

# Contemporary Esthetics

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AND  
RESTORATIVE  
PRACTICE®

## **Creating a Predictable and Esthetic Three-Unit Inlay Bridge Using Minimally Invasive Techniques**

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## **Altering the Concepts of Implantology for the 21<sup>st</sup> Century**

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## **Smile-Vision® Provides The Missing Link For Replacing Missing Teeth Conservatively With Nitrogen- and Heat-Processed Microhybrids**

Lorin Berland, DDS

# Altering the Concepts of Implantology for the 21<sup>st</sup> Century



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With the advent of Brånemark's screw-type submerged implants and their extensively documented treatment protocol, implant therapy has evolved into a sound therapy with more predictable results.<sup>1,2</sup> When osseointegration became a reality, a great number of diverse implant fixtures became available to satisfy the esthetic requirements, because neither dentists nor patients would tolerate the unsightly high pillars previously needed to support restorations. This new orientation demanded substantial changes in surgical placement techniques to restore the implant patient's teeth in a more esthetic manner.<sup>3-5</sup>

## PAST PROBLEMS Bone Foundation

The continuous advancements led to the realization that because fixtures could not always be placed where they needed to be from a physiological perspective, the bone foundation had to first be rebuilt to accommodate the planned restoration. This requirement led to further developments of surgical bone augmentation procedures using autogenous bone grafts and/or synthetic materials to create ridges of ideal volume, size, and position.

## Removable Restorations

The remaining deterrents and persistent difficulty evolved around our inability to maintain patients in a fixed dentate state rather than using removable restorations, which unavoidably created pressure and interfered with tissue remodeling and osseointegration. In the many instances where fixtures were incompletely integrated or shifted as a result of pressure, further surgical intervention significantly delayed initiation of the restorative process because: (1) it was difficult to manage the initial 4- to 6-month healing period, and (2) the additional round of procedures frequently extended the time to 1 year or more, which created difficulties in our practice and for the patient.

## Explaining Implantology Benefits

In our attempts to explain implantology benefits to patients, we also needed to describe the procedures requiring their consent. The prolonged

healing periods and the need to be without teeth created substantial concerns for patients and, in fact, created a deterrent, frequently causing patients to refuse the implant-supported treatment plans.

## THE MTI SYSTEM

At this time, it is appropriate to recognize the efforts and foresight of **Dentatus USA, Ltd.**, the company that developed the comprehensive **Modular Transitional Implant (MTI) and Prosthetic System**. This system allows us to treat patients humanely and to efficiently maintain them in a continuous dentate state from the first day of surgery and during the ensuing process, however lengthy it may need to be.<sup>6-9</sup>

We have used the MTI system in many of our procedures and in conjunction with all types of implant fixtures, and believe it makes economical sense to have the system readily available at all times. We use the system to support temporary fixed restorations and denture-type prostheses. MTIs are also useful for fixed unilateral and individual restorations. Plus, they are dependable anchors for bone grafts and sinus lifts and facilitate the immediate repair of failing key abutments, defusing emergency measures in our practice.<sup>10</sup>

Other advances, such as the elevation of the sinus level and the creation of natural emergence profiles, have substantially changed the landscape of implantology.<sup>11-13</sup> The MTI system serves to anchor bone grafts and synthetic materials, making it easier to rebuild ridges to the ideal position of function and esthetics. Defects of inadequate ridge position that would have compromised function and esthetics in the past are now routinely treated by experienced practitioners. On a practical matter, the formerly limited pool of patients that would have otherwise greatly benefited from implant supported restorations has been vastly expanded.

The use of transitional implants has become more common as implantologists and restorative specialists learn of their benefits and, through experience, learn their ease of use. The MTI system has likewise benefited from the substantial development and improvements for their easier and wider use.

New components of the MTI system make it easier to replace missing teeth at first-stage surgery and provide function throughout the length of the implant/restoration procedures. The modular components simplify chairside prefabrication of restorations. Transitional implants are most often placed at the time of anchor installation; however, they may be used initially to rebuild ridges, allowing them to mature. When placing the fixtures in the restored ridge, the MTI may need to be repositioned in the available space for the support of the restoration.

