

# Managing Missing Single Tooth Loss with a Loop Connector Resin Bonded Bridge: Case Report

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Received: 30 Apr 2024; Accepted: 02 Jun 2024; Published: 09 Jun 2024

**Citation:** Boujoual I, Wahid HO, Moussaoui H, et al. Managing Missing Single Tooth Loss with a Loop Connector Resin Bonded Bridge: Case Report . Oral Health Dental Sci. 2024; 8(2); 1-5.

## ABSTRACT

*A 19-year-old girl, in a good general health condition, has consulted for aesthetic reasons: replacing her left upper central incisor. Her financial state doesn't allow her an implant; mixed restoration, but the presence of a bilateral diastema makes the situation difficult as we can't realize a classic resin bonded bridge, in this case we chose to modify the shape of the resin bonded bridge by using a double loop connector shape that keeps the space between the teeth apparent and so keeps the diastemas.*

## Keywords

Loop connector, Resin bonded bridge, Diastema, Single tooth replacement.

## Introduction

Patients missing a single tooth with diastema have restricted treatment alternatives. The use of a conventional fixed partial denture is too invasive and will result to a very wide tooth that is aesthetically disagreeable. The classic resin bonded bridge will lead to metal appearance, so the alternative is either resin bonded bridge with loop connectors, cantilever bonded bridge or implant-supported prosthesis if the patient has the financial ability.

The prosthodontist is faced to a hard challenge: “keeping the diastema, and realizing an aesthetic rehabilitation with symmetric proportions of the central incisor”.

The aim of our article is to illustrate this minimally invasive approach, and its steps of achievement.

## Clinical Case Report

A 19-year-old girl, in a good general health condition, has consulted for replacing her left upper central incisor mainly for aesthetic reasons.

The clinical examination revealed the absence of the tooth extracted due to an invasive caries process. The adjacent teeth (11 and 22) are free from caries and restorations. The edentulous space present slightly resorbed crest and the mesio-distal space exceeded the diameter of the tooth to replace (Figure 1).

The soft tissues were integral and in good health. The functional examination of occlusion highlighted a unilateral mastication, a stable occlusion and a coincidence between the position of the Maximum intercuspation and the centric relation. Also a Classe I of Angle was noticed either right and left. The overjet measured 3mm and the overbite 2mm. The dynamic movements showed an efficient anterior guidance.

The financial state of the patient doesn't allow her an implant fixed restoration, but the presence of bilateral diastemas will compromise the aesthetic result if we choose a classic resin bonded bridge as the metallic connexions will be visible. And since the adjacent teeth are undamaged, the conventional fixed partial denture becomes a very invasive treatment option and will result to a very wide tooth that is aesthetically unpleasant. So, the best alternative in that case is the loop connector resin bonded bridge. This solution allows keeping the diastema and so the natural aspect, and also it is a minimally invasive treatment option because the dental preparations are minor.

Before starting our treatment, the wax-up and the treatment project were shown to the patient and her informed consent was obtained.



**Figure 1:** Intra oral vestibular view showing wide edentulous space for the 21.

#### • Teeth preparations

The preparations were pellicular and obeyed the mechanical, biological and aesthetic required imperatives.

It consisted of a uniform reduction of the palatal surface of the teeth by 0.6 mm, with a finishing line located 1 mm from the gingiva and 2 mm from the free edge (Figure 2). In order to avoid the visibility of the metal, the preparation was set back from the proximovestibular angles.

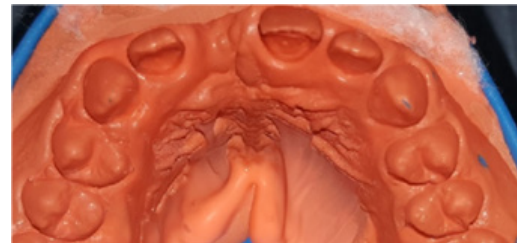
#### • Impression

The impression mixed with a double viscosity silicone A is produced, disinfected and sent to the laboratory with a technical file containing the diagram of the desired shape.

At the end of the session, the preparations were protected by a non-eugenol temporary sealant to avoid any subsequent interference with the bonding phase (Figure 3).



**Figure 2:** Occlusal view showing minimal teeth preparations



**Figure 3:** One stage impression with silicone-A

#### • The fitting of the metallic framework:

The control was done on the model and in the mouth. Verification of the fins after insertion of the bridge highlighted a perfect cervical adaptation without hiatus or over-contour. The shape of the intermediary was adapted to the edentulous ridge (Figure 4-6).

The shape of the handle requires special attention, its contact with the mucosa must be intimate and without pressure on the underlying mucosa. The static and dynamic occlusion was controlled, no overload or interference is allowed to avoid destabilizing the bonded bridge, the bridge must reinforce the anterior guidance and respect the function of the preexisting group.



