

NATURAL TOOTH PONTIC RE-VISITED: A CASE REPORT

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ABSTRACT:

The loss of teeth in the aesthetic zone of maxillary or mandibular anterior region can be psychologically and socially catastrophic to the patient. These teeth can be inadvertently lost due to trauma, periodontal disease, or endodontic failure. A plethora of treatment options for replacing the missing tooth are available which include removable prosthesis, tooth-supported prosthesis, and implant-supported prosthesis. Regardless of the definitive treatment, the first line of management would be to provisionally restore the patient's aesthetic appearance at the earliest, while functionally stabilizing the compromised arch.

This paper describes the successful immediate replacement of both the mandibular central incisors of the patient using a fibre-composite resin with natural tooth crowns as pontics. The merits of this technique are the conservative management of that the abutment teeth with minimal or no preparation, thus keeping the technique reversible, and can be completed at chair side thereby avoiding laboratory costs.

Key words: Fiber reinforced composite resin, Natural tooth pontic, splinting, and aesthetics



INTRODUCTION

The rehabilitation of esthetics in patients with reduced periodontal tissue support is often a daunting task. Teeth play an integral role in maintaining the structural, functional, and aesthetic harmony of the face.

Periodontitis may cause destruction of the supporting tissue, which most often is so advanced that extraction of the offending tooth seems as the most viable option. Anterior teeth affected with severe periodontitis in the presence of excessive occlusal forces migrate pathologically with an associated development of gingival

recession and bone loss creating a situation where in they are unsalvageable.^[1] Loss of an anterior tooth can be devastating to the patient and cause social embarrassment and phonetic disabilities which may eventually affect the quality of life of the person.

Conventional treatment options available include the orthodontic closure of the edentulous space with fixed appliances, removable temporary acrylic prosthesis, resin bonded bridges, and traditional metal and ceramic fixed partial denture (FPD) and amongst the relatively newer options is osseointegrated implant-supported prosthesis. ^[2,3,4]

In certain clinical scenarios, using an intact natural tooth which is in good clinical condition as pontic for interim duration could offer a plethora of benefits like excellent colour, shape, and size match, positive psychological value, minimal cost, and minimum chair side time with no laboratory procedure involved.[5] Besides, Natural tooth pontic (NTP) suitably modified and bonded to adjacent teeth enables proper healing in the area without compromising the anterior aesthetic demands of the patient. [6]

This article describes the technique of replacing two extracted mandibular anterior teeth with a modified resin-bonded bridge utilizing the extracted natural teeth as a pontic.

CASE DETAIL:

A patient aged 55 years reported to the Department of Periodontology, Government Dental College and Hospital with a chief complaint of mobility of teeth in the lower anterior region. Intra-oral examination revealed periodontally involved mandibular central incisors displaying grade III mobility and class III recession according to Miller's classification. (Miller, 1985). On the basis of clinical and radiographic findings, a diagnosis of Generalized moderate Chronic Periodontitis was made and a tentative treatment plan was formulated for the patient. [Fig 1]

Extraction was advised in relation to the mandibular central incisors due to their poor prognosis followed by scaling and root planing and flap surgery.

The patient was presented with several treatment options for replacement of the missing teeth, which included implant-supported crown, resin-bonded fixed partial denture and a fibre-reinforced bridge. A fixed-partial denture was not indicated because the periodontal health of 32 and 42 was not favorable for fixed prosthesis.

The patient was unwilling to use a removable partial denture. An implant-supported prosthesis could not be placed due to severe vertical bone loss and undetermined prognosis of periodontal disease and economic aspects. After assessing the condition and considering the patients need for immediate replacement and aesthetic concerns, a NTP was planned after extraction of 31 and 41.

Phase I periodontal therapy was carried out and patient was recalled after 4 weeks for flap surgery which was done quadrant wise over a period of four weeks. Teeth #31 and # 41 were extracted under local anesthesia as traumatically as possible [Fig 2] and adequate hemostasis was achieved. Surfaces of extracted teeth were root planed with curettes to make the root surface free from debris & remaining periodontal attachment. [Fig3] The roots of extracted teeth were resected with aerotor hand piece and diamond burs approximately 4 mm apical to cement-enamel junction so as to establish optimal emergence profile of the pontics at the extraction site. [Fig 4]

After making an access opening, all pulpal remnants of the extracted teeth were

extirpated [Fig 5] and the orifice was sealed using composite resin. The apical end of the root canal was sealed off with light cure composite resin and contoured to mimic an ovate pontic design for optimum aesthetics and hygiene. A two step etching and bonding procedure using commercially available composite kit was carried out on to the natural tooth pontic [Fig 6,7]. A small 0.75 mm groove was made on the lingual surface of the two pontics to enhance mechanical retention of splint; however the adjoining abutments were only etched with 37% Phosphoric acid. The well-contoured pontics were gently manipulated in the extraction socket and occlusion was checked. Intra-orally, the etching and bonding of the middle one third of the lingual surfaces of the teeth to be involved was carried out to receive the fibre splint. It was then splinted to the adjoining abutments in the oral cavity using a flowable composite resin. [Fig-8]

In order to maintain the accessibility of inter proximal embrasures for plaque control and to protect the gingival papilla, plastic wedges were placed in the inter-proximal areas. Excess composite resin material was removed with a fine diamond instrument. The teeth were corrected for occlusal pre-maturities in centric as well as excursive movements using an articulating paper and diamond finishing points. Oral hygiene instructions were given to the patient and the uses of inter-proximal brushes and Superfloss were reinforced. It was emphasized to the patient to avoid heavy biting pressure on the splinted teeth and to come for a

periodic recall every three months. The patient entered into continuous maintenance program, and the bonded pontic has been functioning for more than two years.

