



**Stony Brook
School of Dental Medicine**

2021

Leo and Mickey Sreebny Lectureship

and

School of Dental Medicine

Virtual Research Symposium

Honorary Chair

David K. Lam, MD, DDS, PhD, FRCDC

April 28, 2021

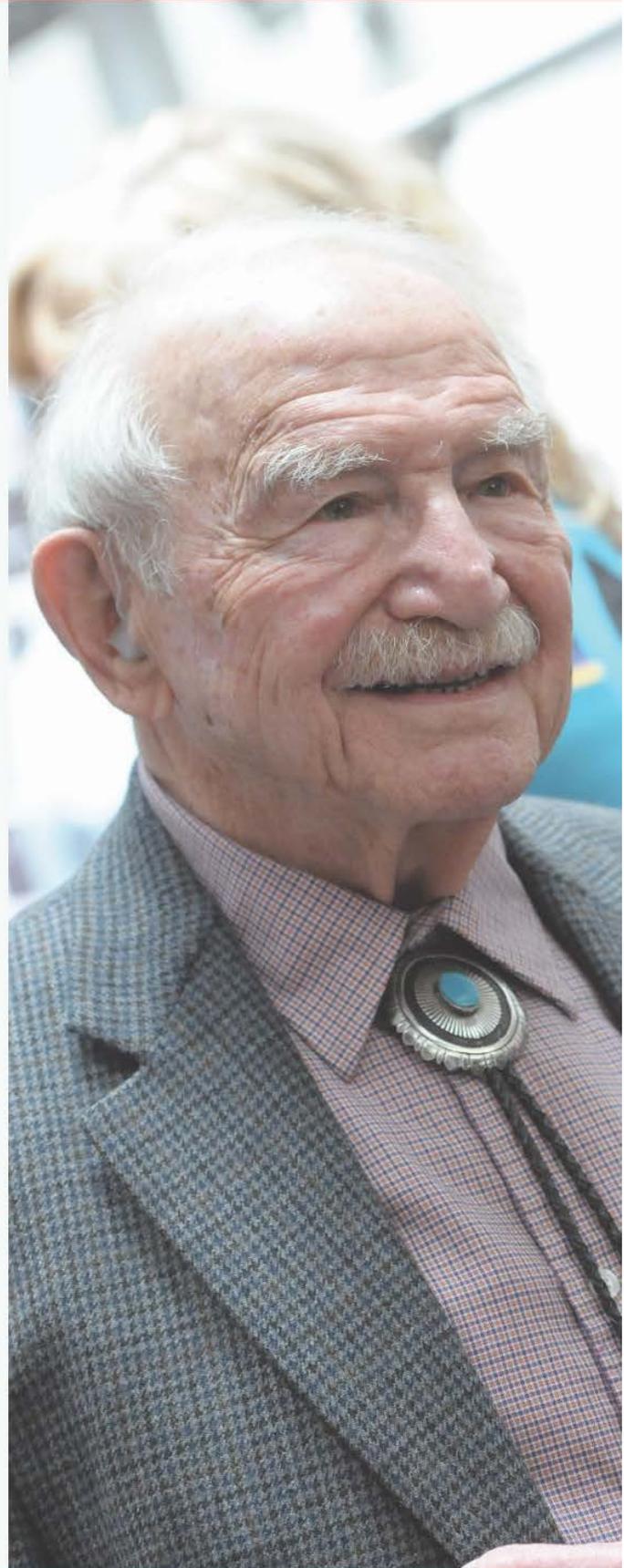
Stony Brook University

In Honor of Dr. Leo M. Sreebny

Dr. Leo M. Sreebny, former Dean (1975–1979) and faculty member (1975–2005) of Stony Brook School of Dental Medicine, passed away on April 5th, 2020 from complications caused by COVID-19. Dr. Sreebny was a passionate advocate for research and innovation. He encouraged discovery for hundreds within our community through his establishment and generous support of the annual Leo and Mickey Sreebny Lectureship and Stony Brook School of Dental Medicine Research Symposium.

Dr. Sreebny's impressive career — spanning from his military service in World War II to his numerous academic papers — is worth celebrating. Personally, Dr. Sreebny was genuine and kind, known within our community for his warmth and his backing of our students and their academic pursuits, particularly in the name of research. It is a testament to his legacy that his namesake day of research will live on within the School of Dental Medicine.

Read more about the life and accomplishments of Dr. Sreebny: dentistry.stonybrookmedicine.edu/news/2020-DrSreebny



PROGRAM

2:00 PM - 2:05 PM

Welcome and Introductory Remarks

Allan J. Kucine, DDS

Interim Dean

Associate Professor & Vice Chair, Department of Oral & Maxillofacial Surgery

2:05 PM - 2:10 PM

Introduction of Keynote Distinguished Lecturer

David K. Lam, MD, DDS, PhD, FRCDC

Interim Associate Dean for Clinical Affairs

Interim Associate Dean for Research, Office of Research & Innovation

Professor & Chairman, Department of Oral & Maxillofacial Surgery

Director, LITElab

2:10 PM - 3:00 PM

Keynote Address

William V. Giannobile, DDS, MS, DMSc

Dean

Harvard School of Dental Medicine

Future Prospects in Periodontal Tissue Engineering

3:00 PM - 3:05 PM Vendor Spotlight: **GlaxoSmithKline**

3:05 PM - 3:06 PM Vendor Spotlight: **42 North Dental**

3:06 PM - 5:30 PM

Presentations and Judging

Breakout Rooms

Room 1 - DDS & Graduates Students

Vendor Spotlight: **Komet**

Room 2 - Residents & Undergraduate Students

Vendor Spotlight: **Komet**

5:30 PM - 5:35 PM Vendor Spotlight: **Eastern Dentists Insurance Company**

5:35 PM - 5:36 PM Vendor Spotlight: **Dental Dreams**

5:36 PM - 6:00 PM

Presentation of Awards

- ◆ New York Academy of Dentistry 2019 Award Winner
- ◆ AADR/Dentsply Sirona Student Research Award
- ◆ Hinman Symposium Award
- ◆ AADR National Student Research Day Award
- ◆ AADR LI Section Student Research Award
- ◆ Resident/Fellow Research Award
- ◆ Graduate Student Research Award
- ◆ Omicron Kappa Upsilon Sigma Tau Chapter Research Award



Leo & Mickey Sreebny

Distinguished Lectureship



William Giannobile, D.D.S., M.S., D.M.Sc.

Dean

Harvard School of Dental Medicine

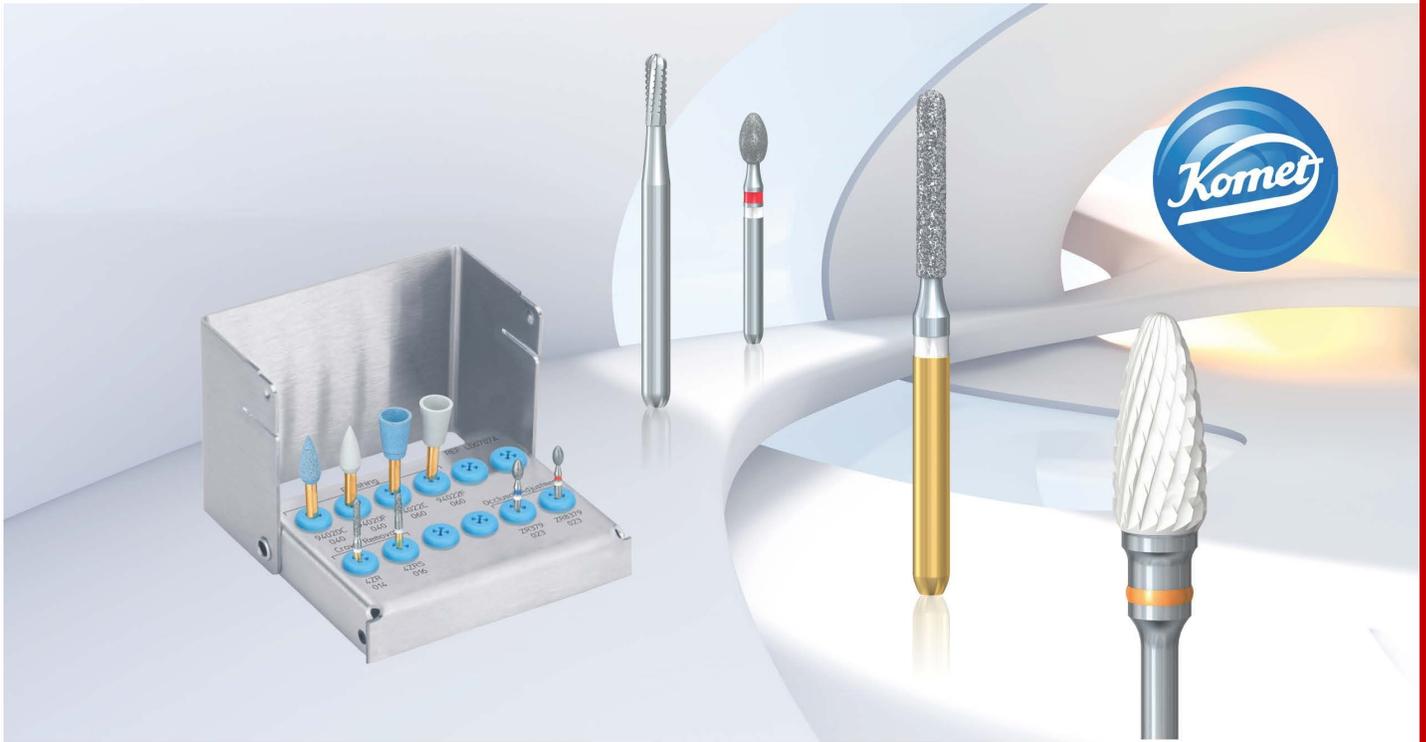
Future Prospects in Periodontal Tissue Engineering

In 2020 William Giannobile was named the 11th Dean of the Harvard School of Dental Medicine. He is also a Professor in the Department of Oral Medicine, Infection and Immunity at Harvard. He previously served as the Najjar Endowed Professor of Dentistry and Biomedical Engineering at the University of Michigan School of Dentistry from 1998-2020. He received his DDS and MS in Oral Biology from the University of Missouri. He later received his Certificate in Periodontology and Doctor of Medical Sciences in Oral Biology from Harvard University. He completed postdoctoral training in Molecular Biology at the Dana-Farber Cancer Institute and Harvard Medical School. He has served as a Visiting Professor at the University of Genoa Medical School Biotechnology Institute and the Eastman Dental Institute, University College London.

Dr. Giannobile's continuously NIH-funded research program over the past 25 years has focused on Oral and Periodontal Regenerative Medicine, Tissue Engineering and Precision Medicine. He currently serves as Co-Principal Investigator to the NIH/NIDCR-supported Michigan-Pittsburgh-Wyss Regenerative Medicine Resource Center. The goal of the center is to translate early stage dental, oral and cranio-facial reconstructive technologies into clinical practice. He has produced over 300 manuscripts, textbook chapters, and patents focused on periodontology, regenerative medicine and oral health research. He is the editor or co-editor of 9 books focused on clinical, translational research, periodontology and regenerative medicine. Dr. Giannobile recently completed a 10-year term as the Editor-in-Chief for the *Journal of Dental Research*, the official journal of the International Association for Dental Research. Dr. Giannobile has served as a consultant to the U.S. Food and Drug Administration for Dental Devices. He serves as an Associate Editor for the upcoming report on the U.S. Surgeon General's Report on Oral Health – 2021.

