International Collaborative Symposium on
Development of Human Resources in Practical Oral Health and Treatment

PROGRAM BOOK

May 31 – June 1, 2024
Pullman Bangkok King Power Hotel
Bangkok, Thailand

Welcome to International Collaborative Symposium 2024

We are honored to host the International Collaborative Symposium on the Development of Human Resources in Practical Oral Health and Treatment in Bangkok, Thailand, from May 31 to June 1, 2024.

As globalization progresses, the Japanese government encourages us to cultivate a younger generation with a global mindset. Therefore, the Faculty of Dentistry at Niigata University has been actively committed to creating international networks at both student and faculty levels. Over the past decade, our dental school has organized International Collaborative Symposium annually, in collaboration with dental schools in Asian countries, focusing on recent advances in dental research.

This year, we are proud to co-host the symposium with Mahidol University, Thailand. Our agenda encompasses diverse oral health topics, including Oral Biology, Periodontology, Oral and Maxillofacial Surgery, Preventive Dentistry, Geriatric Dentistry and Rehabilitation, and Current Trends in Dentistry, all of which are crucial for modern society. One of the primary aims of this symposium is to inspire outstanding PhD students and young faculty to become future leaders in dental research by exposing them to a competitive international environment.

Japan is now experiencing a super-aged society, and this demographic trend is also prevalent in Asian and European countries. The challenges posed by an aging society necessitate improvements in the dental education system to meet the new demands. Graduates from dental schools require updated knowledge and skills to address the needs of aging populations. Therefore, it is essential to share clinical and social challenges in super-aging societies to develop innovative dental treatments and services and to establish new research domains.

By collaborating and strengthening our professional bonds, we can accelerate progress in dentistry across all levels, from faculty members to students. We eagerly anticipate productive academic interactions in the field of dental sciences, benefiting faculty members and PhD candidates alike. This symposium will serve as a platform to enhance international relations between Japan and collaborating countries, particularly those in Southeast Asia. We look forward to fruitful academic exchanges and meaningful collaborations during the symposium.

Professor Makoto Inoue

Dean of the Faculty of Dentistry

Niigata University, Japan

Welcome to International Collaborative Symposium 2024

It is with great pleasure and honor that I warmly welcome you to the *"International Collaborative Symposium on Development of Human Resources in Practical Oral Health and Treatment"* which will take place from May 31 to June 1, 2024, in Bangkok, Thailand.

This significant symposium is a collaborative effort between the Faculty of Dentistry, Mahidol University, Thailand, and the Faculty of Dentistry & Graduate School of Medical and Dental Sciences at Niigata University, Japan.

We are particularly excited about this gathering as it coincides with the 56th anniversary of the Faculty of Dentistry, Mahidol University. This milestone reflects our commitment and dedication to enhancing dental education, research, and practice over the past five decades.

The symposium promises to be an enriching experience for all participants. The event's activities will feature the Symposium session, poster presentation, oral presentation, deans' business meeting, and special lectures. These activities will provide a platform for sharing knowledge, fostering collaborations, and exploring innovative approaches to oral health and treatment.

Your participation would be crucial to the success of the event. We look forward to engaging in insightful discussions and networking opportunities that will advance the development of human resources in practical oral health and treatment.

Clinical Professor Sirichai Kiattavorncharoen

Dean of the Faculty of Dentistry

Mahidol University, Thailand

Faculty of Dentistry, Niigata University, Japan

1. Professor Makoto Inoue (Dean)
2. Professor Hiroshi Ogawa (Vice Dean)
3. Assistant Professor Kaung Myat Thwin
4. Dr. Natcha Tassanapong
5. Mr. Akira Seino
6. Mr. Mitsuru Konishi
7. Mr. Masaki Ono

Faculty of Dentistry, Mahidol University, Thailand

1. Clinical Professor Sirichai Kiattavorncharoen (Dean)
2. Clinical Professor Siriruk Nakornchai
3. Associate Professor Yaowaluk Ngeonwiwatkul
4. Associate Professor Tippanart Vichayanrat
5. Associate Professor Varangkanar Jirarattanasopha
6. Assistant Professor Sasipa Thiradilok
7. Assistant Professor Prakan Thanasrisuebwong
8. Dr. Pobploy Petchmedyai
9. Dr. Raksanan Karawekpanyawong
10. Ms. Siriluk Promvisut
11. Ms. Siyaphat Piyasakphitchaya

May 31, 2024 (Friday)

07:30 – 08:30 **Registration**

08:30 – 09:00 **Opening Ceremony**

Opening Remarks by

Assoc. Prof. Nopraenue Sajjarax, Vice President of Mahidol University, Thailand

Prof. Makoto Inoue, Dean of Faculty of Dentistry, Niigata University, Japan

09:00 – 10:00 **Special Lectures**

Chair:

Prof. Makoto Inoue, Niigata University, Japan

Speakers:

(09:00 – 09:30) Enhancing Oral Health of Care-Dependent Older Adults in Eldercare Facilities: A Call for Inter-professional Collaboration and Systemic Reform

Asst. Prof. Sayaka Tada

National University of Singapore, Singapore

(09:30 – 10:00) Exploring the Oral-Gut Axis: The Role of Periodontal Pathogens in Gastrointestinal Diseases

Assoc. Prof. Naoki Takahashi

Niigata University, Japan

10:00 – 10:15 **Coffee Break**

10:15 – 11:30 **Symposium 1: Current Trends in Dentistry: From Research to Clinical Practice**

Chairs:

Prof. Atsushi Ohazama, Niigata University, Japan

Assoc. Prof. Dutmanee Seriwatanachai, Mahidol University, Thailand

Speakers:

(10:15 – 10:27) **S1-1:** A Study on the Use of Guided Surgery and Customized Plates in Orthognathic Surgery for Temporomandibular Joint Instability Patients
Dr. Sukkarn Themkumkwun
Mahidol University, Thailand

(10:27 – 10:39) **S1-2:** Effects of Strontium-Substituted Bioactive Glasses-Alginate Hydrogel on Dental Pulp Regeneration
Dr. Sawanya Prutthithaworn
Mahidol University, Thailand

(10:39 – 10:51) **S1-3:** Evaluating Discoloration Factors of Ocular Prosthesis: An In Vitro Study
Dr. Cheewin Towithelertkul
Mahidol University, Thailand

(10:51 – 11:03) **S1-4:** A Network Analysis of Self-reported Sleep Bruxism in the Netherlands Sleep Registry: Its Associations with Insomnia and Several Demographic, Psychological, and Life-style factors
Dr. Thiprawee Chattrattrai
Mahidol University, Thailand

(11:03 – 11:15) **S1-5:** Investigation of Fluoride Kinetics Following Brushing without Rinsing with No-rinse Formula Toothpaste: A Pilot Study
Dr. Tipparat Parakaw
Mahidol University, Thailand

(11:15 – 11:27) **S1-6:** A Hydrogel-Sandwich Culture: Understanding Mechanobiology in 3D-iPSC Aggregates
Dr. Praphawi Nattasit
Mahidol University, Thailand

(11:27 – 11:30) Discussion

11:30 – 13:45 Lunch Break

12:15 – 13:45 Optional Faculty Tour (Faculty of Dentistry, Mahidol University)

13:45 – 15:15 Symposium 2: Advances in Oral Biology
Chairs:
Prof. Miho Terunuma, Niigata University, Japan
Prof. Thantrira Porntaveetus, Chulalongkorn University, Thailand

(13:45 – 13:50) Introduction

Speakers:

(13:50 – 14:10) **S2-1:** Oxidative Stress in Organogenesis
Prof. Atsushi Ohazama
Niigata University, Japan

(14:10 – 14:30) **S2-2:** Role of Tumor Microenvironment in Head and Neck Cancer and Natural Product-based Treatment
Assoc. Prof. Kusumawadee Utispan
Thammasat University, Thailand

(14:30 – 14:50) **S2-3:** Precision Dentistry Unveiled: Elevating Oral Healthcare Standards
Prof. Thantrira Porntaveetus
Chulalongkorn University, Thailand

(14:50 – 15:10) **S2-4:** Targeting Lipogenesis as a Potential Strategy for Oral Cancer Treatment
Prof. Miho Terunuma
Niigata University, Japan

(15:10 – 15:15) Discussion

15:15 – 15:30 Coffee Break

15:30 – 17:00 Oral Presentation 1: Oral Health Promotion

Chairs:
Asst. Prof. Kaung Myat Thwin, Niigata University, Japan
Dr. Raksanan Karawekpanyawong, Mahidol University, Thailand

Presenters:

(15:30 – 15:40) **O1-1:** Oral Health-Related Quality of Life in Liver Transplant Patients
Andreea C. Didilescu, Adelina Lazu, Hendrik Brand
Carol Davila University of Medicine and Pharmacy, Romania

(15:40 – 15:50) **O1-2**: Relationship between Oral Health and Frailty among Community-Dwelling Elderly Living in Sleman District, Yogyakarta, Indonesia
Elastria Widita, Christia Aye Waindy Vega, Budi Rodestawati, Regina TC., Tandelilin, Iffah Mardiyah, Bekti Nuraini, Prayudha Benni Setiawan, and Jong-Hwa Jang
Universitas Gadjah Mada, Indonesia

(15:50 – 16:00) **O1-3**: Psychological Factors Associated with Oral Health Status among COVID-19 Affected Older Adults in Myanmar
Natcha Tassanapong, Olenka Valenzuela Torres, Kaung Myat Thwin, Hiroshi Ogawa
Niigata University, Japan

(16:00 – 16:10) **O1-4**: Differences in Periodontal Status Among Employees in Japanese Manufacturing Establishments Having and Not Having a Family Dentist

Hikaru Okubo, Yoshiyuki Soyama, Sachiko Takehara, Noboru Kaneko, Hiroshi Ogawa

Niigata University, Japan

(16:10 – 16:20) **O1-5:** Impact of a Teledentistry Program on Tooth-brushing Behavior and Oral Status in Cleft Lip and Palate Patients

Chawalit Chanintonsongkhla, Pornpat Theerasopon, Kamonporn Nanekrungsan, Maturin Jaihong, Paphaon Kheawseema, Patcharawan Srisilapanan

University of Phayo, Thailand

(16:20 – 16:30) **O1-6:** Relationship Between Alcohol Consumption and Tooth Loss: A Five-year Cohort Study

Kana Suwama, Masanori Iwasaki, Yumi Ito, Junta Tanaka, Keiko Kabasawa, Akihiro Yoshihara

Niigata University, Japan

(16:30 – 16:40) **O1-7**: Dental Caries and Tooth Wear Among 12-Year-Old Hong Kong Children

Faith Miaomiao Zheng, Iliana Gehui Yan, Chun Hung Chu, Jing Zhang

The University of Hong Kong, Hong Kong SAR, China

(16:40 – 16:50) **O1-8**: The Evaluation of Electromyographic Property of Tongue and Suprahyoid Muscles During Isometric Tongue Pressure Generation

Reiko Ita, Jin Magara, Takanori Tsujimura, Makoto Inoue

Niigata University, Japan

(16:50 – 17:00) **O1-9:** Effect of Chemotherapy on Survival in Patients with Jaw Osteosarcoma: A Systematic Review

Luqing Zhang, Yihan Guo, Kei Tomihara

Niigata University, Japan

19:00 – 21:00 **Gala Dinner**

June 1, 2024 (Saturday)

08:00 – 08:30 **Registration**

08:30 – 09:30 **Special Lectures**

Chair:

Asst. Prof. Bundhit Jirajariyavej, Mahidol University, Thailand

Speakers:

(08:30 – 09:00) Masticatory Performance and Behaviors in Older People

Prof. Kazuhiro Hori

Niigata University, Japan

(09:00 – 09:30) The Neural Mechanisms of Initiation of Mechanically Evoked Swallows

Assoc. Prof. Takanori Tsujimura

Niigata University, Japan

09:30 – 09:45 **Coffee Break**

09:45 – 11:15 **Symposium 3: Future Perspective for Oral and Maxillofacial Surgery in Asian Countries**

Chairs:

Prof. Kei Tomihara, Niigata University, Japan

Prof. Chandan Upadhyaya, Kathmandu University School of Medical Sciences, Nepal

Speakers:

(09:45 – 10:00) **S3-1:** Skeletal Stability after Two-jaw Surgery in Patients with Cleft Palate

Dr. Ryoko Takeuchi

Niigata University, Japan

(10:00 – 10:15) **S3-2:** An Investigation of Masseter Muscle Activity during Awake and Sleep in Healthy Indonesian University Students using A Portable EMG Device

Assoc. Prof. Acing Habibie Mude

Hasanuddin University, Indonesia

(10:15 – 10:30) **S3-3:** Simplifying Complex & Maximizing Predictable Outcome in Implant Treatment - Mahidol Dental Implant Center

Dr. Pranai Nakaparksin

Mahidol University, Thailand

(10:30 – 10:45) **S3-4:** Treatment Strategy for Advanced-Stage Oral Cancer
Prof. Kei Tomihara
Niigata University, Japan

(10:45 – 11:00) **S3-5:** Maxillofacial Fractures: Etiology, Pattern Treatment and Outcome – An Experience from Tertiary Care Hospital, Nepal
Prof. Chandan Upadhyaya
Kathmandu University School of Medical Sciences, Nepal

(11:00 – 11:15) Discussion

11:15 – 12:30 Lunch Break

11:15 – 12:45 Deans Meeting

12:30 – 15:00 Oral Presentation & Poster Presentation (Parallel sessions)

12:30 – 13:30 Oral Presentation 2: Periodontology
Chairs:
Assoc. Prof. Naoki Takahashi, Niigata University, Japan
Asst. Prof. Kallapat Tansriratanawong, Mahidol University, Thailand

Presenters:

(12:30 – 12:40) **O2-1:** Hypoxia Aggravates Cell Death and Impairs Fibronectin Deposition in Human Gingival Fibroblasts treated with Alendronate
Chia-Chen Wu, Jiiang-Huei Jeng, Yong-Deok Kim, Hangsheng Chen, Yu-Hsun Kao, Ting-Hsun Lan, Chun-Nan Hsiao, Yuko Fujihara, Kazuto Hoshi, Edward Chengchuan Ko
Kaohsiung Medical University, Taiwan

(12:40 – 12:50) **O2-2:** Antibacterial and Antibiofilm Activities of Choline Geranate-Ionic Liquid for Periodontal Therapy
Chunyang Yan, Mayuka Nakajima, Mayuko Yanagawa, Koichi Tabeta
Niigata University, Japan

(12:50 – 13:00) **O2-3:** Comparing Root Coverage Outcomes of Subepithelial Connective Tissue Grafts Harvested from the Palate Before and After Recipient Site Preparation
Kaewkwan Tanthai, Thitiphong Rueangpaisal, Wichurat Sakulpaptong
Mahidol University, Thailand

(13:00 – 13:10) **O2-4:** N-Acyl Homoserine Lactones Lactonase est816 Suppresses Biofilm Formation and Periodontitis in Rats Mediated by Aggregatibacter actinomycetemcomitans

Zelda Ziyi Zhao, Chun Hung Chu, Jing Zhang

The University of Hong Kong, Hong Kong SAR, China

(13:10 – 13:20) **O2-5:** Histological Observation on Periodontal Tissue After Vertical Root Fracture Repair with 4-META/MMA-TBB Resin mixed with CTGF, TGF-β3, and FGF

Chuta Kooanantkul, Masako Nagasawa, Tongtong Zhang, and Katsumi Uoshima

Niigata University, Japan

(13:20 – 13:30) **O2-6:** Astrocytes as Potential Therapeutic Target for Epilepsy

Yusuke Nasu, Koichi Tabeta, Miho Terunuma

Niigata University, Japan

13:30 – 15:00 **Oral Presentation 3: Diverse Oral Health Research**

Chairs:

Assoc. Prof. Takanori Tsujimura, Niigata University, Japan

Asst. Prof. Kajohnkiart Janebodin, Mahidol University, Thailand

Presenters:

(13:30 – 13:40) **O3-1:** Possible Mechanisms of Potassium ion Induced Swallowing Facilitation

Satomi Kawada, Titi Chotirungsan, Tsutsui Yuhei, Pan Charng Rong, Midori Yoshihara, Jin Magara, Takanori Tsujimura, Makoto Inoue

Niigata University, Japan

(13:40 – 13:50) **O3-2:** Functional Role of the Sternohyoid Muscle in Breathing and Swallowing in Rats

Titi Chotirungsan, Charng-Rong Pan, Nozomi Dewa, Yuhei Tsutsui, Jin Magara, Takanori Tsujimura, Makoto Inoue

Niigata University, Japan

(13:50 – 14:00) **O3-3:** Involvement of Posterior Belly of Digastric Muscle During Swallowing in Rat

Yuhei Tsutsui, Kajita Piriyaprasath, Titi Chotirungsan, Nozomi Dewa, Pan Charng-Rong, Jin Magara, Takanori Tsujimura, Keiichiro Okamoto, Kensuke Yamamura, Makoto Inoue

Niigata University, Japan

(14:00 – 14:10) **O3-4:** Craniofacial Development Requires MicroRNAs for Inhibiting Senescence

Finsa Tisna Sari, Vanessa Utama, Alex Kesuma, Katsushige Kawasaki, Maiko Kawasaki, Takeyasu Maeda, Atsushi Ohazama

Niigata University, Japan

(14:10 – 14:20) **O3-5:** The Nitrate-reducing Bacteria Veillonella parvula and V. atypica are Indicators of Poor Oral Hygiene in Young People

Boy M. Bachtiar, Citra Fragrantia Theodorea, Lisa R. Amir, Wahyu Sulistiadi, Endang W. Bachtiar

University of Indonesia, Indonesia

(14:20 – 14:30) **O3-6:** Novel Anticancer Mechanism of Acetyl-CoA Carboxylase Inhibitor TOFA

Yu Sonobe, Genki Ito, Kei Tomihara, Miho Terunuma

Niigata University, Japan

(14:30 – 14:40) **O3-7:** Survival of Vertically Fractured Tooth Roots after Repair Treatments

Masako Nagasawa, Chuta Kooanantkul, Yoshiki Ono, Hikaru Koide, Katsumi Uoshima

Niigata University, Japan

(14:40 – 14:50) **O3-8:** Modulation of Oxidative Stress at Transplantation Site Enhances Bone Regeneration

Quang Nguyen Van, Akiba Yosuke, Eguchi Kaori, Akiba Nami, Uoshima Katsumi

Niigata University, Japan

(14:50 – 15:00) **O3-9:** Wound Healing Mechanism after Pulpotomy in Type 2 Diabetes Mellitus Rats

Rosa Baldeon-Gutierrez, Naoto Ohkura, Shintaro Takahara, Susan Gomez-Kasimoto, Takako Ida, Naoki Edanami[1], Shoji Takenaka, Nagako Yoshiba, Yuichiro Noiri

Niigata University, Japan

12:30 – 15:00 **Poster Presentation (1)**

Chairs:

Assoc. Prof. Yaowaluk Ngeonwiwatkul, Mahidol University, Thailand

Assoc. Prof. Lisdrianto Hanindriyo, Universitas Gadjha Mada, Indonesia

Presenters:

P1-1: Xerostomia and Saliva Quality among Thai Older Population in Nakhon Ratchasima Province, Thailand

Phetnin Namon, and Amornsuradech Sirinthip

Ministry of Public Health, Thailand

P1-2: Effect of Lactobacillus acidophilus, Lactobacillus paracasei and Bifidobacterium lactis in Yogurt on the Quantity of Oral Candida among Older Adults

Pinyo Kerdpolwattana, Thararat Chitov, Chatsri Kuansuwan, Surawut Pongsiriwet, Kanyarat Korwanich, Jitjiroj Ittichaicharoen

Chiang Mai University, Thailand

P1-3: Prevalence of Taste Alteration in Thai Older Adults with Dentures Wearing

Arunroongrasmi N., Kiattavorncharoen S., Surarit R., Srimaneekarn N.

