高雄醫學大學 Kaohsiung Medical University | 口腔醫學院

第17屆研究日國際學術研討會

跨領域牙周再生:牙周疾病預防　診斷　治療

International Conference of the 17th Research Day

Interdisciplinary Periodontal Regeneration: A Comprehensive Study from Prevention, Diagnosis to Treatment of Periodontal Disease

活動日期｜114.03.14 (星期五)

Date : Fri., March 14, 2025

活動地點｜高雄醫學大學勵學大樓3F半視聽教學中心

Venue : 3FM Audio-Visual Education Center, Li-Hsueh Building, Kaohsiung Medical University

PROGRAM BOOK

KMU

International Conference of the 17th Research Day

International Conference of the 17th Research Day

高雄醫學大學口腔醫學院
第 17 屆研究日國際學術研討會

International Conference of the 17th Research Day
College of Dental Medicine, Kaohsiung Medical University

活動日期： 2025 年 3 月 14 日星期五

Date： Fri., March 14th, 2025

活動地點： 高雄醫學大學勵學大樓 3F 半 視聽教學中心

Venue： 3FM Audio-Visual Education Center, Li-Hsueh Building, KMU

主辦單位： 高雄醫學大學口腔醫學院、教育部大專校院學生雙語化學習計畫

Organiser： College of Dental Medicine, Kaohsiung Medical University (KMU)
The Program on Bilingual Education for Students in College, Ministry of Education

協辦單位： 高雄醫學大學牙醫學系、口腔衛生學系
高雄醫學大學附設中和紀念醫院牙科部
高雄醫學大學附設中和紀念醫院臨床教育訓練部醫師訓練中心
高雄醫學大學牙醫學系總校友會
臺灣牙周補綴學會、臺灣牙周病醫學會、
高雄醫學大學口腔醫學院全球卓越口腔健康研究發展中心、口腔顎顏面影像研究中心、齒科醫療器材產業研究中心、厭氧暨口腔微生物研究中心
高雄醫學大學附設高醫岡山醫院牙科部
高雄市立小港醫院牙科部
高雄市立旗津醫院牙科部

Co-Organisers： School of Dentistry and Department of Oral Hygiene, KMU
Department of Dentistry, KMUH
Department of Clinical Education and Train, Physician Training Center, KMUH
Dental Alumni Association, KMU
Academy of Perio-Prothodontics Taiwan
Taiwan Academy of Periodontology
Global Center of Excellence for Oral Health Research and Development, KMU
Oral Maxillofacial Imaging Center, KMU
Dental Medical Devices and Materials Research Center, KMU
Anaerobic and Oral Microorganism Research Center, KMU
Department of Dentistry, KMU Gangshan Hospital
Department of Dentistry, Kaohsiung Municipal Siaogang Hospital
Department of Dentistry, Kaohsiung Municipal Cijin Hospital

Contents (目錄)

Preface

序言（院長的話）

Dear Colleagues,

It is with great pleasure and enthusiasm that I welcome you to the International Conference of the 17th Research Day, College of Dental Medicine, Kaohsiung Medical University, held on March 14, 2025. This year's conference is dedicated to the theme: "Interdisciplinary Periodontal Regeneration: A Comprehensive Study from Prevention, Diagnosis to Treatment of Periodontal Disease." Periodontal disease remains a significant global health challenge, affecting millions and contributing to systemic conditions beyond oral health. We aim to create an engaging environment that promotes meaningful discussions and inspires new ideas for tackling periodontal disease from an interdisciplinary perspective. As research continues to uncover the intricate connections between periodontology and other medical disciplines, it becomes increasingly important to foster collaboration among specialists in dentistry, biomaterials, biomedical engineering, and related fields. This conference serves as a platform for knowledge exchange, encouraging innovative research and the development of cutting-edge treatment modalities.

In this conference, we are honored to invite Prof. Frank Roberts and Asst. Prof. Yung-Ting Hsu from the University of Washington, Prof. Yasuo Takeuchi from the Institute of Science, Tokyo, and Prof. Zhou Ye from the University of Hong Kong. Additionally, Prof. Yu-Chao Chang from Chung Shan Medical University, Dr. Min-Kang Lee, and Dr. Kuan-Hsuan Liao from Kaohsiung Medical University Hospital will share their insights. This is a valuable opportunity to engage in advanced research discussions and explore the future of periodontal regeneration. Throughout the event, distinguished keynote speakers, researchers, and clinicians will share their insights into emerging regenerative therapies, novel diagnostic tools, and preventive strategies. We aim to create an engaging environment that promotes meaningful discussions and inspires new ideas for tackling periodontal disease from an interdisciplinary perspective.

I would like to extend my sincere appreciation to all the participants, speakers, and organizing committee members who have contributed to making this event possible. Your dedication to advancing periodontal research and clinical practice is truly commendable. We hope that this conference will not only enhance your knowledge but also foster new collaborations that will shape the future of periodontal regeneration. Once again, welcome to the 17th Research Day, College of Dental Medicine, Kaohsiung Medical University. May this conference be a fruitful and inspiring experience for all.

Jiiang-Huei Jeng, DDS, Ph.D.
College of Dental Medicine
Kaohsiung Medical University
2025.03.14

The Agenda of International Conference
國際學術研討會議程

International Conference (國際學術研討會)	
Date ：	2025/03/14 (Fri)
Venue： 地 點：	3FM Audio-Visual Education Center, Li-Hsueh Building, KMU 高醫大勵學大樓 3F 半視聽教學中心

Agenda (議程)			
Time (時間)	**Program/Topic (內容)**	**Speaker (主講人)**	**Moderator (主持人)**
09：00~09：20	***Registration 報到***		
09：20~09：40	***Opening Remark 開幕式-貴賓致詞 (貴賓合照)***		
09：40~10：30	***Topic 1：*** *Genetic Influences on Oral Health and Disease (基因遺傳對口腔健康與疾病的影響)*	Prof. Frank Roberts University of Washington Seattle, USA 美國華盛頓大學	Prof. Jiiang-Huei Jeng Kaohsiung Medical University 鄭景暉教授 高雄醫學大學
10：30~11：20	***Topic 2：*** *Microbiome Analysis in Periodontitis and Peri-implantitis: Insights and Related Perspectives (牙周炎和植體周圍炎的微生物組分析：深入見解與相關觀點)*	Prof. Yasuo Takeuchi Institute of Science Tokyo, Japan 日本東京科學大學	Prof. Chun-Ming Chen Kaohsiung Medical University 陳俊明教授 高雄醫學大學
11：20~11：30	***Break***		
11：30~12：10	***Topic 3：*** *Periodontal breakthrough discovery: The periodontal-systemic connection (當代牙周學的重大突破：牙周健康與全身系統的關聯)*	Prof. Yu-Chao Chang Chung Shan Medical University 張育超教授 中山醫學大學	Prof. Je-Kang Du Kaohsiung Medical University 杜哲光教授 高雄醫學大學
12：10~13：30	***Lunch***		
13：30~14：20	***Topic 4：*** *Dynamic smart materials for periodontal research (牙周學研究中的創新動態智慧材料)*	Asst. Prof. Zhou Ye University of Hong Kong 葉舟助理教授 香港大學	Prof. Ting-Hsun Lan Kaohsiung Medical University 藍鼎勛教授 高雄醫學大學
14：20~15：10	***Topic 5：*** *Immune Regulation and Tissue Remodeling during Gingivitis and Periodontitis (牙齦炎與牙周炎中的免疫調節和組織重建)*	Asst. Prof. Yung-Ting Hsu University of Washington Seattle, USA 美國華盛頓大學	Asst. Prof. I-Hui Chen Kaohsiung Medical University 陳怡惠助理教授 高雄醫學大學

15：10~15：30	***Coffee Break***		
15：30~15：50	***Topic 6：*** *Therapies for Mucogingival Defects (黏膜牙齦缺損的治療)*	Dr. Min-Kang Lee Kaohsiung Medical University Hospital 李敏綱醫師 高醫大附設醫院家庭牙科	A. P. Jung-Chang Kung Kaohsiung Medical University 龔榮章副教授 高雄醫學大學
15：50~16：10	***Topic 7：*** *The dilemma of periodontal treatment (牙周治療的困境)*	Dr. Kuan-Hsuan Liao Kaohsiung Medical University Hospital 廖官瑄醫師 高醫大附設醫院牙周病科	Asst. Prof. Yu-Hsiang Chou Kaohsiung Medical University 周郁翔助理教授 高雄醫學大學
16：10~16：40	***Closing & Awards Ceremony 頒獎暨閉幕式 (大合照)***		

Poster Exhibition (貼示報告海報展)		
2025/03/11~14	**E-poster Exhibition** (電子海報展)	Venue：1F, International Academic Research Building, KMU 地 點：高醫大國際學術研究大樓 1F
2025/03/14 **12：20~13：20**	**E-poster Competition** (電子海報學生論文競賽) E-poster Presentation (Q&A 及電子海報學生論文競賽評分)	

Activities (系列活動)		
2025/03/15 **09：30~12：00**	**2025 Southern Taiwan PGY Dentists Case Report Competition** (114 年牙醫 PGY 醫師案例報告競賽)	Venue：Auditorium Ⅲ, 2F, Building W, KMUH 地 點：高醫大附設中和紀念醫院 W 棟 2F 第三講堂
2025/03/11~14 **08：30~17：00**	**Learning History Exhibition of Internship Student in Dental Department** (牙科部實習學生學習歷程展)	Venue：PBL & OSCE Classroom, 6F, Building W, KMUH 地 點：高醫大附設中和紀念醫院 W 棟 6F PBL & OSCE 教室
2025/03/13 **13：30~17：30**	**International Conference of the 17th Research Day, College of Dental Medicine, Kaohsiung Medical University: Oral Presentation & Competition for Students** (高雄醫學大學口腔醫學院第 17 屆研究日國際學術研討會論文口頭報告暨學生論文競賽)	Venue：Conference Room, College of Dental Medicine,5F, International Academic Research Building, KMU 地 點：高醫大國際學術研究大樓 5F 口腔醫學院會議室

Topic 1

Genetic Influences on Oral Health and Disease

Prof. Frank Roberts
University of Washington Seattle, USA

Oral health and disease are influenced by a complex interplay of genetic and environmental factors. This presentation explores the role of genetics in the pathogenesis of various oral diseases, including periodontitis, dental caries, and oral cancers. While environmental factors such as diet, oral hygiene, and smoking play significant roles, genetic predisposition is crucial in determining an individual's susceptibility to these conditions. Studies on identical twins and population-based research have highlighted the heritability of oral diseases, indicating that genetic factors significantly influence the host's immune response and disease progression. Key cellular mechanisms involve immune cells such as polymorphonuclear leukocytes (PMNs) and macrophages, which contribute to tissue destruction and disease severity. Understanding the genetic basis of these responses is essential for developing personalized treatment strategies and improving clinical outcomes in oral health management. Additionally, recognizing the interaction between genetic predisposition and environmental factors can help in the prevention and early detection of oral diseases, ultimately enhancing overall oral health.

This lecture will be engaging and accessible, designed for a non-expert audience. It aims to provide a comprehensive yet understandable overview of how genetics influence oral health, making it interesting and informative for all attendees.

Speaker：Prof. Frank Roberts

CURRICULUM VITAE

Frank Alan Roberts

Current position:

Professor
Department of Periodontics,
University of Washington School of Dentistry, Seattle, USA

Education:

2000-2010 Certificate, Public Health Genetics University of Washington
1999 University of Washington Summer Institute in Clinical Dental Research Methods
1990-1996 Ph.D. Molecular Biology Certificate, Periodontics Dentist Scientist Award
University of Alabama at Birmingham, Departments of Microbiology and Periodontics
1986-1990 D.D.S. with Honors
University of Tennessee, Memphis College of Dentistry
1982-1986 B.S. (Pre-dental Studies) Davidson College, Davidson, NC

Professional Boards and Licenses:

Southeast Regional Dental Board
Dental License, State of Washington
Dentist Moderate Sedation with Parenteral Agents Permit, State of Washington
Diplomate, American Board of Periodontology

Academic/Hospital Appointments:

2022-Present Professor, Department of Periodontics, University of Washington, Seattle, Washington
2020-Present Associate Dean, Regional Affairs, University of Washington School of Dentistry, Seattle, Washington
2019-Present Acting Chair, Department of Periodontics, University of Washington, Seattle, Washington
2015-2020 Periodontics Clerkship Director, University of Washington School of Dentistry, Seattle, Washington
2013-Present Director, Regional Initiatives in Dental Education (RIDE), University of Washington School of Dentistry, Seattle, Washington
2006-Present Pre-doctoral Program Director, University of Washington Department of Periodontics, Seattle, Washington
2004-2022 Associate Professor, Department of Periodontics, University of Washington, Seattle, Washington
2004-Present Adjunct Associate Professor, Department of Oral Health Sciences, University of Washington, Seattle, Washington

1999-Present Research Affiliate, Regional Primate Research Center, University of Washington, Seattle, Washington

1997-Present Chief of Periodontics, Department of Veterans Affairs Puget Sound Health Care System, Seattle, Washington

Honors and Awards:

2020 Thomas F. Nowlin Award for Outstanding Performance by a Section, demonstrating activities above and beyond requirements (9/20), while serving as Chair for ADEA Community, Prevention, and Public Health Dentistry Section

2018 American College of Dentists, inductee

2017 International College of Dentists, USA Section, inductee

2016 American Dental Education Association Geis Award for Vision for the Regional Initiatives in Dental Education (RIDE) Program

2016 American Academy of Periodontology Teaching Award

2015-2016 American Dental Education Association Academy for Academic Leaders Fellow

2014-2021 Seattle's Top Dentists, Seattle Metropolitan Magazine

Service Activities – Academic:

2022-Present University of Washington Faculty Senate

2022-Present Appointments, Promotion, and Tenure Committee, University of Washington School of Dentistry

2012-Present Reviewer, University of Washington Institute for Translational Research

2010-Present Chair, University of Washington Saul Schluger Endowed Chair in Periodontics Search Committee

2006-Present Legislative Team, University of Washington School of Dentistry

2003-Present Curriculum Committee, University of Washington School of Dentistry

2002-Present University of Washington Graduate School Faculty

2000-Present Safety Committee, University of Washington School of Dentistry

1999-Present Reviewer, University of Washington Royalty Research Fund

1998-Present Reviewer, University of Washington Regional Clinical Dental Research Center

1997-Present University of Washington Health Sciences Library Collection Development Committee

1997-Present University of Washington School of Dentistry Pre-doctoral Periodontics Advisory Committee

2016-Present University of Washington Hack Estate Grant Review Board

Service Activities - Professional:

2002-Present State of Washington Dental Quality Assurance Board and Washington State Medicaid Program, Infection Control Consultant

2002-Present State of Washington Department of Labor and Industries (L&I) and Washington Industrial Safety and Health Act (WISHA), Infection Control Consultant

2002-2015 American Academy of Periodontology Foundation Bud and Linda Tarrson Fellowship Selection Committee

2001-2008 American Dental Association Commission on Dental Accreditation Site Visitor, Pre-doctoral Basic Science Programs

2010-Present American Academy of Periodontology Predoctoral Program Directors' Group

2012-Present Council of Faculties, American Dental Education Association

2017-Present Community, Preventive, and Public Health Dentistry Section, American Dental Education Association, Secretary 2018, Vice Chair 2019, Chair 2020, Councilor 2021-23

2017-Present Community-Based Service Learning Group, American Dental Education Association, Founder and Chair

2018-Present Washington State Legislature Dental One Table, State Representatives Frank Chopp and Marcus Riccelli leadership group

Research Interests:

Service learning; rural health; teledentistry; innovative models of dental education; interprofessional education and practice; genetics of tooth development; regulation of inflammation in human adult periodontitis and other chronic inflammatory diseases; bacterial pathogenesis of inflammatory diseases; biology and imaging of the dental implant, blood- and air-borne pathogen exposure risks in dentistry.