In 2019, Dr. Giannobile received the American Dental Association Norton Ross Award for Excellence in Clinical Research. He is also a recipient of the Distinguished Scientist Award from the Academy of Periodontology. He is a Fellow of the American Association for the Advancement of Science, the American Association for Dental Research and the International and American Colleges of Dentists. He is a past president of the American Academy of Periodontology Foundation, and currently serves as the President of the Osteology Foundation, a foundation with the mission of promoting science through clinical practice in oral tissue regeneration. In addition to his administrative and teaching responsibilities, he practices periodontics and implant dentistry at the Harvard Dental Center.





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As always, we wish the best to the faculty and students at SUNY Stony Brook School of Dental Medicine.



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POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Adam Tanner. BS DDS Candidate Class of 2023. School of Dental Medicine, Stony Brook, University. Georgios Romanos. DDS, PhD, Prof Dr med dent. Professor. Department of Periodontology. School of Dental Medicine, Stony Brook University. #Rafael Delgado-Ruiz. DDS, MSC, PhD. Associate Professor. Department of Prosthodontics and Digital Technology. School of Dental Medicine, Stony Brook University

Effect of Bone Loss on the Available Lateral Surface Area of Short-Tapered Implants

Introduction/Objectives:

To determine the lateral surface area (LSA) of short tapered implants available for osseointegration.

Methods:

Using a metrology digital microscope Keyence VHX-6000, short tapered implants were scanned in the horizontal and vertical axis. The scanning parameters were vertical and horizontal steps of 5µm with fully automated movement. Five short tapered implants from three different implant systems were evaluated. The maximum height and width were marked and the area measurement tool was activated to evaluate the implant dimensions. The mathematical formula for the calculation of the lateral surface area (LSA) $AL = \pi r \sqrt{h^2 + r^2}$ was used. Where $\pi = 3.1416$; r = radius of each implant; h = height of each implant; $\sqrt{\quad}$ = square root. Afterwards, a bone loss of 1mm and 2mm was included for new calculations. Tables with the values are presented assuming 70% of bone to implant contact and 50% of bone to implant contact. Descriptive statistics, mean and SD were used.

Results:

The results showed that short implants present different true widths and lengths from what is presented in the packaging from the manufacturers. In addition, the LSA is reduced dramatically with each mm of bone loss specially 70% and 50% of bone to implant contact.

Conclusion:

Simulated bone loss, affects the LSA available for bone to implant contact.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Brian Himelfarb*, BS (Stony Brook School of Dental Medicine); Clarisa Amarillas Gastelum# MS, DDS (Stony Brook School of Dental Medicine); Ana Carolina Botta# MS, DDS, PhD (Stony Brook School of Dental Medicine); Danielle Wajngarten, MS, DDS, PhD (Faculdade de Odontologia de Araraquara); Taiseer A. Sulaiman BDS, PhD (University of North Carolina)

Effect of Ceramic Thickness and Cement Shade on Lithium-Disilicate Glass-Ceramic

Introduction/Objectives:

The aim of this study was to evaluate the effect of ceramic thickness, cement and ceramic shades, and time (pre- and post-cementation) on color and translucency of a lithium-disilicate glass-ceramic.

Methods:

120 specimens of a monochromatic feldspathic ceramic (Mark II) were used as stump shades. Lithium-disilicate (E.max, Ivoclar) blocks were sectioned, polished, and sintered in 0.5mm and 1mm-thicknesses. Specimens were randomly assigned into twenty-four groups (n=5) according to stump shade (A1, A2, A3), ceramic shade (A1, A2, A3), cement shade (light+, light, neutral, warm), and thickness. L*, C*ab, and hab values were measured pre- and post-cementation to determine color stability (CIEDE2000), contrast ratio (CR), and translucency parameter (TP). CR and TP data were analyzed using three-way mixed ANOVA and Sidak post hoc test ($\alpha=.05$). CIEDE2000 data was subjected to three-way ANOVA and Pairwise comparison ($\alpha=.05$).

Results:

Significant interaction between thickness and time was observed for CR ($F=9.99$; $p<.01$) and TP ($F=8.03$; $p=.01$). For 0.5mm-thickness, CR was increased and TP was decreased after cementation. One-mm specimens had higher CR and lower TP than 0.5mm specimens pre- and post-cementation. A2 and A3 ceramics presented higher CR and lower TP than A1. Significant interaction was found between cement and ceramic shades ($F=4.85$; $p<.01$), and thickness and cement shade ($F=3.70$; $p=0.01$) for color stability. The greatest color change was observed for the light+ cement for both thicknesses. 0.5mm-thickness presented higher color change than 1mm-thickness, except for neutral cement. A3 had the greatest color change among ceramic shades with light+.

Conclusion:

CR and TP were affected by thickness and ceramic shade, and time of evaluation only for 0.5mm-thickness. The higher thickness led to higher CR and lower TP. A1 presented the lowest CR and highest TP. Light+ affected significantly the color of the restoration. Neutral cement had no effect on color for both thicknesses.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Daniel Greenberg, Varma M+, Delgado-Ruiz R, Romanos GE (Dept. of Periodontology and Dept. of Prosthodontics and Digital Technology, School of Dental Medicine, Stony Brook University, Stony Brook, NY)

Drilling Direction and Implant Stability with Different Macro-designs.

Introduction/Objectives:

Dental implant initial stability is fundamental especially in poor bone qualities. The purpose of this study was to evaluate the effect of bone drilling in a conventional vs. counterclockwise direction of three different implant designs through performing osteotomies in vitro.

Methods:

Three implant macro-designs (\varnothing 4.1mm x 10mm) were used: Bone Level□ (BL), Tissue Level□ (TL), Bone Level Tapered□ (BLT). The experimental (test) group consisted of the implants placed using counterclockwise- and the control group using clockwise-drilling direction (800 RPM). A total of 120 implants were placed by the same calibrated clinician. Each implant design that was evaluated consisted of 40 osteotomies (20 in the test and 20 in the control group) in an artificial representation of type IV bone quality. Implant primary stability was recorded using insertion torque (IT) and Resonance Frequency Analysis (RFA). Statistical comparison between the two groups was performed using ANOVA.

Results:

The IT and ISQ of all test group implants showed higher values for the test group compared to the control group. Statistical difference ($p < 0.05$) for IT and ISQ were found for TL and BL, respectively.

Conclusion:

Even though tapered designed implants have a better stability than parallel walled implants, counterclockwise drilling direction does not seem to statistically improve the initial stability.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Geena Bell, (B.A. Psychology), E. Kan+ (B.S. Biology), K. McMahon+ (B.S. Biology), A. Nasti DMD

Adjunctive Learning Technologies to Support Foundation Knowledge

Introduction/Objectives:

In review of the evidence based literature, educational games contribute to the learning process by helping students retain information for a longer period of time.(1)Educational games create a vigorous learning environment that motivates students to actively participate and be accountable for their own learning.(2) The purpose of this study was to evaluate the effectiveness of an interactive game show, "Dental Jeopardy," created as a supplemental learning tool within Club CAD, the Stony Brook School of Dental Medicine's digital study club.

Methods:

Ten participants were randomly selected from an audience at each monthly event, including dental students of various class years and post-graduate residents. Categories were derived from topics such as digital dentistry, radiology, and infection control, with a category devoted to material presented by a guest lecturer. Using Microsoft PowerPoint, slides with questions were hyperlinked to the main Dental Jeopardy board (Figure 1). Each Dental Jeopardy board contained six categories with three questions worth

numerical points. Participants were instructed by a host to choose a category and a point value. Contestants would have a 30-second-limited response time for each question. The top 3 contestants with the highest scores won prizes.

In order to successfully evaluate the effectiveness of Dental Jeopardy as a supplemental learning tool, participants were asked to complete a brief written survey consisting of 7 questions based on a Likert Scale ranging from Strongly Agree to Strongly Disagree.

Results:

Definitive results indicate 26/27 responses from participants. Of these responses, 84.6% of participants strongly or mostly agreed that Dental Jeopardy provided an enjoyable experience. 61.5% of participants strongly or mostly agreed that they would recommend Dental Jeopardy to their colleagues (Figure 2).

Conclusion:

Students responded with positive views of Dental Jeopardy at Club CAD events. An interactive learning strategy, Dental Jeopardy is an effective way to reinforce material, clinical protocol, foundation knowledge as well as provide an interactive peer mentoring environment for students and residents.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Gerard Fischer, BS Department of Periodontology/Stony Brook School of Dental Medicine; **Rahman, Zaid BS** Department of Periodontology/Stony Brook School of Dental Medicine; **Delgado-Ruiz, Rafael, DDS, PhD** Department of Prosthodontics and Digital Technology/Stony Brook School of Dental Medicine; **Romanos, Georgios DDS, PhD**, Department of Periodontology/Stony Brook School of Dental Medicine

Spectrometric Analysis of Material Residue from Wear During Implant Insertion

Introduction/Objectives:

The aim of this study was to investigate the process of material residue due to wear from dental implants at the time of insertion.

Methods:

X-ray fluorescence spectrometry and an in vitro insertion protocol were utilized. Five groups of implants were analyzed: Groups 1-4 (Ti-implants: Astra, Nobel Active, Nobel Replace, Straumann Bone Level) and group 5 (Zirconia implants). A bovine bone block (type I) without implant insertion was utilized as a control. Three implants per group were inserted into two bovine bone blocks held together by a vice. The blocks were then separated in two parts, and insertion sites were analyzed using XRF spectrometry for titanium and zirconium elements in the coronal, middle and apical bone interface (n=18 per group). Global counting was calculated. Descriptive analysis of the amount of titanium and zirconium ppm levels per implant system group was performed. Analysis of Variance and Tukey HSD were completed to compare differences between groups.

Results:

The produced material residue differed among groups being higher for groups 1, 2, and 3 and lower for group 4 ($p < 0.001$). No statistically significant differences were found between the groups 3 and 4 as well as 2 and 3. Group-5 implants did not show significant zirconium accumulation compared to controls.

group 1 (Astra): $2,003.89 \pm 817.77$
group 2 (Nobel Active): $1,406.72 \pm 590.54$
group 3 (Nobel Replace Select): $1,063.22 \pm 383.49$
group 4 (Straumann, Bone Level): 689.11 ± 452.30
group 5 (Zeramex): 155.11 ± 25.61

Conclusion:

The results of this study suggest that metal residue due to wear from dental implants may occur as early as the time of initial insertion in dense bone and will be different depending on the implant system. The zirconia implants produced lower residue compared to titanium implants.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Jasmine Sze, BS, Kyung Nam, DDS; Nathan Estrin, DDS; Jamie Saragossi, MLS; Vincent Iacono, DMD; Hossein Bassir, DDS, DMSc

Long-term Outcomes of Periodontal Regenerative Procedures: A Meta-analysis

Introduction/Objectives:

Periodontal regenerative procedures are performed to treat teeth with periodontal intrabony defects with the goal of reconstruction of the periodontium. It is imperative to analyze the long-term efficacy of these procedures by focusing on studies with long-term follow-ups. Therefore, the present systematic review and meta-analysis aimed to assess the long-term efficacy of periodontal regenerative procedures for the treatment of intrabony periodontal defects.

Methods:

This systematic review and meta-analysis was performed in accordance with PRISMA guidelines. Studies conducted in human subjects with intrabony periodontal defects treated with periodontal regenerative therapy and a minimum follow-up period of 5-years were included. All studies had to provide quantitative outcomes for tooth retention (primary outcome variable), clinical attachment level, probing depth, and vertical defect fill, or patient-centered outcomes. Electronic literature database search was performed in CINAHL, EMBASE, PubMed, and Web of Science. Additionally, a manual search of the table of contents of relevant journals was performed. Meta-analysis was performed using CMA software (Biostat, Englewood, NJ). Data from included studies were pooled to estimate effect size.