Mahidol University, Thailand

P1-4: Edentulism and Physical Function in the Elderly: Evidence from the Indonesian Family Life Survey

Rieski Prihastuti, Daisuke Hinode, Omar Rodis, Yoshizo Matsuka

Tokushima University, Japan

P1-5: Comparing the Effect of Various Stimulation Parameters of Neuromuscular Electrical Stimulation on Hyoid Movement

Leung Ho Yin, Jin Magara, Zhang Mengjie, Chisato Aizawa, Reiko Ita, Takanori Tsujimura and Makoto Inoue

Niigata University, Japan

P1-6: Exploring the Efficacy of Crystalline Oil and Fat Powder in Facilitating Swallowing Under Hyposalivation Conditions

Mengjie Zhang, Jin Magara, Reiko Ita, Chisato Aizawa, Takanori Tsujimura, Makoto Inoue

Niigata University, Japan

P1-7: A Pilot Project for Health Promoting School Initiative in Indonesia Using a Multidimensional Approach

Lisdrianto Hanindriyo, Hiroshi Ogawa, Indra R Dharmawan, Erlin Puspaputri, Marina Hardiyanti, Dibyo Pramono, Elastria Widita, Fania Chairunisa, Fitrina Rachmadanty Siregar, Muhammad Fahmi Alfian, Agatha Ravi Vidiasratri

Universitas Gadjah Mada, Indonesia

P1-8: Relationships Between Occlusion and Body, including Head, Sway in Community-Dwelling Older Adults

Ayuko Odajima, Akihiro Yoshihara, Masayoshi Kubo, Kazuo Ishigami

Niigata University, Japan

P1-9: Oral Health Education with Dental Students for Teenagers – A Sustainable Approach

Ruxandra Sfeatcu, Mihaela Adina Dumitrache, Roxana Ilici, Ana Maria Cristina Țâncu, Marina Imre, Andreea Didilescu

Carol Davila University of Medicine and Pharmacy, Romania

P1-10: The Relationship Between Periodontal Inflammation and Risk of MCI in Type 2 Diabetic Patient: A Preliminary Study

Aulia Ramadhani, Azusa Tanaka, Kumiko Minagawa, Sachiko Takehara, Takaho Yamada, Kaname Nohno, Hiroshi Ogawa

Niigata University, Japan

P1-11: Novel Therapeutic Approach for Osteoradionecrosis. Harnessing the Regenerative Potential of Autologous Growth Factors Along with Statins

Magar Akash Pulami, Upadhyaya Chandan, Chaurasia Nitesh, Shakya Mamata, Rauniyar Dilip

Kathmandu University School of Medical Sciences, Nepal

P1-12: Computer-assisted Surgery in Mandibular Reconstruction and a Patient-specific Mandibular Reconstruction Plate

Kenta Haga, Akinori Funayama, Naoaki Saito, Daichi Hasebe, Daisuke Saito, Hidenobu Sakuma, Daisuke Suda, Ryoko Takeuchi, Takafumi Hayashi, Jun-ichi Tanuma, Tadaharu Kobayashi

Niigata University, Japan

P1-13: Demineralised Dentine Graft and Platelet Rich Fibrin as Tissue Regenerating Materials in Oral Surgery

Thapa Siddhant, Upadhyaya Chandan, Chaurasia Nitesh, Shakya Mamata, Rauniyar Dilip

Kathmandu University School of Medical Sciences, Nepal

P1-14: Case Report: Cystic Hygroma

Thant Te Oo, Tun Ngwe

University of Dental Medicine, Yangon, Myanmar

P1-15: Treatment of Replanted Avulsed Teeth with Root Canal Treatment and Re-Splinting: A Case Report

Komala Antonietta Natasha, Indrayanto Fransiscus Xaverius, Tarigan Gita, Sugiaman Vinna Kurniawati

Maranatha Christian University, Indonesia

P1-16: Enhancing Smile Aesthetics: A Case Report of Indirect Restoration on Teeth 13-23 with Exposed Metal Post PFM on Tooth 21

Indrayanto Fransiscus Xaverius, Komala Antonietta Natasha, Tarigan Gita, Sugiaman Vinna Kurniawati

Maranatha Christian University, Indonesia

12:30 – 15:00 **Poster Presentation (2)**

Chairs:

Assoc. Prof. Masaru Kaku, Niigata University, Japan

Assoc. Prof. Puangwan Lapthanasupkul, Mahidol University, Thailand

Presenters:

P2-1: The Beneficial Effects of Recombinant Collagen Peptide in Periosteal Cell-Derived Osteoregeneration

Tran Thi Thuy Diep, Naoki Takahashi, Takahiro Tsuzuno, Shunya Motosugi, Yuta Ueda, Masaki Nagata, Koichi Tabeta

Niigata University, Japan

P2-2: The Impact of Periostin-knockout on the Periodontal Ligament

Azusa Dobashi, Masaru Kaku, Yoshiki Ono, Mizuki Kobayashi, Hlaing Pwint Phyu, Katsumi Uoshima

Niigata University, Japan

P2-3: Extracellular Matrix-Oriented Proteomic Profiling of Human Periodontal Ligament

Masaru Kaku, Lay Thant, Azusa Dobashi, Mizuki Kobayashi, Hlaing Pwint Phyu, Yoshiki Ono, Katsumi Uoshima

Niigata University, Japan

P2-4: The Role of Glutamine Transporters in The Dental Pulp and Periodontal Ligament

Susan Gomez Kasimoto, Naoto Ohkura, Rosa Baldeon Gutierrez, Shintaro Takahara, Naoki Edanami, Takako Ida, Shoji Takenaka, Nagako Yoshiba, Yuichiro Noiri

Niigata University, Japan

P2-5: Viability of Palatal Sub-Epithelial Connective Tissue Graft Harvest: A Pilot Study

Chanutda Chatchaiyadej, Wichurat Sakulpaptong

Mahidol University, Thailand

P2-6: Building a Sustainable Future in Dentistry: Education as a Catalyst for Change

Ana Maria Cristina Ţâncu, Andreea Cristiana Didilescu, Silviu Mirel Pițuru, Ruxandra Sfeatcu, Mihaela Pantea, Marina Imre

Carol Davila University of Medicine and Pharmacy, Romania

P2-7: Student's Workshops on Didactic Tools Production Through Digital Workflow in Dentistry

Marina Imre, Andreea Didilescu, Ana Maria Tancu, Ruxandra Sfeatcu, Toma Ciocan, Silviu Pituru

Carol Davila University of Medicine and Pharmacy, Romania

P2-8: Effectiveness of Implant Supported Prosthesis in Unilateral Free-end Case

Yi Yi Soe, Tun Ngwe

University of Dental Medicine, Yangon, Myanmar

P2-9: The Influence of The Hardness of Gummy Jelly and the Maximum Occlusal Force of the Individuals on the Muscle Activity

Ayaka Yasuno, Kazuhiro Murakami, Jumpei Okawa, Kazuhiro Hori

Niigata University, Japan

P2-10: Effect of Difference in Aroma Content of Gummy Jelly on Swallowing Threshold

Kaho Yamada, Jumpei Okawa, Ma Therese Sta. Maria, Aye Mya Mya Khaing, Min Thu Ya, Takahiro Ono, Kazuhiro Hori

Niigata University, Japan

P2-11: Shear Bond Strength of Silver Diamine Fluoride Applied Dentine Comparison Between Glass Ionomer Cement and Resin Composite

Thitipat Chotveerasatanont, Taechin Mingvanish, Narawit Prapakornrattana, Pawaris Sawanpantakorn, Traithawit Naksagoon

University of Phayao, Thailand

P2-12: Artificial Intelligence in Radiology

Shubhangi Khatri

Kathmandu University School of Medical Sciences, Nepal

P2-13: Inhibitory Roles of Agmatine on Anxiety-Like Behaviors and Brain Responses Associated with Masseter Muscle Pain in Male Mice

Yuya Iwamoto, Kajita Piriyaprasath, Mana Hasegawa, Yoshito Kakihara, Keiichiro Okamoto[1], Noritaka Fuji, Kensuke Yamamura

Niigata University, Japan

P2-14: Engineering Epithelial Basement Membrane in a Tissue-Engineered Oral Mucosa: a Preliminary Study

Witsanu Yortchan, Yuji Yamada, Nagako Yoshiba, Sho Takada, Yuka Aizawa, Rintaro Tanaka, Ayako Suzuki, Kenji Izumi

Niigata University, Japan

P2-15: Comparative Analysis of Gene Expression in Cultured Oral Mucosal Epithelial Cell Sheets Manufactured on Substrates with Different Physical Properties

Yuka Aizawa, Yiwei Ling, Sho Takada, Witsanu Yortchan, Rintaro Tanaka, Ayako Suzuki, Atsushi Uenoyama, Shujiro Okuda, Kei Tomihara[3], Kenji Izumi

Niigata University, Japan

P2-16: Changes in Extracellular Matrix Protein Composition and Their Gene Expression Profile During Osteoblast Differentiation

Hlaing Pwint Phyu, Masaru Kaku, Azusa Dobashi, Mizuki, Kobayashi, Yoshiki Ono, Katsumi Uoshima

Niigata University, Japan

15:00 – 15:15 **Coffee Break**

15:15 – 16:45 **Symposium 4: Oral Health Promotion and Disease Prevention**

Chairs:

Prof. Hiroshi Ogawa, Niigata University, Japan

Dr. Matana Kettratad-Pruksapong, Thammasat University, Thailand

Speakers:

(15:15 – 15:30) **S4-1:** Implementing Geriatric Oral Health Components as Part of Primary Health Care in Thailand: Hope Amidst the Struggle

Dr. Matana Kettratad-Pruksapong

Thammasat University, Thailand

(15:30 – 15:45) **S4-2:** Assessment and Management of Oral Hypofunction

Dr. Jin Magara

Niigata University, Japan

(15:45 – 16:00) **S4-3:** The Use of Digital Technology for Oral Health Survey and Community Oral Health Programs: An Indonesian Experience

Asst. Prof. Melissa Adiatman

University of Indonesia, Indonesia

(16:00 – 16:15) **S4-4:** Improving Nutritional Status in Older Persons with Tooth Loss

Assoc. Prof. Tippanart Vichayanrat

Mahidol University, Thailand

(16:15 – 16:45) Discussion

16:45 – 17:00 **Closing Ceremony**

Closing Remarks by

Prof. Hiroshi Ogawa, Vice Dean of Faculty of Dentistry, Niigata University, Japan

June 2, 2024 (Sunday)

09:00 – 14:00 **Optional Community Tour**

May 31, 2024 (Friday)

09:00 – 10:00 **Special Lectures**

Chair:

Prof. Makoto Inoue, Niigata University, Japan

Speakers:

(09:00 – 09:30) Enhancing Oral Health of Care-Dependent Older Adults in Eldercare Facilities: A Call for Inter-professional Collaboration and Systemic Reform

Asst. Prof. Sayaka Tada

National University of Singapore, Singapore

(09:30 – 10:00) Exploring the Oral-Gut Axis: The Role of Periodontal Pathogens in Gastrointestinal Diseases

Assoc. Prof. Naoki Takahashi

Niigata University, Japan

June 1, 2024 (Saturday)

08:30 – 09:30 **Special Lectures**

Chair:

Asst. Prof. Bundhit Jirajariyavej, Mahidol University, Thailand

Speakers:

(08:30 – 09:00) Masticatory Performance and Behaviors in Older People

Prof. Kazuhiro Hori

Niigata University, Japan

(09:00 – 09:30) The Neural Mechanisms of Initiation of Mechanically Evoked Swallows

Assoc. Prof. Takanori Tsujimura

Niigata University, Japan

Name: Assistant Professor Sayaka Tada

Affiliation: Faculty of Dentistry, National University of Singapore

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Enhancing Oral Health of Care-Dependent Older Adults in Eldercare Facilities: A Call for Interprofessional Collaboration and Systemic Reform

Authors and Co-authors	Sayaka Tada
Affiliations	Faculty of Dentistry, National University of Singapore
Presentation Summary	Oral health management for care-dependent older adults remains a significant global public health challenge. In long-term care settings (LTCs) such as nursing homes (NHs), despite the considerable impact of poor oral health on physical health, nutrition, and overall quality of life, it often receives inadequate attention. Recent studies underscore that multifaceted barriers continue to hinder effective care delivery, despite growing awareness of the importance of oral health for these populations. This lecture will present key findings from a series of studies examining the current state of oral healthcare in NHs in Singapore. These studies reveal a fragmented oral healthcare system within LTCs, leading to the under-prioritization of oral health. Dentists have identified systemic and structural barriers that discourage their involvement in NHs. Medical practitioners have highlighted a significant lack of geriatric oral healthcare resources as well as he need for educational initiatives and collaborative platforms to bridge this gap. Additionally, care staff in NHs faced significant challenges, including a lack of oral health knowledge and difficulties managing daily oral care for uncooperative residents, often due to cognitive impairments or because they are bed-bound. These residents often resist oral care and present with complex oral conditions, making care provision both time-consuming and difficult. These barriers are intricately interconnected, indicating that there is no one-size-fits-all solution to this complex issue. The integration of dental professionals as core members of the eldercare team is a crucial step towards improving this situation.

	Participants in this lecture will gain a deep understanding of the interconnected barriers and complex dynamics of oral healthcare delivery in LTCs across different professional domains. This insight highlights the urgent need for interprofessional collaboration and systemic reform to enhance the quality of life for care-dependent older adults in these settings.
Keywords	Oral Health, Geriatric Dentistry, Interprofessional Relations, Health Services for the Aged, Healthcare Disparity, Long-Term Care

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Exploring the Oral-Gut Axis:

The Role of Periodontal Pathogens in Gastrointestinal Diseases

Author	Naoki Takahashi
Affiliations	Division of Periodontology, Niigata University Graduate School of Medical and Dental Sciences
Presentation Summary	Periodontitis is a chronic inflammatory condition affecting the supporting structures of the teeth, characterized by bacterial plaque accumulation, leading to tissue destruction and potential tooth loss. Over the past few decades, substantial evidence has accumulated on the link between periodontitis and extra-oral systemic diseases including cardiovascular disease, respiratory tract infection, and diabetes. Recent studies have shown that oral microbes including periodontal pathogens translocate to the gut, resulting the ectopic enrichment of oral bacteria in the gut and subsequent adverse effect in gastrointestinal diseases. Our previous study has shown that oral administration of *P. gingivalis*, one of the major periodontitis-related bacteria, reaches the gastrointestinal tract and induces local and systemic inflammation by altering the gut barrier function, immune system, and microbiota. In this symposium, I would like to review the possible involvement of the oral-gut connection in gastrointestinal disease with introduction of our previous and ongoing projects.
Keywords	periodontal medicine, oral-gut axis, gastrointestinal diseases

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Masticatory Performance and Behaviors in Older People

Authors and Co-authors	Kazuhiro Hori
Affiliations	Division of Comprehensive Prosthodontics Niigata University Graduate School of Medical and Dental Sciences
Presentation Summary	Frailty and oral hypofunction in the older people are often considered important problems. Oral hypofunction may lead to malnutrition due to a decrease in the variety and amount of foods that can be ingested. It has long been said that chewing anything and frequently is the key to good health. Therefore, many functional assessments such as masticatory function had been performed. The increased surface area of comminuted testing gummy is one of assessment methods for masticatory performance. We developed image analyzing methods and reported masticatory function of older adults. On the other hand, few reports investigated the relationship between masticatory behavior such as the number of chews due to difficulty to exactly recognize our own eating behavior; i.e., eating fast or slow and less or more chewing. Additionally, assessing mastication behaviors lacks objectivity because of the lack of devices for measuring mastication behaviors during daily meals. Recently, a simple and accurate mastication measuring device was developed. Using this device, we reported on the relationship between Japanese people's daily eating behavior and their general condition. Furthermore, the characteristics of chewing behavior in the older adults were analyzed.