Selective Invited Oral Presentation:

- Roberts, F (2023) Washington State Legislature: House of Representatives House Health Care & Wellness Committee meeting: "Rural Dentistry Training in the UW School of Dentistry RIDE Program," Olympia, WA
- Roberts, F (2023). Immunology and Molecular Biology for the Dental Practitioner. The Lee Study Club, Vancouver, BC, Canada
- Roberts, F (2021). The Montana RIDE Program. 1st District Dental Society Meeting, Kalispell, MT
- Roberts, F (2021). COVID 19 Vaccination Training for Dentists and Dental Hygienists. Seattle King County Dental Society/Washington State Dental Association, Seattle, WA, Online training module and In person.
- Gordon, S and Roberts, F (2021). Remote and Rural in North America, Online lecture for The Royal Society of Medicine, London, UK, Online
- Roberts, F (2020). Novel Coronavirus and Dental Care, Online and Web-based Training for Washington Dental Care Providers, Online
- Roberts, F (2020). Novel Coronavirus and Dental Care Update. Online and Web-based Training for Washington Dental Care Providers, Online
- Roberts, F (2020). Interprofessional Education (IPE) Training for Montana healthcare provider students. University of Montana and Montana State University, Online

Selective Peer reviewed Publications:

- **Roberts, FA**, Steinberg, S. In Memorium, Paul B. Robertson. J. Dent. Res. 2023
- Okumu BA, Tennant M, Kruger E, Kemoli AM, **Roberts FA**, Seminario AL. Geospatial Analysis of Dental Access and Workforce Distribution in Kenya. Ann Glob Health. 2022 Nov 21;88(1):104. doi: 10.5334/aogh.3903. eCollection 2022. PMID: 36474897

- Kerns, K. A., Bamashmous, S., Hendrickson, E.L., Lamont, E., Kotsakis, G. A., Leroux, B. G., Zenobia, C., Chen, Chang, A., **Roberts, F.**, D., Darveau, R.P., McLean, J.S. Microbially-Induced Inflammation Produces Changes in Distant Healthy Tissues in the Human Oral Cavity. 2022 (In-Prep, waiting on patent application approval).
- Nguyen, L., Leroux, B., **Roberts, F.**, Seminario, AL. Characteristics of Refugee Children Receiving Dental Care in Washington. 2022 (In preparation).
- Huynh AV, Latimer JM, Daubert DM, **Roberts FA.*** Integration of a New Classification Scheme for Periodontal and Peri-Implant Diseases Through Blended Learning. J Dent Educ. 2021 Jul 15. doi: 10.1002/jdd.12740. Epub ahead of print. PMID: 34268772.
- Greene, R., Van Houten, S., Albrecht, J., and **Roberts, F.*** 2020 Student and Preceptor Manuals for External Service Learning Rotations. ADEA Community, Prevention, and Public Health Dentistry Section web series. Uploads for use by US and Canadian dental student externship programs.
- **Roberts, F.A.***, DiMarco, A.C., Skillman, S.M., Mouradian, W.E. Growing the Dental Workforce for Rural and Underserved Communities: The University of Washington RIDE program. Generations: J. Amer. Soc. On Aging, 2016: 40(3), 79-84.
- Daubert, D.M., Kelley, J.L., Udod, Y.G., Habor, C., Kleist, C.G., Furman, I.K., Tikonov, I.N., Swanson, W.J., and **Roberts, F.A.***. Human Enamel Thickness and ENAM Polymorphism. Int. J. Oral Sci. (a Nature publication), 2016: Jun 30;8(2), 93-97.
- **Roberts, F.A.** and Darveau, R.P. Microbial Protection and Virulence in Periodontal Tissue as a Function of Polymicrobial Communities: Symbiosis and Dysbiosis. Periodontol. 2000. 2015 Oct;69(1):18-27.
- Schuler, R.F., Janakievski, J., Hacker, B.M., O'Neal, R.B., **Roberts, F.A.*** Effect of implant surface and grafting on implants placed into simulated extraction sockets: a histologic study in dogs. Int. J. Oral Maxillofac. Implants. 2010 Sep-Oct;25(5):893-900.
- **Roberts, F.A.**, Hacker, B.M., Oswald, T.K., Mourad, P.D., McInnes, C. Evaluation of the use of ultrasound within a power toothbrush to dislodge oral bacteria using an in vitro Streptococcus mutans biofilm model. Am. J. Dent. 2010 Apr;23(2):65-9.
- Mourad, P.D., **Roberts, F.A.**, McInnes, C. Synergistic use of ultrasound and sonic motion for removal of dental plaque bacteria. Compend. Contin. Educ. Dent. 2007 Jul;28(7):354-8.

Topic 2

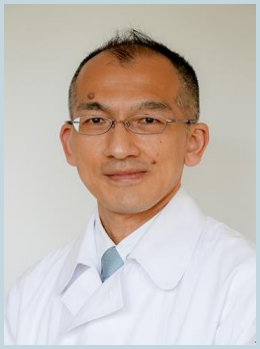
Microbiome Analysis in Periodontitis and Peri-implantitis: Insights and Related Perspectives

Prof. Yasuo Takeuchi
Institute of Science Tokyo, Japan

Periodontitis and peri-implantitis are chronic inflammatory diseases that affect the supporting structures of teeth and dental implants, respectively. Both diseases are caused by dysbiosis of the microbiota at subgingival/submucosal areas and seemingly show similar clinical phenotypes. Data also suggest that the progression of peri-implantitis appears to be faster than that of periodontitis, with more aggressive bone resorption. Early studies investigated the pathogenesis of these diseases focused on the association of specific obligate anaerobic bacteria, while subsequent advancements in next-generation sequencing (NGS) technology have enabled comprehensive analysis of the microbial community. The complex microbial profiles of periodontitis and peri-implantitis have been elucidated using this technology, and further exploration is underway to identify key microbial taxa and functional pathways contributing to disease progression, as well as host-microbe interactions. However, the consistent characteristics of the microbiome, especially in peri-implantitis, have not been fully described. Nevertheless, several researchers have indicated that the distinction in the bacterial community between peri-implantitis and periodontitis appears to be due to compositional differences of taxa in the entire microbiome, rather than attributed to the presence of specific pathogenic taxa.

The lecture will provide an overview of the current knowledge on the microbiome in periodontitis and peri-implantitis, highlighting key findings from recent studies, including our research. We will also discuss the issues of microbiome-based diagnostics and treatment, including the use of microbial biomarkers for early detection of disease and the development of targeted interventions to restore microbial homeostasis.

Speaker：Prof. Yasuo Takeuchi



CURRICULUM VITAE

Yasuo Takeuchi

Current position:

Professor
Department of Lifetime Oral Health Care Science,
Institute of Science Tokyo, Japan

Education:

4/1997-3/2001	Ph.D., Graduate School, Tokyo Medical and Dental University
4/1993-3/1997	D.D.S., Faculty of Dentistry, Tokyo Medical and Dental University

Work Experience:

6/2023-Present	Professor, Department of Lifetime Oral Health Care Science, Graduate School, Tokyo Medical and Dental University
4/2023-5/2024	Junior associate Professor, Department of Lifetime Oral Health Care Science, Graduate School, Tokyo Medical and Dental University
4/2017-3/2023	Junior associate Professor, Department of Periodontology, Graduate School, Tokyo Medical and Dental University
4/2008-3/2017	Assistant Professor, Department of Periodontology, Graduate School, Tokyo Medical and Dental University
4/2004-3/2009	Dental Resident, Clinics for Periodontics, Dental Hospital of Tokyo Medical and Dental University
3/2002-3/2004	Postdoc, Department of Preventive and oral pathology, School of Dental Medicine, University of Geneva, Switzerland

Certification:

6/2023 – Present	JSCD (Japanese Society of Conservative Dentistry) Board-Certified Dentist
6/2020 – Present	JDSB (Japanese Dental Specialty Bord) -Certified Periodontist
5/2015 – Present	JSP (Japanese Society of Periodontology) Board-Certified Instructor
9/2007 – Present	JSP Board-Certified Periodontist

Research Topics:

- Compositional and functional analysis of periodontal and peri-implant microbiomes
- Phototherapy for the infection control in periodontal disease
- The impact of the oral microbiome on systemic health

Academic Publications (2022-2024) (*Corresponding Author):

1. Nagai T, Shiba T, Komatsu K, Watanabe T, Nemoto T, Maekawa S, Kobayashi R, Matsumura S, Ohsugi Y, Katagiri S, **Takeuchi Y***, Iwata T. Optimal 16S rRNA gene amplicon sequencing analysis for oral microbiota to avoid the potential bias introduced by trimming length, primer,

and database. Microbiol Spectr. 2024 Oct 22;12(12):e0351223. doi: 10.1128/spectrum.03512-23. Online ahead of print.

2. Okano T, Ashida H, Komatsu N, Tsukasaki M, Iida T, Iwasawa M, Takahashi Y, **Takeuchi Y**, Iwata T, Sasai M, Yamamoto M, Takayanagi H, Suzuki T. Caspase-11 mediated inflammasome activation in macrophages by systemic infection of *A. actinomycetemcomitans* exacerbates arthritis. Int J Oral Sci. Int J Oral Sci. 16(1): 54, 2024.
3. **Takeuchi Y***, Nemoto T, Kitanaka Y, Aoki A, Izumi Y, Iwata T, Arakawa S. Antibacterial activity of lysozyme-chitosan oligosaccharide conjugates on two periodontal bacteria. Oral Dis. 30(4): 2728-2735, 2024.
4. Shiba T, Komatsu K, **Takeuchi Y***, Koyanagi T, Taniguchi Y, Takagi T, Maekawa S, Nagai T, Kobayashi R, Matsumura S, Katagiri S, Izumi Y, Aoki A, Iwata T. Novel flowchart guiding the non-surgical and surgical management of peri-implant complications: A narrative review. Bioengineering. 11(2):118, 2024.
5. **Takeuchi Y***, Aoki A, Hiratsuka K, Chui C, Ichinise A, Aung N, Kitanaka Y, Hayashi S, Toyoshima K, Iwata T, Arakawa S. Application of different wavelengths of LED lights in antimicrobial photodynamic therapy for the treatment of periodontal disease. Antibiotics. 12(12):1676, 2023.
6. Hayashi S, **Takeuchi Y***, Hiratsuka K, Kitanaka Y, Toyoshima K, Nemoto T, Aung N, Hakariya M, Ikeda Y, Iwata T, Aoki A. Effects of various light-emitting diode wavelengths on periodontopathic bacteria and gingival fibroblasts: An in vitro study. Photodiagnosis Photodyn Ther. 44:103860, 2023.
7. Hirasawa I, Odagiri H, Park G, Sanghavi R, Oshita T, Togi A, Yoshikawa K, Mizutani K, **Takeuchi Y**, Kobayashi H, Katagiri S, Iwata T, Aoki A. Anti-inflammatory effects of cold atmospheric plasma irradiation on the THP-1 human acute monocytic leukemia cell line. PLoS One. 18(10):e0292267, 2023.
8. Aoki A, Mizutani K, Mikami R, Ohsugi Y, Kobayashi H, Akizuki T, Taniguchi Y, **Takeuchi Y**, Katagiri S, Sasaki Y, Komaki M, Meinzer W, Izumi Y, Iwata T. Er: YAG laser-assisted comprehensive periodontal pocket therapy (Er-LCPT) for residual periodontal pocket treatment: a randomized controlled clinical trial. J Periodontol. 94(10):1187-1199, 2023.
9. Toyoshima K, Ohsugi Y, Lin P, Komatsu K, Shiba T, **Takeuchi Y**, Hirota T, Shimohira T, Tsuchiya Y, Katagiri S, Iwata T, Aoki A. Blue light-emitting diode irradiation without a photosensitizer alters oral microbiome composition of ligature-induced periodontitis in mice. Photobiomodul Photomed Laser Surg. 41(10):549-559, 2023.
10. Ikeda Y, Chigasaki O, Mizutani K, Sasaki Y, Aoyama N, Mikami R, Gokyu M, Umeda M, Izumi Y, Aoki A, **Takeuchi Y***. The potential of a saliva test for screening of alveolar bone resorption. Healthcare. 11(13):1822, 2023.
11. Shiba T, Komatsu K, Watanabe T, **Takeuchi Y***, Nemoto T, Ohsugi Y, Katagiri S, Shimogishi M, Marukawa E, Iwata T. Peri-implantitis management by resective surgery combined with implantoplasty and Er:YAG laser irradiation, accompanied by free gingival graft: a cases report. Ther Adv Chronic Dis. 14:20406223231174816, 2023.
12. Hayashi K, **Takeuchi Y**, Shimizu S, Tanabe G, Churei H, Kobayashi H, Ueno T. Continuous oral administration of sonicated *P. gingivalis* delays rat skeletal muscle healing post-treadmill training. Int J Environ Res Public Health. 19(20):13046, 2022.
13. Shiba T, Katagiri S, Komatsu K, Nemoto T, **Takeuchi Y**, Chen B, Zhou Y, Iwata T. Treatment of peri-implantitis caused by malpositioning and an extra implant: a case report. Int J Periodontics Restorative Dent. 42(1):e15-e20, 2022.

Topic 3

Periodontal Breakthrough Discovery: The Periodontal-Systemic Connection

Prof. Yu-Chao Chang
Chung Shan Medical University

Periodontitis, one of the most prevalent oral diseases worldwide, is a chronic inflammatory disease triggered by microbial biofilm and characterized by an immunologically moderated destruction of periodontium. The effects of such host bacterial interactions in oral cavity could evoke a systemic response. The association between periodontitis and systemic diseases has been increasingly recognized. With our research, we demonstrate that periodontitis is positively related to the disorders of nervous, cardiovascular, respiratory, digestive, and immune systems. Taken together, periodontal health plays an important role in general health as a goalkeeper. Improving periodontal health may have good systemic implications and would facilitate individual life quality.

Speaker：Prof. Yu-Chao Chang

CURRICULUM VITAE
Yu-Chao Chang

Current position:

Professor
School of Dentistry, Chung Shan Medical University
President, Taiwan Association for Dental Sciences

Education:

09/1999-01/2002	PhD, Chung Shan Medical University, Taichung, Taiwan
09/1994-01/1996	MS, Chung Shan Dental and Medical College, Taichung, Taiwan
09/1985-06/1991	DDS, Chung Shan Dental and Medical College, Taichung, Taiwan

Experience:

2023-Present	President, Taiwan Association for Dental Sciences
08/2020-07/2024	Vice President, Chung Shan Medical University
08/2016-07/2022	Dean, College of Oral Medicine, Chung Shan Medical University
08/2012-10/2014	Chair, School of Dentistry, Chung Shan Medical University
2009-2010	Visiting Professor, USC School of Dentistry
08/2004-07/2009	Chair, Institute of Stomatology, Chung Shan Dental and Medical College

Honors and Awards:

- Stanford University: "World's Top 2% Scientists 2021, 2022, and 2023".
- 15th General Meeting of the International Association for Dental Research South-East Asia Division, October 2-4, 2000, Taipei. IADR SEA Division Travel Award 1st price.
- 75th general session and exhibition of the International Association for Dental Research, March 19-23, 1997, Orlando FL. The Experimental Pathology Group Meeting Award.

Expertise:

Periodontology; Dental Radiology; Implantology; Oral Biology

Peer reviewed Publications:

1. Huang LG, Yu CC, Lin MC, Wang YH, Chang YC* (2024). Asssociation between periodontitis and hematologic cancer: A NHIRD corhort study in Taiwan. Cancers (Basel). 2024 Apr 25;16(9):1671.
2. Huang YK, Chang YC* (2022). Oral health: the first step to Sustainable Development Goal 3. Formos Med Assoc. 2022 Jul;121(7):1348-1350.
3. Yang SF, Wang YH, Su NY, Yu HC, Wei C, Yu CH, Chang YC* (2018). Changes in prevalence of pre-cancerous oral submucous fibrosis from 1996-2013 in Taiwan: a nationwide population-based retrospective study. J Formos Med Assoc. 117, 147-152.

4. Yu CC, Liao YW, Yu CH, Chang YC* (2018). STRO-1 confers myofibroblast transdifferentiation in fibroblasts derived from oral submucous fibrosis. J Oral Pathol Med. 47, 299-305.
5. Wang TY, Chiu YW, Chen YZ, Wang YH, Yu HC, Yu CC, Chang YC* (2018). Malignant transformation of Taiwanese patients with oral leukoplakia: a nationwide population-based retrospective cohort study. J Formos Med Assoc. 117, 347-380.
6. Fang CY, Wu CZ, Chen PN, Chang YC, Chuang CY, Lai CT, Yang SF, Tsai LL (2018). Antimetastatic potentials of salvianolic acid A on oral squamous cell carcinoma by targeting MMP-2 and the c-Raf/MEK/ERK pathway. Environ Toxicol. 33, 545-554.
7. Yu HC, Chen TP, Wei CY, Chang YC* (2018). Association between peptic ulcer disease and periodontitis: a nationwide population-based case-control study in Taiwan. Int J of Environ Res Public Health. 15, 912-912.
8. Lin TC, Tseng CF, Wang YH, Yu HC, Chang YC* (2018). Patients with chronic periodontitis present increased risk for primary Sjögren syndrome: a nationwide population-based cohort study. Peer J. 6, 5109.
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10. Chen YT, Wang YH, Yu HC, Yu CH, Chang YC* (2018). Time trend in the prevalence of oral lichen planus based on Taiwanese National Health Insurance Research Database 1996-2013. J Dent Sci. 13(3):274-280.
11. Yu HC, Chen TP, Chang YC* (2018). Inflammatory bowel disease as a risk factor for periodontitis under Taiwanese National Health Insurance Research Database. J Dent Sci. 13(3):242-247.
12. Yeh YT, Wang BY, Lin CW, Yang SF, Ho SW, Yeh HW, Huang JY, Chang YC*, Yeh CB (2018). Periodontitis and dental scaling associated with pyogenic liver abscess: A population-based case-control study. J Periodontal Res. 53(5):785-792.
13. Liao YW, Yu CC, Hsieh PL, Chang YC* (2018). miR-200b ameliorates myofibroblast transdifferentiation in precancerous oral submucous fibrosis through targeting ZEB2. J Cell Mol Med. 22(9):4130-4138.
14. Huang IS, Yu HC, Chang YC (2016). Schneiderian membrane repair with platelet-rich fibrin during the maxillary sinus augmentation with simultaneous implant placement. J Formos Med Assoc. 115, 820-821.
15. Zhao JH, Chang YC* (2016). The alveolar ridge preservation following tooth extraction using platelet-rich fibrin as the sole grafting material. J Dent Sci. 2016 Sep;11(3):345-347.
16. Yu CC, Yu CH, Chang YC* (2016). Aberrant SSEA-4 upregulation mediates myofibroblast activity to promote pre-cancerous oral submucous fibrosis. Sci Rep. 6, 37004
17. Wang TY, Peng CY, Lee SS, Chou MY, Yu CC, Chang YC (2016). Acquisition cancer stemness, mesenchymal transdifferentiation, and chemoresistance properties by chronic exposure of oral epithelial cells to arecoline. Oncotarget. 7, 84072-84084.
18. Yu HC, Huang FM, Lee SS, Yu CC, Chang YC* (2016). Effects of fibroblast growth factor-2 on cell proliferation of cementoblasts. J Dent Sci. 11, 463-467.
19. Huang YW, Chuang CY, Hsieh YS, Chen PN, Yang SF, Lin SH, Chen YY, Lin CW, Chang YC* (2017). Rubus idaeus extract suppresses migration and invasion of human oral cancer by inhibiting MMP-2 through modulation of the Erk1/2 signaling pathway. Environ Toxicol. 32, 1037-1046.

