

Incorporating Mini-Implants Within the General Dental Practice

Raymond Choi, DDS*

Dental implants represent a key business opportunity for today's practitioner. Demographically speaking, the number of candidates for implant dentistry continues to increase, and clinicians have in these patients a vast resource for practice expansion. Small-diameter implant therapy is thus a valuable service offering for clinicians challenged to remain abreast of current techniques and technologies. The following presentation highlights the associated demographics, clinical considerations and procedures, and practice marketing benefits of IMTEC's MDI to the contemporary practice.

Many general practitioners seek to add service offerings for their patients in an attempt to increase production and profitability. It is the author's experience that the addition of small-diameter implant dentistry significantly enhances patient satisfaction as well as practice profitability, aligning with demographic trends observed throughout the industry. For instance, the segment of the population over the age of 65 is projected to increase to more than 20% of the population within the next 50 years.¹ Life expectancy grew from 65 in 1965 to 85 in 2001.² A healthy 65-year-old female has a 50% chance to live to 88 years and 25% chance to live to 97 years of age.³

It is similarly important to consider the incidences of complete and partial edentulism in the aging population. Approximately 26% of the population aged 65 years and 44% of seniors over the age of 75 are completely

edentulous in both arches.⁴ Partially edentulous seniors older than 65 years of age have lost an average of 17.9 teeth.⁵ When one considers that the median net worth of retirees is three times that of working families 35 to 45 years of age, and almost 20% of today's retirees have a net worth of more than one quarter of a million dollars,⁶ the need and the expected demand for various implant procedures to treat this aging population is enormous.

The availability of ample information about dental implants on the Internet as well as other consumer media has educated the general public on their inherent benefits. Therefore, it is becoming easier for dentists to discuss and recommend implant treatment to their patients on a daily basis. The efficacy of dental implant treatment has been proven and well-accepted by the profession for decades,^{7,9} and should be considered an important part of managing the care of a patient with an edentulous mandible or a missing single tooth.¹⁰ Due to increased public awareness and a gradually increasing acceptance by both the public and dental professionals, the demand for dental implant modality will continue to accelerate at a more rapid rate in the future.

Conventional implant placement requires adequate bone width and interdental space. Extensive bone

*Clinical Director, Sendax Mini Dental Implant Mini-Residency, California; private practice, Tustin, California.

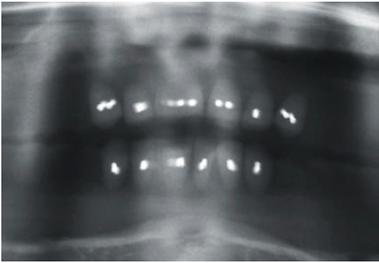


Figure 1. Case 1. Radiograph of female patient who desired to improve the function and stability of her maxillary and mandibular complete dentures.



Figure 2. Edentulous mandible prior to placement of five 1.8 mm x 10 mm IMTEC O-Ball MDI Implants in a flapless surgical procedure.



Figure 3. The five IMTEC O-Ball MDI Implants would immediately support the patient's converted prosthesis.



Figure 4. View of the patient's prosthesis as prepared for insertion on the MDI Implants.



Figure 5. Postoperative radiograph demonstrating successful placement of the MDI Implants according to the IMTEC protocol.

