precise preparation and meticulous cementation regimen can all ensure the long-term success of Maryland Bridges, making them ideal candidates for temporary replacement of single anterior missing tooth in adolescents.

Conclusion

Resin bonded bridges can be highly effective in replacing missing teeth, restoring oral function and aesthetics and result in high levels of patient satisfaction.RBBs have the advantages of taking minimal clinical time and rarely requiring anaesthetic , therefore they may be appropriate for patients who are apprehensive of dental treatment or unable to commit to more involved treatment involving multiple appointments.

References

- 1. Howe DF, Denehy GE (1977) Anterior fixed partial dentures utilizing the acid-etch technique and a cast metal framework. J Prosthet Dent 37: 28-31.
- St George G, Hemmings K, Patel K (2002) Resinretained bridges re-visited. Part 1.History and indications. Prim Dent Care 9: 87-9

damage to abutment teeth, it is an inconvenience.

- Pjetursson B E, Tan W C, Tan K, Bragger U, Zwahlen M, Lang N P. A systematic review of the survival and complication rates of resin-bonded bridges after an observation period of at least 5 years. Clin Oral Implants Res 2008; 19: 131–141.
- Gupta K, Tandon S, Prabhu D. Traumatic injuries to the incisors in children of South Kanara district: A prevalence study. J Indian Soc Pedod Prev Dent. 2002 Sep;20(3):107–113
- Jepson N J, Moynihan P J, Kelly P J, Watson G W, Thomason J M. Caries incidence following restoration of shortened lower dental arches in a randomized controlled trial. Br Dent J 2001; 191: 140–144
- Knoernschild K L, Campbell S D. Periodontal tissue responses after insertion of artificial crowns and fixed partial dentures. J Prosthet Dent 2000; 84: 492– 498
- Rashid S A, Al-Wahadni A M, Hussey D L. The periodontal response to cantilevered resin-bonded bridgework. J Oral Rehabil1999; 26: 912–917.
- Pratyusha P, Jyoti S, Kaul RB, Sethi N (2011) Maryland bridge: An intrim prosthesis for tooth replacement in adolescents. Int J ClinPediatr Dent 4: 135-138.
- Goodacre CJ, Bernal G, Rungcharassaeng K, YK Kan J (2003) Clinical complications in fixed prosthodontics. J Prosthet Dent 90: 31-41
- Kerschbaum T, Haastert B, Marinello CP. Risk of debonding in three-unit resin-bonded fixed partial dentures. J Prosthet Dent. 1996 Mar;75(3):248–253.
- Djemal S, Setchell D, King P, Wickens J. Long-term survival characteristics of 832 resin-retained bridges and splints provided in a post-graduate teaching hospital between 1978 and 1993. J Oral Rehabil 1999; 26: 302–320.

- Chan A W, Barnes I E. A prospective study of cantilever resin-bonded bridges: an initial report. Aust Dent J 2000; 45: 31–36.
- Olin P S, Hill E M, Donahue J L. Clinical evaluation of resin-bonded bridges: a retrospective study. Quintessence Int 1991; 22: 873–877.
- Bassi G S, Youngson C C. An in vitro study of dentin exposure during resin-bonded fixed partial denture preparation. Quintessence Int 2004; 35: 541– 548.

© 2019 IJDSIR, All Rights Reserved