## CASE DESCRIPTION

A 52-year-old partially edentulous man (a former smoker) presented for implant reconstructive therapy (Figure 1). During the initial evaluation and planning, it was decided that teeth Nos. 21, 22, and 27 would be extracted and implant reconstruction of the fully edentulous arch would be implemented (Figure 2).

In the upper arch, crown lengthening would be performed on the remaining teeth, with tooth No. 3 requiring regenerative periodontal therapy. The maxillary left quadrant required a sinus-elevation procedure and four implants to be placed simultaneously. Transitional



**Figure 10**—The titanium bar was seated in the plastic modular copings' undersurface of the chairside-constructed temporary.



**Figure 11**—Postoperative panoramic radiograph showing the permanent implants in both arches with the transitional implants placed at sites between them. Note the transitional implants placed in the area of the sinus elevation.

with **GORE-TEX™** sutures (W.L. Gore & Associates) using a continuous sling and horizontal mattress technique with special attention to suturing the zone of keratinized tissue on both the buccal and lingual aspects of the transitional implants (Figure 9).

Using a clear vacuum stent prepared in advance from the corrected diagnostic models, an acrylic temporary shell was fabricated at chairside by filling the form with self-curing, tooth-colored resin. The shell was then attached over the MTI components (Figure 10). After the acrylic had set, the restoration was removed, finished smooth, and immediately cemented in place. All occlusal interferences and high points of occlusion were corrected.

A postoperative panoramic radiograph shows the placement of the permanent implants in both arches and exhibits the transitional implants and the titanium bar seated to support the transitional prosthesis (Figure 11).

**W**hen osseointegration became a reality, a great number of diverse implant fixtures became available to satisfy the esthetic requirements.

Two weeks postoperatively, the sutures were removed and an impression was taken using the MTI impression transfer copings (Figures 12 and 13). The brass analogs were placed into the impression transfer copings and firmly secured, providing a precise orientation of the MTIs in the model (Figure 14).



Figure 12—Clinical appearance 3 weeks postoperatively.



Figure 13—The placement of the impression transfer copings line up with the slot in the head of the transitional implants.



Figure 14—The brass analogs placed into the impression transfer copings were picked up in the full-arch impressions.



Figure 15—Occlusal view of the master cast with the brass analogs mimicking the correct orientation of the transitional implants in the oral cavity.



Figure 16—Mandibular full-arch lab-processed, acrylic custom-stained temporary.



Figure 17—Clinical view of the mandibular transitional implant-supported full-arch temporary.



Figure 18—Six-month pre-Stage 2 appearance. Note that one of the transitional implants was removed when the temporary bridge was removed with virtually no soft-tissue damage.



Figure 19—The placement of four temporary and three healing abutments allowed retrofitting of the processed acrylic temporary, which was used for 6 months.



Figure 20—Occlusal view of the precision-milled final substructure.

The laboratory constructed a master cast with a precise position of the transitional implants (Figure 15), which allowed the laboratory to fabricate a more elegant acrylic provisional restoration using the same MTI components and without the need for cast-metal frames (Figure 16). The lab-processed and chairside-custom-stained temporary was then cemented with a strong temporary cement (Figure 17).

### Stage 2 Surgery: Removal of Transitional Implants and Abutment Placement

After 6 months of maturation, Stage 2 surgery was performed to expose the osseointegrated fixtures. Transitional implants were then removed (Figure 18), and healing and temporary abutments placed. The transitional implants were removed in a counterclockwise rotation with slight apical pressure. The same

provisional restoration was hollowed out and placed over the temporary abutment cylinders, and healing abutments were placed on the other remaining implants (Figure 19).

The final prosthesis consisted of a precision-milled bar as a substructure, which was secured to the implants (Figure 20). The superstructure with porcelain teeth was secured to the substructure by three lingual set-screws (Figure 21). Excellent tissue maturation in the areas of the removed MTIs can be seen with the final prosthesis showing access for cleansability and long-term maintenance (Figure 22).

### Notes

Before the development of the transitional implant system, the patient in this case would have had three implant prosthetic options:

1. The patient could have worn a full denture, but only after refraining from its use during

the first 7 to 14 days after Stage 1 surgery. The full denture would have required relining with a soft reline material every 7 days for the first full month of wear, and then every 2 weeks for the remaining period.

2. The three remaining teeth could have been retained to support a partial denture; consequently, the implants would not have been placed in the most ideal positions.
3. Teeth Nos. 21, 22, and 27 could have been prepared for a fixed temporary bridge; likewise, this option would not have permitted the placement of implants in the preferred position.

