



AN IMMEDIATE INTERIM PROSTHESIS WITH A NATURAL TOOTH PONTIC: A CASE SERIES

Dental Science

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ABSTRACT

Sudden tooth loss in the esthetic zone impairs patients physically and emotionally. Irrespective of the final treatment, the first line of treatment would be to provisionally restore the patient's esthetic appearance at the earliest, while functionally stabilizing the compromised arch. Using the patient's own natural tooth as a pontic offers the benefits of being the right size, shape and color, economical and fulfills functional and psychological requirements of the patient. This article describes the use of a resin bonded; wire retained natural tooth as a pontic to restore the edentulous space until the final restoration. It was seen that the natural tooth pontic served as a satisfactory interim restoration. The same natural tooth pontic can be used as a provisional prosthesis during two stage implant procedure.

KEYWORDS

Interim Restoration, Natural Tooth Pontic, Wire Retained Provisional Restoration.

INTRODUCTION

Sudden loss of an anterior tooth is a catastrophic event for a patient.¹ Most of the patients demand immediate treatment, because they usually suffer from psychological trauma and their social life gets affected by compromised esthetics. The clinician should have a wide arsenal of treatment options to encounter the compromised esthetics. This may include the immediate restoration/ replacement of the missing tooth.²

Replacement of the missing tooth can be temporary, semi temporary or permanent in nature.³ The various treatment options for a single missing tooth includes single tooth implants, conventional FPDs and a RPD, all of which require multiple visits to achieve desirable results.⁴ Alternatively, replacing a missing tooth in a single visit can be made possible by utilizing acid etch bridge technique, in which a fiber reinforced composite or even the patient's own natural tooth can be used for replacement.^{5,6}

Use of patient's own natural tooth as a pontic and bonding it to adjacent teeth is more conservative, less time consuming, economic, offers the benefits of being the right size, shape and colour and fulfills functional and psychological requirements of the patient.⁷

Selection criteria for this tooth replacement approach includes:-

- A patient who requires an extraction in an esthetic area and desires an immediate replacement and minimally invasive approach.
- A patient with no para-functional habits such as bruxism.
- To attain favorable soft tissue contour before implant placement/loading.
- In patients with a contraindication for FPD.
- Cost considerations.⁸

The current article describes a clinical case series of 5 patients who had an atraumatic extraction done with respect to the periodontally compromised tooth/teeth, followed by the fabrication of a Natural Tooth Pontic (NTP) for an immediate replacement of the missing tooth/teeth.

MATERIAL AND METHODS

5 male patients aged between 35 - 50 years, reported to the Department of Periodontics, M.R. Ambedkar Dental College & Hospital, with the chief complaint of loosening of front tooth/teeth.

On clinical examination the patients were diagnosed to have chronic localized periodontitis with respect to the grade three mobile teeth.

Correlating the compromised periodontal status, radiographic findings and clinical appearance of the tooth/teeth, it was decided to atraumatically extract the periodontally compromised anterior tooth/teeth. Replacement options for the resultant edentulous space

were discussed with the patients. The patients preferred a fixed prosthesis rather than a removable one. Due to the compromised hard and soft tissue, immediate implant supported prosthesis was not a feasible replacement option.

Therefore, an immediate chair-side wire retained resin bonded fixed partial denture, using the patient's own natural tooth with an ovate contact surface was decided as the treatment of choice until final restoration using an implant. The patient was duly informed about possible limitations and outcome of the procedure.

PREOPERATIVE ANALYSIS

Length of the NTP required was pre-determined on a study cast of the patient by measuring the gingival level to the incisal edge (of the adjacent tooth) plus 3mm, so that it could be extended into the alveolar socket to shape the gingivo-proximal tissue level and preserve the papilla.⁵

CLINICAL PROCEDURE

- Atraumatic tooth extraction:- The respective tooth/teeth were extracted atraumatically under local anesthesia. The periosteum was used to gradually sever the PDL around the teeth and then the luxated teeth were simply removed from the mouth using forceps. The extracted teeth were immersed in normal saline and the remaining soft tissue removed from the surface.
- Replacement of edentulous space with NTP:
- The crown was separated from the root, using an airtor hand piece and a diamond bur (ISO No. 314). The apical opening of the pulp canal was cleaned, pulp extirpated and sealed with GIC.
- An ovate pontic was designed for the apical area to facilitate cleaning and to give an emergence profile to the natural tooth pontic. A high, smooth surface area was then achieved at the apical area of the natural tooth pontic with diamond finishing instruments.
- Two grooves were made mesio-distally on the palatal/lingual surface of the crown (1st groove- junction of the incisal and middle third; 2nd groove- junction of the middle and the cervical third) and the pontic was stabilized in the extraction socket with two 0.001'' braided stainless steel wires, embedded into the prepared grooves using composite resin and splinted to two adjacent teeth on either side. The proposed technique not only improves the stability of the pontic but also prevents rotatory movements of the pontic around all axis of rotation.
- Occlusal adjustments at centric relation were then made using articulating paper and diamond finishing burs.
- The patients were given the required oral hygiene instructions.

