

# UTILIZATION OF EXTRACTED TEETH AS PROVISIONAL RESTORATIONS FOLLOWING IMMEDIATE IMPLANT PLACEMENT – A CASE REPORT

Dr. Arun Choudhary\*, Dr. Ritesh Gourav\*\*, Dr. Pratheek Shetty\*\*\*, Dr. Abhay Sonthalia\*\*\*\*

## Abstract

Patients facing the unexpected loss of a tooth in the esthetic zone in an otherwise healthy dentition may feel psychologically distressed. The placement of an implant into a fresh extraction socket followed by an immediate provisional restoration supported by adjacent teeth can help alleviate an upsetting experience. The utilization of a patient's own teeth can further provide a seamless transition from hopeless teeth to implant supported restorations. This case report utilized a patient's natural teeth as provisional restorations supported by immediately placed implants to provide a seamless transition period of healing.

**Key Words** Immediate implant, ovate pontic, provisional restoration, reinforcement fiber.

## INTRODUCTION

The loss of a tooth in the anterior esthetic region due to periodontal disease, trauma, endodontic failure, or root resorption can be a traumatic experience for the patient to go through. Dentists occasionally are faced with the difficult esthetic situation of having to remove an anterior tooth because of trauma, advanced periodontal disease, root resorption or failed endodontic therapy<sup>1</sup>. The utilization of a patient's own teeth can further provide a seamless transition period of healing a extraction socket of a hopeless tooth<sup>2</sup>.

The most common forms of temporary restorations are fixed bridges supported by retained natural teeth, resin bonded bridges, and removable interim prostheses<sup>3,4</sup>.

- **Using an existing prosthesis** is beneficial because it provides a transitional solution that was already esthetically and functionally satisfactory to the patient.
- **Removable partial dentures**, while less than ideal for many reasons, do replace missing teeth and the flanges can provide necessary lip support. However, the inherent lack of stability may compromise function and speech.
- **Adhesive Bridges**<sup>5</sup>: Resin Bonded Restorations meet the requirements established for provisional implant restorations in so far as they are totally tooth-supported and retained by acid etched bonding. It is quite useful to bond the anatomical crown of the extracted tooth to the adjacent teeth.

The **Essix appliance**<sup>6</sup>, is a patient removable, temporary restoration, which avoids the many disadvantages of a partial denture. A vacuform shell of the arch is fabricated from a stone model, prior to the extraction of a tooth. The crown of the extracted tooth may be bonded into the retainer, or more commonly, tooth colored resin fills the space

## ABOUT THE AUTHORS

\*PG Student, \*\*Professor, \*\*\*H.O.D. & Principal, \*\*\*\*Reader  
Dept. of Prosthodontics and Crown & Bridge including Implantology,  
Awadh Dental College & Hospital, Jamshedpur, Jharkhand, India.

previously occupied by the crown of the extracted tooth. This appliance should fit snugly over the remaining teeth in the arch.

### Provisional Options for Maxillary Single-Tooth Implants.

Though the utilization of a temporary partial denture during the healing phases of the fixed prosthetic treatment is an acceptable, affordable, and convenient method of provisionalization, there are many potential negatives associated with this procedure. Temporary removable partial dentures are typically tissue-borne prosthetics and lack hard-tissue stops to prevent apical forces in the area of the single-tooth site. Additionally, many patients object to the concept of wearing a "denture" in general and prefer to have a fixed provisional prosthetic when at all possible. In cases such as this one where the surrounding dentition is highly polychromatic with variable internal chromagenic tints and areas of hypocalcification (white spots), it is nearly impossible to find a stock denture tooth that replicates these nuances in color and texture.

### Natural Tooth Pontic as a Provisional Restoration

The concept of using the patient's extracted tooth as a natural tooth pontic has been reported in the literature.<sup>1-5</sup> The benefits of using the patient's natural tooth as an interim pontic, particularly in the anterior aesthetic zone are compelling. Barring traumatic fracture or previous discoloring prior to extraction, the natural tooth is typically the ideal shape, contour, and color of the surrounding dentition and mitigates the necessity of custom staining and contouring of a denture tooth or free-hand composite pontic. Aside from the obvious aesthetic benefits of using the patient's extracted tooth as a provisional, the natural tooth is available immediately for bonding at the time of surgery, and no preliminary lab work is necessary.

The use of an ovate pontic adapted to an ovate pontic receptor site is well documented in the literature.<sup>1,2,5</sup> In the past, a ridge lap or modified ridge lap pontics have been utilized in fixed partial dentures to replace a missing anterior tooth. These



**Fig.1: Inflamed gingival margin of 12**

pontic forms remain useful when significant buccal-lingual bone loss has already occurred and the patient does not desire surgical augmentation of the defective site prior to fixed bridge placement.