	In this lecture, I will talk about the relationship between chewing behavior and masticatory performance in the older people, and their relationship to the oral frailty.
Keywords	Masticatory performance, Masticatory behavior, older people

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The Neural Mechanisms of Initiation of Mechanically Evoked Swallows

Authors and Co-authors	Takanori Tsujimura, Makoto Inoue
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Presentation Summary	Swallowing subserves essential homeostatic and airway defensive functions. With population aging in Japan, the number of older patients with swallowing disorders, i.e. dysphagia, has been increasing. Mechanically sensitive vagal afferent neurons terminate in the upper airways and esophagus. When these sensory neurons are activated *in vivo*, swallowing is initiated. In dysphagia patients, impaired laryngeal and pharyngeal mechanosensation increases the risk of aspiration and thus aspiration pneumonia. Based on our animal studies, this lecture will explain the peripheral and central neuronal mechanisms that initiate swallowing evoked by mechanical stimulation. These new findings will help to develop novel strategies for treating dysphagia.
Keywords	animals, larynx, medulla, swallowing, vagal nerve

Symposium I: Current Trends in Dentistry: From Research to Clinical Practice

Chairs:

Prof. Atsushi Ohazama, Niigata University, Japan

Assoc. Prof. Dutmanee Seriwatanachai, Mahidol University, Thailand

Speakers:

S1-1: A Study on the Use of Guided Surgery and Customized Plates in Orthognathic Surgery for Temporomandibular Joint Instability Patients

Dr. Sukkarn Themkumkwun, Mahidol University, Thailand

S1-2: Effects of Strontium-Substituted Bioactive Glasses-Alginate Hydrogel on Dental Pulp Regeneration

Dr. Sawanya Prutthithaworn, Mahidol University, Thailand

S1-3: Evaluating Discoloration Factors of Ocular Prosthesis: An In Vitro Study

Dr. Cheewin Towithelertkul, Mahidol University, Thailand

S1-4: A Network Analysis of Self-reported Sleep Bruxism in the Netherlands Sleep Registry: Its Associationswith Insomnia and Several Demographic, Psychological, and Life-style factors

Dr. Thiprawee Chattrattrai, Mahidol University, Thailand

S1-5: Investigation of Fluoride Kinetics Following Brushing without Rinsing with No-rinse Formula Toothpaste: A Pilot Study

Dr. Tipparat Parakaw, Mahidol University, Thailand

S1-6: A Hydrogel-Sandwich Culture: Understanding Mechanobiology in 3D-iPSC Aggregates

Dr. Praphawi Nattasit, Mahidol University, Thailand

Name: Sukkarn Themkumkwun
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A Study on the Use of Guided Surgery and Customized Plates in Orthognathic Surgery for Temporomandibular Joint Instability Patients

Authors and Co-authors	Sukkarn Themkumkwun, Kiatanant Boonsiriseth
Affiliations	Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Mahidol University
Presentation Summary	In our study focusing on temporomandibular joint (TMJ) instability, we utilized surgical guides and customized plates for orthognathic surgery, demonstrating a significant enhancement in surgical precision and esthetic outcomes. The patients include individuals with TMJ instability, such as those with hemifacial microsomia and those who have undergone gap arthroplasty. Through advanced virtual preoperative planning, we tailored the design of guides and plates to the unique characteristics of each patient's jaw bone. Maxillomandibular surgery, including genioplasty, was performed and fixed with customized plates. The maximum surface difference was measured using the superimpose method, with results indicating good accuracy, with the surface difference being less than 1.5 mm. This technology not only improves surgical outcomes but also holds promise for revolutionizing orthognathic surgery in complex cases, offering patients the potential for better esthetic results and an improved quality of life. Additionally, this technique decreases the risk of injuries to vital structures, improves accuracy in both maxilla and mandible positioning, enables complete control of the maxilla position without being affected by the unstable mandible and temporomandibular joint, and eliminates the need for internal or external vertical measurements, thus enhancing surgical efficiency and safety.
Keywords	Orthognathic Surgery, Customized Plates, Surgical guides, TMJ Instability

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Effects of Strontium-Substituted Bioactive Glasses-Alginate Hydrogel on Dental Pulp Regeneration

Authors and Co-authors	Sawanya Prutthithaworn[1], Simon Rawlinson[2], Ferranti Wong[3], Robert Hill[3]
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Presentation Summary	Vital pulp therapy (VPT) is a treatment modality for managing damaged dental pulp tissue to preserve its vitality. Bioactive glasses (BAGs) are the materials used widely for bone regeneration. They undergo dissolution in physiologic fluid and have the capability to form apatite. Strontium (Sr) at specific concentrations can effectively stimulate human dental pulp stem cell (hDPSC). In this study, Sr was substituted for Ca in the BAG network to enhance the bioactivity. After *in vitro* bioactivity of the BAGs were assured, they were incorporate into Alginate (Alg) medium to form a novel VPT material consisting of BAG/Alg in a hydrogel form. The effects of VPT materials from all BAG formulas and the influences of Sr^{2+} and Ca^{2+} on the hDPSC regenerative functions will be presented.
Keywords	Strontium-substituted, Bioactive glass, Pulp regeneration, Vital pulp therapy, Human dental pulp stem cells (hDPSCs)

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Title: Evaluating Discoloration Factors of Ocular Prosthesis: an In-vitro Study

Authors and Co-authors	Cheewin Towithelertkul Assoc. Prof. Dr. M.L. Theerathavaj Srithavaj Assist. Prof. Dr. Natdhanai Chotprasert Dr. Binit Shrestha
Affiliations	Department of prosthodontics, Maxillofacial prosthetic services, Mahidol University, Bangkok, Thailand
Presentation Summary	The eyes are one of the five senses, and losing eyesight can be life's stigma. Ocular prostheses fabricated by maxillofacial prosthodontists, although incapable of restoring functions, help restore esthetic appearance as well as psychology. An Ocular made with polymethyl methacrylate acrylic resin (PMMA) owing to its customization. However, PMMA colour may change over time. Therefore this study aims to find factors affecting the color stability of scleral PMMA in clinical situations to instruct patients how to prolong their ocular prosthesis's color. The first part of the study demonstrated discolouration of two PMMA specimens' colours, which were imitated as ocular prostheses, after immersion in disinfectant solutions. The result showed the duration of immersion is the most influential factor.
Keywords	Ocular Prosthesis, PMMA, Discoloaration

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A Network Analysis of Self-Reported Sleep Bruxism in the Netherlands Sleep Registry: Its Associations with Insomnia and Several Demographic, Psychological, and Life-Style Factors

Authors and Co-authors	Thiprawee Chattrattrai[a,b,*], Tessa F Blanken[c], Frank Lobbezoo[a], Naichuan Su[d], Ghizlane Aarab[a], Eus J W Van Someren[e,f,g]
Affiliations	[a] Department of Orofacial Pain and Dysfunction, Academic Centre for Dentistry Amsterdam (ACTA), University of Amsterdam and Vrije Universiteit Amsterdam, Amsterdam, the Netherlands [b] Department of Masticatory Science, Faculty of Dentistry, Mahidol University, Bangkok, Thailand [c] Department of Psychological Methods, University of Amsterdam, Amsterdam, the Netherlands [d] Department of Social Dentistry, Academic Centre for Dentistry Amsterdam (ACTA), University of Amsterdam and Vrije Universiteit Amsterdam, Amsterdam, the Netherlands [e] Department of Sleep and Cognition, Netherlands Institute for Neuroscience, Amsterdam, the Netherlands [f] Department of Integrative Neurophysiology, Center for Neurogenomics and Cognitive Research (CNCR), Amsterdam Neuroscience, Vrije Universiteit Amsterdam, Amsterdam, the Netherlands [g] Department of Psychiatry, Amsterdam Public Health Research Institute and Amsterdam Neuroscience Research Institute, Amsterdam UMC, Vrije Universiteit Amsterdam, Amsterdam, the Netherlands
Presentation Summary	Objectives: To investigate the association between self-reported sleep bruxism and insomnia and their potential risk factors (e.g., depression and anxiety), and to construct a network model with all these factors. Methods: We recruited 2251 participants from the Netherlands Sleep Registry. All participants completed questionnaires on self-reported sleep bruxism, insomnia, depression, anxiety, smoking frequency, and alcohol and caffeine consumption. The associations between self-reported sleep bruxism and other variables were analyzed by univariate analysis, multivariate logistic regression, and network analysis. Results: Although univariate analysis showed that there was a positive association between sleep bruxism and insomnia ($P<0.001$), this association disappeared in the multivariate logistic regression model ($P=0.258$). However, multivariate logistic regression did show an association between self-reported

	sleep bruxism and anxiety (OR= 1.087, 95% CI 1.041-1.134). The network model showed that there was no direct link between self-reported sleep bruxism and insomnia. However, there was an indirect link between self-reported sleep bruxism and insomnia via anxiety. Conclusions: Although self-reported sleep bruxism has no direct association with insomnia, anxiety is a bridging factor between these variables.
Keywords	sleep bruxism; insomnia; anxiety; network analysis

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Investigation of Fluoride Kinetics Following Brushing Without Rinsing with No-Rinse Formula Toothpaste: A Pilot Study

Authors and Co-authors	Tipparat Parakaw, Sirada Srihirun, Pornpen Dararat, Nisarat Ruangsawasdi
Affiliations	Department of Pharmacology Faculty of Dentistry Mahidol University
Presentation Summary	Fluoride is essential for preventing tooth decay, and its addition in oral care products is key for good oral health. A no-rinse brushing method and a no-rinse formula toothpaste have emerged to maximize fluoride retention in the mouth. This study compared its efficacy and safety with traditional rinsing after brushing. Participants (n=10) underwent a crossover study, measuring fluoride levels in saliva (both supernatant and sediment compartments) and urine at various intervals. Additionally, plasma fluoride levels were assessed 1-hour post-brushing with the no-rinse formula. The no-rinse group exhibited significantly higher fluoride levels in saliva immediately and up to 30 minutes post-brushing compared to the rinse group. However, systemic absorption, evaluated through blood and urine fluoride levels, did not significantly differ between the two methods. These findings suggest that the no-rinse method enhances fluoride retention in the mouth without affecting its systemic absorption, indicating its potential as a beneficial oral care practice.
Keywords	Fluoride kinetics, brushing without rinsing, no-rinse method

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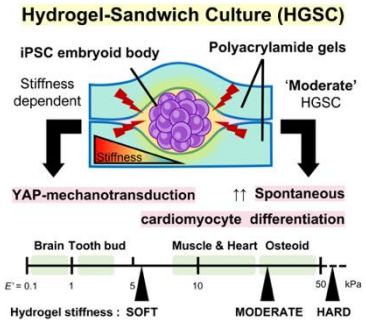
A Hydrogel-Sandwich Culture: Understanding Mechanobiology in 3D-iPSC Aggregate

Authors and Co-authors	Praphawi Nattasit[1], Kunimichi Niibe[2], Masaya Yamamoto[3], Hiroshi Egusa[2]
Affiliations	[1]Department of Oral Medicine and Periodontology, Faculty of Dentistry, Mahidol University, Thailand [2]Division of Molecular and Regenerative Prosthodontics, Tohoku University Graduate School of Dentistry, Japan [3]Department of Material Processing, Graduate School of Engineering, Tohoku University, Japan
Presentation Summary	 Mechanical cues, such as substrate stiffness, are known to regulate stem cell differentiation. However, few studies have focused on these effects in induced pluripotent stem cell (iPSC) aggregates and there are difficulties in retrieving cells from the encapsulated environment. To overcome this limitation, 'hydrogel-sandwich culture' (HGSC) has been established by our group, aiming to modulates mechanical cues according to the stiffness of the hydrogel. Our studies using HGSC revealed the roles of environment stiffness applied to iPSC aggregates on the mechanotransduction and differentiation of iPSC-embryoid bodies. Hence, HGSC holds the potential platform for further *in vitro* investigation of mechanobiology in a 3D cell culture model of dental-derived cells. Reference: Nattasit, P., (2023). *Macromolecular Bioscience*, 23(7), 2300021.
Keywords	Hydrogel, iPSC, Embryoid bodies, 3D-culture, Mechanobiology, Mechanotransduction

Symposium II: Advances in Oral Biology

Chairs:

Prof. Miho Terunuma, Niigata University, Japan

Prof. Thantrira Porntaveetus, Chulalongkorn University, Thailand

Speakers:

S2-1: Oxidative Stress in Organogenesis

Prof. Atsushi Ohazama, Niigata University, Japan

S2-2: Role of Tumor Microenvironment in Head and Neck Cancer and Natural Product-based Treatment

Assoc. Prof. Kusumawadee Utispan, Thammasat University, Thailand

S2-3: Precision Dentistry Unveiled: Elevating Oral Healthcare Standards

Prof. Thantrira Porntaveetus, Chulalongkorn University, Thailand

S2-4: Targeting Lipogenesis as a Potential Strategy for Oral Cancer Treatment

Prof. Miho Terunuma, Niigata University, Japan

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Oxidative Stress in Organogenesis

Authors and Co-authors	Atsushi Ohazama
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Presentation Summary	All living organisms on the Earth live under an oxidant atmosphere (a percentage of molecular oxygen of about 20%). Reactive oxygen species (ROS) are normally produced in the living organisms as a result of normal cellular metabolism and homeostasis. Production of ROS is thus a part of physiological process. In physiological conditions, the deleterious effects of ROS are neutralised by our body's natural antioxidant system. However, when ROS production exceeds the neutralising ability of antioxidant defences or antioxidant system does not function properly, ROS production overwhelm antioxidant defenses, leading to the generation of a noxious condition called, oxidative stress. Oxidative stress is known to induce various types of damages including the destruction of intracellular structures such as proteins, lipids and DNA, which lead to senescence and/or wide variety of diseases. Recently, we found that oxidative stress is occurred in embryonic skin, tooth germ and face. I will introduce recent findings showing how oxidative stress is involved in organogenesis.
Keywords	Organogenesis, Oxidative stress

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Role of Tumor Microenvironment in Head and Neck Cancer and Natural Product-Based Treatment

Authors and Co-authors	Kusumawadee Utispan
Affiliations	Faculty of Dentistry, Thammasat University, Thailand
Presentation Summary	Head and neck squamous cell carcinoma (HNSCC) typically originates from the epithelial lining of mucosal surfaces within the head and neck region. Despite efforts, the five-year survival rate for HNSCC has remained significantly unchanged, largely due to the tumor's resistance to treatment. The tumor microenvironment (TME) is a multifaceted entity that envelops and promotes tumor cell advancement while also conferring resistance to diverse therapeutic interventions. The composition of the TME encompasses various elements such as immune cells, stromal cells, blood vessels, and extracellular matrix. We investigated the impact of TME on tumor progression across different clinical stages of primary and metastatic HNSCC cell lines. Our findings revealed that macrophages-associated or tumor-associated molecules including nitric oxide, migration inhibitory factor, and tumor necrosis factor-alpha play significant roles in promoting HNSCC cell proliferation, autophagy, evasion of apoptosis, and invasion, with effects varying between different clinical staging. To reduce chemoresistance in tumor cells, numerous natural products have been proposed as potential cancer therapeutic agents. Among these, propolis (bee glue) and *Ocimum sanctum* Linn. (holy basil) are traditional Thai remedies with promising anti-cancer properties. In our study, we explored the cytotoxic effects of propolis and *O. sanctum* extracts on HNSCC cells. Our results demonstrated that propolis extract exerted cytotoxic activity against HNSCC cells, while *O. sanctum* extract

	induced oxidative stress, attenuated matrix metalloproteinase activity, and reduced invasiveness in HNSCC cells. In conclusion, the influence of TME on HNSCC cell behavior is intricately linked to the characteristics of tumor cells and their environmental niche. Targeting TME components and tumor cells using natural products represents a contemporary avenue in cancer therapy. Understanding the role of TME and the application of natural products are pivotal for refining therapeutic strategies against HNSCC.
Keywords	Head and neck cancer, tumor microenvironment, propolis, *Ocimum sanctum*, anti-cancer properties

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Precision Dentistry Approaches for Dentinogenesis Imperfecta

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Affiliations	[1]Center of Excellence in Genomics and Precision Dentistry, Department of Physiology, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand [2]Department of Pediatric Dentistry, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand [3]Center of Excellence for Medical Genomics, Department of Pediatrics, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand [4]Excellence Center for Medical Genetics, King Chulalongkorn Memorial Hospital, Thai Red Cross Society, Bangkok, Thailand [5]Graduate Program in Geriatric and Special Patients Care, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand.
Presentation Summary	Dentinogenesis Imperfecta (DGI) is a genetic disorder causing abnormal dentin formation. The non-syndromic form of DGI is caused by pathogenic variants in the *DSPP* gene. We analyzed two DGI-affected families, identifying disease-causing variants through Exome and Sanger sequencing, coupled with bioinformatics analysis. Physical characteristics of DGI-affected teeth were investigated. In these families, two novel heterozygous frameshift DSPP variants were detected. Both variants are located in exon 5, likely altering the dentin phosphoprotein (DPP) repeating sequence pattern. All affected individuals displayed opalescent teeth, bulbous crowns, and obliterated pulp chambers. Additionally, the first proband exhibited a copper-beaten skull, a sign of craniosynostosis, necessitating immediate medical intervention. Ultrastructural analysis of DGI-affected primary teeth revealed

	dark and red-yellow coloration, reduced mineral density, hardness, and elastic modulus. Disruptions in the dentinal tubules and dentinoenamel junction, along with changes in mineral content, were observed. These findings underscore the influence of DSPP frameshift variants on dentin properties, composition, and ultrastructure. Overall, these findings enhance our understanding of DGI-DSPP genotype-phenotype relationships and emphasize the crucial role of dental professionals in managing dental issues and contributing to broader medical interventions.
Keywords	Dentin, DSPP, Genetics, Genome

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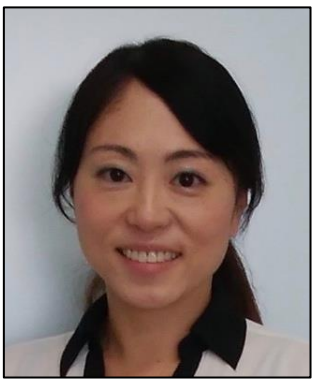

Targeting Lipogenesis as a Potential Strategy for Oral Cancer Treatment

Authors and Co-authors	Miho Terunuma
Affiliations	Division of Oral Biochemistry, Graduate School of Medical and Dental Sciences, Niigata University
Presentation Summary	Cancer cells are different to normal cells in many ways. They can quickly divide, grow and form a tumor. To do so, cancer cells undergo metabolic reprogramming and fulfill their demands. Oral squamous cell carcinoma (OSCC) is the most common form of head and neck cancer. It has a high prevalence in certain regions in the world and is associated with a high mortality rate. To identify a novel cancer therapeutic target, my lab has focused on the lipid metabolism because lipids are an essential component of cell membranes and hormones. It is also an efficient source of energy. In this symposium, I will introduce a novel pathway that is enhanced in the OSCC cells and a previously un-understood mechanism of anti-cancer drugs targeting lipid metabolism.
Keywords	Oral cancer, lipid metabolism

Symposium III: Future Perspective for Oral and Maxillofacial Surgery in Asian Countries

Chairs:

Prof. Kei Tomihara, Niigata University, Japan

Prof. Chandan Upadhyaya, Kathmandu University School of Medical Sciences, Nepal

Speakers:

S3-1: Skeletal Stability after Two-jaw Surgery in Patients with Cleft Palate

Dr. Ryoko Takeuchi, Niigata University, Japan

S3-2: An Investigation of Masseter Muscle Activity during Awake and Sleep in Healthy Indonesian University Students using A Portable EMG Device

Assoc. Prof. Acing Habibie Mude, Hasanuddin University, Indonesia

S3-3: Simplifying Complex & Maximizing Predictable Outcome in Implant Treatment - Mahidol Dental Implant Center

Dr. Pranai Nakaparksin, Mahidol University, Thailand

S3-4: Treatment Strategy for Advanced-Stage Oral Cancer

Prof. Kei Tomihara, Niigata University, Japan

S3-5: Maxillofacial Fractures: Etiology, Pattern Treatment and Outcome – An Experience from Tertiary Care Hospital, Nepal

Prof. Chandan Upadhyaya, Kathmandu University School of Medical Sciences, Nepal

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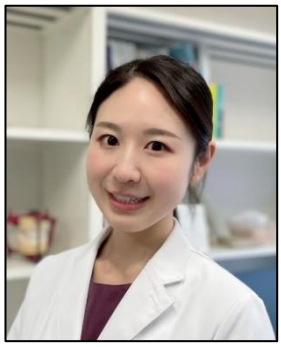

Impact of Velopharyngeal Function and Skeletal Stability after Orthognathic Surgery in Cleft Palate Patients

Authors and Co-authors	Ryoko Takeuchi
Affiliations	Division of Reconstructive Surgery for Oral and Maxillofacial Region, Faculty of Dentistry & Graduate School of Medical and Dental Sciences, Niigata University
Presentation Summary	Introduction: In orthognathic surgery for cleft palate patients with maxillary undergrowth, it should be carefully planned because maxillary advancement affects velopharyngeal function (VPF). In addition, they have already been invasive by cleft palate surgery before undergoing orthognathic surgery, so it is pointed out that they may have problems with relapse after surgery. In this study, we evaluated VPF and skeletal stability before and after orthognathic surgery in cleft palate patients. Subjects: The cleft palate patients who underwent two-jaw surgery were included. VPF was evaluated using a 4-grade evaluation based on the cleft palate language test and a nasalance score using a nasometer before and after surgery. The relationship between maxillary advancement and VPF was investigated. Regarding skeletal stability, we determined the two-dimensional coordinate values of each measurement point on the maxilla and mandible in standard lateral cephalometric X-ray photographs taken before, immediately after, and over 1 year after surgery. We calculated the amount of movement during surgery and the amount of change after surgery using a straight line parallel to the FH plane as the X axis and a straight line perpendicular to the FH plane as the Y axis. Results: In patients whose VPF was good in preoperative evaluation, there was no effect on postoperative speech function even when the amount of maxillary advancement was determined with priority given to improving facial

	morphology. In a case in which preoperative VPF was mildly impaired, we prioritized the patient's chief complaint and moved the maxilla forward, resulting in a temporary deterioration of postoperative speech function. Regarding skeletal stability, the position of the maxilla remained relatively stable postoperatively, but the mandible showed various changes. Postoperative orthodontic treatment resulted in mostly satisfactory occlusion, but patients with preoperative open bites had a strong tendency to relapse, and sufficient care was needed.
Keywords	Orthognathic surgery, Cleft palate, Velopharyngeal function, Skeletal stability

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An Investigation of Masseter Muscle Activity during Awake and Sleep in Healthy Indonesian University Students using a Portable EMG Device.

