Advances in Dentistry & Oral Health
ISSN: 2472-6389

Juniper Publishers
key to the Researchers

Case Report
Volume 6 Issue 1 – October 2017
DOI: 10.19080/ADOH.2017.06.555678

Adv Dent & Oral Health

All Ceramic Bonded Bridge: Clinical Procedure and Requirements

Imen kalghoum[2], Ines Azzouzi[1], Amina Khiari[2], Dalenda Hadyaoui[2]*, Belhssan Harzallah[2] and Mounir cherif[2]

[1]*Department of Fixed Prosthodontics, Faculty of dental medicine, Tunisia*

[2]*Professor, Department of Fixed Prosthodontics, Faculty of dental medicine, Tunisia*

Submission: September 06, 2017; **Published:** October 25, 2017

***Corresponding author:** Dalenda Hadyaoui, Professor, Department of Fixed Prosthodontics, Faculty of dental medicine, Monastir, Tunisia, Email: dalendaresearch@gmail.com

Abstract

One of the basic principles of tooth preparation for fixed prosthodontics is conservation of tooth structure. This is the major advantage of bonded bridge as an alternative to implant retained restorations in the esthetic zone. Especially used for juvenile patient who do not come into consideration for implant therapy? This article describes the use of an all ceramic resin-bonded bridge as a conservative and esthetic solution for the replacement of 2 mandibular incisors for a 17 -year female patient.

Keywords: All ceramic resin bonded bridge; Lithium discilicate; Mini invasive restoration; RBFPD; Esthetic prostheses

Introduction

The frequency of teeth trauma permanent denture reaches 10-35% of the general population, especially, for the central mandibular incisors (3, 8 à 13, 3%) [1]. As a result, the need for fixed prostheses becomes necessary, nevertheless, tooth preparation is challenging because of their small axial. Diameters recent developments in the field of implant logy have presented a treatment alternative for replacement of missing teeth. However, there are many cases in which implant therapy is not indicated, because of the patient's age or insufficient space between the adjacent roots, or is simply refused by the patient [2-4]. Nowadays, Metal-ceramic and all-ceramic resin bonded fixed partial denture(RBFPDs) with 2-retainers design have been proposed as conservative treatment approach for the replacement of missing teeth with caries-free abutments [5]. This technique of bonded bridges was introduced in 1963 by Brochette. It was the first type of noninvasive fixed prosthesis [5]. It offer further advantages such as applicability to juvenile patients, simplified tooth preparation, low cost, the preservation of alternative treatment options, no risk of pulp irritation, low risk of caries since no unnoticed loss of retention [6].

These adhesive bridges have experienced significant development from their conception to the present. Clinically, the single retainer RBFPDs showed a higher survival rate than the classic two retainer's ones and with the continuous development off dental ceramics, all ceramic Resin bonded bridges were introduced at the begging with alumina ceramic, then zirconium and glass ceramics nowadays [7].

This clinical report presents resin bonded prosthesis as a viable treatment alternative to conventional fixed or removable prosthesis for the replacement of a missing mandible anterior tooth fabricated from lithium dislocate ceramic (IPS Emax CAD) as a provisional solution.

Miss A.B, a 17years-old girl with two missing central mandibular incisors (Figure1) due to a trama, was referred to our department of fixed Prosthodontics fir their replacement. Her medical history was unremarkable.

Figure 1: Facial view of initial situation.

She had a defective removable fixed partial denture (Figure 2). Her chief complaint was the replacement of the missing two mandibular incisors with a fixed prosthesis. The opposing maxillary anterior teeth were favorably positioned and within

normal physiological tooth mobility (Figure 3). Implant seems to be a good solution but the patient was 17 years old under the age of minor surgery. As lingual part of mandibular incisors are out of the occlusal bite in the anterior teeth, and the sufficient length of the abutments teeth which were vital and aligned; the indication of resin bonded bridge was retained. As a provisional solution under the age of periodontal maturation is achieved (about 20 years).

Figure 2: the defective RPD.

Figure 3: preparation edges.

Patients with small edentu¬lous spans bounded by sound teeth are good candidates for RBFPDs.

The potential abutment teeth should be healthy, unretired or minimally restored, free of caries and periodontal disease, and have an adequate crown height and width. A non mobile tooth with an adequate surface area of enamel provides an ideal abutment. Although the young are more likely to have sound teeth, deboned rates are higher among people under 30 years of age [8].

