

All Ceramic Resin Bonded Bridge - An Esthetic Alternative to Conventional Fixed Prosthesis

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Abstract: *This clinical report presents resin bonded prosthesis as a viable treatment alternative to conventional fixed or removable prosthesis for the replacement of a missing mandibular anterior tooth fabricated from lithium disilicate ceramic (IPS Emax Press, Ivoclar Vivadent). The prosthesis resulted in satisfactory functional and esthetic outcomes. Resin bonded prosthesis using lithium disilicate ceramic is an interesting treatment option in selective cases. Further research is required to evaluate its clinical longevity and long term potential.*

Keywords: resin bonded bridge, lithium disilicate, Emax, all ceramic

1. Introduction

Recent developments in the field of implantology and adhesive dentistry have presented various treatment alternatives for replacement of missing teeth [1]. Implant therapy, however, necessitates surgical intervention and may require second stage surgery to improve esthetics. In contrast, resin bonded bridges provide a viable, esthetic and minimally invasive treatment alternative for replacing missing teeth.

Resin bonded bridge (RBB) may be preferable to a removable partial denture especially in cases where implant therapy may be complex due to deficiency of space, patient's medical condition or economical constraint. RBB are essentially reversible and maintain the integrity of the pulp [2,3]. This article aims to re-evaluate the role of RBBs in fixed prosthodontics.

2. Case Report

A 33 year old female patient reported to the Department of Prosthodontics with chief complain of unesthetic smile due to missing lower front tooth lost due to trauma two years back. On clinical examination, 41 was found to be missing with ridge defect showing reduced buccolingual width (Figure 1). Attrition was seen on mandibular anterior teeth with wear facets on maxillary and mandibular posterior teeth. Insignificant mobility was noted in teeth 31, 42. Malalignment of maxillary anterior teeth was seen along with deep bite and reduced overjet. After clinical and radiographic evaluation, irreversible hydrocolloid impressions were made, the diagnostic casts mounted and a diagnostic wax up done to serve as blueprint for the final restoration. After discussing various treatment modalities, resin bonded bridge using lithium disilicate ceramic (IPS Emax Press, Ivoclar Vivadent) was selected as treatment option of choice. The abutments 32 and 41 were conservatively prepared with a chamfer margin and incisal offset to act as vertical stop for the prosthesis. Final impressions were made using polyvinyl siloxane impression material (Silagum, DMG). A provisional restoration was fabricated using autopolymerising resin (Luxatemp, DMG)

intra-orally using the diagnostic wax up as guide and secured using autopolymerising resin without etching the tooth surface. Prior to cementing the final restoration (Figure 2), the bonding surface of the retainer of the completed RBFDP was etched with hydrofluoric acid and treated with silane coupling agent (Monobond S, Ivoclar Vivadent). The abutment teeth were cleaned with fluoride free cleaning paste using a rubber cup. The tooth surface was etched with 37% phosphoric acid and the prosthesis cemented with dual cure polymerising resin (Variolink N, Ivoclar Vivadent) (Figure 3,4).



