



Review Article

A literature review on immediate implant placement

Dimple Budhiraja^{1,*}, Lalita Sheoran², Sonali Sharma³, Asusa Cicilia Loli³,
Chander Udhey³, Monika Sehrawat¹

¹Dept. of Prosthodontics, Kalka Dental College, Meerut, Uttar Pradesh, India

²Dept. of Orthodontics, Kalka Dental College, Meerut, Uttar Pradesh, India

³Dept. of Prosthodontics, Bhojia Dental College and Hospital, Baddi, Himachal Pradesh, India



ARTICLE INFO

Article history:

Received 01-03-2021

Accepted 21-04-2021

Available online 07-06-2021

Keywords:

Immediate implant placement

Implant

Extraction site

Tooth extraction

ABSTRACT

In today's time implants are becoming the most promising treatment modality in the replacement of missing tooth or teeth in the oral cavity. With the evolution of newer techniques and better implant biomaterials, implants become the prime most treatment option in day to day life. With the evolution of new techniques, placement of implant in the fresh site of the extraction gives different numbers of advantages that were significant to the patient as well as to the clinician. There are a lot of evidences that confirm that immediate implant placement provides excellent and good predictable results.

© This is an open access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>) which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

1. Introduction

Dental implant is an option for those people who have lost a single tooth or teeth due to trauma, dental injury or due to any periodontal condition.¹ This concept of placement of dental implant into the fresh extraction socket has been emerged in the recent time period. This concept is better understood by better understanding of the phenomenon of healing after extraction. Initially it was believed that the placement of implant immediately is limited to the healthy site only, but with the evolution of techniques this implant placement can be done to the sites where there is reduced periodontal support, by taking special precautions at the particular site.

The success of implant placement immediately in to the extraction site is totally dependent over the phenomenon of osseointegration with the alveolar bone in to the surrounding tissue. The primary concern of retaining the good results can be achieved from modifications achieved from tissue architectural. These changes related to tissue architectural

might occur before tooth extraction or after tooth extraction by the process of gingival recession through loss of buccal or interproximal tissue, or by the process of bone resorption or bone remodeling.

In today's world immediate implant placement becomes an accepted as well as advantageous technique, only if all the fundamentals of implant placement are followed, otherwise it may lead to damage. Literature suggested that earliest dental implant was inserted in the era of pre-columbian.²⁻⁴ After that a porcelain crown is being constructed over a shell made up of platinum with lead that is moulded to make the root form.⁵ After that endosteal design of the implant is being developed in 1950's. In the year 1947, a single helix implant was developed which was made up of material i.e. stainless steel or by tantalum.⁶

In the year of 1952, Branemark introduced threaded endosteal implant with cylindrical design and got acceptance to the system by ADA in the year 1986.⁶ Lazzara in the year of 1989 was one of the initial clinicians who attempted the technique of immediate implant placement with its prime concern of maintenance of normal alveolar architecture along with the use of implants of

* Corresponding author.

E-mail address: drdimple1122@gmail.com (D. Budhiraja).

longer dimension which ultimately follows the shorter treatment time.⁷ literature stated that placement of implant immediately in the extraction site shows positive and significant results.⁸ another study revealed that success rate of 98.84% for 5 years follow up for 83 implants by using a tapered implant system.⁹

1.1. Indications

1. Fracture of the root
2. Resorbed root
3. Peri apical pathology
4. Endodontically failed tooth
5. Root perforation
6. Psychological advantage to the patient
7. Reduced treatment time interval

1.2. Contraindications

1. Alveolar wall resorption
2. Periodontal disease
3. Acute infection peri apical
4. Anatomy of the alveolar bone not favorable
5. Any risk of infection
6. Bisphosphonates therapy.^{10,11}

1.3. In general consideration of the patient undergoing the immediate implant placement therapy

1.3.1. Radiographic evaluation

Intra oral peri apical radiography imaging provide better information considering the primary cause of extraction of tooth, whether from periodontal disease , fracture of the root or from any other peri apical pathology. When to get the topographic information of the alveolar bone that too properly one should go for three dimensional imaging technique of the alveolar bone, which includes cone beam computed tomography. It provide accurate information regarding the space available for the placement of the dental implant with respect to its position, numbers and location. This single technique eliminates the need of panoramic radiography as well as intra oral radiography.¹²

