

# Natural Tooth Pontic: An Instant Esthetic Solution for Hopeless Tooth

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## ABSTRACT

**Aim:** To provide an immediate interim restoration of a hopeless tooth using natural tooth as pontic in a patient with generalized aggressive periodontitis.

**Summary:** Extraction or loss of a hopeless tooth especially in the esthetic region is very distressing for a person and hence its immediate replacement becomes indispensable. Using natural tooth as a pontic bonded to the adjacent abutment teeth with a fiber reinforced resin is a cost effective, simple, easy chair side technique with high esthetically acceptable immediate results. This article provides a step by step procedure and a case report of a natural tooth pontic used successfully to treat the loss of a lower incisor in a patient with generalized aggressive periodontitis, subsequently acting as a splint for the remaining teeth, with a follow up of 2 years

**Keywords:** Esthetic, Interlig, Natural Tooth, Pontic, Ribbond.

## INTRODUCTION

For any person sudden loss of an anterior tooth is an emotional and sometimes heart breaking event. Anterior tooth may have to be removed because of trauma, advanced periodontal disease, root resorption or failed endodontic therapy and consequently dentists are left in a critical situation. Loss of a tooth in the anterior zone, though is an esthetic emergency, may also pose problems relating to speech and mastication. Hence, sometimes the patient requests for an immediate replacement of the missing tooth.

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Although a permanent replacement of the missing tooth/teeth, such as removable prosthesis, tooth-supported prosthesis and the increasingly popular implant-supported prosthesis may be planned after the tissues have healed, the options available for a good esthetic temporary prosthesis are limited. A provisional prosthesis may vary between simple removable tissue supported dentures; temporary full coverage fixed partial dentures and bonded fixed partial dentures. When the final permanent restoration does not require tooth preparation, tooth structure removal is contra-indicated for the interim restoration, such as in case of an implant-supported prosthesis.<sup>1</sup>

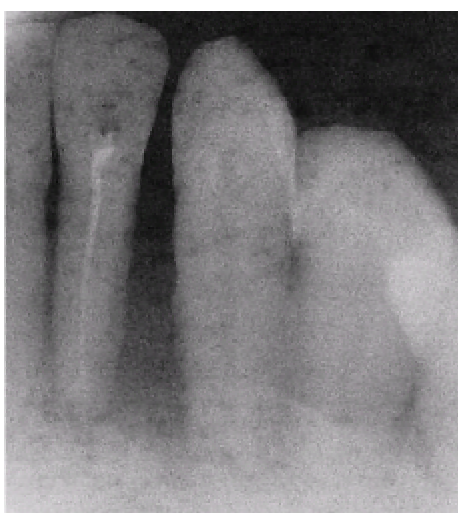
If acrylic removable partial dentures are placed immediately after the tooth is extracted, they tend to impede healing and may be uncomfortable for the patient.<sup>2</sup> If the tooth is intact, it is easiest to use that tooth as a natural tooth pontic and bond it to the adjacent teeth with fiber reinforcement ribbon and adhesive composite resin.<sup>3</sup> A pontic is an artificial tooth on a fixed partial denture that replaces a missing natural tooth, restores its function, and usually fills the space previously occupied by the clinical crown.<sup>4</sup> Considerable modifications are often required to achieve an acceptable appearance when using prefabricated acrylic denture tooth as a pontic bonded to the adjacent teeth. These can present challenges in regard to matching color, size and shape. Hence, using the natural tooth as a pontic offers the benefits of being the right size, color and shape.<sup>2</sup> Furthermore, the positive psychological value to the patient in using his or her own natural tooth is an extra advantage. As the crowns of the periodontally compromised teeth are usually in an unadulterated condition, they can be easily used as a natural tooth pontic with esthetically positive outcomes.<sup>5</sup> The original Rochette Resin Bonded Partial Denture (RBPDP) has a metal backing, requiring dental laboratory involvement.<sup>6</sup> Alternative designs utilize a plasma-treated woven polyethylene fiber (Ribbond, Ribbond Inc, Seattle, Wash.) to reinforce a resin-based framework.<sup>1</sup> The following technique utilizes a similar method using natural tooth as a pontic bonded with fiber reinforced resin.

## CASE REPORT

A non-smoker, 38 year old female with non-contributory medical history, reported to the Department of Periodontics,

with the chief complaint of severe mobility in the lower front tooth since one year. Patient gave the history of root canal treatment (RCT) in lower right lateral incisor 1 year before. Intraoral clinical examination showed generalized 1 and 2 grade mobility with deep (>5 mm) probing depth. After the careful analysis of the case history, clinical (the gingival and periodontal status, plaque and calculus score), and radiographic examination [intra oral periapical (IOPAs)] and amount of periodontal destruction present, which did not commensurate with the amount of plaque and calculus present, the patient was diagnosed as a case of generalized aggressive periodontitis.

