



RESEARCH ARTICLE

IMMEDIATE IMPLANT PLACEMENT IN UPPER ANTERIOR TOOTH WITH GTR-A CASE REPORT

*¹Dr. Pooja Patel, ²Dr. Hans Raj Saini, ³Dr. Parveen Ranga, ⁴Dr. Cheena Singh
and ⁵Dr. Renu Devi

¹Consultant Dental Surgeon at Aesthetic Smiles, Khar West, Mumbai

²Consultant Dental Surgeon, Deptt. of Conservative dentistry & Endodontics, Postgraduate
Institute of Dental Sciences, Rohtak, Haryana

³Dental Surgeon, Om Dental Clinic, Narela, Delhi

⁴Assistant Professor, Deptt. of Oral Medicine & Radiology, Postgraduate Institute of Dental
Sciences Rohtak, Harayana

⁵Demonstrator, Deptt. of Periodontology, Postgraduate Institute of Dental Sciences
Rohtak Harayana

ARTICLE INFO

Article History:

Received 28th May, 2017
Received in revised form
07th June, 2017
Accepted 18th July, 2017
Published online 31st August, 2017

Key words:

Dental Implant,
Collagen Membrane,
Bone Graft,
Extraction.

ABSTRACT

Immediate dental implant placement has been an acceptable procedure for at least the past two decades. Commonly, immediate implants have been reserved for the single rooted anterior tooth and single or bi-rooted premolar tooth. Perhaps the most important aspect of any implant surgery in accordance with the successful procedure is implant stability and bone to implant contact (BIC). In the case of extraction and immediate placement of dental implants preserving alveolar bone proper, particularly that of the labial and lingual plates of bone is essential in providing the optimal environment for maximizing BIC and implant stability. Also, the position of the final restoration must be considered, in relation to intra and inter arch position, occlusion, function and esthetics.

Copyright©2017, Dr. Pooja Patel et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Dr. Pooja Patel, Dr. Hans Raj Saini, Dr. Parveen Ranga, Dr. Cheena Singh and Dr. Renu Devi, 2017. "Immediate implant placement in upper anterior tooth with gtr-A case report", *International Journal of Current Research*, 9, (08), 55949-55952.

INTRODUCTION

Dental Implants are today considered as a reliable treatment option to replace missing teeth both for esthetics and function (Gottfredsen, 2012). Earlier in 70s and 80s implants were placed in healed alveolar ridges (Adell, 1981). It was in the early 90s that implant placement started in fresh extraction sockets or in partially healed alveolar ridges predominantly for implants in the esthetic zone (Schwartz-Arad, 1997; Nir-Hadar, 1998). Implant placement in anterior maxilla area is challenging because of esthetic concern and unfavorable bone topography. The success of an implant restoration depends on proper implant placement and the hard and soft tissue architecture that surrounds the fixture (Kan, 2001). The conventional panoramic radiograph (OPG) remains an excellent diagnostic method to examine intra oral structures.

*Corresponding author: Dr. Pooja Patel,
Consultant Dental Surgeon at Aesthetic Smiles, Khar West, Mumbai

However, the two-dimensional panoramic radiograph imaging is imprecise, and the distorted image can lead to incorrect diagnosis resulting in wrong treatment. The advanced images afforded by the three dimensional (3D) cone-beam computed tomography (CBCT) scan gives the clinician exact details of the hard and soft tissue structures necessary for proper diagnosis and accurate treatment planning. CBCT creates real time images in axial, coronal, sagittal, and oblique planes-known as multiplanar reformation that provides accurate 3D information (Sonick, 1994). CBCT is well suited for imaging craniofacial structure. In maxillary anterior, there is a risk of damaging buccal plate during the extraction of a prominent root. In 2007, Elian *et al.* classified extraction sockets as Type 1: Where the buccal bone and the soft tissue around are intact, Type 2: Where the buccal soft tissue is present, but the facial bone plate is lost during extraction, and Type 3: Where both hard and soft tissue is lost after extraction and usually requires regenerative procedures to restore. In this case report successful immediate implant placement with GTR is discussed.

Case report

A 32-year-old male patient in excellent general health reported with mobile tooth in maxillary anterior jaw region 21# (Figure 1) to the OPD of Department of Periodontology, PGIDS, Rohtak, Haryana. The patient's medical history was unremarkable. On dental hard tissue examination there were no other significant findings. Periodontal status, oral hygiene was good. No marginal gingival inflammation was detected. No periodontal pockets were present, no tooth mobility found. The patient expressed his desired for fixed type replacement which preserved the neighboring healthy teeth. IOPA x-ray reveals broken post w.r.t 21 (Figure 2).