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Presentation Summary	Previous studies have confirmed the correlation between masticatory muscular activity (MMA) and temporomandibular disorders (TMD). Most of them investigated the activity of masseter muscles relate it to the muscle state in healthy subjects. However, the feature of MMA in healthy subjects remains unclear. Revealing MMA properties under healthy conditions is expected, particularly in order to elucidate those under disordered ones. Therefore, we evaluated the features of MMA in a large sample of healthy individuals during their daily lives including waking and sleeping periods using an EMG portable. We found that MMA during awake had a considerably higher frequency of episodes and a longer total duration of episodes than during sleep. Considering the common fact that awake hours are longer than sleeping hours, the EMG activity during awake might have stronger effect on stomatognathic system.
Keywords	Masseter muscle activity, temporomandibular disorders, electromyography devices.

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Simplifying Complex & Maximizing Predictable Outcome in Implant Treatment - Mahidol Dental Implant Center

Authors and Co-authors	Pranai Nakaparksin, DDS, MSD, FRCD(c), FACP
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Presentation Summary	Implant dentistry has been utilized worldwide to improve the function and aesthetics of patients with missing dentition. Despite its benefits, there is no denying that implant treatment requires complex procedures. Implant treatment generally involves a high degree of modality, from surgery to potentially undesirable prosthesis outcomes that may differ from the planned result. This presentation will demonstrate the protocol of the Mahidol University Dental Implant Center, advocating the use of digital technology to simplify and maximize predictable outcomes from single-tooth to full-arch restoration.
Keywords	Dental implant, Guided surgery, 3D-printed, Dental esthetic

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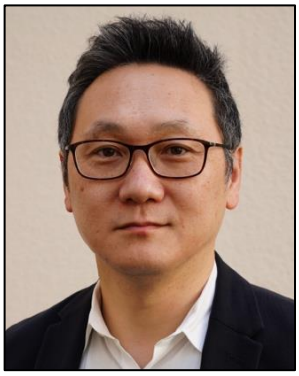

Treatment Strategies for Advanced-Stage Oral Cancer

Authors and Co-authors	Kei Tomihara
Affiliations	Division of Oral and Maxillofacial Surgery, Niigata University, Graduate School of Medical and Dental Sciences
Presentation Summary	Most patients with stage I or II oral cancer can be successfully treated with either surgery or radiation therapy. Stages III and IVA advanced cancers have often required a combination of therapy and surgery followed by reconstruction. In more advanced cases with metastatic disease or recurrence, platinum-based combination chemotherapy or chemoradiotherapy has been the standard treatment. However, current therapeutic options are often ineffective for these cases. Therefore, the development of new strategies would be desirable. Recently, molecular targeting therapy against epidermal growth factor receptor EGFR cetuximab has been widely used for recurrent oral cancers, and if conventional chemotherapies are no longer working, radiation and anti-EGFR drug cetuximab can be used in some cases, but all patients will ultimately develop the progressive disease by treatment resistance. More recently, as a newer option, immunotherapy targeting immune checkpoint molecules has opened new opportunities for recurrent or metastatic oral cancers. In this presentation, we will focus on novel strategies for advanced-stage oral cancer especially immunotherapy by immune checkpoint inhibitors.
Keywords	Oral cancer, Advanced stage, Immunotherapy, Immune checkpoint molecules, Molecular targeting therapy

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Maxillofacial Fractures: Etiology, Pattern Treatment and Outcome – An Experience from Tertiary Care Hospital, Nepal

Authors and Co-authors	Upadhyaya C[1], Chaurasia NK[2], Dulal S[3]
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Presentation Summary	The etiology of maxillofacial trauma has changed continuously over the past three decades, and they continue to do so. It varies by socioeconomic status, and cultural characteristics, from one geographical location to another and among different age groups. This study included all of the patients with trauma with their demographic data of the patient, pattern of injury, treatment given and outcome in terms of any complications were recorded. The paper presentation will provide an insight into changing etiology and pattern of maxillofacial fractures in Nepal
Keywords	Maxillofacial trauma, Maxillofacial fractures, Motor vehicle accidents, Treatment outcome

Symposium IV: Oral Health Promotion and Disease Prevention

Chairs:

Prof. Hiroshi Ogawa, Niigata University, Japan

Dr. Matana Kettratad-Pruksapong, Thammasat University, Thailand

Speakers:

S4-1: Implementing Geriatric Oral Health Components as Part of Primary Health Care in Thailand: Hope Amidst the Struggle

Dr. Matana Kettratad-Pruksapong, Thammasat University, Thailand

S4-2: Assessment and Management of Oral Hypofunction

Dr. Jin Magara, Niigata University, Japan

S4-3: The Use of Digital Technology for Oral Health Survey and Community Oral Health Programs: An Indonesian Experience

Asst. Prof. Melissa Adiatman, University of Indonesia, Indonesia

S4-4: Improving Nutritional Status in Older Persons with Tooth Loss

Assoc. Prof. Tippanart Vichayanrat, Mahidol University, Thailand

Name: Matana Kettratad-Pruksapong

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Implementing Geriatric Oral Health Components as Part of Primary Health Care in Thailand: Hope Amidst the Struggle

Authors and Co-authors	Matana Kettratad-Pruksapong
Affiliations	Thammasat University, Faculty of Dentistry
Presentation Summary	The Primary Care System Act B.E. 2562 came into force since 2019. This legislative mechanism identifies dental professionals as part of the primary care team for every catchment area. However, the roles and responsibilities of dentists and dental nurses/hygienists have been requested for clarification. Mainly, the definition of primary care itself is often misunderstood. Hence, the confusing direction of policies and action plans. The objectives of this presentation comprise of 1) describing historical background and recent development of primary care reform in Thailand and how oral health care fits in; and 2) sharing a critical reflection, from the standpoint of a task force member, on the hope and the struggle implementing oral health care into the dynamic of changes of primary care in Thailand.
Keywords	Primary Health Care, Oral Health, Delivery of Health Care, Primary Dental Care, Patient-Centered Care

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Assessment and Management of Oral Hypofunction

Authors and Co-authors	Jin Magara, Wakana Onuki, Reiko Ita, Takanori Tsujimura, Makoto Inoue
Affiliations	Division of Dysphagia Rehabilitation, Niigata University Graduate School of Medical and Dental Sciences
Presentation Summary	According to the concept of oral hypofunction proposed by the Japanese Society of Gerodontology, clinical examination and management of oral hypofunction had been covered by the national health insurance of Japan since 2018. Clinical practice has recently been expanding among dentists in Japan. The dental department of our hospital established a laboratory for management of oral function in June 2019 to evaluate oral function in outpatients who visited the dental department. The first part of this presentation summarized clinical data on patients who underwent functional oral examination and the impact of management on patients with oral hypofunction in the University Hospital. In the latter part, we introduce the basic study to evaluate electromyographic properties of tongue pressure generation, which is one of the seven items to diagnose oral hypofunction.
Keywords	Oral hypofunction, Tongue pressure

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The Use of Digital Technology for Oral Health Survey and Community Oral Health Programs: An Indonesian Experience

Authors and Co-authors	**Melissa Adiatman**, Atik Ramadhani, Gita Sjarkawi, , Febriana Setiawati, Risqa Rina Darwita, Armasastra Bahar, Anton Rahardjo, Iwany Amalliah
Affiliations	Department of Dental Public Health and Preventive Dentistry, Faculty of Dentistry, Universitas Indonesia
Presentation Summary	The advancement of digital technology has provided new opportunities for enhancing oral health survey methods and community oral health programs. This symposium session discusses the Indonesian experience in utilizing digital technology for oral health survey and promote community-based oral health initiatives. By optimizing the use of technology, such as mobile applications, electronic data collection tools, and telehealth services, oral health surveys have become more efficient, accurate, and accessible. These modifications enable real-time data collection, analysis, and visualization, facilitating prompt referral and targeted interventions. Furthermore, digital platforms have facilitated the implementation of community oral health programs, including oral health education, preventive interventions, and remote consultations, particularly in underserved areas with limited access to dental care. In Indonesia, social media offers a powerful platform for optimizing oral health promotion by reaching diverse audiences, fostering engagement, and disseminating educational content. Oral health promoters can enhance awareness, knowledge, and behaviors related to oral health, ultimately contributing to improved oral health outcomes.
Keywords	e-oral health, digital technology, oral health survey, oral health promotion, social media use

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Improving Nutritional Status in Older Persons with Tooth Loss

Authors and Co-authors	Kasamaporn Rakyoo[1], **Tippanart Vichayanrat[2]**, Chuchai Anunmana[3], Wantanee Kriengsinyos[4], Piyada Gaewkhiew[2]
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Presentation Summary	Considering the vital role nutrition plays in the health and well-being of older adults, it is crucial for dental professionals to understand how tooth loss and dietary changes affect this demographic. However, research suggests that merely replacing missing teeth may not suffice to enhance the nutritional well-being of older individuals with tooth loss. This presentation explores the adverse outcomes associated with inadequate nutrition in older persons and tools for assessing nutritional status in older persons dealing with tooth loss. Additionally, it delves into the effectiveness of combining dentures with dietary guidance, particularly in Thailand. The utilization of INMUCAL-NUTRIENTS V.4.0 software for nutrient analysis, as well as dietary counseling strategies grounded in the Health Belief Model (HBM), is also explored. Ultimately, to ensure adequate nutritional intake, dental practitioners are encouraged to integrate dietary advice into providing dental prostheses for older adults with tooth loss.
Keywords	tooth loss, nutrition, diet, denture, tooth loss, health belief model

May 31, 2024 (Friday)

15:30 – 17:00 **Oral Presentation 1: Oral Health Promotion**

Chairs:

Asst. Prof. Kaung Myat Thwin, Niigata University, Japan

Dr. Raksanan Karawekpanyawong, Mahidol University, Thailand

June 1, 2024 (Saturday)

12:30 – 13:30 **Oral Presentation 2: Periodontology**

Chairs:

Assoc. Prof. Naoki Takahashi, Niigata University, Japan

Asst. Prof. Kallapat Tansriratanawong, Mahidol University, Thailand

13:30 – 15:00 **Oral Presentation 3: Diverse Oral Health Research**

Chairs:

Assoc. Prof. Takanori Tsujimura, Niigata University, Japan

Asst. Prof. Kajohnkiart Janebodin, Mahidol University, Thailand

Oral Health-Related Quality of Life in Liver Transplant Patients

Andreea C. Didilescu[1], Adelina Lazu[1,2], Hendrik Brand[2]

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Type of presentation: ■ Oral Presentation ☐ Poster Presentation

Abstract

Background: Liver transplant (LTx) candidates represent a population group with serious general health problems, with quality of life being an important issue in the success of the procedure.

Aim/objectives: The objective of the present study was to assess the quality of life in relation to oral health in LTx patients in the context of specific socio-demographic conditions.

Materials and Methods: The study included 27 LTx patients recruited from the Department of Liver Transplant, St Mary's Clinical Hospital, Bucharest, and 29 systemically healthy dental outpatients (controls). Quality of life in relation to oral health was assessed using the Oral Health Impact Profile (OHIP-14) questionnaire validated in Romanian language.

Results: There were no significant differences between the mean ages of the two groups (54.35 +/- 9.26 years LTx patients *versus* 53.41 +/- 9.92 years dental patients; $p>0.05$). Gender analysis found no significant differences between the two groups (55.56% female LTx patients *versus* 75.86% female controls; $p>0.05$). The socioeconomic environment was predominantly urban in both groups (81.48% LTx patients *versus* 96.55% controls; $p>0.05$). The total scores obtained by completing the OHIP-14 questionnaire were higher in the LTx group, without statistical significance, reflecting a lower quality of life compared to the control group (means 12.45 *versus* 11.21). The negative correlation of OHIP-14 scores with time since transplant ($r=-0,22$) suggests an improvement in oral health-related quality of life as patients progressed from the time of surgery.

Conclusion: The quality of life in relation to oral health in LTx patients seems to be affected especially close to the surgery time; therefore, prophylaxis and dental treatment for liver transplant patients should be taken into consideration prior and after liver transplantation.

Keywords: liver transplant; oral health; questionnaire

May 31, 2024 (Friday) 15.30 – 17.00: O1-2

Relationship between Oral Health and Frailty among Community-Dwelling Elderly Living in Sleman District, Yogyakarta, Indonesia

Elastria Widita[1,7], Christia Aye Waindy Vega[2,7], Budi Rodestawati[3,7], Regina TC., Tandelilin[3,7], Iffah Mardiyah[4,7], Bekti Nuraini[2,7], Prayudha Benni Setiawan[5,7], and Jong-Hwa Jang[6]

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Type of presentation: ■ Oral Presentation ☐ Poster Presentation

Abstract

Background: The oral health status among population is an essentials aspect of overall health. The elderly population have a higher prevalence of oral disease which have been proven to have a positive association with frailty.

Aim/objective: The aim of this study was to explore the relationship between oral health and frailty among the community-dwelling elderly in Sleman District, Yogyakarta Province, Indonesia.

Material and Methods: A cross-sectional study design involving was used to explore the relationship. Frailty was measured using fried frailty index includes weight loss, physical endurance, low physical activity, weakness and slow walking speed. Frailty was defined as having three out of five phenotypic criteria. Binary logistic regression analyses were conducted with frailty as the outcome of variable. While, number of teeth, caries, periodontal, dysphagia, and xerostomia status, oral hygiene related behaviour were measured as independent variables. Analyses were additionally adjusted for socioeconomic, nutrition status and behavioural characteristic.

Results: The prevalence of frailty was 31.9% among participants (N=405). In the final adjusted model, having more teeth significantly associated with lower odds of being more frail (p=0.027; OR=0.523; 95% CI[0.294-0.930]).

Conclusion: Findings from this study show having more teeth are associated with lowering risk of being frail.

Keywords: frailty, oral health, number of teeth, periodontal disease, dysphagia, xerostomia.

Psychological Factors Associated with Oral Health Status among COVID-19 Affected Older Adults in Myanmar

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Type of presentation: ■ Oral Presentation ☐ Poster Presentation

Abstract

Background: The COVID-19 pandemic has profoundly impacted global health systems, with older adults being particularly susceptible to its adverse effects; many challenges also occurred in dentistry field. Myanmar, like other nations, has experienced a rapid spread of COVID-19, recording over 640,000 confirmed cases, with a notable proportion affecting older adults.

Aim/objectives: The objective is to assess the association between psychological factors and oral health status in Myanmar older adults with a history of COVID-19 infection.

Materials and Methods: This cross-sectional research was conducted in Yangon from February 2023 to January 2024. Data were collected by using a paper-based questionnaire with face-to-face interviews in Myanmar language; self-structured socio-demographic and behavioral factors were included, and clinical oral examinations were performed at the health center. Participants' emotional states of depression, anxiety, and stress were measured using the validated instrument tool (DASS-21).

Results: Among 130 participants, the mean number of present teeth, DMFT, bleeding on probing, and periodontal pockets were 28.90 ± 3.08, 6.57 ± 6.45, 5.04 ± 4.12 and 4.93 ± 5.25, respectively. In linear regressions with adjusted for both socio-demographics and behavioral factors, we found positive associations in depression with DMFT (B:3.73; 95%CI:1.22,6.24), while anxiety with present teeth (B:1.72; 95%CI:0.60,2.85), bleeding on probing (B:1.60; 95%CI:0.02,3.18), and periodontal pockets (B:6.14; 95%CI:4.42,7.86). On the other hand, there was no significant association between stress and oral health status. However, we are unable to conclude that these psychological factors related to COVID-19's history. To fully understand the complicated relationship between psychosocial factors and COVID-19's history, and their effects to older adults' oral health in Myanmar, especially after overcame COVID-19, more retrospective cohort studies are necessary.

Conclusion: This study shows the associations between both depression and anxiety with oral health status, indicating psychological factors may indicate a higher risk for oral health problems in Myanmar older adults.

Keywords: Myanmar, COVID-19, older adults, oral health, psychological factors

Differences in Periodontal Status Among Employees in Japanese Manufacturing Establishments Having and Not Having a Family Dentist

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Type of presentation: ■ Oral Presentation ☐ Poster Presentation

Abstract

Background: Recent studies have indicated that individuals with a family dentist have better oral health. However, since there are no mandatory dental checkups for periodontal disease and dental caries for workers in Japan, most research in this area uses questionnaires rather than oral examinations. Therefore, there are still many unresolved issues regarding understanding oral health at a working age.

Aim/objectives: This research aimed to investigate whether having a family dentist was linked to the periodontal status of manufacturing industry employees.

Materials and Methods: Participants were employees of a manufacturing company in Toyama. The cross-sectional data was obtained from the annual dental checkups and self-completed questionnaires conducted in 2023. The self-completed questionnaire included questions on having a family dentist and the self-evaluated periodontal condition. IBM SPSS ver. 29.0.1.0 was used to analyze the oral condition by having a family dentist (FD (+) participants and FD (-) participants).