The IOPA revealed incompletely filled root canal space and severe bone loss in mandibular right lateral incisor (42) (Fig. 1) with clinically grade 3 mobility. As the IOPAs were taken from some radiodiagnostic centre outside the institution,



**Figure 1: Intra oral periapical radiograph revealing severe bone loss in mandibular right lateral incisor 42.**

radiograph quality was not good enough. We did not repeat the IOPAs as any further radiation exposure was not required to make the diagnosis, we could easily make the diagnosis based on other findings. The distal and lingual surface of 42 had periodontal probing depth of 10 mm (Fig. 2), whereas at mesial and facial surface the probing depth was 8 mm and 9 mm respectively. The tooth had a hopeless prognosis and was scheduled to be extracted. The mandibular right canine had grade 2 mobility along with 7 mm probing pocket depth.

Since the patient had to attend an important formal meeting, she wanted the tooth to be replaced immediately after the extraction and also she was interested in tooth replacement by implant in future. The decision was made to extract the tooth and fabricate a single visit, bonded fiber ribbon reinforced fixed partial denture using the crown of the extracted tooth as a natural tooth pontic that would also serve as a



**Figure 2: Probing pocket depth on distal aspect of 42 is 10 mm.**

periodontal splint. The treatment plan was explained to the patient and an informed consent was signed.

As a part of the therapy, full mouth scaling and root planing was done. Prior to the procedure the position of the tooth to be extracted in the arch and its relationship to the adjacent teeth was noted (Fig. 3). On subsequent visit, the tooth 42 was atraumatically extracted without any damage to the adjacent teeth (Fig. 4). Since the tooth was grade 3 mobile we did not use any periosteal luxator or luxator to extract it. The only precaution we had to take was to give rotational movement for extraction and to avoid any trauma to adjacent teeth as they were also grade 2 mobile.

The length of the natural tooth pontic was determined by measuring the distance from incisal edge of the central incisor to the gingival margin of the extraction site using UNC-15



**Figure 3: Position of the tooth in the arch**



Figure 4: Atraumatic extraction of the hopeless tooth

probe. Some additional length was added so that the pontic would be touching the gingival tissue when the extraction site healed. The extracted tooth was measured with a periodontal probe to the length needed. The root was cut from the crown with a straight fissure bur and stains if present were removed and any debris from the pulp chamber were cleaned out and root canal was filled with gutta-percha and apically sealed with a composite retrofilling. The gingival aspect of the tooth was smoothed and shaped to be rounded. The sectioned tooth was placed in the missing tooth area to assess the size of the pontic (Fig. 5). The enamel of the two abutment teeth on either side of the extracted lateral incisor as well as natural tooth pontic were etched (lingual as well as the proximal areas).

Interlig ribbon (Angelus, Brazil) was selected for the natural tooth pontic bridge-splint (Fig. 6). Because all the remaining mandibular incisors were mobile due to periodontal disease, it was decided that all the lower incisors would be splinted



Figure 5: Assessment of the area by sectioned tooth



Figure 6: Interlig fiber ribbon

with the fiber ribbon from canine to canine. To measure the length of fiber ribbon needed, a piece of dental floss was placed on the facial surfaces of the teeth, extending from the mesial of the left mandibular canine to the mesial of the right mandibular canine. Bonding agent was applied on the etched tooth surfaces as well as the fiber and light cured. The fiber was approximated on the lingual surface of the mandibular anterior teeth, starting from the side adjacent to the site of extraction. As the fiber was adapted to the teeth with sterile dry pliers, a layer of flowable composite was applied over it and cured. At the extraction site composite was applied to the proximal and lingual surfaces of the adjacent abutment teeth as well as pontic tooth, the pontic tooth was bonded with the fiber and cured. Finishing and polishing was done (Fig. 7). The necessary occlusal corrections were made to remove any interferences taking care that the natural tooth pontic should not be in contact with the opposing teeth either in function or at rest. Chlosite was administered at all the sites where deep pockets were present with a syringe to act as local drug delivery system (Fig. 8). The patient was taught the use of a proximal brush to clean the embrasures of splinted region. A post-operative orthopantomogram (OPG) was taken which showed no overhangs of resin material (Fig. 9). The defects visible in the panoramic radiograph in rest of the region were planned for flap and regenerative surgeries later on as per the patient's convenience.

In such a case administration of chlosite alone could not give better results. The patient was educated and motivated for plaque control. The patient underwent full mouth periodontal flap surgeries with bone grafts where ever required along with appropriate antibiotics. We are not discussing the phase 2 part, that is the surgical and the endodontic part, in detail, for this case deliberately.