20. Yu CC, Su NY, Liu CM, Yang LC, Tsai CH, and Chang YC (2017). The upregulation of embryonic stem cell marker Nanog in human gingival fibroblasts stimulated with cyclosporine A - an in vitro study. J Dent Sci. 12, 78-82.
21. Ho YC, Yang SF, Lee SS, Chang YC* (2017). Regulation of hypoxia-inducible factor-1α in human buccal mucosal fibroblasts stimulated with arecoline. J Formos Med Assoc. 116, 484-487.
22. Chung HH, Chen MK, Chang YC, Yang SF, Lin CC, Lin CW (2017). Inhibitory effects of Leucaena leucocephala on the metastasis and invasion of human oral cancer cells. Environ Toxicol. 32, 1765-1774.
23. Chen CK, Wu YT, Chang YC* (2017). Association between chronic periodontitis and the risk of Alzheimer's disease: a retrospective, population-based matched-cohort study. Alzheimers Res Ther. 2017 Aug 8;9(1):56.
24. Chen CK, Wu YT, Chang YC* (2017). Periodontal inflammatory disease is associated with the risk of Parkinson's disease: A population-based retrospective matched-cohort study. PeerJ. 10:5, 3647.
25. Yang PY, Su NY, Lu MY, Wei C, Yu HC, Chang YC* (2017). Trends in the prevalence of diagnosed temporomandibular disorder from 2004 to 2013 using a Nationwide Health Insurance database in Taiwan. J Dent Sci. 12, 249-252.
26. Su NY, Yang LC, Chang YC* (2017). Platelet-rich fibrin is the first-line treatment option for periodontal regeneration. J Dent Sci. 12, 203-204.
27. Huang IJ, Yu HC, Chang YC* (2017). Occurrence of trigeminocardiac reflex during dental implant surgery: An observational prospective study. J Formos Med Assoc. 116(10), 742-747.
28. Chung HH, Chen MK, Chang YC, Yang SF, Lin CC, Lin CW (2017). Antimetastatic effects of Rheum Palmatum L. extract on oral cancer cells. Environ Toxicol. 32, 2287-2294.
29. Yang PY, Chen YT, Wang YH, Su NY, Yu HC, Chang YC* (2017). Malignant transformation of oral submucous fibrosis in Taiwan: a nationwide population-based retrospective cohort study. J Oral Pathol Med. 46, 1040-1045.
30. Yu HC, Su NY, Huang JY, Lee SS, Chang YC* (2017). Trends in the prevalence of periodontitis in Taiwan from 1997 to 2013: A nationwide population-based retrospective study. Medicine. 96, 8585
31. Su NY, Huang JY, Hu CJ, Yu HC, Chang YC* (2017). Increased risk of periodontitis in patients with psoriatic disease: a nationwide population-based retrospective cohort study. Peer J. 5, 4064.
32. Zhao JH, Chang YC* (2016). The alveolar ridge preservation following tooth extraction using platelet-rich fibrin as the sole grafting material. J Dent Sci. 11, 345-347.

Topic 4

Dynamic Smart Materials for Periodontal Research

Asst. Prof. Zhou Ye
University of Hong Kong

Periodontitis, a chronic disease affecting numerous global populations, presents treatment challenges due to the invasive nature of surgical interventions and the limitations of non-surgical ones. Non-surgical treatments such as scaling and root planning aim to eliminate bacteria, the primary cause of periodontitis. Adjuvant local delivery of antibiotics has been developed to enhance this bacterial elimination. However, this method necessitates multiple injections and suffers from non-controllable release and low patient compliance, limiting its effectiveness.

Hydrogels have emerged as promising drug delivery systems due to their biocompatibility and 3D network structure. Nevertheless, uncontrolled drug release remains a significant issue. In our study, we developed peptide hydrogels with antibacterial, anti-inflammatory, and osteogenic properties. These hydrogels, formed through the noncovalent bonds of self-assembling peptides, represent a breakthrough in controlled release as the peptides act as both the hydrogelator and the drug.

A crucial factor in periodontitis progression is the destruction of soft tissues and bone resorption caused by reactive oxygen species (ROS) from inflammation. To address this, we have developed a series of innovative hydrogels that either scavenge ROS as required or utilize ROS as a trigger for drug release. In these smart hydrogels, the drug is directly conjugated with a self-assembling peptide via a ROS-responsive linker. When excessive ROS is present, the drug is cleaved by the ROS and released to kill periodontal tissue bacteria. These smart hydrogels utilize noncovalent forces, offering a precise approach in periodontitis treatment.

Speaker：Asst. Prof. Zhou Ye

CURRICULUM VITAE
Zhou Ye

Current position:

Assistant Professor
Biofunctional Materials, University of Hong Kong,
Hong Kong

Education:

05/2017 Ph.D. Mechanical Engineering, Virginia Tech, Blacksburg, VA, USA
07/2011 Bachelor, Science in Mechanical Engineering, Shanghai Jiao Tong University, Shanghai, China

Professional Experiences:

07/2022- Present Assistant Professor, The University of Hong Kong, Hong Kong SAR, China
08/2020-06/2022 Postdoctoral Associate, University of Notre Dame, Notre Dame, IN, USA
04/2017-07/2020 Postdoctoral Associate, University of Minnesota, Minneapolis, MN, USA
08/2011-02/2017 Graduate Research Assistant, Virginia Tech, Blacksburg, VA, USA

Honors, Recognitions and Outstanding Achievements:

2023 IADR Innovation in Oral Care Awards
2020 Finalist, IADR Joseph Lister Award for New Investigators
2019 CTSI-Education Travel Award of University of Minnesota
2019-2020 Translational Research Development Program (TRDP) Award of University of Minnesota
2011-2012 Robert E. Hord, Jr. Mechanical Engineering Graduate Fellowship of Virginia Tech
2011 Outstanding Graduates of Shanghai Jiao Tong University
2010 Atlas Copco Scholarship of Shanghai Jiao Tong University
2008 China National Scholarship

Editor: Youth Editorial Board Member, BMEMat

Committee Membership:

Committee of Society of Dental Material Science, Chinese Stomatological Association (CSA)

Academic Society Membership:

International Association for Dental Research (IADR)
American Society of Mechanical Engineers (ASME)
Society for Biomaterials (SFB)

Selective Peer reviewed Publications:

- Jiang W, Ma X, Li B, Jiang T, Jiang H, Chen W, Gao J, Mao Y, Sun X, Ye Z, Zhao S, Huang S, Chen Y. Role of the PGAM5-CypD mitochondrial pathway in methylglyoxal-induced bone loss in diabetic osteoporosis. Bone. 2024.
- Zhang Y, Cong Y, Du J, Guo D, Huang J, Pan J, Liang Y, Zhang J, Ye Z, Liu Y, Zhou Y. Lif-deficiency promote systemic Iron metabolism disorders and increases the susceptibility of osteoblasts to ferroptosis. Bone. 2024.
- Zhang X, Chen Y, Zhou S, Liu Y, Zhu S, Jia X, Lu Z, Zhang Y, Zhang W, Ye Z, Cai B, Kong L, Liu F. RNA Coating Promotes Peri-Implant Osseointegration. ACS Biomater. Sci. Eng. 2024.
- Peng S, Guan Y, Cai H, Zhu Z, Mahayyudin MAM, Ye Z*, Sang T*. Efficacy of peptide-based enamel coatings in the prevention of demineralization using fixed orthodontic brackets in a rat model. Am. J. Orthod. Dentofacial Orthop. 2024.
- Tang W#, Fischer NG#, Kong X, Sang T*, Ye Z*. Hybrid coatings on dental and orthopedic titanium implants: current advances and challenges. BMEMat, e12105, 2024.
- Ye Z, Chi T, Evans CJ, Liu D, Addonizio CJ, Su B, Addonizio CJ, Pramuyda I, Xiang Y, Roeder RK, Webber MJ. Implications of supramolecular crosslinking on hydrogel toughening by directional freeze-casting and salting-out. Adv. Funct. Mater. 202402613, 2024.
- Kong X, Vishwanath V, Neelakantan P, Ye Z*. Harnessing antimicrobial peptides in endodontics. Int. Endod. J. 57, 815-840, 2024.
- Dai J#, Fischer NG#, Rahimi JR, Wang H, Hu C, Chen W, Lin Y, Sang T, Chew HP, Kong L, Aparicio C*, Ye Z*, Huang S*. Interpenetrating nanofibrillar membrane of self-assembled collagen and antimicrobial peptides for enhanced bone regeneration. Int. J. Biol. Macromol. 267, 131480, 2024.
- Chen W, Zhang C, Peng S, Lin Y*, Ye Z*. Hydrogels in dental medicine. Adv. Therap., 7, 2300128, 2024.
- Chi T#, Sang T#, Wang Y, Ye Z*. Cleavage and Non-cleavage Chemistry in Reactive Oxygen Species (ROS)-Responsive Materials for Smart Drug Delivery. Bioconjugate Chem. 35, 1, 1-21, 2024.
- Yu S#, Ye Z#, Roy R, Sonani RR, Pramudya I, Xian S, Xiang Y, Liu G, Flores B, Nativ-Roth E, Bitton R, Egelman EH, Webber MJ. Glucose-Triggered Gelation of Supramolecular Peptide Nanocoils with Glucose-Binding Motifs. Adv. Mater. 36, 2311498, 2023.
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- Wang Y#, Wu Z#, Wang T, Tang W, Li T, Xu H, Sun H, Lin Y, Tonin BSH, Ye Z*, Fu J*. Bioactive dental resin composites with MgO nanoparticles. ACS Biomater. Sci. Eng. 9, 8, 4632–4645, 2023.
- Ye Z, Pramuyda I, Xiang Y, Yu S, Chi T, Liu D, Su B, Addonizio CJ, Xian S, Zou L, Webber MJ. Detachable microneedles via host−guest supramolecular polymer networks. ACS Mater. Lett. 5, 1684-1691, 2023.
- Tian J#, Wu Z#, Wang Y, Han C, Zhou Z, Guo D, Lin Y, Ye Z*, Fu J*. Multifunctional dental resin composite with antibacterial and remineralization properties containing nMgO-BAG. J. Mech. Behav. Biomed. Mater. 141, 105783, 2023.
- Ye Z#, Qi Y#, Zhang A, Karels BJ, Aparicio C. Biomimetic mineralization of fibrillar collagen with strontium-doped hydroxyapatite. ACS Macro Lett. 12, 408-414, 2023.

- Peng S#, Sang T#, Wang H, Guan Y, Deng Y, Wang P, Huang Z, Ye Z*, Wu J*. Bioinspired anti-demineralization enamel coating for orthodontics. J. Dent. Res. 101, 1620-1627, 2022.
- Zhu X, Tang W, Cheng X, Wang H, Sang T*, Ye Z*. Roles of self-assembly and secondary structures in antimicrobial peptide coatings. Coatings 12, 1456, 2022.
- Ye Z#, Xiang Y#, Monroe T, Yu S, Dong P, Xian S, Webber MJ. Polymeric microneedle arrays with glucose-sensing dynamic-covalent bonding for insulin delivery. Biomacromolecules 23, 4401-4411, 2022.
- Ye Z#, *, Sang T#, Li K, Fischer NG, Mutreja I, Echeverría C, Kumar D, Tang Z*, Aparicio C*. Hybrid nanocoatings of self-assembled organic-inorganic amphiphiles for prevention of implant infections. Acta Biomater. 140, 338-349, 2022. Highlighted by Materials Today.
- Ye Z, Aparicio C. Interactions of two enantiomers of a designer antimicrobial peptide with structural components of the bacterial cell envelope. J. Pept. Sci. 28(1), e3299, 2022.
- Ye Z#, Zhu X#, Mutreja I, Boda SK, Fischer NG, Zhang A, Lui C, Qi Y, Aparicio C. Biomimetic mineralized hybrid scaffolds with antimicrobial peptides. Bioact. Mater. 6(8), 2250-2260, 2021.
- Ye Z, Kobe AC, Sang T, Aparicio C. Unraveling dominant surface physicochemistry to build antimicrobial peptide coatings with supramolecular amphiphiles. Nanoscale 12, 20767-20775, 2020.

Book Chapters:

- Mutreja J, Ye Z, and Aparicio C. Cell responses to titanium and titanium alloys. Handbook of Biomaterials Biocompatibility, edited by Masoud Mozafari, 2020.

Patents:

- Gorr S-U, Aparicio C, Ye Z. “Peptides, Hydrogel Compositions and Methods of Use Thereof” US patent US12037374B2
- Webber MJ, Ye Z, Xiang Y. “Polymeric microneedle arrays crosslinked by PBA-Diol Complexes for Glucose-Responsive Insulin Delivery” US provisional patent 63/369,432
- Webber MJ, Ye Z. “Biopolymer and supramolecular PEG microneedle arrays for detachable and locally embedded microneedles in the skin for insulin delivery” US provisional patent 63/479,255
- Ye Z, Huang J, Kuwentrai C, Tang W, Webber MJ. “Hydrogel-based delivery system for induction of intratumoral tertiary lymphoid structures and augmentation of immune checkpoint blockade and methods thereof” US provisional patent 63/584,248

Topic 5

Immune Regulation and Tissue Remodeling during Gingivitis and Periodontitis

Asst. Prof. Yung-Ting Hsu
University of Washington Seattle, USA

Immune and tissue homeostasis are essential for maintaining periodontal health and preventing tissue destruction. Mediators play a crucial role in orchestrating the crosstalk between immune cells and tissues, helping to maintain the balance between tissue and immune homeostasis. When this balance is disrupted, periodontal disease can progress, leading to irreversible tissue destruction and potential tooth loss. Recent findings indicate that tissue remodeling may begin as early as four days after plaque accumulation. A comprehensive analysis of this tissue homeostasis will enhance our understanding of the pathogenesis, diagnosis, and treatment of periodontal diseases. This presentation will highlight our recent investigations into host responses during gingivitis, focusing on individuals with periodontal health, experimental gingivitis, naturally occurring gingivitis, and periodontitis.

Speaker：Asst. Prof. Yung-Ting Hsu

CURRICULUM VITAE

Yung-Ting (Lizzy) Hsu

Current position:

Assistant Professor
Department of Periodontics, University of Washington, Seattle, WA, USA

Education:

2020-2024 Ph.D., University of Washington
Oral Health Science Mentors: Dr. Richard Darveau
Dr. Diane Daubert
2010-2014 MS. Periodontics (2013), University of Michigan
M.S. (2014), University of Michigan
09/2007-06/2009 M.D.Sc. Periodontics Kaohsiung Medical University
09/2001-06/2007 D.D.S. Kaohsiung Medical University

Private Practice:

10/2015-02/2016 General Dentistry, Kaohsiung, Taiwan
10/2020-Present Periodontics and Implant Dentistry, Seattle, Washington

Honors and Awards:

2006 University Scholarship Award for Exchange Student Program, Kaohsiung Medical University, Taiwan
2007 3rd prize, Student Clinician Research Program Competition, ADS-ROC, Taiwan
2007 Dean's Honor list, Kaohsiung Medical University, Taiwan
2008 3rd prize, Research Forum Foundation Thesis Competition, Academy of Periodontology, Taiwan
2009 Excellent graduate student award, Kaohsiung Medical University, Taiwan
2011 Benson Duff Endowed Graduate Periodontics Scholarship, University of Michigan, USA
2014 Finalist, AAP research forum poster competition, American Academy of Periodontology, USA
2016 AAP Foundation Fellowship to the Institute for Teaching and Learning in the Health Professions, American Academy of Periodontology, USA
2018 Osteology Education Grant for Osteology Research Academy Gothenburg 2018, Osteology Foundation
2018 Nevins Teaching and Clinical Research Fellowship, American Academy of Periodontology Foundation, USA
2019 Leadership, Engagement, Action, and Development (LEAD) program, American Academy of Periodontology, USA

2020 Recipient, Dental Alumni Endowed Faculty Award, University of Washington School of Dentistry, USA
2021 Finalist, AO research forum e-poster competition, Academy of Osseointegration, USA
2021 Recipient, Dental Alumni Endowed Faculty Award, University of Washington School of Dentistry, USA
2021 Clinical Research Award, American Academy of Periodontology Foundation, USA
2021 Excellence in Teaching and Mentoring Award, American Academy of Periodontology, USA
2021 Finalist, Research Forum Poster Competition, American Academy of Periodontology, USA (S. Prajapati; Advisor: Y Hsu)
2021 Award of Clinical Science, Research Forum Poster Competition, American Academy of Periodontology Annual Meeting, USA (P Nazeman; Advisor: Y Hsu)
2021 Award of Clinical Impact, Research Forum Poster Competition, American Academy of Periodontology Annual Meeting, USA (P Nazeman; Advisor: Y Hsu)

Memberships and Offices:

- American Association for the Advancement of Science, American Dental
- Association, American Academy of Periodontology, American Board of Periodontology, Western Society of Periodontology,
- Academy of Osseointegration, American and International Associations for Dental Research, Taiwan
- Academy of Periodontology

Selective Peer reviewed Publications:

1. Mei-Chi Chang, Ju-Hui Wu, Shyuan-Yow Chene, **Yung-Ting Hsu**, Sin-Yuet Yeung, Yu-Hwa Pan, Jiiang-Huei Jeng. Inducing cyclooxygenase-2 expression, prostaglandin E2 and prostaglandin F2α, production of human dental pulp cells by activation of toll-like receptor-3, mitogenactivated protein kinase kinase/extracellular signal-regulated kinase and p38 signaling. J Dent Sci. 2024 Apr;19(2):1190-1199.
2. Chun-Teh Lee, Karishma Choksi, Ming-Chieh Shih, Paul Rosen, Shale Ninneman, **Yung-Ting Hsu***. The impact of surgical techniques on sinus membrane perforation during sinus lifting: A systematic review and network meta-analysis. Int J Oral Maxillofac Implants 2023 Jul- Aug;38(4):681-696.
3. Fadi Shaya, Bobby Butler, **Yung-Ting Hsu***. Role of Keratinized Tissue on the Management of Peri-implantitis: A Case Report Int J Periodontics Restorative Dent 2023 Jul-Aug;43(4):517-523.
4. Saumya Prajapati, Shale Ninneman, Ida Zarrabi, Diane Daubert, I-Chung Wang, and **Yung-Ting Hsu***. Risk Factors and Longitudinal Regenerative Outcomes of Sinus Membrane Perforation during Lateral Window Sinus Floor Elevation: A Retrospective Analysis up to 9 Years. J Periodontol 2023 Feb 7.
5. **Yung-Ting Hsu**, Paul Rosen, Karishma Choksi, Ming-Chieh Shih, Shale Ninneman, Chun-Teh Lee. Complications of Sinus Elevation Procedure and Their Management: A systematic review. Clin Implant Dent Relat Res 2022 Dec;24(6):740-765.
6. Richard T Kao; Donald A Curtis; David M Kim; Guo-Hao Lin; Chin-Wei Wang; Charles Cobb; **Yung-Ting Hsu**; Joseph Kan; Diego Velasquez; Gustavo Avila-Ortiz; Shan-Huey Yu;