Results: Participants included 5,646 employees aged 19-75 years (mean 39.89 ± 12.58), of whom 4,049 (71.7%) were male and 3,744 (66.3%) were FD (-). Oral examination results showed that FD (-) participants had a statistically higher prevalence of bleeding on probing (BOP) than FD (+) participants (47.6% vs. 39.2%; $p<0.001$), and a higher prevalence of moderate or higher calculus (14.5% vs. 4.8%; $p<0.001$) and poor oral hygiene (8.3% vs. 3.5%; $p<0.001$). The prevalence of self-reported symptoms of 'often bleeding when brushing' and 'having calculus' were higher among FD (-) participants than FD (+) participants (4.7% vs 2.1%; $p<0.001$, and 84.7% vs 64.9%; $p<0.001$).

Conclusion: FD (-) participants had a significantly worse periodontal status including BOP, calculus, and oral hygiene than FD (+) participants. FD (-) participants were also significantly more aware of bleeding when brushing and having calculus than FD (+) participants.

Keywords: Family dentist, Periodontal disease, Occupational dental health

Impact of a Teledentistry Program on Tooth-brushing Behavior and Oral Status in Cleft Lip and Palate Patients

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Abstract

Background: Patients with cleft lip and/or palate are prone to dental diseases due to unique dental abnormalities. Mechanical plaque control, primarily through tooth brushing, is fundamental for preventing oral diseases. Studies have demonstrated that teledentistry utilizing social networks can improve oral health awareness and potentially be used in remote areas by increasing access to dental services.

Aim/objectives: To assess a teledentistry-based program's impact on oral health and attitudes in children with cleft lip and palate from Thailand, Laos, and Myanmar.

Materials and Methods: A quasi-experimental study was initiated in October 2023 and concluded in December 2023, involving thirty-two children aged 6-15 and their guardians. Data collection involved interviewing about brushing behaviors by two trained interviewers and assessing clinical parameters, including the plaque index and gingival index. Subsequently, the oral health promotion program included personal consultation, instructions on oral behavior through entertainment activities, and tooth brushing with plaque disclosing tablets. Guardians were invited to join a voluntary group chat titled "Brushing Activities" on the Facebook Messenger platform and guided to capture and share close-up photographs of their teeth marked with the plaque disclosing tablet weekly.

Results: At the two-month follow-up, 27 participants (84%) remained engaged, with 11 (34%) actively participating for four to seven weeks, 9 (28%) for one to three weeks, and 7 (22%) showing no engagement. There were improvements in self-reported brushing behaviors, including increased brushing duration ($p < 0.001$), inducing a positive brushing technique ($p=0.003$), but no significant effect on inducing brushing discipline and brushing frequency. In terms of clinical parameters, the analysis showed significant reductions in both gingival index ($p<0.001$) and plaque index ($p<0.001$).

Conclusion: This study suggests a potential for applying teledentistry in oral health promotion programs, leading to innovative approaches to dental care accessibility and patient education.

Keywords: Teledentistry, Oral Health Promotion, Cleft Lip and Palate, Plaque Index, Gingival Index

May 31, 2024 (Friday) 15.30 – 17.00: O1-6

Relationship Between Alcohol Consumption and Tooth Loss: A Five-year Cohort Study

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Type of presentation: ■ Oral Presentation □ Poster Presentation

Abstract

Background: Alcohol consumption may be associated with an increased risk of tooth loss, but the relationship between alcohol consumption and tooth loss has not been thoroughly investigated.

Aim/objectives: The aim of this study was to investigate the relationship between alcohol consumption and tooth loss over a five-year period in community-dwelling Japanese persons.

Materials and Methods: Longitudinal data from the survey of the Uonuma Cohort Study in Niigata were used. A questionnaire survey of residents aged 40 years or older was conducted at baseline and then five years later. The characteristics of the participants were compared by sex and baseline alcohol consumption (never drinker, past drinker, and current drinker: 1-149 g ethanol/week, 150-299 g ethanol/week, 300-449 g ethanol/week, ≥450 g ethanol/week). The relationship between baseline alcohol consumption and tooth loss over a five-year period was assessed using logistic regression analysis, stratified by sex. The number of missing teeth over the five-year period was selected as the dependent variable, and the characteristics of the participants were used as independent variables.

Results: This study included 15,315 Japanese adults [7,843 men and 7,472 women; mean (standard deviation) age 60.6 (10.6) years]. Only in women, the highest quartile of the number of missing teeth was significantly correlated with never drinker, past drinker, and consumption of ≥ 450 g ethanol/week (compared with 1-149 g ethanol/week). The adjusted odds ratios [95% confidence intervals] were 1.21 [1.04-1.40], 1.69 [1.20-2.38], and 1.81 [1.13-2.91], respectively.

Conclusion: The results suggest that alcohol consumption had a significant correlation with tooth loss in women, but not in men, showing a clear sex difference.

Keywords: Alcohol consumption, Tooth loss, Cohort study

Dental Caries and Tooth Wear Among 12-Year-Old Hong Kong Children

Faith Miaomiao Zheng, Iliana Gehui Yan, Chun Hung Chu, Jing Zhang

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Type of presentation: ■ Oral Presentation ☐ Poster Presentation

Abstract

Aim/objectives: This study aimed to investigate the dental caries, tooth wear status and oral health-related habits of 12-year-old Hong Kong children.

Materials and Methods: This cross-sectional survey recruited 12-year-old children using clustered random sampling. Twelve primary schools were selected from the three main districts according to the population. A trained examiner performed the dental examination in the primary schools. The child's caries experience was recorded using the decayed, missing, and filled tooth (DMFT) index. The tooth wear status was determined using the Basic Erosive Wear Examination (BEWE) index. The child's oral hygiene practice was collected using a self-administered questionnaire.

Results: This survey recruited 445 children and 396 children participated (response rate 89%). Their mean DMFT was 0.3±0.7. Most children (82%, 326/396) had no caries experience (DMFT=0). Seventy children (18%, 70/396) had caries experience (DMFT>0) and they had a total of 116 teeth suffered from caries. Among these 116 teeth, 75 (65%, 75/116) teeth were filled (FT), one tooth (1%, 1/116) was extracted due to caries (MT), and 40 teeth (34%, 40/116) were carious (DT). Five children had more than one decayed tooth (DT>1), and one child had the highest DT at 4. BEWE found 367 (93%, 376/396) children had no tooth wear (BEWE=0). No child had severe tooth wear (BEWE=3). Additionally, 380 (96%, 380/396) children brushed their teeth daily and 116 children (29%, 116/396) flossed their teeth.

Conclusion: Most 12-year-old Hong Kong children had neither caries experience nor tooth wear, and their oral health-related habits were satisfactory.

Significance: Most 12-year-old Hong Kong children brushed their teeth daily. Additionally, the Hong Kong Government provided oral health education, school dental care services, and water fluoridation. These could contribute to the low dental caries status and low dental erosion status among 12-year-old Hong Kong children.

Keywords: Caries, Children, Erosion, Wear, Oral health

The Evaluation of Electromyographic Property of Tongue and Suprahyoid Muscles During Isometric Tongue Pressure Generation

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Type of presentation: ■ Oral Presentation □ Poster Presentation

Abstract

Background: Intrinsic tongue (I-ton), extrinsic tongue and suprahyoid (S-hyo) muscles work cooperatively during tongue pressure generation. However, it has not been revealed that how intrinsic tongue muscle contributes to tongue pressure generation.

Aim / objectives: To clarify the characteristics of the activity of the I-ton and S-hyo muscles during isometric tongue pressure generation.

Materials and Methods: Twenty healthy adult volunteers participated and underwent the measurement of maximum tongue pressure using a balloon-type device. Next, they were instructed to perform 10-second tongue pressure generation at 25, 50, 75, and 100% of the maximum effort in randomized order with visual feedback. During each task, electromyograms (EMGs) of I-ton and S-hyo–muscles were simultaneously recorded. I-ton muscle EMG was recorded by using suction type surface electrode and S-hyo muscle EMG was recorded by using bipolar surface electrode. Average of rectified EMG burst and mean power frequency of EMG burst were compared among the tasks. Furthermore, temporal changes of these values were evaluated by dividing the 10-second recording period into three substages; early (1-4s), middle (4-7s) and late (7-10s). Each comparison of strength of tongue pressure and temporal change was statistically analysed with Friedman test, and significance level was set at 0.05.

Results: There was no time-dependent change of I-ton EMG activity during the 10-second task while the mean power frequency of tongue EMG burst was decreased in all tasks. However, S-hyo EMG activity gradually increased except 25% strength and there was no temporal change of mean power frequency.

Conclusion: When the strength of tongue pressure increases, not only I-ton muscle but also S-hyo muscle activity increase. Although tongue muscle may easily fatigue during 10-second tongue pressure generation, S-hyo muscle may help compensate the weakened tongue muscle activity by increasing their activity to maintain tongue pressure.

Keywords: electromyogram, tongue pressure, tongue muscle, suprahyoid muscle, muscle fatigue

Effect of Chemotherapy on Survival in Patients with Jaw Osteosarcoma: A Systematic Review

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Type of presentation: ■ Oral Presentation ☐ Poster Presentation

Abstract

Background: Jaw osteosarcoma presents challenges compared to long bone osteosarcoma due to its distinctive presentation and behavior. Although chemotherapy has demonstrated survival benefits in long bone osteosarcoma, its efficacy in jaw osteosarcoma remains uncertain. This review aims to investigate whether chemotherapy provides a survival advantage for patients diagnosed with jaw osteosarcoma.

Aim / objectives: The primary objective of this review is to determine the impact of chemotherapy on survival outcomes in patients diagnosed with jaw osteosarcoma. The secondary objective is to assess potential factors affecting chemotherapy outcomes.

Materials and Methods: A thorough search of PubMed/Medline, EMBASE, and Google Scholar databases was conducted to identify studies examining the effect of chemotherapy on survival in patients with osteosarcoma. Data extraction, pooling, and analysis were performed using Kaplan-Meier methods and Cox regression.

Results: Studies reporting on the association between tumor grade and chemotherapy efficacy, as well as the influence of surgical margins and radiological findings, were included. Among the studies identified, tumor grade emerged as a significant factor influencing the efficacy of chemotherapy. Patients with high-grade osteosarcoma tended to derive greater benefit from chemotherapy compared to those with low-grade tumors. Additionally, factors such as surgical margins and radiological results were found to impact treatment outcomes.

Conclusion: This systematic review suggests that chemotherapy may not confer a consistent survival advantage to all patients with jaw osteosarcoma. Patients with high-grade jaw osteosarcoma may benefit more from chemotherapy compared to those with low-grade jaw osteosarcoma. Margin status, age, and tumor grade emerged as significant prognostic factors for survival in these patients. Further research is warranted to elucidate optimal treatment strategies and identify patients who may benefit most from chemotherapy in the management of jaw osteosarcoma.

Keywords: Jaw Osteosarcoma Chemotherapy Pathology and Histology Surgical Margins Survival

June 1, 2024 (Saturday) 12.30 – 13.30: O2-1

Hypoxia Aggravates Cell Death and Impairs Fibronectin Deposition in Human Gingival Fibroblasts treated with Alendronate

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Type of presentation: ■ Oral Presentation ☐ Poster Presentation

Abstract

Aim/objectives: The role of hypoxia in wound healing has been extensively studied in various conditions. However, its influence on the treatment of medication-related osteonecrosis of the jaw (MRONJ) remains uncertain. This study aims to investigate the impact of hypoxia on the viability and fibronectin deposition of human gingival fibroblasts (HGnF) treated under hypoxic conditions.

Methods: HGnF cells were cultured and subjected to normoxia (control group) or hypoxia (experimental group) using a hypoxic chamber. The viability of HGnF cells was assessed using a cell viability assay, while fibronectin deposition was evaluated through immunofluorescence staining. Additionally, gene expression analysis was performed to assess the expression levels of genes related to cell death and fibronectin synthesis.

Results: Our findings demonstrated that hypoxia significantly decreased the viability of HGnF cells compared to the normoxic conditions ($p < 0.05$). Furthermore, hypoxia led to substantial reduction in fibronectin deposition in HGnF cells ($p < 0.05$). Gene expression analysis revealed upregulation of pro-apoptotic genes and downregulation of genes involved in fibronectin synthesis in the hypoxic group compared to the normoxic group.

Conclusion: Hypoxia exacerbates cell death and impairs fibronectin deposition in human gingival fibroblasts. These results suggest that maintaining adequate oxygenation levels during MRONJ treatment might be crucial for promoting optimal wound healing and tissue regeneration. Further studies are warranted to explore potential therapeutic strategies targeting hypoxia-related mechanisms in MRONJ management.

Keywords: Hypoxia, Cell Death, Fibronectin Deposition, Gingival Fibroblasts, Alendronate

June 1, 2024 (Saturday) 12.30 – 13.30: O2-2

Antibacterial and Antibiofilm Activities of Choline Geranate-Ionic Liquid for Periodontal Therapy

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Type of presentation: ■ Oral Presentation ☐ Poster Presentation

Abstract

Background: Elimination of the subgingival pathogen, especially biofilm, is critical in the periodontal treatment. Choline Geranate-Ionic Liquid (CAGE) showed promising effects as a topical ointment against periodontitis with self-penetration into deep periodontal pockets and gingiva. However, little is known about its efficacy against the pathogens, especially those in the biofilm phase.

Aim/objectives: The purpose of this study was to evaluate the details of the antibacterial and antibiofilm activities of CAGE.

Materials and Methods: *Porphyromonas gingivalis* (ATCC33277/ W83), *Fusobacterium nucleatum* ATCC25586, *Prevotella intermedia* ATCC25611 and *Streptococcus mitis* ATCC903 were used. Antibacterial efficacy was assessed by measuring minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC). Mature multi-species biofilm was formed by 3-day incubation under anaerobic conditions. The inhibitory effect against biofilm-embedded pathobiont was assessed by live/dead staining and confocal laser scanning microscopy (CLSM). Reduction of biofilm mass was assessed by crystal violet (CV) staining and scanning electron microscopy (SEM). The penetration of CAGE into the biofilm was visualized by CLSM imaging.

Results: CAGE displayed complete killing efficacy on the representative planktonic bacteria at the concentration of 2.5 μg/μl without selectivity. The ratio of live/dead cells in biofilms was significantly decreased after CAGE treatment (1.25 μg/μl for 10 min), and cell death was obvious in CLSM images, demonstrating the bactericidal effect of CAGE on the biofilm bacteria. Quantification by CV staining showed that the CAGE treatment significantly decreased the biofilm mass, which was consistent with SEM images showing biofilm destruction. Furthermore, the actual penetration of CAGE into the biofilm was observed.

Conclusion: CAGE exhibited great permeability into the biofilm and significant antibacterial and antibiofilm activities against the periodontal pathogen. Combined with its self-permeability into periodontal pockets and gingiva, CAGE-ointment has great potential as a new topical periodontal agent.

Keywords: Periodontitis, Biofilms, Ionic Liquids, Drug Delivery Systems

Comparing Root Coverage Outcomes of Subepithelial Connective Tissue Grafts Harvested from the Palate Before and After Recipient Site Preparation

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Type of presentation: ■ Oral Presentation ☐ Poster Presentation

Abstract

Background: Gingival recession is a significant issue that affects about 50-100% of the population. This condition causes patients to experience hypersensitivity and unpleasant esthetics. A combination of subepithelial connective tissue graft (SCTG) with a coronally advanced flap (CAF) has been identified as the gold standard for treating gingival recession. Recently, some clinicians have modified traditional SCTG techniques by harvesting the donor graft prior to preparing the recipient site. This modified approach is believed to prevent overpreparation of the recipient site and minimize the duration of exposure for the recipient flap. However, there is still a lack of scientific evidence on this modified surgical technique.

Aim/objectives: This study aims to compare the root coverage outcomes of SCTG harvested from the palate before and after recipient site preparation.

Materials and Methods: Twenty single gingival recessions at buccal sites of single-rooted teeth classified as RT1 or RT2 were randomized into two treatment groups: harvested graft AFTER (Group A: control) and BEFORE (Group B: test) preparing recipient. Clinical examination, complications, and patient satisfaction were assessed at baseline and three months. Intraoral scanning was performed using 3-shape TRIOS 3 at baseline, 1-month, and 3-month and superimposed for digital evaluation of gingival recession depth, width, recession reduction (RecRed), percentage of root coverage (RC), area of recession, and gingival thickness (GT).

Results: At three months, digital evaluation of RC was 75.5% in group A and 84.2% in group B. No statistically significant difference was observed, but slightly higher RecRed, RC, and GT favors were presented in group B.

Conclusion: Harvested graft before recipient site preparation has no harm on clinical outcome. Still, it presents a slightly higher recession reduction compared to harvested graft after recipient site preparation.

Keywords: Gingival recession, root coverage, digital measurement

N-Acyl Homoserine Lactones Lactonase est816 Suppresses Biofilm Formation and Periodontitis in Rats Mediated by *Aggregatibacter actinomycetemcomitans*

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Type of presentation: ■ Oral Presentation ☐ Poster Presentation

Abstract

Background: est816 is a *N*-acyl homoserine lactones (AHLs) lactonase which catalyzes hydrolysis of AHLs, which are bacterial quorum sensing molecules for bacterial communication and regulate biofilm formation.

Aim/objectives: To explore the adjuvant therapeutic effect of *N*-acyl homoserine lactones (AHLs)-lactonase est816 on *Aggregatibacter actinomycetemcomitans* (*A. actinomycetemcomitans*) biological behaviors and periodontitis progression.

Materials and Methods: The inhibitory properties of est816 were detected by live/dead bacterial staining, scanning electron microscope (SEM), crystal-violet staining and reverse-transcription quantitative PCR (RT-qPCR). Biocompatibility of est816 on human gingival fibroblasts (HGFs) and human gingival epithelial cells (HGEs) was evaluated by CCK8 and ELISA. The ligature-induced periodontitis model was established in rats. Micro computed tomography and immunohistochemical and histological staining served to evaluate the effect of est816 on the prevention of periodontitis *in vivo*.

Results: est816 significantly attenuated biofilm formation, reduced the mRNA expression of cytolethal distending toxin, leukotoxin and poly-N-acetyl glucosamine (PNAG) and downregulated expressions of interleukin-6 and tumor necrosis factor-α with low cell toxicity. *In vivo* investigations revealed est816 decreased alveolar bone resorption, suppressed matrix metalloproteinase-9 expression and increased osteoprotegerin expression.

Conclusion: est816 inhibited *A. actinomycetemcomitans* biofilm formation and virulence release, resulting in anti-inflammation, and soothing of periodontitis in rats, indicating that est816 could be investigated in further research on periodontal diseases.

