

Retaining and Stabilizing Dentures With Narrow-Bodied Implants



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With the average American living longer, having more disposable income, and seeking better healthcare, implants have become a realistic alternative for the partially or completely edentulous individual. Data from the 1988 to 1991 Oral Health Survey funded by the National Institute of Dental Research¹ indicates that approximately 10.5% (28 million) of all Americans were completely edentulous. Yet only a small percentage of patients who might benefit from implant therapy ever elect to do so. Instead, millions of people wear full dentures that are ill fitting, unstable, and pre-

Approach all your current patients who are wearing full dentures. Suggest to them that there is a relatively inexpensive and proven way to stabilize their dentures using small implants in a simple surgical procedure and utilizing a new type of relined material.

vent them from enjoying an acceptable quality of life. Even those individuals who have reasonably fitting dentures must face the accepted fact that, over time, bone resorbs from the pressure of the hard denture acrylic. To the distress of both doctor and patient, relines every few years become a way of life to keep dentures fitting accurately. Some even reach the point where so much bone resorbs that relining is no longer effective.

In 1951 Levanthal observed that bone appeared to attach to titanium, and in 1952 orthopedic surgeon Dr. Per-Ingvar Branemark began a series of studies, unrelated to implants, that became a major breakthrough and the basis for modern implantology. By 1965 Branemark had developed a surgical protocol that would potentiate a direct, live bone-implant interface, which he called osseointegration. Based on his research, Branemark designed cylindrical, screw-type titanium implants that required a 2-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 3 to 6 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.

While many implants were placed in the 1960s and 1970s, it wasn't until the 1980s that



Figure 1a. Although this mandibular ridge is quite narrow, there is more than enough solid bone for the narrow-bodied Atlas implant.

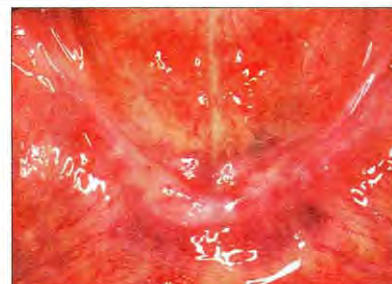


Figure 1b. Occlusal view of the locations of the 4 osteotomies.



Figure 1c. The Profile drill is being utilized to create an osteotomy without opening a flap.



Figure 1d. Occlusal view after insertion of 4 Atlas implants.



Figure 1e. Panorex of the 4 installed Atlas implants with the dome caps protruding above the soft tissue.



Figure 1f. The denture is stabilized and retained by the 4 Dome Keeper heads.

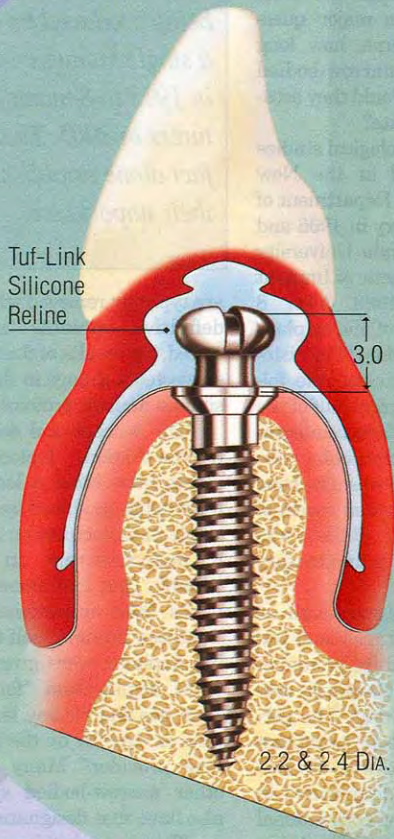
techniques and biocompatible materials were refined enough to achieve a high rate of success. This led to the American Dental Association granting provisional acceptance to implant treatment in 1986. In the early 1990s Bernard Weissman, president of Dentatus USA, decided on a different approach due to the fact that patients were not accepting many implant treat-

ment plans. He developed the transitional implant, which was a narrow-bodied (1.8 mm in diameter), 1-piece, self-threading implant that would be installed at the same time of stage-one implant surgery, but immediately loaded. For the first time, patients undergoing edentulous implant treatment never had to be without

continued on page 102

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Retaining and...

continued from page 104



Figures 2k and 2l. The 2-component Tuf-Link material should be expelled to a mixing pad and mixed by spatulating and folding the 2 components into each other with pressure for 40 to 60 seconds. Spread the mixed liner material over the entire denture base and against the encasement groove.