This will serve as a provisional restoration, to help maintain gingival architecture for the final prosthesis, while simultaneously meeting the

high esthetic demands of the patients. The patients were recalled after 1 month, to assess the health of the soft tissues in the extraction socket. And later, after 3 and 6 months to radio-graphically assess the hard tissue healing in the extraction socket.

Figure 1: Case 1; 42 years male with a periodontally compromised 11



Figure 2: Case 2; 37 years male with periodontally compromised 31,41



Figure 3: Case 3: 50 years male with periodontally compromised 31



Figure 4: Case 4; 45 years male with periodontally compromised 31,41



Figure 5: Case 5; 43 years male with periodontally compromised 32



DISCUSSION

The present era of dentistry relies extensively on esthetic principles because of increasing patient demands.⁹ Immediate replacement of the extracted anterior tooth has to be given due consideration for better esthetics, to fulfill patient's needs and restore function to a certain extent.¹⁰ This case series describes a simple, economical, and quick method to improve the esthetics of patients with a poor prognosis anterior tooth/teeth, due to trauma or extensive bone loss, by utilizing a NTP.

The development of implants supported restorations has led to a more conservative approach to a single-tooth replacement, with improved psychological health, regained proprioception (occlusal awareness), increased stability, retention, phonetics and improved function, in

comparison to the conventional FPDs that require aggressive tooth reduction during the preparation of abutment teeth with a high risk of pulp exposure¹² or RPDs, that pose a problem of residual ridge resorption and deterioration of periodontal health of adjacent teeth.

Therefore, the most feasible option to temporarily restore the edentulous space after extraction of a periodontally compromised tooth would be to replace it with the patient's own tooth in the form of wire retained resin bonded NTP.

In addition to the ease of usage and minimum adaptability period, NTP achieve favorable esthetics, have a positive psychological effect on the patient, allow for same visit tooth replacement, avoid laboratory work and is a reversible technique allowing other definitive restorative options to be evaluated. Also, the micro-resiliency and ovate design of the pontic stimulates underlying tissue, avoids excessive post extraction ridge resorption and contouring of soft tissue architecture.¹³

Kermanshah et al and Stumpel LJ, have shown a successful long term follow ups of such natural tooth pontics.^{5,7} Also Quirynen et al in their long term prospective study, replaced periodontally compromised lower anterior teeth with pontics using natural and acrylic teeth, have reported similar favorable long term results.¹⁴

This procedure is also associated with a number of limitations like relying on patient's motivation and manual dexterity to maintain oral hygiene around the pontic, limited functional efficiency and chances of splint breakage.¹⁰ The predominant location of de-bonding with resin-bonded FPDs is between the luting cement and the framework of the denture.¹⁵ In the present case series, good adhesion was ensured by incorporating two palatal/lingual grooves and splinting the NTP to two adjacent teeth on either side (instead of just one groove and one additional tooth on either side). The proposed new technique provides optimum stability of the pontic around all axes of rotation, greater durability and enhanced retention, which may not be obtained with a single groove and an esthetically acceptable replacement option.

Replacement with NTP is technically demanding and cannot be used for every patient. Some key factors need to be considered before performing such restorations, such as:

- Patient's bite.
- Any interfering para-functional habits.
- Inadequate occlusal clearance space for the wire-composite bonding.
- Inability to maintain isolation of field during bonding procedures.
- Primary dentition.¹⁶⁻¹⁸

Despite such restrictions, this technique of using NTP, has been tested by various researchers earlier and shown very satisfying results.¹⁹⁻²¹ Even in this case series, a 6-month follow-up demonstrated good clinical success. All the patients were satisfied with the esthetics provided; however, two of them did desire a more permanent treatment option.

Complications, such as postoperative sensitivity, caries, de-bonding and fracture at the connector area and discoloration, were not observed. However, efforts in preserving the gingival papilla by immediately placing an ovate pontic in the extraction area was not achieved in three of the patients, most likely due to preexisting periodontitis. Even though this data is obtained from a limited number of patients, this case series highlights that NTP has been successfully used as a temporary restoration until implant placement and the same NTP can be used as a provisional prosthesis during the two stage Implant procedure.

CONCLUSION

Loss of teeth due to caries, trauma or periodontal disease often affects a person psychologically and emotionally. In recent years, the desire expressed by many patients for cosmetic and esthetic restorations is on a rise. Hence the described technique using patient's natural tooth as a pontic is an immediate, conservative, esthetic and cost-effective method for the replacement until future implant therapy.

However, additional studies are necessary to provide more clinical data to draw further conclusions regarding this therapeutic approach. Patient selection, their mental status, plaque control and precision during the fabrication and placement of NTP should be considered to achieve optimum results.

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