Keywords: acyl-homoserine lactones, *Aggregatibacter actinomycetemcomitans*, biofilm, virulence factor, periodontitis

June 1, 2024 (Saturday) 12.30 – 13.30: O2-5

Histological Observation on Periodontal Tissue After Vertical Root Fracture Repair with 4-META/MMA-TBB Resin mixed with CTGF, TGF-β3, and FGF

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Type of presentation: ■Oral Presentation □Poster Presentation

Abstract

Background: The remaining periodontal pocket after repair of vertical root fracture (VRF) could be problematic.

Aim/objectives: To investigate tissue responses to VRF repaired with 4-META-TBB resin (Superbond®, Sun Medical, Japan; SB), SB mixed with connective tissue growth factor (SB/CTGF), transforming growth factor-β3 (SB/TGF-β3), and fibroblast growth factor (SB/FGF).

Materials and Methods: Thirty-nine 4-week-old Sprague-Dawley rats were used. After general anesthesia, both maxillary first molars were extracted. VRF imitating groove was created at the mesial surface of the mesial root from the cementoenamel junction to the root apex using a diamond disc and pulpal tissue was removed. For SB group, SB was mixed and applied to the cavity. For SB/CTGF, SB/ TGF-β3, and SB/FGF group, 0.5 μL of each material was mixed with SB. In the control group, the groove was not repaired. The tooth was soaked in saline solution for 10 min before replanting and stabilized with the adjacent tooth. Opposing teeth were extracted. Rats were euthanized after 2, 4, and 6 weeks. Samples were stained with Hematoxylin and Eosin and Masson Trichrome, and histologically investigated.

Results: In SB group, mild-moderate inflammation was observed while severe inflammation was observed in the control group. No hard tissue formation on the material surface was found in both groups. The other groups showed no ankylosis, inflammation, or root resorption. Newly formed bone and cementum-like tissue were found close to the material where fibrous tissue was aligned parallel to the root surface. The soft tissue layer became narrower along the time passed. The challenge of this study was that the ratio of cavity/tooth size was considerably bigger than that of clinical repair.

Conclusion: The possibility of regenerating the hard tissue at the surface of repair materials upon VRF repair was suggested. A longer observation period is required to confirm the findings.

Keywords: Vertical root fracture, periodontal regeneration, Superbond, growth factor

June 1, 2024 (Saturday) 12.30 – 13.30: O2-6

Astrocytes as Potential Therapeutic Target for Epilepsy

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Abstract

Background: Astrocytes are the major glial cells in the brain that mediate brain function by taking up excess excitatory neurotransmitter glutamate in the synaptic cleft as well as ammonia from the blood vessels and converting them to glutamine. This function is carried out by the enzyme called glutamine synthetase (GS). It has been reported that GS expression is significantly reduced in the epileptic brain, which in turn causes glutamate elevation, persistent seizures, and neuronal cell death. However, the mechanism of GS downregulation remains unclear.

Aim/objectives: This study aimed to identify the mechanism of GS reduction in epilepsy and a novel pharmacological target for therapy.

Materials and Methods: Primary cultured astrocytes derived from fetal rat cerebral cortex were subjected to various stimuli and analyzed by western blotting and immunocytochemistry. The mouse model of epilepsy was generated by the intraperitoneal injection of kainic acid into C57BL/6 mice, and the immunohistochemical staining was performed.

Results: The treatment of cultured astrocytes with glutamate and ammonia reduced both GS mRNA and protein levels. We thus searched for the transcription factors that regulate GS and identified that Yes-associated protein (YAP), a potent transcription coactivator, modulates GS expression. Glutamate and ammonia stimulation suppressed YAP nuclear localization which led to GS reduction, but they were prevented by the Hippo pathway inhibitor XMU-MP-1. Therefore, we tested the effect of XMU-MP-1 in the mouse model of epilepsy, in which GS was significantly reduced. We found that XMU-MP-1 treatment promoted YAP nuclear translocation, restored GS expression, and inhibited neuronal cell death.

Conclusion: The expression of GS in astrocytes, which is reduced in epileptic brain, could be restored when YAP nuclear translocation was promoted. Thus, YAP expressed in astrocytes may be a novel therapeutic target for epilepsy.

Keywords: Astrocyte, Epilepsy, Glutamine Synthetase, YAP, Brain

Possible Mechanisms of Potassium ion Induced Swallowing Facilitation

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Type of presentation: ■ Oral Presentation ☐ Poster Presentation

Abstract

Background: In most dysphagia patients, swallowing initiation is impaired. To facilitate swallowing initiation, we explored which peripheral mechanisms are responsible for evoking swallow.

Aim/objectives: In this study, we evaluated the effect of potassium ion on swallow-related afferent activity and swallowing initiation in rats.

Materials and Methods: Experiments were performed on 7-9 w Sprague-Dawley male rats. In the first experiment, the number of swallows was compared among 3-µl distilled water (DW), solutions containing potassium (KCl, KF, and K_2SO_4) at several concentrations. In the second experiment, afferent discharges of superior laryngeal nerve (SLN) were recorded for 1 min after topical application of 3-µl DW, saline (160 mM NaCl) and KCl (160 mM) to the vocal folds. In the third experiment using conscious rats, compared licking behavior among DW, saline and KCl (160 mM). In the fourth experiment, the number of KCl evoked swallows was compared before and after topical application of K_{ATP} and Kir channel blocker. In the fifth experiment, we investigate expression of Kir6.2 and Kir3.1 in nodose ganglion (NG) and vocal fold mucosa by using immunohistochemical staining.

Results: The number of swallows was significantly larger during application of solutions containing potassium ion in the concentration dependent manner. The SLN responses to KCl were significantly larger during than DW and saline. Time interval of swallowing initiation was significantly smaller during KCl licking than that during saline and DW although the licking behavior did not differ among the conditions. After topical application of K_{ATP} and Kir blocker, the number of KCl evoked swallows was decreased. Finally, we confirmed expression of K6.2 and Kir3.1 in both NG and vocal fold mucosa.

Conclusion: Potassium ion facilitated the afferent responses and swallowing initiation in our acute and chronic studies. Further, current results suggest that K_{ATP} and Kir channels are responsible KCl evoked swallows.

Keywords: Swallowing initiation, Potassium ion, K_{ATP}, Kir.

June 1, 2024 (Saturday) 13.30 – 15.00: O3-2

Functional Role of the Sternohyoid Muscle in Breathing and Swallowing in Rats

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Abstract

Background: The sternohyoid muscle (SH) is a strap-like infrahyoid muscle located bilaterally lateral to the trachea. While it is believed to primarily lower the hyoid bone, its role in breathing and swallowing remains unclear.

Aim/objectives: To investigate the involvement of SH in the swallowing reflex, particularly focusing on how its activity is influenced under conditions of airway stenosis and fixed muscle length.

Materials and Methods: Anesthetized rats were used in three-part investigation. In the first part, electromyograms (EMGs) were used to evaluate the activities of intact SH, thyrohyoid muscle (TH), anterior belly of digastric muscle (Dig), and diaphragm (Dia) during swallowing with airway stenosis. In the later parts, SH was detached at its insertion to fix the muscle length because the myotatic reflex was expected to contribute to SH contraction during swallowing. In the second part, SH contraction was measured by a force transducer as with EMGs. The final section involved confirming neuron activation through motoneuron recordings.

Results: SH activity coincided with inspiration and swallowing, showing coordination with Dig and TH. With airway stenosis, respiratory activity was enhanced in all muscles, particularly in the extra-thoracic muscles. However, swallowing activity was only facilitated in Dig, not in TH or SH. Notably, swallowing activity was absent when the SH length was fixed, even though inspiratory activity persisted. Motoneurons in the detached SH were not activated during swallowing.

Conclusion: During the inspiration, SH is slightly activated. The impact of airway stenosis on respiratory function may vary between the muscles of the upper airway and the Dia. The swallowing CPG does not have dominant control over the swallowing activity in the sternohyoid muscle; instead, it is activated through the myotatic reflex.

Keywords: sternohyoid muscle; motoneuron; EMG; rat; swallowing

June 1, 2024 (Saturday) 13.30 – 15.00: O3-3

Involvement of Posterior Belly of Digastric Muscle During Swallowing in Rat

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Abstract

Background: Although suprahyoid muscles are known to be activated during swallowing, functional role of posterior suprahyoid muscles such as posterior belly of digastric muscle (PostDig) or stylohyoid muscle has not yet been understood.

Aim/objectives: The aim of this study was to clarify the location of PostDig motor neurons in the brain and their activities during swallowing.

Materials and Methods: Experiments were carried out on Sprague-Dawley male rats. The first experiment was designed to characterize the neurons in the accessory facial nucleus (Acs7) associated with swallowing reflex shown below: (1) c-Fos immunoreactivities evoked by repetitive mechanical stimulation of the larynx: (2) immunoreactivities of retrograde tracer, Fluoro-Gold (FG), administered into the PostDig muscle: (3) quantification of the number of both c-Fos and FG positive cells: (4) immunoreactivities of choline acetyltransferase (ChAT). In the second experiment, electromyographic (EMG) activity in PostDig and thyrohyoid muscles were recorded during swallowing evoked by mechanical stimuli to the vocal folds. In the third experiment, extracellular neural recordings in the Acs7 was conducted and investigated the Acs7 activities during swallowing evoked by topical administration of distill water (DW) or capsaicin to the pharynx.

Results: A substantial level of c-Fos expression was found in rostral rather than caudal Acs7 after swallowing. Quantitative analysis revealed the number of c-Fos cells was significantly greater than that of sham rats. Further, c-Fos positive cells were also found in the nucleus tract solitarius and nucleus ambiguus. ChAT immunoreactivity was identified in the Acs7. FG labeled cells were clearly found in the Acs7, and several c-Fos/FG double-labeled cells were identified in the rostral Acs7. EMG bursts were observed in the Post-Dig and thyrohyoid muscles during swallowing, while neural activities in the Acs7 were increased during swallowing.

Conclusion: Our current results indicate Acs7 and PostDig muscle were activated during swallowing.

Keywords: swallowing, digastric muscle, suprahyoid muscle, rat

June 1, 2024 (Saturday) 13.30 – 15.00: O3-4

Craniofacial Development Requires MicroRNAs for Inhibiting Senescence

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Type of presentation: ■Oral Presentation ☐Poster Presentation

Abstract

Background: MicroRNAs are essential for numerous biological processes including organogenesis. However, the role of microRNA in facial development remains unclear.

Aim/objectives: This study is to understand whether microRNAs are involved in facial development.

Materials and Methods: We examined mice with mesenchymal deletion of microRNAs (*Dicer$^{fl/fl}$;Wnt1Cre*).

Results: *Dicer$^{fl/fl}$;Wnt1*Cre mice exhibited facial deformities. Mutant midfaces showed evidence of ectopic senescence. Based on molecular analysis, C1q expression and Wnt signaling activity were increased in *Dicer$^{fl/fl}$;Wnt1Cre* mice. It has been shown that senescence is induced in aged tissue due to Wnt signaling triggered by C1q. We generated *Dicer* and *C1q* double mutant mice (*Dicer$^{fl/fl}$;Wnt1Cre;C1qa$^{-/-}$*), and *Dicer* and *Ctnnb1* (essential molecule for Wnt signaling) double mutant mice (*Dicer$^{fl/fl}$;Wnt1Cre;Ctnnb1$^{fl/WT}$*) to investigate whether upregulated Wnt signaling and C1q are related to ectopic senescence in *Dicer$^{fl/fl}$;Wnt1*Cre mice. These double mutant mice showed improvements in midfacial abnormalities and decreased ectopic senescence. C1q is known to transcribe through a central promoter which is regulated by transcription factors, STAT1, Irf8, and PU.1. qPCR analysis indicated that *Irf8* and *PU.1* expression were upregulated in *Dicer$^{fl/fl}$;Wnt1*Cre mice. Some miRNAs highly expressed in the wild-type face primordia were found to have the ability to bind either *PU.1* or *Irf8* (e.g. miR214 for Irf8 and miR2137 for PU.1).

Conclusion: These results suggested that in normal face development, miRNA reduce the transcription of Irf8 or PU.1, which lead to normal level of C1q expression. In the absence of miRNA, increased Irf8 and PU.1 led to upregulation of C1q/Wnt/senescence pathway, which result in ectopic senescence induced facial deformities. microRNAs thus control face development trough inhibiting senescence.

Keywords: microRNA, Dicer, craniofacial development, C1q, complement system, Wnt, senescence

June 1, 2024 (Saturday) 13.30 – 15.00: O3-5

The Nitrate-reducing Bacteria *Veillonella parvula* and *V. atypica* are Indicators of Poor Oral Hygiene in Young People

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Type of presentation: ■ Oral Presentation ☐ Poster Presentation

Abstract

Background: Although *Veillonella spp*. are nitrate-reducing oral bacteria, their abundances are native to poor oral health conditions. We hypothesized that the relationship between the proportion of *V. parvula*/*V. atypica* and the transcription level of the nitrate reductase gene could be used as an indicator of poor oral health.

Aim/objectives: To evaluate the relationship between the proportion of *V. parvula*/*V. atypica* and the transcription level of the nitrate reductase gene.

Materials and Methods: This is a preliminary cross-sectional study. Saliva and tongue swab samples were obtained from twenty-seven participants recruited in this study. They comprised adolescents between 10 and 19 years old with poor (n =16) and sound (n = 11) oral health participants. Using quantitative real-time quantitative PCR (qPCR), we counted the proportion of *V. parvula* and *V. atypica*. We assessed the cytosolic nitrate reductase (*narG*) transcription levels and the periplasmic nitrate reductase (*napA*) genes.

Results: Our data showed that all targeted bacteria and mRNA expressions could be detected in all oral samples derived from all participants. The proportion of *V. parvula* in saliva was higher than in *V. atypica* ($p < 0.05$). In contrast, *V. atypica* was more abundant on the tongue surface than *V. parvula* ($p < 0.05$). We further observed a reverse relationship between the proportion of *V. parvula*/ *V. atypica* and the transcription levels of *narG*/*napA*. Except for the correlation between *V. atypica* and *narG*/*napA* in saliva, the antagonistic relationship was strong ($p < 0.05$). The relationship and sensitivity/ specificity between *Veillonella* counts and *narG*/*napA* transcription levels were also evaluated using the Receiver Operating Characteristic (ROC) curve.

Conclusion: This study showed that the relationship between *Veillonella* species count, and nitrate-associated genes was antagonistic and can be used to indicate poor oral health in young people.

Keywords: nitrate-reducing bacteria; *Veillonella parvula*; *V. atypica*; oral hygiene; the cytosolic nitrate reductase gene (narG); periplasmic nitrate reductase (napA) gene.

June 1, 2024 (Saturday) 13.30 – 15.00: O3-6

Novel Anticancer Mechanism of Acetyl-CoA Carboxylase Inhibitor TOFA

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Type of presentation: ■ Oral Presentation □ Poster Presentation

Abstract

Background: Rapid proliferating cells such as cancer cells undergo metabolic reprogramming to meet their demands. In human gingival squamous cell carcinoma cells, the inhibition of acetyl-CoA carboxylase (ACC), the first rate-limiting enzyme in fatty acid synthesis (FAS), have been reported to exhibit anticancer activity. However, there are many ACC inhibitors on the market, and it is unclear whether the target of these inhibitors is specific to FAS.

Aim/objectives: The aim is to examine the pharmacological effect of ACC inhibitors in the human gingival squamous cell carcinoma cell line, Ca9-22 cells.

Materials and Methods: Ca9-22 cells were treated with either 5-(Tetradecyloxy)-2-furoic acid (TOFA) or PF-01575157. The anti-cancer effect was evaluated by cell counting. Cell morphology was examined using light microscopy. Expression of proteins were quantified by western blotting and their cellular localization was evaluated using immunofluorescence microscopy.

Results: We found that both TOFA and PF-01575157 induced cell death in Ca9-22 cells as expected. However, the cellular morphology after treatment was quite different between two inhibitors. TOFA reduced cell spines and increased extracellular spaces. In contrast, PF-01575157 induced cellular shrinkage. We searched for the cell adhesion molecules that are altered by TOFA and found the appearance of high molecular weight E-cadherin (hE-cad). The hE-cad was not expressed on the plasma membrane and identified as immature E-cadherin accumulated in the Golgi apparatus. In addition, the expression of E-cadherin on the plasma membrane was significantly reduced by TOFA. Since proteins can be accumulated within cells by stresses, we used ER stress inducer thapsigargin and found that it generates hE-cad. Furthermore, we confirmed that TOFA activates one of the ER stress marker IRE1alpha.

Conclusion: Our results suggest novel pharmacological mechanism of TOFA in cancer cells. TOFA induces cellular stress to suppress E-cadherin maturation and inhibits cell adhesion.

Keywords: oral cancer, E-cadherin, ACC

June 1, 2024 (Saturday) 13.30 – 15.00: O3-7

Survival of Vertically Fractured Tooth Roots after Repair Treatments

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Type of presentation: ■ Oral Presentation □ Poster Presentation

Abstract

Background: Teeth extraction because of root fracture has been relatively increasing. Preserving vertically fractured teeth is important to prevent the progression of natural tooth loss and occlusal collapse.

Aim/objectives: This retrospective cohort study aimed to examine the survival of treated teeth using 4-methacryloxyethyl trimellitate anhydride in methyl methacrylate initiated by tri-n-butyl borane.

Materials and Methods: Participants were the patients with vertical root fractured teeth treated at Niigata University Medical and Dental Hospital in Niigata, Japan from 2001 to 2022. The end point was the extraction of repaired root fractured teeth. Age, sex, tooth location, existence of adjacent teeth, Eichner's classification, Miyaji's occlusal triangle and type of fractured were assessed. The Kaplan-Meier method was used for the survival analysis of teeth after root fracture restoration. A log-rank test and Cox regression analysis were conducted for factor analysis. This study was approved by the Ethical Review Committee (IRB# 2015-5095).

Results: This study was conducted with 332 repaired vertical root fractured teeth. The Kaplan-Meier estimates of the survival teeth after root fracture restoration showed 82.4% after 3 years and 70.1% after 5 years, with a median of 8.1 years. The log-rank test showed the absence of adjacent teeth ($p=0.01$), Eichner's classification B and C ($p<0.01$), and Miyaji's occlusal triangle II, III, IV ($p=0.03$) were significant. The Cox proportional hazard model showed the absence of adjacent teeth posed a risk compared to existing adjacent teeth (HR=1.78, 95%CI 1.05-3.08, $p=0.03$), and a higher risk was associated with Eichner's classification B and C compared to class A (HR=2.27, 95%CI 1.14-4.62, $P=0.02$).

Conclusion: Treating vertical root fractures may be an effective strategy to prevent occlusal collapse before tooth extraction. The risk factors for fractured teeth treatment were larger number of missing teeth and fewer occlusal supports.

Keywords: Vertical root fractured teeth, 4-META/MMA-TBB resin, Kaplan-Meier method.