Results:

The literature search identified 1904 citations. Thirty-eight citations met the inclusion criteria. Quantitative analysis showed a tooth retention rate of 92.8% (95%CI: 0.91; 0.94) and 87.7% (95% CI: 0.83; 0.91) after at least 5 years and 10 years follow-up, respectively. The meta-analysis revealed a mean gain in clinical attachment level of 3.47 mm ($p < 0.001$; 95% CI: 3.13; 3.82). The quantitative analyses demonstrated a mean reduction of 4.06 mm in probing depth ($p < 0.001$; 95% CI: 3.65; 4.48), and a mean radiographic vertical defect fill of 3.69 mm ($p < 0.001$; 95% CI: 2.83; 4.55). No studies reported patient-centered outcomes.

Conclusion:

The available evidence supports the long-term efficacy of periodontal regeneration procedures for the treatment of intrabony periodontal defects. Periodontal regenerative procedures for the treatment of intrabony defects result in long-term tooth retention, defect reduction, and lasting improvements in clinical attachment level and pocket probing depth.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Joseph Masselli, BS Department of Periodontology Stony Brook University, Carrion, Julio A. DMD, PhD Department of Periodontology Stony Brook University, Wang, Howard H. Department of Periodontology Stony Brook University, Park, Jihye MS Department of Mathematics Stony Brook University, Iacono, Vincent J DMD Department of Periodontology Stony Brook University, Myneni, Srinivas BDS MS PhD Department of Periodontology Stony Brook University

Enhanced Guided Bone Regeneration by Using a Perforated Resorbable Membrane

Introduction/Objectives:

The purpose of the present study was to determine whether the use of Perforated resorbable barrier membranes (PRBMs) would lead to an increase in horizontal bone regeneration in localized alveolar ridge defects when compared to the traditional Nonperforated resorbable barrier membrane (NPBM).

Methods:

Ten systemically healthy, non-smoker patients were blinded and randomized to treatment groups of PRBM (N=5) or control (N=5) group using NPBM. Clinical and cone beam computed tomography (CBCT) examinations indicated significant horizontal ridge deficiency (<5 mm) in all cases. Horizontal bone augmentation was performed following guided bone regeneration principles using a mineralized mixed cortico-cancellous (70:30) allograft followed by either a PRBM or NPBM. Clinical horizontal bone augmentation results were compared at baseline to approximately 5 months later at the re-entry surgery for implant placement. In addition, volumetric changes were compared using pre- and postoperative CBCT. Histomorphometric analysis including hematoxylin and eosin, trichrome blue, and sirius red staining were performed on bone core biopsies to assess de novo bone formation in the PRBM treatment group.

Results:

Overall, the width of the alveolar ridge was similar in both groups, but slightly higher (<0.5 mm) in the PRBM group. The CBCT showed greater bone width in the PRBM group (<0.5 mm; p-value 0.0159). Histological analysis showed that PRBM had significantly greater new bone formation as compared to NPBM (P <0.05). H&E analysis showed a gain of 37.15% in the PRBM group. Trichrome staining showed both groups had osteoid present around particles of the graft, however there was significantly more graft being incorporated into bone in the PRBM group.

Conclusion:

GBR with the use of a PRBM results in enhanced regeneration both in bone quantity and quality. The enhanced results were likely due to the contribution of the progenitor cells in the cambium layer of the periosteum as well as better clot stabilization attributed to the membrane perforations.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Mohit Varma, BA, Daniel Greenburg+ BS, Georgios Romanos+# DDS, PhD, Rafael Delgado-Ruiz+ DDS, PhD, MsC

Implant Length Effect on Stability of Implants using Reverse Drilling

Introduction/Objectives:

Tapered implant design is used to enhance primary stability through osseous condensation in type IV bone. The purpose of this study was to analyze the primary stability of Tapered Effect□ (TE)-implants at different implant lengths by performing osteotomies in both a clockwise (control) and counterclockwise (test) direction (800 RPM).

Methods:

Three groups of TE-implants (Ø 4.1mm) were used with lengths of 10mm (Group A), 12mm (Group B), 14mm (Group C). Each group consisted of 40 osteotomies in type IV bone blocks simulants (20 in the control group and 20 in the test group). Insertion torque (IT) and Implant Stability Quotient (ISQ) values were recorded for each individual implant. (Test IT-A/B/C: 19.5±4.56/21.75±3.35/17± 2.51; Control: 12±3.4/13.25±2.45/9.25±2.45). (Test ISQ-A/B/C: 61.23±2.31/64.68±2.56/64.93±2.79; Control: 60.15±3.3/64.8±2.55/63.2±4.61). Statistical analysis using ANOVA was performed.

Results:

IT and ISQ values were higher ($p < 0.05$) for test- than control-groups. No statistical differences ($p > 0.05$) were found for IT and ISQ with changing the implant lengths.

Conclusion:

Counterclockwise drilling seems to have a better implant stability in TE-implants. However, increased implant length does not have an impact on overall stability.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Noelle Fischer, BS; Quinn, Stephanie, BS; Trepeta, Nicole, BS; Vieira, Stefan-ny, BS; Nasti, Ann, DMD, Cannella, Dolores, PhD

Peer Mentoring in the Vertically Integrated Group Practice Model

Introduction/Objectives:

Peer mentoring in the clinical environment has been shown to increase professional development and future career preparation for students in healthcare. In accordance with these benefits Stony Brook's School of Dental Medicine incorporated a peer mentoring program when it transitioned to a vertically integrated, Group Practice Model in the academic school year of 2018-2019.

The purpose of this study was to determine the effectiveness of peer mentoring in the newly implemented vertically integrated Group Practice Model, in comparison to the pre-existing Traditional Clinic Model where there were separate clinical cohorts of second, third, and fourth year students, respectively.

Methods:

In order to successfully evaluate the effectiveness of peer mentoring in the clinical environment, the Classes of 2020 and 2021 were asked to complete a brief online survey consisting of 7 questions based on a Likert Scale. Participants' class year and assigned group practice was obtained while the subjects' identities remained anonymous. Responses were analyzed in order to evaluate the current peer mentoring program implemented within the Group Practice Model to determine its efficacy and value in clinical education.

Results:

Results indicate 40/43 responses from the Class of 2020 and 42/44 responses from the Class of 2021 (94% response rate). Of these responses, students "Strongly Agreed" or "Agreed" that their assigned 3rd and/or 4th year student was responsive to questions regarding clinical workflow and patient care (81.7%); that they benefited from being in clinic with upperclassmen (75.6%); and that they better understood clinical workflow due to the mentorship provided by their near peer colleagues (3rd and/or 4th year students) (65.9%).

Conclusion:

Students responded with positive views of peer mentoring in the clinical environment, representing its value in clinical education. Peer mentoring is an effective way to help students better understand and execute organized clinical workflow. (2) Future studies will explore the correlation between mentoring and specific discipline-based patient services.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Philip Bacigalupo, DDS Stony Brook University School of Dental Medicine, Odingo, Nora, BDS, DMD, MPH Stony Brook University School of Dental Medicine#

Amyloid Deposits of the Palate: Case Report and Literature Review

Introduction/Objectives:

To present an unusual case of amyloid deposits of the palatal mucosa in a patient with no known related medical conditions, and to review the literature on oral amyloidosis. Amyloidosis can present as an organ-limited form, most commonly on the tongue when intra-oral, or as part of a systemic condition such as multiple myeloma. The literature on amyloidosis of the palate with associated systemic disease is uncertain.

Methods:

An 82-year-old male presented with a painless soft tissue mass of the left palate of several years' duration (Fig. 1). His medical history was significant for myocardial infarction, stent placement, hepatitis A, hypertension, and cataracts. The mass was biopsied in the Oral & Maxillofacial Surgery Department. A PubMed search was conducted for case reports of palatal amyloidosis.

Results:

Histopathologic diagnosis of amyloid deposits, based on H&E and Congo red stains (Fig. 2 and 3). Final diagnosis pending medical investigation to rule out systemic

Conclusion:

This study reviewed cases of amyloidosis of the palatal mucosa and their association with systemic disease. Systemic forms of amyloidosis such as multiple myeloma must be ruled out to ensure that patients receive appropriate comprehensive treatment.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Rui Zhang, BS Oral Biology and Pathology, Stony Brook School of Dental Medicine. Wang, Ruixue MD Oral Biology and Pathology, Stony Brook School of Dental Medicine. London, Steven D. DDS, PhD Oral Biology and Pathology, Stony Brook School of Dental Medicine. #London, Lucille BS, PhD Oral Biology and Pathology, Stony Brook School of Dental Medicine.

Parotid Gland Immunization Induces Differential Activation of Th Immune Responses

Introduction/Objectives:

Salivary glands are a major component of the mucosal immune system that confer adaptive immunity to mucosal pathogens. Previous work demonstrated that inoculation of the submandibular gland with either attenuated virus or a subunit murine cytomegalovirus (MCMV) vaccine in mice produced both a mucosal and systemic immune response, with the formation of inductive site germinal centers characterized by differentiated plasma cells and antibody class switching, the generation of MCMV specific antibodies, and protection against a secondary lethal challenge. We also demonstrated that parotid gland inoculation also induced both a mucosal and systemic immune. This current study analyzed cytokine expression after parotid gland immunization with attenuated MCMV.

Methods:

The parotid glands of mice were inoculated via surgical incision with attenuated MCMV and examined for expression of specific cytokines and transcription factors necessary for the generation of Th immune responses at 4, 7, 14, and 21 day timepoints post-inoculation. qPCR was performed from RNA samples obtained from both the parotid glands and associated lymph nodes. Each control and timepoint contained 2-10 samples and were compared with a 2-tailed Student's T-test.

Results:

The parotid glands expressed increased mRNA for TGF- β , IL-6, IL-10, and T-bet while its associated lymph nodes expressed increased mRNA for IFN- γ , TGF- β , IL-4, T-bet, and FOXP3. T-bet is a transcription factor that increases Th1 cytokines, such as IFN- γ , TNF- α , and IL-2 while FOXP3 mainly activates the differentiation of regulatory T cells, which are involved in immune homeostasis.

Conclusion:

This study demonstrated that inoculation of the parotid gland with tcMCMV resulted in differential activation of transcription factors and cytokines in the parotid gland vs its associated lymph nodes. These data also demonstrate that parotid gland inoculation induces expression of several cytokines responsible for Th1 and Th2 cell differentiation and their immune response, supporting its use as a vaccination route.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Stefanny Vieira, BS; Trepeta, Nicole, BS; Quinn, Stephanie, BS; Stony Brook University School of Dental Medicine

A Retrospective Analysis of the Traditional Model vs. Vertical Model

Introduction/Objectives:

Objectives: Stony Brook's School of Dental Medicine transitioned to a vertically integrated, Group Practice Model in the school year of 2018-2019. The purpose of this study was to assist in evaluating the effectiveness of the GPM in comparison to the Traditional Model.

Methods:

Completed student experiences across various disciplines were analyzed from 2017-2019 for the year 2 and year 4 classes. Completed experiences in the school year of 2017-2018 were of the Traditional model, while experiences of 2018-2019 were of the GPM.

Results:

On average, year 2 students of the GPM completed more operative and preventative experiences than those of the Traditional Model. The total amount of completed student experiences for the year 4 students remained stable between the Traditional Model and GPM, with increasing preventative experiences completed in the GPM.

