

Insights

A Digest of Recent Trends, Techniques and Clinical Concepts of Dental and Facial Esthetics



Chlorhexidine in Prosthodontics

Thomas J. Balshi, D.D.S., F.A.C.P.

In dental practices today, antimicrobial agents are rapidly becoming accepted as an adjunct to traditional mechanical oral hygiene measures. These oral rinses have a potential impact on plaque control, the basis for most dental disease today. The most powerful agent is chlorhexidine, marketed as Peridex (chlorhexidine gluconate 0.12%), which is the only prescription oral rinse accepted by the ADA's Council on Dental Therapeutics under its guidelines for chemotherapeutic control of supragingival plaque and gingivitis. Chlorhexidine gluconate at 0.12% has been prescribed for the control of gingival inflammation and bleeding and related oral conditions. These benefits can contribute to improved success rates in prosthodontic procedures, serving to increase patient benefits.

Recently, chlorhexidine has been used in conjunction with crown and bridge procedures, which can be compromised by patients with gingival inflammation and bleeding. Specifically, the compound has been shown to be beneficial as a pre-therapy for impression procedures, during the interim period before final crown seating, and after the procedure to facilitate the patient's return to optimal gingival health.¹

¹Sorensen J, Doherty F, Flemmig T, et al: Gingival enhancement in fixed prosthodontics. *J. Dent Res.* 1988;67 (special issue): Abstract 2901.

continued on page 5

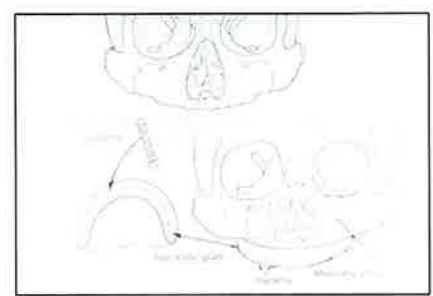
Academy of Osseointegration Annual Scientific Session, Dallas 1988

Composite Grafts in Maxillary and Mandibular Reconstruction

E. E. Keller, D.D.S.

The literature pertaining to placement of dental implants into bone grafts is quite limited. Two papers which deserve attention and should be read by those interested in pursuing this field are published by our Swedish colleagues at the Institute of Biotechnology in Goteborg and appeared in the *Scandinavian Journal of Plastic and Reconstructive Surgery* in 1980 and 1981. The paper reports on 245 operated jaws and placement of 1,145 Branemark implants. In this group there were 10 maxillary patients and 6 mandibular patients involving bone grafting in concert with titanium (Branemark) implants.

Maxillary cases were divided into two groups: the first group entitled "immediate placement" consists of five patients where autogenous onlay iliac bone graft is placed simultaneously with (Branemark) implants. The implant extends through



Bone graft with immediate implant placement.

the onlay bone graft into the residual atrophic maxilla. The implant provides graft stabilization and eventually functions as bone anchorage for the maxillary osseoprosthesis. This technique utilizes lateral cortex iliac bone. This method of iliac graft procurement differs from traditional procedures and deserves special mention. The graft is obtained from the medial cortex and superior aspect of the iliac crest just posterior to the anterior-superior spine. The lateral-superior crest cortex and associated musculature is left intact

continued on page 5

"Osseointegrated" Interfaces— Biomechanical Testing and Histological Evaluation

J. B. Brunski, J. A. Hipp,
G. V. B. Cochran, and K. W. Higuchi

Clinical success over 15 years with "osseointegrated" dental implants in Sweden has been achieved with direct, or nearly direct, interfacial apposition of mineralized tissue to implant surfaces. Most dental and orthopedic implants are intended to bear loads and require that the implant-tissue interface be capable of transmitting loads without adverse interfacial responses. This study's goal was to quantitatively investigate the relationship between interfacial responses and implant-tissue biomechanics. Bone-implant interfaces exposed to known loaded and control conditions in an animal model were analyzed by histomorphometric methods.

Twenty-four screw shaped, pure titanium implants were placed bilaterally in

continued on page 6

Biomaterial and Implant Surfaces: A Surface Science Approach

Kengt Kasemo and Jukka Lausmaa

When a biological system encounters an implant, reactions are induced at the implant-tissue interface. This paper deals with various surface properties that are expected to influence the tissue-implant reactions, and with methods that are available for implant surface characterization.

