

# Narrow-Body Implants Preserve Patients' Quality of Life

*Keith D. Rossein, DDS*

Most people who were chronically bleeding from any part of their body would not hesitate to consult a physician; this is not necessarily the case for bleeding gums. The same holds true for the loss of a body part. For the majority this would be an immediate concern and initiate thoughts on how to replace it. Many of these same people view the loss of teeth [body parts] as acceptable. “Despite popular belief, the loss of teeth cannot be considered part of the healthy aging process; however, since caries and periodontal disease are cumulative in essence, the number of edentulous people increases with age.” [Philippe Mojon [Chapter 1, *World Without Teeth: Demographic Trends*]<sup>1</sup>

The possibility of implant ther-

apy as an adjunct to replacing missing teeth had its roots in the early 1950s. In 1951 Levanthal observed that bone appeared to attach to titanium, and in 1952

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orthopedic surgeon Dr. Per-Ingvar Brånemark began a series of studies, unrelated to implants that became a major break-

through and the basis for modern implantology. By 1965 Brånemark had developed a surgical protocol that would potentiate a direct live bone/implant interface, which he called osseointegration. Based on his research, Brånemark designed cylindrical, screw-type titanium implants that required a two-stage surgical technique. These implants were installed into the bone during a first stage surgery, covered with healing caps, and then covered by the gingival tissue. In four to six months, after osseointegration had taken place, a second stage surgery was performed to uncover the implants and insert abutment posts that would hold the prosthetic restoration.<sup>2</sup>

While many implants were placed in the '60s and '70s, it wasn't

until the 1980s that techniques and biocompatible materials were refined enough to achieve a high rate of success. This led to the American Dental Association granting provisional acceptance to implant treatment in 1986. In the early 1990s, Bernard Weisman, president of Dentatus, who understood early why so many implant treatment plans did not get accepted, decided on a different approach. He developed the first narrow-bodied implant [1.8mm diameter], a one-piece, self-threading transitional implant that would be installed at the same time of stage-one implant surgery, but immediately loaded. This was an amazing breakthrough, since for the first time, patients undergoing edentulous implant treatment never had to be without teeth and, yet, the surgical site would remain completely protected.

Not only were these implants much smaller in diameter than what was traditional being utilized, but there were no holes or wedges into which the bone could grow. The major questions then became, how long would these narrow-bodied implants last? Would they actually osseointegrate?

A paper published in *The International Journal of Oral & Maxillofacial Implants* from research done by Dr. Stuart Froum et al., at New York University, on narrow-bodied transitional implants concluded that, "The percentage of BIC [bone to implant contact] achieved with TIS [transitional implants] was similar to that documented in the literature for conventional turned screw-shaped, machine-surfaced implants."

The NYU research indicated that the average percentage of bone to implant contact was  $52.9\% \pm 13.81\%$ .<sup>3</sup>

The answer to those questions

were substantiated in 2004 when the FDA approved the Dentatus narrow body implants for "long-term use and for any length of time as decided by the healthcare provider."

Narrow-body implants are not meant to replace traditional implants. However, it has been estimated that 25-30% of all patients who could use implant therapy never receive treatment because they have residual alveolar ridges that are too thin or have an insufficient amount of vertical or horizontal bone, are frail and/or elderly, have systemic problems mak-

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ing bone augmentation procedure rather risky. Often, these patients lack the ability to pay for more traditional treatment.

Narrow body implants are very patient friendly, and, as a rule, they eliminate the need for a two-stage surgery and the patient having to wait for their teeth. Other advantages of the narrow body implants are that flap surgery is usually unnecessary and sutures are not needed. For patients, narrow body implants are minimally invasive and are affordable to a large segment of the population.

For the purpose of this article I will focus on how these implants improve and maintain a patient's quality of life both during the implant treatment phase and

after insertion of the final prosthesis.