George Mandelaris; Paul Rosen; Marianna Evans; John Gunsolley; Hom-Lay Wang; Katie Goss; Jeanne Ambruster. American Academy of Periodontology best evidence consensus statement on modifying gingival phenotype in preparation for orthodontic and restorative treatment. J Periodontol. 2020; 1–10. **. Recipient of 2021 Clinical Research Award, American Academy of Periodontology, USA

7. **Yung-Ting Hsu***, Richard Kao, Nan-Chieh Huang, Adrienne Wong, Charles Cobb, Samantha Lee, Yasmin Mikail. Periodontal Risk Assessment Based on Dental and Gingival Morphology: A Comparative Analysis of African- Versus Asian American Cohorts. Clinic Advances in Periodontics 2020;10:224–230.
8. Timothy J Sego, **Yung-Ting Hsu,** Tien-Min Gabriel Chu, Andres Tovar. Modeling Progressive Damage Accumulation in Bone Remodeling Explains the Thermodynamic Basis of Bone Resorption by Overloading. Bulletin of Mathematical Biology 2020 82:134.
9. **Yung-Ting Hsu,** Maya Nair, Nikola Angelov, Evanthia Lalla, and Chun-Teh Lee. Impact of Diabetes on Clinical Outcomes After Non-Surgical Periodontal Therapy. Journal of Clinical Periodontology 2019:46 (2):206-217.
10. **Yung-Ting Hsu,** Guo-Hao Lin and Hom-Lay Wang. Effects of Platform-Switching on Peri-Implant Soft and Hard Tissue Outcomes: A Systematic Review and Meta-Analysis. *Int J Oral Maxillofac Implants.* 2017; 32(1): e9-e24.
11. **Yung-Ting Hsu**, Yu-Hsiang Chou, Tzu-Hsuan Yang, Yi-Min Wu, Chiung-Lin Huang, and Kun-Yen Ho Simultaneous Implantation and Guided Bone Regeneration Using a Platelet-Rich Fibrin Membrane: Two Case Reports. *Clinical Advances in Periodontics.* 2017; 7 (1):19-24.
12. **Yung-Ting Hsu,** Khalid Al-Hezaimi, Pablo Galindo-Moreno, Francis O'Valle, and Hom-Lay Wang. Effects of Bone Morphogenetic Protein-2 on Vertical Bone Augmentation in a Canine Model. *Journal of Periodontology*. 2017; 88(9):896-905.
13. **Yung-Ting Hsu**, Hsun-Liang Chan, Ivan Rudek, Jill Bashutski, Hom-Lay Wang, and Tae-Ju Oh. Comparison of Clinical and Radiographic Outcomes of Platform-Switched Implants with a Rough Collar and Platform-Matched Implants with Smooth Collar: A 1-year Randomized Clinical Trial. *Int J Oral Maxillofac Implants*. 2016; 31:382-390.

Chapters in Books:

1. **Yung-Ting Hsu** and Hom-Lay Wang. Clinical Assessment of the Gingiva and Alveolus. *Implant Aesthetics: Keys to Diagnosis and Treatment.* In Karateew, Edward Dwayne (Eds) (pp. 103-116). Springer International Publishing. 2017
2. Chun-Teh Lee, Nan-Chieh Huang and **Yung-Ting Hsu**. Periodontics and Implant Esthetics. In Shing-Zeng Dung (Eds), *Asian Aspects of Periodontology and Implantology* (pp). Airiti Press. 2017

Topic 6

Therapies for Mucogingival Defects

Dr. Min-Kang Lee
Kaohsiung Medical University Hospital

The term "mucogingival defects" is becoming more and more familiar to dentists nowadays. Most of the issue is related to dental implants recently; however, the history of concerns to mucogingival defects had early emerged in the 1960s, concerning the malpositioned frenum, keratinized tissue insufficiency and root coverage. By reviewing the histories, we can understand the core concept of therapy for the mucogingival defects. Additionally, we will discuss evolving trends in techniques and biologics related to high aesthetic demands and implant issues.

Speaker：Dr. Min-Kang Lee

CURRICULUM VITAE
Min-Kang, Lee

Affiliation:
Division of Family Dentistry,
Kaohsiung Medical University Hospital

Education:

09/2016-01/2019 MS. Graduate Institute of Dentistry, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

09/2007-06/2013 DDS. College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

Experience:

2019-2024 Attending Staff, Division of Family Dentistry, Kaohsiung Medical University Hospital

2024 Visiting Scholar, Division of Periodontics, University of Washington

2017-2019 Residency, Division of Periodontics, Kaohsiung Medical University Hospital

Honors and Awards:

2020 Best Original Article Award of Journal of Periodontics and Implant Dentistry

Certifications:

2019 Diplomate, Taiwan Academy of Periodontology

2019 Diplomate, Taiwan Association of Family Dentistry

Professional Associations:

2022-2024 Deputy Secretary General, Southern-Taiwan Academy of Implant Dentistry

Research Interests:

- Clinical interventions for the mucogingival defects.
- Correlations between salivary and gingival crevicular fluid biomarkers and gingivitis, and their responsiveness to therapeutic interventions.

Publications:

- Lee MK, Chen IH, Hsu IL, Tsai WH, Lee TY, Jhong JH, Liu BC, Huang TY, Lin FK, Chang WW, Wu JH. The impact of Lacticaseibacillus paracasei GMNL-143 toothpaste on gingivitis and oral microbiota in adults: a randomized, double-blind, crossover, placebo-controlled trial. BMC Oral Health. 2024 Apr 20;24(1):477. doi: 10.1186/s12903-024-04251-4. PMID: 38643116; PMCID: PMC11031891.

- Wu JH, Lee MK, Lee CY, Chen NH, Lin YC, Chen KK, Lee KT, Du JK. The impact of the COVID-19 epidemic on the utilization of dental services and attitudes of dental residents at the emergency department of a medical center in Taiwan. J Dent Sci. 2021 Jul;16(3):868-876. doi: 10.1016/j.jds.2020.12.012.
- Min-Kang Lee, Ying-Chu Lin, Kun-Yen Ho. The Comparisons in Treatment Outcomes of Chronic Periodontitis between Two Nonsurgical Periodontal Treatment Protocols and Their Correlations with Saliva Levels of Matrix. Journal of Periodontics and Implant Dentistry 2019; 2(1): 25-34 doi: 10.3966/261634032019060201004

Presentations (Oral and Poster):

- An overview of soft tissue therapy, Academic Lecture Series by Taipei Dental Association, 2023/10/29, Taipei
- A brief concept of dental implant and hands-on course, Kaohsiung Medical University, 2023/05/09, Kaohsiung

Topic 7

The Dilemma of Periodontal Treatment

Dr. Kuan-Hsuan Liao
Kaohsiung Medical University Gangshan Hospital

When performing periodontal treatment, one often wonders whether this is the correct treatment choice and whether it is the best option for the patient. When encountering certain cases of periodontal destruction, the thought of recommending tooth extraction frequently comes to mind. However, sometimes in similar cases of periodontal destruction, some teeth can remain functional for eight or even ten more years. This often leads to reflecting on whether it is too quick to give up on preserving natural teeth, and there is always a dilemma when making treatment decisions.

Speaker：Dr. Kuan-Hsuan Liao

CURRICULUM VITAE
Kuan-Hsuan Liao

Current position:

Five-year periodontist in Taiwan serving at the teaching hospital at Kaohsiung. Regularly assistant hosting meetings and all kinds of teaching activities.

Education

- 09/2007-06/2013 DDS, School of Dentistry, College of Dental Medicine, Kaohsiung Medical University

Skills

- Performed osseous surgery, regenerative surgery, and soft tissue graft
- Placed multiple implants with immediate and delayed protocols

Work History

- 01/2025- Present Attending Staff, Department of Dentistry, Kaohsiung Medical University Gangshan Hospital.
- 08/2019-12/2024 Attending Staff, Department of Dentistry, Kaohsiung Municipal Ta-Tung Hospital

  Perform periodontal therapy, periodontal surgery, and implant surgery. Clinical teacher for interns, postgraduate students, and residents. Teaching assistant at Southern Taiwan Academy of Implant Dentistry since 2022.

Research

I have been researching the topic of 'discriminating microbial community structures among non-periodontitis individuals before and after periodontitis treatment through metagenomic analysis'. This research was accepted as a thematic research project at Kaohsiung Municipal Ta-Tung Hospital in 2021.

Certifications

- 06/2018 Family Dentistry
- 06/2019 Periodontist

Interests:

- Volunteering at Tzu Chi International medical association, providing dental check-ups and treatments for underserved communities.

Interests:

- Volunteering at Tzu Chi International medical association, providing dental check-ups and treatments for underserved communities.

Publications:

- **Kuan-Hsuan Liao**, Kai-Fang Hu, Chiung-Lin Huang, Yu-Hsiang Chou. Relationship between Subgingival Restoration and Guided Tissue Regeneration: Case Series and Literature Review. Journal of Periodontics and Implant Dentistry. 2020;2(2):119-128.

Presentations:

- A case report of ridge preservation and implantation with a bioresorbable calcium-based bone substitute, Artificial Intelligence, and Precision medicine in Dentistry, 2019/11/01~11/03, Taipei World Trade Center

Poster List

GROUP: Fundamental Research

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P1-01	Using atomic layer technology to improve the antibacterial performance on the surface of the bionic ECM structure	Jhong-Kun Xiao	Institute of Oral Medicine, National Cheng Kung University
P1-02	Investigation of the molecular mechanism of interleukin-13 in arecoline induced oral submucosal fibrosis	Kuei-Lin Chia	School of Dentistry, College of Dental Medicine, KMU*
P1-03	Effect of storage temperature on the physical properties of two self-cure acrylic resins used in prosthodontics	Shih-Chieh Kao	School of Dentistry, College of Dental Medicine, KMU*
P1-04	The impact of oral health empowerment workshop on oral health knowledge of elementary school teachers and early childhood educators	You-Yang Lin	Department of Oral Hygiene, College of Dental Medicine, KMU*
P1-05	Investigated the association between oral health and handgrip strength in community-dwelling older adults	Tzu-Yu Li Ling-Jing Feng Wei-Chi Liang	Department of Oral Hygiene, College of Dental Medicine, KMU*
P1-06	AR toothbrushing system with video instructions for training indonesian caregivers in geriatric oral care: a preliminary analysis	Peng-Hua Chen Tao-Hung Chen	Department of Oral Hygiene, College of Dental Medicine, KMU*
P1-07	Impact of environmental moisture on deformation of 3D printing PMMA dental resin	Ching-I Huang	Department of Dentistry, KMUH*
P1-08	A study on structure and properties of SLM fabricated Co-Cr alloy after simulated porcelain firing	Cih-Huei Chen	Department of Dentistry, KMUH*
P1-09	The study of esophageal comorbidity in oral precancer and oral cancer patients	Yu-Chuan Wang	School of Dentistry, College of Dental Medicine, KMU*

*KMU (Kaohsiung Medical University)
*KMUH (Kaohsiung Medical University Hospital)

No.	Topic	Presenter	Institution
P1-10	Functional synthesized copolymer electrospun membranes for enhanced osteoblast activity in periodontal regeneration	Ze-Wei Hu	School of Dental Technology, College of Oral Medicine, Taipei Medical University
P1-11	Scanning accuracy of finishing line designs on anterior teeth using four intraoral scanners	Chia-Che Liu	School of Dentistry, College of Dental Medicine, KMU*
P1-12	Exploring the regulatory effect of silicate bioceramics on cellular inflammatory response	Ruo-Wei Wu	School of Dentistry, College of Dental Medicine, KMU*
P1-13	The association between children' oral health care literacy and salivary oral health indicators on preschool children	Wan-Jhen Su Yu-Xuan Chen Yang-Shih Zhuo Hong-Wei Liao Shi-Pei Yen	Department of Oral Hygiene, College of Dental Medicine, KMU*
P1-14	Automated tooth alignment using combined point and mesh features with diffusion probabilistic models	Tzu-Hsuan Chuang Ting-Yu Chiang	Department of Oral Hygiene, College of Dental Medicine, KMU*
P1-15	Clinical efficacy of dental lasers on frenulum abnormalities	Chi-Chia Chang-Chen Yi-Hsien Li Chi Wang	Department of Oral Hygiene, College of Dental Medicine, KMU*
P1-16	Oral health education program of indigenous care attendants at cultural health station	Shao-Tung Yang Chia-Yi Lin	Department of Oral Hygiene, College of Dental Medicine, KMU*
P1-17	Effect of different designs of end bristles of toothbrushes on dentin abrasion - An in vitro study	Cheng-Sheng Tang	Department of Oral Hygiene, College of Dental Medicine, KMU*

*KMU (Kaohsiung Medical University)
*KMUH (Kaohsiung Medical University Hospital)

P1-01

Using atomic layer technology to improve the antibacterial performance on the surface of the bionic ECM structure

▲Jhong-Kun Xiao[1], Chan-Yuen Chang[2], Chi-Chung Kei[2], Chih-Ling Huang[3], Tzer-Min Lee[1]

[1]Institute of Oral Medicine, National Cheng Kung University, Tainan, Taiwan
[2]Taiwan Instrument Research Institute, Hsinchu, Taiwan
[3]Center for Fundamental Science, Kaohsiung Medical University, Kaohsiung, Taiwan

Objectives: Titanium and its alloys lack antibacterial properties and osseointegration capabilities, leading to risks of infection and implant failure. These limitations can be overcome through surface modification. Methods: In this study, a porous and rough calcium-phosphorus coating was prepared on the surface through micro-arc oxidation, and then a micro-nano-scale hydroxyapatite (HA) structure was produced on the surface through hydrothermal synthesis to promote bone tissue growth and cell adhesion. Finally, zinc oxide is deposited on the surface of the substrate through atomic layer deposition technology, giving it good antibacterial properties. Surface characteristics are analyzed through water contact angle (WCA), SEM, EDS, and XRD. Cell proliferation is used to culture MG-63, which is the influence of growth on the surface of the substrate. In order to evaluate the antibacterial effect, Escherichia coli (E. coli) will be selected for antibacterial experiments. Results: SEM shows that there are no obvious changes in the volcanic pore structure after MAO, the rod-like structure after hydrothermal synthesis, and the surface after ALD ZnO. Water contact angle tests showed that the hydrophilicity improved after hydrothermal treatment and remained unchanged after ZnO deposition. ALD ZnO 10nm has the best antibacterial effect, with an antibacterial rate of 92%. Cell proliferation experiments showed that ALD ZnO is nontoxic and promotes cell growth. Conclusions: The substrate treated with MAO has good biocompatibility. The hydrothermal synthesis method can promote cell proliferation. The atomic layer deposition of zinc oxide gives it good antibacterial properties, which proves that it can improve the antibacterial property and osseointegration ability of the implant.

P1-02

Investigation of the molecular mechanism of interleukin-13 in arecoline induced oral submucosal fibrosis

▲Kuei-Lin Chia[1,2], Yan-Hsiung Wang[1,2]

[1]School of Dentistry, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

[2]Orthopaedic Research Center, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

Objectives: Oral submucous fibrosis (OSF) is potentially one of the precancerous conditions characterized by juxta-epithelial inflammation and progressive fibrosis of submucosal tissue. Its etiology is associated with arecoline, a major alkaloid of areca nut. IL-13 is a major inducer of fibrosis in many chronic diseases, but its role in OSF remains unknown. This study investigates how IL-13 regulates arecoline-induced oral submucous fibrosis. Methods: Human gingival fibroblasts (HGF) were used to assess the effects of IL-13 on proliferation, migration and fibrotic-related gene expression in response to arecoline. Results: In the presence of arecoline, the proliferation activity of HGF was inhibited when the concentration of arecoline exceeded 200μM. Additionally, arecoline inhibited the migration ability of HGF at concentrations above 100μM. The gene expression of IL-13 on HGF did not increase, but one of the receptors, IL-13Rα2, was upregulated in a dose-dependent manner. Also, IL-13 reversed the inhibitory effect of arecoline on the proliferation and migration of HGF. Conclusion: Our findings suggest that IL-13 could play an important role in arecoline-induced oral submucous fibrosis by enhancing fibroblast proliferation and migration. These findings provide new insights into the molecular mechanisms underlying OSF and highlight IL-13 as a potential therapeutic target.