Conclusion:

The overall stability in the amount of completed student experiences between the classes of 2018 and 2019 could be attributed to the year 4 students of the GPM allotting time to provide mentorship to lowerclassmen. Although patient care began earlier in the Traditional Model, year 2 students of the GPM had mandatory assisting rotations prior to commencing patient care. A possible explanation for the increase in completed student experiences by the year 2 students of the GPM, could be due to the mentorship provided by upperclassmen during assisting rotations. This mentorship provided a strong foundation of clinic workflow, allowing for a more effective execution of patient care.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Stephanie Quinn, BS, Fischer, Noelle BS, Bell, Geena BS, Nasti, Ann DMD & Cannella, Dolores PhD

A Year in Review of Stony Brook's Digital Study Club

Introduction/Objectives:

With the continued presence and growth of digital technology in dentistry,(1) Club CAD, Stony Brook School of Dental Medicine's digital study club, which was founded in 2017, promotes collaboration between students, residents, and faculty to further one's knowledge and improve techniques on current and emerging technologies.

The purpose of this study was to retrospectively assess student, resident, and faculty engagement, participation, and satisfaction of Club CAD's numerous hands-on and didactic lecture events over the course of the 2018-2019 academic year. In doing so, Club CAD can facilitate better organization of future events and enhance foundational content material.

Methods:

Attendees were registered for each of the 7 events held during the 2018-2019 academic year, and were categorized as student, resident, or faculty member status. Through analysis of the recorded attendance, the average number of events attended per person, the cohort that attended the most events, and the type of event (hands-on or didactic lecture) that attracted the most attendees was determined. Post event surveys were sent out to every event attendee to determine overall event relevance and satisfaction.

Results:

Results indicate that among all Club CAD attendees, two events were attended per person on average. Didactic lecture events were perceived to be well organized, relevant to attendees' level of training, and were overall rated higher when compared to hands-on events.(3) Didactic lecture events had greater numbers of participants than the hands-on events (179 vs. 71 attendees). Overall, the Class of 2021, who were Year 2 students at the time, had the most members attend events over the course of the academic year.

Conclusion:

Club CAD received widespread engagement and positive feedback from students of all four cohorts, residents, and faculty, who worked together throughout the 2018-2019 academic year to enhance their knowledge of emerging digital technology.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Susan, Erickson BS, Department of General Dentistry/Stony Brook University; Bhatt, Heta Dinesh, BDS, PhD, Department of Oral Biology and Pathology/Stony Brook University; Walker, Stephen, PhD, MSc, Department of Oral Biology and Pathology/Stony Brook University; Hui, Jessica, BS, Department of Oral Biology and Pathology/Stony Brook University; Golub, Lorne M, DMD, MSc, DSc, MDS (honorary), FNAI, SUNY Distinguished Professor, Department of Oral Biology and Pathology/Stony Brook University; Lee, Hsi-Ming, PhD, Research Associate Professor, Department of Oral Biology and Pathology/Stony Brook University; Johnson, Francis, PhD, BSc, Professor, Department of Chemistry and Pharmacological Sciences/Stony Brook University; Gu, Ying, DDS, PhD, Professor, Department of General Dentistry/Stony Brook University;

Therapeutically-Effective Chemically-Modified-Curcumin: Effect on Microflora in Dog Periodontitis

Introduction/Objectives:

The gram-negative bacteria *Porphyromonas gulae* and *Tannerella forsythia* are dominant periopathogens in dogs. This study will evaluate the effect of chemically-modified-curcumin (CMC2.24), a novel MMP-inhibitor, on the microflora *P. gulae* and *T. forsythia* in a dog model of natural periodontitis.

Methods:

Microflora (sub-gingival plaque) was collected on sterile paper points in 8 beagle dogs exhibiting generalized periodontitis, after 4-months therapy with either placebo or CMC2.24 (10mg/kg) capsules orally administered daily. DNA was purified from the paper points and quantified using the NanoDrop microvolume spectrophotometer. A universal primer set confirmed the amplification of purified DNA by end-point PCR using species-specific primers to identify both *P. gulae* and *T. forsythia*. Purified DNA from *P. gulae* (ATCC®51700 TM) and *T. forsythia* (ATCC®43037 TM) served as positive controls and RNase-free water as a negative control. Results were visualized on 0.7% agarose DNA gels containing ethidium bromide.

Results:

All plaque samples from both groups of dogs exhibited *P. gulae* and *T. forsythia* DNA; however, end-point PCR showed no differences in gel band intensity for both bacteria, between control and treatment groups.

Conclusion:

Orally-administered CMC2.24 was shown to be effective as a host-modulator in the dog model of periodontitis. However, this was not associated with significant antimicrobial efficacy against the periopathogens *P. gulae* and *T. forsythia*. Our investigation into the discrete quantification of *P. gulae* and *T. forsythia* in treatment versus control groups is ongoing. As *P. gulae* in dogs is functionally analogous to *P. gingivalis* in humans as a marker of periodontal disease severity, further studies must be conducted to determine the efficacy of CMC2.24 as periodontal therapy.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Nicole Francisco, BS, DDS/MS Student; Botta, Ana, DDS, MS, PhD, General Dentistry/Stony Brook School of Dental Medicine; Amarillas, Clarisa DDS, MS, General Dentistry/Stony Brook School of Dental Medicine; Wajngarten, Danielle, DDS, MS, PhD, Social Dentistry/Faculdade de Odontologia de Araraquara

Material Thickness of CAD/CAM Designed and Milled Leucite-reinforced Glass-ceramic Crowns

Introduction/Objectives:

The aim of this study was to compare material thickness of digitally designed crowns to milled crowns using different methods of analysis, design modes and areas of evaluation.

Methods:

Impressions of mandibular and maxillary arches from 40 dental students were taken (IRB approval: CORIHS #2017-4284-F). Standardized crown preparations were performed and digitally scanned on the right mandibular first molar of each cast. Three different crowns were designed using design modes provided by the Planmeca Romexis software (n=40): Pre-Op, Library A, and Library C. 120 IPS Empress CAD LT crowns were milled. Thickness (mm) of designed crowns was evaluated by Planmeca and 3 Shape software, and milled crowns by a caliper (Calipretto-CR). Material thickness was evaluated in 4 areas: central fossa (CF), bucco-axial wall (BAW), mesiobuccal (MBC) and distolingual (DLC) cusps. Data was evaluated using three-way ANOVA, Games Howell, and Tukey's post hoc tests ($\alpha=.05$).

Results:

There was significant statistical difference ($p<0.001$) among areas of evaluation, crowns designed by Planmeca (1.12 ± 0.75) and milled crowns evaluated by the caliper (1.28 ± 0.61). PreOp presented the highest values of thickness in MBC and DLC, Library A in the MBC and Library C in the DLC. The highest values of thickness were achieved in the BAW for Library C, MBC for PreOp and Library A, and DLC for Libraries A and C. CF was affected by the method of analysis, having higher values of thickness when measured by the caliper.

Conclusion:

Material thickness was affected by the design modes in all areas of evaluation, except for CF. Milled crowns had higher material thickness in the CF than designed crowns. DLC presented higher material thickness than other areas of evaluation, regardless the methods of analysis.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Aya Sabbah, Oral Biology and Pathology Department, Stony Brook University School of Dental Medicine; Delgado-Ruiz, Rafael, Prosthodontics and Digital Technology, Stony Brook University, School of Dental Medicine; Romanos, Georgios, Periodontology, Stony Brook University, School of Dental Medicine

3D-Printed Dental Resin Modified With Chlorhexidine Affects Its Mechanical Properties

Introduction/Objectives:

Chlorhexidine (CHX) is a widely used antimicrobial agent in dentistry. Its prolonged potency and tissue biocompatibility influenced its addition into intraoral appliances whenever oral infections are anticipated. The aim of this study was to evaluate the changes of the mechanical properties of dental appliances fabricated by stereolithography apparatus (SLA) 3D-printing modified with CHX.

Methods:

Samples were designed with the software AutoDesk-Fusion360® in accordance with ASTM-standardized shapes. Designs were uploaded to a 3D-printer (Formlabs® SLA-printer), and Dental-LT-Clear resin was used for printing. Twenty samples were printed with two groups of resins, the resin without modifications as a control group (n=10) and the resin mixed with CHX 0.12% as a test group (n=10). CHX percentage was determined following minimum inhibitory concentrations (MIC) results done previously. Five mechanical tests: Tensile/elongation (modulus), compressive (modulus), flexural (3-point bending modulus), Izod impact (strength), and Vickers (hardness) tests were performed. Analysis was done by t-test and $p < 0.05$ for significance.

Results:

Incorporation of the CHX into the 3D-printed resin led to a significant decrease in the printed resin's tensile modulus of elasticity implying increased stiffness and low resistance to permanent elongation forces ($p=0.01$), a significant increase in resistance to compressive strength ($p=0.001$), a significant increase in resistance to impact sudden forces ($p=0.03$), a very significant increase in flexural modulus to resist bending ($p = 2.7 \times 10^{-5}$) and a significant drop in hardness ($p=0.03$).

Conclusion:

Incorporation of chlorhexidine to the resin used in 3D-printed dental appliances influenced mechanical behavioral changes of the products by a significant increase in stiffness, resistance to compression, impact forces, and bending forces, and a drop in hardness.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Heta Dinesh Bhatt, BDS, PhD, Department of Oral Biology and Pathology/Stony Brook University; **Golub, Lorne M, DMD, MSc, DSc (h), MD (honorary), FNAI**, SUNY Distinguished Professor, Department of Oral Biology and Pathology/Stony Brook University; **Lee, Hsi-Ming, PhD**, Research Associate Professor, Department of Oral Biology and Pathology/Stony Brook University; **Deng, Jie, BDS, MDS, DDS, Orthodontist, PhD**, Department of Oral Biology and Pathology/Stony Brook University; **Kanwal, BDS, MS**, Department of Oral Biology and Pathology/Stony Brook University; **Hong, Houlin, MPH**, Department of Family, Population & Preventive Medicine/Stony Brook University; **Zhu, Steven, BS**, Department of Biochemistry/Stony Brook University; **Hui, Jessica, BS**, Department of Biology/Stony Brook University; **Johnson, Francis, BSc, PhD**, Professor, Department of Chemistry and Pharmacological Sciences/Stony Brook University; **Gu, Ying, DDS, PhD**, Professor, Department of General Dentistry/Stony Brook University.

Chemically-Modified-Curcumin: A Novel MMP-Inhibitor in Long-term Diabetic Rat Model

Introduction/Objectives:

CMC2.24, a novel chemically-modified (phenylaminocarbonyl)-curcumin, was developed as a pleiotropic MMP-Inhibitor for various inflammatory/collagenolytic diseases including periodontitis. This compound demonstrated safety and efficacy in vitro, in cell culture, and in vivo (oral administration) in mice, rats, and dogs. The current objective was to determine whether orally-administered CMC2.24 can reduce severity of diabetes, and its role as an MMP-inhibitor, in a long-term rat model.

Methods:

21 adult male Sprague-Dawley rats were randomly distributed into three groups: Normal (N), Diabetic(D) and Diabetic + CMC2.24 (D+2.24). All three groups were orally administered vehicle: carboxymethylcellulose alone (N, D), or CMC2.24 (D+2.24; 30mg/kg/day). Blood was collected at 2-months and at the end of 4-month study. At completion, gingival tissue and peritoneal washes were collected/analyzed, and jaws analyzed for alveolar bone loss by micro-CT.