Fig.1. Pre-operative



Fig.2. Pre-Operative IOPA X-RAY

Treatment planning

After the clinical examination and review of the initial periapical radiograph (IOPA), the possibility of an extraction of the remaining root structure of tooth 21# and subsequent implant placement seemed feasible. The patient was advised of the potential benefits of a CBCT scan, this information would yield the information necessary to recommend the optimal treatment plan, based on a comprehensive assessment of the bone for the potential implant placement. Based on this decision was made to take CBCT scan. The cross-sectional CBCT data was visualized which revealed that the thickness of the palatal and buccal plate were intact (Figure 3). There were no deficits in the bony structure around the entire

circumference of the residual root. Cross-sectional image dictated the existing tooth position in relation to the surrounding bone. When we viewed the recipient site, it was realized that the anatomy was ideal for immediate implant placement, and the amount of available bone apical to the existing tooth which could be utilized to provide stability for the immediately placed implant was adequate (6.5mm). Patient's written consent was taken, and impressions of upper and lower arch were taken to prepare Study cast models. Initial phase-I therapy was performed.

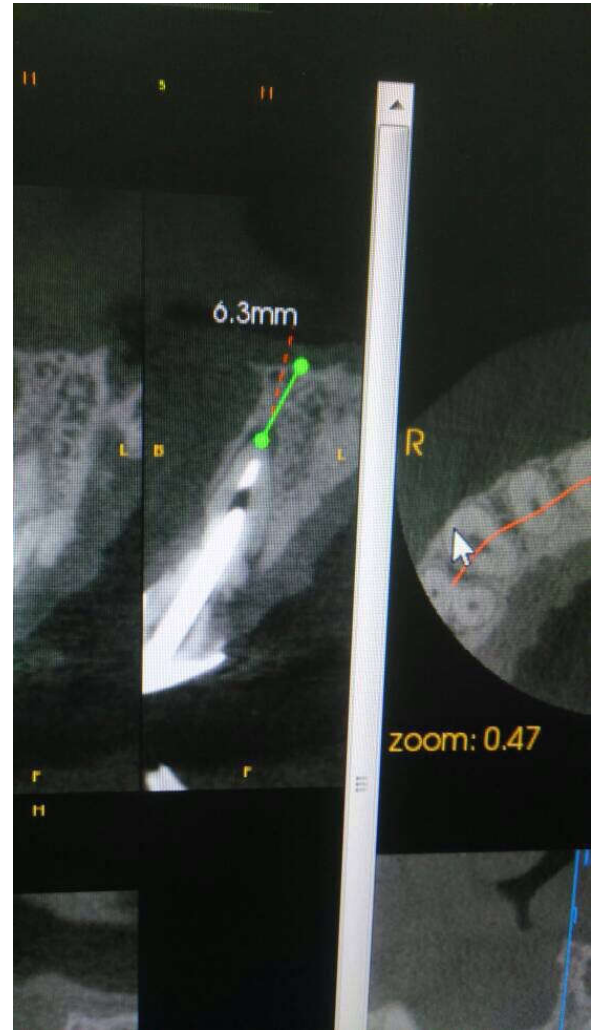


Fig.3. CBCT

Surgical procedure

At the day of surgery, the patient was prepared and draped. The patient was appropriately anesthetized with 2% lignocaine HCL. The 21# tooth was atraumatically removed (Figure-4). The socket was checked for any residual granulation tissue or debris. Osteotomy site was marked. 2.0 diameter pilot drill was used to start the bone preparation, labiolingual and mesiodistal angulation was assessed using paralleling pins. The osteotomy was done in a sequential manner. Implant site was flushed with normal saline and betadine to remove any debris, 4.0x13 mm length implant was placed in the prepared osteotomy site (Figure 5). The exposed implant site labially was successfully covered with PERIOGLASS bone graft along with collagen membrane. (Figure 6 & 7) The site was closed with 3-0 silk sutures. Immediate pontic with composite was delivered provisionally (Figure 8).