P1-03

Effect of storage temperature on the physical properties of two self-cure acrylic resins used in prosthododntics

▲Shih-Chieh Kao[1], Ting-Hsun Lan[1,2]

[1]School of Dentistry, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

[2]Division of Prosthodontics, Department of Dentistry, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan

Objectives: This study aimed to evaluate the effects of different storage temperatures on the physical properties of two acrylic resins commonly used in prosthodontics and to compare the performance of two types of composite resins. Methods: Two self-cured PMMA resins, Unifast 3 and Unifast Trad, were tested. The resins were stored at 4°C, 25°C, and 35°C for 48 hours before specimen preparation at 25°C. Specimens were allowed to stand for 24 hours at 25°C to ensure complete polymerization. For mechanical testing, ten samples underwent a three-point bending test to measure flexural strength (FS). Micro-Vickers hardness (HMV) was evaluated on polished samples (N=5) using 600-grit SiC abrasive paper. Results: The FS of Unifast 3 increased slightly with temperature, ranging from 42.2 MPa at 4°C to 48.3 MPa at 35°C, while Unifast Trad maintained consistent FS (~58.1 MPa). HMV testing revealed no temperature effects on hardness, though Unifast Trad exhibited higher hardness than Unifast 3 across all conditions. Conclusions: Unifast Trad demonstrated superior mechanical properties compared to Unifast 3, making it a more suitable choice for prosthodontic applications. These findings highlight the importance of considering storage conditions in clinical material selection.

P1-04

The impact of oral health empowerment workshop on oral health knowledge of elementary school teachers and early childhood educators

▲You-Yang Lin[1], Chih-Chang Chen[2], Hsiao-Ling Huang[1]

[1]Department of Oral Hygiene, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

[2]School of Dentistry, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

Objective: The aim of the study is to understand the differences in oral health knowledge among teachers and early childhood educators before and after the oral health empowerment workshop. Methods: This study involved 261 elementary school teachers and 18 early childhood educators from 15 schools across 5 counties with high caries rates, who participated in an oral health empowerment workshop as part of the oral health-promoting school program in 2024. Pre- and post-workshop questionnaires were administered, and statistical analyses, including McNemar's test, Chi-square test, and paired t-test, were conducted. A p-value of less than 0.05 was considered statistically significant. The analyses examined the demographic characteristics of the participating teachers and the changes in their oral health knowledge before and after the training. Results: All early childhood educators scored 7.9±1.4 points before the training and 8.8±1.4 points after the training, showing improvement but without statistically significant differences. Educators from Changhua County demonstrated the greatest improvement, with an increase of 2.0±2.0 points. All elementary school teachers scored 7.3±1.7 points before the training and 9.1±1.1 points after the training, showing a significant improvement ($p<0.001$). Among them, teachers from Changhua County exhibited the most substantial progress, with an increase of 2.7±1.9 points. Conclusion: The results indicate that providing oral health empowerment workshop for elementary school teachers and early childhood educators can effectively enhance their oral health knowledge.

P1-05

Investigated the association between oral health and handgrip strength in community-dwelling older adults

▲Tzu-Yu Li, ▲Ling-Jing Feng, ▲Wei-Chi Liang, Pei-Chen Lin

Department of Oral Hygiene, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

Background: Oral health is essential for individuals of all ages, particularly for older adults, as it can significantly impact their eating efficiency and nutritional intake. This study investigates the association between oral health and hand grip strength in community-dwelling older adults. Methods: This cross-sectional study included 65 community-dwelling individuals aged 65 years and older. We measured oral diadochokinesis and hand grip strength. Oral health was assessed using the Oral Health Assessment Tool (OHAT). Descriptive statistics are presented as mean (SD), and we performed t-tests and chi-squared tests for analysis. Results: The findings indicate that approximately 29.9% of participants were taking more than one medication for metabolic diseases. Among the participants, 83.5% had hand grip strength within the normal range. An OHAT score exceeding 2 indicated poor oral hygiene in 16.9% of cases. Additionally, while hand grip strength was found to be normal in 83.5% of participants, there was no statistically significant relationship between oral hygiene and grip strength in older adults. However, oral diadochokinesis measured with the syllables "pa," "ta," and "ka" showed statistically significant differences when comparing those with normal and abnormal grip strength (p-value < 0.05). Conclusion:We found that oral diadochokinesis associated with hand grips.

P1-06

AR toothbrushing system with video instructions for training indonesian caregivers in geriatric oral care: a preliminary analysis

▲Peng-Hua Chen[1], ▲Tao-Hung Chen[1], Kuo-Hsun Lu[2], Hsiao-Ling Huang[1]

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[2]School of Dentistry, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

Objectives: With the increasing demand for long-term care, Taiwan's need for foreign caregivers has also risen, particularly for Indonesian caregivers, who constitute the majority (77.12%). This study aims to evaluate the effects of an AR toothbrushing system combined with video instruction on the oral care knowledge, attitudes, and self-efficacy of Indonesian caregivers. Methods: We employed an experimental design, with 24 participants randomly assigned to three groups: the AR+Video group(ARV), the Video group(VG), and the Control group (CG). All groups received oral health education pamphlets. Participants in the ARV group used the AR toothbrushing system alongside video instruction, while those in the VG received only video instruction based on pamphlets of oral hygiene knowledge and skills. A self-administered questionnaire was used to collect data on knowledge, attitudes, and self-efficacy. Results: After the intervention, the correct response rates for the statement "Dentures can be soaked in denture cleaning tablets overnight" increased by 44.5% in the ARV group and 33.4% in the VG, while the CG group decreased by 16.7%. Regarding the attitude statement "Assisting the elderly with oral care is troublesome," positive responses increased by 33.2% in the ARV group and 11.2% in the VG, whereas the CG decreased by 23.5%. For the statement "I do not have enough time to assist the elderly with oral care," a negative attitude of both the ARV and VG saw an increase of 11.1%, while the CG decreased by 0.1%. Conclusion: The use of AR technology combined with video education can effectively enhance the oral health knowledge, attitudes, and self-efficacy of Indonesian caregivers.

P1-07

Impact of environmental moisture on deformation of 3D printing PMMA dental resin

▲Ching-I Huang[1], Yu-Jing Zhou[1], Ting-Hsun Lan[1,2]

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[2]School of Dentistry, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

Objectives: This study aimed to evaluate the influence of moisture levels on the deformation of dental materials fabricated using 3D printing technology. Deformation was assessed using both traditional methods (digital calipers) and advanced digital approaches (3D scanning and software analysis) to understand the impact of environmental factors on the precision of 3D-printed dental resin. Methods: Nine PMMA specimens (5 × 5 × 25 mm) with reference points were fabricated using the Phrozen XL4K 3D printer. The specimens were divided into three groups based on environmental storage conditions: dry (N=3), normal (N=3), and humid (N=3). Each group was evaluated after 1 day, 7 days, and 14 days of storage. Deformation was measured using two methods: traditional measurement with digital calipers and advanced analysis via 3D scanning performed with a desktop scanner (F8, 3Shape Co.). The scanned digital images were further analyzed using EXOCAD software to quantify deformation and assess dimensional change. Results: Using the 1-day measurements as the baseline, caliper data after 7 days showed mean deformations of -0.03 mm for the dry group, -0.02 mm for the normal group, and -0.02 mm for the humid group. After 14 days, the mean deformations were -0.03 mm (dry), -0.03 mm (normal), and -0.06 mm (humid), indicating a notable increase in deformation under humid conditions. Digital image analysis revealed mean deformations after 7 days of -0.24 mm (dry), -0.08 mm (normal), and -0.08 mm (humid). After 14 days, these values were -0.16 mm (dry), -0.09 mm (normal), and -0.20 mm (humid). The results demonstrate that deformation progresses over time, with humid environments causing the greatest degree of dimensional change. Conclusions: Environmental moisture significantly impacts the deformation of 3D-printed PMMA dental resin. Dry conditions minimize deformation, while humid conditions exacerbate it, underscoring the importance of environmental control in optimizing the precision and reliability of 3D-printed dental resin.

P1-08

A study on structure and properties of SLM fabricated Co-Cr alloy after simulated porcelain firing

▲Cih-Huei Chen[1], Hsueh-Chuan Hsu[2]

[1]Division of Prosthodontics, Department of Dentistry, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan

[2]Central Taiwan University of Science and Technology, Taichung, Taiwan

Objectives: This study aimed to fabricate cobalt-chromium (Co-Cr) alloy specimens using selective laser melting (SLM) technology and investigate their surface microstructure, electrochemical, and mechanical properties following simulated porcelain firing. Methods: The Co-Cr alloy specimens were categorized into three groups: as-built (AB), heat-treated (HT), and porcelain-fired (PF). Scanning electron microscopy (SEM) was used to analyze surface morphology and microstructure, while X-ray diffraction (XRD) identified phase compositions. Mechanical properties, including fracture strength and Vickers hardness, were assessed, and the effects of porcelain firing on ductility and yield strength were evaluated. Results: SEM revealed significant differences in surface morphology and microstructure influenced by porcelain firing parameters. XRD confirmed the presence of face-centered cubic (fcc, γ) and hexagonal close-packed (hcp, ε) phases in the Co-Cr alloy. Porcelain firing increased ductility while reducing yield strength and Vickers hardness. Fracture strengths for AB, HT, and PF specimens were 727 MPa, 765 MPa, and 822 MPa, respectively. SEM analysis of fracture surfaces indicated honeycomb-like pores in PF specimens, suggesting ductile fracture, whereas AB and HT specimens exhibited stepped wedge fractures, indicative of brittle fracture. Conclusions: Porcelain firing significantly alters the mechanical properties and fracture characteristics of SLM-fabricated Co-Cr alloys. The results provide valuable insights for optimizing materials used in dental applications.

P1-09

The study of esophageal comorbidity in oral precancer and oral cancer patients

▲Yu-Chuan Wang[1], Yen-Yun Wang[1], Shyng-Shiou Yuan[1,2]

[1]School of Dentistry, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

[2]Graduate Institute of Medicine, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

Objectives: The 110-year cancer registration report of Taiwan indicates that oral cancer incidence of ranks third among men, and its mortality rate ranks fourth. Previous studies have shown that the incidence of second primary tumors (SPT) in the esophagus ranges from 9% to 44%. Early-stage esophageal cancer can be treatedwith endoscopic mucosal resection , and early intervention through microscopic screening may enhance the survival rate of oral cancer patients. However, there is currently no consensus on early prevention and screening strategies for second primary esophageal cancer (SPEC) through endoscopiy, highlighting the need for furtherresearch. This study aims to identify the incidence and risk factors associated with esophageal comorbidities in patients with oral cancer and oral precancer. Methods: We recruited patients with oral cancer and oral precancer from five medical centers in Taiwan between 2018 and 2024.We analyze demographic data, gastroesophagoscopy screening results, and clinical information to determine the incidence and risk factors for second primary esophageal cancer. Results: Our findings indicate that smoking, alcohol drinking, betel quid chewing, and age are significant risk factors for esophageal comorbidities.. Additionally, longer durations and higher quantities of substance use correlate with an increased risk of developing these comorbidities. with a higher risk of developing esophageal comorbidities. Conclusions: Oral cancer patients who develop second primary esophageal cancer have a poorer survival rate compared to those without these comorbidities. Screening individuals with risk factors can enhanceearly detection rates and ultimatelyreduce mortality.

P1-10

Functional synthesized copolymer electrospun membranes for enhanced osteoblast activity in periodontal regeneration

▲Ze-Wei Hu, Tien-Li Ma

School of Dental Technology, College of Oral Medicine, Taipei Medical University, Taipei, Taiwan

Objectives: Guided Tissue Regeneration (GTR) is an essential technique for promoting bone and tissue regeneration, particularly in treating large periapical lesions and through-and-through defects. This study evaluates the effects of electrospun poly(γ-benzyl-l-glutamate) (PBG) and P((CBZL)70-co-(BG)30) (7C3B) on the proliferation and differentiation of MG63 osteoblast-like cells and explores their potential applications in GTR. Methods: Electrospinning technology was used to fabricate three materials: PCL, PBG, and 7C3B, with standardized thickness and fiber diameter. MG63 cells were divided into control (DMEM only), PCL, PBG, and 7C3B. Cell viability assays were conducted to assess the cytotoxicity of the materials, while fluorescence staining was used to evaluate cell proliferation and differentiation. Scanning electron microscopy (SEM) was employed to examine the microstructure of the materials and analyze cell adhesion. Results: All materials significantly enhanced MG63 cell viability, with PBG and 7C3B outperforming PCL. Fluorescence staining indicated that both PBG and 7C3B effectively promoted cell proliferation and differentiation, demonstrating comparable results that were significantly better than PCL. SEM analysis showed that PBG and 7C3B exhibited uniform and porous microstructures that supported cell adhesion and growth, whereas PCL had a smoother surface with fewer attached cells. Conclusions: Electrospun PBG and 7C3B demonstrated excellent performance in promoting MG63 cell proliferation, differentiation, and adhesion, highlighting their good biocompatibility and potential for application in GTR. In comparison, PCL showed weaker results. These findings suggest that PBG and 7C3B are promising materials for GTR applications to enhance bone regeneration.

P1-11

Scanning accuracy of finishing line designs on anterior teeth using four intraoral scanners

▲Chia-Che Liu[1], Ting-Hsun Lan[1,2]

[1]School of Dentistry, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

[2]Division of Prosthodontics, Department of Dentistry, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan

Objectives: This study aimed to evaluate the scanning accuracy of different finishing line designs on anterior teeth using four intraoral scanners. The analysis focused on scanning deviations at six specific locations: Buccal, Mesial-Buccal, Distal-Buccal, Lingual, Mesial-Lingual, and Distal-Lingual, across various finishing line designs . Methods: Dental models with four finishing line designs (light chamfer, heavy chamfer, round shoulder, and sloped shoulder) were created using CAD-CAM technology, and initial STL files were obtained via a desktop scanner (3Shape F8). Four intraoral scanners (iTero, 3Shape, Medit, and Straumann) scanned each model ten times. Scanning deviations were measured using ExoCAD software, and statistical analysis was conducted with one-way ANOVA and Tukey post hoc comparisons to assess differences among groups. Results: Statistically significant differences were observed among all groups ($P < 0.05$). The Medit and Straumann scanners exhibited the highest trueness with the light chamfer margin, while the iTero and Medit scanners performed better with the heavy chamfer margin. Straumann consistently demonstrated the lowest mean deviation, indicating the highest scanning precision. In contrast, 3Shape showed the highest deviation values, indicating lower precision. Conclusions: The findings highlight that scanner performance varies significantly based on finishing line design. Straumann consistently achieved the highest scanning accuracy, making it the optimal choice for precise digital impressions, whereas 3Shape requires further evaluation for specific applications. These results emphasize the importance of matching scanner capabilities to margin designs for optimal clinical outcomes.

P1-12

Exploring the regulatory effect of silicate bioceramics on cellular inflammatory response

▲Ruo-Wei Wu, Yan-Hsiung Wang

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Orthopaedic Research Center, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

Objectives: Calcium silicate (CS), a bioceramic with osteogenic, angiogenic, and anti-inflammatory potential, releases calcium and silicon ions that may regulate inflammation. This study investigates the anti-inflammatory effects of CS in human gingival fibroblasts (HGF) and compares it with sodium metasilicate (SMS), another silicon-ion-releasing material, to assess their therapeutic potential for inflammatory conditions. Methods: Inductively coupled plasma optical emission spectrometry (ICP-OES) was used to measure the concentrations of calcium (Ca), silicon (Si), and phosphorus (P) ions released from both calcium silicate (CS) and sodium metasilicate (SMS) in solution. The cytotoxicity of CS and SMS on HGF was assessed using the CCK-8 assay to determine the appropriate concentrations for subsequent experiments. HGF were pretreated with either CS or SMS, followed by stimulation with interleukin-1β (IL-1β) to induce inflammation. Quantitative PCR was then performed to analyze the expression levels of inflammation-related mediators. Results: Our results demonstrated that the CCK-8 cytotoxicity assay successfully identified the appropriate concentration range of both CS and SMS for subsequent experiments. Both CS and SMS were found to reduce inflammation-related mediators in IL-1β-induced HGF; however, CS exhibited a stronger anti-inflammatory effect compared to SMS. These findings suggest that CS has superior anti- inflammatory potential over SMS. Conclusions: Both CS and SMS show anti-inflammatory effects in HGF, with CS demonstrating greater therapeutic potential for inflammatory conditions.

P1-13

The association between children' oral health care literacy and salivary oral health indicators on preschool children

▲Wan-Jhen Su,▲Yu-Xuan Chen, ▲Yang-Shih Zhuo, ▲Hong-wei Liao, ▲Shi-Pei Yen, Tien-Ting Chiang, Yung-Kai Huang

Department of Dental Hygiene, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

Objectives: Oral health literacy impacts oral health and caregiving behavior. While most studies examine oral health literacy, little research focuses on caregivers' oral care literacy, which influences preschool children's oral hygiene and health.The objective of this study is to explore the association between the oral health literacy of preschool children and salivary oral health indicators in preschool children. Methods: This convenience sampling cross-sectional study recruited 119 preschool caregivers (3-6 years) with exclusions for incomplete questionnaires or inability to perform mouth rinsing. The children' oral health care literacy was determined by Hong Kong Oral Health Literacy Assessment Task for Pediatric Dentistry (HKOHLAT-P). HKOHLAT-P includes three items: knowledge, numeracy and comprehension. Oral health indicators utilized a commercial meter Salivary Multi Test®. Seven indicators were measured including cariogenic bacteria, acidity, buffering capacity, occult blood, white blood cells, proteins, and ammonia. Data were analyzed using SPSS. Chi-square, Fisher's test, and Pearson correlation was used to analyze association between literacy and children's oral health indicators. Results: Caregivers aged 50 and above have significantly lower children' oral health care literacy compared to caregivers under the age of 50. The children' oral health care literacy scores significantly increase the caregiver's education level or household income. Caregivers without dental visit experience have significantly lower children' oral health care literacy than those who have intermittent or regular dental visits. The higher the children' oral health care literacy scores were shown in the carvers who had longer weekly reading Chinese printed materials or digital information. The higher the knowledge score of children' oral health care literacy, the lower the occult blood indicator, showing a significant negative correlation ($r=-0.19$, $p<0.05$). Conclusion: Caregivers' oral health knowledge is negatively correlated with children's occult blood levels. The further study should investigate caregivers' literacy in improving children's oral health outcomes.