The authors have emphasized that the primary interaction between an implant and its host tissue takes place on the atomic/molecular level at their interface. The biological reactions on the cellular and macroscopic levels that are implant-related are a consequence of the molecular-level interactions. For these reasons the status of implant surfaces is of central importance in biological evaluation of implants, as well as in clinical use of implants. The surface properties of interest are chemical composition, microstructure,

continued on page 6

The Use of Chlorhexidine Gluconate (Peridex) to Establish and Maintain Gingival Health Associated with Teeth Treatment Planned for Fixed Prosthesis

G. T. Terezhalmay, D.D.S., M.A.
C. Farah, D.D.S., M.S.D.
Case Western Reserve University,
School of Dentistry

It is well established in the literature that there is a direct relationship between gingival health and the prognosis of fixed prostheses. Their success is significantly influenced by plaque retention, gingival inflammation, and gingival bleeding. The efficacy of 0.12% chlorhexidine gluconate (Peridex) to significantly reduce plaque retention, gingival inflammation, and gingival bleeding in a variety of clinical settings prompted the authors to include Peridex rinses in the protocol to be followed with patients' treatment planned for fixed prostheses. Five phases of fixed prosthodontic procedures were defined: I—priority treatment, such as emergency care; II—disease control and selected procedures such as (a) oral hygiene instruction, (b) extraction of non-restorable teeth, and (c) management of periodontal condition; III—restoration of function and aesthetics; IV—reevaluation; and V—recall phase. In the second phase, following initial periodontal preparation, patients were instructed to rinse with 1/2 oz.

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of Peridex twice daily, after breakfast and before bedtime following brushing and flossing. This regimen is followed for a minimum to two weeks before initiating the prosthetic restoration. The longer a patient remains in phase II, the more significant is the reduction in plaque retention, gingival bleeding, and gingival inflammation. The above regimen is continued through the crown preparations, making of impressions, temporization of abutments, and delivery of the fixed prosthesis. Clinical observations indicate continued improvement in gingival health through the reevaluation phase. The entire evolution, from the initial appointment to the final treatment is approximately three months. Following reevaluation, if no further treatment is indicated, the treatment plan progresses to the recall phase.

The adjunctive use of an antimicrobial agent, such as 0.12% chlorhexidine gluconate (Peridex), significantly enhances the clinician's ability to optimally improve and maintain gingival health before, during, and immediately after the fabrication and cementation of fixed prostheses. This enhancement is germinal to clinical success.

Gingival Enhancement in Fixed Prosthodontics: 1. Clinical Findings

J. A. Sorensen
UCLA School of Dentistry

The effectiveness of 0.12% chlorhexidine gluconate (Peridex) in reducing plaque and subsequent gingival inflammation is well documented. The purpose of this study is to assess the usefulness of Peridex in the enhancement and maintenance of gingival health in patients receiving fixed prosthodontic treatment. Nine of 30 patients were matched into two groups, with one group using Peridex 15 ml bid in addition to normal hygiene. The product was used for 2 weeks prior to crown preparation, 3 weeks during provisional crown placement and 2 weeks after definitive crown cementation.

Plaque, gingivitis and bleeding indices were measured initially and at the 3 aforementioned points during the 7 week period. Plaque indices for control patients remained unchanged (.38 - .21) while Peridex patients were reduced from .68 to undetectable at 7 weeks. The gingival index of Peridex patients was reduced throughout the entire study period (BL = 1.87, 7 wks = .65). Subjective responses of the doctors highlighted the increased ease of prosthodontic procedures especially during crown preparation and impression phases in patients using Peridex.

The adjunctive use of peridex with fixed prosthodontic procedures improves gingival health making the crown fabrication process easier, more expedient,

ultimately improving the quality of the crown margin.

This study was funded by a grant from Procter & Gamble Co.

* Gingival enhancement in fixed prosthodontics. *J. Dent Res* 1988:67 (special issue): Abstract 2901.

Hydroxyapatite and Osseointegrated Implants

The Institute for Facial Esthetics would like to thank the staff of Insights and all the surgeons and prosthodontists who responded to the hydroxyapatite survey conducted earlier this year. The data is being correlated and a summary will be published in the near future.

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June 19-21, 1989

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Skagen, Denmark

Faculty:

Prof. P-I Branemark, M.D., Ph.D.
Thomas J. Balshi, D.D.S., F.A.C.P.
Torsten Jemt, D.D.S., Ph.D.
William R. Laney, D.D.S.
Hans Nilson, D.D.S.
Bo Rangert, Ph.D., Mech. Eng.

For information call:
The Institute For Facial Esthetics
215-643-5881,
or write
IFFE, Box 1141,
Fort Washington, PA 19034

Osseointegration for the Periodontally Compromised Patient

Thomas J. Balshi, D.D.S., F.A.C.P.

Osseointegrated titanium implants as developed by Branemark have proven effective in the treatment of complete edentulism. Titanium fixtures with a specific screw-shaped configuration and special surface finish, according to the "osseointegration procedure" prescribed by Branemark et al, can produce a strong, intimate, and long-lasting connection between the implanted fixture and living bone.

Since 1965, patients have been restored with bone anchored fixed partial dentures that approach or equal the function of dentate individuals with the same quality and distribution of teeth. More recently, osseointegrated titanium fixtures

have been used for the restoration of the partially edentulous dentition, as well as the use of the Branemark tissue integrated prosthesis to restore the hemidentate arch.

The use of the tissue integrated prosthesis supported by Branemark fixtures for the restoration of the partially edentulous periodontally compromised dentition has been demonstrated with a patient study. Clinical and laboratory aspects of treatment include the diagnosis and treatment planning required for the use of the tissue integrated prosthesis to stabilize adjacent mobile teeth.

Laboratory points important to note include: casting design and fabrication, porcelain application, and especially the avoidance of porcelain particles in the access screw holes. Clinical points important to note include: the master impression technique, modification of the provisional restoration, verification of fit, delivery of the final tissue integrated prosthesis, and oral hygiene maintenance.

In the author's experience, all patients who have received a sectional tissue integrated prosthesis to restore partial edentulism have responded favorably to treatment and identify comfort and function as the most important aspects. In addition, many of these patients felt that the elimination of a removable prosthesis and its replacement with the osseointegrated fixed prosthesis had positive psychologic benefits and a definite improvement in the quality of their lives.



Adjacent teeth stabilized with osseointegrated implants.

* *Int. J. of Pros.* V1, #1; 1988:51-58.

N.I.H. Consensus Development Conference

Dental Implants—June, 1988

The use of dental implants to provide support for replacement of missing teeth is becoming an important component of modern dentistry. It has been estimated that the overall number of dental implants inserted in the United States increased fourfold from 1983 to 1987, and during that same period, the number of practitioners who perform implant therapy increased tenfold.

According to the 1985-1986 National Institute of Dental Research's (NIDR) national survey of oral health, approximately 42 percent of those 35 to 64 years of age are totally edentulous.

Traditional removable dentures or fixed bridges are not satisfactory for a significant number of individuals who have lost the tooth-bearing portions of the bone and simply cannot manage removable appliances. Moreover, there is a strong suggestion that a substantial number of patients prefer implant-supported prostheses over soft tissue supported prostheses.

The NIDR in conjunction with the National Institutes of Health (NIH) Office of Medical Applications of Research and the Food and Drug Administration convened a consensus development conference on June 13-15, 1988. They reported:

There is evidence from a number of case series studies that a large proportion of specific types of dental implants remain in place for periods of 10 years or more when inserted by clinicians experienced with the respective techniques. Additional knowledge about the biology of hard and soft tissues, coupled with technological advances in the construction and insertion of various implants, will likely result in a trend toward improved long-term success rates. The best reported long-term survival rates have been achieved with systems that have bone at the interface (such as the Branemark system of osseointegration*).

With regard to indications for a specific implant type, the bone available to support the implant is the primary factor after prosthodontic diagnosis and treatment plan. Other factors affecting indications for implant type are the degree and location of the edentulism of the patient.

The panel recommends that the individual who assumes the surgical treatment phase be well prepared in accepted surgical methodologies. The panel also recommends advanced instruction in the prosthodontic phase of implantology.

This program also should include expertise in short and long-term tissue maintenance addressing gingival status as well as radiographic evaluation of tissue support.

Patient selection should be restricted to those patients who show a need and motivation for the implant procedures.

The panel supports the need for a multidisciplinary approach and recommended a pre-implant consultation involving professional participants with the patient. Post-implant procedures should include communication, monitoring, and collection of recorded data by the professional team. The panel recommended that the patient be thoroughly instructed in maintenance therapy with the understanding that the patient do oral self care.

Before surgery, a medical history should be taken to evaluate the history of the presenting problem and chief complaints. A review of the current status of the organ systems should be made. Factors related to prediction of health risks need to be continuously assessed before the surgical decision, after implantation, and at 6-month intervals throughout the followup period.

The release of constituent material from the implant may influence biocompatibility. To achieve a more complete understanding of tissue response to the implant, basic experiments in host implant physiology must be continued.

Among the factors involved in the design of an implant are the force components produced during loading, the dynamic nature of loading, and the mechanical and structural properties of the prosthesis. Such information is essential for appropriate design of implants.

The panel feels that one important method of accumulating accurate data on implant performance is to establish a National Dental Implant Registry, which will standardize reporting forms to collect information on this activity in the United States. Consideration also should be given to the establishment of centers for training, treatment, and research in dental implantology.

The public is entitled to educational materials that enable informed participation in implant treatment decisions.

The panel concluded that the indications and contraindications of various types of dental implants have been described. The complexity of the surgical, prosthodontic, and periodontal procedures used to successfully insert and maintain dental implants demonstrate the need for a multidisciplinary approach in this field. Long-term studies that concurrently compare various types of implants are needed to provide information beyond mere survival rates. Functional success of various implants should include such criteria as ability to support fixed or removable prostheses in the absence of discomfort, the presence of satisfactory esthetics, and clinical and radiographic evidence of tissue health.

* Editor's comment.

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Prosthodontics Intermedica
467 Pennsylvania Avenue
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