

## What Is Your Philosophy on Placing Implants Immediately Into Extraction Sites?



### Dr. Sonick

Factoring in implant placement, exposure, and temporization, clinicians have at least nine timing possibilities to consider when treatment planning the replacement of a hopeless tooth with a dental implant. This encompasses when the implant is to be placed and when it is to be exposed or temporized (Figure 1).

The implant may be placed into a fresh extraction socket (immediate placement), at 3 to 8 weeks after extraction to allow for complete soft-tissue healing (early placement), or at the time of significant or complete bone maturation, which is typically at or after 3 or more months (delayed/conventional placement).<sup>1</sup>

Placement of dental implants into fresh extraction sites is alluring. Proponents of immediate implantation tout that this modality abbreviates the overall treatment time, reduces the number of surgical procedures, preserves papilla, encourages patient acceptance, and boosts profitability. What does the literature suggest? Three recent systematic reviews and meta-analyses published that the survival rate of immediate implants may be roughly 3% to 4% lower than that of delayed ones (approximately 95% versus 99%),<sup>2-4</sup> although another investigation showed no survival dissimilarities between immediate, early, or delayed protocols.<sup>5</sup> Anatomy of the socket, and of the patient, may influence outcomes. One examination noted a 9% difference favoring the higher success of conventional compared to immediate placement (98.6% versus 89.6%) in the presence of a defective buccal wall; no differences were found when the labial wall was intact.<sup>6</sup> Correspondingly, a thick biotype seems to resist mid-buccal recession and maintain papillary height better than a thin form for immediate implantation situations.<sup>7</sup> Kinaia et al also found somewhat superior papillary height maintenance (by 0.396 mm) in delayed placement compared to immediate cases, especially at the distal aspects of maxillary anterior teeth.<sup>7</sup>

In general, the aforementioned studies do not find statistical differences in mid-facial recession, pink esthetic score, marginal bone loss, or probing depth between immediate and delayed protocols. The authors, however, stressed that high heterogeneity and limited number of trials that met inclusion criteria may give imprecise results regarding cosmetics and health. Mid-facial recession of 0.5 mm to 1 mm may be expected after immediate placement.<sup>1,7</sup> Cosyn et al indicated that soft-tissue grafting regardless of implant placement timing may be necessary to accomplish ideal esthetics.<sup>2</sup>

Empirically, my practice has had much success with immediate implantation in the anterior zone largely because of strict case selection. We attain long-term integration, health, and natural gingival and dental silhouettes by choosing patients who have immaculate plaque control, no apical infection around the tooth in question (immediate placement into infected sites may have a failure rate three times higher than non-infected areas<sup>8</sup>), a thick biotype, and an intact, substantial ( $\geq 2$  mm wide) labial plate (type 1 socket).<sup>9</sup>

Bone regeneration and soft-tissue augmentation, of course, may be carried out at the immediate implantation step, but the predictability of these procedures may hinge on the morphology of the deficiency and, frankly, the surgeon's level of expertise. My philosophy is to have or surgically create at least 2 mm of bone circumferentially

around dental implants to enhance predictable integration and soft-tissue contours.<sup>10</sup> Tissue may be regenerated either at the time of immediate implant placement, at the time of extraction without implant placement (socket preservation), after extraction but before implant placement (site development), at the time of implant placement in a healed site, or after implant placement.

While immediate implant placement can be effective, the technique reduces the clinician's ability to perform future bone grafting conveniently; patients may not expect the need for supplementary surgery post-immediate placement, at least when one-stage or immediate temporization is chosen. With socket preservation or later site development, mature and well-vascularized bone can be built prior to implant placement. The clinician is then able to graft the ridge at the time of implant placement as needed. Thus, a second opportunity exists to ameliorate the alveolar ridge volume.

A two-stage approach (ie, primary coverage of the implant post-placement) permits soft-tissue augmentation at the fixture-uncovering appointment. Flap design, free connective tissue grafting, and guided gingival growth may facilitate mucosal development.<sup>11</sup> Bone regeneration, too, may be repeated during this phase.

In our practice we tend to delay implant placement in the esthetic zone unless a type 1 socket (intact buccal plate with no soft-tissue recession) and thick biotype exist.<sup>9</sup> If a labial plate defect is present with or without soft-tissue recession (type 2 and type 3 sockets), then we graft the extraction site (socket preservation) and follow a conventional and possibly two-stage approach, which offers multiple potential opportunities for tissue augmentation.<sup>9</sup> To ensure optimal results, the clinician should prepare to the utmost and have more than one strategy.



### **Dr. Levine**

My philosophy on the topic of immediate implant placement is simple, reproducible, and evidence-based. To achieve success, treatment specifically in the esthetic zone requires careful patient selection and treatment planning, along with precise execution by skillful clinicians. The decision to place immediately in our practice's type 1 placement protocol starts with thorough planning with a prosthetically guided endpoint. In a periodontally healthy, nonsmoking patient in whom immediate (type 1) placement is planned, a site-specific CBCT is necessary to evaluate the presence/absence of both the buccal and palatal plates, their thickness, apical room available beyond the tooth, apical disease, and anatomy. These are all important aspects to analyze before surgery.