Results:

Treatment did not reduce severity of hyperglycemia. The % active-MMP-9 in plasma increased from 26% in normal rats, to 46% in diabetic rats, which was reduced to essentially normal (15%) after 4-months CMC2.24 treatment. In gingival tissue, % active-MMP-9 increased from 13% in normal to 32% in diabetic rats which, upon treatment with CMC2.24, was again normalized (16%). Also, in cell-free peritoneal exudate, the pro-MMP-9 increased significantly for both the diabetic and treatment- groups. However, the active-MMP-9 increased by 158% for diabetics compared to only 15% for treatment- group. Thus, the treatment substantially decreased the conversion of pro- to actively- destructive proteinase. No significant changes were observed in pro-inflammatory cytokines, but RvD1 (resolvin) was increased ($p < 0.05$). Micro-CT analysis of maxillae showed that bone mineral density ($p < 0.05$) and bone volume ($p < 0.05$) decreased for the diabetic group and were normalized by CMC2.24 treatment.

Conclusion:

This study indicates MMP-9 serves as an early/sensitive biomarker and confirmed the potency of CMC2.24 as an MMP-inhibitor independent of severity of hyperglycemia.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Fnu Kanwal, BDS, MS, Department of Oral Biology and Pathology/Stony Brook University
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A Novel Chemically-Modified-Curcumin Reduces Bacterial Biodegradation of Dental Adhesive Materials

Introduction/Objectives:

Esterase produced by *Streptococcus mutans* can biodegrade the resin-dentin interface, producing recurrent caries. This study aims to determine (1) the Minimum Inhibition Concentration (MIC) of a novel compound, Chemically-modified-curcumin (CMC2.24) for the growth of *S. mutans*, (2) the inhibition of CMC2.24 on esterase activity, and (3) its inhibition on the biodegradation of dental adhesives mediated by *S. mutans* esterase.

Methods:

For MIC assays, 3 different strains of *S. mutans* (ATCC® 25175™, ATCC® 700611™, ATCC® 700610™) were incubated with Curcumin, Doxycycline, Chemically-modified-tetracycline-8(CMT-8), and CMC2.24 for 2 days. MIC was recorded. Enzyme Inhibition Assay was performed using Porcine liver esterase, Substrate (Resorufin Butyrate), and Inhibitor (CMC2.24). Fluoro-spectrometer measurements were recorded by reading the kinetic absorbance at Excitation 540 nm and Emission 590nm at 250C. In a separate experiment, dental adhesive materials were incubated with *S. mutans* with or without CMC2.24 for 4 weeks, surface roughness pre and post incubations were assessed by laser diffraction patterns.

Results:

CMC2.24, curcumin, CMT-8 exhibited high MIC compared to doxycycline against all 3 strains of *S. mutans*. MIC of CMC2.24 for all 3 strains of *S. mutans* were as follows: 0.312 mM for ATCC® 25175™, 0.6 mM for ATCC® 700611™, and 0.225mM for ATCC® 700610™. In addition, 2 µM, 5 µM, 10 µM, and 100 µM CMC2.24 inhibited the esterase activity by 40%, 31%, 59%, and 96% respectively, with IC50 at 6 µM. CMC2.24 (5 µM) also significantly reduced the surface roughness of dental adhesive materials, mediated by *S. mutans* biodegradation, by 40%.

Conclusion:

This study demonstrated that CMC2.24 does not inhibit the growth of *S. mutans*. However, CMC2.24 did effectively inhibit *S. mutans* derived esterase activity and reduced biodegradation of dental adhesive materials. This therapeutic potential of CMC 2.24 may reduce secondary caries and prevent failed restorations.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Raksha Narendra MS, Department of Oral Biology and Pathology, Stony Brook University, Soosan Ghazizadeh Ph.D., Department of Oral Biology and Pathology, Stony Brook University)

Characterization of K14 Expressing Cells in Parotid and Sublingual Glands.

Introduction/Objectives:

Patients suffering from irreversible degenerative salivary gland diseases experience severe hyposalivation. In order to reverse this condition, current studies focus on stem cell-based regenerative therapies to restore gland function. Earlier studies in the mouse submandibular gland have identified K14 expressing ductal stem cells, as the only stem cell population in the gland. Our objective is to identify and characterize K14 expressing ductal stem cells in parotid and sublingual glands (SLG), as the knowledge about the existence and function of stem cells in these glands is very limited and is critical as major salivary glands are the prime contributors of saliva secretion in the oral cavity.

Methods:

Here we have employed transgenic mouse models to perform in-vivo genetic labeling and fate mapping analysis in both Parotid and SLG to trace the lineage of K14 expressing cells for up to 6 months, then we investigated the mechanism of regeneration in SLG using a model of severe and reversible injury.

Results:

Here we show that K14-expressing ductal stem cells are present in the adult parotid gland and contribute to the maintenance of ductal cells during steady-state conditions. In the sublingual gland, however, although K14-expressing ductal cells are present, they do not display characteristics of tissue stem cells. We, however, found that in response to a severe injury, regeneration of the sublingual gland is mediated by myoepithelial cells that show remarkable plasticity by de-differentiating to acinar cells.

Conclusion:

These studies reveal the similarities and differences in the role of ductal stem cells among the major salivary glands and widen the treatment options for each salivary gland type. All this knowledge could be employed in crafting different treatment options to cure salivary hypofunction.



POSTER PRESENTERS

Room 1 - DDS & Graduate Students

Rita O'Dwyer, DDS, Division of Endodontics, Oral Biology and Pathology
Stony Brook University; Li, Kao, BE, Materials Science and Chemical Engineering,
Stony Brook University; Cymerman, Jerome J., DMD, Assistant Clinical Professor,
Division of Endodontics, Stony Brook University; Simon, Marcia, PhD, Professor,
Oral Biology and Pathology, Stony Brook University; Rafailovich, Miriam, PhD, Dis-
tinguished Professor, Materials Science and Chemical Engineering, Stony Brook
University

The role of blood clots in regenerative endodontic treatments

Introduction/Objectives:

The role of blood clots in regenerative endodontic treatments

Methods: :

To generate hard and soft matrices, gelatin gels (9% (w/v)) were cross-linked overnight at 37°C and 5% CO₂ with two concentrations of mouse transglutaminase in the presence and absence of 4 mg/mL fibrinogen and 3 U/mL thrombin. The mechanical and structural properties were measured using rheometry and cryo-scanning electron microscopy (SEM). DPSC were plated on these scaffolds, and the degree of biomineralization measured using Electron Dispersive X-ray spectroscopy (EDX) and X-ray fluorescence (XRF). DPSC differentiation was monitored by the expression of osteocalcin (OCN) and dental sialophosphoprotein (DSPP) measured by RT-PCR. DPSC migration on each gel was measured after placing a 1.25 µL drop of DPSC (1.5 X 10⁷ cells/mL) in agarose onto each surface.

Results:

Addition of fibrin changed gel morphology, reduced gel moduli, and increased gel flexibility. Fibrin modified gels also supported nearly a doubling in cell migration rates. While XRF and Alizarin red showed significant acellular biomineralization, more extensive biomineralization was detected with DPSC. Notable was the 10X increase in mineralization in the fibrin-modified gels. Furthermore, while RT-PCR indicated that the differentiation of DPSC occurred on all scaffolds, addition of fibrin increased DSPP expression 2X compared to pure gelatin, consistent with odontogenic differentiation.

Conclusion:

Fibrin, the primary component in blood clots, remodels the structure of gelatin, enabling increased DPSC migration, differentiation, and biomineralization, which are all essential components in dental regeneration.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Barsoum, Maria, DDS - Pediatric Dentistry, Stony Brook School of Dental Medicine, **Sean Challenger, DDS** - Pediatric Dental Resident, Stony Brook School of Dental Medicine, Sherwin, Rhona, DDS - Program Director, Stony Brook School of Dental Medicine, Yehuda, Marciano, DDS – Clinical Assistant Professor, Stony Brook School of Dental Medicine

Protocol for dental management of newly diagnosed pediatric oncology patients

Introduction/Objectives:

To establish an interprofessional collaborative protocol for dental evaluation, oral health education, and case management of newly diagnosed pediatric oncology patients. The oral health status is an integral component of medical care for children and adolescents diagnosed with cancer. Childhood cancer is the second most common cause of death in children in the United States. A protocol was initiated at Stony Brook Children's Hospital such that pediatric dentists and the pediatric oncology teams can work collectively to screen for and treat dental and oral diseases.

Methods:

- Designed a checklist for pediatric attendings and residents to follow to ensure proper oral cavity evaluation of pediatric oncology patients
- Developed a system to dentally clear pediatric oncology patients to ensure they receive any necessary treatment prior to initiating their cancer treatment
- Developed a system to treat pediatric oncology patients in an outpatient or inpatient setting
- To assist families in finding a dental home for children

Results:

Patients in need of dental treatment prior to procedures related to their cancer regimen were treated in either an inpatient setting in the Operating Room under General Anesthesia, bedside/chairside in the Children's Hospital, and/or in an outpatient setting at Stony Brook School of Dental Medicine clinic.

Conclusion:

The pediatric dentist needs to work alongside the oncology team to deliver safe and effective dental treatment and to ensure the child is free of any possible urgent care needs prior to initiating therapies. Ideally, the child's oral cavity should be disease-free to avoid complications before, during, and after cancer therapy. Essentially, an interprofessional collaborative approach to care works toward ensuring a proper assessment of the oral cavity and management of dental complications for children with cancer.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Hayley Golden, DDS, Department of Pediatric Dentistry*

Case Report on Dental Management of a Child with Treacher Collins Syndrome

Introduction/Objectives:

Patients with Treacher Collins Syndrome often have multiple developmental anomalies of the face affecting the dentition, including cleft palate, micrognathia, hypoplasia of the maxilla, and restricted airway. This case study examines the multidisciplinary approach to complex dental management of these patients.

Methods:

This study is a case report of a 10-year-old female patient with Treacher Collins Syndrome who has been seen at Stony Brook University Hospital since her birth in 2010, and at Stony Brook School of Dental Medicine since 2012. The patient has received care from multiple dental specialties, including Oral Surgery, Orthodontics, and Pediatric Dentistry. This study follows the patient's care in the clinic, as well full mouth dental rehabilitation in the operating room, and orthodontic treatment to encourage proper development of the permanent dentition.

Results:

This patient has had multiple dental complications, including cleft palate, hypoplastic teeth, impacted teeth, congenitally missing teeth, dental caries, and dental anxiety. She has been treated in the operating room for cleft palate repair and full mouth dental rehabilitation, as well as other medical conditions. The patient is routinely followed by the Stony Brook Craniofacial Team, as well as individual dental specialties. This patient has benefitted from an interdisciplinary approach to care.

Conclusion:

Dental disease in patients with rare underlying conditions can be more difficult to manage due to providers' lack of familiarity of the disorder. This case report can instruct clinicians toward a better understanding of how to manage dental disease in patients diagnosed with Treacher Collins. Additionally, this presentation demonstrates the importance of an interdisciplinary approach to treatment of patients with complicated medical and dental histories. Because of the patient's access to a craniofacial team and routine follow-up, the patient should have a good dental prognosis, despite the many complicating factors.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Aliza Kaye, DDS, Division of Endodontics, Stony Brook University*; Yang, Fan, PhD, Materials Science and Chemical Engineering, Stony Brook University+; Feng, Kuan-Che, PhD, Materials Science and Chemical Engineering, Stony Brook University +; Fu, Shi, MS, Materials Science and Chemical Engineering, Stony Brook University +; Cymerman, Jerome J., DMD, Assistant Clinical Professor, Division of Endodontics, Stony Brook University#; Walker, Stephen G., PhD, Associate Professor, Oral Biology and Pathology, Stony Brook University #; Simon, Marcia, PhD, Professor, Oral Biology and Pathology, Stony Brook University#; Rafailovich, Miriam, PhD, Distinguished Professor, Materials Science and Chemical Engineering, Stony Brook University#

Hypochlorous Acid, an Intracanal Irrigant for Regenerative Endodontics

Introduction/Objectives:

Hypochlorous acid (HOCl) has been used for wound management, surgical preparation and as a disinfectant. In vitro studies have shown that HOCl can degrade the cell wall of bacteria, spores and viruses. The aim of this study is to assess the potential of HOCl (Ecologic Solutions, 500 ppm Cl, pH 5.03) as an intracanal irrigant.