augmentation procedures, which may involve a separate surgical donor site, may be necessary to achieve adequate bone volume. These augmentation procedures can lengthen treatment duration, cause postoperative edema and pain, trigger possible nerve injury, and incur additional expense. Many patients who desire implant treatment present to dental offices with less than ideal situations. Narrow-diameter implants can be utilized in many such cases to overcome anatomical and other limitations (Figures 1 through 5). The efficacy of MDI Implants has been documented in the literature. Balkin et al have found that the bone around immediately loaded MDI Implants appeared histologically to be integrated to the surface of the implant at the light microscope level.¹¹ Simon et al^{12,13} have shown that Dentatus MTI Implants do integrate despite immediate loading in their study involving removal torque. Simon et al also found that the percentage of bone-to-implant contact of Dentatus' MTI was comparable to that of conventional implants and thus suggested the use of small-diameter implants in more definitive treatments over the long term. Bulard and Vance reported 8.83% average failure rates and suggested that small-diameter implants can be effective devices for use in long-term denture stabilization.¹⁴ Shatkin et al reported an overall implant survival rate of 94.2% in a five-year study following 2,514 IMTEC MDIs under fixed (N=1278) and removable (N=1236) prosthesis.¹⁵ Due to the narrow diameter and simplified insertion protocol for the Sendax implant, which allows dentists to place MDI Implants without raising a flap and periosteum as well as immediate loading, MDI Implants can be used in numerous situations where conventional implants are not suitable. Indications for MDI Implant therapy include but are not limited to the following:

- 1) Patients with inadequate bone width;
- 2) Older or medically compromised patients (flapless insertion of an MDI Implant preserves continuous blood flow to the area);
- 3) Financially challenged patients who cannot afford conventional implant treatment;
- 4) Patients who are unwilling to undergo extensive bone augmentation;
- 5) Patients who are unwilling to wait the several months of healing frequently associated with conventional implant treatment;
- 6) Congenitally missing maxillary lateral incisors with inadequate bone width for conventional implants; and
- 7) Patients missing narrow-diameter teeth such as maxillary and mandibular lateral incisors.

It is advisable for the clinician, when communicating with patients, to focus not on the technical aspects but on the appropriate benefits (eg, quality of life, comfort, function, social acceptance, preservation of natural tooth structures) they will receive as result of the treatment. More specifically, advantages associated with narrow-diameter implant treatment include: 1) minimally invasive surgical insertion; 2) greater postoperative comfort; 3) decreased morbidity,

4) the immediate use of a prosthesis without an extended healing period; and 5) affordable cost compared to that of conventional implant treatment. It is the responsibility of the clinician to convince patients to accept the treatment they need and want by effectively communicating the benefits of a particular treatment.

Clinical Utilization

The first step in implementing small-diameter implant treatment is receiving proper training. IMTEC Corporation offers different types of programs that equip dentists who have no previous surgical training to become competent and effective in delivering various treatments using the MDI System. After receiving proper training, the dentist would look to select an ideal patient from the existing patient base according to the list of MDI Implant indications cited previously. The following is a guideline of steps a dentist can follow in properly planning an MDI Implant case.

- 1) Identify the patient's desires and how MDI Implants can fulfill them
- 2) Obtain diagnostic casts and proper radiographs to evaluate and plan the surgical and restorative phases of treatment
- 3) Evaluate the patient's existing prosthesis to determine whether or not it can be used for retrofitting over MDI Implants
- 4) Review the patient's medical history and obtain medical clearance from his or her physician if necessary
- 5) Obtain informed consent—verbal and written—and its proper documentation
- 6) Prescribe proper antibiotics and analgesics before the surgery
- 7) Answer any and all the questions the patient may have
- 8) Secure proper financial arrangement and collection of involved fees

All the aforementioned can be accomplished in a presurgical appointment. If this is one's first case, the author suggests that the dentist select a time where there will be no other procedures scheduled so that he or she can focus entirely on the MDI Implant procedure without any distraction and/or time constraints. The following case presentation illustrates IMTEC MDI surgical and restorative techniques the dentist will commonly encounter in the private practice setting.

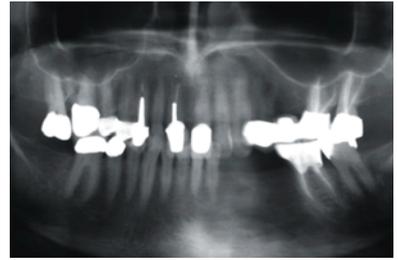


Figure 6. Case 2. Preoperative radiograph of patient, who desired a conservative treatment for missing teeth #27 through #29.



Figure 7. Preoperative clinical view of the missing mandibular teeth.

