

Restoring Facial Appearance Using Osseointegrated Dental (Branemark) Implants

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Collapse and inversion of the lower lip and perioral musculature frequently follow total edentulism and the subsequent loss of the alveolar ridge.

The remaining mandibular bone may atrophy further, thereby creating additional intraoral complications which make conventional denture prosthodontics difficult or frequently impossible. This leaves the patient without the benefit of intraoral lip support. (Figures 1, 2a, 2b)

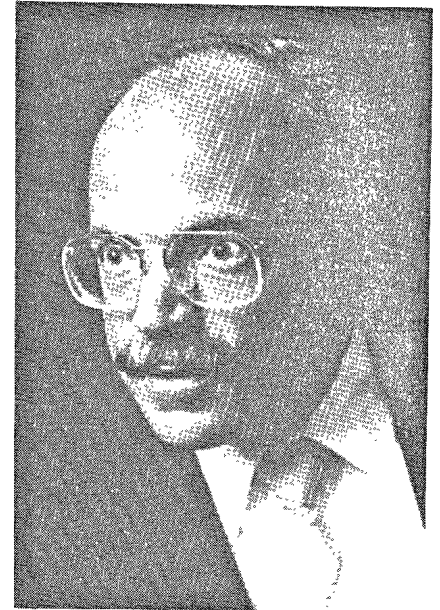
Several reconstructive methods have been used in the past. These have included rib and iliac crest autogenous grafts which had only limited degrees of success. More recently, hydroxyapa-

tite crystal or block implantation has also been used to rebuild the residual ridge. In both cases, the best results permit the patient to wear only a removable denture.

The proven success of osseointegration¹, now allows reconstructing lower lip support to be permanently accomplished. Patients no longer need to depend on removable denture prosthodontics to establish intraoral soft tissue support. Permanent teeth can be installed in cases of even the most severe maxillary or mandibular atrophy.

Reconstructive facial surgeons and prosthodontists together can produce drastic changes enhancing facial features, with a high degree of predictability.

The basis for long term success stems from the stability created by the



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osseointegrated titanium fixtures which serve as the basis for the jawbone anchored prosthesis. (Figure 3)

The term osseointegration was coined by Per-Ingvar Branemark, M.D., Ph.D., the Swedish physician and researcher who has been primarily responsible for the long-term research and development of this implantation and reconstructive process. His basic research began in 1952 and clinical studies started in 1965 with the treatment of the first patient to receive an osseointegrated implant prosthesis. That patient is still successfully wearing an implant prosthesis.

The term *osseointegration* is defined as "a direct structural and functional connection between ordered, living bone and the surface of a load carrying implant."² (Figure 4)

Using the Branemark titanium screw implants, securely integrated in the remaining mandibular bone, a custom gold substructure is designed to support prosthetic teeth (Figures 5a, 5b). This allows the nonremovable teeth to be anteriorly and laterally

Figure 1



Edentulous atrophic mandibular alveolar ridge.

Figure 2a



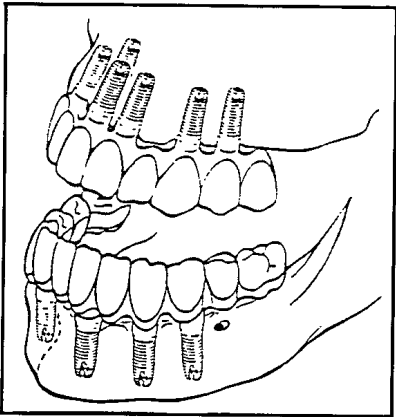
Profile: Lip inversion resulting from lack of intraoral support.

Figure 2b



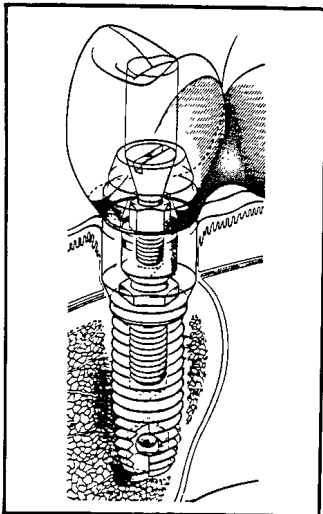
Frontal view: Collapse of the lower third of the face from lack of intraoral support.