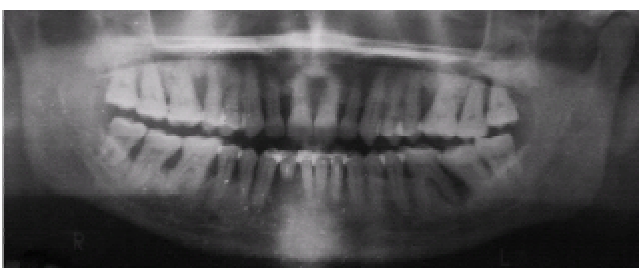




**Figure 7:** Lingual and facial view of fiber reinforced resin bonded fixed partial denture with natural tooth as a pontic



**Figure 8:** Chlosite administration into the mesial side of canine



**Figure 9:** Post-operative OPG at day 21 showing natural tooth in 42 region as a pontic bonded to adjacent teeth with a fiber ribbon

The patient was kept on 1 months recall initially after phase 2 therapy for first three months; later on, observing the patient plaque control, the interval was increased to 3 month for next two visits and then 6 month. Oral hygiene instructions were

reinforced everytime, ensuring that the patient was following strict oral hygiene regimen at all appointments. Administration of chlorhexidine was only done once as patient could not afford it. Even after 2 years the patient is very much satisfied with the esthetic and functioning of the natural tooth pontic and is not interested in getting it replaced.

**DISCUSSION**

Tooth loss especially in the esthetic zone can lead to drifting of the adjacent teeth, midline deviation, and space loss, over-eruption of the antagonistic teeth, apart from a severe mental trauma. Mastication and speech also get compromised. The space loss following tooth removal can be provisionally bridged by a removable partial denture, resin fixed partial denture and recently, fiber reinforced bridge have also proven to be successful.

Use of composite resin splints with submerged wires and mesh grids demanded more bulk and thickness of composite resin in order to protect against breakage and this over bulking ultimately led to an increase in food and plaque retention resulting in making it more difficult to clean around the restoration and maintain good oral health.<sup>3</sup> Additionally, one of the inherent problems with these materials when replacing a missing tooth were their inability to be chemically incorporated into the dental resin.<sup>3</sup>

The challenge to place a thin but strong, bonded composite resin-based single visit fixed partial denture was met with the introduction of a high strength polyethylene, biocompatible, bondable, esthetic, easily manipulated, fiber ribbons that could be embedded into a resin structure.<sup>3</sup>

The introduction of fiber-reinforced composite (FRC) technology has brought a new material into the realm of metal-free, adhesive esthetic dentistry. Chris<sup>7</sup> in 2008 discussed the new and advantageous aspects of Resin-bonded fixed partial dentures (RBFDP). Apart from the combination of composite resin and FRC showing significant benefits in terms of mechanical properties, the possibility of direct chair side application and the ability to bond to tooth structure make FRC an attractive choice for a variety of dental applications.<sup>8</sup> Either a prefabricated artificial crown or the patient’s own tooth can be used as a pontic. Use of a natural tooth as a pontic not only overcomes the difficulties encountered while using artificial tooth as a pontic, but also allows for exact repositioning of the coronal part of the extracted tooth in its original intra-oral 3-dimensional position, with no problem regarding color, size and shape matching. This chair side technique does not require laboratory involvement also. The durability of such type of natural tooth pontic is uncertain. In the 1970s, Howe and Denehy<sup>9</sup> adapted the Rochette bonded cast-metal periodontal splint concept to create the first resin bonded fixed partial denture. The early procedures like RBFDP were conservative, but problems with debonding resulted in

a survival rate of only 28% at 7.5 years.<sup>11</sup> In this case, however, the bonding was done with fiber-reinforced material, and increased survival rate is thus expected. There might be other factors like location of the tooth in the arch, the masticatory force and periodontal support of adjacent teeth which may be responsible for the durability of such type of pontics.

In present case, we had not initiated this treatment as a definitive procedure as patient wanted it to be replaced by an implant. Since there was some mobility in almost all teeth, we could take this natural tooth pontic as an interim restorative procedure, as well as to act as splint, while performing the flap surgeries. Once all the phase 1 and phase 2 procedures were over, we had planned to go for definitive restorative procedures, i.e. cast partial denture, Maryland bridge or implant supported prosthesis. Patient was not willing at all for fixed partial dentures using full coverage crowns. After 2 years as the natural tooth pontic is still intact and esthetically and functionally in good condition, patient has refused for any other procedure at this stage. We had to respect her will and we have restrained any further treatment till the next developments.

## CONCLUSION

The instant provisional restoration using resin fiber bonded natural tooth pontic allows for exact relocation of the coronal part of the extracted tooth in its original intraoral three dimensional position, and thus relieves the anxiety of the patient caused by the sudden loss of an anterior tooth. Moreover, in situations where anterior teeth need to be removed, use of the natural tooth pontic *while the gingival*

*tissue heals* is an excellent, esthetically acceptable treatment option, and reflects the dentist's concern for the patient's esthetic, functional as well as psychological needs.

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