Case Presentation

A female patient presented with missing teeth #27 through #29 (Figures 6 and 7); she was unable to get accustomed to a removable mandibular partial denture, which she suspected of damaging the anchor teeth. The patient requested MDI Implant treatment after two consultations with oral surgeons, both of whom proposed a treatment plan inclusive of ramus block bone grafting and placement of two conventional-diameter implants and a three-unit cantilever fixed partial denture (FPD). After proper discussion of various treatment options, the patient accepted a treatment plan consisting of no ramus block grafting, placement of three MDI Implants, and a three-unit FPD.

Previously discussed diagnostic steps were taken, including a diagnostic waxup and fabrication of a surgical guide (Figure 8), which would function as a stent for the provisional restoration. The length of the implants was determined based on CT scans provided by the patient. After only a local infiltration of the area using anesthetic containing vasoconstrictor, three 2.4 mm x 13 mm IMTEC MDIs (IMTEC Corp, Ardmore, OK) were placed according to the IMTEC MDI insertion protocol (Figures 9 through 11). A provisional restoration was then fabricated with acrylic resin using the previously prepared stent and temporarily cemented (Figures 12 through 15). The definitive three-unit FPD was cemented four months after implant placement, and the patient was appointed for recall at four months. The patient reported minimal postoperative discomfort and extreme satisfaction with the MDI Implant procedure and her decision to proceed with this modality instead of the more invasive ramus block grafting. She especially enjoyed not having to wear the bulky removable partial denture, which had placed excessive pressure on the anchor teeth and interfered with her speech.



Figure 8. A diagnostic waxup would guide the clinician in implant placement and the intended result.



Figure 13. The surgical guide functioned as a stent that permitted provisionalization to be conducted with ease.



Figure 9. Placement of the IMTEC MDI Implants (IMTEC Corp, Ardmore, OK) following anesthetization of the patient.



Figure 14. View of the three-unit provisional restoration seated in place at the day of surgery.



Figure 10. Note the flapless surgical protocol used in conjunction with this MDI Implant treatment.

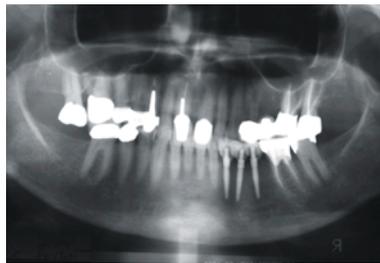


Figure 15. Postoperative radiograph demonstrates successful placement of the implant-supported provisional restoration.



Figure 11. Placement of the final MDI Implant; note the position of the implants as facilitated by the surgical template.

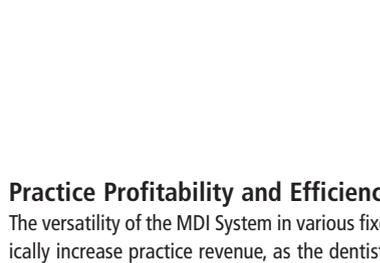


Figure 12. Plastic impression caps were placed on the top of MDI Implants to permit final impressions.

Practice Profitability and Efficiency

The versatility of the MDI System in various fixed and removable cases can dramatically increase practice revenue, as the dentist is now able to perform procedures that would have been unfeasible any other way. The placement of small-diameter implants according to the IMTEC protocol is extremely time-efficient; much of the prosthodontic phase can be delegated to trained auxiliaries to save the clinician's chairtime. The MDI Implant procedure is one of the most productive modalities per hour and thus highly profitable.

In addition, the initial investment to acquire proper equipment and instruments as well as training is minimal compared to that of conventional implants. An MDI Implant is a one-piece implant that does not require a separate abutment, which greatly simplifies the restorative phase—bypassing more complex laboratory procedures that are necessary in conventional implant treatment. This restorative simplicity, coupled with rapid, minimally invasive placement of MDI Implants, results in considerably lower overall cost to patients and therefore a higher case acceptance rate.

