

## **DENTAL IMPLANTS AND THE DRY MOUTH PATIENT**

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Modern dental restorative techniques have evolved rapidly, in particular since the development and implementation of the modern oral implant systems. The need for implants among the general population has been clearly demonstrated and importantly, implants have been particularly useful in the patient with specific needs not generally amenable to standard or traditional dental restorative techniques. Indeed, the oral and systemic health consequences as well as the psychological ramifications of individuals in need of such treatment can be severe. In most instances, traditional fixed or removable dental appliances or prostheses can offer viable if not always optimal treatment results. However, in many cases, oral implants are required or are the treatment of choice in an effort to once again produce the functional and esthetic demands of day to day living.

Oral implants can be classified into three general categories: 1) subperiosteal; 2) transosteal; and 3) endosteal

### **Subperiosteal Implants**

The subperiosteal implant is a thin crib or frame-shaped metallic alloy casting shaped to the underlying bone in a very precise way, which evenly distributes forces over the jawbone. This form of implant is constructed from an impression of the underlying bone and is placed beneath the covering of the bone known as the periosteum, with the mucous membrane subsequently closed over such. Attached to the implant are posts which extend through the gum tissue allowing the dentist or the prosthodontist to anchor a prosthetic appliance. This form of implant is generally best suited to severely atrophic or shrunken jaws where the endosteal implant is not a viable option.

### **Transosteal Implants**

The transosteal implant has a specific indication. This form of implant is used only in the mandible, the lower jawbone, and utilizes a metallic plate beneath the chin. The plate contains retaining posts which pass from the lower border of the jaw through the jawbone itself, extending through the overlying mucous membrane into the mouth. Subsequently a removable appliance can be attached to these posts which are stabilized to the anterior or front portion of the mandible.

There are specific contraindications for this form of implant, including patients having had radiation therapy to the jaws, prosthodontic or esthetic considerations, and the ability to understand and comply with the necessary procedures and appropriate levels of expectations by the patient.

### **Endosteal Implants**

The endosteal implant or the osseointegrated appliance is that form of implant which is placed directly into the jawbone and, after a period of time, becomes solidly anchored to the jawbone itself. The implant material is highly purified titanium which allows living bone tissue and the implant to be biologically fused or integrated. Once this occurs, the implants are capable of supporting artificial teeth attached to the prosthetic portion of the implant protruding through the gum tissue.

The endosteal implant represents the single most important advance in restorative dentistry since the advent of the high speed drill over forty years ago. It is the result of nearly twenty years of research by Dr. P. I. Branemark, with his group in Sweden, as well as many other centers that continue to advance the science of implantology. Several systems have been developed with expanded applications for oral implants, and are now the standard of care in certain circumstances where prior traditional forms of dentistry are essentially impractical.

### **The Procedure**

Prior to the design of any implant prosthesis, a CT scan should be performed to ensure that an implant of adequate length and width will be accommodated by the existing bony structure. There are specific instances where bone structure can be enhanced by grafting.

The procedure for insertion of endosteal implants involves exposure of the underlying bone through a small incision in the mucous membranes. Several implants are usually done in a single procedure, rather than in a staged or progressive manner. Through use of specially designed instruments and burs or drills, a series of openings are made into the bone, being extremely careful not to induce damage by heat or physical trauma. Research has found that bur temperatures cannot exceed one hundred and sixteen degrees Fahrenheit. Therefore, slow revolutions and efficient cooling are critical in this phase of the process.

After placement of the implant into the predetermined width and depth of the bony opening, the mucous membrane is closed to allow for healing and remodeling. In some instances, a properly designed removable appliance can be used over the implant site while osseointegration is occurring. For implants in the lower jaw or mandible, approximately four months of healing time is needed, whereas the upper jaw or maxilla generally requires a longer healing period of approximately six months. After the appropriate period of stress free healing, being sure that the bone and surrounding tissues around the implant remain as passive as possible, remodeling occurs, allowing direct union of bone and implant or osseointegration. Premature loading or function can lead to loss of the implant.

Once osseointegration is confirmed, the implant is accessed through a small incision in the gum tissue and a suitable fixture is attached to it which extends through the gum tissue, allowing the dentist to fabricate a fixed or removable appliance. Such appliances require a similar level of careful design as does the surgery in carefully distributing occlusal forces over the implants and remaining teeth as well as residual bone.

### **Success Rates**

The rate of success for this particular form of implant is high. There is evidence from a number of case studies and large series that when specific types of implants are inserted by experienced clinicians with appropriate and proper techniques, at least 90% of such implants remain in place for periods of ten years or more. Achievement of osseointegration and continued success in retaining such requires atraumatic surgical insertion done under sterile conditions, undisturbed bone healing, a

well designed and well fabricated prosthesis with careful distribution of physical forces or loads and maintenance of such implants through daily oral hygiene and thorough long term follow-up. With meeting these criteria, recent evaluations have shown that after sixteen years of follow-up of over fifteen hundred patients who have had jaw reconstructions from 1968 to 1984, the overall cumulative success rate was 94.6% for the first five to six years and 91% for ten to sixteen years after placement of such implants.

In terms of the future for implants, the horizon continues to broaden, with reconstruction not only of the dental arch but likewise the reconstruction of the face after cancer surgery utilizing implants in areas away from the mouth itself, including the skull base and other craniofacial bones.

### **Implants and Dry Mouth Patients**

As far as the patient with xerostomia or dry mouth is concerned, implants in the carefully selected patient offer an option which is indeed a viable one. In the patient with autoimmune disease, placement of implants and their integration into the underlying bone occur normally, assuming there is no significant immunosuppression or high dose steroid therapy which may influence such. The absence of saliva or the presence of only small amounts of saliva will have little effect on the implant material itself, although the demands of daily hygiene are of course heightened in the individual with inadequate salivary flow. Nevertheless, under appropriate circumstances of clinical indication, proper case selection and execution and day to day maintenance, the patient with xerostomia is now afforded a meaningful alternative to dental breakdown and appliances which are unable to be retained due to the absence of adequate amounts of oral moisture.

When considering dental implants, a patient should expect to learn from his or her dentist what is the reasonable time frame relative to when the implants are likely to be uncovered, loaded and temporized prior to final prosthesis construction. It is also critical to know what the maintenance strategy would be under such circumstances. In my experience, medical health plans do not cover dental implants, whereas some dental plans will reimburse to a certain level. Each patient must carefully analyze his or her individual policy concerning such benefits.