### CONCLUSION

The MTI system permits the installation of implant fixtures in the preferred sites, maintaining a stable vertical dimension and reducing the number of patient visits during the heal-



Figure 1—Pretreatment clinical view in central occlusion.

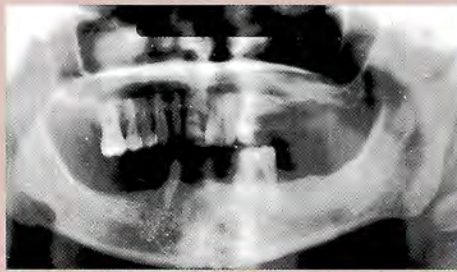


Figure 2—Preoperative clinical panoramic radiograph.



Figure 3—Completed MDM<sup>®</sup> mounted on the articulator.



Figure 4—Clinical appearance after teeth Nos. 21, 22, and 27 were extracted.

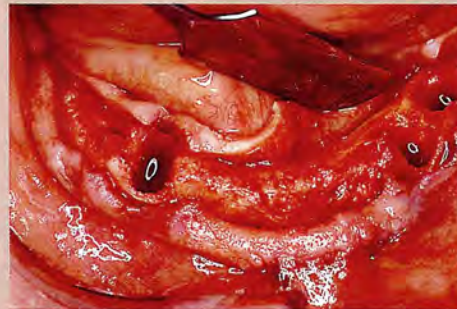


Figure 5—Crestal incision with full-thickness flaps elevated and degranulation of the extraction sites.



Figure 6—Clinical view of the seven implants.



Figure 7—Occlusal view of the seven implants with the cover screws seated.



Figure 8—Occlusal view of the six transitional implants between the submerged fixtures.



Figure 9—Closure with a combined continuous sling and horizontal mattress suturing technique.

implants would be employed in the maxillary left region of the sinus graft and throughout the mandibular arch to allow immediate provisional restoration while maintaining a constant vertical dimension.

Treatment planning included comprehensive medical and dental diagnosis consisting of a complete medical and dental history. A thorough periodontal evaluation, radiographic analysis with panoramic images, tomographs, and impressions of the upper and lower jaws with a face-bow transfer registration were obtained.

The Master Diagnostic Model<sup>®</sup> (MDM<sup>®</sup>) (Valley Dental Arts) technique was used to

create a complete diagnostic wax-up of hard and soft tissues to be replaced (Figure 3). This technique also permits the patient to accurately visualize the tooth form and esthetic considerations to be incorporated into the completed restoration. All necessary information and markings from the above were forwarded to the laboratory for the creation of an MDM<sup>®</sup> for office, technical, and patient educational purposes.

The MDM<sup>®</sup> allows pretreatment determination of the sites where implants will be placed and subsequently facilitates fabrication of the surgical stents and a transitional restoration.

### Stage 1 Surgery: Clinical Procedures

The procedure commenced with local anesthesia and an intramuscular injection of Versed<sup>®</sup> (midazolam), an antianxiety agent. The surgery was performed on the upper and lower arches at the same appointment. For the sake of brevity, the focus here is on the treatment of the mandibular arch only.

The surgery involved the extraction of teeth Nos. 21, 22, and 27 (Figure 4), and a crestal incision was made with full-thickness flap elevation. All extraction sites were then thoroughly debrided, and remnants of periodontal ligament fibers were removed (Figure 5). A slight

osteoplasty was performed to plane the crestal bone to facilitate implant placement in accordance with the treatment plan. Seven Osseotite<sup>™</sup> implants (3i Implant Innovations<sup>®,</sup> Inc.) (Figure 6) were placed in the mandibular arch, and cover screws were seated (Figure 7). Six MTIs were placed in the available sites between the implant fixtures (Figure 8).

Autogenous bone particles harvested from all osteotomy sites were placed in the extraction sockets and defects. Guided tissue regeneration using GORE-TEX<sup>™</sup> Augmentation Material (GTAM) (W.L. Gore & Associates) was placed in the areas of the extraction sites, and closure was made



Figure 21—Final lab-completed porcelain superstructure.