Clinical procedure

The diagnostic cast was waxed to model cast to assess the size and form of mandibular incisors. The preparation edges were drawn on the model cast and then reported on teeth (Figure 3). The two lateral incisors were minimally prepared. 0,5-mm lingual reduction of the enamel and a 1mm supragingival reduction extending to the centre of the inter¬proximal contact, with an incisal finish line 2mm short of the incisal edge for optimal esthetics.

The indicated preparation provides the seating of the restoration and optimal bond strength but not mechanical retention. A temporary bridge was realized by isomoulage technique using a silicon index and acrylic resin (Texton) and cemented with temporary non eugenol cement (Figure 4). A complete arch impression was made with a silicone impression material (high viscosity washed with a low viscosity), then was transferred to the laboratory to be casted (Figure 5).

Figure 4: provisional restoration.

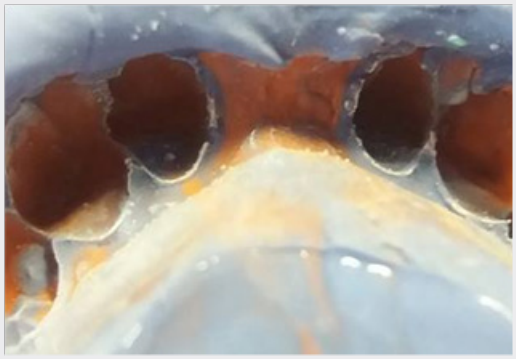

Figure 5: Arch impression.

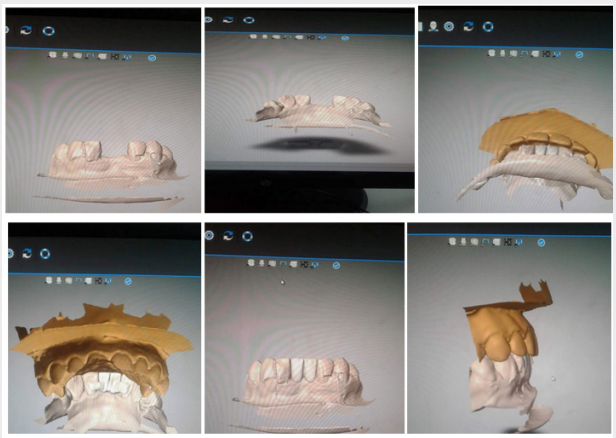

Figure 6: model scanning (CAD:CAM) and manufacturing.

The master cast was checked. The limits of prepared surfaces were marked. Then the model was referred to the technician to be

How to cite this article: Imen kalghoum, Ines Azzouzi, Amina Khiari, Dalenda Hadyaoui, Belhssan Harzallah, Mounir cherif. All Ceramic Bonded Bridge: Clinical Procedure and Requirements. Adv Dent & Oral Health. 2017; 6(1): 555678. DOI: 10.19080/ADOH.2017.06.555678.

scanned. Finally, the bonded bridge was manufactured with Emax Cad Cam technique which has the advantage of allying accuracy of adaptation and aesthetic outcome (Figure 6).

The resin bonded bridge with 2 retainers was checked intra-orally in order to assess the complete seating of prosthesis, the ocuracy of marginal fit, besides, form of the pontic and tissue contact were assessed. Finally, for a secure bonding, the use of rubber dam was necessary (Figure 7), using a self-adhesive and self-etching resin Totaled (Figure 8). It was important to clean the prepared area. Teeth surfaces were cleaned and etched for 15sec and rinsed off using 37%phosphoric acid gel (Figure 9).

Figure 7: Application of hydrofluoric acid.

Figure 8: Application of silage.

Figure 9: the rubber dam placement.

As for the prosthetic surface, hydrofluoric acid was applied for 20 seconds followed by thorough rinsing and drying (Figure 8), the external surface should be waxed in order to protect it from etching effects (Figure 9-11).

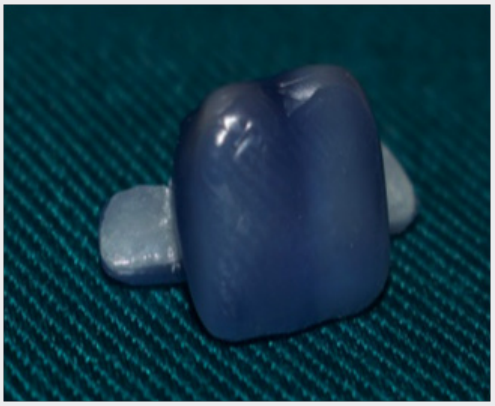

Figure 10: The protection of the external surfaces.

Figure 11: Drying.