1.3.2. Stability of the implant at the time of immediate implant placement / primary stability

It is defined as the capacity of the dental implant to with stand with the occlusal forces, axial forces, lateral and rotational forces. There are some factors on to which the primary stability depends like implant length, quality of the bone, quantity of the bone and the technique used in the surgery.¹² literature revealed that whenever the primary stability is not attained properly, the procedure of immediate implant placement should not to be followed.¹³

1.3.3. Quantity and quality of the bone

Bone quality plays a major role in determining the success rate of dental implant therapy that too when the case is of immediate implant placement. Literature revealed that the bone quality as well as quantity is better in the mandibular arch when compared to the maxillary arch. That's why the success rate of immediately placed implant is more in the mandibular arch than the maxillary arch.¹³

1.3.4. Morphology of the alveolar bone

It is one of the important determinant factor in the success of the immediate implant placement procedure. Morphology at the extraction site include, good axial inclination of the residual alveolar ridge, curvature of the root of the extracted tooth , and location of the apex of the socket. Lastly the extraction should be having enough bony as well as soft tissue structure on the buccal and lingual as well as on the mesial and the distal side.

1.3.5. Anatomical surrounding structures

Every case should be selected after carefull examination of the surrounding anatomical structures. Like presence of bone with respect to length near the maxillary sinus and near the mandibular canal, so as to avoid perforation of the maxillary sinus and the canal while performing the implant surgery. The mental foramina, sublingual mandibular concavities and the inferior alveolar neuro vascular bundle, there should be

1.4. Surgical phase

1. Round bur technique is used mostly in the immediately implant placement procedure. Drilling is initiated with the help of a small round bur, drilling should be carried out to the palatal direction following the long axis of the tooth. In some of the cases grafting of the material is required when there is residual space greater than 2mm.
2. The other technique known as trepan technique allows better implant control.
3. During the preparation of the osteotomy, the drilling should be extended beyond the extraction socket to attain the primary stability
4. If there is any peri apical lesion is present with respect to the osteotomy site, the drilling should be performed beyond the lesion so as the infected portion should be excavated during the osteotomy preparation time.
5. Implant size should be determined by the availability of the alveolar bone around the osteotomy site.
6. A 3-4 mm horizontal distance between the adjacent implant/tooth and a 3-5 mm vertical distance between contact point/ inter-proximal bone are significantly associated with a complete inter-dental papilla fill.
7. In the upper anterior region, implant placement should be made more palatally as compared to the extraction

site, in case of maxillary premolar and molar teeth , implant should be placed at the level of the septum.

8. Implant should be placed at the level of the inter radicular septum , in case of mandibular molars.
9. Implants should be placed as parallel as possible in the mandibular anterior region.

1.5. Risk factors

There is a high risk of failure of implant when placed immediately at the extraction site of the patients having severe periodontitis.¹⁴ Mucosal recession is found to be a very common and serious problem associated with immediate implant placement.^{15,16} Literature revealed that 2-0 to 30 percent of buccal mucosal recession for more than 1 mm was reported. So a thin bio type could be a precipitating factor in the development of muco gingival defect after implant placement. Literature revealed that the immediate implantation is successful in limited or otherwise ideal extraction cases in terms of aesthetics or in otherwise compromised cases the aesthetic results of immediate implant placement is unpredictable.^{17,18} rough surface of the implant found to be having more primary stability when compared to the smooth machined surface implant. Literature revealed that patient not taking antibiotic course including amoxicillin after implant placement are at 3 times more likely to develop chances of failures after implant placement .

2. Conclusion

By increasing the aesthetic demand and limited time period, immediate implant placement could be a better option for the patient as well as to the clinician. Literature revealed high success rate of 95 percent to 98 percent with immediate implant placement, but when the inclusion criteria for the patient is followed well.¹⁹ parametres that are clinical and case selection criteria would be taken seriously in to account to achieve the possibility of achieving good results.

3. Source of Funding

No financial support was received for the work within this manuscript.

4. Conflicts of Interest

There are no conflicts of interest.

