

# Maryland Bridge as a Minimally Invasive Restoration of a Missing Anterior Tooth

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## ABSTRACT

Minimally invasive option for replacing missing teeth include resin-bonded bridges. These are highly effective in restoring oral function and aesthetics and result in high level of patient satisfaction. Maryland bridges are the resin-retained bridges most commonly used as an interim restoration to replace single anterior tooth in young patients till the growth is completed for the permanent tooth replacement options. This case report demonstrates the management of a single missing tooth in anterior region of upper jaw with Maryland bridge.

**Keywords:** Maryland bridge; minimally invasive; single missing tooth.

## INTRODUCTION

Adhesive-retained fixed dental prosthesis is a conservative replacement of missing tooth.<sup>1</sup> Maryland bridge is porcelain-fused-to metal pontic attached to two metal wings bonded to lingual or palatal surfaces of abutment teeth. It is most conservative approach of tooth replacement as reduces need for teeth preparation significantly.<sup>2</sup>

Mechanism of attachment is unique which consists of three components - enamel to resin bond, cohesive bond of composite resin, and resin to framework bond.<sup>3</sup> It is an aesthetic alternative to conventional fixed prostheses to restore function.<sup>4</sup> Maryland bridge thus serves as an interim solution for young patients who cannot receive implant immediately.<sup>5,6</sup>

## CASE REPORT

A 15-years old female presented to the Department of Prosthodontics and Crown-bridge, BP Koirala Institute of Health Sciences, Dharan, Nepal with a chief complaint of a missing tooth in upper front region of jaw. The patient gave a history of loss of

tooth due to trauma about three months ago. The patient was mainly concerned about her aesthetics and did not want removable restoration to replace the missing tooth.

On intra-oral examination, upper right central incisor was missing (Figure 1). Gingival defect was also noted in the same region. All remaining



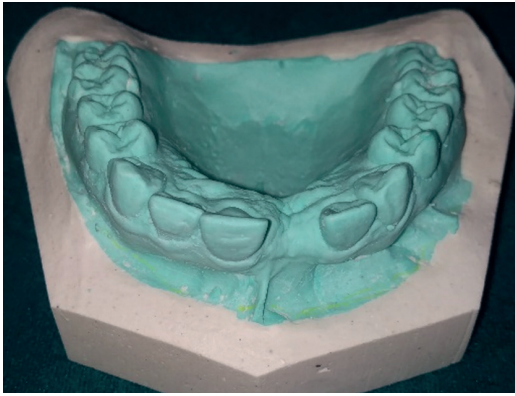
**Figure 1:** Intraoral photograph showing missing 11.

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**Figure 2: Diagnostic cast.**



**Figure 3: Diagnostic wax-up.**

teeth were well aligned in the arch and there was presence of posterior occlusal support. The mesio-distal width of 11 was similar to that of 21 while the crown height space of 11 was more due to the gingival defect. Mandibular excursive movements were favorable for pontic.

An intra-oral periapical radiograph of the missing tooth region was advised, which revealed complete root formation and favorable pulpal morphology of 12 and 21, no root stumps of 11 and complete bone formation in socket of 11.

The patient's age did not permit the use of dental implants. The patient did not wish for conventional fixed partial prosthesis due to more tooth reduction required. After considering the patient's as well as parent's wish and the clinical situation, the options of removable partial denture, conventional fixed partial denture and implant were eliminated. Finally, the missing tooth was decided to be replaced with Maryland Bridge as an interim solution.

Diagnostic impression was made using alginate impression material and poured in dental stone to obtain the diagnostic cast. (Figure 2)

Diagnostic wax-up was done on the diagnostic cast. (Figure 3) It revealed the pontic would be longer in length than the adjacent central incisor due to the presence of gingival defect. So, gingiva-coloured porcelain was planned to be used in cervical third of the pontic.

Tooth preparation was done according to the guidelines for fabrication of wings of resin bonded bridge on abutment tooth. (Figure 4A, B)

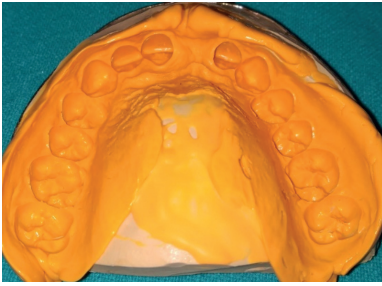
Final impression was made with polyvinyl siloxane impression material (Figure 5) and was sent to the laboratory for the fabrication of Maryland bridge. Shade selection was also done.