Figure 3



Tissue integrated prosthesis to restore maxillary and mandibular jaws.

Figure 4



The screw design of the titanium Branemark implant permits stress distribution during functional loading.

well beyond the point of muscle attachment which previously limited the removable denture position and provided only minimal lip support.

During various prosthodontic try-in visits, adequate lip support and dental esthetics is established. The prosthesis is then completed using conventional gold and acrylic denture materials. (Figures 6a, 6b)

The prosthesis combined with the titanium Branemark implanted fixtures have been referred to as the *Tissue Integrated Prosthesis.*" This prosthesis becomes one with the jawbone when small gold screws are used to fasten the custom designed dental prosthesis securely to the titanium fixtures. (Figure 7)

The pre- and post-treatment profile views of a 72-year-old female clearly demonstrate the perioral collapse evident when the patient is without her prosthesis; however, with ideal lip support normal facial contours are returned following the intraoral restoration with a tissue integrated prosthesis. (Figures 8a, 8b)

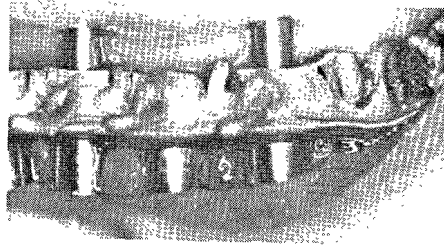
In the area of facial esthetics, plastic and reconstructive facial surgeons

now feel that any patient wearing removable dentures and considering cosmetic plastic surgery for facial rejuvenation (face lift) should first be evaluated as a candidate for a tissue integrated prosthesis³. Implant prosthesis should be completed before the cosmetic surgery is performed. This essential prerequisite to cosmetic surgery, particularly to face lift procedures, requires interdisciplinary treatment planning between the prosthodontist and the plastic surgeon.

When treating patients with the tissue integrated prosthesis in preparation for cosmetic surgery or with the intention of providing proper intraoral lip support, special attention should be paid to restoring the correct dental occlusal vertical dimension. This contributes greatly to the restoration of normal morphology to the lower third of the face.

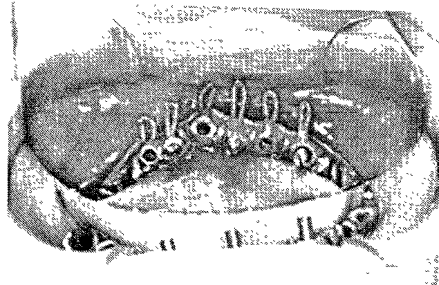
Continuous degenerative bone loss is considered physiologic and inevitable when wearing a removable denture. Unfortunately, this gradual process often goes unnoticed by the

Figure 5a



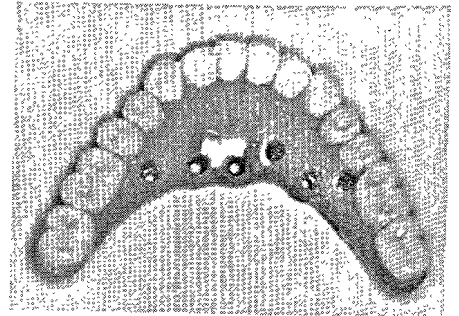
Labial view of gold substructure casting.

Figure 5b



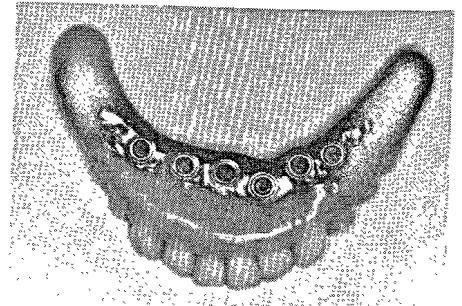
Occlusal view of the gold substructure shows anterior cantilevered gold loops to support the prosthetic teeth.