Figure 2m. The patient's denture is retained and stabilized by the silicone reline over the Atlas dome caps.

ent; by their perceived lack of training and skills; by their inexperience and failure to schedule appropriate time and set suitable fees in many instances; and by the great variety of implant systems from which to choose.

However, implant treatment can be extremely lucrative for the dentist and a great boon to the patient. So, I make this suggestion. Approach all your current patients who are wearing full dentures. They return every few years for a den-

ture reline. Suggest to them that there is a relatively inexpensive and proven way to stabilize their dentures using small implants in a simple surgical procedure and utilizing a new type of relining material. Explain that this process will also slow down the resorption of their bone. Emphasize that the outcome can dramatically and positively change their quality of life.

Set a goal to do one of these cases each month and watch your implant practice

start to take off and grow. If you are a restorative dentist and surgery is "still not your thing," send the patient to a periodontist or oral and maxillofacial surgeon to have the implants placed, and then you may perform the denture reline. Don't be surprised when some of these patients ask for and want implant-supported "fixed teeth" after they see and feel the results. Your confidence and motivation to present implant treatment will increase, and your success and your income

will increase as well. ♦

References

1. Marcus SE, Drury TF, Brown LJ, Zion GR. Tooth retention and tooth loss in the permanent dentition of adults: United States, 1988-1991. *J Dent Res.* 1996 Feb;75 Spec No:684-695.
2. Tarnow D, Froum S. A case report and histology of MTI modular transitional implant. *NYU School of Dentistry.* 1996 May; Abstract.
3. Bohsali K, Simon H, Kan JY, Redd M. Modular transitional implants to support the interim maxillary overdenture. *Compend Contin Educ Dent.* 1999;20:975-978,980,982-983.
4. 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 Implants. 2005;20:54-60.
5. Kim BS, Yoon YE, Matsunaga T, Cho SC, Eilan N, Froum S, Tarnow DP. *Clinical Application of Transitional Implants as Long-Term Support for Implant-Supported Overdentures.* Poster Presentation at: American College of Prosthodontics Meeting; Oct 9, 2005. Dallas, Texas.

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Disclosure: Dr. Rossein is a consultant for Dentatus.

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Retaining and...

continued from page 103

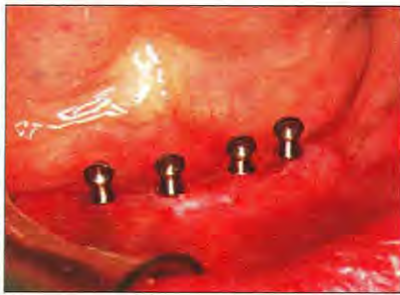


Figure 2f. The 4 dome caps of the installed Atlas implants protrude through the mucosa.



Figure 2g. The inside of the patient's denture has been marked to show the location of the 4 Atlas implants.



Figure 2h. The denture is hollowed out above the ridge to provide space for the Tuf-Link silicone relining material, to a depth that will ensure that the protruding dome caps of the Atlas implants don't interfere with the full seating of the denture.



Figure 2i. The Dentatus No. 4 encasement bur is used to create a beveled finishing line that will firmly lock the silicone liner in place.



Figure 2j. Gingival view showing the "hollowed out" denture base in which the mixed Tuf-Link silicone material will be placed and then seated in the mouth over the implants.

screwing them in. Figure 1e is a Panorex of the 4 installed Atlas implants with the dome caps protruding above the soft tissue. They have been placed into excellent bone and will retain, stabilize, and with the silicone reline, cushion the patient's mandibular denture.

