

## INDUSTRY NEWS

## Small diameter implants in prosthetic dentistry

By Eugene LaBarre, DMD, MS

Conventional complete dentures in the mandible are among the least predictable and least satisfactory treatments in prosthetic dentistry. The placement of dental implants in the edentulous mandible for the purpose of supporting and retaining an overdenture greatly improves both prosthetic predictability and patient satisfaction.

Despite a 50-year record of advance and success with dental implants, several aspects of oral health in the 21st century United States suggest that an alternative for standard implants is needed.

- Tooth loss will continue in the U.S. population. A decrease in edentulism rates is more than offset by higher edentulism incidence in aging and immigrant populations, which are both growing exponentially.

The absolute number of edentulous individuals and number of dentures needed is expected to increase in the coming decades.

- Edentulism rates vary across regions of the U.S., but it is increasingly associated with lower socioeconomic status.

Low-income communities have a greater need for prosthetic services, but are least able to afford universally recommended basic implant-overdenture protocols.

- Utilization of implant methodologies for edentulous patients is low. The estimated market saturation in the U.S., with fee-for-service as the primary financial vehicle for implant treatment and without the likelihood of future third party support, is 1 to 2 percent.

In the Netherlands, with governmental and third party support for implant treatment in edentulous patients, the saturation among denture patients is 8 percent.

- Typical surgical placement of dental implants in the edentulous mandible is moderately invasive because of the need to create a soft-tissue flap and to expose the crestal aspect of the alveolus for visualization.

Computer-generated surgical guides have the potential to improve accuracy of implant siting and dra-

matically reduce invasivity. However, guided implant surgery has high technology costs and is not widespread at this time in the U.S.

- The most rapidly enlarging population cohorts are the advanced elderly. Polypharmacy and management of multiple chronic medical conditions are now routine in these populations and require a conservative approach in implant dentistry.

Surgical techniques with minimally invasive aspects are often indicated for these patients.

- The resorption patterns of the edentulous mandible often create a narrow ridge crest, which is problematic for placement of standard diameter implants (4 mm).

- The need for a healing interval of months following traditional implant placement is inconvenient for patients who increasingly expect instant results.

Narrow-body implants (NBI) have a diameter less than 5 mm and have been commercially available in the U.S. for more than 10 years. They are made of titanium alloy and are placed in alveolar bone for a variety of prosthetic purposes.

The optimal indication for these implants is in the anterior edentulous mandible for retention of a mandibular overdenture. If the placement is sound (at least 20 Ncm of torque), the implants can be immediately loaded. Osseointegration will occur if the early loading is optimized. Once integrated, the long-term prognosis is favorable.

Several studies have documented 5-year individual NBI survival rates around 94 percent with high patient satisfaction.<sup>1</sup>

The minimally invasive nature and reduced expense of NBIs are advantageous for patients compared with conventional implant treatment. NBIs are being used to solve mandibular denture problems on a routine basis in private practice, hospital and community clinics and in dental schools.

There is potential for widespread use in dentistry because of the oral health issues presented above and because NBIs broaden the spectrum of treatable prosthetic conditions by implant modalities.

The Dentatus Atlas NBI was engi-

neered specifically for denture retention and is unique in its lack of an additional attachment device inside the denture. In the Atlas system, a resilient silicon material (Tuf-Link) is placed inside the patient's existing denture, creating a close fit around the retention features in the Atlas implant head.

The silicon material is simple to use and replace. Dentists who lack familiarity with attachments and implants find the Atlas system to be user-friendly and effective.

Patients are extremely gratified that the surgical procedure is atraumatic and that denture adhesive is no longer needed to secure the denture in place.

A range of implant diameters and lengths make the Atlas system very versatile for treating a variety of edentulous patients and is particularly well suited for those patients with narrow ridges, complex medical histories and financial restrictions.

In the real world of dental practice, this means that the Atlas NBI is an appropriate implant option that can return hope and confidence to the majority of patients with mandibular dentures. **DT**

1. Cho S-C, Froum S, Tai CH, Cho YS, Elian N, Tarnow DP. "Immediate loading of narrow diameter implants in severely atrophic mandibles." *Practical Procedures & Aesthetic Dentistry*, Vol. 19, No. 3, April 2007, pp. 167-174.

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