DISCUSSION:

When a periodontally compromised tooth in the visible or esthetic zone is planned for extraction, the patient's primary concern is esthetics. Various therapeutic solutions can be used to replace a single missing tooth.

Removable appliances or prostheses are a suitable treatment option, but patient compliance may hinder optimal treatment. Besides aesthetics may be of prime concern because of canine clasps which are commonly used to provide stability and to enhance retention. For many years, metal-ceramic fixed-partial dentures (FPDs) have been the treatment of choice. [7] Moreover, to provide the FPD with retention and stability, aggressive tooth reduction is necessary during the preparation of abutment teeth with a high risk of pulp exposure. [8] Quiryneen et al assessed the longevity of composite bonded resin or natural teeth as replacements for periodontally lost lower incisors and reported a survival rate of 80% after 5 years of function. [9]

The main limiting factors with this technique are patient compliance with maintenance of meticulous oral hygiene, limited functional efficiency, chances of discoloration of the pontics over years and chances of splint fracture.

With the advent of implants, the vistas for treatment modalities for edentulism have expanded by leaps and bounds to a more conservative approach. However, high cost of treatment and phobia of surgery may lead to some patients to decline this therapeutic option. Systemic problems too may also contraindicate surgery.

Using the natural tooth as a pontic offers the benefits of being the right shape, size, and color. Moreover, it is psychologically re-assuring to the patient to see his own tooth being used instead of an artificial one. These natural tooth pontics can be splinted to the adjacent teeth by composite resins, with or without wire reinforcement.^[10]

There are several types of fibre reinforcement materials like polyethylene (RIBBOND) ,E-Glass (everStick) ,quartz glass (QUARTZ GLASS) and fibre glass (SPLINT AID). They have replaced metal for variety of reasons like strength -to-weight ratios, biocompatibility, and aesthetics.^[11]

In a study measuring the survival rates of resin bonded glass-fibre reinforced composite fixed partial dentures, Vallittu showed a functional survival rate of 93% after re-bonding or repairing with a mean survival time of 55 months.^[12]

However, a problem that may be encountered in handling the fibre -glass splint is the exposure of the ends of the fibreglass resin and de-bonding of the fibre from the tooth. These shortcomings can be easily overcome by ensuring meticulous isolation protocol during

etching and bonding of the teeth. In addition, care should be taken to ensure that adequate composite resin is added on the fibreglass splint so as to avoid inadvertent exposure of the native splint material to oral fluids that may further contribute to fracture and breakage of the prosthesis. The lingual grooving to a depth of 0.75 mm on the pontics further enabled the fibre to be placed perfectly within the tooth surface without any protruding area. When the fibreglass material was reinforced with a flowable composite material, integration of the resin with the fibre is further enhanced due to the gas plasma treatment done to the fibre.

CONCLUSION:

The restoration of a smile is one of the most challenging and gratifying services that a dentist can render to a patient. Loss of teeth especially lower anterior teeth can psychologically and socially be traumatic to the patient.

Natural Tooth Pontic offers the advantage of being an interim or a definitive restoration, which is aesthetically pleasing, minimally invasive, economical and promises to be an excellent transient aesthetic solution for a lost tooth. The abutment teeth can be conserved with minimal or no preparation, thus keeping the technique reversible, and can be completed chair side thereby avoiding laboratory costs.

However, NTP is technique sensitive and the success of the restoration rests on appropriate patient selection, their

motivation levels for plaque control, and

precision during placement of NTP .

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FIGURES:



FIG.1 PRETREATMENT



FIG.2 AFTER SRP/EXTRACTIONS OF 31,41



FIG.3 ROOT PLANING OF EXTRACTED TEETH



FIG.4-ROOT SECTIONING

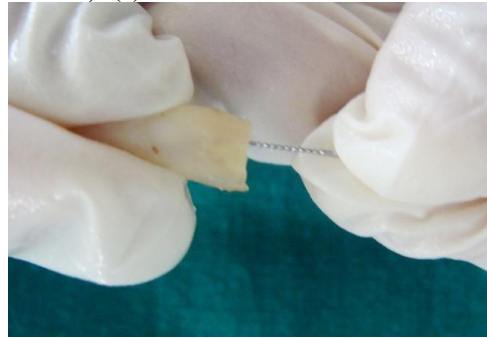


FIG.5-PULP EXTIRPATION WITH ENDODONTIC FILES



FIG.6-ETCHANT APPLICATION



FIG.7-BONDING AGENT APPLIED



FIG. 8 -LIGHT CURED



FIG.9-IMMEDIATE POST OPERATIVE VIEW AFTER SPLINTING



FIG 10-POST OP AFTER 1 YEAR (FACIAL)



FIG 11-POST OP AFTER 1 YEAR (LINGUAL)