Case Report

Resin Template for Guiding Preparation in Resin Bonded Fixed Partial Denture – A Case Report

ANNALS OF DENTISTRY
UNIVERSITY OF MALAYA
www.adum.edu.my
Ann Dent UM 2020, 27:22-27
DoI: 10.22452/adum.vol27no4

Leni Hadi[1], Haslinda Z Tamin[1], Ariyani[1], Putri Welda UtamiRitonga[1]

KEYWORDS

resin template, preparation principles, resin bonded fixed partial denture, minimal invasive

ABSTRACT

Resin Bonded Fixed Partial Denture (RBPFD) is a popular treatment for tooth preservation. Mechanical retention is a problem for RBFPD, where debonding is the main cause of failure. RBFPD preparation is minimal invasive. It removes undercut and tooth structure that supports retention so that single insertion guide can be achieved. This preparation was achieved by using surveyor on diagnostic cast, but there was a concern how to copy the surveyed cast to intraoral. Resin template method as a preparation guide was useful to avoid excessive tooth removal. RBFPD design was marked by using pencil on the diagnostic cast. The cast was surveyed to get the preparation designed and prepared by using milling device surveyor and burs. The template was made on the cast. Separator was applied and resin template was built along the margin until the occlusal line angle. The abutment teeth were etched and bonded. Bonding procedure was done on template. The template was placed on the teeth and polimerized. Abutment teeth preparation were done according to the cast with the bur contact simultaneously with the template's margin and finishing line. Resin template has better accuration and adaptation, easier made and efficient, also prevent excessive tooth removal and control the preparation, mechanical retention can be achieved for RBFPD restoration longevity. Resin template is useful because preparation can be transfered from diagnostic cast to intraoral accurately.

INTRODUCTION

The Resin Bonded Fixed Partial Denture (RBFPD) has become a well-known treatment when the abutments are relatively intact or when preservation of tooth structure is needed [1]. These dentures can also be preferable for young patient with big pulpal chambers. In addition, the RBFPDs have been attractive for patients and dentists because of the minimal loss of tooth structure during tooth preparation. Anaesthesia can be avoided in some patients' treatment. RBFPDs also enable vitality test and/or endodontic treatment of the abutments after its insertion [2,3]. Resin bonded fixed partial denture is considered as the replacement of conventional fixed partial denture (FPD) to keep the abutment intact and not prepared into crown. This design is conservative for replacement of single tooth [1,4]. Minimally invasive RBFPD is not meant to reduce unnecessary tooth structure but still having a good mechanical retention for long term success of the restoration. RBFDP was indicated in these cases for replacement of missing anterior tooth in young people, the missing span was too small, and the patients like to use fixed dentures with minimal cost.

The mechanical retention of retainer resin bonded by tooth micropreparation is crucial; however specific tooth preparation, good luting cement will increase bonding to metal and tooth structure so the failure will be minimized [2,5,6]. In order to achieve precision intraoral preparation, Okada and Inoue (2008) stated that the ideal preparation isn't

[1]Department of Prosthodontics, Faculty of Dentistry, Universitas Sumatera Utara, Medan, Indonesia

***Correspondence**: chihargo89@gmail.com

easy to be achieved, even for professional dentist; moreover for college students and beginners [5,7].

Most researchers suggest rest seats, groove, and parallel tooth preparation so that RBFPD can be inserted with the same axis and longitudinal to abutments [2,5,7]. Surveyor can save time and higher accuracy [2].This case report described a conservative method for replacement of a missing anterior and posterior tooth using RBFPD with resin template. Resin template is used to prevent excessive tooth removal so that the final result can mimic the diagnostic model which has been surveyed.

CASE REPORT

Case 1

A thirty-eight-year-old woman came to Prosthodontic Department of RSGM FKG USU, with a chief complaint of not confident to laugh widely because of her missing tooth. The patient wants to make fixed denture. The second upper left premolar was extracted six months ago.

The patient was diagnosed with Class III Kennedy classification with treatment options were conventional FPD, implant, and RBFPD. The history revealed that patient has never used denture before and doesn't want to use removable denture. Patient cannot afford to pay much money for implant treatment. RBFPD was suggested because the edentulous space proportion was small and the patient agreed.