Figure 6a



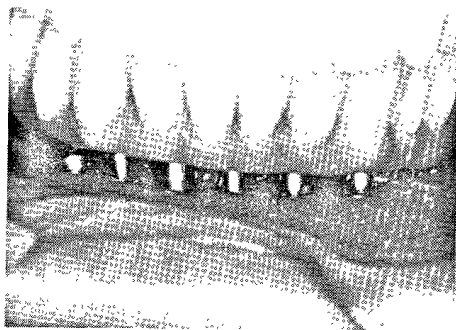
Occlusal view of the tissue integrated prosthesis (T.I.P.).

Figure 6b



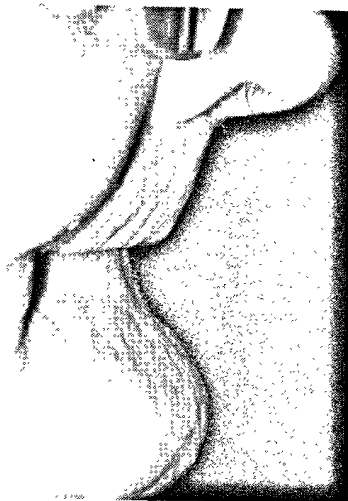
Underside view of the T.I.P. reveals the substantial gold framework.

Figure 7



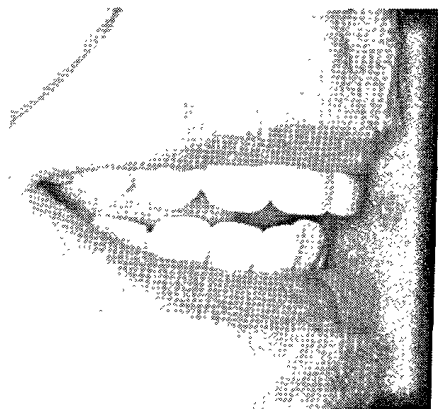
The T.I.P. securely fastened to the lower jaw.

Figure 8a



A 72-year-old patient: The pre-treatment profile.

Figure 8b



Post T.I.P. treatment view demonstrates stable lip support.

patient. These changes are frequently associated with the aging process. Perioral lines and wrinkles, loss occlusal vertical dimension and the development of a prognathic appearance associated with the auto rotation of the mandible are often the result of edentulism. These and other factors tend to accelerate an aging appearance.

Patients functioning for two or more years with a removable dental prosthesis should be examined by a prosthodontist prior to any elective cosmetic surgery to determine if the existing prosthesis provides adequate dental function and facial soft tissue support.

The effects of combined interdisciplinary treatment are significant. The use of a tissue integrated prosthesis in combination with a rhytidectomy and/or dermabrasion frequently minimize and often eliminate the perioral lines of the aging face.

The use of osseointegrated Branemark fixtures also have an excellent prognosis for patients with controlled systemic debilitations such as diabetes, hypertension, hyperthyroidism, or for patients following cancer treatment with radiation therapy⁴.

With healthy individuals, the osseointegrated fixtures have served successfully, supporting non-removable dental bridges for over twenty years. It is not unlikely that such reconstruction methods will successfully provide function and support which simultaneously maintain residual bone levels for "50 years."⁵

Osseointegration realistically provides a superior alternative to the constant problems and changing facial support evidenced with conventional removable dentures.

Use of the tissue integrated prosthesis concept of oral and facial reconstruction can extend the benefits of patient treatment beyond the physiologic and morphologic realm. The

psychologic benefit of this treatment cannot be over-emphasized.

Frequently in post-treatment discussion, patients have reported that the tissue integrated prosthesis feels "like my own teeth." Others have stated that this treatment most definitely has improved the quality of life. One patient comment often quoted best exemplifies this: "I wonder how people who have not experienced a denture, compared with a jawbone-anchored bridge, can understand the tremendous difference. The quality of my life improved. It moved from difficult depressions, with a series of physical and psychological disorders that concerned everything important in life, to the realization that everything suddenly works in the same way as it did when I was young and my teeth were undecayed."⁶

The interdisciplinary approach to patient treatment must address the psychologic benefits of therapy. The use of osseointegrated dental implants adds an effective modality to combined treatment programs. The tissue integrated prosthesis offers a physiologic restoration with a favorable long-term prognosis. It also offers patients a dramatically improved quality of life.

TDA

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