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CASE REPORT ARTICLE

IMMEDIATE AESTHETIC REHABILITATION OF A FRACTURED ANTERIOR TOOTH BY USING THE NATURAL TOOTH AS A PONTIC: AN INNOVATIVE TECHNIQUE

Dr. Urvashi Rai¹, Dr. Ranjeet Dhonkal², Dr. Vishal Bamniya³, Dr. Ashish Verma⁴, Dr. Guruprasad Uikey^{5,5}
and Dr. Bhumika Patel⁵

1. MDS Prosthodontics and Crown & Bridge.
2. Master's in Public Health Student, Department of Health Sciences, Faculty of Life Sciences, Hamburg University of Applied Sciences, Hamburg, Germany.
3. PG Student, Department of Oral Medicine Diagnosis and Oral Radiology, Govt. College of Dentistry, Indore.
4. PG Student, Department of Oral Pathology and Microbiology, Govt. College of Dentistry, Indore.
5. PG Student, Department of Oral and Maxillofacial Surgery, Govt. College of Dentistry, Indore.

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Abstract

Sudden tooth loss in the esthetic zone of the maxillary or mandibular anterior region can be due to dental trauma, endodontic failure, extensive root resorption, or advanced periodontal disease. The treatment options for replacing the missing tooth can vary between removable temporary acrylic prosthesis, Resin-bonded bridges, Traditional metal, and ceramic fixed partial denture, and implant-supported prosthesis. Irrespective of the final treatment, the first line of management 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 and provides exact repositioning in its original intraoral three-dimensional position. The abutment teeth can also be preserved with minimal or no preparation, thus keeping the technique reversible, and can be completed at the chairside thereby avoiding laboratory costs.

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Introduction:-

The purpose of modern dentistry is the placement of aesthetically pleasing restorative materials. Providing a functionally sound prosthesis in the aesthetic zone is considered the greatest challenging task in prosthodontics[1]. Conditions such as trauma, advanced periodontal disease, root resorption, or failed endodontic treatment may necessitate extraction of teeth from a high esthetic zone which can cause distress to patients[2]. An immediate prosthesis should be considered whenever there is a loss to the anterior tooth to counter the psychosocial trauma, loss of aesthetics, prevention of drifting of the adjacent tooth, difficulty in speech, and mastication. Earlier the fabrication of a provisional restoration using the adjacent teeth as abutments, removable temporary acrylic prostheses, and resin-bonded bridges were popular as primary treatment options[3-5]. Each of these approaches has its own specific advantages and disadvantages. In a few obvious clinical contexts, utilizing an intact natural tooth as pontic for interim duration could provide benefits like remarkable color, contour, and size match, positive psychological value, cost-effective, and minimum chairside time with no laboratory procedure involved [6]. With

recent advancements in adhesive technology, it is possible to create a conservative, highly esthetic prosthesis that is bonded directly to teeth adjacent to the missing tooth.

The immediate bonding of a natural tooth to adjacent elements presents a low-cost alternative for direct tooth replacement [7]; this technique enables the original tooth anatomy to be replaced, providing excellent function and esthetics at the same time. The use of the patient's own tooth as pontic represents a conservative restorative solution with no laboratory procedures involved; it is well-suited for patients who ask for an immediate replacement of a hopeless tooth in the esthetic zone [8,9].

The aim of this article is to describe a conservative rehabilitation strategy for the replacement of a fractured maxillary central incisor, which was used as pontic following atraumatic extraction, repositioned promptly with a customized index, and finally bonded to adjacent teeth with orthodontic wire and resin composite.

Case Presentation:-

A 24-year-old male patient reported to the Department of Prosthodontics and Crown & Bridge, GDCH, Ahmedabad with a chief complaint of pain in the upper front tooth region. The medical history of the patient was not significant. Past Dental history revealed an episode of trauma in the maxillary anterior region about one year ago. On clinical examination maxillary right central incisor showed mobility and extrusion. The adjacent teeth were also checked for mobility and vitality. For the right central incisor, radiographic examination revealed a fracture line extending below CEJ on the root which after extraction was found to be a perforation. Both clinical and radiographic examinations indicated extraction of the maxillary right central incisor. Because of the high aesthetic demands of the patient, immediate bonding of the natural tooth pontic as a provisional restoration was performed. The steps advocated were as follows:

Step 1: After formulating the treatment plan, we extracted the maxillary right central incisor atraumatically under local anesthesia; the alveolar socket was carefully debrided and finally rinsed with saline solution (Fig. 1a, 1b)

Step 2: The crown was separated from the root by using a diamond disc (Fig. 1c). The pulp chamber was then cleaned, sealed with composite resin, and stored in normal saline till replacement. An Ovate pontic was designed for the cervical area to give an emergence profile to the natural tooth pontic (Fig. 1d).

Step 3: The pontic was stabilized and aligned in the extraction socket using the previously made putty index, to provide exact repositioning in its original intraoral three-dimensional position (Fig. 2a, 2b).