The patient had a good medical record and oral hygiene. Intraoral examinations showed that patient edentulous on #25 where the space was smaller than its proportion and she still had intact adjacent teeth. The patient occlusion shows that she has a Class I Angle classification on the left side and Class III Angle classification on the right side. Lateral occlusion in working side was group function. The height of the ridge and mucosa were good. There was no root deformity, nor caries, nor bone loss of the abutment teeth. Proportion of the crown and the root was 1:2. The colour of the teeth was 2R2,5 vita 3D shade guide.

The treatment was made to have a single insertion guide with resin templates for RBFPD. The diagnostic cast was surveyed and the patterns preparation were marked by using pencil (Figure 1 and 2).

Preparation of diagnostic cast according to the insertion guide and the design. Then we applied the separating media to the diagnostic cast (Figure 3) and resin templates were accurately constructed and adapted to the margins (occusal line angle) on the prepared diagnostic cast.

Figure 1: Diagnostic Cast showing edentulous in second premolar left maxillary

Figure 2: Diagnostic cast was surveyed. Thenmarking the line using pencil, milling, and preparation using bur according to the marking line. The bur that used was identical bur as intraorally.

Figure 3: Diagnostic cast was painted by using separating medium (CMS) and then margin resin templates were made on the finish line preparation of diagnostic cast by using colored and flowable composit (Any com flow rainbow, Mediclus Co. Ltd, Korea) and polimerized.

We cleaned the teeth with pumice, etching, bonding the correspondence teeth (Figure 4, 5 and 6) and then applied bonding agent on the resin template (Figure 7).Put the resin on the teeth and then polimerized (Figure 8). We prepared the teeth according to the template design (Figure 8), it would touch simultaneously the template margins and the teeth finish line. At the end, we did the fisiologic impression phase, casting of wax pattern, cementation as usual (Figure 9 and 10).

Figure 4: Brushing the teeth with prophylaxis paste.

Figure 5: Etching the teeth, Gluma Etching Phosphoric Acid 37%, Bisco.

Figure 6: Bonding the teeth (G Premio Bond, GC, Japan) Corp)

Figure 7: Bonding the resin template

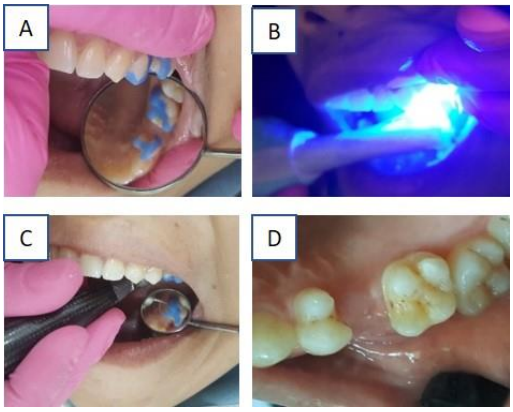

Figure 8: A. Resin tempalates were lightly bonded to the corresponding teeth.B. Polimerized the teeth. C. Preparation intraorally follow the pattern of resin templates.D. Final preparation

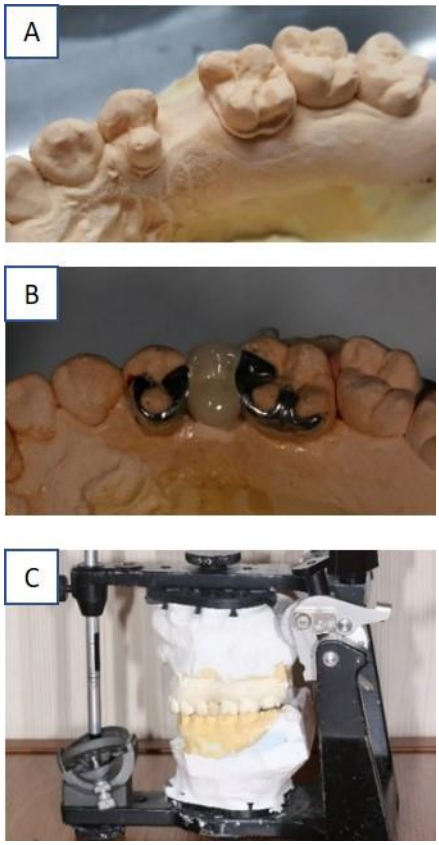

Figure 9: A**.** Physiologic Impression cast. B. RBFPD in physiologic cast. C. RBFPD in semi-adjustable articulator.