Figure 22—Final prosthesis secured by lingual set-screws allows for proper implant maintenance and cleansability with excellent soft-tissue maturation.

ing and maturation periods. The transitional implant-supported provisional restoration prevents pressure from being placed on the submerged implant fixtures and the adjacent tissue, thus enhancing their long-term success.

The securely fixed restorations offer greater opportunities to evaluate phonetics, function, and esthetics. Plus, they are great for obtaining the patient's consent before they are duplicated in the ultimate restoration, preventing difficulties that are, at times, impossible to correct.

Considering the present state of the art, we fully realize why many patients previously declined implant-supported treatment. Observing patients' favorable reactions to treatment plans that will provide them with immediate fixed teeth, the substantial opportunities for a wider patient base accepting implant-supported restorations become readily apparent. ■

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## Product References

- Product:** GORE-TEX™ Augmentation Material (GTAM)  
**Manufacturer:** W.L. Gore & Associates, dist. by 3i Implant Innovations®, Inc.  
**Address:** 4555 Riverside Drive Palm Beach Gardens, FL 33410  
**Phone:** 800.443.8166  
**Fax:** 561.776.1272
- Product:** Master Diagnostic Model® (MDM®)  
**Manufacturer:** Valley Dental Arts  
**Address:** 1745 Northwestern Avenue Stillwater, MN 55082  
**Phone:** 800.328.9157  
**Fax:** 651.439.9027
- Product:** Modular Transitional Implant (MTI) and Prosthetic System  
**Manufacturer:** Dentatus USA, Ltd.  
**Address:** 192 Lexington Avenue Suite 901 New York, NY 10016  
**Phone:** 800.323.3136  
**Fax:** 212.532.9026
- Product:** Osseotite™ Implants  
**Manufacturer:** 3i Implant Innovations®, Inc.  
**Address:** 4555 Riverside Drive Palm Beach Gardens, FL 33410  
**Phone:** 800.443.8166  
**Fax:** 561.776.1272

In their article, Drs. Petrunaro, Smilanich, and Adams detail the process for using transitional implants to “maintain patients in a fixed dental state rather than using removable restorations.” From a patient-service standpoint, this is a factor in facilitating case acceptance. Why? What do all consumers ultimately want? Results NOW! Immediate gratification of their wants, needs, and desires! Who wants to order a new car and wait 6 months to drive it when they were required to pay for it up front? Answer: only the *seriously* motivated person (patient)—the exception.

### CASE ACCEPTANCE: DECIDING FACTORS

The challenge for implant dentistry is to make the entire process more attractive for patients. The more immediate gratification accomplished with implants will expand the patient population attracted to replacing their missing teeth.

Any time a patient makes a decision to invest significant time, money, and discomfort, there are two factors controlling their decision:

1. Pain
2. Pleasure

It is generally accepted that people will do more to avoid pain than they will to gain pleasure. Let's take a look at the pain factor, because there are three sides to this story.

1. The pain of the patient's current condition—the quality of their dental health.
2. The loss of teeth—feeling less than whole and prematurely old.
3. The prospect of wearing a removable appliance with the attending inconvenience, discomfort, and embarrassment.

The pain factors motivate them away from dentures and toward implants.

### Implant Pain Factors

1. The discomfort of surgery.
2. The lengthy healing period in a temporary appliance, which is an esthetic and lifestyle compromise from their point of view.
3. A significant financial investment.
4. The long wait before they're “finally done” and have their teeth and all the freedom and peace of mind that goes with solid, strong teeth.

To date, far too many patients have avoided implant reconstruction because the implant pain factors outweighed those of their current condition or the prospect of wearing removable appliances.

Clients tell me the major reason patients say no to implants is because of the money. However, after our consultation and implementation of payment plans, those who still say no do so because of the hassle. It's just too long and complicated a process for them to endure while their appearance (temporary appliance) is less than desirable. They would rather have a quality denture that is done quickly (in comparison to implants) and for less money.

So now our challenge is to increase the weight on the pleasure side of the scale with facts and with results the patient wants.

### Implant Pleasure Factors

1. With transitional implants, they get solid, strong teeth immediately so they feel whole, can eat what they choose, and enjoy peace of mind.
2. They get an attractive restoration immediately. This eliminates embarrassment and/or discomfort.
3. They have results NOW. Although the final result is in their future, they feel like the process is 90% done. Clinically, that's not accurate, but from the patient's point of view, it is. They “feel like a new per-

son.” And more importantly, their appearance and daily quality of life is improved NOW!