Methods:

Antibacterial efficacy of HOCl was assayed using 1×10^8 E. faecalis CFU/ml dried onto corrugated PLA discs. Toxicity towards fibroblasts was measured using HOCl at 10%, 20%, 30% and 40% in culture medium for 0 (control), 1, 3, and 5 min. Doubling times and migration velocity were measured on days 0, 1, 3 and 5 post-exposure. The toxicity of 50% HOCl (5-minutes) towards dental pulp stem cells (DPSC) was measured during 32-days of growth where RNA was isolated on day 14, 21, and 32 and differentiation monitored by RT-PCR to measure alkaline phosphatase (ALP), osteocalcin (OCN) and dental sialophosphoprotein (DSPP). HOCl driven apoptosis of mouse organs was monitored with anti-active caspase3 antibody.

Results:

A 5-minute exposure to liquid HOCl (500 ppm Cl at pH=5.03) caused a six log reduction of E. faecalis on PLA. In contrast, human fibroblasts treated with 10%-20% HOCl for up to 5-minutes or 30%-40% HOCl for up to 3-minutes showed no change in proliferation. Longer treatments with 30%-40% HOCl decreased proliferation for up to 3-days after which cells recovered. Fibroblast migration showed no difference between HOCl-exposed and control groups. DPSCs responded with an early increase in differentiation markers (ALP, OCN). Mouse tissues treated with HOCl showed no increase in apoptosis.

Conclusion:

HOCl can be used as an intracanal irrigant effective in reducing E. faecalis infection, while not impacting surrounding tissue even after 5 min exposures to concentrations in tissue fluids of 40% or less.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Amber Bruckner, DDS, Sherwin, Rhona DDS, Manders, Thomas DDS

Management Considerations for Avulsed Permanent Teeth in an Adolescent Patient

Introduction/Objectives:

Dental trauma occurs often in the pediatric population, and can sometimes cause avulsion of teeth in the permanent dentition. Treatment and prognosis of reimplanted avulsed teeth depends on various factors including extraoral dry time, storage medium, and apex maturation. When reimplantation occurs, these patients require extensive follow up to monitor success, make appropriate referrals to other specialists, and educate the patient and parents on potential infection. Here we present the case of a patient who avulsed four permanent maxillary incisors which were reimplanted at different times, and stored in different mediums. The reimplanted teeth were splinted and the patient followed up with pediatric dental specialists and referred for treatment intervention with endodontic specialists.

Methods:

Patient presented to emergency department after motor vehicle accident where teeth #7-10 were avulsed and patient had teeth #7, #8, and #10. Teeth #7 and #10 were found at the scene of the accident and upon presentation to ED were placed in Hanks Balanced Salt Solution before being reimplanted. Tooth #8 was avulsed but remained in the mouth by soft tissue attachment. Tooth #9 was found several hours later and brought to the ED to be reimplanted. All teeth were reimplanted and splinted. Patient followed up several weeks later for evaluation and was seen by endodontal department where instrumentation was completed.

Results:

Patient was recently evaluated eleven weeks after reimplantation. Patient reports no pain, no percussion or palpation sensitivity. Clinical and radiographic evaluation illustrated no signs of infection, no resorption, and class 1 mobility.

Conclusion:

Reimplantation of avulsed permanent teeth requires extensive follow up and multidisciplinary team. It is also important to educate the patient and parents about trauma and risks associated.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Anish Ghai, DDS, Division of Endodontics, Stony Brook University; Feng, Kuan -Che, PhD, Materials Science and Chemical Engineering, Stony Brook University+; Fu, Shi, Materials Science and Chemical Engineering +; Liu, Haijiao, MS, Materials Science and Chemical Engineering +, Cymerman, Jerome J., DMD, Assistant Clinical Professor, Division of Endodontics, Stony Brook University #; Walker, Stephen G., PhD, Associate Professor, Oral Biology and Pathology, Stony Brook University#; Simon, Marcia, PhD, Professor, Oral Biology and Pathology, Stony Brook University#; Rafailovich, Miriam, PhD, Distinguished Professor, Materials Science and Chemical Engineering, Stony Brook University#

Effect of HOCl fogging on *E. faecalis* and H1N1

Introduction/Objectives:

Aerosol generation occurs during most dental procedures. These respiratory aerosols are a source of infection transmission. This study aimed to determine the effectiveness of hypochlorous acid, HOCl, (Ecologic Solutions, NY) dispersed through an ultrasonic fogger on common surfaces present in dental offices. Aluminum and polystyrene surfaces were contaminated with H1N1 (PR8), an enveloped RNA virus similar in disease-transmission to COVID-19, and *E. faecalis* (ATCC® 19433TM) a Gram-positive facultative anaerobe highly-resistant to endodontic treatment. Toxicity of HOCl was assessed on mouse lung. The disinfection efficacy of HOCl, as a function of pH and Cl concentration were also determined.

Methods:

Aluminum and polystyrene plates were contaminated with 5×10^8 *E. faecalis* or 5×10^5 H1N1 PFU, allowed to dry and placed in a vertical orientation in a desiccator. HOCl vapor was either dispersed continuously for 5-minutes and the sample removed after another 5 minutes (H1N1 and *E. faecalis*), or in 4 pulses for 15-seconds every 10 minutes for 45 minutes (*E. faecalis*) or 2 pulses for 15-seconds for 20 minutes (H1N1). Mouse lungs were immersed in undiluted HOCl for 5 minutes. Tissue apoptosis was monitored with anti-active caspase 3 antibody and Hemotaxalin-Eosin (H&E) staining.

Results:

The Cl concentration and pH immediately after opening one-gallon bottles were 512 ppm and pH 5.03, which were reduced to pH=5.0 and 358 ppm (a 30% decrease) after storage for 100 days at room temperature. Fogging further reduced the Cl concentration by 20%. All solutions yielded a 6-log reduction in *E. faecalis* and 4.5 log reduction in H1N1. H&E staining and anti-Caspase 3 antibody showed no significant difference between exposed and control mouse lung tissue.

Conclusion:

Our data indicate that dispersion of HOCl via ultrasonic fogging can provide thorough disinfection of surfaces in a safe manner and improve workflow in a dental office.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Farzad Koosha, DDS, Endodontics/Stony Brook University, Jerome Cymerman, DMD, Endodontics/Stony Brook University, Marcia Simon, PhD, Oral Biology and Pathology/Stony Brook University, Thomas Manders, DDS, Endodontics/Stony Brook University, Stephen Walker, PhD, Oral Biology and Pathology, Stony Brook University, Miriam Rafailovich, PhD, Material sciences/Stony Brook University#

Characterization of a Novel Antimicrobial Agent for Endodontic Applications

Introduction/Objectives:

Recurrent endodontic infections are primarily caused by *Enterococcus faecalis* and are more challenging to treat, compared to primary infection of the root canal system. Currently, calcium hydroxide (CaOH) is used as an inter-visit medication in endodontic procedures despite its inefficacy against *E. faecalis* and other pathogens of the root canal system such as *Candida albicans*. Additionally, its high pH contributes to dental pulp cell necrosis. To improve antimicrobial properties and limit cytotoxicity, we've developed a new composite material named "CASA" to disinfect the canal. This study determines CASA's antimicrobial activity and its cytotoxicity and differentiation potential for dental pulp stem cells (DPSCs).

Methods:

CASA was tested against common endodontic pathogens to determine its antimicrobial activity using a modified disk diffusion antibiotic sensitivity test. Agar plates, with 6mm wells containing CASA or CaOH, and inoculated with *E. faecalis*, *Candida albicans*, *Escherichia coli* and other bacteria were incubated at 37°C for 24 hrs, then zones of inhibition were measured.

Results:

CASA produced larger zones of inhibition than CaOH for all species tested. Cytotoxicity studies indicated a high tolerance for DPSCs for CASA, with a measured IC50 of 1.0 mg/ml, a far higher dose than tissue would be exposed to during standard treatment. Addition of 0.25 mg/ml of CASA to DPSCs in osteogenic culture, in the absence of dexamethasone, was observed to hinder differentiation and preserve stemness of the culture, these results were confirmed using scanning electron microscope and identification of calcium and phosphate ions in the culture in all test groups.

Conclusion:

CASA was proved to be a promising antimicrobial agent in this study, suitable for endodontic purposes as it overcomes the main pathogens responsible for recurrent endodontic infections while maintaining a limited cytotoxicity when tested against DPSCs.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

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Long Term Survival of Enterococcus faecalis Without Nutrients

Introduction/Objectives:

Enterococcus faecalis has been implicated as a common secondary endodontic pathogen that demonstrates resistance to endodontic therapy. It has also been previously observed to survive in nutrient starved conditions, allowing for its long term survival. The aim of this study was to observe for any surviving E. faecalis in a 15 year old sample.

Methods:

A 15 year old sample of an extracted human tooth that was previously treated with root canal therapy, inoculated with Enterococcus faecalis and sealed was prepared. The sample was cultured at 37°C and a gram stain and catalase test was performed on any viable bacterial growth. DNA was isolated and a PCR test was conducted to confirm if the isolate was Enterococcus faecalis

Results:

Viable Enterococcus faecalis was present in a 15 year old sample

Conclusion:

Enterococcus faecalis demonstrates resilience even in nutrient starved conditions as observed in this 15 year old sample. This has significant implications, especially in the field of endodontics because it implies that it can survive in human teeth as a secondary infection without nutrients for an indefinite period of time. This also may discredit the theory that Enterococcus faecalis can be “entombed” during root canal therapy by sealing off remaining surviving bacteria from nutrients with obturation material.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Jadwiga Stec, DDS, Dept. of Periodontology, Division of Endodontics, School of Dental Medicine, Stony Brook University; **#Georgios Romanos, DDS, Ph.D., Dr. med. dent.**, Dept. of Periodontology, School of Dental Medicine, Stony Brook University; **#Thomas Manders, DDS**, Dept. of Periodontology, Division of Endodontics, School of Dental Medicine, Stony Brook University

Root Perforations: A Lack of Advances in the Literature

Introduction/Objectives:

Root perforations are often thought to have a poor long-term prognosis. Time, size of defect and location were historically thought to be the most important prognostic factors that could affect success, though mainly orthograde repair was typically considered as a treatment option.

Methods:

A systematic literature review of 40 articles was conducted including both human trials, animal and in vitro studies, and excluding any case reports. Significant attention was given to all possible prognostic factors, particularly to how authors classified these factors and definitions of success.

Results:

A total of 36 articles were reviewed, including 2 previous systematic reviews, 17 human studies focusing on repair, 11 in vitro studies and 6 animal studies. Root perforations negatively impact long-term tooth survival through either periodontal defects or increased risk of fracture. The majority of prognostic factors showed mixed results as to their effects on the success of perforation repair. Studies are hindered by a lack of consistency in characterizing these prognostic factors as well as varying definitions of success. Additionally, the majority of the studies focus only on an orthograde approach to repair, and fail to attempt more innovative, multispecialty treatments.