### Considerations for Utilization of a Natural Tooth Pontic<sup>7,8</sup>

Several factors must be taken into consideration when choosing a natural tooth pontic as an interim provisional. First and foremost, the extracted tooth should possess an intact, clinical crown that is of ideal shape, contour, and shade, with intrinsic characterization that ideally matches the adjacent dentition. In the case shown, the adjacent natural teeth displayed polychromatic shade variation with multiple areas of hypocalcification and internal tints, which would require custom staining if a traditional denture tooth were utilized. If a prosthetic replacement would be more aesthetically optimal, the extracted tooth should be discarded, and a suitable denture tooth may be utilized in the technique described here.

## CASE REPORT

### Diagnosis and treatment Planning:

A twenty-one year old female patient was referred to the department of Prosthodontics and crown & bridge for the management of the traumatized maxillary right lateral incisors (Fig.1). The incisor was diagnosed with crown-en-mass fracture due to trauma and hopeless.

Available restorative options were presented to the patient, which included a removable partial denture, a fixed bridge, or an implant supported restoration. The adjacent teeth had not been previously restored, so the patient chose to have an implant-supported restoration to avoid preparation of the adjacent teeth. The patient also did not want to wear a removable appliance during the implant, healing phase.

On radiographic evaluation no active infection or apical pathology was seen (Fig 2,3). Periodontal



**Fig.2:  
I.O.P.A.  
Radiograph  
of 12**



**Fig.3: O.P.G.**

evaluation revealed a thick normal scalloped periodontal bio type. Approximately 85% of the population present with thick, flat periodontal forms, whereas the periodontal architecture of the remaining population is thin and scalloped.<sup>9</sup> Although the amount of post-operative soft tissue modifications is generally minimal for patients with thick and flat gingiva, significant changes have been observed in those with thin and scalloped type.<sup>10</sup>

**Steps for treatment procedure:**

**Surgical Procedure**

1. Local anesthetic was administered and periostomes were used to loosen the periodontal ligament.
2. The tooth was extracted atraumatically, without flap reflection.
3. A periodontal probe was used post-extraction to verify the integrity of the facial plate, and the socket was thoroughly debrided.

4. Primary stability was achieved by engaging the palatal wall and bone approximately 3mm beyond the apex to the extraction socket with a 11.5mm length and diameter 4.5mm Osstem implant. The top of the implant was placed approximately 3mm from the final proposed free gingival margin. Ideally the 1mm polished collar should be above the bone level (Fig.4).

With a flapless surgical approach, this is sometimes difficult to visualize. The implant diameter was within the confines of the tooth socket, without engaging the coronal portion of the facial plate to prevent possible perforation. A minimal distance of approximately 1.5-2.0mm between the implant and adjacent teeth is recommended to minimize marginal bone loss due to encroachment. Although not necessary with a horizontal distance less than 2mm from the implant to the facial bone, synthetic bone graft was placed around the implant.

5. Sutures were placed and provisionalization was then begun using extracted crown portion of the natural tooth (Fig.5).



**Fig.4: Immediate implant placement**



**Fig.5: Sutures placed**



**Fig.6: Disinfection of the coronal portion**



**Fig.7: Ovate pontic preparation**



**Fig.8: Pulp cavity filled with flowable composite**



**Fig.9: Reinforcement fiber**



**Fig.10: Preparing abutment**



**Fig.11: Reinforcement fibers attached**



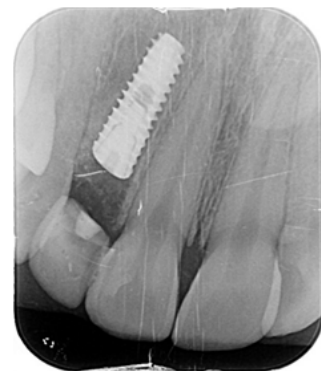
**Fig.12: Groove made on pontic**



**Fig.13: pontic attached with fiber**



**Fig.14: Final temporization done**



**Fig.15: Post-operative I.O.P.A. radiograph**



**Fig.16: Post-operative OPG.**

## RESTORATIVE PROCEDURE

1. Crown portion was disinfected with 2% sodium hypochloride solution; ovate pontic is prepared using diamond bur: pulp space was cleaned and was filled with light cure composite resin (Fig.6,7,8,9).
2. Adjacent teeth were etched with 37% ortho phosphoric acid, primer applied and light curing done to prepared for abutment (Fig.10).
3. Resin fiber is attached with the prepared surface of the abutment using composite resin to support the pontic (Fig.11).
4. A groove is prepared using diamond bur on the palatal side of the pontic, etched and primer applied to adapt with prepared abutments (Fig.12).
5. Pontic was attached with prepared abutments with flowable light cure composite resin and light curing done (Fig.13).
6. Clearance in incisal third was given to minimize the occlusal forces in centric and eccentric position.