4. The long-term prognosis for tissue esthetics and maintenance is excellent. The patient is confident that this new level of dental health and esthetics can be maintained.

With the immediate gratification factor of solid, strong, and attractive teeth, a significant number of patients will now rationalize (logically justify) investing in themselves with dental implants. Why? Because in our culture, people want what they want, and they want it NOW! And, if dentists elect to overcome the financial pain associated with major cases (more patients will elect care), then convenient bank financing is the answer.

### BANK FINANCING—HOW AND WHY TO MAKE IT WORK

Major implant and/or dental cases are easily accepted by a patient with substantial financial reserves. However, that leaves out 80% to 90% of the American public. If one doubts this fact, look in the local classified ads for automobiles. A large portion of the print space is devoted to “low down payment” figures and \$200/month to \$500/month payments. (Know anyone who paid cash for their last auto purchase with no financing?)

Fact: 38% of all cars purchased in 1997 were leased. Why? People will buy what they want if they can work it into their monthly budget.

Fact: More people will buy what they want if it costs \$444.89 per month for 5 years (\$20,000 borrowed at 12% interest) versus \$20,000 paid over 1 year.

### How to Get Your Bank to Work For You

Banks are in business to loan money. They are always soliciting new customers. So approach your banker and say something like this:

“Mr./Ms. Banker, my patients with good credit ratings want to invest in themselves with dentistry. Currently, with no long-term financing capabilities, my practice is leaving \$100,000 to \$250,000 per year in revenue on the table. I am going to find a lending institution that wants to make good loans to people with worthy credit. Do you want my referral business? If you do, I will refer only patients with good credit reports (because I've checked them out), and I want you to make a prompt decision on the loan and expedite the process, meaning the paperwork is completed in advance by you, so all my patient has to do is walk in, sign the note, and pick up the check. You will get a good, prescreened loan, and the opportunity to earn more of my patients' business.”

Does this work? Absolutely! I have clients doing it now. In fact, one bank in the East developed a campaign to promote within the city's dental community.



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*G.L. Johnson has 22 years serving the dental profession. In his 10 years as a “wet-fingered” in-office consultant and speaker, he focused on practice leadership, effective dentist/staff/patient communication, and team motivation. He has been a facilitator/coach for 55 Mini-Residency Comprehensive/Esthetic Treatment Planning Study Clubs in more than 26 states. He invests half his time personally doing “in-office” consulting and half his time doing motivational practice-growth seminars. His seminars deal with what it takes for a team to consistently gain acceptance for comprehensive/esthetic cases with no insurance coverage. He is based in the Seattle area and travels nationally.*

### Why Does This Work?

- ▶ You make it easy for patients to elect dentistry with low monthly payments instead of large chunks of cash.
- ▶ You control the process at the “window of opportunity” when patients are motivated. (After

they leave your office, the auto, travel, and luxury vacation advertisements will be vying for your patients’ attention.)

- ▶ The bank attracts quality new customers easily because you have done the screening.
- ▶ Patients win because they get

quality care that will serve them longer and better than, say, a new car. (What’s a \$20,000 car worth in 5 years?) You know your dentistry will be in service much longer than the new car.

- ▶ When you organize the financing, the bank will not ask you

to take a discount on your fee.

By organizing a smooth and simple process of financing major cases, any dentist can significantly increase major case acceptance. My clients routinely see their production and income increase \$10,000 to \$30,000 per month by handling the “money problem” in a businesslike fashion. Any dentist who elects to operate as a business that delivers dental services can make sound, fundamental business principles work for them and their patients.

### Additional Bonuses

1. The number of patients who can and will accept major treatment plans will increase by 300% to 600%. That’s at least tripling your market size.
2. From these major case patients, you will realize new patient referrals who desire similar treatment.
3. You will gain the reputation of a quality provider who uses payment plans to make dentistry affordable, just like your orthodontist colleagues. Financing dentistry enables patients to overcome the financial pain they normally associate with major dentistry. This fear is why more than 40% of our population does not visit any dental office on a regular basis.

### WHAT A CONCEPT!

Treatment plan quality dentistry, facilitate patients getting the care they want, and paying for it in a way that makes sense for them and you. What a concept! ■

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