Conclusion:

Considerable disagreement exists about the various prognostic factors that may affect the repair of iatrogenic root perforations, dependent on the location.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Lauren Heisinger, DDS, Larsen, Charles DMD, Michael Proothi MD DMD

Rapid Palatal Expansion In A Newborn With Pyriform Aperture Stenosis: A Case Report

Introduction/Objectives:

When diagnosed in infancy, pyriform aperture stenosis (PAS) is a condition that can lead to severe respiratory complications, especially in Infants who are obligate nasal breathers. Any obstruction can lead to severe difficulty with respiration. Historically, cases that have been diagnosed in infancy have been treated with an invasive surgical approach, where the airway openings are enlarged, typically with a surgical drill. This approach has a high rate of relapse and risk of complications such as injury to the lacrimal system, and damage to developing tooth buds, as well as necessitating future procedures. Previous research has suggested that a premature fusion of the midline palatal suture can lead to insufficient mid face growth and respiratory symptoms of PAS in infancy. An innovative, less invasive treatment approach utilizing a rapid palatal expander has been documented in the literature with variable success. Here we present the case of fabricating a rapid palatal expansion device to treat a severe case of pyriform aperture stenosis in a newborn.

Methods:

Impressions were taken in the operating room using a custom tray and compound. A rapid palatal expander was fabricated with Triad and a 6mm rapid palatal expander screw (Henry Schein). The patient was taken to the operating room for insertion. Expander was inserted with 4 KLS screws into the palate and expanded 1mm/day for seven days. Expander was left in for 3 months and removed under general anesthesia without complication.

Results:

The patient experienced a significant decrease in nasal obstruction which was evaluated clinically after placement.

Conclusion:

The use of a rapid palatal expansion device can be considered a less invasive but clinically successful modality of treatment for pyriform aperture stenosis when diagnosed in infancy.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Lexi Lippe, DDS, Department of Prosthodontics and Digital Technology/ Stony Brook School of Dental Medicine*; **Somohano-Marquez, Tanya, DMD, FACP**, Department of Prosthodontics and Digital Technology/Stony Brook School of Dental Medicine; **Botta Martins de Oliveria, Ana Carolina, DDS, MS, PhD**, Division of Operative and Dental Materials, Stony Brook School of Dental Medicine; **Amarillas Gastelum, Clarissa, DDS, MS**, Department of General Dentistry, Stony Brook School of Dental Medicine

Color Stability Evaluation of Denture Base Acrylic Resins Fabricated by Rapid Prototyping, Milling and Heat-Polymerization.

Introduction/Objectives:

The purpose of this in vitro study was to compare the color stability of denture base acrylic resins fabricated by three methods and submitted to three different thermocycling conditions.

Methods:

Three different fabrication techniques of denture base acrylic resin were evaluated, and divided into 3 groups: Compression molded (1), milled (2), and rapid prototyped (3). Each group contained 15 samples prepared into disks of 20 mm diameter and 2 mm thickness, for a total of 45 samples. The specimens were submitted to thermocycling for 5,000 and 10,000 cycles to simulate 6 months and 1 year of clinical use respectively. Specimen colors were measured with a spectrophotometer, using the CIE L*a*b system at baseline, and after each thermocycling interval, for a total of 3 readings. Color differences (ΔE) were calculated.

Results:

Preliminary results to be determined.

Conclusion:

Conclusions to be determined.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Michelle Fackler, DMD, Delgado-Ruiz, Rafael, DDS, MSc, PhD, Somohano-Marquez, Tanya, DMD, FACP

Comparing the Dimensional Stability of Denture Bases Fabricated Using Compression Molding, CAD/CAM Milling and Rapid Prototyping Methods

Introduction/Objectives:

Complete dentures fabricated using computer-aided design and computer-aided manufacturing (CAD-CAM) are becoming increasingly popular. The two principal techniques that have emerged are milling and rapid prototyping (3D printing). While these have been reported to be clinically acceptable, in-vitro studies comparing the physical properties of denture bases constructed using these technologies to conventional heat-polymerized PMMA denture bases are still scarce. The purpose of this study was to compare the dimensional stability of complete denture bases that have been fabricated using 3 different techniques: Milled from pre-polymerized resin blocks (CAD/CAM PMMA - Ivobase), 3D printed from using, or processed using conventional heat-polymerized PMMA.

Methods:

Using CAD software a template design for the samples was made. The design was a 20mm diameter disc with three pyramidal projections. 20 samples for each of the three test groups (conventionally processed, printed, and milled) were fabricated. For each test group, 10 of the samples were stored in room temperature tap water, and 10 of the samples were stored in room air. A series of measurements of distance between the apex of the pyramidal projections on each sample were made using a 3D digital microscope. The distances were measured immediately following fabrication and after 8 hours, 24 hours, and 1 week of storage.

Results:

The study is currently in progress and results are pending.

Conclusion:

The study is currently in progress and conclusions are pending.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Nicole Hinchy, DDS MS; Anderson, Nina PhD; Mahdian, Mina DDS MDS

Metal Artifact Reduction using Common Dental Materials

Introduction/Objectives:

The appearance of metal artifact as dark and bright streaks is based upon the absorption and scatter characteristics of the incident x-ray beam as related to the atomic number of the substance through which it travels. This artifact can become detrimental to the interpretation and evaluation of maxillofacial CBCT volumes. In therapeutic radiology, the interaction of high voltage x-ray beam with high density and high atomic number materials creates backscatter of electrons, resulting in local dose enhancement. Often, removable prosthetics made of various dental materials are used during radiotherapy to reduce this sequela. The hypothesis tested there may be clinical means to minimize metal artifact evident in diagnostic radiology similar to the practice of controlling local dose received by tissues during therapeutic radiology using a fabricated prosthesis.

Methods:

A total of seven common dental lab materials – alginate, alluwax, baseplate wax, blu mousse, PVS, pink wax, and red wax – were molded to a dental sextant of four extracted, restored teeth. Each were scanned using the Carestream 9600 CBCT unit at three separate resolutions – 0.3mm, 0.015mm, and 0.075mm - at manufacturer established exposure parameters. ImageJ software was used to assess the greyscale along profile lines of representative axial slices from each material at the three resolutions.

Results:

There were no statistically significant differences between the control and the materials. However, on a subjective analysis of the greyscale plot profiles, there was a difference between the blu mousse and the remaining materials. These showed statistically significant differences.

Conclusion:

Blu mousse, PVS, and red wax appear to reduce the extent of metal artifact in subjective comparison to the control and the remaining materials. This may add to improving the quality of the resultant image and can be used in choosing materials for use as radiographic guides during implant treatment planning.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Rahul Tase, DMD, MS* and Bassir, Hossein, DDS, DMSc (Department of Periodontology, School of Dental Medicine, Stony Brook University, Stony Brook, NY)

Periosteal Flap Stretch Technique for Lateral Ridge Augmentation: Case Report

Introduction/Objectives:

Bone augmentation procedures are routinely performed for implant site development. The overlying soft tissue must be carefully managed during these surgical procedures to attain tension-free primary soft tissue closure. The Periosteal Flap Stretch technique that is described in this case report is a simple technique that facilitates achieving passive and predictable primary flap closure. This technique is performed using a blunt surgical curette that is moved against the periosteum in a coronal and outward direction.

Methods:

A forty-eight year old male presents to the Dental Care Center at Stony Brook University with a Seibert Class III alveolar ridge deficiency in the anterior maxilla. A CBCT scan was taken and revealed insufficient alveolar ridge dimensions to support implant placement at the maxillary anterior sextant. The decision was made to conduct a lateral ridge augmentation for implant site development. The surgical method involved making a full thickness flap beyond the mucogingival junction. The flap was prepared using Periosteal Flap Stretch technique to ensure achieving tension-free primary soft tissue closure. Lateral ridge augmentation was performed using a cortico-cancellous allograft and cross-linked resorbable collagen membranes. Passive tension-free primary closure of the flap was achieved.

Results:

A CBCT scan was taken seven months after lateral ridge augmentation and confirmed significant alveolar ridge augmentation which could support placement of dental implants at sites #6, #7, and #9. Clinical evaluation after flap elevation showed similar findings. All implants were placed in ideal prosthetically driven three-dimensional positions.

Conclusion:

When using bone augmentation procedures, it is vital to achieve tension-free primary soft tissue closure. The novel Periosteal Flap Stretch technique provides the clinician with the benefit of achieving tension-free primary soft tissue closure with ease. Future clinical studies are needed to evaluate the efficacy of this technique.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Tara Earls, DDS*; Sherwin, Rhona DDS

Management of Multiple Dental Extractions on a Child with Hemophilia: A Case Report

Introduction/Objectives:

Hemophilia A is a hereditary bleeding disorder caused by a deficiency of factor VIII, which is a requirement for normal blood clot formation. This disorder can be characterized as mild, moderate, or severe based upon clinical observations and the patient's factor VIII levels. For those with moderate or severe forms of hemophilia, safely completing dental procedures and surgeries can be challenging, as these patients are at a high risk for bleeding complications. The World Federation of Hemophilia (WFH) recommends consulting the patient's hematologist prior to dental surgeries in order to determine the patient's factor level and the need for factor replacement or systemic hemostatic agents surrounding treatment.

Methods:

N/A

Results:

This paper reports on a pediatric male patient with severe Hemophilia A and evidence of an inhibitor, who presented to the Stony Brook Dental Clinic with multiple grossly decayed primary teeth requiring extractions. This paper details the dental and medical management of this patient, including procedural techniques and medications used. An emphasis is placed on the importance of interprofessional cooperation for dental treatment of patients with severe bleeding disorders.

Conclusion:

Dentists should possess a general understanding of how to safely provide dental treatment to patients with varying types and severities of coagulopathies. For pediatric patients with severe hemophilia, it is recommended that dental extractions be performed in a hospital setting so that the patient may receive perioperative pharmaceutical management and monitoring to avoid complications from bleeding or infection. Pharmaceutical management should be determined and discussed with all involved parties prior to treatment, and all providers should make every effort to limit bleeding within their scope of practice.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Kyung Nam, DDS* Department of Periodontology, School of Dental Medicine, Stony Brook University, Stony Brook, NY. **Mahbub, Syeda BS+** Stony Brook University School of Dental Medicine, Stony Brook, NY. **Anderson, Nina PhD** Department of Orthodontics and Pediatric Dentistry, School of Dental Medicine, Stony Brook University, Stony Brook, NY. **Bassir, Seyed Hossein DDS, DMSc** Department of Periodontology, School of Dental Medicine, Stony Brook University, Stony Brook, NY

Regenerative Therapy with Enamel Matrix Derivatives for Intrabony Periodontal Defects

Introduction/Objectives:

The present retrospective study aimed to evaluate the outcomes of regenerative periodontal therapy with Enamel Matrix Protein Derivatives (EMD) for the treatment of intrabony periodontal defects.

Methods:

The electronic health records of all patients who had received periodontal regenerative procedures between 1/1/1999 and 12/31/2019 were reviewed (IRB2020-00458). Data collection was performed for all patients that met the inclusion criteria of the present study. The changes in probing pocket depth (PPD), clinical attachment level (CAL), gingival recession (GR), bleeding on probing (BOP), radiographic horizontal defect depth, radiographic vertical defect depth (primary outcome variable), and tooth retention rate were assessed from baseline to 1-year, and the final visit. The effects of several patient-related factors and surgical-related variables on the outcomes of therapy were investigated. A significance level of 0.05 was used for all comparisons.