References

1. Official website of American Academy of Periodontology. Available from: <http://www.perio.org/consumer/dental-implants>.
2. Scotta A, Guelcher HJ. An introduction to biomaterials. vol. 396. CRC Press; 2007.
3. Scotta A, Guelcher HJ. An introduction to biomaterials . vol. 553. CRC Press; 2007.
4. Cranin AN. The anchor oral endosteal implant. *J Biomed Mater Res*. 2008;73:235–49.
5. Wilwerding T. History of dentistry. 2001;1:9.
6. Branemark PI, Zarb GA, Albrektsson T. Tissue integrated prosthesis; Osseo integration in Clinical dentistry. vol. 1985. Chicago, III: Quintessence Publishing company.; p. 11.
7. Lazzara RJ. Immediate implant placement into extraction sites: Surgical and restorative advantages. *Int J Perio Rest Dent*. 1989;9:333–43.
8. Grunder U, Pollizzi GA. A 3 year prospective multicentric follow up report on the immediate and delayed immediate placement implants. *Int J Oral Maxillofac Implants*. 1999;14:210–226.
9. Roman GG, Schulte W, Hoedt B, Kramer A, D. The Frialit 2 Implant system: Five year clinical experience in single tooth and immediate post extraction applications. *J Oral Maxillofac implants*. 1997;12:299–309.
10. Yong TL. Case Series of Single Stage Immediate Implant Placements into Fresh Extraction Sockets of Mandibular Molars. *Proceedings of Singapore Healthcare*. 2012;21(1):65–72.
11. Cartos VM, Zhu S, Zavras AI. Bisphosphonate Use and the Risk of Adverse Jaw Outcomes. *J Am Dent Assoc*. 2008;139(1):23–30. doi:10.14219/jada.archive.2008.0016.
12. Sennerby L, Ross J. Clinical study on the primary stability of two dental implant systems with resonance frequency analysis. *J Clin Oral Invest*. 2007;11:257–65.
13. Lekholm U, Zarb GA. Patient selection and preparation. In: Branemark P, Zarb G, Albrektsson T, editors. Tissue integrat–ed prostheses: osseointegration in clinical dentistry. Chicago: Quintessence; 1985. p. 199–209.
14. Matarasso S, Salvi GE, Siciliano VI, Cafiero C, Blasi A, Lang NP, et al. Dimensional ridge alterations following immediate implant placement in molar extraction sites: a six-month prospective cohort study with surgical re-entry. *Clin Oral Implants Res*. 2009;20(10):1092–8. doi:10.1111/j.1600-0501.2009.01803.x.
15. Buser D, Chappuis V, Belser U, Chen S. Implant placement post extraction in esthetic single tooth sites: when immediate, when early, when late . *Periodontol*. 2000;73:84–102.
16. Kan JYK, Rungcharassaeng K, Sclar A, Lozada JL. Effects of the Facial Osseous Defect Morphology on Gingival Dynamics After Immediate Tooth Replacement and Guided Bone Regeneration: 1-Year Results. *J Oral Maxillofac Surg*. 2007;65(7):13–9. doi:10.1016/j.joms.2007.04.006.
17. Kissa J, Kholti WE, Laalou Y, Farouki ME. Augmentation of keratinized gingiva around dental implants. *J Stomatol Oral Maxillofac Surg*. 2017;118(3):156–60. doi:10.1016/j.jormas.2017.04.003.
18. Juodzbalsys G, Wang HL. Soft and hard tissue assessment of immediate implant placement: a case series. *Clin Oral Implant Res*. 2007;18(2):237–43. doi:10.1111/j.1600-0501.2006.01312.x.
19. Nkenke E, Fenner M. Indications for immediate loading of implants and implant success. *Clin Oral Implant Res*. 2006;17(S2):19–34. doi:10.1111/j.1600-0501.2006.01348.x.

Author biography

Dimple Budhiraja, 2nd Year MDS Student

Lalita Sheoran, 3rd Year MDS Student

Sonali Sharma, 2nd Year MDS Student

Asusa Cicilia Loli, 2nd Year MDS Student

Chander Udhey, 1st Year Post Graduate MDS Student

Monika Sehrawat, 2nd Year MDS Student

Cite this article: Budhiraja D, Sheoran L, Sharma S, Loli AC, Udhey C, Sehwat M. A literature review on immediate implant placement. *IP Ann Prosthodont Restor Dent* 2021;7(2):68-71.