## EDENTULOUS PATIENTS

Let's look first at totally edentulous individuals. James P. Lund notes that about half of senior Canadians are edentulous which would classify 20% of older Canadians as disabled. [Introduction - It is time to tackle Denture Disability].<sup>1</sup>

In the United States, there are 39 million denture wearers. According to Gordon Christensen, 90% of all denture wearers are dissatisfied with their mandibular dentures because they are ill-fitting, unstable and prevent them from enjoying an acceptable quality of life.<sup>4</sup>

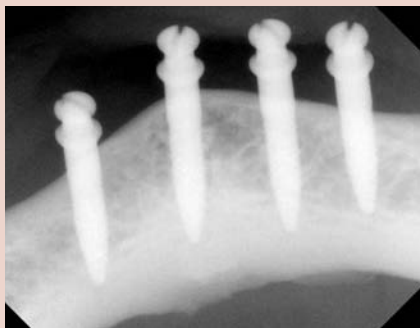
"With prolonged life expectancy, chronic illness is the major health care problem in Western society." Many denture wearers "Suffer substantially from chronic dysfunction, pain, low self-esteem and reduce quality of life." [Michael MacEntee, Chapter 3, *The Impact of Edentulism on Function and Quality of Life*].<sup>1</sup> James P. Lund emphasizes that the chapter authors in *Implant Overdentures* "provide plenty of evidence that mastication, speech, quality of life and even nutrition improve dramatically if two implants are placed in the anterior mandible to support and stabilize an overdenture."<sup>1</sup>

The Atlas® narrow body implant system [Dentatus USA — New York, NY; [www.dentatus.com](http://www.dentatus.com)] is utilized to stabilize, retain and cushion a patient's denture.<sup>5,6,7</sup> The entire procedure, including drilling the osteotomies, can be performed by most general practitioners and takes about an hour. There is very little downside to placing the Atlas implants by the restorative dentist as long as the four osteotomies and implants are positioned anterior to the

CASE 1



**FIGURE 1**—Patient created edge-to-edge bite, because he used his maxillary denture teeth to stabilize the mandibular denture.



**FIGURE 2**—Radiograph of four Atlas implants after installation [all anterior to the mental foramen].



**FIGURE 3**—Atlas implants placed clinically.



**FIGURE 4**—Note openings in the silicone reline that will grip the head of the Atlas implants for retention.



**FIGURE 5**—Bite is immediately changed and stabilized.

mental foramina.

Perhaps, the greatest benefit to this system is that no o-rings or copings are necessary. Often, it is difficult to retrofit a denture for a housing without drilling through the lingual denture flange or up into the teeth, because there is not enough vertical height in the acrylic. If the implants have parallelism discrepancies, the copings create undue pressure on the implants that can cause a failed case. The Atlas technique utilizes a one-piece silicone reline that grips the heads of the implants for retention and cushions the patient's ridge for comfort. Patients receiving Atlas implants can sleep with their dentures.

The implant option leads to preservation of tooth structure since abutment teeth do not have to be prepared.

**CASE 1**  
[Courtesy of Dr. Timothy Kosinski, Figs. 1-5]

A 69-year-old black male, who had worn conventional dentures for 42 years and who had undergone bilateral osteotomies of the mandible presented to the office.

Following the surgical procedure, the patient had great difficulty tolerating his conventional complete mandibular denture, and his quality of life dramatically suffered due to the instability of the appliance.

It was determined through oral and radiographic examination that the small diameter implants could be placed in the symphysis area without complication. Cost was a big factor in determining the type of implants to be placed since the patient just had his latest conventional, mandibular denture fabricated.

The patient was thrilled with the result and amazed that his denture had such good immediate

retention. The patient has reported comfort, stability and increased chewing ability. Dr. Kosinski noted that the patient was charged \$2,100 for the four implants and \$625 for the reline material, for a total of \$2,725. He explained that, typically, he would have placed two traditional dental implants in the symphysis [Straumann Corp., Boston, MA, www.straumann.com] and fabricated an implant retained overdenture with attachments such as the Locator Attachments [Zest Anchors, Escondido, CA, www.zestanchors.com] — at a cost of \$7,300 to the patient who would have had to wait several months for completion of stage two surgery before having his denture retrofitted.

**Single tooth replacement**

There has been much discussion comparing a three-unit bridge to a single implant-supported restoration. According to Dr. Carl Misch,<sup>8</sup> a single tooth implant has become acceptable as the standard of care. Within a 15-year period, a three-unit bridge has numerous problems that often lead to failure or, at best, a repaired prosthesis. These include Decay — 18%, Endodontic compli-

cations — 6-11%, Cement Failure — 7-11%, Porcelain Fracture — 7-10%, Periodontal Disease — 3%.<sup>9</sup>

There are other advantages of a single tooth implant-supported crown over a 3-unit bridge. The implant maintains the surround-

**What do you do when you need to replace a mandibular incisor?**

ing alveolar bone if properly loaded. Often there is bone resorption under the pontic of a bridge. The implant option leads to preservation of tooth structure since abutment teeth do not have to be prepared.