Results:

21 patients met the inclusion criteria. Patient population included 12 males and 9 females with a mean age of 62.48 ± 15.22 years. Three teeth were extracted during the follow-up period, resulting in a tooth retention rate of 85.71%. Quantitative analysis showed a mean PPD reduction of 2.94 mm ($p < 0.001$; 95%CI = 1.89, 4.05). In addition, the mean gain in CAL was 1.77 mm ($p = 0.02$; 95%CI = 0.316, 3.21), and the mean change in gingival recession was 1.41 mm ($p = 0.001$; 95%CI = 2.12, 0.706). The radiographic analyses demonstrated significant mean reductions of 2.60 mm ($p < 0.001$; 95%CI = 1.82-3.37) in vertical defect depth and 0.58 mm ($p = 0.019$; 95%CI = 0.107, 1.05) in horizontal defect depth.

Conclusion:

The results of the present study support the clinical efficacy of periodontal regeneration therapy using EMD for the treatment of intrabony periodontal defects.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Nathan Estrin, DMD Department of Periodontics, Lesniewski, Agata School of Dental Medicine, McClain, Steven MD Department of Dermatology, Hou, Wei PhD, Department of Preventive Medicine, #Romanos, Georgios DDS, PhD, Prof. Dr. med. dent.

Penetration Depth of Pulsed Lasers in Gingival Tissues In-Vitro

Introduction/Objectives:

With laser irradiation emerging as a treatment for periodontally involved dentition, it is important to understand the variance of penetration depth among the different laser wavelengths. The purpose of this study was to evaluate the penetration depth of CO₂-, Er:YAG-, and Er,Cr:YSGG-lasers on the bovine gingiva in an in vitro model.

Methods:

Four mandibles from freshly slaughtered, periodontally involved cows were utilized in this study. Buccal and lingual root debridement were provided using three different laser wavelengths, all in pulsed settings. A CO₂- (10,600nm), Er:YAG- (2,940nm), and Er,Cr:YSGG- (2,780nm) were utilized to irradiate pockets of two mandibular posterior teeth in each group. Laser power output settings were set to 2W. The posterior teeth were irradiated for 30 seconds buccal and 30 seconds lingual of each tooth for all selected treatment test groups. Instrumentation with curettes was performed as a control group. Gingival flaps including the entire gingiva were fixed in 10% formalin and stained with Elastin van Gieson. Sections were examined microscopically to evaluate thermal damage and statistically compared using mixed effect model with Tukey adjustment.

Results:

The CO₂-laser irradiation presented a statistically significant lower mean compared to Er,Cr:YSGG-laser ($p < 0.0001$). Er,Cr:YSGG-laser had a higher penetration depth compared to Er:YAG-laser ($p < 0.0001$). There was no statistically significant difference found in penetration depth between CO₂- and Er:YAG-laser irradiation.

Conclusion:

It can be concluded that all tested pulsed lasers had minimal penetration depth into the gingiva. However, the pulsed CO₂- and Er:YAG-lasers presented lower thermal effects compared to Er,Cr:YSGG-laser in vitro.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Rebecca Aminov, DDS and Robert Lopatkin, DDS

Orthodontics and Multidisciplinary Treatment Planning: A Survey of Stony Brook University School of Dental Medicine Alumni

Introduction/Objectives:

The vast majority of general dentists claim to have a fundamental understanding of the need for orthodontics in treatment planning multidisciplinary cases. However, if this were true, the discrepancy between recognizing orthodontic need and referring for treatment wouldn't exist. The results from a previous study (Chinitz, 2019) suggest that most general dentists are indeed able to recognize the need for orthodontics in treatment planning multidisciplinary cases. The aim of this study was to gain insight specifically into whether general practitioners and specialists who graduate from Stony Brook University School of Dental Medicine (SBU) are adequately trained to recognize orthodontic need prior to, or in lieu of, prosthodontic restoration.

Methods:

An eight-question survey with case-specific photos was distributed to 561 general dentists and other specialists who graduated from SBU, and who agreed to receive emails from the SBU alumni office. The survey was sent out via email using the Qualtrics survey software with two reminders. The responses were recorded anonymously.

Results:

Eighty-six valid surveys were received, for a response rate of 15.3%. In 80% of the case-specific questions, the majority of the SBU alumni recognized orthodontic need. In the four questions for which orthodontic treatment would be considered the optimal selection, 45%, 71%, 64%, and 56% of the respondents, respectively, selected orthodontic treatment. In 20% of the case-specific questions, 41% of the SBU alumni stated that they would restore the missing space with an implant immediately, rather than first referring the patient for an orthodontic consultation.

Conclusion:

Most SBU alumni have a fundamental understanding of the need for orthodontics in treatment planning multidisciplinary cases. However, exactly what criteria guide them to conclude whether a patient is a candidate for prosthodontic/implant dentistry or orthodontics, if they have the criteria to guide them at all, is not completely understood, as exhibited by this survey. Further research may be necessary to ascertain this data. Additionally, placing more of an emphasis on the role of orthodontics in treatment planning multidisciplinary cases may be of importance while students are in dental school in order to avoid the common error of placing final restorations prior to orthodontic consultation in their practices in the future.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Tzicha Wang, DMD. Fischer, Gerard, BS. Romanos, Georgio E., DDS, PhD,
Prof. Dr. med. dent.

Presence of Titanium Particles After Cleaning of Implant Surfaces

Introduction/Objectives:

Titanium particles (TiP) are associated with localized inflammatory response and may play a role in further peri-implant tissue breakdown. The purpose of this study was to evaluate the presence of titanium ions and particles after instrumentation of implant surfaces using common dental debridement methods.

Methods:

Three types of debridement instruments, stainless steel curette (SS), ultrasonic tip (CV), and ultrasonic tip with plastic sleeve (CS) were evaluated. A simulated peri-implantitis defect was created around a titanium dental implant in type II bone block and irrigation was performed with operatory unit water. Twenty samples (per debridement method) were collected using paper points after 30 seconds of instrumentation. Chemical composition analysis of the bone block, water irrigation and instruments (baseline) were evaluated for presence of TiP and liquid samples after instrumentation were examined with an x-ray fluorescent spectrometer. Statistical analysis using simple t-test was performed for each debridement method.

Results:

Baseline measurements showed no TiP. After instrumentation, TiP parts per million (ppm) were found in SS and CV groups with the values of 0.0234 ± 0.0181 and 0.0047 ± 0.0042 , respectively. Titanium particles were not observed in CS group. The semiquantitative data showed a higher presence of TiP in the SS and CV groups in comparison to the baseline ($p < 0.0001$).

Conclusion:

Titanium ions and particles were found after instrumentation using stainless steel currettes and ultrasonic device without plastic sleeve which may affect the disease etiology and outcomes of peri-implantitis therapy.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Ilyasse Benezha, BS; Mina Madian, DDS, PhD, Department of Prosthodontics and Digital Technology; Georgios Romanos, DDS, PhD, Prof. Dr. Med, Department of Periodontology; #Rafael Delgado-Ruiz, DDS, MSC, PhD, Department of Prosthodontics and Digital Technology

Evaluation of Implant Osteotomies After Counterclockwise Drilling by Optical-Coherence-Tomography

Introduction/Objectives:

To evaluate the condensation of the implant site bed walls and changes of the microarchitecture of sites prepared with counterclockwise drilling using different implant drills and optical coherence tomography(OCT).

Methods:

Implant drills (Megagen, Nobel Biocare, Anker, and Densah) with comparable dimensions but, different wall and tip angles were used. Polyurethane laminas resembling type IV bone microarchitecture were super imposed and clamped with a vice to simulate the coronal, middle, and apical aspects of the implant site. The total thickness of three coupled laminas was 9.9mm. Twenty implant beds were prepared at a rotation speed of 1,200rpm in clockwise (control) and counterclockwise (test) direction for all the drill groups (N=160).OCT was used to evaluate the microarchitecture and condensation characteristics of controls and tests from each group at the coronal, middle, and apical areas. The recording settings were 26.7dB LV, 51.2 dB HV, scanrange 6.51, scan depth 2.37, and high sensitivity detection level. Relative bone density was calculated using the Image J software Bone application. The microarchitecture was evaluated in reconstructed 3D volumes inXY, XZ, and YZ sections. Statistical analysis was performed using one-way ANOVA with post-hoc Dunn test.

Results:

Test-osteotomies condensed and changed the microarchitecture of implant bed walls at coronal, middle, and apical regions for all groups compared to controls. The coronal ($p=0.043$) and apical ($p=0.026$) regions showed higher relative bone condensation compared to controls. The Anker drill produced the highest condensation (60%) compared to Nobel (43%), Densah (35%), and Megagen (28%) drills.

Conclusion:

Counterclockwise drilling with tapered drills produces condensation and increases the relative-bone density at coronal and apical regions of the osteotomy. Increased drill wall angles and reduced drill tip angles increase bone condensation during counterclockwise drilling.



POSTER PRESENTERS

Room 2 - Residents & Undergraduates

Maryam Hafeez, BS *, Calce, Loredana BS, Romanos, Georgios DDS, PhD

Infrared Diode Laser-Irradiation on Titanium Implants In Vitro: Thermal Effects

Introduction/Objectives: :

The aim of this study was to determine the thermal effects of infrared laser radiation on titanium implants.

Methods:

A titanium implant (3.5x11mm) was placed into an organic bovine bone block. A 3-wall intrabony defect was created to simulate peri-implant bony defect. Two thermocouples were secured to the apical and coronal surfaces of the implant in order to measure the temperature changes during laser irradiation. The defect was irradiated with 810 nm, 940 nm, 970 nm, and 980 nm diode laser wavelengths. While the laser tip was positioned parallel to the implant and continuously moved in a semi-circular motion, the defect was irradiated for 30 seconds at 2W in both continuous (c.w.) and pulsed mode. Initial temperatures and the total change in temperature were recorded for each laser. 20 laser irradiations were performed for each laser wavelength with each setting for mean values assessment of the temperature increase.

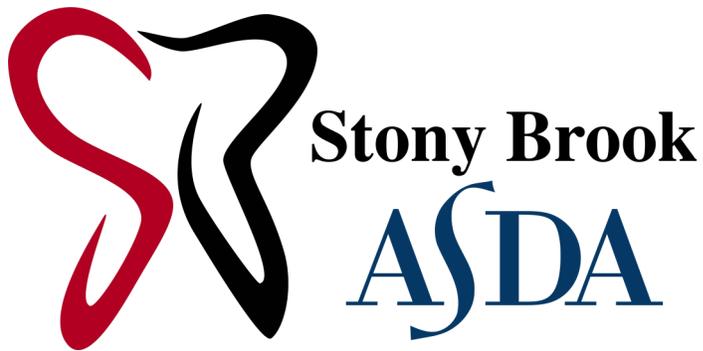
Results:

The 940 nm laser resulted in the lowest change in temperature at the coronal level in comparison to the other lasers ($p < 0.0001$), with the temperature increase being 21.8 °C and 10.1 °C for c.w. and pulsed wave settings. The 810 nm laser exhibited the highest temperature change compared to the rest of the lasers ($p < 0.0001$), with the change in temperature at the coronal level for the c.w. and pulsed wave being 28.1°C and 14.3°C, respectively. There was no significant difference in mean temperature change between 970 nm and 980 nm lasers at the coronal level when used in c.w. mode ($p = 0.19$).

Conclusion:

The titanium implant surpassed the critical threshold of 10°C when irradiated for 30 seconds when each of the lasers was used. However, the 940 nm pulsed diode laser appears to be the safest in terms of overheating risk during implant irradiation.





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**We would like to thank the following people for their contributions
to this event:**

Stony Brook ASDA

Lauren Toledo, Ashley Lau, Nicholas Santaro, and Joseph Masselli

Dr. Jeffrey Seiver, Faculty Advisor

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