P1-14

Automated tooth alignment using combined point and mesh features with diffusion probabilistic models

▲Tzu-Hsuan Chuang[1], ▲Ting-Yu Chiang[1], Han-Jen Hsu[1,2]

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[2]Division of Oral and Maxillofacial Surgery, Department of Dentistry, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan

Tooth alignment is vital in orthodontics, enhancing health, aesthetics, and confidence. To improve alignment efficiency and reduce design errors from inexperienced practitioners, deep learning-based methods have been developed. Most current approaches use multi-layer perceptrons (MLPs) to model the nonlinear relationship between tooth features and transformation matrices for automated alignment. However, these methods are limited by the scarcity of publicly available clinical datasets, restricting their ability to address diverse malocclusion cases. We propose a tooth alignment neural network using a diffusion probabilistic model. This model, conditioned on features from dental models, learns the transformation from malocclusion to normal occlusion by gradually denoising random variables, effectively handling real orthodontic data. To utilize effective features fully, we design encoding networks that extract local (tooth) and global (jaw) features using mesh and point cloud representations. In addition to conventional metrics like ADD, PA-ADD, CSA, and MErot, we introduce a new metric based on dental arch curves to evaluate whether generated teeth achieve normal occlusion. Experimental results show that our method provides state-of-the-art alignment and satisfactory occlusal relationships. We plan to release the code and dataset for further research.

P1-15

Clinical efficacy of dental lasers on frenulum abnormalities

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Objectives: This study was designed to investigate the effect of using Er: YAG dental laser to treat patients with frenulum abnormalities. Methods: 35 Patients were collected form the Department of Dentistry, Kaohsiung Medical Hospital and all were treated with Er: YAG dental laser over their frenulum abnormality after doctor's diagnosis. All of these patients were data collected on four time points: pre-treatment and post-treatment, two weeks follow up and four weeks follow up. This study used Image J software to utilize for quantitative analysis of wound size changes. Results: The results demonstrated that wounds recovered by 50% within one week and by 98% within four weeks post-treatment. Patients also reported minimal postoperative discomfort, highlighting the laser's advantages over traditional excision methods. Conclusions: The study concludes that the Er:YAG laser offers significant benefits in wound healing and postoperative care, reducing discomfort and improving overall treatment outcomes. Future research should explore broader applications of this technology in dental care to further enhance patient experiences and oral health.

P1-16

Oral health education program of indigenous care attendants at cultural health station

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Objectives: This study aimed to examine the effect of oral health education on care attendants in Taiwan's Indigenous cultural health stations. Methods: The study design was one-group pretest-posttest recruited care attendants in Taiwan's Indigenous cultural health stations. A total of 49 participants completed a 5-hour training course consisting of oral health knowledge and skills for elderly people. Data were collected pre and post test data by self-administered questionnaires, and statistical analyses were performed using paired t-tests and ANOVA in SPSS 29.0. Results: Out of the 49 participants, there were 43 female (87.76%), 21 (42.86%) had a college education or higher, and 40 (81.63%) had more than two years of service. Most of them (N=32, 65.31%) had prior oral hygiene education. After completing post-training, knowledge scores improved, particularly for identifying fluoride levels in toothpaste (63.27% to 93.88%). Also, the pre-test and post-test attitude scores regarding the perception that brushing teeth after meals is time-consuming were statistically significantly influenced by the frequency and duration of education ($p=0.007$; $p=0.010$). Conclusions: The long-term care personnel in aboriginal areas showed oral health knowledge and attitudes, which were significantly improved through oral health education program. Therefore, continued training enhances their capacity to provide effective oral health care and education.

P1-17

Effect of different designs of end bristles of toothbrushes on dentin abrasion - An in vitro study

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Objectives: The prevalence of individuals with gum recession varies between 30% and 90%. Abrasive dentine attrition was observed to be increased by applying greater toothbrushing forces. Nevertheless, this fact is contingent upon the toothbrush bristles' response to the applied force, i.e., the toothbrush bristle properties. This study examined the impact of three distinct bristle tip configurations on dentin attrition under a constant brushing force. Methods: Preparation of 15 toothbrushes of each variety, comprising round-end bristles, floss-tip bristles, and tetra-tip bristles, with three distinct tail-end designs. Forty-five bovine incisors were randomly allocated into three groups (A, B, C, n = 15 each). Each group underwent a brushing regimen consisting of 120 strokes per minute for 3 minutes 7 seconds, utilizing an abrasive slurry with a relative dentin abrasivity (RDA) of 70, while exerting a brushing force of 2.5 N. Abrasive dentin wear was quantified using a stylus profilometer, and the wear for each group was measured, with the mean and standard deviation determined. The Kruskal-Wallis test was employed to assess the differences among the three groups. Results: Maintaining the applied brushing force, the use of floss-tip bristles led to markedly reduced dentin abrasion compared to tetra-tip bristles and round-end bristles. The correlation between bristle configuration and brushing force was statistically significant ($p < 0.001$). Conclusions: Floss-tip bristles minimize abrasion by contacting a smaller region of the teeth during brushing. Floss-tip bristles may be a safer option for individuals, particularly those exhibiting evidence of gingival recession and dentin exposure. The findings may assist dentists and dental hygienists in providing counsel to their patients

Poster List

GROUP: Clinical Research

No.	Topic	Presenter	Institution
P2-01	Prevalence of peri-implantitis after Alveolar Ridge Preservation in molar and non-molar regions.	Yu-Yu Huang	School of Dentistry, College of Dental Medicine, KMU*
P2-02	Prevalence of body dysmorphic disorder and assessment of psychological comorbidities in orthognathic surgery patients	Yu-Chen Cheng	Department of Oral Hygiene, College of Dental Medicine, KMU*
P2-03	Evaluation of scan accuracy using one intraoral scanner on Kennedy Class II Modification I ridge: in vitro study	Wan-Ting Chang	School of Dentistry, College of Dental Medicine, KMU*
P2-04	Oral health-related knowledge, attitudes and behavior associated with gingival health and oral health-related quality of life in dental patients-a example of a dental clinic in southern Taiwan	Yu-Jo Ciou	Department of Oral Hygiene, College of Dental Medicine, KMU*
P2-05	Analysis of dental anomalies and associated factors in permanent dentition using cone-beam computed tomography: medical center in southern Taiwan	Wei-Li Chen	Department of Oral Hygiene, College of Dental Medicine, KMU
P2-06	Efficacy of Health Education Combined with AR Toothbrushing System on Glycemic Control in Patients with Type 2 Diabetes: A Preliminary Analysis	Ji-Xuan Wang Ting-Wei Pan	Department of Oral Hygiene, College of Dental Medicine, KMU*
P2-07	Measurement of Freeway Space at Different Points in Time Via Digital and Traditional Methods	Ya-Ju Chan	Department of Dentistry, KMUH*
P2-08	Comparison of roughness different polishing systems for dental zirconia	Ming-Hung Ko	Department of Dentistry, KMUH*

*KMU (Kaohsiung Medical University)

*KMUH (Kaohsiung Medical University Hospital)

No.	Topic	Presenter	Institution
P2-09	Intraoperative hemorrhage and postoperative sequelae after bilateral vertical ramus osteotomy and genioplasty	Chia-Chuan Wei	Department of Dentistry, KMUH*
P2-10	Automatic vs. manual superimposition: a study on accuracy and clinical reproducibility	Yu-Jing Zhou	Department of Dentistry, KMUH*
P2-11	The association between oral behaviors, appetitive traits, and temporomandibular disorders	Chang-Lin Hsu	Department of Oral Hygiene, College of Dental Medicine, KMU*
P2-12	The roles of Visfatin in human inflammatory Pulp: their relationship in endodontic health and disease	Shu-Hui Ho	School of Dentistry, College of Dental Medicine, KMU*

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P2-01

Prevalence of peri-implantitis after Alveolar Ridge Preservation in molar and non-molar regions

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Objective: Alveolar ridge resorption occurs after tooth extraction. Therefore, alveolar ridge preservation (ARP) will be performed to reduce the loss of alveolar ridge volume. However, alveolar ridge absorption cannot be entirely prevented and may affect subsequent implant placement and even cause peri-implantitis (PI). Apart from that, several factors could influence the development of PI, including smoking, implant characteristics and types of restoration. Nowadays, Implant location is considered to be one of the influencing factors. In this study, we aim to evaluate the prevalence of PI in patients who underwent ARP procedures and also to analyze the possible factors that associated with PI. Methods: This was a retrospective study of 126 patients with 168 implants who had undergone at least one implant treatment with ARP procedure. Of the 168 implants, 46 implants were placed in non-molar sites, and 122 were in the molar region. Using chi-square test, two-sample t-test and generalized estimating equations (GEE) to analyze all data. Results: Most implants are major in the mandible and in the molar site, with the prevalence of PI is 8.9%. The two-sample t-test showed that only the prosthetic connection had a significant difference between PI and non-PI gropps. In the GEE model, gender, age, wider diameter of implant and the tooth extraction due to periodontitis were significantly associated with PI. Conclusion: Implants undergoing ARP procedure had a lower incidence of PI. The use of cement-retained restorations may accelerate the incidence of PI. Gender, age, wider implant diameter and tooth extraction due to periodontitis were the risk factors of PI. However, further research is still needed to complete the evaluation.

P2-02

Prevalence of body dysmorphic disorder and assessment of psychological comorbidities in orthognathic surgery patients

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Objectives: Body dysmorphic disorder (BDD) is under-recognized and underrated among patients undergoing orthognathic surgery. This study aims to estimate the prevalence of BDD in orthognathic surgery patients and to assess the comorbidities of BDD, depression, and anxiety in our patient population. Methods: The subjects were 114 patients who consulted for orthognathic surgery evaluation or were ready for surgery in the Department of Oral and Maxillofacial Surgery at Kaohsiung Medical University Hospital. The prevalence of BDD was screened by the Body Dysmorphic Disorder Questionnaire (BDDQ). Patients were also asked to complete the Yale-Brown Obsessive-Compulsive Scale Modified for Body Dysmorphic Disorder (BDD-YBOCS) to assess obsessive thoughts based on DSM-5 criteria. The Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) were used to assess comorbidities. Results: Among patients who underwent orthognathic surgery, fifteen (13.2%) exhibited tendencies towards BDD. Most patients were female (n=66, 57.9%), had no full-time job (40.4% were students and 16.7% were part-time employees), and had a mean age of 25.7 years (SD=5.60). The majority reported that their primary purpose for surgery was to improve appearance (n=74, 64.9%). A comparison of demographic characteristics and clinical variables revealed no significant differences between BDD-positive and BDD-negative patients, indicating a homogeneous patient population at the hospital. A proportion of patients showed moderate to severe depression (7.9%) and anxiety (8.8%). A stepwise linear regression analysis indicated that anxiety has a more substantial impact on BDD compared to depression (p=0.019). Conclusions: The prevalence of BDD among orthognathic surgery patients is high. Surgeons performing such procedures should be aware of this condition to prevent potential postoperative disputes. Since BDD is associated with depression and anxiety—with anxiety having a more significant impact—patients presenting these symptoms during consultations should be carefully evaluated and referred to mental health specialists when necessary.

P2-03

Evaluation of scan accuracy using one intraoral scanner on Kennedy Class II Modification I ridge: in vitro study

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Objectives: Integration digital technology to create partial removable dental prostheses (PRDP) enhances patient comfort, workflow efficiency, and usability. The effectiveness of intraoral scanners (IOS) in capturing impressions of partially edentulous ridges is contentious. This study aims to develop a partially edentulous model and assess the accuracy of digital impressions using IOS. Methods: Maxillary and mandibular Kennedy Class II Modification I models were fabricated using a 3D printer (NextDent 5100, Soesterberg, Netherlands) with NextDent Model material as study models. The models were scanned with a desktop scanner (3Shape F8, Copenhagen, Denmark) to generate standard tessellation language (STL) files as reference files. Each model was scanned ten times (n=10) using an IOS (Virtuo Vivo, Montreal, Canada) to produce test files. For analysis, the reference and test files were superimposed using CAD software (Exocad, Darmstadt, Germany). The discrepancies between the reference and test files in the rest seat area and the middle of the major connectors were measured to assess the trueness of the IOS. Results: The trueness of the IOS ranged from 0.018 ± 0.012 μm to 0.078 ± 0.021 μm, with precision values ranging from 0.010 ± 0.007 μm to 0.087 ± 0.010 μm. Notable discrepancies were observed at the right canine in the maxillary model and the right premolars in the mandibular model. Conclusions: The findings indicate that the Virtuo Vivo scanner can deliver clinically acceptable results for fabricating PRDPs under Kennedy Class II Modification I conditions, highlighting its potential utility in clinical settings.

P2-04

Oral health-related knowledge, attitudes and behavior associated with gingival health and oral health-related quality of life in dental patients-a example of a dental clinic in southern Taiwan

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Objectives: We aimed to explore the oral health knowledge, attitudes, and behaviors related to gingival health and oral health-related quality of life in dental patients. Methods: A cross-sectional study was conducted to recruit dental patients from February to November 2024 (n=163) at the Southern Taiwan Dental Clinic. We employed questionnaires to assess oral health knowledge, attitudes, behaviors, and oral health-related quality of life, along with a Salivary Testing Instrument (SillHa LH-4912) to evaluate gingival health. Descriptive statistics, including percentages, means, and standard deviations, were used to summarize the basic demographics, oral health knowledge, attitudes, behaviors, oral health-related quality of life, and gingival health. A regression model was utilized to analyze the correlations between dental patients' oral health knowledge, attitudes, behaviors, and gingival health, as well as oral health-related quality of life. Results: Attitudes [β=−1.03, 95% CI (−1.94 to −0.11)] and dental visits [β=−9.90, 95% CI (−18.92 to −0.87)] were significantly negatively correlated with blood values in gingival health indicators. Brushing time showed a significant negative correlation with leukocyte count [β=−9.12, 95% CI (−17.78 to −0.47)]. Additionally, dental visits were significantly negatively correlated with protein levels [β=−9.75, 95% CI (−18.20 to −1.30)]. Conclusion: Oral health attitudes, dental visiting behaviors, and brushing time were negatively correlated with gum health, suggesting that improving dental patients' oral health attitudes and behaviors may positively influence gingival health outcomes.

P2-05

Analysis of dental anomalies and associated factors in permanent dentition using cone-beam computed tomography: medical center in southern Taiwan

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Objectives: Variations in the number, size, morphology, structure and eruptive pattern of the teeth are categorized as dental anomalies. The prevalence of dental anomalies is variable, it depends on the types of the anomalies and the populations studied. This study aimed to evaluate the prevalence of dental anomalies in permanent dentition and associated factors using dental cone-beam computed tomography (CBCT) images. Methods: A total of 247 patients were collected between January 2019 and June 2020 from Kaohsiung Medical University Hospital. Their dental CBCT images and medical histories were reviewed by an endodontist and an oral and maxillofacial radiologist (Kappa = 0.77). Results: The most common dental anomaly is impaction (28.34%), followed by dens invaginatus (10.12%), supernumerary tooth (5.26%), dilaceration (3.64%), microdontia (1.21%), and supernumerary cusp, taurodontism, hypercementosis (0.40%). 10 of the 155 impacted teeth (6.45%) were found coexist with cystic changes. Conclusions: Even though the prevalence of dental anomalies may be underestimated in this study, some of them would be associated with specific dental diseases. Early identification of the risky anomalies should be emphasized to prevent further dental problems.

P2-06

Efficacy of health education combined with AR toothbrushing system on glycemic control in patients with type 2 diabetes: a preliminary analysis

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Objectives: Research indicates a bidirectional relationship between periodontal disease and Type 2 Diabetes Mellitus (T2DM). Effective management of periodontal disease may improve glycemic control and overall health outcomes in T2DM patients. This study evaluates the impact of oral health education combined with AR toothbrush intervention on blood glucose levels in patients with T2DM. Methods: A randomized controlled trial design was employed, randomly assigning T2DM patients to three groups: an AR group (n=2), an AR with Health Consultation group (ARHC) (n=2), and a control group (n=2). The AR and ARHC groups utilized the Pvix AR Oral course software along with optical toothbrushes and interdental brushes to train dental hygiene skills. Continuous Glucose Monitoring (CGM) tracked patients' blood glucose changes at 1 month, 3 months, and 6 months. The ARHC group received additional oral health counseling, while the control group received no intervention. The Fisher's exact test and Kruskal-Wallis test were used to compare intergroup and intragroup differences in average blood glucose levels and time in range (TIR). Results: After 6 months of intervention, average blood glucose levels decreased from baseline in the AR group (−7.0±32.5 mg/dL), ARHC group (−5.0±144.2 mg/dL), and control group (−50.0±19.8 mg/dL). The proportion of TIR increased in all three groups. Conclusion: Preliminary results suggest that AR toothbrush intervention may improve blood glucose control and TIR in T2DM patients. Future studies should increase the sample size for further investigation.

P2-07

Measurement of freeway space at different points in time via digital and traditional method

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Objectives: Determination of vertical dimension (VD) is a necessary step in fabricating full-mouth rehabilitation. Using freeway space (rest RVD – occlusal OVD:2~4mm) is one of the methods to determine vertical dimension, which was affected by the operator, the posture of the patient, measured time, etc. The study aimed to observe the relationship between freeway space and time. Methods: Both the RVD and OVD were conducted on 12 subjects comprising eight females and four males in the age range of 22–26 years who met the inclusion criteria were recruited. Measurements were taken for participants using two different measurement techniques: traditional measurements with an electronic vernier caliper and digital measurements with a facial scanner (Accu 3D Scan). Measurements were taken at various time intervals (T0=0 min, T1=1 min, T3=3 mins, T7=7 mins). The data was analyzed, and the histogram was used to show the results of the two different methods. Exploring the application of facial scanning in dental clinical practice. Results: The findings revealed that the values of Rest VD and Occlusal VD obtained digitally were significantly higher than the traditional measurements ($P<0.05$). Specifically, traditional measurements are recommended at T0–T1 due to predictable relationships, while digital measurements are best conducted within T0–T3, as both intervals show positive correlations. Average values increase at T0–T1 and decrease at T1–T3. Conclusion: The measurement of freeway space is influenced by time factors, and the results may vary depending on the measurement method. Therefore, traditional measurements are ideal in clinical practice at T0–T1, while digital methods are reliable within T0–T3. Timely measurement is crucial for consistent results.