There are various instances where a traditional implant is too large for the available space. Congenitally missing maxillary

laterals are commonly seen in most dental practices. Even after orthodontic treatment, there is little horizontal space and often converging roots. What do you do when you need to replace a mandibular incisor? Patients would prefer fixed rather than removable restorations in these situations. Due to limited space and cosmetic expectations, obtaining good results are difficult to achieve with conventional diameter implants.

The narrow-body implant, Anew® [Dentatus USA — New York, NY; www.dentatus.com] has solved this problem.<sup>10,11</sup> It is the opinion of this author that, there is nothing better for replacing maxillary laterals or mandibular incisors. Anew implants are available in three diameters — 1.8 mm, 2.2mm and 2.4mm, as well as three lengths — 14.3mm, 17.3mm and 21.3mm.

Anew implants are simple, one-piece implants that can be immediately loaded. The implant threads are mechanically roughened, and they are pre-sterilized. Above the square collar of the abutment is an external threaded surface. An

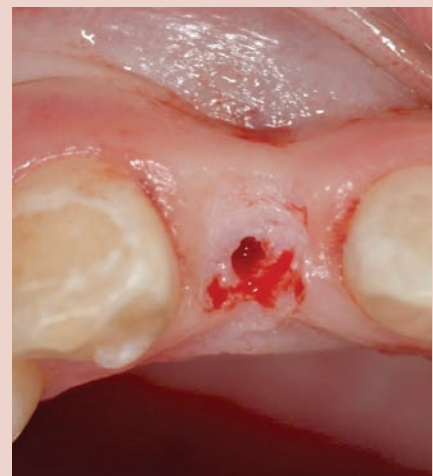
**CASE 2**



**FIGURE 6**—Preoperative view of maxillary right lateral space.



**FIGURE 7**—Preoperative periapical x-ray.



**FIGURE 8**—Osteotomy created with the Profile pilot drill.



CASE 2 (continued)



FIGURE 9—Anew implant inserted.



FIGURE 10—Index coping attached with the plastic screwcap.



FIGURE 11—Lingual of crown form relieved to make room for the screw.



FIGURE 12—Provisional restoration screwed into place.

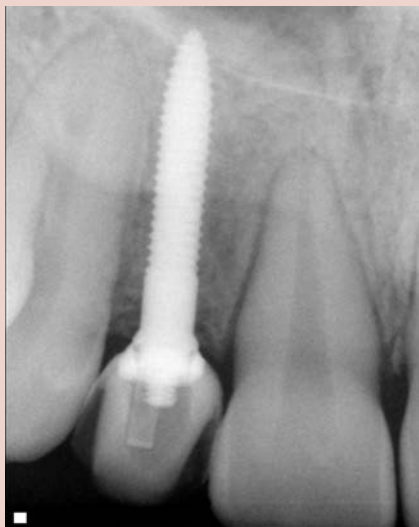


FIGURE 13—X-ray of provisional restoration attached to abutment head of Anew implant.



FIGURE 14—Impression coping placed over abutment.

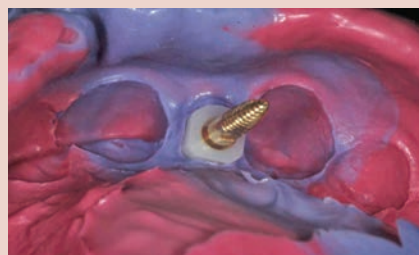


FIGURE 15—Analog placed into impression. Model will be poured from which the final ceramic restoration will be fabricated.

Index coping, which is incorporated into the restoration, fits over the collar and is attached to the abutment with a plastic screw.

**CASE 2**

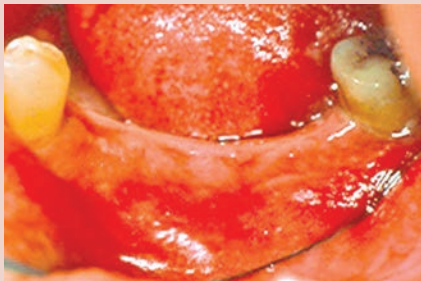
*[Courtesy of Dr. Paul S. Petrungaro, Figs. 6 -15]*

A 14-year-old girl with a congenitally missing right maxillary lateral after completion of her orthodontic treatment. The gingival space from the distal of the central to the mesial of the canine measured 4.7mm. The patient, along with her parents, would not accept any reduction of natural teeth or a resin bonded bridge. This procedure was accomplished with a flapless approach. A 2.4mm X 14mm Anew implant was installed.