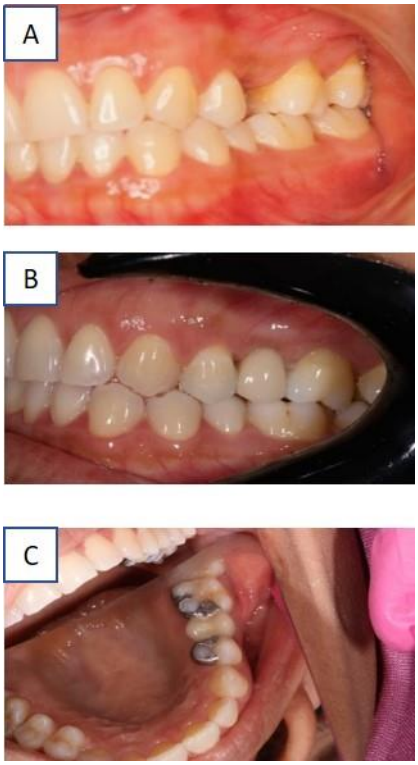

Figure 10: Final EstheticOutcome. A. Before insertion. B. After cementation of RBFPD (lateral side). C. After cementation of RBFPD (in occusal view)

Case 2

A 16 year old woman came to Prosthodontic Department of RSGM FKG-USU, with the chief complaint for missing front tooth so that she lost her confidence. The patient wanted to replace her missing tooth. The patient had extracted #11 tooth's root three months ago.The patient had a good medical record and oral hygiene.Intraoral examination showedthat tooth #11 was missing, and the adjacent teeth were still intact.

The occlusions showed the patient had Class I of molar relationship for both left and right side. Working side in lateral excursion was group function. Large U-shaped ridge was covered by firm keratinized mucosa. There was no root deformity, nor caries, nor bone loss of the adjacent teeth. Proportion of the crown and root was 1:2. The colour of the tooth was 3M3 vita 3D shade guide.

The patient was diagnosed with Class III Kennedy classification and the treatment option was conventional FPD, implant, and RBFPD. Dental history revealed that the patient had never worn any denture and refused to wear removable appliance. The patients also could not afford the implant treatment. RBFPD was proposed as the patient was young and she had a wide pulp chamber and the patient consented with the treatment.The treatment plan was the same like previous case to achieve single insertion guide with a good resin template for RBFPD (Figure 11-17).

Figure 11: Diagnostic Cast showing edentulous in first right maxilary incisor

Figure 12: Diagnostic cast was surveyed. Then marking the line and milling according to the marking line .

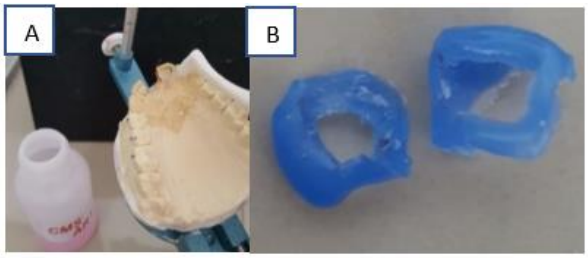

Figure 13: A. Diagnostic cast was prepared and painted by using seperating medium (CMS).B.Resin templates were made on the preparation diagnostic cast.

Figure 14: A. Resin templates in the anatomical cast. B and C. Resin templates were lightly bonded to correspondance teeth

Figure 15: A. Preparation for the teeth follow the resin templates. B. Final intraoral preparation. C. The bur that used was identical bur between diagnostic cast and intraoral

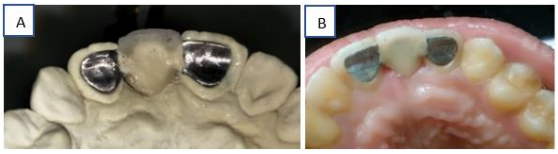

Figure 16: A. RBFPD in working cast. B. RBFPD was cemented in the mouth

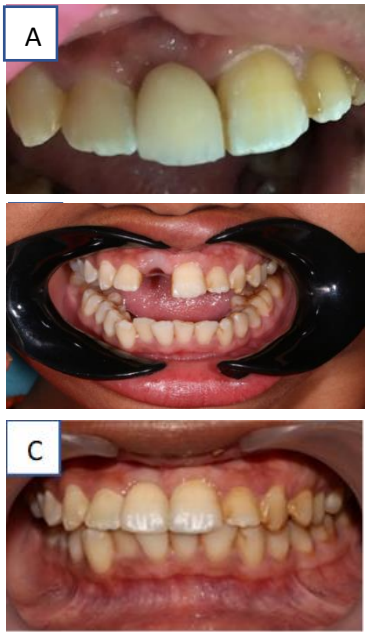

Figure 17: A. Try-in RBFPD. B. Initial intra oral photo. C. After cementation of RBFDP.