In Figure 1f, the denture is stabilized and retained by the 4 Dome Keeper heads. The retromolar pads act as tissue stops, and the soft silicone reline material cushions the tissue ridge against the forces of mastication. Patients should be instructed to maintain a soft diet for 24 hours. Patients should also be advised not to remove the denture for 4 to 6 days so that the implants and denture can become adapted

without disturbance. After this period, patients can easily insert and remove their denture without distortion or tearing.

Figure 1g shows 4 Atlas implants 6 months post-insertion.

Case Report No. 2: Technique for Mandibular Placement and Restoration of 4 Atlas Narrow-Bodied Implants

For this patient who was edentulous in the mandibular arch (Figure 2a), a Profile drill is used to create the osteotomy at the marked locations (Figure 2b). In mandibular D-1 and D-2 hard bone, the osteotomy should be drilled to the full depth and then further enlarged with the corresponding reamer for safe, stress-free installation of the implants. In

the maxilla, with D-3 and D-4 porous bone, the osteotomy should be made with only one drill entry to half of the needed depth.

As seen in Figure 2c, an instrument is placed in the adjacent osteotomy as a guide to parallelism. Dentatus drills and reamers should be used at 800 to 1,000 rpm with a copious stream of biocompatible sterile water or saline solution to prevent overheating the surrounding bone.

In Figure 2d the Dentatus No. 2 spherical profiling instrument is being used to indent the mucosa at the opening of the osteotomy (approximately one-fourth mm), so that there is a smooth interface of the implant shoulder flush with the

tissue ridge. In Figure 2e the Atlas implant is being installed manually with the Coletted Driver (Dentatus) by turning it in a clockwise direction.

The 4 dome caps of the installed Atlas implants protrude through the mucosa (Figure 2f). The oversized abutment heads will aid in retention.

In Figure 2g the inside of the patient's denture has been marked to show the location of the 4 Atlas implants. The denture is hollowed out above the ridge to provide space for the Tuf-Link silicone reline material to a depth that will ensure that the protruding dome caps of the Atlas implants don't interfere with the full seating of the denture (Figure 2h). The Dentatus No. 4 encasement bur is used to create a beveled finishing line that will firmly lock the silicone liner in place (Figure 2i). Figure 2j is a gingival view showing the "hollowed out" denture base in which the mixed Tuf-Link silicone material will be placed, seated in the mouth over the implants, and held in position for 5 to 7 minutes.

The 2-component Tuf-Link material should be expelled to a mixing pad and mixed by spatulating and folding the 2 components into each other with pressure for 40 to 60 seconds. Spread the mixed liner material over the entire denture base and against the encasement groove (Figures 2k and 2l).

In Figure 2m the patient's denture is now retained and stabilized by the silicone reline over the Atlas dome caps. (The patient has some trouble smiling because of his numb lip.)

DISCUSSION

A major reason for failure with an immediate loaded implant is too much stress or movement. Because the Atlas implants are so narrow in comparison to definitive implants that are immediately loaded, they are almost always placed in good, hard bone, and thus become initially stabilized (the precursor to good osseointegration). And since the Atlas implants require no o-rings or copings, they don't have lateral forces applied that could prevent osseointegration through pressure and movement.

While stress is directed through the long axis of the Atlas implants, the soft silicone

Restorative dentists are lagging far behind in presenting implants to patients as an alternative form of treatment. As a group, restorative dentists appear to be intimidated when considering taking the plunge into implant dentistry. They find themselves outside their zone of comfort.

reline material cushions the bony ridge against the forces of mastication and prevents resorption of bone caused by the pressure of the hard denture acrylic. Studies have shown that bacteria thrive in many adhesives and cements, causing irritation and inflammation from their toxins.⁵ No adhesives are required to retain the Tuf-Link silicone in the denture, thus alleviating this potential problem. The reasonable cost of these implants allows the dentist to receive a fair fee for the procedure and affords a great opportunity to a majority of denture patients. Aesthetics and function will be restored immediately.

