

REVIEW ARTICLE

Complications of Immediate Implant Placement and its Management: A Review Article

Seema S. Patil¹, Arunachaleshwar S. Balkunde², Aditi Samant³, Rupali Patil⁴ & Pankaj Kadam⁴

¹Assistant professor, Department of Prosthodontics, Bharati Vidyapeeth Deemed University, Dental College and Hospital, Pune [MS], India

²Assistant professor, Department of Oral and Maxillofacial surgery, MIDSR Dental College, Latur, [MS], India .

³Consultant prosthodontist, ⁴Assistant professor, Department of Prosthodontics, Bharati Vidyapeeth Deemed University, Dental College and Hospital, Pune [MS], India.

Abstract:

As endosseous dental implant therapy rapidly becomes the prosthetic standard of care for a vast array of clinical applications, we are faced with the challenge of developing dynamic treatment planning protocols. An excellent technology of immediate implant placement is in the hands of today's dentist world which means placement of an implant, immediately after the extraction of the tooth. Although immediate implant placement is associated with high success rates and survival rates, complications can occur. Complication sometimes is unforeseen, but it is urgent to identify and rectify them.

Key Words: Implant Placement, Complications, Tooth Extractions etc,

Introduction:

The standard protocol requires at least 6 months before the placement of an implant in an extraction socket [1,2]. Immediate implant placement describes the placing of implants immediately into the sockets after tooth extraction [3]. Immediate implant placement is regarded as a viable technique, provided that proper patient selection and meticulous surgical procedures are adopted [4]. Clinical studies have demonstrated that the success rate of immediately placed implants is similar to that of implants placed after healing of extraction sites [5-7]. Placement of an immediate implant has the desirable effect of preserving alveolar bone width and height. Delayed implant placement may result in compromised esthetics and function due to lingual placement of the implant [8,9]. Hence, in certain circumstances, immediate implants will provide for more ideal prosthetic placement and will optimize

esthetics, all via the preservation of bone. Few studies, however, systematically have addressed the frequency or natural history of complications related to the use of dental implants [10-13]. So is the fact with immediate implant placement. The most common complications associated with immediate implant placement are poor 3-dimensional implant positioning, inadequate band of keratinized tissue, gingival recession, unacceptable esthetics, and implant failure because of surgical trauma, contamination of the surgical field, premature loading, implant design, anatomic limitations such as quality and quantity of bone, systemic factors, and unknown factors [14].

The aim of this article is to summarize complications associated with immediate implant placement and its prevention.

Address for correspondence:

Dr. Seema S. Patil,
Assistant Professor,
Department of Prosthodontics,
Bharati Vidyapeeth Deemed University, Dental College and Hospital,
Pune, [MS] India.
Email: dr.seemapatil1110@gmail.com

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Prevention of complications associated with immediate implant placement:

Recession: Absence of keratinized gingiva around the dental implant affects the success of an implant. Peri-implant mucosa lacks keratinized epithelium at the base of the sulcus, which forms the junctional epithelium and has a hemidesmosomal attachment and internal basal lamina in the lower regions of the interface.^{15,16} It adheres poorly to implant surfaces, is more permeable and has a lower capacity for proliferation and regeneration. Recession can be avoided and the long-term stability of the mucosal tissue around the implant can be ensured by the use of adjunct soft tissue grafting.

Poor quality and insufficient quantity of bone: Implant failure rates are higher when the quality and quantity of bone at the implant site are insufficient. Packing of bone graft particulates and simultaneous use of osteotome transforms very spongy bone into dense bone [14]. The early phase of bone regeneration at grafted sites is dominated by active bone resorption and formation throughout the graft. The latter phase of incorporation is characterized by osteoconduction [17]. Osteoinduction is also an influencing factor to synthesize new bone during first weeks.

Surgical trauma: Overheating the bone during preparation of the implant osteotomy site can lead to necrosis of the bone tissue surrounding the dental implant. clinician's skill is an important factor in the successful outcome of dental implants. Overheating the bone should be avoided by using copious irrigation and periodic replacement of twist drills to ensure sharpness [18]. The implant manufacturer's guidelines for drilling speed should be followed, and low hand pressure is warranted during high speed drilling in dense bone.