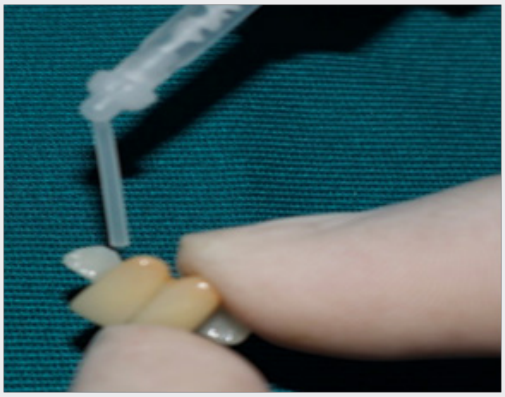

Figure 12: Bonding material applied on the intra surface of retainers.

The restoration should be supported while the resin is cured. Gross excess resin can be removed after a spot cure. Light curing is then done in accordance with the resin manufacturer's recommendations, the occlusion is checked and the patient is instructed regarding adequate oral hygiene with regard to the restoration (Figure 12-15).

How to cite this article: Imen kalghoum, Ines Azzouzi, Amina Khiari, Dalenda Hadyaoui, Belhssan Harzallah, Mounir cherif. All Ceramic Bonded Bridge: Clinical Procedure and Requirements. Adv Dent & Oral Health. 2017; 6(1): 555678. DOI: 10.19080/ADOH.2017.06.555678.

Figure 13: Seating of the bonded bridge.

Figure 14: Final result showing natural mimicry.

Figure 15: Palatal view.

Recalls

A recall appointment should be scheduled 5 to 14 days after bonding for a short check and to take an alginate impression of the treated arch for archiving a model cast. Especially in our case for young patient, this cast might help to detect movement of teeth at an early stage and to fabricate a broken retainer if necessary. The patient subsequently joins a regular recall plan (Figure 16).

Figure 16: Final result after 14 days.

Discussion

This clinical report describes a treatment option for the provisional replacement of 2 missing mandible anterior teeth using all ceramic bonded bridge fabricated from lithium discilicate the patient was satisfied with the outcome. The use of metal retainers would compromise esthetics by display of metal through the gingival embrasures, so the use of an all ceramic resin bonded prosthesis would result in an esthetic outcome: IPS e max cad is a lithium discilicate glass ceramic with flexural strength of about 400 MPA, and it's an etch able ceramic and permits a strong and durable resin-ceramic bond [4].

Case reports on the use of this procedure as a provisional treatment continue to be published [8,9]. Poyser et al. [10] recommend the Rochette bridge as an alternative to an acrylic resin removable partial denture. Al-Wahadni & Al-Omari [11] calculated a 90.5% success rate over the short term (35 months) for 21 RBFPDs used as provisional prostheses immediately following tooth extraction. However, the RBFPD is consid¬ered as a definitive solution for short edentulous bounded by healthy teeth. The literature search identified one meta-analysis on survival, success and complication rates of different fixed partial denture [12]. Prospective and retrospective studies on patients with fixed prostheses with a follow-up time of at least 5 years were included. The 5-year survival rate of conventional bridges was 93.8% and 87.7% for resin-bonded bridges for both one and two rings. After 10 years of function, the survival rate decreased to 89.2% conventional bridges and to 65% for resin-bonded bridges [13].

One prospective study examined the survival rates of 38 all-ceramic resin-bonded bridges [14]. Bridges the survival rates were 60.3% for the two-retainer resin-bonded bridges and 90.9% for the single retainer wing resin-bonded bridges. In our case, the use of two retainer design was preferred because two teeth are missing and the similar mobility of mandibles laterals reduces the interabutment stresses that tend to cause deboning. Concerning

How to cite this article: Imen kalghoum, Ines Azzouzi, Amina Khiari, Dalenda Hadyaoui, Belhssan Harzallah, Mounir cherif. All Ceramic Bonded Bridge: Clinical Procedure and Requirements. Adv Dent & Oral Health. 2017; 6(1): 555678. DOI: 10.19080/ADOH.2017.06.555678.

the use of lithium discilicate, the some initial results of clinical studies showed 90.9% of survival at 15 months. According to Sailer et al. [15] in a recent study, a survival rate of 100% at 6 years was reported. Only 5, 7% of ceramic chipping are reported [15].

Lam et al seem to prefer restorations by all ceramic RBFPDs to implant restorations, this resin bonded bridges present fewer biological complications. Than implants [16] about the preparation El-Mowafy & Rubo [16] recom¬mend an anterior design involving a 0.5mm lingual reduction of enamel and a 1mm supragingival reduction extending to the centre of the inter¬proximal contact, with an incisal finish line 2 mm short of the incisal edge for optimal esthetics. In our case, only 0, 2mm lingual reduction because it's a provional solution and preservation of tissue is required [16].