P2-08

Comparison of roughness different polishing systems for dental zirconia

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Objective: Yttrium-stabilized tetragonal zirconia polycrystal (Y-TZP) is widely used in dental procedures due to its superior physical properties and biocompatibility. Highly polished Y-TZP enhances aesthetics, reduces wear on opposing teeth, and minimizes bacterial adhesion. However, guidelines for Y-TZP polishing are lacking. This study aimed to compare the surface roughness (Ra, μm) of Y-TZP polished using three commercial systems (Meisinger, Komet, Shofu) and polishing paste. Materials and Methods: Thirty Y-TZP specimens (10×10×2 mm^3) were uniformly ground and polished at 15,000 RPM with Meisinger, Komet, or Shofu systems following manufacturers' recommendations. Half of the specimens were further polished using a paste with a goat hair brush. Surface roughness was measured at six locations per specimen using a surface roughness tester (SJ-301, Mitutoyo, Japan). Statistical analyses included t-tests, ANOVA, and Tukey's post hoc test. Results: The Meisinger group achieved the lowest roughness (0.592±0.165 μm), followed by Komet (0.649±0.198 μm) and Shofu (0.801±0.186 μm). Polishing paste reduced Ra values further to 0.452±0.113 μm (Meisinger), 0.527±0.171 μm (Komet), and 0.703±0.146 μm (Shofu). Statistical differences were observed among groups ($P < 0.001$), with Shofu showing significantly higher roughness. Meisinger and Komet showed no significant difference ($P = 0.09$). Conclusion: Meisinger demonstrated superior performance, likely due to its use of green stone for initial smoothing. Polishing paste significantly enhanced surface smoothness, highlighting its importance in Y-TZP polishing.

P2-09

Intraoperative hemorrhage and postoperative sequelae after bilateral vertical ramus osteotomy and genioplasty

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Orthognathic surgery, which includes several procedures of varying complexity requiring high surgical skill, demands that surgeons consider multiple variables, such as the patient's overall physical condition, operating time, intraoperative hemorrhage, postoperative pain, and potential postoperative sequelae and complications. Not only are surgeons cautious about intraoperative hemorrhage and subsequent transfusion, patients are also concerned and may question the safety and risks of blood transfusion. Sagittal split ramus osteotomy (SSRO) and intraoral vertical ramus osteotomy (IVRO) being among the most popular of the current techniques. In our study, we aim to investigate the intraoperative hemorrhage and postoperative sequelae occurring in patients who undergo IVRO with or without genioplasty to treat mandibular prognathism. We also analyze the amount of blood loss of the patient under intentional hypotensive anesthesia recently compared with the cases in decade.

P2-10

Automatic vs. manual superimposition: a study on accuracy and clinical reproducibility

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Objectives: This study aimed to compare the efficiency and reproducibility of automatic and manual superimposition of 3D intraoral scan files and study models scanned with a desktop scanner for clinical applications. Methods: Three patients (A, B, C) underwent simultaneous impressions using an intraoral scanner and traditional impression materials, which were subsequently poured into study models. The study models were scanned into STL files using a desktop scanner. Automatic superimposition was conducted using Medit, and manual superimposition was performed with exocad software. Maximum deviation values for the buccal, lingual, and occlusal surfaces of the left and right canines and second molars were calculated using deviation display modes in the respective software. Results: The comparison between automatic and manual superimposition methods revealed that both approaches introduced errors. However, automatic superimposition resulted in significantly larger deviations on the buccal-lingual and occlusal surfaces compared to the manual method ($P < 0.05$). The buccal-lingual deviation values for the four teeth were: 33 (1.139 ± 0.404 mm), 37 (0.797 ± 0.598 mm), 43 (1.090 ± 0.807 mm), and 47 (1.243 ± 0.644 mm). The occlusal deviation values were: 33 (0.582 ± 0.717 mm), 37 (0.230 ± 0.028 mm), 43 (0.287 ± 0.317 mm), and 47 (0.796 ± 0.715 mm). Among all teeth, tooth 47 exhibited the largest deviations for both buccal-lingual and occlusal measurements. These findings highlight the greater instability and reduced precision of automatic superimposition compared to the manual method. Conclusions: While automatic superimposition significantly reduces measurement time and captures all required values, it exhibits greater instability and reduced reliability compared to manual methods. These findings emphasize the need for further refinement in automatic alignment algorithms for consistent clinical application.

P2-11

The association between oral behaviors, appetitive traits, and temporomandibular disorders

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Objectives: Oral behaviors have been suggested as risk factors of temporomandibular disorders (TMDs); however, the appetitive traits of TMD patients have not been explored. The aim of this study is to investigate the association between oral behaviors, appetitive traits, and TMDs. Methods: Our case-control study included 178 TMD patients and 163 controls. Participants completed structured questionnaires that included the Chinese version of the Oral Behavior Checklist and the Adult Eating Behavior Questionnaire. The questionnaires assessed daily oral behaviors and eight categories of appetitive traits: enjoyment of food, emotional overeating, emotional undereating, food fussiness, food responsiveness, slowness in eating, hunger, and satiety responsiveness. Stepwise logistic regression analysis was performed to estimate odds ratios for TMDs. Results: The case group had a significantly lower mean age (35.12±13.16) and a higher proportion of females (73.6%) compared to the control group (43.11±15.91 and 62.6%, respectively). Univariate analyses revealed that several oral habits and appetitive traits showed statistically significant differences between groups. Binary logistic regression analysis revealed that “clenching teeth together during waking hours” (aOR = 1.61, 95% CI = 1.170 - 2.203), “holding tight or tensing muscles without clenching or bringing teeth together” (aOR = 2.03, 95% CI = 1.476 - 2.283), “place tongue between teeth” (aOR = 0.70, 95 % CI = 0.505 – 0.969), and “chew food on one side only” (aOR = 1.31, 95 % CI = 1.021 – 1.669) were associated with TMDs. Additionally, the probability of developing TMD will decrease by 3.3% for each one-year increase in age. Conclusions: This study found strong associations between oral behaviors and TMDs, consistent with prior research. However, appetite traits were not found to be risk factors for TMDs. Future studies may focus on exploring the association between TMD subtypes and oral behaviors.

P2-12

The roles of Visfatin in human inflammatory Pulp: their relationship in endodontic health and disease

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Objectives: To investigate the association between visfatin expression and pulp health. Methods: Pulp tissue samples were obtained from both healthy (n=21) and diseased (n=18) groups. The intensity and distribution of visfatin signaling were evaluated using immunohistochemistry. Results: Visfatin intensity was significantly elevated in the diseased group and demonstrated a positive correlation with pain levels. Conclusions: These findings suggest that visfatin is implicated in pulp inflammation and pain, highlighting its potential role in the pathophysiology of pulp disease.

Poster List

GROUP: Case Report

No.	Topic	Presenter	Institution
P3-01	A case of adenoid ameloblastoma in maxilla	Yu-Min Lin	School of Dentistry, College of Dental Medicine, KMU*
P3-02	A case of skeletal class III malocclusion managed with camouflage treatment	Tin-Jia Hsu	Department of Dentistry, KMUH*
P3-03	Orthodontic treatment combine temporary anchorage device (TADs) of skeletal Class I jaw relation with deep overbite - A case report	Pei-Huan Tsai	Department of Dentistry, KMUH*
P3-04	A case with large overjet and deep bite treated by orthodontic treatment combine temporary anchorage devices	Jia-Wen Lu	Department of Dentistry, KMUH*
P3-05	Surgery-first treatment combined with orthodontic treatment of skeletal class III malocclusion – case report	Li-Yun Lin	School of Dentistry, College of Dental Medicine, KMU*
P3-06	A case of Skeletal Class II Jaw Relation treated with orthodontic treatment and orthognathic surgery	Kuan-Ying Huang	School of Dentistry, College of Dental Medicine, KMU*

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P3-01

A case of adenoid ameloblastoma in maxilla

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Ameloblastoma is a benign but locally aggressive odontogenic tumor originating from odontogenic epithelial rests of dental lamina and enamel organ. Traditionally, ameloblastoma is classified into three types, including conventional ameloblastoma, unicystic amaeloblastoma, and peripheral ameloblastoma. Adenoid ameloblastoma (AA) was recently introduced in the 2024 WHO classification of odontogenic lesions, representing the sole novel entity included in this update. This tumor is molecularly distinct from conventional ameloblastoma, characterized by the absence of BRAF mutations and the presence of a CTNNB1 mutation. Clinically, AA manifests similarly to other ameloblastoma variants, with patients typically presenting with a painless, slow-growing swelling of the jaw. However, AA demonstrates more aggressive behavior, including a higher recurrence rate and greater local invasiveness. A review of the English literature from 1959 to 2018 revealed that AA has been rarely reported, with only 38 cases documented globally to date. In this report, we present a case of adenoid ameloblastoma in a 28-year-old female who presented with a painless swelling in the posterior maxilla. Radiographic imaging revealed cortical destruction and tumor invasion into the maxillary sinus. The lesion was surgically excised, and no evidence of recurrence was observed during a two-year follow-up period.

P3-02

A case of skeletal class III malocclusion managed with camouflage treatment

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Introduction: Skeletal Class III malocclusion is one of the challenging problems encountered with orthodontist. It is characterized by an anteroposterior discrepancy between maxilla and the mandible which orthognathic surgery is often brought to as treatment option in severe skeletal discrepancy. However, mild class III malocclusion with acceptable facial profile can benefit from camouflage treatment: a compensatory orthodontic treatment that involves displacing teeth relative to their supporting bone to mask for an underlying jaw discrepancy. This clinical report presents a case of skeletal class III malocclusion managed with camouflage treatment. Treatment overview: A 22-year-old adult female patient sought treatment of difficulty of cutting food with front teeth and protrusive chin. Clinical examinations revealed a mild skeletal class III malocclusion with straight profile. The patient choose camouflage orthodontic treatment after treatment plan explanation. Treatment protocols included class III elastics with posterior bite raiser were used to correct anterior crossbite. Results: After 27 months of treatment, the anterior crossbite was corrected and harmonious esthetics and stable occlusion were achieved. Conclusion: For mild-to-moderate skeletal Class III malocclusions, various camouflage treatment protocols have been proposed to improve functional occlusion and esthetics without surgical intervention. In this case, we applied camouflage treatment with class III elastics and posterior bite raiser, and achieved an ideal treatment outcome. Camouflage treatment could be an effective alternative to mask underlying jaw discrepancy.

P3-03

Orthodontic treatment combine temporary anchorage device (TADs) of skeletal Class I jaw relation with deep overbite - a case report

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Deepbite, crowding are often seen in patients with Class I jaw relation and malocclusion. Sometimes, it is challenging to address these issues orthodontically without extractions. However, when circumstances permit, whole arch distalization using temporary anchorage devices (TADs) can be an effective treatment option. This clinical report presents a case of skeletal Class I jaw relationship with deepbite and crowding, treated by orthodontic fixed appliance and maxillary TADs. Diagnosis: Skeletal Class I jaw relation and Angle's Class I malocclusion with deep overbite. Treatment Overview: A 18-year-old adult female patient with chief complaints of upper anterior crooked teeth came to our OPD for evaluation. Extra-oral examinations revealed a straight lateral profile. Non-extraction orthodontic treatment is selected after discussion with the patient and her family. Full-mouth fixed appliances were bonded and bilateral IZC screws were placed at 10th month. After 32 months of treatment, the treatment goal was achieved. Conclusion: To achieve proper dental relationship, stable occlusion, and harmonious facial profile, orthodontic treatment along with temporary anchorage device were selected. With the aids of mini screws as temporary anchorage devices, the required space can be regained to a desired amount without the need for extraction. This advancement significantly expands the range of non-extraction orthodontic treatments available compared to previous methods. After further post-treatment follow-up, the treatment result was stable, and any relapse was insignificant, demonstrating the long-term effectiveness of the approach. Regular maintenance visits ensured the patient's occlusion and facial profile remained optimal.

P3-04

A case with large overjet and deep bite treated by orthodontic treatment combine temporary anchorage devices

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Introduction: Convex profile due to protrusive teeth is a common esthetic concern which often affects self-esteem for patients. Protrusive and proclined upper incisors may accompany large overjet which also increases the risk of dental trauma. While deep bite may not be most patient's chief complaint, impinging deep bite may cause damage in periodontium on palatal surface of the incisors if left untreated. This case presents how large overjet and deep bite is treated with orthodontic treatment with TADs. Diagnosis: Skeletal Class I jaw relation, Angle's Class III malocclusion 32, 42 missing teeth. Treatment Overview: An 18 years old male patient asked for orthodontic treatment because of protrusive lips and dentition. Extra-oral examinations revealed a hypodivergent facial pattern and convex lateral profile. Alignment and leveling of teeth were carried out following extraction of maxillary first premolars. Mini-screws were used for anchorage control and torque control to correct proclined upper incisors. After 36 months of treatment, the patient has harmonious facial profile and ideal occlusion. Conclusion: Extraction of upper bicuspids has been a common treatment to correct large overjet. However, bowing effect often inevitably happens while doing anterior retraction with fixed appliances. In this case, ANS screw was inserted to avoid this situation. We effectively achieved the goal of torque and bite control with the use of TADs.

P3-05

Surgery-first treatment combined with orthodontic treatment of skeletal class III malocclusion – case report

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Introduction: This case report demonstrated treatment of a patient with skeletal class III malocclusion . A "surgery-first" orthognathic approach combined with orthodontic treatment were used. Diagnosis: The patient was diagnosed as having a skeletal Class III jaw discrepancy with facial asymmetry that was attributed to a retrognathic maxilla and a prognathic The patient was diagnosed as having a skeletal Class III jaw discrepancy with facial asymmetry that was attributed to a retrognathic maxilla and a prognathic The 17-year-old female visited our orthodontic department with chief complaint of protrusive chin. Pretreatment examination showed anterior crossbite, class III molar relation and concave profile. The lateral cephalometric analysis indicated a skeletal Class III pattern with mandibular prognathism. Treatment overview: The patient was bonded with fixed edgewise appliances(.022 OPAK system) two weeks before OgS with placement of passive wire on both arches. The surgical plan was to perform one-jaw surgery, bilateral intraoral vertical ramus osteotomy setback with genioplasty. After release of the intermaxillary fixation, the patient came back regularly for orthodontic adjustment. The treatment is finished after 24 months, and the patient was delivered with fixed retainers and upper wrap-around retainer. Discussion: Surgical first approach provides several positive aspects like immediate improvement of facial appearance and reduced total treatment time. However, some negative aspects were showed, such as an unstable occlusion only surgical treatment. Undergoing surgical first approach with orthodontic treatment after surgery, an esthetic outcome and occlusal function were improved in this case.

P3-06

A case of Skeletal Class II Jaw Relation treated with orthodontic treatment and orthognathic surgery

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Introduction: Skeletal Class II jaw relation accompanied by protrusive teeth can be treated by a combination of maxillary and mandibular surgeries, maxillary surgery alone, or by mandible surgery solely depending on the underlying skeletal discrepancy. This clinical report presents a case of skeletal Class II jaw relation and protrusive teeth treated by orthodontic treatment combined with orthognathic surgery. Diagnosis: Skeletal Class II jaw relation with mandibular retrognathism Angle's Class II div. l, subdivision left. Treatment Overview: A 35-year-old female patient sought treatment for protrusive teeth and insufficient chin. Clinical examinations showed a convex profile and protrusive teeth and lips. Orthodontic treatment combined with orthognathic surgery was performed after discussion with the patient. Presurgical orthodontic treatment corrected lower anterior crowding problems, followed by 3-piece Le-fort I surgery, bilateral maxillary first premolars extraction, and genioplasty correcting chin deficiency. Postsurgical orthodontic treatment consolidated residual spaces and created proper space for dental substitutes. After 25 months of treatment, harmonious esthetics and ideal occlusion are achieved. Conclusion: Class II malocclusions require careful diagnosis and treatment planning for a successful outcome. Identifying the etiology of a patient's protrusive teeth and unsatisfying profile plays a significant role. A combination of orthodontic treatment and orthognathic surgery could be regarded as an effective method for patients with protrusive teeth and skeletal discrepancies.

Poster List

GROUP: The Achievement Exhibition of Resident Training in Dental Department

No.	Topic	Presenter	Institution
P4-01	Evaluation of trueness in digital impressions for Kennedy Class III arches: a comparative study of Primescan and 3 Shape Trios 4	Yun-Chu Lai	Department of Dentistry, KMUH*
P4-02	A case series of endodontic management of C-shaped canal in mandibular second molars	I-Ching Lin	Department of Dentistry, KMUH*
P4-03	Pre-orthodontic composite resin restoration of an unilateral peg-shaped lateral incisor: a case report	Wei Fang	Department of Dentistry, KMUH*
P4-04	Effect of tool wear on the cutting quality of PMMA crowns: a comparative study	Chu-Chun Hsiao	Department of Dentistry, KMUH*
P4-05	The analysis of surface roughness changes in PMMA produced by different manufacturing processes during the three-step staining procedure	Lu Chou	Department of Dentistry, KMUH*

*KMUH (Kaohsiung Medical University Hospital)

P4-01

Evaluation of trueness in digital impressions for Kennedy Class III arches: a comparative study of Primescan and 3 Shape Trios 4

▲Yun-Chu Lai[1], Ting-Hsun Lan[1,2]

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Objective: This study aimed to evaluate the trueness of two intraoral scanners (IOS)—Primescan and 3Shape Trios 4—for fabricating Kennedy Class III denture framework using a standardized digital workflow. Both maxillary and mandibular arches were investigated to assess the scanners' reliability and accuracy. Methods: Standardized Kennedy Class III models for maxillary and mandibular arches were scanned using a high-precision desktop scanner to generate reference Standard Tessellation Language (STL) files. Primescan and Trios 4 were used to perform 10 scans per arch, following identical scanning protocols, resulting in 20 scans per scanner. The STL files were superimposed with the reference files and analyzed for deviations at key points, including framework design and major connectors. Statistical analyses were conducted using independent and paired sample t-tests, with Tukey's post hoc tests for multiple comparisons. Results: For maxillary arches, mean deviations were 0.031 ± 0.023 mm (Primescan) and 0.038 ± 0.03 mm (Trios 4), with no significant difference between scanners ($P = 0.095$). For mandibular arches, Primescan achieved a mean deviation of 0.012 mm, significantly outperforming Trios 4, which exhibited deviations of 0.024 ± 0.017 mm ($P < 0.05$). Deviation maps highlighted Primescan's superior consistency in mandibular scans, while both scanners showed comparable accuracy for maxillary impressions. Conclusions: Both Primescan and Trios 4 demonstrated clinically acceptable trueness for digital impressions of Kennedy Class III arches. Primescan exhibited superior accuracy for mandibular scans, while both scanners performed similarly for maxillary scans. These results support the integration of digital workflows for precise denture framework fabrication in clinical practice.