Fig.4. Extracted Tooth



Fig. 8. Provisional prosthesis



Fig.5. Implant placed safely 4.2x13mm

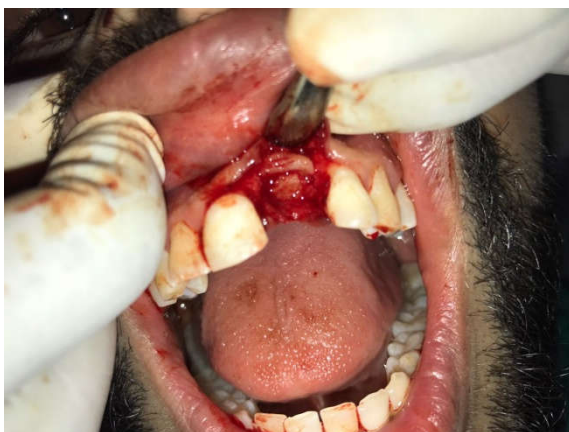


Fig.6. Bone graft placed (periglass)

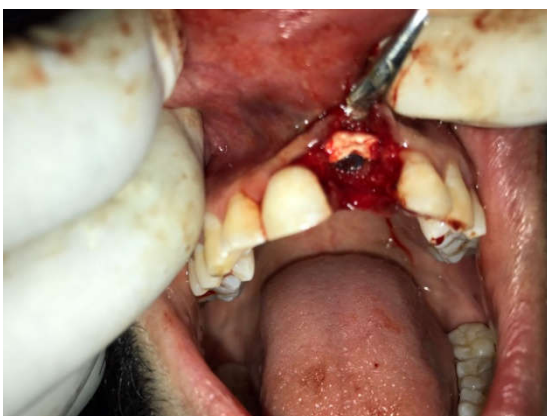


Fig.7. Collagen Membrane placed

DISCUSSION

Dental implants have been used as a best treatment modality for replacement of missing natural teeth in terms of stability and esthetic outcome. The success of dental implant therapy is no longer based only on functional osseointegration but positive patient outcomes of creating a restoration which resembles a natural tooth in all respects (Wilson, 2002). Implant placement in esthetic zone requires careful preoperative treatment planning, hard and soft tissue augmentation and complete knowledge of surgical and prosthetic techniques. Immediate implant placement reduces the overall treatment time, prevents bone and soft tissue resorption and has better patient acceptance due to less trauma (Quirynen *et al.*, 2007).

The decision to extract the teeth and place implants immediately is always a risk. This risk is lowered if we understand why the tooth had to be removed, how biology works and what we can or must not do. In this case, a flap raise or papilla raise would have been fatal with regard to aesthetics, resulting in unpredictable and major defects. The implant position slightly beneath the crestal bone level is correct, calculating the inevitable loss of crestal height through the former local inflammation. The grafting of the buccal plate gap is also appropriate and leads to a higher predictability when performed with a combination of fast and slow, or slow and non-resorbable biomaterials. (Elian *et al.*, 2007; Funato *et al.*, 2007; Abu-Hussein *et al.*, 2013) Decisive factors for the success of immediate implant are a lack of infection in periodontal tissues and an intact tooth socket. The evaluation of alveolar bone with CBCT helps the implantologist to assess the quality and quantity of cortical and cancellous bone, especially in the buccolingual dimension.

Immediate implant placement following tooth extraction in appropriately selected cases has been considered the optimal procedure for the following reasons: the natural healing process are mobilized to the maximum, no bone resorption has taken place yet, drilling is reduced, a number of surgical stages are eliminated, design and construction of prosthesis is simplified, and positive psychological effect on the patient (Nowzari, 2001; Sukovic, 2003 and Cohnen, 2002). The implant diameter is often smaller than the diameter of the root of the extracted tooth, which may lead to a gap between the implant and the extraction socket wall. In cases where the distance between the implant and the extraction socket is less

than 2mm, spontaneous bone healing can be expected without the necessity for additional grafting procedures (Schulze, 2004; Ngan, 2003 and Danforth, 2000).

Barrier membranes have been developed to allow guided tissue regeneration by the principle of osteopromotion (Danforth, 2000; White, 1992; Novaes, 1995). In this case report as implant was 2-3mm exposed buccally so we covered it with Bonegraft and membrane to prevent future implant dehiscence. The material was chemically and biologically inert. However, non resorbable and resorbable membranes are also available in the market, the non resorbable e-PTFE (Expanded Poly Tetra Floro Ethylene) (Gore-Tex) remains the most widely used membrane (Novaes, 1995; Hatcher, 2003; Van Assche, 2007; Mandelaris, 2008; and Jung, 2009).

Conclusion

The implant restoration in the esthetic zone is one of the most demanding and complex treatment due to the necessity to obtain esthetic result. Although osseointegration and restoration of function and soft tissue esthetics dictate implant success, the patient's satisfaction is a key element of the success of implant therapy. This case report demonstrates that immediate implant placement and early loading is a viable option to give patient sound, timely and comfortable treatment.