I routinely use a checklist from an article I co-authored in 2017, "10 Keys for Successful Esthetic-Zone Single Immediate Implants."<sup>12</sup> Using these key principles keeps us on track and helps avoid trouble regarding future soft- and hard-tissue complications. The 10 keys include two diagnostic, five surgical, and three prosthetic principles when working in the esthetic zone, where there is a high complication rate of 30% to 50% based on up to 5-year published studies.<sup>2,13</sup> Evaluation of the patient using an esthetic risk assessment (ERA)<sup>14</sup> prior to treatment aids in communicating with the whole clinical team and understanding the esthetic risk based on 12 clinical factors, each of which is scored as low, medium, or high. These factors include the patient's smile line, tissue biotype, and expectations and whether they are realistic or not.

A final ERA is then noted and reviewed with the patient and team. A minimally invasive, flapless if possible, approach is taken with the primary goal of protecting the thin buccal plate (<1 mm in approximately 90% of cases). After extraction of the anterior tooth, the presence or lack of both the buccal and palatal plates is evaluated with a periodontal probe in relation to the gingival margins. The procedure should proceed only if both plates are intact.

Accurate 3D implant placement is aided with an anatomically correct surgical guide template with placement along the palatal wall so that the provisional and final restorations are in a screw-retained position. If there is loss of the buccal or palatal wall the decision needs to be made to abort the procedure in favor of either placement of a hard- and/or soft-tissue graft for type 3 implant placement in 3 to 4 months or delaying implant placement with contour grafting in a type 2 placement protocol in 6 to 8 weeks to allow for soft-tissue healing. The decision to place or abort is based on many factors, including lip-line esthetics and whether the patient is willing to accept potential gingival asymmetry post-surgery. Bone grafting the buccal gap (ideal gap size is >2 mm) with soft-tissue grafting for "biotype conversion" is also part of the protocol.<sup>15</sup> Clinical experience and communication with the patient are important factors in this decision process in the esthetic zone.

Following the "10 keys"<sup>12,15</sup> can keep clinicians on track in this endeavor. The esthetic zone is a complex area to treat in both the surgical and prosthetic phases and requires meticulous execution.



### Dr. Kim

In today's society, patients often demand immediate satisfaction. When a tooth is lost, whether a molar or central incisor, patients usually want not just the best possible treatment but they also want it in the shortest amount of time. Implant dentistry has evolved considerably over the past 20 years compared to the traditional Brånemark protocol of extracting a tooth and allowing the site to heal for 4 to 6 months. Today, concepts such as same-day surgery, teeth in a day, and even completion of implant and final restoration in a few weeks are popular.

Immediate implant placement reduces treatment times, thereby reducing the number of surgical procedures and surgical trauma to the hard and soft tissues. On the downside, bone resorption, unpredictable soft-tissue recession, and possible esthetic complications in the esthetic zone may result.<sup>16</sup> The most challenging case in dentistry may well be restoration of a single anterior tooth in the esthetic zone.

With the development of new techniques and novel instrumentation, placing implants immediately into extraction sites is now more predictable than in the past. It can be done safely and successfully in both anterior and posterior cases. The underlying factor in immediate placement is primary stability. Atraumatic surgical protocols indicate sectioning of teeth to remove roots individually. This helps maintain and protect the facial plate of bone, which is especially important in the anterior esthetic zone. For posterior cases, the remaining interseptal bone is critical for primary stability of the implant provided it is in its correct prosthetic position. Piezoelectric technology, periostomes, and ultrasonics are but a few instruments that may be used to facilitate extractions.

Correct prosthetic position means taking a "crown-down" approach to treatment planning for proper implant placement. Knowing what the final restoration will be will dictate if, when, and how a tooth can be immediately replaced with an implant. If primary stability cannot be achieved, then extraction and socket preservation will be performed. The use of osseodensification drills has dramatically improved primary stability for molars by engaging and expanding the interseptal bone. Implants can then be placed immediately, and also platelet-rich fibrin technology and autologous biologics can be incorporated with bone grafting to fill voids and gaps within the socket.

In the anterior esthetic zone a different approach is needed with regard to whether implants may be immediately placed. These cases will be dictated by evaluation of a series of esthetic risk factors, such as smile line, gingival phenotype, facial bone phenotype, bone levels on adjacent teeth, and type of provisional, plus patient expectations. For anterior implant cases my goal is to restore the implant with a screw-retained restoration, making placement of the implant critical. To achieve primary stability and ensure a screw-retained restoration, engagement of the palatal wall for a palatal placement is indicated. Studies show that the average buccal bone thickness is less than 1 mm, and suggest that at least 2 mm of bone be on the facial aspect of the implant.<sup>10,17</sup> This means use of an implant no wider than 4 mm in diameter would be favorable for long-term stability.