Adequate and parallel axial reduc¬tion of the proximal surface adjacent to the edentulous area and extending lingual to the planned interproximal contact is required for a path of in¬sertion and retention. Maximum ex-tension into the proximal surfaces will enhance resistance for the bridge and pre¬vent mesiodistal and faciolingual dislodgement. A cingulum rest with a flat floor is avoided in this situation in order to keep the reversibility of the treatment option.

Conclusion

To maximize the chance of a successful, esthetic, and minimally invasive treatment, the correct indication of all ceramic RBFPDs must be present. The survival rate of RBFPDs is still considerably less than that of conventional fixed partial dentures. The principle reason for failure is possible deboning of the framework from the abutment teeth. The use of RBFPDs made from lithium disclicate is suitable as a fast and safe solution when a perfect clinical procedure is followed however; further clinical studies are required to evaluate the long term potential of lithium disclicate RBFPD as a definitive solution.

References

1. Gassner R, Bösch R, Tuli T, Emshoff R (1999) Prevalence of dental trauma in 6000 patients with facial injuries: implications for prevention. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 87(1): 27-33.
2. Koutayas SO, kern M, Ferraresso F, Sirub JR (2002) Influence of framework design on fracture strength of mandibular anteriorall ceramic resin bondedfixed partial dentures. Int J Prosthodont 15(3): 223-229.
3. Sasse M, Kern M (2014) All-ceramic resin-bonded fixed dental prostheses: Treatment planning, clinical procedures and outcome. Quintessence Int 45(4): 291-297.
4. Conrad HJ, Seong WJ, Pesun IJ (2007) Current ceramic materials and systems with clinical recommendations: a systematic review. J Prosthet Dent 98(5): 389-404.
5. Goodacre CJ, Rungcharassaeng K, Kan JY (2003) Clinical complications in fixed prosthodontics. J Prosthet Dent 90(1): 31-41.
6. Weng D, Ries S, Richer EJ (2002) Treatment of a juvenile patient patient with maxillary all-ceramic resin-bonded fixed partial denture: a case report. Quintessence Int 33(8): 584-588.
7. Roux T, Cazier S (2014) Intervention minimalement invasive: remplacement d'une dent antérieure par bridge colléesLes entretiens d'odontologie stomatologie de Bichat, pp. 1-5.
8. Matsumura H, Kolzumi H, Tanoue N (2004) Resin-bonded casting used an anterior fixed partial denture. Int Chin J Dent 4: 80-84.
9. Shimizu H, Takahashi Y (2004) Retainer design for posterior resin-bonded fixed partial denture: a technical report. Quintessence Int 35(8): 653-654
10. Poyser NJ, Briggs PF, Chana HS (2004) A modern day application of the rochette bridge. Eur J Prosthodont Restor Dent 12(2): 57-62.
11. Al Wahadni AM, Al Omari WM (2004) Immediate resin-bonded bridgework: results of a medium-term clinical follow-up study. J Oral Rehabil 31(1): 90-94.
12. Fugazzotto PA (2009) Evidence-based decision making: replacement of the single missing tooth. Dent Clin North Am 53(1): 97-129.
13. Hemmings K, Harrington Z (2004) Replacement of missing teeth with fixed prostheses. Dent Update 31(3): 137-141.
14. Sailer I, Bonani T, Brodbeck U, Hämmerl CH (2013) Retrospective clinical study of single-retainer cantilever anterior and posterior glass-ceramic resin bonded fixed dental prostheses at a mean follow-up of 6 years. Int J Prosthodont 26(5): 443-450.
15. Lam WYH, Botelho MG, McGrath CPJ (2013) Longevity of implant crowns and 2-unit cantilevered resin-bonded bridges. Clin Oral Implants Res 24(12): 1369-1374.
16. El Mowafy O, Rubo MH (2000) Retention of a posterior resin-bonded fixed partial denture with a modified design: an in-vitro study. Int J Prosthodont 3(5): 425-431.

DOI: 10.19080/ADOH.2017.06.555678

How to cite this article: Imen kalghoum, Ines Azzouzi, Amina Khiari, Dalenda Hadyaoui, Belhssan Harzallah, Mounir cherif. All Ceramic Bonded Bridge: Clinical Procedure and Requirements. Adv Dent & Oral Health. 2017; 6(1): 555678. DOI: 10.19080/ADOH.2017.06.555678.