June 1, 2024 (Saturday) 13.30 – 15.00: O3-8

Modulation of Oxidative Stress at Transplantation Site Enhances Bone Regeneration

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Type of presentation: ■ Oral Presentation □ Poster Presentation

Abstract

Background: In cell-based bone augmentation, transplanted cells can become dysfunctional and apoptotic due to oxidative stress generated by an excess of reactive oxygen species.

Aim/objectives: We aimed to investigate the effects of controlling oxidative stress on bone regeneration using edaravone (EDA).

Materials and Methods: Bone marrow-derived cells were collected from 4-week-old rats. The effects of EDA on cell viability and osteogenic differentiation under conditions with or without hydrogen peroxide (H_2O_2) were evaluated by *in vitro* experiment. Collagen gels containing PKH26-prelabeled cells were implanted into the calvarial defects of 12-week-old rats. An amount of 100 μl of normal saline or 500 μM EDA was subcutaneously injected into the defects once daily for the first 4 days. Micro-CT and histological staining and immunofluorescence staining were performed to examine bone regeneration.

Results: EDA reduced oxidative stress and apoptosis caused by hydrogen peroxide (H_2O_2), recovering cell viability. EDA reversed the inhibitory effect of H_2O_2 on the expression of osteogenesis-related genes and mineralization. EDA treatment *in vivo* increased new bone volume 2 weeks postoperatively. Fewer CD86-positive M1 and more CD163-positive M2 macrophages were detected in the EDA group. The EDA group also showed stronger immunofluorescence for vascular endothelial growth factor and CD31.Additionally, an increased number of PKH26-positive cells and PKH26 and osteocalcin-double positive cells was observed in the EDA group, demonstrating that the survival of the transplanted cells was prolonged and that they differentiated into bone-forming cells. This could result from the reduction of oxidative stress at the transplantation site by EDA treatment.

Conclusion: Modulating oxidative stress using EDA facilitates bone regeneration by improving the local environment, prolonging the survival, restoring the osteogenic potential of transplanted cells, and promoting angiogenesis. More research is needed to clarify the mechanisms underlying the effects of EDA on osteogenesis.

Keywords: Bone regeneration, Oxidative stress, Edaravone

Wound Healing Mechanism after Pulpotomy in Type 2 Diabetes Mellitus Rats

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Type of presentation: ■ Oral Presentation □ Poster Presentation

Abstract

Background: Type 2 diabetes mellitus (DM2) is well-known for delayed wound healing. However, it is still unclear how DM2 is related to delayed wound healing. Macrophages play a critical role in the initiation, maintenance, and resolution of inflammation, by polarizing into subtypes called M1 and M2. Several studies suggested that a persistent M1 polarization in patients with DM2 might be affecting the wound healing. Furthermore, hyperglycemic conditions induced to interfere with the differentiation of dental pulp stem cells.

Aim/objectives: In this study, we evaluated whether hyperglycemia affects macrophage polarization and odontoblast-like cell (OLC) differentiation after pulpotomy.

Materials and Methods: We used eight-week-old spontaneously diabetic Torii fatty rats (SDTF; DM2 model rats) and Sprague Dawley rats {control group: CG) (4 each group). The upper left first molars were pulpotomized, pulp capping with mineral trioxide aggregate, and observed after 7 days. Osteopontin was analyzed immunohistochemically, to evaluate the initiation of the wound healing. Double immunofluorescence of nestin (odontoblast marker) and alpha-smooth muscle actin (α-SMA) (mesenchymal stem-like cell marker) was used to evaluate the differentiation stages of OLCs. We counted CD68 + iNOS double immunopositive cells (M1 macrophages) and CD68 + CD206 double immunopositive cells (M2 macrophages). Proliferating cell nuclear antigen (PCNA), CD90 and CD146 were evaluated by immunofluorescence in cell proliferation and mesenchymal stem-cells, respectively.

Results: Inflammation persisted, and no reparative dentin was observed in DM2 compared to CGs. However, there was no significant difference in the osteopontin positivity. Compared with CGs, PCNA and CD146 were increased in DM2, whereas CD90 was decreased. Pan-macrophages and M1 macrophages were increased in DM2, whereas M2 macrophages were decreased.

Conclusion: The macrophage polarization and OLC differentiation were altered, suggesting hyperglycemia may interfere with delayed wound healing. These findings emphasize the importance of normoglycemia in pulp wound healing.

Keywords: Type 2 diabetes mellitus, wound healing, pulpotomy

June 1, 2024 (Saturday): Parallel sessions

12:30 – 15:00 **Poster Presentation (1)**

Chairs:

Assoc. Prof. Yaowaluk Ngeonwiwatkul, Mahidol University, Thailand

Assoc. Prof. Lisdrianto Hanindriyo, Universitas Gadjha Mada, Indonesia

12:30 – 15:00 **Poster Presentation (2)**

Chairs:

Assoc. Prof. Masaru Kaku, Niigata University, Japan

Assoc. Prof. Puangwan Lapthanasupkul, Mahidol University, Thailand

Xerostomia and Saliva Quality among Thai Older Population in Nakhon Ratchasima Province, Thailand

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Xerostomia is one of the common problems in older adults. Reduced salivary flow can cause difficulties in dietary intake and increase caries risk which directly affects oral health and quality of life. However, there are few studies concerning xerostomia and saliva quality in Thai older population.

Aim/objectives: This study aimed to study xerostomia status and saliva quality in Thai older adults.

Materials and Methods: Participants aged 60-75 years were recruited from Geriatric Dental Clinic, Health Promotion Center 9th, Nakhon Ratchasima Province, Thailand from December 2023 to February 2024. Data collection included general information, a xerostomia screening form, and a saliva test. Quantitative statistical analysis includes general information, the self-reported xerostomia of participants as percentages means, and standard deviations. Chi-square tests were used to examine the differences between genders.

Results: There were 190 older adults including 71 males and 119 females with an average age of 66.2±4.9 years old. The majority of the participants had systemic diseases (54.7%), received routine medication (53.2%), and reported to have xerostomia (74.2%). For the saliva quality, most participants had normal saliva quality (85.3%), normal viscosity consistency (54.7%), normal saliva pH (85.3%) and normal saliva buffering capacity (53.7%). However, there were no significant different in xerostomia and saliva quality between male and female.

Conclusion: The results of this study indicated that although most of participants reported xerostomia, they had a good saliva quality. So, for further study etiology and relationship between xerostomia and saliva quality in Thailand should be investigated.

Keywords: Xerostomia, Saliva Quality, Older Population

Effect of *Lactobacillus acidophilus*, *Lactobacillus paracasei* and *Bifidobacterium lactis* in Yogurt on the Quantity of Oral *Candida* among Older Adults

Pinyo Kerdpolwattana[1,2], Thararat Chitov[3], Chatsri Kuansuwan[4], Surawut Pongsiriwet[4], Kanyarat Korwanich[5], Jitjiroj Ittichaicharoen[4]

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: *Candida* species are major human fungal pathogens that cause oral candidiasis. While probiotic strains used in commercially available yogurts have been shown to inhibit the growth of *Candida* species, it remains unclear whether consuming such yogurt will affect the quantity of oral *Candida*.

Aim/objectives: The aim of this study was to investigate the effect of daily intake of yogurt containing *Lactobacillus acidophilus, Lactobacillus paracasei*, and *Bifidobacterium lactis* on the counts of oral *Candida*.

Materials and Methods: This was a double-blind randomized placebo-controlled study in which 60 older adults were allocated into two groups: the study group and the control group. After baseline examination and randomization, the study group was given yogurt containing *Streptococcus thermophilus, Lactobacillus bulgaricus, Lactobacillus acidophilus, Lactobacillus paracasei*, and *Bifidobacterium lactis*, while the control group was given yogurt containing *Streptococcus thermophilus* and *Lactobacillus bulgaricus*, twice daily. Saliva samples were collected at baseline and after the administration period of 2 weeks. The oral rinse was used for the isolation of oral *Candida*, saliva pH was measured from unstimulated saliva by pH Meter.

Results: There was a significant reduction ($p < 0.05$) in the prevalence of oral *Candida* counts in the study group. The secondary outcome showed a significant increase ($p < 0.05$) in the amount of unstimulated salivary flow and saliva pH in the study group.

Conclusion: Short-term consumption of yogurt containing *Lactobacillus acidophilus*, *Lactobacillus paracasei*, and *Bifidobacterium lactis* may represent an alternative approach to prevent oral candidiasis and xerostomia.

Keywords: *Candida*, older adults, oral candidiasis, probiotics, yogurt

Prevalence of Taste Alteration in Thai Older Adults with Dentures Wearing

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Type of presentation: ☐Oral Presentation ■Poster Presentation

Abstract

Background: Diet and nutrition play essential roles in the elderly. Adequate nutrient intakes are critical factors for older adults. With increasing age, older adults may have altered taste sensation resulting in malnutrition.

Aim/objectives: To investigate the prevalence of taste alteration in Thai older adults with denture wearing and to study factors related to taste alteration, such as salivary flow rate, salivary pH, medical status, the number of Candida albicans, Streptococcus mutans, Lactobacilli species, and denture hygiene.

Materials and Methods: Fifty older adults aged over60 years old who wore dentures were included in this study. Filter paper disc taste kits were used to assess taste sensation. The saliva spitting method was used to measure the participants' stimulated salivary flow rate. The MU dip slide test kits were used to determine the number of Candida albicans, Streptococcus mutans, Lactobacilli species. Questionnaires were also made on smoking habit, denture hygiene practice, problem about taste sensation, and subjective report of xerostomia.

Results: Only 4 out of 50 participants (8%) had normal taste sensation of all tastes. Umami had the highest mean recognition threshold, follow by sweet, salt, sour, and bitter taste. Denture hygiene did not have a statistically significant relationship with any taste sensations. Salivary pH and denture hygiene had statistically significant relationship with Candida albicans score (p-value = 0.016) for salivary pH and p-value = 0.003 for denture hygiene.

Conclusion: Denture hygiene had no significant relationship with a taste sensation. The number of Candida albicans showed a significant relationship between salivary pH and denture hygiene. Therefore, it is necessary to emphasize the importance of maintaining good denture hygiene in older adults.

Keywords: denture hygiene, taste sensation

Edentulism and Physical Function in the Elderly: Evidence from the Indonesian Family Life Survey

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Type of presentation: ☐Oral Presentation ■ Poster Presentation

Abstract

Background: Poor oral health status will likely lead to a substantial increase in the health burden and disease conditions in the elderly.

Aim/objective: This study aims to identify the relationship between edentulism and physical function.

Materials and Methods: This study utilized data from the Indonesian Family Life Survey (IFLS-5) conducted in 2014-2015. Edentulism was assessed using a self-reported questionnaire. Physical function, including physical capability, physical activity, physical performance, and appendicular skeletal muscle mass (ASM) was assessed using the activity daily living (ADL) and instrumental ADL questionnaire, international physical activity questionnaire, a 5-time chair stand test, and ASM equation based on sex, weight, and waist circumference, consecutively. Logistic regression was performed to identify the association between edentulism and physical function.

Results: Two hundred and eighty participants, constituting 10.96% of the total sample, were found to be edentulous. Edentulism was significantly associated with physical capability, physical performance, and ASM after controlling for age. However, when further adjustments were made for sex, education level, residency status, subjective general health, hypertension, diabetes, depression, smoking habits, and body mass index, the association remained significant only for physical performance (OR=1.75, 95% CI=1.31-2.34).

Conclusion: Edentulism was associated with physical performance in the elderly. Integrating oral health assessments into routine geriatric health check-ups may facilitate early interventions and improve overall health outcomes.

Keywords: edentulism, tooth loss, physical fitness, physical function, elderly

June 1, 2024 (Saturday) 12.30 – 15.00: P1-5

Comparing the Effect of Various Stimulation Parameters of Neuromuscular Electrical Stimulation on Hyoid Movement

Leung Ho Yin, Jin Magara, Zhang Mengjie, Chisato Aizawa, Reiko Ita, Takanori Tsujimura and Makoto Inoue

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Neuromuscular electrical stimulation (NMES) for submental muscles has been introduced as a rehabilitative treatment approach for dysphagic patients; nevertheless, the rationale behind stimulus parameters has not been fully elucidated.

Aim/objectives: This preliminary study aims to investigate the effect of stimulation intensity and frequency on hyoid bone movement among healthy individuals.

Materials and Methods: Twelve healthy volunteers aged 26 – 44 years were recruited, and a pair of surface electrodes embedded on an elastic head band were attached submentally near the anterior belly of right and left digastric muscles. NMES was delivered in a randomized order at five different frequencies; 20, 30, 50, 100 and 200 Hz. NMES intensities for each stimulus frequency were set at 4 different threshold levels; sensory, motor, 80 % of maximum tolerated level (MTL) and MTL. Hyoid movements during NMES were captured using videofluoroscopy. Horizontal, vertical, and diagonal total displacement of hyoid from resting position were calculated and statistically compared among threshold levels within each stimulus frequency using the Friedman test followed by post hoc analysis with the Bonferroni correction. Furthermore, hyoid displacements at each threshold level across 5 different stimulus frequencies were compared.

Results: Frequency-dependent comparisons reported significant differences at all stimulation frequencies in horizontal displacement of hyoid; at 200 Hz in vertical displacement; and at 100 Hz and 200 Hz in diagonal total displacement. Threshold level-dependent comparisons detected a significant difference only at 80% MTL and subsequent post hoc test showed that hyoid diagonal total displacement at 100 Hz was significantly higher than that at 20 Hz.

Conclusion: The results suggest that submental NMES can help promote horizontal hyoid movement and stimulation at higher frequency can evoke larger displacement. Further study can investigate the effect of different stimulus modalities under constant level of stimulation current on hyoid movement.

Keywords: Dysphagia, Hyoid, Neuromuscular electrical stimulation (NMES), Videofluoroscopy

Exploring the Efficacy of Crystalline Oil and Fat Powder in Facilitating Swallowing Under Hyposalivation Conditions

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Type of presentation: ☐Oral Presentation ■Poster Presentation

Abstract

Background: There are many previously reported cases of elderly people who have difficulty swallowing because of hyposalivation and oral dryness. Our previous research has highlighted the unique properties of crystalline oil and fat powder (COF), which absorbs heat in the oral cavity with endothermic reaction when it melts, reducing surrounding temperature to activate cold-sensitive receptors.

Aim/objectives: This study aims to explore the COF's beneficial effects on swallowing under conditions of hyposalivation.

Materials and Methods: This study included 20 young, healthy volunteers (12 females, with an average age of 28.3±4.8 years). Baseline suprahyoid and infrahyoid electromyograms (EMGs) were recorded during swallowing 0.5 g of three oil materials: medium chain fatty acid triglycerides oil (MCT oil), MCT powder and COF. Next, 1.0 mg of atropine sulfate was orally administrated. EMGs of the hyoid muscles during swallowing of the three test foods were remeasured at 30 and 60 minutes after atropine administration. The ease of swallowing and the feeling of cold sensation were also assessed using a visual analogue scale. To evaluate the hyposalivation, subjective feeling of oral dryness and the unstimulated salivary flow per 30 sec were recorded every 10 min up to 60 min following atropine administration.

Results: The subjective feeling of oral dryness increased, while salivary flow decreased over time after atropine administration. The time latency between the swallowing cue and onset of suprahyoid EMG burst was significant longer in MCT powder than those in MCT oil and COF and the time latency only in MCT powder significantly increased at 60 min. Moreover, suprahyoid EMG activity of MCT powder was significantly larger than that of MCT oil especially at 60 min

Conclusion: The results in the present study suggest that COF can be less affected by hyposalivation condition rather than MCT powder despite of the powder form.

Keywords: swallowing, crystalline oil, hyposalivation condition, atropine

A Pilot Project for Health Promoting School Initiative in Indonesia Using a Multidimensional Approach

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: The Indonesian Ministry of Health reported that the national average of dmft index among population aged 3-4 years and 5 years old were 6.2 and 8.1, respectively. The average DMF-T index was reported very high (1.1) within this population. There were also 11.3% stunting (under-nutrition problem) cases in Kota Yogyakarta (one city in Indonesia), which certainly need an integrated health approach to effectively overcome it.

Aim/objectives: To do some effective and efficient interventions in the improvement of general and oral health condition.

Materials and Methods: This project uses Fluoride Mouthrinse (FMR) Program, Augmented Reality (AR)-based oral health education program, and Healthy Cafeteria Program simultaneously. A total of 496 students involved in this project particularly for FMR and AR program. Moreover, 20 school teachers, 20 food handlers were trained for the Healthy Cafeteria program. To evaluate the achievements of this project's objectives, periodic research evaluation protocols were executed.

Results: The baseline data showed that the mean score of PHP-M (40.71) indicates that the oral hygiene of the students are poor, and they have developed almost 1 carious tooth in the early period of the permanent dentition (DMFT = 0.60). Whilst more than 6 sites in their oral cavity experienced gingivitis. All of the schoolteachers have been trained to deliver the FMR and regularly execute this program. The readiness survey for the Healthy Cafeteria Program and the training for food handlers has been completed and will be ready to implement the program within this year. However, the participation rate for the use of the AR program still needs to be improved.

Conclusion: These approaches will have a profound effect on the betterment of oral and general health of Indonesian children. However, the involvement of the government to assure the sustainability of this program is considered to be esential.

Keywords: Fluoride Mouth Rinse; Healthy Cafeteria; AR educative application; Preventive Dentistry

June 1, 2024 (Saturday) 12.30 – 15.00: P1-8

Relationships Between Occlusion and Body, including Head, Sway in Community-Dwelling Older Adults

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: The previous studies demonstrated that occlusal force was associated with equilibrium function in older adults. However, the associations of occlusal force with body sway in three dimensions have not been fully understood.

Aim/objectives: The purpose of this study was to clarify the relationships between occlusal force and angular rate of head and lumbar sway, and center of gravity sway in older adults.

Materials and Methods: The study included 25 community-dwelling older adults aged 65 years or over. An acceleration and angular rate sensor were attached to the head and the lumbar region, and the subjects maintained a static standing posture on a stabilometer. The measurement conditions were a combination of vision (eyes open, eyes closed) and occlusion (mouth open, occlusion) conditions, and body sway was measured over 30 s. An oral assessment was performed, and occlusal force were measured. The subjects were divided into the higher occlusal force group and the lower one with the median value of occlusal force as the cut-off, and angular rate of head and lumbar, and center of gravity sway were compared between the groups.

Results: With the eyes closed and open mouth condition, in the higher occlusal force group, x-axis was 15.0±1.9 deg/sec, y-axis was 13.3±2.7 deg/sec, and z-axis was 7.5±1.8 deg/sec; in the lower one, x-axis was 22.4±17.0 deg/sec (p=0.010), y-axis was 20.1±8.8 deg/sec (p<0.001), and z-axis was 12.3±9.6 deg/sec (p=0.046). The angular rate of head in all directions was significantly less in the higher occlusal force group than in the lower one. No significant differences in center of gravity sway or lumbar sway were found between the groups.