Soft-tissue profile is another key variable for long-term stability. A thicker phenotype will minimize soft-tissue recession, thereby enhancing long-term esthetic success. Immediate provisionalization for anterior esthetic cases, if possible, will help maintain the soft-tissue profile for the final restoration. A back-up provisional must always be on hand for anterior esthetic cases if immediate placement cannot be achieved. Only when these specific guidelines are met will we place immediate implants. For anterior cases, if one of these criteria cannot be met, then the procedure will be staged to facilitate predictability. All factors, including smile analysis, soft-tissue profile, and hard-tissue profile, must be evaluated and planned to achieve long-term success in the anterior esthetic zone, the most challenging area for implant dentistry. If protocols are adhered to, great satisfaction for both the patient and clinician can result.

## References

1. Chen ST, Buser D. Esthetic outcomes following immediate and early implant placement in the anterior maxilla—a systematic review. *Int J Oral Maxillofac Implants.* 2014;29(suppl):186-215.
2. Cosyn J, De Lat L, Seyssens L, et al. The effectiveness of immediate implant placement for single tooth replacement compared to delayed implant placement: a systematic review and meta-analysis. *J Clin Periodontol.* 2019;46(suppl 21):224-241.
3. Canellas JVDS, Medeiros PJD, Figueredo CMDS, et al. Which is the best choice after tooth extraction, immediate implant placement or delayed placement with alveolar ridge preservation? A systematic review and meta-analysis. *J Craniomaxillofac Surg.* 2019;47(11):1793-1802.
4. Mello CC, Lemos CAA, Verri FR, et al. Immediate implant placement into fresh extraction sockets versus delayed implants into healed sockets: a systematic review and meta-analysis. *Int J Oral Maxillofac Surg.* 2017;46(9):1162-1177.
5. Bassir SH, El Kholy K, Chen CY, et al. Outcome of early dental implant placement versus other dental implant placement protocols: a systematic review and meta-analysis. *J Periodontol.* 2019;90(5):493-506.
6. Zhou X, Yang J, Wu L, et al. Evaluation of the effect of implants placed in preserved sockets versus fresh sockets on tissue preservation and esthetics: a meta-analysis and systematic review. *J Evid Based Dent Pract.* 2019;19(4):101336.
7. Kinaiya BM, Ambrosio F, Lamble M, et al. Soft tissue changes around immediately placed implants: a systematic review and meta-analyses with at least 12 months of follow-up after functional loading. *J Periodontol.* 2017;88(9):876-886.
8. de Oliveira-Neto OB, Lemos CA, Barbosa FT, et al. Immediate dental implants placed into infected sites present a higher risk of failure than immediate dental implants placed into non-infected sites: systematic review and meta-analysis. *Med Oral Patol Oral Cir Bucal.* 2019;24(4):e518-e528.
9. Elian N, Cho SC, Froum S, et al. A simplified socket classification and repair technique. *Pract Proced Aesthet Dent.* 2007;19(2):99-104.
10. Spray JR, Black CG, Morris HF, Ochi S. The influence of bone thickness on facial marginal bone response: stage 1 placement through stage 2 uncovering. *Ann Periodontol.* 2000;5(1):119-128.
11. Sonick M, Hwang D. Guided gingival growth: improving aesthetics during second-stage surgery. *Dent Today.* 2016;35(1):108,110-111.
12. Levine RA, Ganeles J, Gonzaga L. 10 keys for successful esthetic-zone single immediate implants. *Compend Contin Educ Dent.* 2017;38(4):248-260.
13. Cosyn J, Eghbali A, Hermans A, et al. A 5-year prospective study on single immediate implants in the aesthetic zone. *J Clin Periodontol.* 2016;43(8):702-709.
14. Chappuis V, Martin W. *ITI Treatment Guide. Implant Therapy in the Esthetic Zone: Current Treatment Modalities and Materials for Single-tooth Replacements.* Vol 10. Berlin, Germany: Quintessence Publishing; 2017.
15. Levine RA, Ganeles J, Kan J, Fava PL. 10 keys for successful esthetic-zone single implants: importance of biotype conversion for lasting success. *Compend Contin Educ Dent.* 2018;39(8):522-529.
16. Kan JY, Rungcharassaeng K, Lozada J. Immediate placement and provisionalization of maxillary anterior single implants: 1-year prospective study. *Int J Oral Maxillofac Implants.* 2003;18(1):31-39.
17. Huynh-Ba G, Pjetursson BE, Sanz M, et al. Analysis of the socket bone wall dimensions in the upper maxilla in relation to immediate implant placement. *Clin Oral Implants Res.* 2010;21(1):37-42.