

# Resin Bonded Bridge: A Subtle Alternative for Restoring Single Missing Tooth

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**Abstract:** The prosthetic restoration of small edentulous spans poses a dilemma when the adjacent teeth do not require crowns. It is difficult to justify extensive reduction of the adjacent teeth to support a conventional fixed partial denture. A single-tooth implant is an alternative but not the treatment of choice for many patients due to anatomic limitations and economical issues. Conservation of tooth structures precipitated the development of the resin bonded bridge. Such conservative procedures present limitations in esthetics and retention but with recent innovations in the acid-etch technique have led to new alternative to traditional treatment for esthetic and restorative procedure.

**Keywords:** Adhesive, Crown, Missing tooth, Esthetics.

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## I. INTRODUCTION

The aim of every dental surgeon is to replace the lost teeth thereby preventing other deleterious effects associated with tooth loss. While rehabilitating short span, bounded saddle situations, fixed partial dentures are the most ideal choice, if bounding teeth are suitable as abutment.

Most frequently the patient may ask, "Is it really necessary to cutaway all that good tooth?" this question has troubled dentist in prescribing the replacement of missing tooth as they have tried to balance the periodontal, occlusal and esthetic benefits of prosthesis against the damage to the abutment teeth.<sup>1</sup>

However, replacement of missing teeth with conventional ceramo-metal fixed partial denture prosthesis requires the removal of substantial amount of tooth structure so that the resulting restorations are strong, appropriately contoured, and esthetically acceptable. If coverage is necessary for cosmetic purposes, because of caries or preexisting restorations this removal of structure is acceptable but when the abutment teeth are sound that is they are intact and caries free the conventional ceramo-metal fixed prosthesis seems to be quite ridiculous.<sup>2</sup>

A single-tooth implant is an alternative for patients with adequate bone dimensions and who are willing to undergo a minor surgical procedure. However, oral implants are not the treatment of choice for many patients and the resin-bonded fixed partial denture (RBFDP) offers a possible solution. In the 1970s, Howe and Denehy<sup>3</sup> adapted the Rochette bonded cast-metal periodontal splint concept<sup>4</sup> to create the first RBFDP. The early procedures were conservative, but problems with debonding resulted in a survival rate of only 28% at 7.5 years.<sup>5</sup> To enhance retention and resistance form of posterior RBFDPs, Livaditis recommended preparation of parallel guide surfaces on the interproximal and lingual aspects of the adjacent teeth along with rests on the occlusal aspect to counteract dislodging forces. Resin bonding was further enhanced by using solid electrolytic ally etched base metal- alloy casting.<sup>6</sup> The result was a doubling of the survival rate to 64% at 7.5 years. In the 1980s and 1990s, significant advances in metal surface treatment, dentin bonding and resin cements potentially improved the clinical success rate of RBFDPs.

The primary goal of the resin retained fixed partial denture is replacement of missing teeth and maximum conservation of tooth structure. The popularity of resin bonded fixed partial denture has increased since its introduction because reliable resin metal bonding can be achieved by electrolytic acid etching of cast base metal alloys.<sup>7</sup>

## II. CASE REPORT

A typical early design of a three unit resin bonded fixed partial denture had a pontic supported by two rest seats and was retained by lingual/palatal plates on adjacent abutment teeth. The grooves, plates and struts are also included in design to provide retention and resistance form to the retainers.

A male patient, aged 15 years presented with a missing upper right maxillary central incisor (11). Patient gave a history of loss of tooth due to trauma 2 years back. On examination it was revealed that the entire tooth was missing with an edentulous area with no space loss. (Figure 1)

An intra oralperiapical radiograph was taken and the radiography revealed complete root formation of the adjacent teeth (12 & 21). After considering the patients wish and the clinical situation, the option of removable partial denture, fixed partial denture and implant were eliminated and it was decided to replace it with a resin bonded bridge. Tooth preparation for both 12 and 21 was done following the standard technique. Lingual preparation ended 1mm from the incisal edge and a light chamfer finish line was prepared 1 mm supragingivally (Fig. 2) an impression was made in addition silicone impression material and sent to the laboratory.

After the metal try-in was successful shade selection was done using a shade guide. The trial fitting of the prosthesis was done and then esthetics, mastication and speech were evaluated. 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. In addition, care was taken to make sure metal would not be visible inter proximally or at the embrasure areas (Figure 3). After isolation with a rubber dam, the Maryland bridge was cemented using a resin cement (Figs 4, 5).

## III. DISCUSSION

A missing tooth in the anterior region is not only a physical loss, but also may be an emotional experience for the patient as well. To remove healthy tooth structure of adjacent teeth to replace a congenitally missing tooth or a tooth lost to decay, trauma, root fracture, failed root canal treatment, or pathology is, for some patients and dentists, a very aggressive treatment option.<sup>8</sup>

Many treatment modalities are available for replacing a single missing tooth; removable partial denture, fixed partial denture or dental implant. Each modality is a possible treatment option and has its own advantages and disadvantages. Patient awareness of the advantages and disadvantages of different treatment modalities is very important for decision making, therefore there are many factors make single-tooth replacement one of the most challenging restorations in dentistry.<sup>9</sup> Satisfaction with RPDs has multifactorial dimensions involving technical and patient-related variables. Comfort, masticatory ability, esthetics, and retention seem to be the most important factors for prosthesis acceptance. Personality, attitude towards RPD and motivation are dependent on the patient and may influence general satisfaction and that seems to make it a difficult option for pediatric patients.

The traditional treatment for a single edentulous space is a conventional fixed partial denture. A major shortcoming of this alternative is the significant tooth reduction of the abutments.<sup>10</sup> The use of fixed partial denture should be avoided in young actively growing patients this is because the rigid fixed partial denture could interfere with jaw growth.<sup>11</sup> Even after 10 years of service the periodontal response for resin bonded fixed partial dentures is minimal.<sup>10</sup> The three most common complications associated with resin-bonded prosthesis are deboning (21%), tooth discoloration (18%) and caries (7%).<sup>12</sup> The implication of interim prosthesis for pediatric patients with proper treatment plan can serve as a shelter from ill effects related to edentulous space and invasive replacement procedure like fixed partial denture and implants in growing patients.

## IV. CONCLUSION

One of the basic principles of tooth preparation for fixed prosthodontics is conservation of tooth structure. This is the primary advantage of resin-retained fixed partial dentures. Precision and attention to detail are just as important in resin-retained fixed partial dentures as they are in conventional prostheses. To provide a long-lasting prosthesis, the practitioner must plan and fabricate a resin-retained restoration with the same diligence used for conventional restorations.

Resin bonded prostheses can be used for a wide variety of clinical situations. They provide long-term esthetically pleasing restorations when proper case selection, design, and bonding conditions are followed. The literature shows divergent

results regarding the success rate of resin bonded prosthesis. Although resin bonding is less complicated than conventional fixed prosthodontics, the procedures are technique-sensitive and demand careful attention to details.

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#### APPENDIX – A

##### List of Figures:



Fig.1. Missing upper right central incisor



Fig.2. Tooth preparation of 12 and 21



Fig.3. Metal Tryin of Maryland bridge



Fig.4. Intra oral after prosthesis cementation



Fig.5. Pre and Post operative view