Figure 1: Pre-Operative intra-oral view

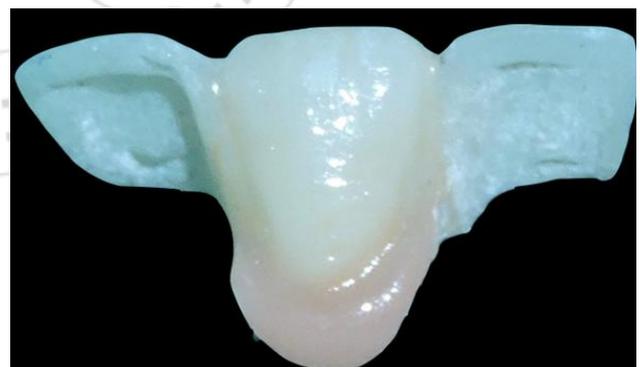


Figure 2: Final Prosthesis



Figure 3: Post-Operative intra-oral view



Figure 4: Post-Operative Occlusal view

3. Discussion

This clinical report presents resin bonded prosthesis as a viable treatment alternative to conventional fixed or removable prosthesis for the replacement of a missing mandibular anterior tooth. The present case presented a clinical scenario with reduced overjet and deep bite ruling out conventional fixed prosthesis as that would require extensive labial preparation. Resin bonded prosthesis in turn would involve only lingual preparation. Increased interabutment distance and mesial undercuts adjacent to the abutments were noted. Use of metal retainers would compromise esthetics by display of metal through the gingival embrasures[4]. Also labial ridge defect was seen in the edentulous area of 41. An all ceramic resin bonded prosthesis accompanied by gingival porcelain would result in an esthetic outcome. IPS e.max (IPS Emax Press, Ivoclar Vivadent) is a lithium disilicate glass ceramic with flexural strength of about 400 MPa[5]. Debonding of the resin bonded prosthesis has been reported to be the most common cause of failure in literature[6]. IPS Emax, being a silica-based lithium disilicate ceramic, is an etchable ceramic and permits a strong and durable resin-ceramic bond. Cementation of silica based ceramics with composite resin cement increases fracture resistance of the prosthesis as well as the abutment [7]. Thus RBB in lithium disilicate (IPS Emax Press, Ivoclar Vivadent) was selected as the treatment of choice. Resin bonded bridges offer several other advantages including exclusion of local anaesthesia, preservation of soft tissues, supragingival margin which not only simplifies impression procedures but also facilitates plaque removal [1].

As with any other fixed dental prosthetic treatment Resin bonded bridges require appropriate examination, diagnosis and treatment planning. In the present case occlusal wear seen on posterior teeth and the incisal wear on mandibular anteriors as also the mobility seen wrt 31,42 indicated premature occlusal contacts. After thorough occlusal examination, occlusal prematurities were noted on maxillary and mandibular third molars. These were equilibrated first on the mounted casts and after satisfactory results the same were carried out intra-orally. Overlooking the premature contacts could jeopardise the final prosthesis [3].

4. Conclusion

In spite of proven success, use of resin bonded prosthesis as a definitive restorative treatment alternative is controversial and their longevity questionable. The five year survival for resin bonded prosthesis has been reported to be 87.7% [6] while that for conventional fixed prosthesis is reported to be 93.8% [8]. The most frequent cause for failure of resin bonded prosthesis was debonding of the restoration [6]. With the recent development and advances in resin cements, retention of resin bonded prosthesis has been enhanced. General 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 for a successful treatment outcome.

References

- [1] Sasse M, Kern M. All-ceramic resin-bonded fixed dental prostheses: Treatment planning, clinical procedures, and outcome. *Quintessence Int.* 2014;45(4):291-7.
- [2] Harrington Khaz. Replacement of Missing Teeth with. *Dent Updat.* 2004;31(April):137-41.
- [3] Clark GT, Yoshihiro Tsukiyama, Kazuyoshi Baba TW. Sixty-eight years of experimental occlusal interference studies: What have we learned?. *J Prosthet Dent.* 1999;82:704-13.
- [4] L. WHA. CWF and PB. The esthetic hybrid resin-bonded bridge. *Quintessence Int.* 1989;20:623-6.
- [5] Conrad, H. J., W. J. Seong and IJP. Current ceramic materials and systems with clinical recommendations: a systematic review. *J Prosthet Dent.* 2007;98:389-404.
- [6] Bjarni E. Pjetursson, Wah Ching Tan, Ken Tan, Urs Bragger, Zwahlen, Marcel NPL. A systematic review of the survival and complication rates of resin-bonded bridges after an observation period of at least 5 years. *Clin Oral Impl Res.* 2008;19:131-41.
- [7] Jensen ME, Sheth JJ TD. Etched-porcelain resin-bonded fullveneer crowns: in vitro fracture resistance. *Compendium.* 1989;10:336-8, 340-1, 344-7.
- [8] Pjetursson B E, Bragger U, Lang N P ZM. Comparison of survival and complication rates of tooth-supported fixed dental prostheses (FDPs) and implant-supported FDPs and single crowns (SCs). *Clin Oral Implant Res.* 2007;18(Suppl 3):97-113.