**Figure 4a-b-c:** Different views of the metallic framework with double loop palatal connectors.

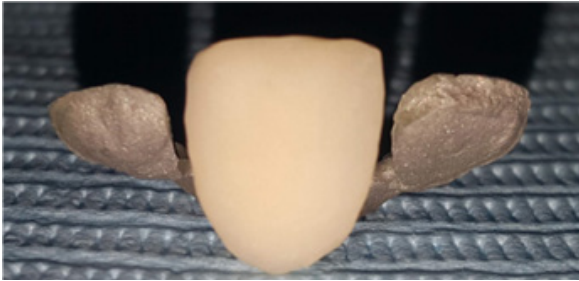


**Figure 5:** Palatal view showing the double loop connectors.



**Figure 6:** Vestibular view of the metallic framework showing the respect of the diastema.

The form and the shade of the prosthetic tooth were verified (Figure 7,8).



**Figure 7:** The fixed partial denture with loop connectors after the heating of the ceramic.



**Figure 8:** Vestibular view of the fitting of the ceramic showing the conservation of the diastema.

We adjusted the form and asked the laboratory technician to do a staining and glazing of the ceramic. Then a sandblasting was realized to ensure the retention of the cement.

#### ▪ The bonding of the loop connector bridge

Prior to the bonding, we placed the rubber dam to avoid humidity on the enamel surfaces.

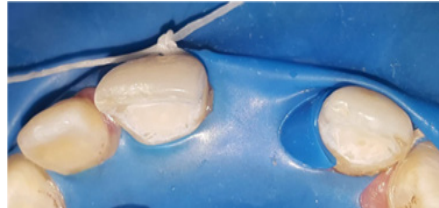
We realized the etching of the enamel using the acid contained in the pack (Figure 9), After rinsing and drying (Figure 10,11), we applied the cement in the intaglio of the retainers and also in the surfaces of the prepared teeth, the cement used is Super Bond, C&B, Inc. U.S.A. We maintained digital pression during 7 minutes before removing excess of cement with a curette (Figure 12,13,14,15).



**Figure 9:** Etching of the enamel of the prepared abutment teeth



**Figure 10:** Rinsing of the etched surfaces.



**Figure 11:** White aspect of the enamel surfaces after drying



**Figure 12:** Cement application on the intaglio of the retainers.



**Figure 13:** Insertion of the bridge.



**Figure 14:** Palatal view of the reconstruction.



**Figure 15:** The removal of the rubber dam and the excess of cement.

### Post-operative instructions

The patient was satisfied with the result (Figure 16). We took a retroalveolar X-Ray control to make sure of the adaptation and the good removal of cement (Figure 17). And the patient was given instructions regarding the maintenance and the oral hygiene and asked for a continuous and strict follow up. The patients should be ordered to do not push the tongue into the gap between the loop and the mucosa [1].



**Figure 16:** Final result showing the perfect fitting and the respect of the middle diastema.



**Figure 17:** X-Ray of control showing the good fitting.

### Discussion

Though implant supported crowns are the best option of treatment in patients with a single tooth missing, there are several patients who cannot undergo such treatment [2,3].

When a single central incisor is missing along with diastema there are restricted treatment option. Closing the diastema with conventional bridge would lead to unpleasant aspect and negative effects on the periodontium. The double loop connector bridge improves the natural look of the restoration, maintains the diastema, enhances emergence profile and preserves the structure of the abutment teeth (minimally invasive approach). Caution must be taken to design the loop-connector not too thick and should have intimate contact to the underlying mucosa to avoid the development of habitual tongue posturing between the loop and mucosa. Also, design should allow the oral hygiene and should not increase any plaque accumulation [1,2,4].

Connectors are the part of the bridge that connect the retainer and the pontic. They can be rigid or flexible. Conventional connectors are more rigid than loop connectors.

Nayar and al. 2015 stated that loop connectors are more flexible, and their flexibility depends upon their lengths and diameter. The main indications for loop connector are:

- Patient desires to preserve the preexistent diastema
- Existence of a large pontic space
- Prosthetic restorations of migrated teeth with a weak periodontium [4].

Resin bonded bridge is simple and noninvasive treatment has progressed since Rochette. Later the designs as well as the cements used advanced and became a reliable prosthetic choice for restoring a single missing teeth. The actual characteristics of resin cements (with MDP monomers) have also permitted resin bonded bridges to be used with multiple loop connectors.

Before indicating such restoration, the clinical evaluation of occlusion is crucial to verify the absence of excursive contacts at the boundaries of the retainer that risk to unseat the retainers regardless to the strength of the cement [5,3].

However, the weaknesses of the loop connectors are related to the supplementary laboratory procedures, to the difficulty of maintaining oral hygiene, and to the possible disorder in speech. Nevertheless confectioning the connectors round and small will not affect the phonetics, and with time the tongue adapts to the presence of the loop connectors [3,4].

### Conclusion

This clinical report highlighted the importance of indicating loop connector bridge for restoring a single missing central incisor with a pre-existing diastema. Loop connectors lead to a proper emergence profile, improve esthetic, preserve the structures of the abutment teeth and also keep the diastema for a natural appearance.

So Loop connector bridge can be one of the best treatment's option to solve this problem of excessive mesiodistal space if implant supported tooth can't be experienced. However, as disadvantages, it may interfere with speech and cause discomfort to the patient.

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