REFERENCES

- Abu-Hussein M, Abdulghani A, Sarafianou A, Kontoes N. 2013. Implants into fresh extraction site: A literature review, case immediate placement report. *J Dent Implants.* 3(2):160-4.
- Adell, R., Lekholm, U., Rockler, B., Brånemark, P.I. 1981. A 15-year study of osseointegrated implants in the treatment of the edentulous jaw. *Int J Oral Surg.*, 10(6):387-416.
- Cohnen, M., Kemper, J., Möbes, O., Pawelzik, J., Mödder, U. 2002. Radiation dose in dental radiology. *Eur Radiol.* 12(3):634-7.
- Danforth, R.A., Clark, D.E. 2000. Effective dose from radiation absorbed during a panoramic examination with a new generation machine. *Oral Surg Oral Med Oral Pathol Oral RadiolEndod.* 89(2):236-43.
- Elian, N., Cho, S.C., Froum, S., Smith, R.B., Tarnow, D.P. 2007. A simplified socket classification and repair technique. *PractProcedAesthet Dent.*, 19(2):99-104.
- Funato, A., Salama, M.A., Ishikawa, T., Garber, D.A., Salama, H. 2007. Timing, positioning, and sequential staging in esthetic implant therapy: A four-dimensional perspective. *Int J Periodontics RestorativeDent.* 27(4):313-23.
- Gotfredsen, K. 2012. A 10-year prospective study of single tooth implants placed in the anterior maxilla. *Clin Implant Dent Relat Res.* 14(1):80-7.
- Hatcher, D.C., Dial, C., Mayorga, C. 2003. Cone beam CT for pre-surgical assessment of implant sites. *J Calif Dent Assoc.*, 31(11):825-33.
- Jung, R.E., Schneider, D., Ganeles, J., Wismeijer, D., Zwahlen, M., Hämmerle, C.H., et al. 2009. Computer technology applications in surgical implant dentistry: A systematic review. *Int J Oral Maxillofac Implants.* 24(Suppl 92):109.
- Kan, J.Y., Rungcharassaeng, K. 2001. Site development for anterior single implant esthetics: The dentulous site. *CompendContinEduc Dent.* 22(3):221-6. 228, 230-1.
- Mandelaris, G.A., Rosenfeld, A.L. 2008. The expanding influence of computed tomography and the application of computer-guided implantology. *Pract Proced Aesthet Dent* 20(5):297-305.
- Ngan, D.C., Kharbanda, O.P., Geenty, J.P., Darendeliler, M.A. 2003. Comparison of radiation levels from computed tomography and conventional dental radiographs. *AustOrthod J.*, 19(2):67-75.
- Nir-Hadar, O., Palmer, M., Soskolne, W.A. 1998. Delayed immediate implants: Alveolar bone changes during the healing period. *Clin Oral Implants Res.* 9(1):26-33.
- Novaes, A.B., Jr, Novaes, A.B. 1995. Immediate implants placed into infected sites: A clinical report. *Int J Oral Maxillofac Implants.* 10(5):609-13.
- Nowzari H. 2001. Esthetic implant dentistry. *Compendium.* 22(8):643-54.
- Schulze, D., Heiland, M., Thurmann, H., Adam, G. 2004. Radiation exposure during midfacial imaging using 4- and 16-slice computed tomography, cone beam computed tomography systems and conventional radiography. *Dentomaxillofac Radiol.* 33(2):83-6.
- Schwartz-Arad, D., Chaushu, G. 1997. The ways and wherefores of immediate placement of implants into fresh extraction sites: A literature review. *J Periodontol.* 68(10):915-23.
- Sonick, M. 1994. A comparison of the accuracy of periapical, panoramic and computed tomographic radiographs in locating the mandibular canal. *Int J Oral MaxillofacImpl.* 9:455-60.
- Sukovic, P. 2003. Cone beam computed tomography in craniofacial imaging. *Orthod Craniofac Res.*, 6(Suppl 1):31-6.
- Van Assche, N., van Steenberghe, D., Guerrero, M.E., Hirsch, E., Schutyser, F., Quirynen, M., et al. 2007. Accuracy of implant placement based on pre-surgical planning of three-dimensional cone-beam images: A pilot study. *J ClinPeriodontol.*, 34(9):816-21.
- White, S.C. 1992. 1992 assessment of radiation risk from dental radiography. *Dentomaxillofac Radiol.* 21(3):118-26.
