Abstracts from the Table Clinic Session of the Annual Session of the American College of Prosthodontists October 28, 2004

Michael A. Mansueto, DDS, MS Chair, ACP Table Clinics Subcommittee

Remount Casts for Removable Partial Dentures

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For a removable prosthesis, the best way to perform occlusal equilibration is to remount the prosthesis on the articulator. To remount a removable partial denture, a remount cast must be fabricated. Many techniques have been presented in the literature, including fabrication with stone, occlusal registration material, or silicone impression material. This presentation will compare several different techniques for making remount casts for removable partial dentures. A new technique of using the silicone impression material with acrylic resin and dental stone will also be demonstrated.

Implant Success and Esthetic Clinical Response of Immediately Loaded Single-Tooth Implants Marcus Abboud, DDS

Assistant Professor University of Bonn, Department of Oral Surgery

Twenty single-tooth implants were placed in healed sites of adult patients and immediately loaded. Temporary, prefabricated acrylic resin crowns were prepared, adjusted, and inserted on the implants. After 6 weeks, a metal-ceramic or all-ceramic crown was cemented. Radiographic and clinical examinations were made at baseline and at 3, 6, and 12 months. The mean change in marginal bone level was 0.01 mm at 12 months. The mean Periotest[®] value after 360 days was -4. The peri-implant mucosal adaptation to the individualized anatomic form of the provisional crown results in a natural esthetic outcome, and a gain in papilla height was observed.

Immediate Mandibular Denture Stability Simplified with the Maximus Os Overdenture System

Natalie Y. Wong, DDS Postgraduate Prosthodontic Student University of Michigan School of Dentistry

The predictable instability of mandibular complete dentures is a problem that continues to plague the dental profession. A patient's function can decrease more than 60% with complete dentures as compared to natural dentition. With an implant-supported prosthesis, it is possible to achieve a result that approaches normal function; however, hurdles must be overcome, including anatomical limitations, extensive surgery, and the high cost of treatment. A simple, cost-effective solution can be found in the Maximus OS Overdenture System. The minimal diameter (3.00 mm) one-piece implant design with ball attachment allows for ease during surgery and is approved for use as a permanent implant. The prosthetic components included allow for a direct reline at implant placement for immediate, permanent stability.

The Use of MKI Plus Attachments in a Fixed Removable Maxillary Prosthesis with a Milled Bar

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A patient presented with a bar clip-designed overdenture that had recurring stress fractures and required clip replacement. The clinician re-designed the framework to fit a milled bar, while adding MKI plus attachments to create a passive-fit fixed prosthesis when the MKI locks are engaged. This positive denture placement reduces the incidence of wear and breakage and virtually eliminates attachment maintenance. This table clinic illustrates the fabrication sequence of the milled bar and the MKI attachment placements using both photographs and laboratory demonstration models.

Prosthetic Rehabilitation of Bisphosphonate Induced Maxillary Osteonecrosis

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With the widespread use of bisphosphonates for the management of metastatic disease to the bone and the treatment of osteoporosis, incidence of associated osteonecrosis of the jaw has recently been identified (Ruggiero SL, et al, J Oral Maxillofacial Surgery 2004; 62:527–534). Osteonecrosis of the jaw and its sequelae may be so extensive as to affect speech, deglutition, mastication, and the overall quality of life. A patient presenting with a spontaneous, total maxillectomy defect secondary to bisphosphonate therapy was successfully obturated with an implant-supported and -retained, rigid, complete overdenture. Clinical aspects of treatment will be elucidated, accompanied by a pertinent literature review.

Procera Implant BridgeTM: An Alternative to Cast Frameworks

Henry H. Vu, DDS Postgraduate Prosthodontic Student VA Medical Center-Detroit and University of Michigan Rami Jandali, DDS, MS Director of Postgraduate Prosthodontics VA Medical Center-Detroit and Adjunct Postgraduate Instructor University of Michigan Michael Razzoog, DDS, MS Professor University of Michigan

Alternative treatments to conventional dentures include the implant-supported overdenture and implantsupported fixed prosthesis. Several complications to these prostheses, which directly relate to the difficulty in achieving a passive fit of the metal substructure, have been reported. The Procera Implant BridgeTM consists of a titanium framework milled through a CAD process. For the case presentation, individual zirconiumcoping crowns were luted to the custom framework and GradiaTMIndirect was bonded to the framework to simulate soft tissue. The advantages are predictable esthetics in cases of unfavorable implant angulations and position, and ease of maintenance and serviceability in case of porcelain fracture.

Treatment of Partial Adontia using Immediate Loading of Dental Implants

Preeda Pungpapong, DDS Postgraduate Prosthodontic Student Lyndon Cooper, DDS, PhD Director, Graduate Prosthodontics UNC School of Dentistry

Treatment of young adults with partial adontia requires simultaneous consideration of esthetics and function. Immediate loading of endosseous dental implants offers an opportunity to address this matter. Chief considerations include 1) implant location, 2) primary stability, and 3) control of soft tissue contour for esthetics. This presentation illustrates this procedure by the replacement of 8 maxillary teeth in a 28-year-old female patient. Provisionalization procedures are used to control implant placement and the esthetic result. The prosthodontist is a key member of the surgical team during this procedure.

Selection of Treatment Scenarios for Maxillary Implant Rehabilitation using Fixed Partial Dentures

Fernando Rojas-Vizcaya, DDS Postgraduate Prosthodontic Student Lyndon Cooper, DDS, PhD Director, Graduate Prosthodontics UNC School of Dentistry

The transition from root- to implant-supported prosthesis requires strategic planning to optimize a) patient comfort/function, b) wound healing, and c) esthetics. This presentation will compare transition strategies from root- to implant-supported maxillary prostheses by: I) tooth removal and subsequent implant placement requiring an interim denture, II) partial edentulism and implant placement requiring interim fixed dentures, III) immediate implant placement and toothassisted immediate provisionalization, and IV) immediate placement and immediate loading of provisional fixed dentures. When major grafting is required, staged procedures using options I or II are advocated. When preservation of existing soft tissue architecture is desired, options III or IV should be considered. Limitations to all procedures exist, and careful analysis must be performed prior to tooth removal.

Implant Overdentures and Mandibular Posterior Alveolar Bone

Long Huynh, BS Dental Student; Monica J. Cayouette, DMD, MS Assistant Professor Medical University of South Carolina College of Dental Medicine

The purpose of this pilot study was to compare residual mandibular alveolar bone resorption over time in edentulous mandibles restored with 4 or 5 implants placed anterior to the mental foramina connected by a metal bar, to those of patients restored with conventional complete dentures. A method, developed by Wilding et al, was used to demarcate 2 areas of the mandible, one of which was defined by the crest of the residual alveolar ridge and the other independent of the alveolar ridge. Both areas were measured, and their proportions were calculated bilaterally for each. This proportional value was referred to as the Area Index. This study found a trend of decreased mandibular alveolar bone resorption in the implant group although there was no statistically significant difference between the 2 groups.

Implant-Supported, Screw-Retained Telescopic Prosthesis (SRTP): Clinical Case Report

Seok-Gyu Kim, DDS Assistant Professor Kwon-Hyo Lee, DDS Resident, Kangnam St. Mary's Hospital

Implant-supported, screw-retained telescopic prostheses (SRTP) have advantages of both cement-retained and screw-retained implant prostheses. In a multiunit case, SRTP has one or two screw-type abutments connected with multiple cement-type telescopic abutments. The fit of the framework in SRTP is not as critical as that in the screw-type implant prostheses. SRTP is a retrievable implant prosthesis, attached with one or two screws and some weak temporary cements. SRTP does not result in accidental dislodgement due to the loss of screw retention. SRTP provides good esthetics and stable occlusion by eliminating screw holes in the premolar areas.

Comparison of Fracture Resistance and Pattern Of Endodontically Treated Teeth Restored with Fiber Posts and Cast Metal Posts

Kwon-Hyo Lee, DDS Resident; Seok-Gyu Kim, DDS Assistant Professor Kangnam St. Mary's Hospital

A total of 36 extracted sound human premolars were endodontically treated and their crown portions were removed to a level of 2 mm above the CEJ. Quartz fiber posts with composite cores, glass fiber posts with composite cores, and cast metal posts and cores were used for restoring the crown portions. All teeth were fully covered with nonprecious metal crowns and were embedded in resin blocks. Fracture loads were measured with a universal load testing machine. Fracture areas were evaluated. There was no statistically significant difference in fracture loads among endodontically treated teeth restored with 2 fiber post systems and cast metal posts and cores.

Biomechanical Strains in Bone after Loading Two Different Implant Designs Replacing a Single Posterior Tooth

Cecilia E. Aragón, DDS, MS Postgraduate Prosthodontic Student University of Alabama at Birmingham

Background: Studies to support biomechanics of different implant designs remain sparse. Purpose: To compare the mechanical strain and magnitudes within cortical bone due to vertical and oblique loads applied to 2 implant designs replacing one posterior tooth. Materials and Methods: Cylindrical and tapered implants were loaded in 4 embalmed human mandibles; the microstrain in surrounding cortical bone was measured with strain gauges and was analyzed using an optical measuring system. Results: Anatomic differences resulted in significant variability in strain magnitudes between mandibles. Conclusions: When the implant collar is recessed into bone, higher microstrain magnitudes are noted. Implant threads surrounded by a great quantity of cancellous bone resulted in higher strain magnitudes. Each mandible and relative implant placement demonstrated relatively unique biomechanical loading conditions.

Progressive Anterior Guidance as an Acceptable Occlusal Scheme in Complete Denture Prosthodontics

Igor Chikunov, DDS David Moed, DDS NYU College of Dentistry – Advanced Education Program in Prosthodontics

One goal of prosthodontic rehabilitation is attaining and maintaining healthy tooth contacts. Bilateral balanced occlusion is the recommended occlusal arrangement for complete denture prosthodontics with the primary purpose of improving retention and stability. Anterior guidance is the occlusal arrangement accepted in fixed prosthodontics. This table clinic demonstrates anatomic, monoplane, and lingualized complete denture tooth arrangements set up with progressive anterior guidance. Clinical experience demonstrates progressive anterior guidance is an acceptable alternative in complete denture prosthodontics based on laws of friction and motion.

Tumor Sensitive Human Calmodulin-Like Protein (CLP) In Oral Epithelial Cells

Michael Brooks, DMD Postgraduate Prosthodontic Student Mayo Graduate School of Medicine

Human Calmodulin-Like Protein (CLP) is a calcium binding protein that resembles calmodulin, but interacts with unique target proteins. Rogers et al observed that CLP was expressed in normal breast epithelium and that in cancer a down regulation occurred. The aim of this study was to establish the presence of CLP in oral epithelial tissue for later efforts to study its down regulation in oral malignancies. Oral epithelial tissue was taken from 3 individuals in a double-blind manner, and total RNA was extracted. The samples were reverse transcribed and PCR performed. PCR product bands were cloned and sequenced. The RNA for CLP was found in normal oral epithelial tissue.

The Effects of 3 Denture Cleansers on Color Stability Of Denture Base Acrylic Resins

Nunnapas Wongvoravit Umaporn Theppornprapakorn, Dental Students Sudsukh Thongthammachat-Thavornthanasarn DDS, MS, Instructor Department of Conservative Dentistry and Prosthodontics, Srinakharinwirot University Dental School

The effects of 3 denture cleansers [chlorhexidine mouthwash (C-20), alkaline peroxide denture cleansing solution (Polident), and 1% sodium hypochlorite] on color stability of heat-cured and autopolymerizing acrylic resin were investigated. Data for color change (ΔE) were recorded in CIE L*a*b* system, and analyzed with repeated-measure ANOVA. The effects between 2 acrylic resins, and among 3 denture cleansers and water were statistically significant (P < 0.05). The ΔE values between water and C-20, water and sodium hypochlorite, and Polident and sodium hypochlorite for each group of acrylic resin was statistically significant (P < 0.05). Heat-cured acrylic resin exhibited better color stability than autopolymerizing acrylic resins. Chlorhexidine mouthwash and sodium hypochlorite should not be routinely used with any type of acrylic resins.

Mechanical Analysis of Prepable Ceramic Abutment Assemblies

Nimet Adatia, BMSc, DDS Postgraduate Student UNC School of Dentistry

Prepable zirconia abutments recently were marketed to overcome esthetic problems of anterior maxillary implants. This research is aimed at determining strength of abutment assemblies after clinical reduction. Ceramic abutments (ZirDesign, AstraTech; varying reduction; 1 mm above height-of-contour) were screwed into implant analogs (20 N-cm torque), and loaded to fracture (n = 5/group; Instron, 60°, CHS = 1 mm/min). Fracture loads for "assemblies" with different abutment axial reductions (0 mm = 506 ± 70 N, 0.5 mm = 679 ± 94 *N, 1.0 mm = 502 ± 66 N) were statistically different (*p < 0.05). Assemblies fractured at abutmentanalog interfaces where the abutments were connected to the analog. Assembly failures included yielding of the implant screw as well as ceramic fracture.

The Use of a Diagnostic Matrix in the Management of the Severely Worn Dentition: A Clinical Report *Phuong D. Doan, DDS*

NYU College of Dentistry, Ferencz Post-Graduate Program in Prosthodontics Gary Goldstein, DDS Professor NYU College of Dentistry

The management of the provisional phase of a complete oral rehabilitation in patients with severely worn dentition is often problematic. This table clinic will demonstrate how a clear thermo-forming matrix fabricated from the diagnostic wax-up can be used as a guide to facilitate treatment.

Reconstruction of a Discontinuity Defect in the Mandible using The Procera Milled Titanium Hybrid Superstructure

Douglas Jensen, DDS Postgraduate Prosthodontic Student Wendell Edgin, DDS, MS Department of Oral and Maxillofacial Surgery The University of Texas Health Science Center at San Antonio

This table clinic demonstrates the use of a Procera milled titanium hybrid superstructure in the restoration of a discontinuity defect caused by the wide excision of an odontogenic myxoma from the lower left mandible in a young woman. Advantages in the use of this technology are several; including a very strong one-piece construction; a biocompatible material (titanium); a milled, precision, passive fit; and much less lab work and associated fees. Basic requirements after grafting and implant placement are a verified master cast with soft tissue model and a carefully planed and shaped mockup of the substructure on temporary cylinders. Standard processing is then followed.

Predoctoral Implant Education in U.S. Dental Schools

Behnoush Rashedi, DMD, MSEd, MS Marie Valentine Lim, DMD, MS Assistant Professors University of Pennsylvania The purpose of this survey was to determine the current trends in predoctoral implant dentistry in curricula, course content, and departmental jurisdiction, and to determine what educational techniques and materials are being used by U.S. dental schools. A questionnaire was mailed to the predoctoral implant dentistry director/chairperson of 54 U.S. dental schools. Of these, 38 schools returned the completed survey resulting in a response rate of 70%. Results were evaluated and trends were discussed.

An Indirect Margination Technique for Provisional Crowns

Charles A. Stock, DMD Postgraduate Prosthodontic Student Lackland AFB TX

A technique that enhances visualization and facilitates trimming of provisional restoration margins is described. This technique uses preformed clasp patterns to block out stone dies apical to preparation margins. Steps include: (1) Make an accurate impression of well-retraced tooth preparations and pour in die stone. (2) Trim the stone circumferentially 2 mm apical to preparation margins. (3) Apply Rubber-Sep and acrylic separating medium to the cast. (4) Paint ti-Seal adhesive to the cast apical to preparation margins. (5) Adapt preformed non-tapered RPD clasp pattern to the die so that 1/2 of its thickness is apical to the finish line and the rest is coronal and lateral to the finish line. (6) Reinforce pattern laterally with flash of wax. Fabricate and trim provisional restorations in the usual manner.

Orthodontic Extrusion: A Pre-Prosthetic Solution to a Complex Diagnostic Dilemma

Mauricio C. Carota, DDS Postgraduate Prosthodontic Student Lackland AFB TX

Restoring a damaged tooth where the remaining tooth structure is at the gingival level can be difficult. Both biologic width and the ability to obtain a proper ferrule are often compromised. Non-surgical endodontics and a dowel core restoration are indicated in conjunction with either crown-lengthening surgery alone or a combination of forced eruption followed by crown lengthening. Crown lengthening alone, however, has several disadvantages. Increased crown-root ratio, compromised gingival esthetics (dark triangles), and inappropriate tooth length may result when obtaining adequate clinical crown height. Forced eruption can be used to overcome these shortfalls. Adequate crown height is achieved while providing for an adequate ferrule, a favorable crown-root ratio, and a more esthetic outcome.

A Diagnostic Tool to Aid in Treatment Planning Appropriate Crown Lengthening Procedures Geoffrey L. Gessel, DDS

Prosthodontic Resident, WHMC Lackland AFB TX

Complex prosthodontic cases often require crown lengthening to correct anterior to posterior plane discrepancies and to obtain a crown height needed for retaining restorations. A unique method to obtain predictable results using casts, measurements, radiographs, a diagnostic wax-up, and diagnostic preparations to aid surgery procedures is presented along with an intraoral preparation guide to ensure adequate occlusal reduction for multiple restorations.

The Optical effect of Resin Cement in All-Ceramic Restorations

Seung Heuk Chang, DMD, MMSc Research Fellow; Hans-Peter Weber, DMD, Chair Department of Restorative Dentistry and Biomaterials Sciences, Harvard School of Dental Medicine

Objectives: The purpose of this study was to investigate the effects of the color of luting cement in factors of ceramic thickness and color of the ceramic and an abutment on the final color of all-ceramic restorations. Methods: Three luting cement systems (Relyx ARC: A3, Panvia 21: white, and Nexus 2: yellow) were used. Porcelain specimens were fabricated using IPS Empress system (shade 110 and 310) with 3 thicknesses (0.5, 1.0, and 1.5 mm). The abutment specimens were fabricated with 2 shades of the die material (B1 and A3, 5 mm thickness). The color measurements were performed using a spectrophotometer for the experimental layered samples consisting of the ceramic, the luting cement, and the abutment, and also for control layered samples consisting of the ceramic, a glycerin, and the abutment. The color difference ΔE values between each experimental and control sample were calculated, and ANOVA and Fisher's PLSD multiple comparison test were performed. <u>Results:</u> The mean ΔE values were more than 3.6 (linear value of clinical acceptance) for 0.55 mm thickness of the ceramic, and there was a significant difference between 0.5 mm vs. 1.5 mm and 0.5 mm vs. 10 mm for the ceramic with shade 110 (p < 0.05), and 0.5 mm vs. 1.5 mm for shade 310 (p < 0.05). On the other hand, there was no significant difference on the mean ΔE values between the 2 shades of the abutment used in this study. Panavia had the highest mean ΔE values (6.04 for shade 110 ceramic and 4.43 for 310 ceramic), and there was a significant difference

among the 3 cements (PA vs. NE, p < 0.05) applied for shade 110 ceramic; however there was no significant difference among the 3 cements for shade 310 ceramic. <u>Conclusions:</u> In this study, the final color of the ceramic samples was affected by their thickness, shade, and the color of the luting cement.

A Simple Method of Verifying the Accuracy of a Multiple-Unit FPD

Chang-Shun Ku, BDS President, the Association of Family Dentistry R.O.C.

This method allows the clinician to quickly fabricate an indoor coping and create an accurate stone cast. Fabrication of the coping may be accomplished in the laboratory, thus saving the dental technician time and expense. This method has been used to fabricate copings with both autopolymerizing acrylic resin and visible light polymerizing provisional materials with equal success.

Immediate Loading & Case Control of Full-Arch Implant Reconstruction

Candice Zemnick, DMD, MPH Postgraduate Prosthodontic Student Columbia University

Immediate-placement and immediate-load approaches represent paradigm shits from the original implant protocol and meet current needs of a specific patient population. Two cases will be presented, illustrating the application of immediate loading techniques with interim hybrid prostheses. Patient evaluation and suitability, essential surgical and restorative criteria, and prosthodontic case control will be discussed. The goals of this presentation are to provide a candid view of inherent incentives and difficulties encountered, to share restorative techniques, and to develop an appreciation for the factors involved leading to the final prosthesis. Copyright of Journal of Prosthodontics is the property of Blackwell Publishing Limited. The copyright in an individual article may be maintained by the author in certain cases. Content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.