Subsequently, trial fitting of the prosthesis was carried out in patient's mouth and then, aesthetics and speech were evaluated. The use of gingiva-coloured porcelain was helpful in re-establishing the aesthetics (Figure 6).

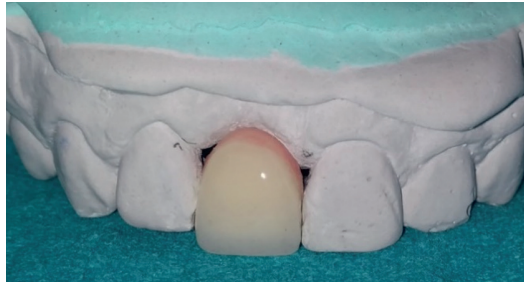
The fitting surfaces of the 'wings' were sandblasted. The prepared tooth surfaces and the sandblasted wing surfaces were etched followed by rinsing with water and drying. Both surfaces – enamel and metal



**Figure 4: Tooth preparation. Outline of planned tooth preparation (A). Final tooth preparation (B).**



**Figure 5: Final impression.**



**Figure 6: Final prosthesis with gingiva-coloured porcelain in master cast.**



**Figure 7: Cementation of Maryland bridge with resin cement.**



**Figure 8: Final prosthesis in situ, gingiva-coloured porcelain was used apically.**

wings were coated with bonding agent followed by light curing. Resin cement (Calibra® Esthetic Resin Cement, Dentsply, Sirona) was applied only to the etched, fitting surfaces of the Maryland bridge which was then securely seated onto the palatal aspect of the abutment tooth (Figure 7). Removal of gross excess cement was done without jeopardizing the seating of the bridges. Then, the resin cement was light cured following the manufacturer's instructions.

The final result was satisfactory since the use of gingiva-coloured porcelain apically masked the gingival defect and the pontic re-established the aesthetics and speech concerns of the patient (Figure 8). Post cementation instructions were given and regular follow-up was advised until the patient is ready to replace the Maryland bridge with a more permanent solution like dental implant.

## **DISCUSSION**

Missing tooth in anterior region of jaw of a youngster due to trauma can not only lead to psychological trauma but also create a functional dilemma for the dentist because the usual treatment options of implant, removable partial denture and fixed partial denture available for adults, are often

inconvenient for an adolescent.<sup>7</sup> Conservation of sound tooth structure has been a major concern in dental practice. Resin bonded prosthesis is an alternative for conventional fixed partial prosthesis for replacement of missing single anterior tooth.<sup>4</sup> This is especially important for young patients since they are more likely to experience endodontic complications due to extensive tooth preparation.<sup>8</sup>

In our case, several advantages of minimal tooth preparation, minimal potential for pulpal trauma, supragingival preparation, thinner retainers yet resist flexing and micromechanical retention were provided by Maryland bridge. However, reduced restoration longevity is the primary disadvantage.<sup>4</sup> The most common reason for failure being debonding, the patient was warned of this risk and to report immediately if loosening of the bridge is felt.<sup>8</sup>

The predictable outcome of the planned treatment was shown to the patient with the help of diagnostic wax-up. Prosthetic approach was used as an alternative to treat the gingival tissue defect. The meticulous use of gingiva-coloured porcelain reproduces a predictable aesthetic result as well as gives the patient satisfaction, without any further invasive procedure.<sup>9</sup>

The success of resin-bonded fixed prosthesis is significantly affected by the operator as well as the patient. With careful attention to detail and adjustment of the occlusion in protrusive and lateral excursions by the operator, combined with cooperation of the patient relative to incisive function and masticatory stress, the interim fixed prosthesis may serve for a substantial period.<sup>10</sup>

resin bonded bridges are minimally invasive fixed prostheses. This not only restores the form, function and aesthetics but also increases the patient's self-esteem and confidence. However, careful patient selection is a significant factor in predetermining the clinical success.

**Conflict of interest:** None.

## SUMMARY

Maryland bridge can be used specifically for young patients with missing anterior teeth because the



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