CONCLUSION

It is estimated that about 12 million full and partial dentures are made every year. Yet, only 400,000 implant patients are treated each year. Why is this number so relatively small, especially since the established protocols and biocompatible materials have made implants over 90% successful? The answer is simple. Implantology has been driven in the past by oral surgeons and periodontists. Restorative dentists are lagging far behind in presenting implants to patients as an alternative form of treatment. As a group, restorative dentists appear to be intimidated when considering taking the plunge into implant dentistry. They find themselves outside their zone of comfort. Restorative dentists are intimidated by the "large fees" they have to pres-

continued on page 106

3-mm-diameter implant "for direct insertion and direct use. A biologic implant with an anatomic design, all in one piece." Both the surgical and prosthetic protocols are getting back to the basics, and the "less-is-more philosophy" is becoming prevalent. Overall, the trend is toward simplicity with 1-piece implants, 1-stage flapless surgery, and immediate or early loading of implants.

Following are 2 case reports using a new implant system and denture reline material that provide immediate implant loading with a retrofitted overdenture.

CASE REPORTS

These case reports use the recently introduced Atlas Dome Keeper Implant System (Dentatus USA). When used in conjunction with Dentatus' Tuf-Link Silicone Reline material, long-term retention, stabilization, and cushioning of a full denture results.⁵ The Atlas design has solved many of the problems associated with the use of copings and o-rings. Copings are fixed housings that can cause undue pressure and lateral forces on the implants, especially if the parallelism of the implants is not exact. When this happens, movement often leads to loosening and possibly loss of an implant. The Atlas implants have no copings or o-rings, thus solving parallel discrepancies. The Tuf-Link silicone denture reline material leaves room for error. The Atlas implant head is much larger than the implant body, creating better retention.

The entire procedure of placing the Atlas implants and relining with Tuf-Link silicone will take 45 to 60 minutes, as demonstrated in case report Nos. 1 and 2. This is a minimally invasive technique that usually requires no surgical flap and therefore no sutures. The drilling of the osteotomy is easier than for most endodontic treatments. The Atlas implant and abutment is a single piece that is screwed into the bone like a wood screw. Its narrow diameter of 2.2 mm makes installation possible even in patients with thin ridges. Because of the low profile of the dome cap (3 mm), parallel inconsistencies and divergent angles are not a problem. The immediate loading of the implant with the retrofitted overdenture allows the patient to leave the

office wearing his or her teeth, returning almost immediately to a normal lifestyle.

Case Report No. 1:
4 Atlas Implants Placed to Support a Mandibular Denture
 As seen in Figure 1a, although this mandibular ridge is quite narrow, there is more than enough solid bone for the nar-

row-bodied Atlas implant. Take appropriate x-rays and measurements to determine the amount of bone and where to drill the osteotomies.

As seen in Figure 1b (occlusal view) the locations of the 4 osteotomies have been marked on the ridge; a surgical guide may be utilized to ensure proper positioning. The same

number of implants should be used on each side of the arch for balance.

In Figure 1c, the Profile (Dentatus) drill is being utilized to create an osteotomy without opening a flap. Because of the sharp tip, the drill holds its position against the bone extremely well. This twist drill brings up the soft

tissue. If the practitioner initiates the osteotomy and realizes the angle is incorrect, he or she may back up the drill and restart the channel in the proper alignment.

Figure 1d shows the occlusal view after insertion of Atlas implants by manual

continued on page 11

Retaining and...

continued from page 100



Figure 1g. Four Atlas implants 6-months post-insertion.



Figure 2a. This patient was edentulous in the mandibular arch. (Clinical photos in Figures 2a to 2m courtesy of Dr. Ziv Mazor.)



Figure 2b. A Profile drill is used to create the osteotomy at the marked locations.



Figure 2c. An instrument is placed in the adjacent osteotomy as a guide to parallelism.



Figure 2d. The Dentatus No. 2 spherical profiling instrument is used to indent the mucosa at the opening of the osteotomy.