Step 4: After etching and application of bonding agent on the adjacent teeth starting from 13, 12, 11, 21, 22, and 23, natural tooth pontic was splinted with the help of orthodontic wire and composite resin to maintain the gingival architecture for the final prosthesis while simultaneously meeting the high aesthetic demands of the patient (Fig. 2c)

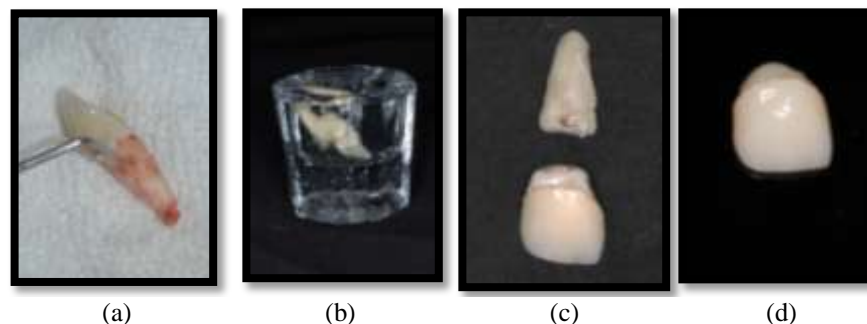


Figure 1:- (a) Atraumatically Extracted #11 with Root perforation (b) Tooth soaked in 3% sodium hypochlorite and 3 % hydrogen peroxide solution (c) Natural tooth sectioned horizontally at CEJ (d) Natural tooth sectioned horizontally at CEJ

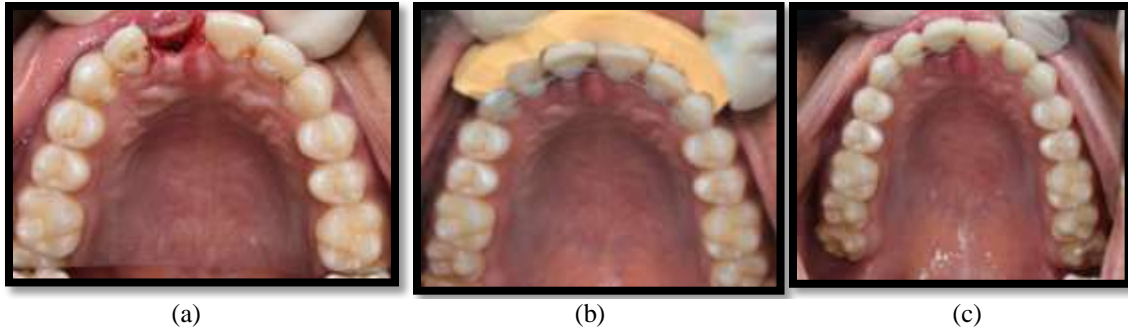


Figure 2:- (a) Immediate post-operative extraction site (b) Assessing alignment using previously made putty index (c) Splinting of the natural tooth

Step 5: A final radiograph of the bonded natural tooth pontic was exposed (Fig.3); oral hygiene instructions were given to the patient for proper interdental and under-the-pontic cleanings.



Figure 3:- Periapical radiograph showing the natural tooth pontic bonded to adjacent elements

Follow up:

The patient was recalled after six months; no fractures of wire or pontic failure (partial or full debonding) were recorded during this period. A satisfactory esthetic integration with adjacent upper incisors is shown (Fig. 4)



Figure 4:- Post- operative intraoral Frontal view

Discussion:-

The restoration of a smile is one of the most appreciative and pleasing services that a dentist can render. Patients with lost anterior teeth require immediate attention for the restoration of esthetics and function and also the prevention of social trauma. Each of the treatment modalities available has its own benefits and disadvantages. Removable temporary partial dentures placed in the immediate postextraction phase are unesthetic due to the presence of clasps that inadequately preserve the extraction socket while delaying the healing process and are bulky, hence causing discomfort to the patient and compromising oral hygiene maintenance. For many years, metal-ceramic fixed partial dentures (FPDs) have been the treatment of choice. However, the display of metallic framework is less than esthetically pleasing and also entails the aggressive reduction of abutment teeth which increases the risk of pulp exposure [8]. Resin-bonded bridges could provide an alternative owing to minimal tooth preparation of the adjacent teeth. However, the high frequency of debonding and substantial modification to achieve an acceptable color, size, and shape of the prefabricated acrylic poses a challenge [10].

Postextraction healing and maturation of the bone occur with three-dimensional remodeling even after three months of healing. The clinically growing demand for adequate alveolar housing for implant placement necessitates performing guided bone regeneration procedures which would prolong the treatment duration [11]. Immediate implant placement on the other hand is a very case-specific protocol. However, some patients reject this therapeutic option, because of either the higher cost or the fear of surgery. Systemic problems may also contraindicate the surgery.

The natural tooth pontic technique could be a suitable alternative in such clinical scenario because it is commonly opted for and highly appreciated by the patients for being a single visit technique, not involving any waiting period and temporization. Moreover, cutting of the neighboring teeth can be avoided and is highly cost-effective. Another major advantage of retaining the patient's natural crown is that the patient can better tolerate the effect of tooth loss psychologically.

In this case, shape of natural tooth pontic was given as an ovate pontic with a well-polished and smooth, convex surface which helps to give the illusion of the replaced tooth emerging from the gingiva like a natural tooth. Also, the ease of usage and almost no adaptability period as it is with the removable partial denture make it a patient-friendly modality. As with any other treatment modality, 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, irritation to the tongue, and chances of splint breakage. Despite these, studies have shown successful long-term follow-ups of such natural tooth pontics [12,13].

Conclusion:-

Natural teeth serve as an excellent treatment option for immediate replacement following extraction in the anterior esthetic zone. The patient satisfaction of continuing to have their natural teeth in the post-extraction period, taking care of his esthetic needs, and simultaneously providing him with time to choose from the various final treatment options available is immense. The patient's positive psychological response, cost-effectiveness, and achievement of excellent soft-tissue contours make this technique very useful. However, appropriate patient selection, motivation levels, plaque control, and precision during placement of Natural tooth pontic are imperative for its success.

Conflicts Of Interest:-

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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