P4-02

A case series of endodontic management of C-shaped canal in mandibular second molars

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Objectives: The root canal configuration of C-shaped canals is complicated. The aim of this report is to discuss the treatment of a C-shaped root canal in the mandibular second molar of Taiwanese people. Case Reports: Case 1: A 47-year-old male underwent endodontics treatment of his right mandibular second molar due to spontaneous pain and lingering pain for 1 week. Case 2: A 38-year-old female underwent endodontics treatment of her right mandibular second molar due to large decay with pulp involved. Discussion: Cleaning and shaping seem to be challenging due to the complicated root configuration of C-shaped canals. Irrigation with sonic or ultrasonic devices is recommended. Meanwhile, intracanal medication for disinfection cannot be overemphasized. Conclusion: The complicated root canal configuration of C-shaped canals makes treating endodontics more challenging. Advanced irrigation and intracanal medication for disinfection help manage such anomalous canal configurations.

P4-03

Pre-orthodontic composite resin restoration of a unilateral peg-shaped lateral incisor: a case report

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Objectives: Peg-shaped lateral incisors are a common congenital developmental anomaly of permanent teeth. Changes in shape and size can often lead to negative impacts on aesthetics and occlusion. Treatment methods typically involve restoration with composite resin, crowns, or ceramic veneers, often accompanied by orthodontic intervention. This report addressed a case of Class I malocclusion with excessive interdental spacing, with the treatment of restoring the shape of a unilateral peg-shaped lateral incisor before orthodontic treatment to reduce the complexity of subsequent orthodontic procedures. Case Report: The patient was a 46-year-old male who sought orthodontic evaluation due to loss of lower right first molar and malocclusion. His upper right lateral incisor was a unilateral peg-shaped tooth, and both the mesial and distal sides had significant interdental spacing. After the assessment, a composite resin restoration was performed on the upper right peg-shaped lateral incisor, referencing the left lateral incisor, to achieve an appropriate size and shape, thereby enhancing temporary aesthetics and facilitating subsequent orthodontic treatment. Discussions: The composite resin restoration improved overall aesthetics and significantly reduced the complexity of arch alignment during orthodontic treatment after the attachment of orthodontic appliances. Conclusions: When there is sufficient space in the dental arch for restoration, resin restoration prior to orthodontics can greatly reduce the difficulty of subsequent space adjustments and enhance the patient's perception of aesthetics during the treatment process.

P4-04

Effect of tool wear on the cutting quality of PMMA crowns: a comparative study

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Objectives: This study aimed to evaluate the impact of tool wear on the cutting quality of dental restorations, specifically single crowns made of PMMA, by comparing cutting integrity and fit accuracy using new and progressively worn cutting tools. Methods: Twenty maxillary molar single crowns were fabricated under four tool conditions: brand new (N=5), 25%-worn (N=5), 50%-worn (N=5), and 76%-worn(N=5) cutting tools. Cutting integrity was assessed via optic microscope and crown fit accuracy was assessed using a coordinate measuring machine. Marginal discrepancies were measured using the triple-scan method with specialized software. Evaluation criteria included margin integrity and the precision of fit on a standard dental model. Results: All crowns with intact crown morphology. Marginal discrepancy values differed significantly between crowns fabricated with new and worn toolsx. Discrepancies were 0.392 ± 0.076 mm for new tools, 0.788 ± 0.16 mm for 25%-worn tools, 0.543 ± 0.121 mm for 50%-worn tools, and 0.714 ± 0.084 mm for 76%-worn tools. Crowns fabricated with new tools exhibited superior fit accuracy compared to those produced with worn tools. Conclusions: Crowns milled with new tungsten carbide burs demonstrated lower marginal discrepancies and better fit accuracy compared to those fabricated with worn tools. These findings underscore the importance of maintaining cutting tool quality to ensure optimal dental restoration outcomes.

P4-05

The analysis of surface roughness changes in PMMA produced by different manufacturing processes during the three-step staining procedure

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Objectives. The study was to investigate the changes of surface roughness during these three coloring stage in PMMA materials produced different techniques: 3D printing, milling, and auto-polymerization. Material and methods. Five milled square shaped specimens (10mm in width and 3mm in thickness) were fabricated with a 5-axis dental milling machine (SYI-DN, Marketech lnternational Corp. U.S.A) from polymethyl methacrylate(PMMA) discs (PMMA Disk; Yamahachi Dental Co., Japan & Telio®CAD). FIve 3D-printed square shaped specimens were fabricated with a digital light processing 3D printer XL4K (Phrozen Technology, Hsinchu, Taiwan) and light-polymerizing resin (AA Temp, Enlighten Materials, Taipei, Taiwan). Five auto-polymerized PMMA (Tokuso CureFast, Tokuyama, Tokyo, Japan) were fabricated under manufacturer instructions with putty (Aquasil putty, Dentsply Sirona U.S.A) molds. The surface roughness (Ra) values (μm) were evaluated by a profilometer (Mitutoyo Surftest SJ-310, Tokyo, Japan). Six tracings at different locations on each specimen were made. Each tracing was measured for 2 times. A three-step surface coloring process was applied in manufacturer's order of Clear, C plus, and Clear HV using the OPTIGLAZE color (OPRTIGLAZETM color, GC, America). Results. For milled group, the mean surface roughness (Ra) before coloring was 0.69±0.32μm, which changed to 0.71±0.42μm after Clear layer, 0.43±0.12μm after the second C plus layer and 0.39±0.14μm after the final Clear HV layer. For auto-polymerized group, the mean Ra before coloring was 2.564±0.71μm, which changed to 2.13±0.52μm after Clear layer, 0.77±0.49μm after C plus layer, and 0.71±0.10μm after the Clear HV layer. For 3D-printed group, the mean surface Ra before coloring was 1.3±0.36μm, which changed to 0.69±0.19μm after first, 0.52±0.22μm the second, and 0.44±0.09μm the final layer. Conclusions: In the present study, OPTIGLAZE color provide smooth surface for PMMA made of different techniques. The milled and 3D-printed group showed smoothest surface before and after OPTIGLAZE color application and may provide better mechanical properties.

Oral Presentation List

GROUP: Oral Biology＆Oral Hygiene

No.	Topic	Presenter	Institution
Oral-01	AI intervention on protection motivation, self-care behaviors, periodontal status and quality of life in patients with periodontitis: a randomized control trial	You-Jie Hu	Department of Oral Hygiene, College of Dental Medicine, KMU*
Oral-02	The Correlation between Craniofacial structure and collapse of upper airways in OSA patients	Po-Ting Chen	School of Dentistry, College of Dental Medicine, KMU*
Oral-03	A survey of students needs and feedback on EMI learning in a college of dental medicine	Wan-Ching Lin Wei-Hsuan Chiu	Department of Oral Hygiene, College of Dental Medicine, KMU*
Oral-04	Investigating the relationship between dry needling treatment and bite force balance in patients with temporomandibular disorder	Yuan Chen Hsiu-Chen Lin An-Chieh Tsai	Department of Oral Hygiene, College of Dental Medicine, KMU*
Oral-05	Sources of stress among oral hygiene students: a preliminary study	Han-Yu Xie Xiang-En Sun	Department of Oral Hygiene, College of Dental Medicine, KMU*

*KMU (Kaohsiung Medical University)

GROUP: Dental Clinic

No.	Topic	Presenter	Institution
Oral-06	Effects of different mandibular setback amounts on condylar position changes after intraoral vertical ramus split osteotomy Osteotomy	Shan-Wei Chang	School of Dentistry, College of Dental Medicine, KMU*

*KMU (Kaohsiung Medical University)

Oral-01

AI intervention on protection motivation, self-care behaviors, periodontal status and quality of life in patients with periodontitis: a randomized control trial

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Objective: Motivation is crucial for patients with periodontitis to enhance their oral hygiene. We utilized an AI dental monitoring (DM) platform to monitor and deliver health messages, stimulating protection motivation (PM) and promoting changes in self-care behaviors. This study aimed to evaluate the effectiveness of the AI intervention on PM, self-care behaviors, periodontal status, and oral health-related quality of life (OHRQoL) for patients with periodontitis. Methods: Patients with periodontitis were randomly assigned to either an AI group (AI group, n = 32), an AI and health counseling group (AIHC group, n = 33), or a control group (n = 33). All patients underwent nonsurgical periodontal treatment. Patients in the AI and AIHC groups underwent additional AI-assisted DM and AI-assisted DM with oral health counseling, respectively, for 3 months. Data on OHRQoL, periodontal measures, self-care behavior, dental plaque control, and PM were collected at baseline and follow-ups. Result: At 3 months of follow-up, the AI and AIHC groups exhibited a significantly greater reduction in probing pocket depth (mean diff: −0.4 and −0.6) and clinical attachment level (mean diff: −0.4 and −0.5) compared with the control group. At 6 months of follow-up, the AIHC groups exhibited a significantly greater improvement in OHRQoL (mean diff: −6.5) compared with the control group. At 6 months of follow-up, the AI and AIHC groups exhibited a significantly greater improvement in self-care behavior (mean diff: 1.1 and 0.9) and coping appraisal of PM (mean diff: 0.1 and 0.2), along with a greater reduction in plaque index (mean difference: −14.6 and −24.0) than the control group. Conclusion: AI-assisted DM effectively improved periodontal status, self-care behavior, dental plaque control, PM, and long-term OHRQoL in patients with periodontitis.

Oral-02

The Correlation between Craniofacial structure and collapse of upper airways in OSA patients

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Objective: This study examined the relationship between craniofacial skeletal anatomy, airway dimensions, and pharyngeal collapse severity in drug-induced sleep endoscopy (DISE) among obstructive sleep apnea (OSA) patients. We hypothesized that skeletal deficiencies and reduced airway dimensions correlate with increased collapsibility. Materials and Methods: A retrospective study was conducted on 30 OSA patients (August 1, 2018 – July 1, 2024). Cone-beam computed tomography (CBCT) and polysomnography (PSG) measurements were analyzed. One-way ANOVA was used to assess differences in DISE collapse severity among craniofacial and airway measurements, while Spearman's correlation analyzed relationships between airway dimensions and AHI. Results: At the velum level, lateral collapse had a longer anteroposterior (AP) airway dimension than AP collapse (8.94 ± 3.77 mm vs. 4.39 ± 2.80 mm, $p < 0.01$). Concentric collapse had a larger airway area than AP collapse (383.49 ± 126.33 mm^2 vs. 228.35 ± 138.59 mm^2, $p < 0.05$). Severe collapse was associated with reduced palatal width ($F = 7.838$, $p < 0.01$) and smaller retropalatal AP length/area ($F = 4.408$, $p < 0.05$; $F = 6.602$, $p < 0.01$). At the epiglottis level, mandibular molar basal bone width was smaller in severe cases ($F = 3.608$, $p < 0.05$). Hyoid position positively correlated with AHI ($r = 0.426$, $p < 0.05$), while airway dimensions (PP airway area, retropalatal narrowest airway area) were negatively correlated. Conclusion: Airway narrowing, reduced transverse skeletal dimensions, and hyoid descent are associated with increased airway collapsibility and OSA severity, highlighting the craniofacial structure's role in airway obstruction.

Oral-03

A survey of students needs and feedback on EMI learning in a college of dental medicine

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Objectives: In 2023, the College of Dental Medicine introduced English-medium instruction (EMI) courses. This study conducted a questionnaire survey to explore students' perspectives, willingness to enroll, and specific needs toward EMI to provide actionable feedback to enhance course design and optimize resource allocation. Methods: This cross-sectional study employed a self-designed questionnaire addressing six domains: cognition and willingness, competency, attitude, stress, and needs. Each domain included 8-12 items rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Independent sample t-tests were used to compare perceptions between dentistry and oral hygiene students. Results: A total of 92 valid responses were collected, comprising 50 from dentistry students and 42 from oral hygiene students. Average scores across the six domains ranged from 3.03 to 4.00, with the "Needs" factor receiving the highest score (4.00) and the "Competency" factor the lowest (3.03). No significant differences were found between the two groups in the "Needs" factor. However, dentistry students scored significantly higher in "Cognition and Willingness" (3.96 vs. 3.31) and "Competency" (3.32 vs. 2.64) compared to oral hygiene students ($p < 0.05$). Conclusions: Students in the College of Dental Medicine generally acknowledged the value of EMI courses and demonstrated a strong demand, particularly for faculty training and teaching assistant (TA) support. These findings provide valuable insights for refining curriculum design and resource distribution, ultimately improving the effectiveness of EMI courses and enhancing students' learning experiences.

Oral-04

Investigating the relationship between dry needling treatment and bite force balance in patients with temporomandibular disorder

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Objective: Temporomandibular disorders (TMD) encompass multiple clinical syndromes involving the temporomandibular joint, masseter muscles, and other related orofacial structures. These disorders are often associated with pain and discomfort with masticatory muscles and it considered in one of a factor influencing patients' bite force. Dry needling (DN) is a commonly used treatment for TMD patients, known for its ability to relieve pain and dysfunction. This study aims to investigate whether the bite force of TMD patients improves after DN treatment. Methods: In observational study involved 12 patients from the Department of Dentistry at Kaohsiung Medical University Chung-Ho Memorial Hospital and who suffered TMD and scheduled for DN treatment, included in this study. Bite force was measured before and after DN treatment on the same clinic day. Data collection includes chart reviews. Descriptive statistics presented as median and quantile, and a Wilcoxon Signed Rank test used to analyze the bite force index. Results: The difference in masticatory force between the right and left sides was 53.7 N (median), with a range from 28.85 to 75.63 before dry needling (DN) treatment, and 24.85 N, with a range from 4.25 to 49.88 after DN treatment. The difference in bite force between the left and right sides showed a statistically significant change before and after DN treatment (p-value=0.0225). Conclusion: This study found that dry needling treatment reduces the difference in bite force between the left and right sides.

Oral-05

Sources of stress among oral hygiene students: a preliminary study

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Objectives: Oral hygiene students face multiple sources of stress that can affect their academic performance. In the context of oral hygiene education, information about these stressors is still scarce. These stressors may originate from heavy coursework, clinical practice demands, or other personal factors. This study aims to understand and identify the sources of stress that oral hygiene students at Kaohsiung Medical University experience during their studies. This survey is a cross-sectional study. The sources of stress include 30 questions related to "academic factors", "educational environment factors," and "family/personal factors." Non-parametric tests were used to evaluate significance, and the top three items with the highest scores were further analyzed. Results: The top three sources of stress based on average scores are " The number of written assignments/reports (3.77±1.15)", "Exams and grades(3.77±0.97)", "Considering whether oral hygiene is an appropriate career choice (3.91±0.68)". In comparing gender and total stress scores, the item "considering whether oral hygiene is an appropriate career choice" showed significant differences (p=0.023). In the descriptive statistics for each category, the average total scores were: 3.31 for academic factors, 2.77 for educational environment factors, and 2.37 for family/personal factors. Conclusions: The primary sources of stress for oral hygiene students are academic factors, with the highest average score being for "considering whether oral hygiene is an appropriate career choice," which showed significant gender differences. This indicates that students place great importance on their future career prospects in the field of oral hygiene, with females experiencing higher levels of stress compared to males.

Oral-06

Effects of different mandibular setback amounts on condylar position changes after intraoral vertical ramus split osteotomy

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Objectives: This study aims to investigate, using cone-beam computed tomography (CBCT) images, whether the condylar position and angulation changes in skeletal Class III adult patients after mandibular setback with bilateral intraoral vertical ramus osteotomy (IVRO) are influenced by the amount of mandibular setback. Methods: This study selected 34 skeletal Class III adult samples from the CBCT database of the Dental Department at Kaohsiung Medical University Hospital. Measurements were taken at three-time points: pre-orthognathic surgery (T1), within one week after orthognathic surgery (T2), and more than six months after surgery (T3). The measurements included the geometric positions of the most superior and posterior points of the bilateral condyles, the bilateral mental foramina, and the axial angulation of the condyles. The samples were divided into two groups based on the amount of mandibular setback: greater than 10 mm and less than 10 mm. Independent sample t-tests were used to compare changes in condylar measurements between T1-T2, T2-T3, and T1-T3. Results: The condylar changes between different time points (T1-T2, T2-T3, and T1-T3) showed no significant differences between the two groups, and the condylar axial angulation also exhibited no significant variation. Conclusions: These results indicate that the amount of mandibular setback achieved through IVRO does not have a significant impact on condylar position. The IVRO procedure may be advantageous for achieving substantial mandibular setbacks without causing notable changes in condylar position.

高雄醫學大學 Kaohsiung Medical University | 口腔醫學院

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