7. Finishing and polishing done (Fig.14).
8. Final radiographs were taken (Fig.15,16).
9. The patient then wore the resin reinforcement retained natural tooth provisional pontic for another 3 months until an implant-borne provisional could be placed.

## DISCUSSION

Tooth removal results in marked reduction in buccal–lingual alveolar bone width.<sup>11,12</sup> Araujo and Lindhe showed that the reduction of the dimension of an extraction site was due to the replacement of bundle bone with woven bone from the inner portion of the socket and the resorption of the outer and crestal portions of the buccal–lingual socket walls.<sup>13</sup>

Various techniques have been proposed to place implants immediately following extraction.<sup>14</sup> Assessment of the morphology of the pre-extraction socket is essential.



The use of a fiber reinforced composite bridge is an effective method to reposition the sectioned natural crown back to its pre-extracted spatial position.<sup>15</sup> The use of the patient's own tooth simplified the provisionalization procedure as no modification was required for cervical margins and interproximal contacts. Furthermore, the tissue response to the patient's own tooth could be expected to be more superior to other provisional materials, which tends to promote plaque accumulation if it is porous or unpolished.

## CONCLUSION

The use of the patient's own tooth simplified the provisionalization procedure as no modification was required for cervical margins and interproximal contacts. Furthermore, the tissue response to the patient's own tooth could be expected to be more superior to other provisional materials, which tends to promote plaque accumulation if it is porous or unpolished. Immediate provisional restorations placed on immediate implants in extraction sockets enhance the preservation of the soft and hard tissue contour. Use of the natural tooth on the abutment will provide an emergence profile similar to the pre-existing condition. This is particularly advantageous for the thin periodontium, where there is greater chance for bone and tissue recession. It is important to evaluate the patient thoroughly before attempting this technically demanding procedure. The patients presenting anatomy can ultimately dictate the final esthetic outcome.

## REFERENCES

1. Kretschmar JL. The natural tooth pontic: a temporary solution for a difficult esthetic situation. *J Am Dent Assoc* 2001; 132: 1552-3.
2. Breault LG, Manga RK, Elliston NK. The reinforced natural tooth pontic. *Gen Dent*. 1997;45:474-476.
3. Kois JC. Altering gingival levels: The restorative connection, Part I: Biologic variables. *J Esthet Restor Dent*. 1994;6:3-7.
4. Banerjee R, Banerjee S, Usha R. Ovate pontic design: An aesthetic solution to anterior missing tooth—A case report. *Journal of Clinical and Diagnostic Research*. 2010;4:2996-2999.
5. Safirstein JJ, Owens BM, Swords RL. The resin retained natural tooth pontic: a transitional esthetic solution. *J Tenn Dent Assoc*. 2001;81:31-33.
6. Sheridan, J.J., Le Doux Ward, W., McMin, R. Essix retainers: fabrication and supervision for permanent retention. *Journal of Clinical Orthodontics* 1993;27: 37-45.
7. Walsh LJ, Liew VP. The natural tooth pontic—a compromise treatment for periodontally involved anterior teeth. *Aust Dent J*. 1990;35:405-408.
8. Miller MB. Aesthetic anterior reconstruction using a combined periodontal/restorative approach. *Pract Periodontics Aesthet Dent*. 1993;5:33-40.
9. Kinzer GK. Comprehensive reconstruction using sequential extraction and implant placement. *Advan Esthet Interdisc Dent*. 2006;2:17-22.
10. Olson M, Linghe J. Periodontal characteristics in individuals with varying form of the upper central incisors. *J Clin Periodontol* 1991;18(1): 78-82.
11. F. Van der Weijden, F. Dell'Acqua, D.E. Slot. Alveolar bone dimensional changes of post-extraction sockets in humans: a systematic review. *J. Clin. Periodontol.*, 36 (2009), pp. 1048–1058.
12. W.L. Tan, T.L.T. Wong, M.C.M. Wong, N.P. Lang. A systematic review of postextraction alveolar hard and soft tissue dimensional changes in humans. *Clin. Oral Implants Res.*, 23 (s5) (2012), pp. 1–21
13. M.G. Araújo, J. Lindhe. Dimensional ridge alterations following tooth extraction. An experimental study in the dog. *J. Clin. Periodontol.*, 32 (2) (2005), pp. 212–218
14. C. H. Hammerle, S. Chen, T. G. Wilson. Consensus statements and recommended clinical procedures regarding the placement of implants in extraction sockets. *Int. J. Oral Maxillofac. Implants*, 9 (Suppl.) (2004), pp. S26–S28.
15. Karbhari VM, Wang Q. Influence of triaxial braid denier on ribbon-based fiber reinforced dental composites. *Dent Mater*. 2007;23:969-976.