DISCUSSION

Template guided preparation was developed by Smarandescu (Romania) in 2008, seems to be an efficient clinical solution and has been used by many dentists throughout Romania, where the technique has been taught since 2009 [5]. The concept of minimal invasive in RBFPD means that it does not reduce the sound tooth structure but still has a good mechanical retention for a long term successful restoration. RBFPD using resin templates in this article needs to be surveyed to get the insertion guide and a good design, because over preparation of the teeth can decrease the mechanical retention (increase the debonding rate) which can be the main reason of the failure [2].Survey of diagnostic cast gives a modality for a quick and efficient method to achieve a good aesthetic with a minimal missing of the tooth structure [8]. After surveying and a good planning of preparation design at the diagnostic cast, it needs a method to transfer the preparation. Resin template gives the clinician a good advantage in imitating diagnostic cast so it can get the same intraoral preparation as the diagnostic cast [2]. There are some templates (silicon, vacuum form, resin) that a clinician used to guide for the preparation. Those templates have their advantages and disadvantages. Resin template in this article was much easier and take less time to make than the other templates. Template was only used to guide the preparation line. The depth of the preparation should use the same bur and can be achieved only by good estimation from the clinician in doing the preparation regarding the depth of the rest approximately 0,75-1,00 mm and proximal 0,3-0,5mm [2].The author of this article does not have any experience in doing RBFPD case but with the presence of resin template, it makes RBFPD much easier, more efficient and can end up with a good result.

CONCLUSIONS

Resin bonded fixed partial denture is extremely sensitive technique which each and every step requires a proper plans and precision design and survey. Resin Template is very useful for clinician for guiding preparation because preparation can be transferred from diagnostic cast to intraoral accurately to avoid excessive preparation of the tooth. Even inexperience dentist was also able to imitate the diagnostic cast preparation intraorally which has already been surveyed.

ACKNOWLEDGEMENT

The authors would like to acknowledge the authors and publishers of all those articles and journals that has been cited in this manuscript.

DECLARATION OF INTEREST

The authors report no conflicts of interest. The author alone is responsible with the content of this article.

REFERENCES

1. Patel Hardi K, et al, Modified Resin Bonded Fixed Partial Denture- A Simplified Approach for treating Long Span Edentulous Arch, Acta Scientific Dental Sciences, vol 2 (5), 2018 :84-6
2. Sampaio Fernandes JCA, et al, A New System of Adhesive Fixed Partial Denture, Revista de Odontologia da UNESP, vol 39(5), 2010 : 317-22
3. Prathyusha. Jyoti, Maryland bridge : An Interim Prosthesis for Tooth Replacement in Adolescents, 2011, J.Clin Pediatric Dentistry,4 (2): 135-137
4. Alok Kumar , et al, Resin Bonded Maryland Bridge, J.of Dental Sciences & Oral Rehabilitation, Bareilly, 2012 : 63-5
5. Smarandescu D, Additional Mechanical Retention for Maryland Bridges- A Case Report, Journal of Dentistry &Oral Disorders vol 4 (2), Austin Pub, 2018 : 1086
6. Shimizu H atal, The Current Status of the Design of Resin-Bonded Fixed Partial Dentures, Splint, and Overcasting. Japanese Dental Science Review, vol 50 (2), Elsevier, 2013 :23-28
7. Okada M, Inoue H, Introduction of Parallel Measurement and Supplementary Apparatus Newly Developed, Prosthodent Res Practice, vol 7(2), 2008: 243-245
8. Roheet A Khatavkar, et al, A Conservative Treatment Option for a Single Missing Premolar Using a Partial Veneered Restoration with the SR Adoro System- a Case Report, J Conserv Dent, vol 13 (2), 2010 : 102-5
9. Rosenstiel et al , Contemporary Fixed Prostodontics, Elsevier, 5th ed, 2016 : 694-710

Editorial History

Date of Submission: 26 August 2019

Review and Revision: 26 November 2019 to 19 December 2019

Accepted: 12 April 2020

Published: