

ACP 2015

PROSTHODONTICS

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2015 Poster Session

Caroline T. Nguyen, DMD, MS, FACP

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11:30 AM- 2:00 PM

Oceans Ballroom 9-12

1 CE Credit

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 AMERICAN COLLEGE OF PROSTHODONTISTS
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1. 2 Implants in Mandibular Arch - 'To Bar or Not to Bar..?'

Rishabh Acharya, BDS

Second Year Prosthodontic Resident

Rutgers School of Dental Medicine

A consensus statement by McGill University concluded that the placement of 2 implants should be the first choice, especially for the compromised atrophic mandibles. One confusing issue for dentists is choosing the appropriate attachment system for 2 implant over denture cases. The poster describes the rationale & criteria for selecting various attachment systems (connecting bar vs. individual) for 2 implants in the mandibular arch. Selection of the most appropriate attachment system for the patient relates to a variety of factors that must be identified early in the treatment sequence. These factors include the following: Implant angulation, need for support, ability of implants to resist force, restorative space, ease of fabrication / repair & cost.

2. Multiple Implant Failure: Systematic Review of the Literature

Bryce P. Adamson, DDS

Second Year Prosthodontic Resident

University of Toronto (Ontario, Canada)

Purpose: This study aimed to systematically review the published literature on multiple implant failure to identify frequency of occurrence and associated risk factors.

Materials and Methods: Electronic and manual search of literature published up to July 2015 was conducted.

Results: 102 articles were identified with 6 articles meeting inclusion criteria. All were retrospective cohort studies. Possible risk factors for multiple implant failure were smoking, local anatomic conditions, and location (Maxilla).

Conclusions: Multiple implant failure is widely reported in the literature. However, inconsistencies in the definition, low frequency of occurrence, and retrospective nature of the studies make drawing definitive conclusions problematic.

3. Prosthodontics Management of a Total Maxillectomy in a Medically Compromised Patient

Hafiz Ahmed Adawi, BDS

Third Year Prosthodontic Resident

Rutgers School and Dental Medicine

Ahmad Khalid Alhokail, BDS

Advanced Program and Graduate Student Alliance Affiliate

Rutgers School of Dental Medicine

This patient presented at SDM 2006 with High risk for morbidity following total maxillectomy except: tooth: #15 due to maxillary SCC, chemotherapy, radiotherapy and bisphosphonate medication administered for her in 2007, thus extraction or implant placement is contraindicated due to her medical history.

In 2007 the first Pg. Prosthodontic resident at RDSM fabricated a maxillary Partial denture obturator with Perma Soft around tooth: #15. In 2013 tooth #15 was extracted due to extensive caries the retention of the Maxillary obturator reduced. The second resident made a new two-piece obturator because it was difficult to the patient to insert the obturator in the mouth due to the increase of the extension of the obturator in the defect for more retention. After one month patient presented to me at Rutgers school of dental medicine with chief complaint "I can not use the two piece obturator it very difficult to attached them intraoral and it difficult to open my mouth so much to put the denture in. I want one piece obturator".

The proposed treatment was to remake the maxillary obturator, which is hollow inside to decrease the weight of the obturator. Reduce the vertical dimension of occlusion to facilitate the insertion of the obturator. Add posterior extension of the obturator over the soft palate to increase the retention.

4. 3 Dimensional Space Analysis for Fabrication of Implant Prosthesis Substructures: A Guide to Better Laboratory Communication

Ahmed M.R. Afify, DMD

Third Year Prosthodontic Resident

University of Texas Health Science Center at San Antonio

For implant-supported prosthesis, space analysis should be implemented in the diagnostic evaluation before any definitive treatment plan is discussed. With limited restorative space, poorly positioned bars/frameworks could lead to catastrophic failure of the supported structure; furthermore, the reduction of the bar/framework dimensions to "fit" this limited space could increase the load on the substructure and eventually result in a compromised supporting foundation. The purpose of this presentation is to explore four distinct approaches to the space analysis required for substructures, as presented from a 3-dimensional view consisting of the buccal, lingual, and intaglio surfaces. This abstract shall also discuss the advantages and disadvantages to each technique.

5. Revisiting the Shortened Dental Arch Concept: Rehabilitation of a Patient with Fixed Implant Supported Prostheses

Leila Ahmadian Khoshe Mehr, DDS, MS

Third Year Prosthodontic Resident

Nova Southeastern University, College of Dental Medicine

The Shortened Dental Arch (SDA) concept was first described for natural dentition. However, with the increasing popularity of the All-on-4 treatment modality, this concept has been adopted extensively in implant dentistry. It affords dentists the opportunity to provide patients with an evidence-based oral rehabilitation while avoiding complex surgical procedures. A case report of such rehabilitation of a partially edentulous patient with severe periodontitis using the SDA concept is presented. Two different prosthetic approaches were used to provide the patient with implant-supported fixed dental prostheses in order to achieve an optimal esthetic and functional outcome.

6. Shear Bond Strength of Silorane and Methacrylate-Based Composites to Zirconia Ceramic

Golsa Akbarian, DDS

Third Year Prosthodontic Resident (May 2015 Graduate)

Nova Southeastern University, College of Dental Medicine

Aim: To compare the effect of different ceramic surface treatments on shear bond strength of methacrylate-based and silorane-based composite resins to Zirconia ceramic.

Materials and Methods: Sixty 5×5×1 mm³ Zirconia ceramic plates were fabricated using CAD/CAM milling. Specimens were sandblasted and then cleaned with 35% phosphoric acid for 30 seconds. The plates were divided into six groups according to the type of ceramic surface treatment: 1) P90 primer and bonding+ Filtek P90 composite resin, 2) single bond+ Filtek Z250 composite resin, 3) similar to the first group+Silano Pen, 4) similar to the second group+Silano Pen, 5) similar to the first group+ silane treatment, 6) similar to the second group + silane treatment. The specimens were subjected to shear loading with a crosshead speed of 0.5 mm/min. Data was analyzed using one-way ANOVA and Tukey's HSD test ($\alpha = 0.05$).

Results: There was no significant difference in shear bond strength between groups 1 and 5. Group 3 showed significantly higher shear bond strength value compared to the other mentioned groups. In addition, there was no significant difference in shear bond strength between groups 2 and 6, while group 4 showed the highest shear bond strength value among the groups.

Conclusion: Sandblasting and application of phosphoric acid and adhesive system followed by Silano Pen was the most effective surface treatment in terms of bond strength of methacrylate-based composite to Zirconia Ceramic.

7. Internal and Marginal Fit Evaluation of Zirconia Crown Copings Using Different CAD\CAM Systems

Haidar A. Alalawi, BDS

Fifth Year Prosthodontic Resident

Boston University

The study aimed to measure marginal and internal fit of single-unit all ceramic zirconia copings fabricated through three different CAD\CAM systems using microcomputed tomography in vitro. Ten zirconia coping were produced for each experimental group. The study sample manufactured using three CAD/CAM systems according to the manufacturing instructions. Scanning of the model with the coping by SkyScan machine. Standard locations of cross-sections for all specimens were obtained to reduce the errors. One way analysis of variance (ANOVA) and Tukey tests were used. The result shows significant difference in precision of fit of the experimental groups at the axio-occlusal transition area location with statistically significant gap present in DeguDent CAD/CAM System compared to the other Systems. Tukey test result shows statistically significant difference in the marginal gap between DeguDent CAD/CAM System and KaVo Everest Dental CAD/CAM System with P-value of 0.004. Also, there is a statistically significant difference in distal to the midline in sagittal section between The DeguDent CAD/CAM System and Lava™ Ultimate CAD/CAM System with P-value pf 0.002. In Conclusion different levels of adaptation were found in the experimental groups. The different CAD/CAM systems

showed clinically acceptable internal adaptation and marginal fit. Marginal fit shows best adaptation in all experimental groups. Gap present in the axio-occlusal transition area shows variety among the three different groups.

8. A Simple Technique for Selective Relining of Immediate Denture

Omar S. Alburawi, BDS

Third Year Prosthodontic Resident

New York University College of Dentistry

Achieving maximum stability of complete dentures is especially important for atrophic mandibular ridge. The optimum stability can be obtained by having proper border extension and seal to utilize all available surface area. The intimate adaptation between the denture base and tissue surface is also critical in resisting the horizontal placement. In this table clinic, a chairside technique used for obtaining functionally available maximum border extension and support in the existing denture is discussed.

9. Implant Planning in a Reconstructed Mandible

Shelby A. Alexander, DDS

Third Year Prosthodontic Resident

West Virginia University

A 68 year old male presented to WVU Graduate Prosthodontics Clinic with a history of mandibular reconstruction following a traumatic event. The mandible was reconstructed in the area of #24- #31 with plating, posterior Iliac crest grafting, and a forearm free flap. After an acceptable healing period, implant planning was completed to reconstruct the defect with a 5 implant Fixed Dental Prosthesis. Complicating matters was the overall thickness of the free flap and the previous surgical restoration hardware. This poster demonstrates the process for planning and developing a sterilytic bone supported guide to aid in implant placement in the reconstructed mandible.

10. Overlay Dentures for Patient with Ectodermal Dysplasia: A Case Series Over 3 Years

Muayad M. AlFuraih, BDS, MS

Second Year Prosthodontic Resident

Rutgers School of Dental Medicine

An 11 year old female patient presented to Rutgers prosthodontics clinic with a chief complaint of broken maxillary and mandibular dentures. Patient was previously diagnosed with ectodermal dysplasia and complete maxillary and mandibular dentures were inserted. Over the course of 3 years, the dentures have fractured due to ongoing growth pattern. New dentures were constructed and relined with permasoft to compensate for growth pattern and improve retention. Grooves were placed on the lingual and palatal surfaces of the teeth to attain additional retention by the permasoft engaging the grooves.

12. The Use of CAD/CAM Technology to Fabricate Surgical Templates and Immediate Complete Dentures

Mohammad Alhaddad, DDS
Second Year Prosthodontic Resident
Harvard School of Dental Medicine

Computer-aided design/Computer-aided manufacturing (CAD/CAM) technology has been widely used in the field of prosthodontics. Its advancement provides the precision and the accuracy in the fabrication of fixed and removable prostheses. The case presentation describes a method to design and fabricate surgical templates for a pre-prosthetic surgery to remove prominent buccal exostoses and the immediate complete dentures using CAD/CAM technology. The virtual planning allows a precise preparation for the surgery and becomes a blueprint for the virtual denture, which is milled to exact specifications.

13. Effect of the Third Point Reference on the Accuracy of Electronic Pantograph Reading

Lama R. AlJabr, BDS
Second Year Prosthodontic Resident
The Ohio State University

Pantographic tracings have been traditionally used to record various condylar movements in order to customize the fully adjustable articulator for a given patient. The ultimate goal is to record each condylar position in every plane of movement. It has been recommended to utilize the pantographic tracings in setting the articulator for complex prosthetic rehabilitation situations. Several studies have been conducted to evaluate the validity and reliability of the different electronic pantographs. The purpose of this study is to compare the effect of different locations of the third point reference for different articulator systems, on the accuracy of electronic pantographic reading.

14. Limitations of Monolithic Zirconia Restorations: Case Study

Amani S. Alsaery, BDS
Third Year Prosthodontic Resident
The Ohio State University

Fixed dental prostheses were designed and milled in a one-piece zirconia substructure and veneering porcelain was then directly fired onto the substructure. Zirconium oxide is a material that has shown increased popularity in contemporary dentistry. Many studies have shown excellent physical, mechanical, biological, and chemical properties of this material. In this case study a patient was restored with maxillary and mandibular fixed implant supported monolithic zirconia full arch reconstruction.

15. Prosthodontic Rehabilitation of Down's Syndrome Patient: Case Report

Hussain D. Alsayed, BDS
Second Year Prosthodontic Resident
Nasser M. Alqahtani, BDS

Fourth Year Prosthodontic Resident
Indiana University

Down's syndrome patients usually present with hypodontia, periodontal disease, and premature tooth loss and lost of vertical dimension. These patients are often moderate to severe mentally disabled, which add a complexity to the overall dental treatment. There is little information in the literature regarding Prosthodontic rehabilitation in combination with dental implant. Implant assist removable partial dentures is technique and cost effective for carefully chosen Down's syndrome patient. The treatment of a 44-year-old man with Down's syndrome and moderate mental disability by prosthodontic and implant approach will be described and presented.

16. Treatment Acceptance and Dental Phobia: A Case Presentation

Crystal J. Ammori, DDS, MA
Third Year Prosthodontic Resident
University of Michigan

A case study of a seventy-five year old male with a bilateral partially edentulous mandible is presented. Unrestorability of existing four-unit FDP with extraction of distal abutment tooth caused patient to seek prosthodontic rehabilitation. Treatment planning and discussion of removable and fixed prosthetic options indicated patient hesitations with dental treatment. Often treatment plan presentation and acceptance is discussed in reference to a patient's socioeconomic status, gender, race, and/or age. This case presentation evaluates acceptance and treatment with reference to dental phobia.

17. A Survey to Determine If There Is Consensus Regarding the Definition of Centric Relation

Mark Andrawis, DMD
Third Year Prosthodontic Resident
New York University College of Dentistry

The definition of Centric Relation has been both controversial and divisive with little consensus. The latest version of The Glossary of Prosthodontic Terms lists 7 possible definitions which have contributed to the maelstrom. The Academy of Prosthodontics, the author of the Glossary, is currently working on a new edition. To determine if any consensus exists; a survey of fellows attending the May 2015 Business Meeting was undertaken. Of the 83 eligible Fellows in attendance, 72 responded to the survey. This presentation will present the results of that survey.

18. A Study of Comparison of the Marginal Fit of CAD/CAM Crowns Fabricated Using Two Different Materials

Atousa Azarbal, DDS
Third Year Prosthodontic Resident (May 2015 Graduate)
University of Pittsburgh School of Medicine

Objective: This study aims to evaluate the marginal fit of CAD/CAM copings made from Hybrid ceramic (Vita Enamic-Vivadent) and lithium-disilicate (IPS e-max CAD- Ivoclar Vivadent) Cerec blocks and also evaluate the effect of crystallization firing on marginal fit of lithium-disilicate copings.

Method and material: a standardized metal die was fabricated with 1mm wide shoulder finish line and was imaged with CEREC 3 scanner. The coping was designed with CEREC software and that design was used to machine 15 lithium-disilicate and 15 hybrid ceramic copings. Design and milling procedure was held by one operator. The copings were seated on the metal die under standardized pressure using a clamp with pressure of 5.5 lbs. A designed macroscope was used for direct viewing of the marginal gap and 4 surfaces were imaged on each coping (buccal, distal, lingual and mesial). An image analyzing software was used to measure the marginal gap in micrometers in 15 randomly selected points on each surface (overall 60 points on each coping). For lithium-disilicate copings the measurements for marginal gap was made before and after firing. Data were analyzed by paired t-test.

Results: The overall mean difference in marginal gap before and after firing (pre-crystallized and crystallized lithium-disilicate copings) showed that the samples, on average had 65 um increase in marginal gap after firing. This difference was significant ($p < 0.01$). The overall mean difference in marginal gap between the hybrid ceramic and crystallized lithium-disilicate copings was also statistically significant ($p < 0.01$).

Conclusion: This study concludes that crystallization firing cycle can result in significant increase in the marginal gap of the lithium-disilicate CAM/CAM crowns. On the other hand the newly introduce hybrid ceramic material displayed clinically acceptable marginal gaps. The result of this study suggests that the type of material can affect the marginal gap of CAD/CAM crowns.

19. Volumetric Analysis of Soft Tissue Contour Around an Ovate Pontic for Post-Extraction Socket Management

Monjir Bakshi, DMD

Third Year Prosthodontic Resident

Columbia University College of Dental Medicine

This study evaluates the volumetric change in mid-facial soft tissue following insertion of an ovate pontic immediately into a post-extraction socket. Twenty subjects needing extraction of anterior maxillary teeth were recruited. Following extraction, measurements of the buccal plate were recorded. An acrylic provisional with ovate pontic design extending 3mm beyond the gingival margin was fixated to adjacent teeth. Impressions were made prior to extraction, 1 and 3 months follow-up. Casts were optically scanned and superimposed using 3D-CAD/CAM software to provide data on mid-facial volume. Preliminary data suggests validation for the use of ovate pontics in the preservation of tissue esthetics.

20. Multidisciplinary Approach to the Functional and Esthetic Rehabilitation of Amelogenesis Imperfecta with Anterior Open Malocclusion: A Prosthodontic Case Report

Joanna K. Basaya, DDS

Third Year Prosthodontic Resident

University of Illinois at Chicago

Amelogenesis Imperfecta is a rare genetic disease affecting the teeth. Patients usually present with unesthetic and malformed teeth, dentin hypersensitivity, and malocclusion. Approximately 25% of the time, it is accompanied with anterior open bite malocclusion, frequently in hypoplastic type. Treatment of this condition is more extensive and requires a comprehensive and multidisciplinary approach. The aim of this particular case is to address all dental, occlusal, developmental, skeletal, soft tissue and esthetic concerns with a more predictable outcome for a 12-year-old patient adjusting with the dynamics of growth. An interdisciplinary approach with prosthodontic, orthodontic, periodontic and endodontic treatment is applied.

21. Comparison of the Dimensional Stability of Verification Jig Material with Different Materials

Saad Bassas, DDS, DABOI

Third Year Prosthodontic Resident

University of Minnesota

Verification jigs have been introduced and widely used to ensure an accurate transfer of implant position and angulation from the clinical environment to the laboratory setting. This is particularly important to insure a passive fit for the framework, when restoring fixed complete dental prostheses in completely edentulous cases. This in vitro study was designed to evaluate the dimensional changes of various materials/methods used in fabricating verification jigs and the effects on the passive fit. A microscope was used to evaluate the accuracy of the transferred implants with a milled titanium bar that was made from the controlled master cast.

22. Novel Nano-Ceramic Coating on Polymethyl Methacrylate Denture Base Material

Randold A. Binns, DMD, DDS

Second Year Prosthodontic Resident

University of Illinois at Chicago

Polymethyl-Methacrylate (PMMA) resin is widely used as denture material. However, it lacks wear resistance and its hydrophobic porous surface is susceptible to retention of microorganisms. Nano-ceramic coating is proposed to eliminate these drawbacks while still retaining the favorable mechanical and physical properties. In this study TiO₂ films were deposited on PMMA resin by ALD method in a thickness of 10, 30, or 60 nm. Results showed that nano-TiO₂ coating renders PMMA surface more hydrophilic and less porous than PMMA. Through TiO₂ coating, it is very promising to increase the wear resistance of PMMA and reduce the retention of microorganisms.

23. Interdisciplinary Management of a Partially Edentulous Patient

Michele Buda, DDS

Second Year Prosthodontic Resident

University of Washington

Orthodontic therapy is a valuable tool to improve prosthetic outcome, from simple cases to full mouth rehabilitations. One of the most critical factors to increase efficiency of orthodontic treatment is the use of osseointegrated implants to obtain stable anchorage. Provisional restoration placed on implants can facilitate orthodontic movement and restore occlusal function.

An orthodontic setup is required to determine post-orthodontic position of the teeth as well as the implant supported restorations. A technique to transfer implant position in initial patients cast and realize an accurate surgical guide will be illustrated.

24. Full-Mouth Implant Supported Rehabilitation with Milled Zirconia Hybrid Prostheses: A Novel Technique Using an Acrylic Prototype to Improve Accuracy

Hamad Burashed, DMD

Second Year Prosthodontic Resident

Harvard School of Dental Medicine

The full arch hybrid prosthesis supported by dental implants is a treatment option to treat edentulous arches. Zirconia can be used as the hybrid material of choice. A 90-year-old male patient presented with seven maxillary and eight mandibular implants. The poster presents a technique and treatment workflow to fabricate a zirconia hybrid prosthesis. An acrylic prototype hybrid was first fabricated to establish and adjust the occlusion of the patient. After the esthetics, phonetics, and occlusion of the patient were verified by the prototype, the prototype was scanned and milled into a monolithic zirconia framework for final adjustment and delivery.

25. Evaluation of Accuracy of Full Arch Printed Models

Catherine G. Cagino, DDS

Third Year Prosthodontic Resident

Nadia A. Basha, DDS

Second Year Prosthodontic Resident

University at Buffalo

Objective: To evaluate accuracy of full arch printed models.

Methods: Typodont model was scanned with 3shape TRIOS[®]. Ten models were printed by ProJet-3510 MP using VisiJet[®] Pearlstone, PS200 Plastic Material. Stone bases and silicone jigs were fabricated to orient the typodont and printed models in the same position. Digital pictures were taken in frontal, lateral and occlusal views. ImageJ software was used to measure 16 defined linear measurements and one area on the pictures by two examiners. T-tests compared measurements ($\alpha=0.05$).

Conclusions: There were no significant differences between printed models and typodont models for linear measurements or area measurement ($p>0.05$).

26. A Novel Approach to Reinforcement of Oral Hygiene in the Non-Compliant Dental Implant Patient

Nathan E.B. Cain, DDS

Second Year Prosthodontic Resident

Montefiore Medical Center

Daily Oral hygiene may be as important for dental implants as for natural dentition. Professional evaluation and maintenance of peri-implant tissues and plaque control is recommended at routine intervals. Chronically non-compliant implant patients present increased risk for hard- and soft-tissue complications. Therefore, we will present a novel method for reinforcement of daily oral hygiene and plaque control for non-compliant implant patients with various prosthetic restorations. This technique will provide individually customized visual cues aimed at prompting appropriate homecare and professional follow-up.

27. Obturation of Cleft Palate in Conjunction with Rapid Palatal Expander Treatment

Jessica E. Canallatos, DDS, BS
Second Year Prosthodontic Resident
West Virginia University

Optimal management of cleft palate patients routinely involves the need for an interdisciplinary approach to care. Nowhere is this more evident than in the pediatric cleft palate patient. This poster demonstrates successful obturation of an eight-year-old female cleft palate patient as they advanced through orthodontic treatment to eventual surgical closure. Orthodontic treatment such as rapid palatal expansion, due to its continuing effect on palatal width, interfered with the patient's existing obturator function necessitating continual modification to the obturator. Successful obturation of the defect is presented to demonstrate the effectiveness of treatment.

28. Interim Prosthodontic Treatment of a Patient with Ectodermal Dysplasia: A Case Report

Juliana Castro Lapeira, DDS
Third Year Prosthodontic Resident
University of Michigan

Ectodermal dysplasia is a group of syndromes that derive from abnormalities of ectodermal structures. One of the common structures affected are the oral tissues, causing multiple tooth abnormalities. A 16-year-old partially edentulous male with ectodermal dysplasia presents to the Prosthodontic Clinic at the University of Michigan after completing orthodontic treatment. The patient's definitive treatment plan, which will be delayed due to incomplete growth, will consist of implant supported crowns, a partial removable dental prosthesis, and a tooth assisted overdenture. An interim treatment plan will be utilized to give the patient function and esthetics during this growing period.

29. Diagnosis, Fabrication, Immediate Complete Fixed Detachable Conversion, and Immediate Milled Provisional Complete Denture Delivery: A Single Stage Digital Approach

Jyme Rae Charette, DMD
Third Year Prosthodontic Resident
University of Louisville

Digital technology is taking the dental field by storm. The world of cone beam radiographic acquisition, digital wax-ups, 3D printing, and milling are influencing the way prosthodontists obtain diagnostic data, treatment plan, and fabricate prostheses. Therefore, it also influences the way our patients experience dental treatment.

By choosing the digital pathway for this patient, I learned about the limitations and benefits of the technology currently being utilized. Thus, I was able to maximize both mine and my patients benefits by using digital pathways to diagnose, fabricate, convert, and deliver his full arch provisional restorations in just two appointments.

30. A Retrospective Analysis of Immediately Loaded Implants Concurrently Placed in Full Mouth Rehabilitations

Robert H. Choe, DMD
First Year Prosthodontic Resident
University of Maryland

There are numerous studies in the literature that examine the effects and survivability of immediately loaded implants and implant supported prostheses in either arch. However, there have been few to no studies that have examined when both arches are concurrently loaded. The goal of this analysis study was to critically evaluate the effects of receiving simultaneous full arch rehabilitation of the maxilla and mandible using immediately loaded implant-supported prostheses. It specifically examines the overall implant and prosthesis survival rates of each patient.

32. When Is a Removable Dental Prosthesis Indicated Instead of Implants?

Andrew N. Dill, DDS
Second Year Prosthodontic Resident
Nuntaporn Rojanasakul, DDS
First Year Prosthodontic Resident
University of Michigan

A 67 year old female presented to the University of Michigan Graduate Prosthodontics clinic with a failing fixed dental prosthesis from #6-11 and was interested in implants as a replacement. Radiographically and clinically, vertical bone loss was significant. Due to high esthetic expectations from the patient implants would not be able to successfully reproduce hard and soft tissue contours optimally. A traditional rotational path RDP was fabricated with an anterior /posterior seating design in cobalt-chrome. The amount of soft tissue replaced by the removable partial denture allowed an improved esthetic and functional result over an implant retained fixed partial denture.

33. Attachment Issues?

Michael Donovan, DMD
Third Year Prosthodontic Resident
New York University College of Dentistry

Overdenture attachments can be connected to the prosthesis by two techniques: chairside or laboratory attachment. Chairside connection involves extensive relief of the denture's intaglio surface until the prosthesis fits passively over the matrix system. Then, an autopolymerizing PMMA resin transfers the location of the matrix to the denture. In laboratory connection, the matrix is connected to a rigid framework on the analog master cast and the assembly becomes a "verification jig". This technique can allow for a more accurate interocclusal record and facilitate prosthesis delivery. This treatment modality has been used successfully for both tooth and implant retained/supported prostheses.

34. Use of Soft Tissue Stent to Maintain Vestibule Post Fibula Reconstruction of Maxilla

Andrey Doroshenko, DDS

Second Year Prosthodontic Resident

University of Maryland

Free flap reconstructions of surgical defects are associated with excessive soft tissue. The tissue presents a problem for the restorative dentist. A gunshot victim presents to University of Maryland Prosthodontic clinic, post free fibula reconstruction of maxilla. Four Camlog implants were placed, into the reconstructed site, and osseointegrated, prior to initial visit. An impression was made during the time of vestibuloplasty and skin graft. A soft tissue stent was fabricated and delivered, engaging the implants, to maintain the vestibule during healing.

35. The Impacts of Partial Removable Prostheses on the Oral Cavity

Askhan Ebrahimpour, DDS, MSc

Third Year Prosthodontic Resident

University of Toronto (Ontario, Canada)

With increasing access to dental care in recent years, people are retaining more teeth. As a result, the rate of partial edentulism is increasing compared to complete edentulism. Removable partial dentures (RPDs) are one of the several treatment modalities to address partial edentulism in patients. A well-designed removable partial prosthesis can possibly serve as an excellent alternative to fixed tooth-supported or implant-supported prostheses. What is more, there are situations where financial circumstances of patients, systemic diseases or local conditions impedes fixed treatment options.

The aim of this study was to review the literature regarding the impact of partial removable prostheses on plaque accumulation.

36. Implant Abutment Placement Overview

Rami M. Elrefai, BDS

Third Year Prosthodontic Resident

Georgia Regents University

Implant abutment placement is always critical for successful treatment. Abutments are available in different shapes and placing it in correct orientation can be challenging. Different techniques can be used to accurately place the implant abutment in the exact position as on the master cast. Abutment placement jig can be fabricated to aid in proper abutment orientation. Combining the concepts of cement and implant supported prosthesis can also be used to accurately seat the abutments. The purpose of this presentation is to review different techniques that can be utilized to accurately place implant abutment intraorally in challenging clinical situations.

37. Detection of Periapical Radiolucencies in Endodontically Treated Teeth on Dental Cone Beam C. T. Scans

Sherman Farahani, DDS

Third Year Prosthodontic Resident

New York University College of Dentistry

Goldstein *et al.* have previously reported that the three dimensional imaging modality of Computed Tomography (CT scan) reveals radiolucencies that would not be apparent on the dental radiograph. Currently, the most common modality of three dimensional dental imaging is Cone Beam Computed Tomography (CBCT), which has been specifically designed for dento-maxillofacial imaging. As such, it is important to investigate the CBCT modality of dental imaging in terms of its ability to identify periapical radiolucencies that would otherwise not be visible in routine two dimensional dental imaging. Here we report cases comparing the CBCT modality of dental imaging in terms of ability to identify periapical radiolucencies versus two dimensional periapical radiographs around previously endodontically treated teeth.

38. Soft Tissue Molding with Screw-Retained Restorations: A Clinical Report

Firas Mourad, DDS, MS

Second Year Prosthodontic Resident

University of Alabama at Birmingham

Emergence profile development for an implant restoration is a key factor in the establishment of optimum esthetic and healthy peri-implant soft tissue results. Screw-retained PMMA provisional were fabricated on the model of three adjacent implants with careful control of both contour and surface finish. The provisional restorations were modified every 2-3 weeks until the desired contour was achieved. The final impression, made after 8 weeks, demonstrated gingival morphology conducive to health and esthetics and was easily scanned to design accurate custom prosthetic restorations. Staged soft tissue molding seems to provide optimum results.

39. Digital Dentistry and Digital Restorative Materials in Full Mouth Reconstruction

Sergio Florencio, DDS

Third Year Prosthodontic Resident

Harvard School of Dental Medicine

All ceramic systems were introduced as an alternative to metal-ceramic restorations in 1967, and since then, many metal-free restorative materials have been introduced in the market. The development of CAD/CAM-based restorative systems has standardized the prosthesis fabrication with high strength materials, making quality control more efficient. This case report demonstrates the application of combined conventional and digital treatment workflows to completely rehabilitate a severely worn down maxillary dentition with a loss of vertical dimension of occlusion. The prototype, which was virtually designed and milled, served as a provisional and blueprint for the final restorations.

40. Novel Application of a Splint to Transition from an Occlusal Tragedy to a Comfortable Provisional Occlusion

Ricardo J. Galindo, DDS

Third Year Prosthodontic Resident

University of Alabama at Birmingham

Transitioning from a debilitated occlusion toward a functional and comfortable outcome is often challenging to the medically compromised patient due to extensive and time-consuming procedures that are often required. In this case presentation, the use of a splint to efficiently transition the patient's occlusion with short appointments is demonstrated. The splint allowed for rapid placement of an immediate denture with minimal prosthetic procedures to the opposing arch following surgery to rapidly transition to post-operative recovery. Later the splint allowed for a stepwise prosthetic rehabilitation of the opposing arch without undue stress. Proper sequencing is essential for a successful outcome.

41. An Investigation of the Effect of Multiple Uses of Stock and Modified 3i Pick-Up Impression Copings on the Accuracy of Transfer of Implant Position, Angulation, and Rotation

Francisco Gallardo, DDS

Third Year Prosthodontic Resident

UTHSCSA/AFPDS

The purpose of this research was to examine the effect of re-sterilization and re-use of impression copings upon the accuracy of implant impressions. Impression coping modifications such as airborne-particle abrasion and VPS adhesive application also were included to simulate common clinical conditions. A coordinate measuring machine was used to determine changes in position, rotation, and/or angulation of dental implant analogs through 30 cycles of impression coping re-processing and re-use. Resultant data provided information regarding the number of times impression copings may be re-sterilized, re-treated, and re-used before impression accuracy is significantly impacted.

42. Peri-Implant Tissue Management from A to Z: A Clinical Case Report

Sabrina S. Garcia-Gazau, DDS

Third Year Prosthodontic Resident

University of Michigan

Replacement of multiple missing teeth in the aesthetic zone is challenging particularly when the three dimensional architecture of the existing bone and soft tissue is deficient. Adequate management of peri-implant structures should start even before implant placement. Bone structure enhancement, soft tissue enhancement, precision in implant placement, and quality of the prosthetic restoration are fundamental factors for success. This poster presentation illustrates the treatment of a patient from the time of the extractions until the delivery of the definitive restoration.

43. Pink Esthetic Scores in the Assessment of Dental Implant Esthetics: A Systematic Review

Robert K. Gazdeck, DDS

Second Year Prosthodontic Resident

University of Illinois at Chicago

The Pink Esthetic Score (PES) provides an objective, quantifiable measure of peri-implant tissue parameters in defining dental implant esthetics. This investigation systematically evaluated the results published using the PES method since 2005. Twenty-nine prospective studies of greater than 1-year duration were identified as including PES measurements along with three co-variables; material of abutment or crown, surgical placement method, and time of loading. Over relatively short periods (1 – 2 years), PES scores appear to be stable within studies. Different co-variables have been reported, yet few appear to dramatically influence PES scores other than grafting procedures that directly influence soft tissue form.

44. Milled PMMA Resin-Bonded Fixed Dental Prostheses Used as Interim Restorations in the Management of Congenitally Missing Lateral Incisors

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Second Year Prosthodontic Resident

University of Texas Health Science Center at San Antonio

Treatment approaches for replacing congenitally missing lateral incisors fall into four broad categories: autotransplantation, canine substitution, tooth-supported restoration and implant-supported restoration. Management of interim restorations during the healing period for implant-supported options can be complex, especially when multiple surgical interventions are required. The purpose of this poster presentation is to demonstrate the use of CAD/CAM resin-bonded PMMA fixed dental prostheses as an alternative to Essix retainers for provisional restoration during implant site preparation healing. In this case study, site development included guided bone regeneration with the use of block graft harvested from the chin, followed by implant placement 4 months later. Milled PMMA fixed interim restorations significantly enhanced the patient's acceptance, function, and aesthetic outcome while facilitating post-surgical tissue management and pontic site development.

45. An Exceptional Case of Severely Worn Dentition: Provisional Management

Evan Grodin, DMD

Third Year Prosthodontic Resident

University of Texas Health Science Center at San Antonio

Patients with severe wear often require comprehensive rehabilitation of the affected dentition. In order to optimize the final outcome, the diagnostically guided esthetic and occlusal design must be evaluated and tested. This testing occurs at various points throughout the rehabilitation process, but one critical step includes the provisional restorations. Provisional restorations help the patient and provider plan the final restoration, aid interocclusal record making, and provide stability throughout treatment. This poster demonstrates three provisional techniques used during the rehabilitation of an exceptional case of severely worn dentition: conventional acrylic, cast base metal, and CAD/CAM base metal.

46. A Review of the US Dental Faculty Shortage Crisis and Creative Solutions

Tien M. Ha-Ngoc, DMD

Second Year Prosthodontic Resident

University of Illinois at Chicago

Faculty shortage is not new to dental education in the United States. While the number of vacant positions has varied during the last 20 years, the trend still indicates a shortage. Fewer graduates are interested in academia; the discrepancy between private practice and faculty salaries is increasing; and faculty members are retiring. Faculty, students, and residents as well as the profession are negatively affected. Short and long-term solutions such as faculty development, financial incentives, early exposure to academia, and improved teacher recognition must be considered and adopted by individual schools as well as nationally in order to address this crisis.

47. Prosthetic Complications of Implant-Supported Full Arch Prostheses: A Comparison of Metal-Acrylic, Copy-Milled Zirconia, and Cementable Crown Prostheses

Virginia L. Hogsett, DMD

Third Year Prosthodontic Resident

University of Illinois at Chicago

Our aim is to evaluate the complication rates for three types of implant-supported full arch prostheses (metal-acrylic, milled zirconia, and cementable crowns) delivered in the UIC Prosthodontics program with at least one year follow-up. We hypothesize that metal-acrylic prostheses will have the most complications but the fewest catastrophic failures. Medical records will be reviewed for complications and patient-directed concerns. Patients will then be recalled for assessment of prosthetic complications and administration of OHIP-49. Interviews will be conducted following a pre-written script. A Kruskal-Wallis analysis will be used to assess complication rate, and OHIP will be assessed using ordered logistic regression.

48. Challenges in Management of an Anterior Marginal Mandibulectomy Patient with an Implant-Supported Fixed Prosthesis: A Clinical Report

Jessica K. Hsieh, DDS

Third Year Prosthodontic Resident

University of Connecticut

Patients having undergone anterior marginal or segmental mandibulectomy with iliac crest graft reconstruction are often faced with many esthetic and prosthodontic challenges. This clinical report describes the prosthodontic management of a 62-year-old male patient following an odontogenic keratocyst diagnosis and subsequent marginal mandibulectomy involving the anterior mandible. Prosthodontic challenges unique to this patient included tissue overgrowth, alloderm graft complications, attaining appropriate mandibular lip support and optimal hygiene contours for the prosthesis. The importance of patient education, inter-disciplinary education, implant placement in the anterior region, and esthetic considerations during mandibular reconstruction are discussed.

49. Prosthodontic Management of Patients with Ehlers-Danlos Syndrome

Wissanee Jia-mahasap, DDS
Second Year Prosthodontic Resident
University of Iowa

Ehlers-Danlos Syndrome (EDS) is a heterogeneous inheritable connective tissue disease. It may be manifested in various degrees including skin hyperextensibility, delayed wound healing with atrophic scarring, joint hypermobility, easy bruising, and generalized fragility of the soft connective tissues. Oral findings may include enamel hyperplasia, irregular dentin structure, abnormal root morphologies and pulp stones. In this case report, we will present a patient with EDS and review prosthodontic rehabilitation for these patients.

50. The Effect of Cyclic Loading on the Zirconia/Titanium Implant Abutment Interface

Geoffrey R. Johnston, DDS
Second Year Prosthodontic Resident
The Ohio State University

The one piece zirconia abutment was produced to help the clinician overcome esthetic challenges of titanium custom abutments. This esthetic abutment option presented with many complications over time which included fracture and excessive wear. The titanium/zirconia abutment was created to give us the best esthetics with a titanium to titanium interface with the implant. Some failures have been noted clinically at the titanium to zirconia interface within the abutment itself. Study was performed to determine the effect of cyclic loading at this interface.

51. Digital Workflow for CBCT Treatment Planning and Guided Surgery of the Partially Edentulous Jaw

Jesse Kane, DDS
Second Year Prosthodontic Resident
University of Michigan

Implant supported fixed restorations in a partially edentulous jaw require precise treatment planning. This includes incorporation of the remaining dentition and desired tooth position with anatomic structures including: alveolar bone, maxillary sinuses and mandibular nerve canal. The utilization of a

CBCT scan that has been integrated with digital scans of diagnostic gypsum models allows for restoratively driven implant positioning within the confines of anatomic limitations. This information can then be transferred to a 3-D printed implant surgical guide to ensure ideal location and angulation. A patient treatment is presented that applies this workflow in the maxillary jaw.

52. Prosthetic Considerations for Patients with Fibrosis of the Lips

Yu Kato, DDS

Second Year Prosthodontic Resident

Stony Brook University

Fibrosis of the lips is characterized by limited mouth opening, also known as microstomia. Etiology includes burn injuries, radiotherapy, and systemic diseases such as Scleroderma and Epidermolysis Bullosa. Limited dental treatment options for patients with those conditions can be challenging to both patients and clinicians. As such, proper education and preventive dental care are crucial for the preservation of oral health and quality of life for patients.

Clinical findings, complications, and treatment modalities including modified impression techniques, and specially designed prostheses for patients with fibrosis of the lips are presented.

53. Clinical and Histologic Outcomes of Socket Grafting After Flapless Tooth Extraction: A Systematic Review of Randomized Controlled Clinical Trials

Florian R. Kernen, DrMedDent

Second Year Prosthodontic Resident

University of Connecticut

Several biomaterials have been reported for socket grafting but the evidence for clinical and histologic outcomes with different types of materials in flapless extraction is not clear. Existing literature have all combined data on flapless extraction and surgical extractions. This poster describes the findings of our recently published systematic review on 32 RCTs focused exclusively on flapless extraction of teeth. Results were analyzed to determine which graft material results in the least loss of socket dimensions, maximum amount of vital bone, least remnant graft material, and the least amount of connective tissue after a minimum of 12 weeks of healing.

54. Use of Digital & 3D Printing Technologies for Managing Maxillofacial Prosthetic Patients Undergoing Cancer Therapy

Seyedeh Parisa Kheirieh, DDS

Third Year Prosthodontic Resident

New York University College of Dentistry

Management of Maxillofacial Patients undergoing cancer therapies requires clinician's ability to readily fabricate and modify according to the patients' needs. These patients are often subjected to multiple treatment modalities including surgical resection, chemotherapy, and/or radiation therapy that result in

significant tissue changes. Making multiple impressions for fabrication of different types of obturators may not be always possible due to difficult physical conditions of patients. The advent of Cone Beam Computed Tomography (CBCT) technology has been a major improvement in imaging modality for designing of prostheses. A printed physical model can be manufactured from CBCT data for this purpose. This table clinic demonstrates use of the CBCT data and 3D printing technology for patients, who underwent surgical resection therapy. The purpose of the presentation is to show the novel digital workflow for these patients.

55. Comparison of the Dimensional Stability of Verification Jig Material with Different Setting Times

Jason Kiangsoontra, DDS

Third Year Prosthodontic Resident

University of Minnesota

Verification jigs have been introduced to ensure an accurate transfer of implant position and angulation from the clinical environment to the laboratory setting. This is particularly important when restoring fixed complete dental prostheses in completely edentulous cases. This bench-top study was designed to evaluate the dimensional changes of an auto-polymerizing resin used in fabricating verification jigs and the effects of different setting times and sectioning. A microscope was used to evaluate the accuracy of the transferred implants with a milled titanium bar that was made from the controlled master cast.

56. Verifying the Seating of the Computer-Generated Implant Surgical Guide

Se Jong Kim, DMD

Third Year Prosthodontic Resident

University of Maryland

CAD/CAM technology allows us to plan and execute the prosthetically driven implant surgery accurately through computer generated guide. It is less traumatic to the patient as well because it can be flapless and reduces the length of the surgery. However, even guided surgery is not without its complications because the accuracy of the surgery with the template-guided treatment depends on the accurate seating of the template. This poster will review the literatures regarding the clinical technique of how to verify the seating of the computer generated guide and present a template-guided treatment with a use of that technique.

57. Molar Autotransplantation Using Reverse-Engineered Surgical Template and Rapid Prototyping Tooth

JaeYoung Kim, DDS

Third Year Prosthodontic Resident

Harvard School of Dental Medicine

Tooth autotransplantation has been documented as a viable option to treat partial edentulism. With advancement of CAD/CAM technology, sound and non-functional teeth can be relocated to an edentulous area where the osteotomy is precisely prepared by a 3D printed surgical template.

This poster presents a surgical and prosthodontic protocol to treat a 16-year old patient who undergoes further skeletal growth. The virtual planning of the osteotomy follows the root morphology of the extracted teeth to achieve the stability and function of the autotransplanted teeth. 3D rapid prototype teeth minimize the surgical intervention and extraoral preparation time of autotransplantation.

58. Prosthodontic Treatment Modalities in Patients with Ehler Danlos Syndrome (EDS): A Case Report and Literature Review

Konstantina Angelara, DDS
Second Year Prosthodontic Resident
University of Washington

Ehler Danlos Syndrome (EDS) is a connective tissue disorder characterized mainly by joint hypermobility, skin elasticity and tissue fragility. Its prevalence is estimated to be about 1 in 5,000 births.

The oral manifestations of various types of EDS include hard tissue defects of teeth, stunted or dilacerated roots, pulp stones, high incidence of teeth fractures, periodontal disease, fragile and sensitive mucous membrane. These factors are likely to complicate dental treatment and especially prosthodontic and implant dentistry.

Objective: The objective of this poster presentation is to review the literature and to address the different treatment modalities for patients with EDS.

59. Multidisciplinary Approach to Sculpting a Smile with Implants: A Case Report

Aditi A. Kulkarni, BDS
Third Year Prosthodontic Resident
Nova Southeastern University, College of Dental Medicine

The distinctive nature of every smile breeds a challenge in achieving the desired esthetic and functional outcome when replacing missing oral structures. A multi-disciplinary restoratively-driven treatment approach is presented for a patient with congenitally missing maxillary lateral incisors and very high esthetic demands. The treatment involves a comprehensive diagnostic work up, orthodontic treatment, guided implant placement, surgical crown lengthening, soft tissue grafting and insertion of definitive restorations after soft tissue molding via provisionalization. This approach emphasizes the integration of sound biological principles with the execution of the desired end result at every treatment phase.

60. Assessment of the Changes in Retention and Surface Topography of Unsplinted, Solitary Abutments and Attachments in Maxillary Four Implant Retained Complete Removable Overdentures

Hsin Yu Kuo, DDS
Third Year Prosthodontic Resident
Columbia University College of Dental Medicine

The purpose of this *in vitro* study was to investigate the change in retention and wear characteristics of solitary abutments (Locator, GPS) and attachments (Locator) in maxillary four implant retained complete removable overdentures with different implant angulation. Zero, 15 and 30 degree implant angulations were designed and tested through the aging cycles of 1, 2.5 and 6 years of use. Scanning electron microscopy was used to examine surface changes of the components.

61. Prosthodontic Rehabilitation of a Patient with Mild Form of Scleroderma

Thomas L. Kwun, DDS

Second Year Prosthodontic Resident

University of Michigan

A 23 year old female with a medical history of CREST syndrome, a mild form of scleroderma, was referred from the Oral and Maxillofacial Surgery service following full mouth extraction. CREST syndrome exhibits fibrosis of connective tissues of the body with hardening and inability of normal function in various organs. Complicating the treatment was the limited mouth opening of 25mm. A sectional tray impression technique was employed to acquire the master cast. The final prosthesis was lined with thermoplastic material in posterior half. Thermoplastic material was used specifically to compensate for limited mouth opening. The poster describes the unique prosthetic treatment challenges of treating a patient with history of scleroderma.

62. Using an MK1 Attachment in a Two Piece Partial Removable Dental Prosthesis

Eldon M. Lamb, DDS

Third Year Prosthodontic Resident

UTHSCSA

Following the loss of two endosteal implants, this 67-year-old healthy male patient presented with a sizeable alveolar defect in the anterior mandible. While a removable prosthesis was preferred, the lingual angulation of the remaining mandibular teeth would have necessitated a labial bar major connector. An alternative treatment modality was developed whereby a two-piece prosthesis was fabricated taking advantage of two separate paths of insertion. The two parts were attached using an MK1 piston attachment which provided excellent retention and esthetics.

63. Repair of an Implant-Supported Metal-Acrylic Fixed Complete Dental Prosthesis with Milled Zirconia Molars: A Novel Approach

Evangelia Lampraki, DDS

Second Year Prosthodontic Resident

University of Rochester

Metal-acrylic Implant-Supported Fixed Complete Dental Prostheses (IFCDP) have become very popular among the treatment options for complete edentulism. The most common technical complication of this prosthesis is the fracture/wear of the veneering material, which is more prevalent in bruxers and when

antagonist materials have different wear rates. Customizing acrylic resin teeth has been suggested as a solution. Y-TZP has shown superior mechanical properties compared to other ceramics. The purpose of this case report is to describe the clinical and laboratory steps of repairing fractured acrylic teeth on a metal-acrylic IFCDP in a bruxer patient, using custom milled zirconia molars.

64. Student and Faculty Perspectives on the Effectiveness of Digital Impression Systems as a Teaching Tool for Crown Tooth Preparations

Sarah K.Y. Lee, DDS

First Year Prosthodontic Resident

University of North Carolina

Objectives: This study examined the effectiveness of digital impressions as a teaching tool in Fixed Prosthodontics.

Methods: Students and faculty were surveyed on their understanding and teaching experience of tooth preparations following conventional teaching methodologies. After imaging and analyzing a tooth preparation using a digital impression system, another survey was completed assessing the perceptions of utilizing digital impressions as a teaching tool.

Results: Survey results revealed unanimous improvements in understanding the major concepts of crown tooth preparations and the teaching experience with digital impressions.

Conclusions: The incorporation of digital impression technologies can be useful and effective in fixed prosthodontic education.

65. The Fabrication of an Acrylic Repositioning Stent for Use During Intensity Modulated Radiation Therapy (IMRT): A Feasibility Study

Vincent S. K. Lee, DDS, BSc

Third Year Prosthodontic Resident

University of British Columbia

Objective: To assess the feasibility of direct intraoral customization of an acrylic repositioning stent for use during Intensity Modulated Radiation Therapy (IMRT) for oral and oropharyngeal carcinomas.

Materials and Methods: 10 head and neck cancer patients were recruited at the BC Cancer Agency. Informed consent was obtained. Stent wax patterns were created and processed in clear heat cured acrylic. QoL and Saliva to be assessed through a follow-up period of 3 months post-IMRT. Patient stability measurements obtained from daily setup data.

Results: Project in progress. Preliminary stability data demonstrates <0.8mm of variation in any axis.

66. Planning Considerations for Maxillary Full Arch Guided Surgery

Christine Lee, DMD

Second Year Prosthodontic Resident

Harvard School of Dental Medicine

New technological innovations in guided surgery can help surgically-trained prosthodontists plan restoratively-driven implants through virtual visualization. This presentation includes two cases, both involving eight maxillary implants. The planning was completed with Codiagnostix software, using an overlay of the DICOM file of the patient's CT-scan and STL file of a diagnostic wax-up. Implant placement was completed according to the Straumann guided protocol, utilizing a 3D printed surgical drill guide. This presentation will compare the planning considerations between the two cases, and discuss the benefits and limitations of guided surgery for the prosthodontic practice.

67. The Influence of an Occlusal Access Hole and/or Basal Denture Tooth Surface Relief on Fatigue Fracture Load of SR Ortholingual DCL (BlueLine) Denture Teeth: A Follow Up Study

Lydia Legg, DDS

Third Year Prosthodontic Resident

University of Florida

Using a chewing simulator, six sample groups are put under an occlusal load (each sample having a different modification to the denture tooth). Variable 1: occlusal access hole cut through the denture tooth, sealed and loaded as done in clinical situations for implant supported fixed complete dentures. Variable 2: relief of the denture tooth on the basal surface (1mm and 2mm), as if often done in the clinical environment. The goal of using these two different variables (both combined and individually) will be to see what their effects are on the fatigue fracture load of SR Ortholingual DCL denture teeth.

68. Comparison of Fabrication Methods for FDP Framework Utilizing a Digital QA Process

James C. Lish, DDS

Third Year Prosthodontic Resident

Naval Postgraduate Dental School Bethesda MD

FDP framework design, materials and manufacturing methods continue to evolve in modern practice. Ceramic metals continue to play a vital role in esthetic FDP framework design due to their ability to function with minimal cross-sectional areas in the connectors. Despite the high fracture toughness and modulus of elasticity of other material options, the ability to develop completely natural gingival and incisal embrasure forms while still maintaining adequate cross-sectional areas for connector strength is difficult, if not impossible, in some cases.

As CAD-CAM fabrication options are becoming increasingly accurate and predictable, clinicians have greater workflow options at their disposal. In partial or complete digital workflows, digital methods to analyze the fit of the restoration without the physical dies are very helpful.

Four manufacturing processes of a 6-unit FDP are highlighted, to include: selective laser melting (SLM) of noble alloy, CAD-Wax and casting technique of noble alloy (without soldering), and 5-axis mill of CR-CO alloy, and 5-axis mill of green-state zirconia.

Analysis will utilize a digital quality assurance (QA) process via comparative scan data following desprueing to assess the unadjusted intaglio accuracy of the framework to the digital fabrication proposal. Physical samples and original scanned cast will be available for visual comparison.

69. Fatigue Resistance of Various Thicknesses of Lithium Disilicate Occlusal Veneers Luted to Enamel and Dentin Substrates

Michael R. Lituchy, DDS, BS
Second Year Prosthodontic Resident
Columbia University College of Dental Medicine

As the aged population grows the demand to treat the worn dentition will increase. Previously, these teeth involved aggressive full coverage restorations. Advances in minimally invasive prosthetic principles allow us to restore worn posterior teeth with occlusally bonded lithium disilicate (Li Di) veneers. The purpose of this *in vitro* study is to investigate the fatigue resistance of CAD/CAM Lithium Disilicate (LiDi) occlusal veneers adhesively luted to enamel compared to dentin at veneer thicknesses of both .7mm and 1.5 mm. Specimens will be evaluated using a chewing simulator and subjected to 100,000 cycles at 3,6,9 and 12 kg loads. Specimens may also be subjected to static loading until failure. Modes of failure will be analyzed using SEM and stereomicroscopic evaluation.

70. Advanced Workflow for Classic Materials

Gustavo Lores, DDS
Third Year Prosthodontic Resident
Naval Postgraduate Dental School Bethesda MD

The purpose of this presentation is to demonstrate a digital workflow that is user-friendly, cost-effective, and less time consuming to fabricate noble metal, base metal, all-ceramic and zirconia restorations.

The question of fit verification, contacts, marginal integrity and esthetics arises if a physical cast does not exist. The relative need to fabricate a cast and include it in a digital workflow is considered.

Tooth #30 was prepared for an all-metal restoration (crown) following conventional preparation design for optimal retention and resistance. A digital scan of the preparation, the antagonist and the bite registration were taken using the Sirona Cerec Omnicam intraoral scanner. The files were transmitted using the CEREC Connect system for crown fabrication using the following materials: gold alloy (milled), base metal (printed), monolithic zirconia (milled) and lithium disilicate (milled). STL format files were sent to Sirona for fabrication of a verification cast. A second set of casts was made using the same method by another company (CADblu). Fit of the restoration was compared on both sets of casts.

This process demonstrated the fabrication of restoration using a fully digital workflow. Casts could be printed for verification of fit, finish and polish of the final restorations with improved results.

71. Prosthetic Solution for a Patient with Oligodontia and Kelly's Combination Syndrome

Joseph A. Lucero, DDS
Second Year Prosthodontic Resident
University of Minnesota

In this clinical case study, a 71-year-old woman with oligodontia, presents with 6 remaining teeth in the mandible and a completely edentulous maxilla with evidence of Kelly's Combination Syndrome and severe resorption in the anterior regions and downward growth of the right and left tuberosities. The mandible was restored with a removable partial denture, utilizing the existing partial denture framework and current Sterns GL precision attachments, along with porcelain teeth. Cutter bar teeth were used in the maxilla to maintain patient's current prosthetic design. This clinical case study discusses the conditions and clinical appearance of Kelly's Combination syndrome, different restorative approaches, treatment planning rationale, outcome, prosthetics, and laboratory fabrication techniques.

72. A Study of Different Parameters Affecting Implant Stability

Taylor J. Manalili, DDS
First Year Prosthodontic Resident
Stony Brook University

This study assessed the primary stability of different implant designs inserted into different bone densities. An in vitro experiment was performed using polyurethane blocks resembling type IV and type II bone. 80 tapered implants with progressive thread design and 80 tapered with symmetrical threads were inserted using the same drilling protocol. Insertion Torque and Implant Stability Quotients were recorded. Two-way ANOVA and Post-Hoc Tukey tests were used for the statistical analysis. Within the limitations of this study, the results showed that the higher bone density and a tapered implant with progressive thread design favors the primary implant stability.

73. Utilizing a Remote Implant for Anchorage in Orthodontic Extrusion: A Case Report

Joshua A. Manchester, DDS
Second Year Prosthodontic Resident
University of Washington

Orthodontic extrusion using tooth borne mechanics requires close proximity of teeth to the intended tooth for extrusion. In this case report, a remote implant crown was utilized without bonding wire or brackets to the remaining abutment teeth and implant crown that provided anchorage in an atypical technique for extruding a central incisor as the terminal abutment tooth in a partially edentulous arch. Furthermore, the treatment modality was designed to be compatible with the patient's existing removable partial denture prosthesis during course of orthodontic extrusion treatment.

74. Bonding Strengths of Porcelain Fused to Titanium Using TiO₂ Nanotubes Analyzed with 3 Point Bending and Acoustic Emissions

Ryan A. Matthews, DMD

Second Year Prosthodontic Resident
University of Illinois at Chicago

Bonding porcelain to titanium has always been difficult due to poor oxidizing characteristics of titanium when heated. In this experiment we attempted to increase the bond strength of porcelain fused to titanium by creating titanium nanotubes to the titanium's surface. Titanium type 2 and 5 were anodized with different conditions and layered with low fusing porcelain. Surfaces characterization was performed using SEM and Zygo analysis. Three point bending and Acoustic Emission test were performed to measure the bonding strength. The findings suggested that the addition of nanotubes did not significantly increase the bond strength of porcelain to titanium.

75. Comparison of Fit of Dentures Fabricated by Traditional Techniques Versus CAD/CAM Technology

James B. McLaughlin, DMD, MPH
Third Year Prosthodontic Resident
US Army, Fort Gordon, GA

The purpose of this research was to determine if denture bases fabricated using CAD/CAM technology have a better and more consistent adaptation than dentures fabricated using traditional heat processing methods. Nine titanium maxillary casts were created using a combination of three arch forms and three palatal forms. Three heat-processed dentures and three CAD/CAM bases were created for each cast. The space between each denture and cast was measured and compared between the two denture fabrication methods. The effect of palate form and arch form was also compared.

76. Comparing the Accuracy of Two Methods to Cure Resilient Denture Attachment into an Acrylic Denture Base Using a Dual-Polymerizing Acrylic Resin (Ivobase Injector; Ivoclar Vivadent) Indirectly and the Traditional Direct Method

Sharif Mohammad, DDS
Third Year Prosthodontic Resident
University of Louisville

This study will determine the accuracy of indirectly adapting the resilient denture attachment into the denture base using the dual-polymerizing acrylic resin (DPAR) and injector processing

This study will determine the accuracy of indirectly adapting the resilient denture attachment into the denture base using the dual-polymerizing acrylic resin (DPAR) and injector processing unit. The hypothesis is DPAR and injector has a smaller volumetric shrinkage to accurately adapt resilient denture attachments indirectly as compared to traditional direct methods. Three groups of 10 dentures were tested on a bench top: a direct pick-up method using auto-polymerizing acrylic repair resin, a DPAR injected to process denture base and a control group using traditional processing methods with heat-polymerizing acrylic. Each group was tested for accuracy using a coordinate measuring device.

77. Marginal Fit of Conventional and Digital Lithium Disilicate Crowns: An In-Vitro Cross-Sectional Analysis

Nesrine Z. Mostafa, BDS, MSc, PhD
Third Year Prosthodontic Resident
University of British Columbia

Marginal fit of lithium disilicate (LDS) crowns fabricated by three methods (digital impression and manufacturing “DM”, digital impression and pressed manufacturing “DP”, or traditional impression and manufacturing “TP”) was evaluated using micro-computed tomography. DM crowns demonstrated significantly smaller marginal gap ($33.3\pm 19.99\ \mu\text{m}$) compared to DP ($54.08\pm 32.34\ \mu\text{m}$) and TP ($51.88\pm 35.34\ \mu\text{m}$) crowns. Incidence of under-extension was higher in DP (6.25%) and TP (5.4%) than DD (0.33%) crowns. While, over-extension was more frequent in DD (37.67%) than TP (28.85%) and DP (18.75%) crowns. Digital impressions and CAD/CAM manufacturing resulted in consistently smaller marginal gaps with more frequent overextension, which can be easily adjusted.

78. A Provisional Denture: A Technique Used to Assure Patient Satisfaction Before Denture Processing

Rami O. Muadab, BDS, MSc
Second Year Prosthodontic Resident
Rutgers School of Dental Medicine

A 61 year-old female patient presented to RSDM with a chief complaint of “I don’t like how these teeth look.” Her existing complete denture exhibited reasonably good esthetics; but the patient was highly exacting and wanted a very specific shape, position, arrangement and angulation of each tooth. The patient felt that 3 hours over 4 visits was not enough time to analyze the wax trial denture. As is true in fixed prosthodontics, a provisional prosthesis gives the patient time to assess and seek opinions before the complete denture is processed.

79. Reliability of Tooth Shade Selection with a Corrected-Light Device

Siamak Najafi-Abrandabadi, DDS
Third Year Prosthodontic Resident
New York University College of Dentistry

Objective: The study was conducted to evaluate the effects of corrected light device and different backgrounds on reliability of shade tab matching.

Materials and Methods: 4 prosthodontists selected 10 shade tabs under 4 different conditions: with and without corrected light device, pink and blue backgrounds. These sessions were repeated after one month to evaluate the degree of intra-rater agreements, which was assessed with the Kappa statistics for value, hue and chroma.

Results: The highest kappa index was with pink background and corrected light device with only statistically significance in chroma

Conclusions: Utilizing the corrected light device with a pink background improved the reliability.

80. Esthetic Implant Provisionalization: A Simple Alternative Procedure

Pranai Nakaparksin, DDS
Third Year Prosthodontic Resident
Indiana University

Provisionalization is a critical procedure in implant restorative treatment, especially when involving the esthetic zone. Provisional implant restorations are typically fabricated via the use of a matrix index made from a diagnostic wax-up. However, the major disadvantage of this technique is the monochromic appearance and lack of translucency normally displayed by natural teeth. Improvement can be achieved by external staining, however, internal characterization and natural layering appearance of dentine and enamel are still missing. The following technique provides an esthetic, functional and dimensionally stable long term provisional restoration by using acrylic resin denture teeth attached to an implant provisional abutment.

81. Contemporary Materials and Designs of Implant-Supported Fixed Protheses in Edentulous Patients

Viensuong Nguyen, DDS
Third Year Prosthodontic Resident
University of Connecticut

By offering functional, esthetic, and psychological advantages to edentulous patients, implant-supported metal-resin (or hybrid) protheses have been popularized in the rehabilitation of edentulism. Conventional prosthetic design and materials are a single bar with acrylic denture teeth and denture-base acrylic resin for gingiva. The evolution of contemporary materials offers more options for prosthetic designs. A prosthetic material blend may comprise porcelain, zirconium, metal, acrylic resin or composite resin. Framework designs may be singular, segmented or splinted in nature, often combining unique features of each design. This poster describes several successful designs of hybrid protheses including segmented metal-ceramic prosthesis with stress-breakers, a splinted titanium-ceramic-resin prosthesis, and a monolithic full contour zirconia prosthesis.

82. A Bioactive Collagen Membrane Containing GDF-5 for Bone Regeneration

Oswaldo A. Nieves Vaca, DDS
Third Year Prosthodontic Resident
New York University College of Dentistry

The objective of this study was to evaluate the subsequent effects of growth/differentiation factor 5 (GDF-5) the released from collagen membranes (CMs) on bone regeneration *in vitro* and *in vivo* compared to platelet derived growth factor (PDGF). CM/GDF-5 significantly increased ALP and cell proliferation activities, and gene expression of *Runx2* and *Osteocalcin* in MC3T3-E1 cells when compared to CM/PDGF or CM alone. CM/GDF-5 significantly accelerated bone regeneration compared to CM/PDGF, CM alone, or control. These results suggest that a CM carrying GDF-5 might lead to an improvement in the current clinical treatment of bone defects for periodontal and implant therapy.

83. Management of Amelogenesis Imperfecta in Adolescent Patients: Literature Review and Case Report

Liliana A. Ortiz Camacho, DDS
Second Year Prosthodontic Resident
New York University College of Dentistry

Amelogenesis Imperfecta (AI) has been described as inherited conditions that disturb developing of enamel structure. AI can be classified into four categories: hypoplastic, hypomaturational, hypocalcified, and hypomature-hypoplastic with taurodontism. This anomaly affects both primary and permanent dentitions. The oral rehabilitation of adolescent patients is complex due to the mixed dentition stage with different eruption sequence. The definitive treatment cannot be rendered until complete eruption of permanent dentitions. In this case report, the management of AI in adolescent patients between the ages of 11 to 21 is discussed with the literature review on the treatment recommendations for this age group.

84. The Effect of Bacteria on Corrosion of Dental Implants

Charles Palin, DMD
Third Year Prosthodontic Resident
University of Illinois at Chicago

Inflammation and bacteria are primary factors in dental implant failures. Bacterial colonization and subsequent surface oxidation of dental implants is a poorly understood phenomenon. The purpose of this research is to examine bacterial effect on dental implant corrosion. Commercial dental implants will be submerged in growth medium and cultured with *Streptococcus mutans*. The electrochemical activity and corrosion of the implants in the lowered pH environment and a control medium will be monitored with a potentiostat for seven days. The implant surface will be examined under microscope/SEM along with statistical analysis of the data to draw conclusions. Research is currently ongoing.

85. Review of Currently Available Commercial Systems to Correct Angulation Issues in Screw Retained Implant Restorations

Mitchell Persenaire, DMD
First Year Prosthodontic Resident
University of Connecticut

The current trend in implant dentistry is toward screw-retained restorations due to increased awareness of inflammatory peri-implant conditions associated with excess luting cement. However, conventional solutions for screw retained implant restorations such as angulated abutments have limitations with regard to angulation and screw access hole placement. Newer solutions that are commercially available claim to correct angulation of the screw access by 25 to 28 degrees. This poster is a review of currently available commercial systems and current literature on this topic including advantages, disadvantages, indications, contraindications and costs of this exciting new technology.

86. Overcoming a Patient Adaptation Difficulty to an Implant-Retained Mandibular Overdenture: A Case Report

David Powell, DMD

Third Year Prosthodontic Resident

University of Toronto (Ontario, Canada)

Mandibular implant-retained overdentures are well-established to improve retention and patient satisfaction compared to conventional removable prostheses. Yet, occasionally patients experience difficulties with adaptation to these prostheses. This case report outlines the management of an 85 year-old male patient who repeatedly damaged the retentive elements for the individual implant attachments despite numerous efforts to address this recurrent problem. The problem was finally traced to the inadequate height of the retentive abutments. The replacement of short retentive abutments with taller ones resolved the recurrent complaints. This report highlights the importance of proper assessment, diagnosis and management of the patient's chief complaint.

87. Fracture Resistance of CAD/CAM Tooth-Colored Implant Custom Abutment

Armand D. Putra, BDS

Third Year Prosthodontic Resident

University of Washington

Objective: To evaluate the reliability of CAD/CAM tooth-colored implant custom abutments.

Methods: Zirconia (Lava Plus), lithium-disilicate (IPS e.max CAD), and resin nano-ceramic (Lava Ultimate) abutments were fabricated according to ISO 14801 standard. Heat-pressed lithium-disilicate was used as controls. Static failure load (n=5) and fatigue failure load (n=14) were tested.

Results: The single failure load ranged from 149.23±37.20N to 318.30±28.19N ($P<.01$). Weibull plots revealed $\beta >1$ for zirconia abutment group indicating a wear-out or cumulative fatigue pattern.

Conclusions: Significant higher reliability in zirconia group was found and no significant differences in fracture resistance were determined between other test groups.

88. Determining the Accuracy of Digital Interocclusal Positions in Maximum Intercuspation

Rodney Raanan, DDS

Third Year Prosthodontic Resident

Harvard School of Dental Medicine

This study evaluated the occlusion of printed casts using Cerec Omnicam system. Opposing resin casts (Panadent) were mounted in MIP on a fixed axis articulator (Artex). Ten digital impressions were made and a closed cast occlusal position recorded. Ten translucent silicone recordings (Regisil 2x) were made of the right first molar occlusal position of the test casts and compared to each of the printed casts. Image Analysis (Image J) of transmitted light through the recordings was used to assess occlusal change. A special grid was used to convert light changes into metric measurements. Changes in first molar positions were compared.

89. Bond of Dual Cure Resin Cements to Enamel and Dentin in Self-Cure Mode

Rashmi Radhakrishnan, BDS, MS

First Year Prosthodontic Resident

Ohio State University College of Dentistry

Abstract: Dual cure resin cements polymerize in the self-cure mode when light cannot pass through.

Purpose: Measure bond strength of 4 dual cure resin cements to dentin/enamel in self – cure mode.

Method: Pretreated e.max rods were cemented to molars ground to flat dentin/enamel using 4 adhesive/cement combinations under force (100g) for 8 minutes. The experiment repeated with specimens in incubator (37°C) for 10minutes. Samples debonded after 24 hours storage in incubator using a universal testing device. Statistical analysis was performed.

Conclusions: Temperature increase improved bond strength with highest bond strength for Panavia V5.

90. Maxillary Arch Size and Obstructive Sleep Apnea: A Case Report and Review of the Literature

Ali H. Ramadhan, BDS

Second Year Prosthodontic Resident

Marquette University

Few reports have described the relationship between obstructive sleep apnea and maxilla arch size. Certain syndromes with a constricted maxillary arch have manifest obstructive sleep apnea syndrome (OSAS). This case report describes a 27 year-old female patient with a skeletal class III discrepancy and a narrow maxilla arch. The patient's major concern was the esthetic appearance of her anterior teeth. Comprehensive clinical examination revealed congenitally missing teeth, bilateral posterior cross bite, and symptoms strongly correlating with sleep apnea. Further investigation will include ENT consultation and genetics study with regards to oligodontia, enlarged adenoid tissue, and the constricted maxilla. Polysomnography study is required to confirm OSAS. The dental treatment after OSAS evaluation should involve orthodontic and orthognathic consultation, then followed by a prosthodontic treatment plan.

91. Comparison of Internal Fit of Restorations Milled from Different Materials

Bryan P. Rasmussen, DDS

Third Year Prosthodontic Resident

Naval Postgraduate Dental School Bethesda MD

The aim of the poster presentation is to evaluate the internal fit of different materials manufactured by the same computer aided milling manufacturer. polymethyl methacrylate, lithium disilicate, zirconia, and cad-wax materials will be used. The same die will be scanned and restorations from each material made, seated, and cemented on identical dies. The restorations will then be sectioned and evaluated to compare internal fit.

92. 3D Printing: An Innovative Approach to Nasoalveolar Molding

Samantha B. Rawdin, DMD

Third Year Prosthodontic Resident
Montefiore Medical Center

Of the many new technologies in the dental field, 3D printing is gaining a lot of attention and popularity. Although the full potential of 3D printing is not yet known, its application in both the laboratory and clinical settings is proving to be very promising. 3D printing in craniofacial reconstruction has been utilized, but has had limited involvement thus far with Nasoalveolar Molding (NAM). Rather than manually fabricating and adjusting a NAM appliance, we propose a series of 3D printed aligners that incrementally approximate the alveolus. This technique could help save time and money and increase patient compliance.

93. The Effect of Core Material on Color of Pressed E-Max with Varying Thicknesses

Priscila Schaefer, DDS
Third Year Prosthodontic Resident
University of Michigan

The purpose of this study will be to assess the effect of underlying core material and the thickness of ceramic on the color of pressed E-max restorations. Thirty heat pressed E-max disks will be separated into three groups of a different thickness. The color of each disk will be evaluated using a colorimeter against a standard white tile for a control, and four different core material specimens, each simulating a clinically relevant core material. The color difference (ΔE^*ab) values between the standard and the specimen tested will be calculated and recorded.

94. Full-Mouth Restoration of a Patient Presenting with Compromised Restorative Space

Stuart R. Schelkopf, DDS
Second Year Prosthodontic Resident
University of Illinois at Chicago

With the evolution of implant designs and the advent of new materials in full-arch restorations, thorough diagnosis and treatment planning is critical in comprehensively treating complex restorative cases. In the presented case, a 60 year old female presents with an edentulous atrophic mandible and a severely compromised fixed complete denture supported by 6 original Brånemark Nobel-Biocare external hex implants in the maxilla with sub-optimal restorative space. With consideration of implant utilization, restorative materials, vertical dimension of occlusion and smile design, treatment was carefully planned and rendered to achieve a satisfactory result.

95. The Comparison of Tensile Strength Among Different Surfaces of Implant Custom Abutments

Sae-Eun Schlottke, DDS
Third Year Prosthodontic Resident
University of Minnesota

The retention of anterior implant crowns is an important factor especially when the crown is cemented with temporary cement. Different mechanical and chemical surface treatment methods are commercially available for better retention and esthetic results. This in-vitro study is designed from a real clinical case that investigates how those changes on abutment surface result in different tensile strength between a CAD/CAM E.max crown and different custom abutment designs; titanium, titanium with retention features, titanium gold anodized, and zirconia. The maximum tensile strength of each combination was measured using the Universal Machine until the interface fails.

96. Two-Body Wear Performance of Zirconia Opposing e.Max Ceramic

Christina Schiltz, DDS

Second Year Prosthodontic Resident

University of Illinois at Chicago

The usage of different opposing all-ceramic materials has increased clinically. However, the wear characteristics of opposing different all-ceramic materials have not been studied. The aim of this study is to examine the two-body wear resistance of opposing e.max and zirconia with 2 different surface treatments. A ball-on-disc tribometer will be utilized to evaluate the effect of Glazed (G) and Glazed-and-Polished (GP) Zirconia balls on the wear characteristics of e.max (G) and (GP) discs as assessed by interferometry and SEM. The volume loss and coefficient of friction will be analyzed. Results: Research in progress

97. Long Term Resin Bonded Fixed Provisional Restoration (RBFPD) During Ridge Augmentation and Prior to Final Implant Restoration: A Clinical Report

Karnik Shah, BDS

Third Year Prosthodontic Resident

The Ohio State University

In contemporary implant practice, consistent results can be predictably achieved utilizing state-of-the-art surgical and prosthetic techniques. These provide desirable solutions for the social and business needs of the prospective patient. Clinical situations where immediate implant placement and loading is not recommended, a fixed provisional restoration will provide for an optimal outcome, with minimal patient discomfort. This clinical report describes the provisionalization of partially edentulous anterior maxillae utilizing a long spanned RBFPD (winged metal ceramic fixed partial denture). This alternative method was useful for shaping and preserving the gingival soft tissues, while restoring function, esthetics, and patient comfort without violating any surgical or prosthodontic principles.

98. Oral Rehabilitation of a Patient with Ectodermal Dysplasia: A Clinical Report

Azadeh Shojaei, DDS, MSc

Third Year Prosthodontic Resident

University of British Columbia

Ectodermal dysplasia (ED) is a hereditary disorder that occurs as a result of defects in the development of 2 or more tissues derived from embryonic ectoderm. Usually the ED patients suffer from both reduced number of teeth and underdeveloped alveolar ridges, therefore the oral rehabilitation of these cases is often challenging.

This case report illustrates the prosthetic rehabilitation of an 11- year-old girl with severe hypodontia. Oral rehabilitation was accomplished with complete upper and lower partial removable acrylic prostheses. After the treatment, patient's facial esthetics, masticatory function, speech and self-esteem improved significantly.

99. Diagnosis and Treatment Modality for Linear IgA Disease: A Case Report

Jose Sierra, DDS

Second Year Prosthodontic Resident

Marquette University School of Dentistry

Linear IgA Disease (LAD) is a rare acquired autoimmune bullous disorder, characterized by linear deposition of IgA along the dermoepidermal basement membrane zone. The clinical presentation of LAD consists of vesiculobullous lesions affecting skin and mucosal surfaces. However, there are few reported cases of involvement of the mouth as the sole manifestation. A 60 year old female presented with stomatodynia, dysphagia, and widespread erosions affecting the palate, buccal mucosa, maxillary and mandibular alveolar ridges. Furthermore, patient is interested in conventional maxillary and mandibular dentures. The use of Clobestol, in an adhesive denture paste is an effective drug for symptomatic oral vesiculo-erosive lesions. The selective pressure technique (Boucher's technique) with relief holes in the tray, and light bodied polyvinyl siloxane is a suitable final impression technique.

100. Wear and Corrosion at the Titanium-Zirconia Implant Abutment Interface

Craig L. Sikora, DMD

Third Year Prosthodontic Resident

University of Illinois at Chicago

Under masticatory activity, micromotion occurs at the dental implant-abutment interface. Recently, there has been a lot of attention given to the material degradation occurring at this junction. This study investigates the wear and corrosion effects between implant and abutment materials. Utilizing a simulated oral tribocorrosive environment, both titanium (TiV) and zirconia (Zr) balls were slid under free potential against TiV and Roxolid™ discs for 25K cycles. The volume loss was calculated, and surface characterization was performed using interferometry and SEM. Overall, volume loss rankings from highest to lowest were (Ball/Disk): TiV/TiV > TiV/Roxolid™ > Zr/TiV > Zr/Roxolid™

102. A Review of the Literature Regarding the Tooth-Implant-Supported Prosthesis (TISP)

Naif G. Sinada, DMD

Second Year Prosthodontic Resident

University of Maryland

Using Tooth-Implant-Supported-Prostheses (TISPs) has been a historically widely debated issue. Inherently, implants do not feature the same anatomical and physiological aspects of teeth. The natural tooth is provided with PDL that functions as a hydraulic system. Implants do not feature any PDL, and are directly connected with the surrounding bone. This literature review discusses (1) recommended techniques for utilizing TISPs to overcome the mobility differences between teeth and implants, (2) advantages/disadvantages of utilizing TISPs, and (3) techniques to prevent intrusion/complications. Ultimately, these guidelines are reviewed in order to reassess a previously stigmatized treatment modality.

103. One Step Triad Custom Tray Impression Technique for Fixed Detachable Prosthesis

Robert A. Sparks, DMD

Third Year Prosthodontic Resident

Georgia Regents University

One of the most popular trends in dentistry is attempting to decrease the treatment time for all involved. Fixed-detachable prosthesis require multiple steps and appointments that requires clinical time and lab fees. The impression for such a prosthesis has historically required an initial impression, followed by fabrication of a verification jig, and a second impression appointment. We have successfully utilized triad to replace the verification jig and 2nd impression appointment. The lower shrinkage of triad and its rigidity appear to make it a material suitable for splinting impression copings and making the final impression without a second impression appointment.

104. Maxillectomy and Midfacial Defects: Lost in Classifications?

Akanksha Srivastava, BDS, MSc

First Year Prosthodontic Resident

University of Connecticut

Surgical defects from maxillary and midfacial resections are often compound and involve many anatomic structures. Surgically driven classifications for such defects are based on the nature of the surgical procedure or by the resultant tissue loss without incorporation of any prosthetic considerations. Conversely, prosthodontic classifications group these defects from a prosthetic management perspective. A classification system that is consistent with both surgical and prosthodontic needs is lacking. This poster will highlight a critical appraisal of 14 classification systems identified from the available literature and present a recently published novel method of a criteria-based universal description of maxillectomy and midfacial defects.

105. Influence of Milling Tools on Marginal Integrity and Accuracy of Zirconia Crowns

Patricia H. Swanson, DDS

First Year Prosthodontic Resident

Stony Brook University

While much attention is given to restorative materials, focus should also be on the milling tools used in fabrication. This poster compares the effect of diamond versus ceramic coated milling tools on zirconia restorations. Four different milling tools will be compared on two different machines (VHF and Roland), using the same design software and CAM software for standardization. To ensure transparency, milling tool life is reported by hours of use. Optical analysis of crown margins is performed, and the relationship between milling tool usage and marginal integrity and accuracy is evaluated for each drill and milling machine.

106. Novel Technique Using 3Shape to Digitally Fabricate and 3D Print Prosthetic Splint for Protecting Soft Tissue Grafts Around Implants

Marko Y. Tadros, DMD

Second Year Prosthodontic Resident

Georgia Regents University

Dentists frequently encounter situations in which the patient has several implants placed with inadequate keratinized tissue. In order to augment this soft tissue deficiency, the patient has to undergo a soft tissue graft that has to be held with wire fixations beneath the mandible. The external wire insertion sites frequently cause significant infection and discomfort. The technique in this poster shows an easy and comfortable approach using 3Shape and 3D printing technology to digitally fabricate implant supported surgical guide cover to hold a full arch soft tissue graft.

107. Prosthodontic Treatment of a Reconstructed Partial Mandibulectomy Patient Using Titanium-Zirconia-Resin Fixed Implant Prosthesis

Tyler Thomas, DMD

Second Year Prosthodontic Resident

University of Connecticut

Metal resin fixed prostheses has traditionally been used to treat mandibulectomy patients seeking a fixed prosthesis. This prosthesis has a finite time limit to event-free survival and is susceptible to significant wear and fracture. To mitigate this problem, newer prosthetic designs have evolved with a unique combination of biomaterials. One such emerging design is a CAD CAM milled titanium bar with cemented individual zirconia crowns, finished with denture base resin for gingival contours and esthetics. This poster describes the outcome of such treatment in a patient who received prosthetic treatment after having previously received a partial mandibulectomy reconstruction.

108. Intra-Oral Scanners: Are They Created Equal?

Joshua C. Treesh, DMD

Third Year Prosthodontic Resident

Navy Post Graduate Dental School, Bethesda, MD

Currently there are approximately 15 intraoral scanners on the market. All commercially available scanners claim a high degree of accuracy. The available literature shows that differences do exist

concerning the overall accuracy of the scanners. Most studies have looked at 'the big four' scanners in their evaluation: Cerec, Bluecam; COS Lava, iTero, and E4D. This table clinic will evaluate the resolution and accuracy of three intraoral scanners in which little to no scientific data is available: Cerec Omnicam, Trios, and Carestream. Specifically the table clinic will analyze the scanning accuracy of a prepared tooth mounted in a plaster mold. The STL files generated from the scans will be compared against a reference scan of the same model using an industrial strength laboratory scanner. The scans will be evaluated using Geomatics 3D software using a 'best fit' algorithm. These scans will also be evaluated for degree of resolution (# of triangles per unit area). This information may help guide the clinician in choosing which intraoral scanner to employ in their clinical practice. Although this table clinic will focus on a single prepared tooth, differences in accuracy may have a significant impact on utilization of the scanner in full mouth reconstruction.

109. Fatigue Behavior of CAD/CAM Ceramic Abutments as a Function of Design and Ceramics Processing

Konstantinos Vazouras, DDS, MPhil
Third Year Prosthodontic Resident
University of Connecticut

Purpose: Testing of four CAD/CAM abutments using a modified ISO implant fatigue protocol to determine performance as a function of design and processing.

Materials-Methods: Two full-zirconia and two hybrid abutments were tested wet at a variety of loads to failure. Data was combined for lifetime analysis from accelerated to clinical conditions.

Results: Two different failure modes were found for both abutment types. Under accelerated conditions performance differed significantly depending on manufacturer. Performance was not related to rotational fit tolerances.

Conclusion: Our modified ISO protocol produced failures seen clinically. Manufacturer matters; differences in design and fabrication cannot be discerned clinically.

111. Pros and Cons of the Fixed Detachable Prosthesis

William M. Wahle, DDS, BS
Third Year Prosthodontic Resident
University of Maryland

The fixed detachable acrylic metal hybrid prosthesis, otherwise known as the hybrid, and fixed complete denture, has recently been a popularized treatment option that provides a fixed solution to edentulous or soon to be edentulous patients. Surgical and prosthetic obstacles will be presented from a clinical aspect for the fixed complete denture with overall pros and cons of the treatment presented.

112. Full-Mouth Rehabilitation of an Edentulous Patient with Dental Implants: A Digital Approach

Kan Wongkamhaeng, DDS
Third Year Prosthodontic Resident
University of Iowa

The use of dental implants in the management of completely edentulous patients provides improved quality of life with predictable treatment outcomes. This case report presents oral rehabilitation for a completely edentulous patient using monolithic zirconia implant-supported (maxillary arch) and metal-resin implant fixed complete denture (mandibular arch). Digital technologies were applied for treatment planning and designing surgical guide and definitive implant restorations. The treatment described here significantly improved the patient's functional, esthetic, oral health and self-esteem.

113. Maxillary Fixed Implant Immediate Rehabilitation of a Microstomic Patient with Systemic Scleroderma

Roberta A. Wright, DMD

Third Year Prosthodontic Resident

University of Connecticut

Scleroderma is an autoimmune rheumatic disease that affects the connective tissues. Oral manifestations include progressive limitation of mouth opening, microstomia, tongue rigidity, osseous resorption of the mandible, and radiographic widening of periodontal ligament space. Complete-arch fixed implant immediate rehabilitation in patients with systemic scleroderma present a number of unique challenges. The use of tilted implants is mechanically favorable; however, the placement of them can be difficult due to severely restricted mouth opening and steep angulation during implant placement. Furthermore, the positioning of angled abutments, and the subsequent fabrication of a conversion prosthesis prove to be complicated. This case report describes unique challenges faced surgically and prosthetically in treating a patient with systemic scleroderma, and offers advantages and tips for treating scleroderma patients with the All-on-Four[®] concept.

114. A Modified Fabrication Technique of a Closed-Hollow Bulb Obturator for the Rehabilitation of an Acquired Maxillectomy Defect

Hui Wen Yu, DDS

Second Year Prosthodontic Resident

Stony Brook School of Dental Medicine

An 85-year-old male patient presented with a history of surgical excision of carcinoma of the maxillary arch. This resulted in an Aramany Class IV defect. Patient's existing obturator lost retention after tooth # 14 was extracted. To reduce the weight and enhance the retention, a closed-hollow bulb obturator was fabricated.

This poster describes a modified technique in fabricating a closed-hollow bulb obturator, in which the repositioning pins were used to index the hollow portion of the obturator. The obturator design characteristics as well as the comparison between a closed- and an open-hollow bulb obturators are discussed.

115. Evaluation of Flexural Strength of Milled Cubic Zirconia After Accelerated Aging of 3, 6 and 9 Years

Omar M. Alaryani, BDS

Third Year Prosthodontic Resident

Columbia University College of Dental Medicine

Recent introduction of cubic zirconia into the dental market claims improved translucency and a flexural strength of 650-700 mpa. The authors recently evaluated the flexural strength of milled polycrystalline zirconia (PCZ) and found the flexural strength to be closer to 850-900 mpa as compared to the manufacturers claim of 1300 mpa. Cubic zirconia presents a different crystal structure than PCZ. The authors seek to determine if milled cubic zirconia undergoes a significant decrease in flexural strength similar to PCZ. Specimens will also undergo accelerated aging of 3, 6 and 9 years to determine if aging affects the flexural strength of milled cubic zirconia.

116. The Wear Characteristics of Opposing CAD/CAM Materials

Alec D. Zurek, DDS

Third Year Prosthodontic Resident

University of Illinois at Chicago

With the improvement of CAD/CAM technology in its application to dentistry, there has been an increase in use of milled, all-ceramic restorations. This study evaluates wear characteristic between two CAD/CAM materials with different surface textures as a function of time. Utilizing a ball-on-disc tribometer and artificial saliva, glazed (G) and glazed then polished (GP) samples of Zirconia and e.Max were tested. Surface characterization was performed using interferometry and SEM. The volume loss and coefficient of friction were analyzed. GP Zirconia showed less volume loss than the G Zirconia, in contrast, GP e.Max showed more volume loss than the G e.Max.

117. One-Appointment Fabrication of a Removable Prosthesis: A Systematic Review

Elahe Behrooz

Fourth Year Dental Student

University of Toronto (Ontario, Canada)

Purpose: This study aimed to systematically review the published literature on removable prostheses fabricated in a single appointment.

Materials and Methods: Electronic and manual search of literature published up to July 2015 was conducted.

Results: Out of a total 461 articles 20 met the inclusion criteria. Majority of studies were technique descriptions or case reports on immediate denture fabrication. No single cohort or comparative trials were identified.

Conclusions: Several techniques for fabrication of removable prostheses in a single appointment are available. Further research should determine which of these techniques are superior in terms of patient satisfaction and clinical performance.

118. The Use of a Functionally Generated Occlusal Registration in Digital Dentistry – Minimizing Occlusal Adjustments During Delivery of Fixed Prosthodontics

Elizabeth S. Felton, BS

Kristin A. Hutkin, BS

Third Year Dental Students

Temple University

The functionally generated occlusal registration, first proposed by Frederick Meyer in 1959, is a dynamic record used as a guide to eliminate protrusive, working, and non-working interferences during restoration construction. Today, digital CAD/CAM systems use an opposing cast or centric occlusal registration to design the occlusal contours of the manufactured restoration. This method doesn't allow for elimination of occlusal interferences encountered during prosthesis construction, resulting in additional time needed for intraoral adjustments of the final prosthesis during delivery. In theory, if the FGOR is utilized on CAD/CAM systems, intraoral adjustments upon delivery of the final restoration should be significantly minimized.

119. Implant or Bridge in the Esthetic Zone: The Dilemma

Danielle J. Indelicato

Fourth Year Dental Student

New York University

Restoring an edentulous area in the maxillary anterior region presents challenges when both function and esthetics are of concern. When planning treatment in such cases close attention needs to be paid to both the hard and soft tissues. This was the challenge for a 30-year-old female patient that presented to NYU with a vertical root fracture on #9 and existing crowns on 7,8 and 10. A clinician faces the dilemma on how to restore the missing anterior tooth, implant vs. fixed bridge, so what are the guidelines?

120. Utilizing Digital Workflow to Restore Single Tooth Implants in a Pre-Doctoral Setting

Jeri K. McCombs, BS

Fourth Year Dental Student

University of Illinois at Chicago

The goal of this case was to introduce a complete digital workflow for the fabrication of a lithium disilicate implant supported crown at the UIC COD predoctoral implant program. Following a lab based scan, a custom abutment core file was generated to virtually design the crown. After the crown was milled, minor try-in adjustments were made. Digital design of monolithic crowns on custom abutments appears to be an effective treatment to restore single edentulous spaces. This process appeared to provide distinct advantages in time and esthetics, however additional research will be required to monitor long-term success of these restorations.

121. Assessing Impact of the SMART Act Cuts on the Rates of Complete Dentures and Mandibular Implant-Supported Overdentures (IODs) Completed at the UIC COD Pre-Doctoral Clinic

Uvoh E. Onoriobe

Second Year Dental Student

University of Illinois at Chicago

In June 2012, the State of Illinois passed the Save Medicaid Access and Resources Together Act limiting adult dental services to emergencies. This paper reports the findings of a retrospective ecological analysis on the effect of the Act on dental student-assisted complete dentures and mandibular implant-supported overdentures (IODs) treatment at the UIC College of Dentistry. During the period under review, the school instituted educational discounts to ensure that students had sufficient patient encounters. There was a slight increase in the number maxillary and mandibular complete dentures delivered during the period the Act was in effect while implant-supported overdentures decreased slightly.

122. Changes in Facial Esthetics with Increases in Occlusal Vertical Dimension in Dentate Models: An Un-Blinded Analysis

David P. Remiszewski, BS

Third Year Dental Student

University of Connecticut

Purpose: To determine if there are subjective changes in facial esthetics with incremental increases in OVD in dentate subjects.

Materials and Methods: Standardized photographs of 10 subjects at varied OVD (2, 3, 4, 5mm) were displayed to 20 Prosthodontists and 20 General Dentists who then rated the degree of “naturalness”/esthetics on a Visual Analog Scale (VAS) and also completed a discriminatory test.

Results: Subjects were rated less natural with increases in OVD, however only a 5 mm increase was significant ($p < 0.05$.) In the discriminatory test, judges correctly identified the odd image 57% of the time ($p < 0.582$).

Conclusion: Increasing the OVD only at 5mm, made a clinically significant difference in the judge’s unfavorable evaluation of facial esthetics.

123. Roughness and Gloss Produced on Y-TZP, PMMA, and CP Ti After Polishing

Jeffrey Willis, BS

Third Year Dental Student

University at Buffalo School of Dental Medicine

Objectives: The purpose of this study is to evaluate the surface properties of Y-TZP, PMMA, and CP Ti—materials used for fixed implant supported prostheses.

Methods: Thirty disc-shaped specimens (D = 15 mm, H = 3 mm) were fabricated from Y-TZP, PMMA, and CP Ti. All specimens were polished following a standard protocol for each material type. Surface gloss

(GU) and average roughness (Ra) were measured using glossmeter and non-contact profilometer respectively.

Results: Gloss and surface roughness mean and standard deviation will be presented. A one-way ANOVA will be used to evaluate the difference in GU and Ra between materials.

124. Effect of Trans-Retinoic Acid on Human Embryonic Palatal Mesenchymal Cells (HEPM)

Ashwini Bichu, DDS

First Year Prosthodontic Resident

University of Pittsburgh School of Medicine

Normal development of the secondary palate is important for normal dentition in animals and human beings and is, thus, of interest to oral biologists and dentists alike. Cleft palate is a common birth defect which results from failure of bilateral palatal shelves to elevate and make contact with each other or failure of the apposing shelves to fuse. Although the exact mechanism of fusion is unknown, prevailing hypotheses invoke either apoptosis or dedifferentiation of the medial edge epithelial cells. A number of environmental contaminants and chemicals are known to cause cleft palate including all- trans retinoic acid (atRA).

All-trans retinoic acid, the oxidative metabolite of vitamin A, is essential for normal embryonic development but high levels are teratogenic in many species. To clarify the mechanism of by which atRA causes cleft palate, my current investigation involving the effect of atRA on proliferation and cell cycle progression in HEPM cells was undertaken.

The cell line was purchased from ATCC, cells were cultured in tissue flasks with MEM containing 10% fetal calf serum. The cells were harvested and seeded in tissue culture plates at 5000 cells per well. After 48 hr, at 40% confluency, the cells were treated with atRA at concentrations of 0.3, 3.0, 30 and 300 μ M for 48 hr. Concentration response for inhibition of cell proliferation was studied by way of inhibition of DNA synthesis.

The cell lysate was prepared and the DNA assay was conducted on the cell lysate by measuring the DNA by way of Hoechst dye mediated fluorescence with the help of a fluorometer. The concentration response, concentration at which the proliferation of the cells was beginning to be affected and IC 50 (the concentration at which proliferation was inhibited 50%) was established. The cells were similarly processed for flow cytometry analysis in order to identify the stage at which the block in cell cycle occurred. It was found that atRA caused a G1 block in cell cycle with an increase in proportion of cells in G0/G1 and a decrease in the proportion of cells in S phase.

We are now proceeding to investigate which cell cycle genes (proteins) are affected by atRA, our hypothesis being that one or more of CDK2, p21 and cyclin E are likely candidates. Once identified, further experiments will be conducted to assess whether restoring the function of this(these) gene(s) will restore normal proliferative capacity of HEPM cells and, eventually, prevent the development of cleft palate even when the pregnant animal/women are exposed to atRA.

My interest in this research is based not only on the significance of this condition to oral biology but also on the possibility that techniques that I learned (cell culture etc) and plan to learn (gene silencing and therapy) can be applied in the study of many other conditions of relevance to dental medicine in the future.

125. Mucormycosis Prosthetic Rehabilitation Using Bone Anchored Endosseous Implants: A Clinical Case Report

Venkata Revuru, BDS
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Mucormycosis is an opportunistic fungal infection frequently infecting sinuses, brain or lungs and mostly affecting immunocompromised patients. However, its occurrence in the maxillae is very rare due to its rich vascularity. Once the maxilla is involved, débridement and resection of the infected/necrotic area is often the best treatment usually resulting in an extensive maxillary defect. Protocols for prosthetic obturation versus microvascular reconstruction have been established and used effectively in tertiary institutions, for patients with such larger defects. Accordingly, Aramany Class VI defect that involves maxillary alveolus and includes both canines are left with little residual palate or dentition to secure an obturator, resulting in poor prosthetic prognosis. Such palatectomy defects involving more than half of the palatal surface can effectively be managed by surgical reconstruction using microvascular free flaps that aid as a bone-anchored platform in supporting the prosthesis. Indeed, providing fixed prostheses may offer several advantages in terms of hygiene, function and esthetics in comparison with the conventional obturator prosthesis. Nonetheless, fixed prostheses retained by endosseous implants in patients with reconstructive osteomyocutaneous flaps often require a sequential team approach between the surgeon and the prosthodontist. This case report describes the reconstruction of maxilla using scapular free flap with the subsequent prosthetic rehabilitation of a patient with maxillary necrosis secondary to mucormycosis.

126. Survey of Predental students at NC State and UNC Regarding Knowledge of Specialty Training in Dentistry (Prosthodontics)

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Purpose: To our knowledge, there is no previous research regarding pre-dental student's knowledge and perceptions of the nine ADA recognized dental specialties. This study gathered data from surveys given to entering predoctoral students at the University of North Carolina at Chapel Hill School of Dentistry as well as undergraduate pre-dental students at North Carolina State University and the University of North Carolina at Chapel Hill.

Methods & Materials: 178 anonymous surveys were completed through Qualtrics, an online survey service, over the course of Fall 2014. There were 15 questions asked that pertained to assessing the survey taker's exposure to the dental field, interest in the dental specialties and their perceptions of the dental field, specifically in regards to prosthodontics. A Fisher's exact test was used to see if there is any correlation between different factors and specialty choice.

Results: After surveying pre-dental students at two neighboring universities, we found that 70.74 percent of the students have had a lack of exposure to prosthodontics. Moreover, students chose impact on patient health as the most influential factor to choosing a specialty; however, only 4 percent of respondents said that they intend to specialize in prosthodontics. In comparison, 34 percent of respondents indicated that they intend to specialize in orthodontics. Demographically, males seemed to be more willing than females to choose prosthodontics (p-value=0.0153).

Conclusion: Unsurprisingly, pre-dental students usually do not have a broad knowledge of the dental specialty field. Whether or not early exposure to the dental specialties has a significant impact on specialty choice remains to be seen. Further survey is necessary to conclude pre-dental student's perceptions and knowledge of the dental specialty field. The sample size of those who plan to specialize in prosthodontics was too small to make definitive conclusions between their perceptions of the dental specialty field and specialty choice.