Infection: Strict antiseptic protocol should be followed during surgical implant placement. Premedication with broad-spectrum antibiotics is recommended. Thorough debridement of contained infection in the extraction socket and excavation of all of the soft and granulation tissues are necessary. In cases of active diffuse infection, delayed implant placement is recommended.

Violation of anatomic structure: The availability of 3 to 5 mm of bone past the apex of the root is often necessary for primary stability and is helpful for avoiding the violation of surrounding anatomic structures. The implementation of a vertical sinus lift with an osteotome and the placement of a wide-neck implant decrease the likelihood of introducing an immediate implant into the maxillary sinus cavity. Obtaining cross-sectional radiographic images for locating the maxillary sinus, the nasal cavity, the inferior alveolar canal, and the lingual undercut (submandibular fossa) is helpful for avoiding the violation of these anatomic structure because it ensures at least 2 mm of clearance between the implant apex and the surrounding structures [14].

Fenestration and dehiscence: The complications of fenestration and dehiscence have been reported to occur after immediate implant placement [19]. The most common area for fenestration during the immediate implant placement are the maxillary anterior and premolar sockets. The socket apex can be more facially oriented and is frequently misleading during the initiation of the osteotomy preparation. A round bur positioned off center toward the palatal side and along the alveolar ridge angulation reduces the chance of fenestration of facial plate of the alveolar ridge. When these complications occur, spontaneous bone regeneration may be possible; however, in some cases, delayed implant placement is advisable [20,21]. For managing fenestration or dehiscence, a resorbable or non-resorbable membrane can be used with or without bone particulate from various sources [22,23]

Implant stability: Primary stability and success of implants are more likely when implants are supported by cortical bone. Bicortical anchorage is associated with some complications, but it results in good primary stability and better distribution of loading forces than monocortical anchorage [14].

Malpositioning of implant: Restoration-driven implant position must be correct in 3 dimensions for optimal functional and esthetic outcomes. Correction of integrated malpositioned implants is difficult and limited to prosthetic correction; otherwise, removal of the implant is warranted [14].

Unesthetic outcome: Tissue alterations leading to recession of the facial mucosa and papillae are common after immediate placement [14]. Indicators of risk of recession after immediate placement include a thin tissue biotype, a facial malpositioning of the implant, and a thin or damaged facial bone wall. A history of chronic periodontitis is an indicator of risk of lack of survival of postextraction implant [24,25]. In studies with observation period of 3 years or longer, approximately 20% of patients who underwent immediate implant placement and delayed restoration experienced suboptimal aesthetic outcomes because of buccal soft tissue recession [26]. For optimal esthetic outcome and limiting of buccal mucosal recession, Tarnow and colleagues recommend placing a bone graft and contoured healing abutment or provisional restoration at the time of flapless implant placement in a post extraction socket [27].

Conclusion:

Overcoming barriers to public utilization of immediate implants will greatly depend on our ability as dentists to appropriately select cases and deliver treatment in a timely and cost-effective manner. Proper case selection of immediate implants helps to deliver good success rates and minimizes treatment cost, time and complications.

References:

1. Branemark PI, Hansson BO, Adell R, Breine U, Lindstrom J, Hallen O, et al. Osseointegrated implants in the treatment of the edentulous jaw. Experience from a 10-year period. *Scand J Plast Reconstr Surg Suppl* 1977;16:1-132.
2. Lekholm U. Clinical procedures for treatment with osseointegrated dental implants. *J Prosthet Dent* 1983;50:116-20.
3. Lazzara RJ. Immediate implant placement into extraction sites: surgical and restorative advantages. *Int J Periodontics Restorative Dent* 1989;9:332-43.
4. Palmer RM, Palmer PJ, Baker P. Immediate and early replacement implants and restorations. *Dent Update* 2006;33:262-4, 266-8.
5. Becker BE, Becker W, Ricci A, Geurs N. A prospective clinical trial of endosseous screw-shaped implants placed at the time of tooth extraction without augmentation. *J Periodontol* 1998;69:920-6.
6. Polizzi G, Grunder U, Goene R, Hatano N, Henry P, Jackson WJ, et al. Immediate and delayed implant placement into extraction sockets: a 5-year report. *Clin Implant Dent Relat Res* 2000;2:93-9.
7. Wagenberg B, Froum SJ. A retrospective study of 1925 consecutively placed immediate implants from 1988 to 2004. *Int J Oral Maxillofac Implants* 2006;21:71-80.
8. Cornellini R, Scarano A, Covani U, Petrone G, Piattelli A. Immediate one-stage postextraction implant: a human clinical and histologic case report. *Int J Oral Maxillofac Implants* 2000;15:432-7.
9. Rosenquist B, Ahmed M. The immediate replacement of teeth by dental implants using homologous bone membranes to seal the sockets: clinical and radiographic findings. *Clin Oral Implants Research* 2000;11:572-82.
10. Bragger U, Aeschlimann S, Burgin W, Hammerle CH, Lag NP. Biological and technical complications and failure with fixed partial dentures (FPD) on implants and teeth after four to five years of function. *Clin Oral Implant Res* 2001;12:26-34.
11. Esposito M, Hirsch J, Lekholm U, Thomsen P. Differential diagnosis and treatment strategies for biological complications and failing oral implants: a review of the literature. *Int J Oral Maxillofac Implants* 1999;14: 473-90.
12. Goodacre CJ, Kan JYK, Rungcharassaeng K. Clinical complications of osseointegrated implants. *J Prosthet Dent* 1999;81:537-52.
13. McGlumphy E, Larsen EA, Peterson LJ. Etiology of implant complications: anecdotal reports versus prospective clinical trials. *Compend Suppl* 1993;15: S544-8.
14. Leon Ardekian, Thomas B. Dodson. Complications associated with the placement of dental implants: *Oral Maxillofacial Surg Clin N Am*, 15,2003,243-249
15. Glauser R, Schupbach P, Gottlow J, Hammerle CH. Periimplant soft tissue barrier at experimental one-piece mini-implants with different surface topography in humans: a light-microscopic overview and histometric analysis. *Clin Implant Dent Relat Res* 2005;7(suppl 1):S44-S51.
16. Schupbach P, Glauser R. The defense architecture of the human periimplant mucosa: a histological study (published correction appears in *J Prosthet Dent* 2005;99[3]:167). *J Prosthet Dent* 2007;97 (6 suppl 1):S15-S25.
17. Zeeshan Sheikh, Corneliu Sima. Bone replacement materials and techniques used for achieving vertical alveolar bone augmentation. *Materials* 2015, 8, 2953-2993.
18. Kyu-Hong J, Kyh-Ho Yoon, Kwan-Soo Park. Thermally induced bone necrosis during implant surgery: 3 case reports: *J Korean Assoc Oral Maxillofac Surg* 2011;37:406-14.
19. Schropp L, Isidor F. Timing of implant placement relative to tooth extraction. *J Oral Rehabil* 2008;35(Suppl 1):33-43.
20. Schropp L, Kostopoulos L, Wenzel A. Bone healing following immediate versus delayed placement of titanium implants into extraction sockets: a prospective clinical study. *Int J Oral Maxillofac Implants* 2003;18(2):189-99.
21. Dahlin C, Andersson L, Linde A. Bone augmentation at fenestrated implants by an osteopromotive membrane technique. A controlled clinical study. *Clin Oral Implants Res* 1991;2(4):159-65.
22. Chen ST, Wilson TG Jr, Hammerle CH. Immediate or early placement of implants following tooth extraction: review of biologic basis, clinical procedures, and outcomes. *Int J Oral Maxillofac Implants* 2004;19(Suppl):12-25.
23. Schwartz-Arad D, Chaushu G. The ways and wherefores of immediate placement of implants into fresh extraction sites: a literature review. *J Periodontol* 1997; 68(10):915-23.
24. Chen ST, Buser D. Clinical and esthetic outcomes of implants placed in post extraction sites. *Int J Oral Maxillofac Implants* 2009;24(Suppl):186-217.
25. Martin W, Lewis E, Nicol A. Local risk factors for implant therapy. *Int J Oral Maxillofac Implants* 2009;24(Suppl):28-38.
26. Lang NP, Pun L, Lau KY, et al. A systematic review on survival and success rates of implants placed immediately into fresh extraction sockets after at least 1 year. *Clin Oral Implants Res* 2012;23(Suppl 5):39-66.
27. Tarnow DP, Chu SJ, Salama MA, et al. Flapless postextraction socket implant placement in the esthetic zone: part 1. The effect of bone grafting and/or provisional restoration on facialpalatal ridge dimensional change-a retrospective cohort study. *Int J Periodontics Restorative Dent* 2014;34(3):323-31.