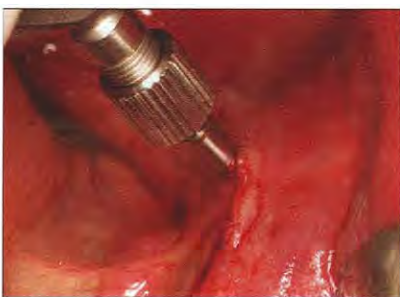


Figure 2e. The Atlas implant is installed manually with the Coletted Driver by turning it in a clockwise direction.

teeth, yet the surgical site would remain completely protected. Not only were these implants much smaller in diameter than what was traditionally being utilized, but they also contained 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?

Human histological studies were conducted at the New York University Department of Implant Dentistry in 1996 and at the Loma Linda University Center of Prosthetic & Implant Dentistry in 1998. After 8 months, a core of the implant and bone was taken. The histological data indicated the following: (1) the apical half of the implant had 50% osseointegration with dense trabecular bone growth, (2) there was new bone growth in the coronal aspect of the implant, and (3) there was no detectable inflammatory response.^{2,3}

More recently, research on narrow-bodied transitional implants conducted by Froum, et al⁴ at New York University concluded the following: "The percentage of BIC (bone to implant contact) achieved with Tis was similar to that documented in the literature for conventional turned, machine-surfaced implants." The NYU research indicated that the average percentage of bone to implant contact was $52.9\% \pm 13.81\%$. Part of their conclusion was that although transitional implants

The concept and design of narrow-bodied, 1-piece implants have come a long way from being produced by only a single manufacturer in 1993 to 8 manufacturers in 2005. That fact alone establishes their importance.

are typically removed when the definitive implants are restored, the results of their study suggested a change in the transitional implant protocol.

The concept and design of narrow-bodied, 1-piece implants have come a long way from being produced by only a single manufacturer in 1993 to 8 manufacturers in 2005 (Chart). That fact alone establishes their importance. The Dentatus titanium self-threading implants were given FDA 510K registration "for long-term use and for any length of time as decided by the health-care provider." Many of the other narrow-bodied systems also have that designation.

This is a significant milestone in implantology and should open up the opportunity for implant therapy to many more patients. It has been estimated that 25% to 30% of all patients who could benefit from implant treatment never have the treatment because of ridges that are too narrow, limited vertical and/or interproximal space, and/or the inability to pay for the treatment. What about the very elderly or those patients with systemic problems and/or those undergoing radiation or chemotherapy? Now there is a cost-reasonable alternative to the traditional implant protocols.

Since the initial development of implant protocols and the 2-stage surgery technique, implant treatment has come full circle. Implant companies are reaching out to all restorative dentists. There is a push to have general dentists in many instances place the implants as well as restore them. So, the implant protocols are being made easier and simpler. For example, Nobel Biocare recently introduced its NobelDirect, a

Chart. Many Manufacturers Now Provide Narrow Bodied, 1-Piece Implants.

Narrow-Bodied One-Piece Implants: Quick Reference Comparison Chart.

Company	Product	Year	Diameter	Thread Length	Head Length
Dentatus	MTI Monorail	1993	1.8 mm	7, 10, 14 mm	7 mm
Nobel Biocare	IPI	1999	2.8 mm	14 mm	8 mm
IMTEC	MDI	1999	1.8 mm	13, 15, 18 mm	4 mm
Bicon	Temporary Implant	2000	2.5 mm	8, 12 mm	7 mm
"O" Company	ISD	2000	3 mm	10, 12, 14 mm	5.65, 7 mm
Stern	ERA	2002	2.2 mm	10, 13, 15, 18 mm	5 mm
Inter-Lock	MDL	2003	2.0, 2.5 mm	10, 13, 15, 18 mm	5 mm
Nobel Biocare	NobelDirect	2004	3 mm	13, 15 mm	8 mm
Biohorizons	Maximus OS	2004	3 mm	12, 15, 18 mm	5, 7 mm
OsteoCare	Midi	2004	2.3, 2.8, 3.3, 3.8, 4.3 mm	10, 13, 16, 19 mm	9 mm
Dentatus	Atlas	2004	1.8, 2.2, 2.4 mm	7, 10, 14 mm	5 mm
Dentatus	Anew	2004	1.8, 2.2, 2.4 mm	7, 10, 14 mm	7 mm