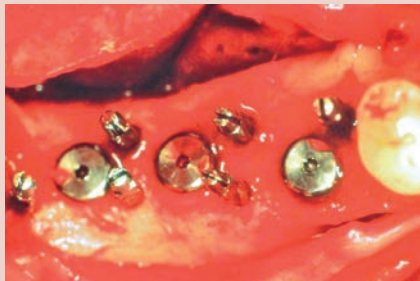
**Transitional restorations**

The original narrow-body implant system, Monorail® [Dentatus USA — New York, NY; www.dentatus.com] was developed as a second set of implants that would be placed and immediately loaded at the same time the definitive implants were installed and covered by the soft tissue until achieving osseointegration. Patients never had to be without

CASE 3



**FIGURE 16**—Preoperative clinical view of the mandibular left posterior region to be restored.



**FIGURE 17**—Three definitive implants and six transitional implants placed. The metal cross bar in the singular coping will fit into the slot of the head of the transitional implant to transfer the stress through the long axis of the implant.



**FIGURE 18**—Panoramic radiograph of all the implants and the singular copings.



**FIGURE 19**—Looking from the gingival view at the metal cross bars of the singular copings that have been retrofitted into the provisional restoration that will be cemented in place.



**FIGURE 20**—Provisional acrylic restoration. Note the excellent embrasures and how closely it resembles the final porcelain to metal restoration.



**FIGURE 21**—Patient is being instructed in oral hygiene techniques that will carry over and be replicated for the final restoration.



**FIGURE 22**—Final restoration screwed to implant abutments.

teeth. The transitional implants allow patients to resume their daily activities and lifestyles almost immediately after surgery with either their own denture

that had been retrofitted and stabilized or a fixed provisional restoration.<sup>12-16</sup>

Having a fixed provisional

that is made to resemble the final restoration as closely as possible provides the patient with additional benefits. Not only does it restore function and

esthetics, it allows the patient to have cosmetic input as to the size, shape and color of their teeth; they become accustomed to the “feel” of what their new teeth will be like; the transition to the final restoration is easy and almost seamless.

It is my observation that implant patients are the worst patients when it comes to oral hygiene. They proved that the first time around when they lost their teeth. It is common practice for a dentist to say to the patient after the final restoration has been placed, “Make an appointment with my hygienist, so she can show you how to practice home care.” Isn’t this a little late in the game to start the instruction and motivational process?

If the transitional restoration closely simulates the final prosthesis, patients can learn and practice proper home care from “day one,” so they can maintain the health of the peri-implant soft tissue, maximizing their chance of long-term success. Poor oral hygiene is already a habit. Therefore, it is critical that the patient understands the importance of home care and has enough time to learn and practice the proper techniques on a restoration very similar to the ultimate prostheses before it is inserted.

A small number of patients are unable to clean and maintain a fixed restoration - if such deficiency is recognized with the interim prosthesis, the treatment plan can be changed to a removable restoration before both the dentist and patient gets too far into the treatment.

**CASE 3**

*[Courtesy of Dr. Dennis Tarnow and Dr. Marion Brown; Figs. 16-22]*

The patient was a dental salesperson who told the treating doc-

tor that he was “on the road” often and that the treatment would probably take longer than usual so that he needed a long-term, functional provisional restoration. Three regular implants were installed and covered for an undisturbed healing period; six Monorail transitional implants were also placed with singular copings that were retrofitted to a provisional restoration. The transitional restoration was cemented to the Monorail implants after the surgical flap was sutured.

Having a fixed provisional that is made to resemble the final restoration as closely as possible provides the patient with additional benefits.

**CONCLUSION**

While narrow body implants are not meant to replace conventional implants, there is a great need for them in specific situations. In instances where narrow body implants are the treatment of choice or an adjunct to traditional treatment, the patient’s quality of life and their ability to maintain their normal lifestyle during the course of treatment is significantly enhanced. Narrow body implants, if considered as an alternative treatment plan, will provide implant therapy to a much larger segment of the population currently not benefiting from it.

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*Oral Health welcomes this original article.*

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