Dentists incorporating MDI Implants into the practice can involve the whole office staff by educating them on the benefits of MDI Implant therapy. The team is thus trained and encouraged to identify and communicate with patients who may benefit from such treatment. In any general dental practice, there are already many potential MDI Implant candidates in their existing patient base. Any patient who has had new complete and partial dentures, relines, and repairs can be contacted by professional correspondences offering MDI Implant procedures and their benefits and inviting him or her to the office for complimentary consultation. Consumer marketing of MDI Implant services (which is supported by IMTEC) is also feasible for practice differentiation and growth. Inevitably, the number of internal new patient referrals will significantly increase as the number of satisfied MDI Implant patients increases, resulting in practice building and viability.

Conclusion

Narrow-diameter, "mini", dental implants, when used properly, can be an extremely versatile adjunct to any general practice and introduces new possibilities to the treatment planning process. They can often help the clinician to meet the needs and desires of patients who would normally not benefit from conventional implant treatments. Additionally, the professional satisfaction a dentist experiences from providing services greatly appreciated by patients can rejuvenate his or her passion for dentistry. Providing services that are desired, appreciated, and readily accepted by patients—as well as remarkable practice profitability and growth—truly makes MDI Implant dentistry a modality every general dentist should incorporate into daily practice.

References

1. Murdock SH, Hoque MN. Current patterns and future trends in the population of United States: Implications for dentists and the dental profession in the twenty-first century. *J Am Coll Dent* 1998;65(4):29-35.
2. Hellmich N. Extra weight shaves years off lives. *USA Today*. Jan 7, 2003:A.01.
3. Dychtwald K. Age wave: The challenges and opportunities of an aging America. New York, NY: St. Martin's Press, 1988.
4. A profile of older Americans, Washington DC, 1993, American Association of Retired Persons.
5. Bloom B, Gift HC, Jack SS. Dental services and oral Health: United States, 1989. Washington, DC: National Center for Health Statistics. *Vital Health Stat* 1992;10(183).
6. Aschenbrener CA. The future is in the present: The impact of generations. *J Am Coll Dent* 1998;65(4):23-28.
7. Adell R, Lekholm U, Rockler B, Brånemark PI. A 15-year study of osseointegrated implants in the treatment of the edentulous jaw. *Int J Oral Surg* 1981;10(6):387-416.
8. Brånemark PI, Hansson BO, Adell R, et al. Osseointegrated implants in the treatment of the edentulous jaw: Experience from a 10-year period. *Scand J Plast Reconstr Surg Hand Surg* 1977;16:1-132.
9. Jemt T, Lekholm U, Adell R. Osseointegrated implants in the treatment of partially edentulous patients: A preliminary study on 876 consecutively placed fixtures. *Int J Oral Maxillofac Impl* 1989; 4(3):211-217.
10. ADA Council on Scientific Affairs. Dental endosseous implants: An update. *J Am Dent Assoc* 2004;135(1): 92-97.
11. Balkin BE, Steflik DE, Naval F. Mini-dental implants insertion with the auto advance technique for ongoing applications. *J Oral Impl* 2001;27(1):32-37.
12. Simon H, Caputo A. Removal torque of immediately loaded transitional endosseous implants in human subjects. *Int J Oral Maxillofac Impl* 2002;17(6):839-845.
13. Froum SJ, Simon H, Cho SC, et al. Histologic evaluation of bone-implant contact of immediately loaded transitional implants after 6 to 27 months. *Int J Oral Maxillofac Impl* 2005;20(1):54-60.
14. Bulard RA, Vance JB. Multi-clinic evaluation using mini-dental implants for long-term denture stabilization: A preliminary biometric evaluation. *Compend Cont Educ Dent* 2005;26(12):892-897.
15. Shatkin TE, Shatkin S, Oppenheimer BD, Oppenheimer AJ. Mini dental implants for long-term fixed and removable prosthesis: A retrospective analysis of 2514 implants placed over a five-year period. *Compend Cont Educ Dent* 2007;28(2):92-99.