Conclusion: A significant association was found between occlusal force and adjustment of head sway, suggesting that equilibrium function is related to head stabilization.

Keywords: older adults, equilibrium function, occlusal force, angular rate of head sway

Oral Health Education with Dental Students for Teenagers – A Sustainable Approach

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Involving dental students in a community-based oral health education programme for schoolchildren is an opportunity for achieving the sustainable development goals: quality of education, and good health.

Aim/objectives: The objective of the project conducted by Faculty of Dentistry of „Carol Davila" University in Bucharest was to create and apply an experiential dental education programme in order to assess oral health, attitudes and habits among a group of teenagers.

Materials and Methods: In Erasmus+ project "Youth Community-Based Oral Health Learning Model" were included subjects from target groups: 60 dental students, 120 pupils (13–18 years) from 3 schools in Bucharest; 50 teenagers from one disadvantaged area in Galati; Faculty of Dentistry staff, schoolteachers and Oral Health providers from schools: 4 dentists, and 4 dental nurses. We used clinical oral health forms recommended by World Health Organization; knowledge, attitudes and behavior questionnaires in order to assess education needs.

Results: With international experience of project partners, Karolinska Institutet (KI) and European Dental Hygiene Federation, there was created 1 oral health education curriculum for dental students from similar European Dental curriculum in dental faculties. We realized 1 oral health promotion guidebook for teachers, to sustain them in applying education lessons in schools. Also, we have created 1 brochure for teenagers regarding oral health promotion. It took place 2 sessions of Short term learning, in Sweden at KI, with participation of 13 dental students and 7 teaching staff. We have done training of dental students in experiential teaching and performed 3 oral health education lesson for the experimental group of adolescents.

Conclusion: The results showed a significant improvement of oral hygiene behavior of schoolchildren. During the experiential learning lessons and trainings, dental students increased the communication skills and also, had the opportunity to get experience from field work, in communities.

Keywords: experiential learning, teenagers, sustainability, quality education

June 1, 2024 (Saturday) 12.30 – 15.00: P1-10

The Relationship Between Periodontal Inflammation and Risk of MCI in Type 2 Diabetic Patient: A Preliminary Study

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Cognitive impairment, such as dementia, is a growing, global challenge. As the population ages, it has become one of the most important health and care issues facing the world. A previous study in Japan shows 11.9% of the diabetic population was diagnosed with dementia. Aside from diabetes mellitus, emerging evidence shows that patients with periodontitis have a higher risk of having cognitive impairment.

Aim/objectives: To investigate the relationship between periodontal inflammation and Mild Cognitive Impairment (MCI) risk using blood-based biomarkers in type 2 diabetic patients.

Materials and Methods: This cross-sectional study included type-2 diabetes mellitus (T2DM) patients aged 40 years old and older who met the inclusion criteria and visited the Department of Endocrinology at Niigata University Hospital. Periodontal inflammation was measured using the Periodontal Inflamed Surface Area (PISA) score. MCI risk score was measured through the Amyloid-β sequester protein analysis (Apolipoprotein A1, Transthyretin, Complement C3) using blood samples. Fisher's exact test and Spearman's correlation analysis were performed to analyze the data.

Results: 29 T2DM patients were included in the study. There was a significant difference in MCI risk score between the low and high PISA levels group ($p<0.05$). Patients with PISA score less than 300 tend to have a lower risk of MCI ($p<0.00$). Variables correlated with MCI risk are PISA ($p<0.05$) and TTR levels ($p<0.01$). ApoA1 has a moderate correlation with CRP ($\rho=0.42$; $p<0.05$) and IL-6 ($\rho=0.43$; $p<0.05$).

Conclusion: There is a correlation between periodontal inflammation and the risk of MCI.

Keywords: Periodontitis, Mild Cognitive Impairment, Inflammation, PISA, Amyloid-beta

Novel Therapeutic Approach for Osteoradionecrosis. Harnessing the Regenerative Potential of Autologous Growth Factors Along with Statins

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Osteoradionecrosis (ORN) can be described as a clinical identification of necrotic bone secondary to therapeutic radiation in head and neck cancer patients. ORN poses a significant challenge in head and neck cancer management, often resulting in debilitating complications and compromised quality of life for affected individuals. There are several effective therapeutic strategies for improving tissue healing, however, a gold standard treatment has not yet been established. Traditional treatment modalities have shown limited success in promoting tissue healing and bone regeneration in ORN patients. By shedding light on this therapeutic approach which could help understand the potential of harnessing autologous growth factors along with a use of statins as a regenerative therapy. It holds a promise for transforming the management of ORN and enhancing the quality of life for affected individuals. The regeneration potential of autologous growth factors is explored in this paper presentation, which focuses on a unique therapeutic approach for ORN management.

Aim/objectives: To evaluate the clinical outcomes and therapeutic efficacy of the novel approach, including improvements in wound healing, pain reduction, and bone regeneration, as observed in the presented case.

Materials and Methods: In a patient with known case of osteoradionecrosis with non healed extraction socket, curettage was done and the site was packed using Platelet Rich Fibrin with 20mg Atorvastatin and the socket site was closed. Clinical Examination of respective site with radiographic evaluation was done.

Results: Use of Platelet Rich Fibrin in the case of osteoradionecrosis has shown promising and encouraging results. Similarly Statins has also shown improved bone regenerative capacity.

Conclusion: In the present case, the combination of curettage and PRF was effective and beneficial in the treatment of ORN, but more robust data, in the form of randomized controlled trials, are needed to confirm the effectiveness.

Keywords: Osteoradionecrosis, Platelet Rich Fibrin

June 1, 2024 (Saturday) 12.30 – 15.00: P1-12

Computer-assisted Surgery in Mandibular Reconstruction and a Patient-specific Mandibular Reconstruction Plate

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: In cases of mandibular resection due to odontogenic tumor, cancer, osteonecrosis, or trauma, mandibular reconstruction is essential to restore function and esthetics. The size of the defect is determined by the preoperative extent of the lesion, pathologic features, and the patient's age. Computer-assisted surgery utilizing custom-made surgical guides and patient-specific titanium plates has recently become a viable option for mandibular reconstruction in the field of oral and maxillofacial surgery, instead of manual bending of reconstructive titanium plates.

Aim / objectives: The aim of this technical note and case reports is to present the utility of computer-assisted surgery and patient-specific titanium plates in mandibular reconstruction.

Patients and Methods: We describe three patients aged between 36 and 69 years with odontogenic tumor of the mandible who were successfully treated with radical surgical approaches using computer-assisted surgery systems (TruMatch CMF®, DePuy Synthes, Switzerland or COSMOFIX ®, TEIJIN, Japan). Based on incisional biopsy results, one patient was diagnosed with ameloblastic fibroma and two patients were ameloblastoma. As a preoperative planning, a 3D image was created using computed tomography (CT) DICOM data. The engineer and the surgeons had a meeting about the resection simulation, the patient-specific plate design and the surgical guide design (the custom-made surgical guide was created by only TruMatch CMF®). With the assistance of virtual surgical planning, segmental mandibulectomy was performed followed by immediate mandibular reconstruction using fibula osteocutaneous free flap or particulate cancellous bone and marrow with patient-specific titanium plates.

Results: The patients achieved good functional and esthetic results, and postoperative CT findings indicated that the surgical results were consistent with the treatment plan.

Conclusion: Computer-assisted surgery systems can be an effective treatment option for the radical approach to odontogenic tumors.

Keywords: Odontogenic tumor, Radical surgical procedure, Computer-assisted surgery, Patient-specific titanium plate, Custom-made surgical guide

Demineralised Dentine Graft and Platelet Rich Fibrin as Tissue Regenerating Materials in Oral Surgery

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Numerous advancement has been made in the field of tissue regeneration for hard and soft tissue replacement, even though autologous graft still being the gold standard. Demineralized Dentin Graft (DDM) can be efficiently used as a form of autogenous graft after various surgical procedures in combination with other materials in inducing hard tissue formation. Platelet-rich fibrin (PRF) derived from blood concentrates has a high content of growth factors. The beneficial effects of PRF in various clinical applications such as alveolar ridge preservation, sinus floor elevation, management and prevention of medical-related osteonecrosis of the jaw, third molar extractions, and guided bone regeneration in dentistry has increased recently. Autogenesis and Versatility of these materials completely fulfills the criteria as a tissue regenerating factors making it a gold standard form as a graft.

Aim / objectives: The paper highlights the application and combination of the tissue remodeling factors after surgical extraction of impacted teeth to evaluate soft and hard tissue changes in the osseous defect post-surgery.

Materials and Methods: Surgical Extraction of Impacted teeth was performed followed by preparation of dentine graft using Dentine grinder. 10 ml blood was drawn and centrifuged at 2700 rpm for 15 minutes for preparation of PRF. The graft was placed into the osseous defect. Radiographic and clinical evaluation was done pre-operatively and at 3 months.

Results: The grafted site showed minimum swelling and pain with significant soft tissue healing and radiographic bone gain.

Conclusion: This paper describes chairside preparation of autologous tooth bone graft and L-PRF used immediately for filling bony defect as a graft material for bone regeneration. This paper highlights the availability of human resource by updating ourselves with new and innovative techniques for better outcome of the patient and the country.

Keywords: DDM, PRF, Autogenous, Osseous defect

June 1, 2024 (Saturday) 12.30 – 15.00: P1-14

Case Report: Cystic Hygroma

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Cystic hygroma is a relatively rare group of congenital dysplasia developed from lymphatic vessels. It most often appears after birth or before the second year of life in 75% of cases. Surgery is the best solutions, despite its difficulties and risks of nerve and vascular injury in the cervical region.

Case Presentation: A two-and-a-half-year-old boy presented with a painless neck swelling at left submandibular region for one year. CT imaging revealed a cystic lesion in the neck. A complete dissection was done while preserving surrounding vital structures and postoperative outcome was satisfactory.

Discussion: Cystic hygroma is a rare congenital cervical malformation. The most frequent location is in the posterior cervical triangle (75-80%) due to the presence of the extensive lymphatic system. Clinical signs vary from a simple presence of a painless mass to signs of compression: dyspnea, dysphagia and difficulty feeding with regurgitation to rarely symptoms of nerve invasion. The diagnosis of cystic lymphangioma is based on clinical and paraclinical data. Cervical ultrasonography specifies location, size, and number of cysts. CT and MRI with contrast injection are useful in planning the surgery. In this reported case, the progressively enlarging neck swelling was successfully removed without causing injury to the surrounding structures, such as nerve, vessel, airway. Regular follow-up examinations revealed no evidence of recurrence.

Conclusion: Among different types of treatment options, surgical excision remains the mainstay treatment for cystic hygroma. Total removal is the only way to minimize recurrence risk but should not be at the cost of nerve or any functional damage. So, careful consideration and assessment for potential surgical complications by experienced surgeon is essential to ensure both aesthetic and functional outcomes.

Keywords: Cystic hygroma, rare congenital cervical malformation, complete dissection, minimize recurrence, aesthetic, and functional outcomes

June 1, 2024 (Saturday) 12.30 – 15.00: P1-15

Treatment of Replanted Avulsed Teeth with Root Canal Treatment and Re-Splinting: A Case Report

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Avulsion of permanent teeth is a severe dental injury requiring prompt management for a favorable prognosis. This case report addresses the treatment of an avulsed tooth (number 12) in a 12-year-old boy.

Aim/objectives: The aim was to present a comprehensive treatment approach involving replantation, root canal treatment, and re-splinting to address the avulsed tooth.

Materials and Methods: The patient underwent replantation of the avulsed tooth, followed by root canal treatment to manage pulpal necrosis and infection. Re-splinting was performed to stabilize the replanted tooth and enhance periodontal support.

Results: Follow-up examinations demonstrated positive outcomes, including reduced tooth mobility and absence of periapical lesions. This case underscores the significance of timely intervention and a comprehensive treatment approach in managing avulsed teeth for successful outcomes.

Conclusion: Root canal treatment, fixed splinting, and knowledge about avulsion management are three crucial components in managing dentoalveolar trauma. Root canal treatment targets infection reduction, while fixed splinting aims to restore periodontal support. Additionally, understanding infection management ensures a favorable prognosis through timely and appropriate treatment

Keywords: Avulsion, replanted teeth, root canal treatment, re-splinting

Enhancing Smile Aesthetics: A Case Report of Indirect Restoration on Teeth 13-23 with Exposed Metal Post PFM on Tooth 21

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Smiling plays a pivotal role in social interactions, influencing psychosocial well-being and self-confidence. Dental imperfections, such as broken porcelain crowns and malocclusions, can significantly impact an individual's confidence and quality of life.

Aim/objectives: This case report aims to illustrate the utilization of indirect veneers and zirconia crowns to address both aesthetic and functional concerns in a 50-year-old male patient with a broken porcelain-fused-to-metal crown and crowded teeth.

Method: The treatment approach involved crown and veneer preparations, mock-ups, and cementation of indirect restorations. Considerations in treatment planning, including the risks associated with pulp chamber involvement and the significance of marginal compliance, were discussed. Alternative options for correcting dental malalignment, such as orthodontic treatment, were also explored, along with the advantages and limitations of veneers.

Results: The case demonstrates the effectiveness of indirect restorations in improving both aesthetics and function while restoring the patient's confidence. By addressing the dental imperfections with indirect veneers and zirconia crowns, the patient achieved enhanced smile aesthetics and improved dental function.

Keyword: Smile design, veneer, PFM crown

The Beneficial Effects of Recombinant Collagen Peptide in Periosteal Cell-Derived Osteoregeneration

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Periosteal cells (PCs) are a promising strategy for cell transplantation therapy with high bone regeneration potential in both dental basic and clinical research. Recombinant human collagen peptide (RCP), a collagen peptide based on human collagen type I, enriched with Arginine-Glycine-Aspartic acid sequences, is expected to be beneficial as a bio-scaffold for bone tissue engineering.

Aim/objectives: In this study, we examined the biocompatibility of cultured human PCs and RCP.

Materials and Methods: MTT assay was performed to determine the concentration of RCP treatment *in vitro*. The effect of RCP on promotion of cellular adhesion and wound healing of PCs was investigated by cell adhesion assay and cell migration assay. Changing in gene expression profiles of hPCs after RCP treatment were monitored using RNA-sequencing and real-time PCR analysis. In addition, a rat-skull critical-size defect model was used to assess the biological effect of RCP on PCs-induced osteoregeneration.

Results: MTT assay verified the applicable concentration of RCP for *in vitro* study. RCP treatment significantly increased the adhesion and migration abilities of PCs. RNA-seq and qPCR analysis demonstrated the alterations of various gene expressions such as extracellular matrix-related genes and osteogenic-related genes by RCP treatment. Furthermore, *in vivo* study with micro-CT and IHC staining suggested the biological effect of RCP on PCs-induced osteoregeneration.

Conclusion: RCP treatment has beneficial effects on human periosteal cells by enhancing cellular adhesion and cellular migration, promoting expressions of genes encoding proteins associated with extracellular matrix, and modulating osteogenesis of PCs.

Keywords: Periosteal cells, Recombinant collagen peptide, Bone regeneration

The Impact of Periostin-knockout on the Periodontal Ligament

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Abstract

Background: Periostin (Postn) is a crucial non-collagenous extracellular matrix (ECM) in the periodontal ligament (PDL) that plays a significant role in fibrogenesis and mechano-response, thereby being vital in PDL tissue homeostasis. Despite its importance in maintaining PDL tissue homeostasis, its exact function remains unclear.

Aim/Objectives: This study aims to analyze the role of Postn in PDL tissue homeostasis by analyzing the gene expression profile of *Postn*-knockout (KO) PDL cells and the effect of excessive occlusal loading on the PDL tissue of *Postn*-KO mice.

Materials and Methods: PDL-derived cells were collected from the molars of *Postn*-KO and Wild-type (WT) mice (male, 5-week-old). After culturing them for 7 and 14 days, a comprehensive gene expression analysis was conducted using RNA-seq. A wire (φ = 0.2 mm) was fixed to the occlusal surface of the right upper molars of *Postn*-KO and WT mice (male, 12-week-old) to apply excessive occlusal loading. After 4 and 7 days, paraffin-embedded sections were prepared and analyzed histologically.

Results: Comprehensive gene expression analysis revealed changes in the cell-ECM interaction and in the levels of matrix metalloproteinases (MMPs) in *Postn*-KO PDL cells. Specifically, the expression of *Mmp2* was significantly reduced in *Postn*-KO PDL cells. Furthermore, excessive occlusal loading caused osteoclast recruitment and bone resorption at the root furcation of the maxillary first molar in WT mice. However, these changes tended to be less in *Postn*-KO mice.

Conclusion: These results showed that *Postn*-KO affects cell-ECM interaction, leading to altered MMP expression and less osteoclast recruitment in PDL, indicating that Postn has matricellular functions in PDL tissue maintenance.

Keywords: Periostin, extracellular matrix, Periodontal ligament

Extracellular Matrix-Oriented Proteomic Profiling of Human Periodontal Ligament

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Periodontal ligament (PDL) plays an essential role in oral functions; however, regeneration of this tissue is still impractical. The extracellular matrix (ECM) of cultured PDL cells (PDLCs) is thought to preserve the original ECM composition to some extent; therefore, it is considered to be an effective substrate for periodontal tissue regeneration. However, the detailed composition of human PDL and their changes in cultured PDLCs remains elusive.

Aim/objectives: The aim of this study was to comprehensively analyze the ECM proteome of human PDL and its changes in cultured PDLCs using chemical digestion-assisted proteomics.

Materials and Methods: Human PDL tissue and PDLCs were isolated from extracted human premolars. The PDLCs were cultured for 2 weeks to obtain PDLC-derived ECM. Samples were decellularized, solubilized with hydroxylamine in guanidine hydrochloride, and analyzed by liquid chromatography with tandem mass spectrometry. The ECM composition and its changes were analyzed using bioinformatics.

Results: The collagen composition of human PDL tissue was 91.8%, but it decreased to 81.1% in cultured PDLCs. In contrast, non-collagenous ECM (i.e., Proteoglycans and ECM glycoproteins) increased from 5.8% to 9.8 in the PDLCs compared to the PDL tissue. Enrichment analysis of differentially expressed ECM proteins in cultured PDLCs compared to PDL tissue indicated the alteration of cell-ECM interactions involving fibronectin-, and thrombospondin 1-centered molecular complex.

Conclusion: Our study using ECM-oriented proteomic profiling has provided a comprehensive and reliable understanding of the ECM composition of human PDL tissue. Moreover, cell-ECM interactions are significantly altered in cultured PDLCs, which could potentially contribute to more effective and reliable PDL tissue regeneration.

Keywords: Periodontal ligament, Extracellular matrix, Proteomics

June 1, 2024 (Saturday) 12.30 – 15.00: P2-4

The Role of Glutamine Transporters in the Dental Pulp and Periodontal Ligament

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Glutamine is the most abundant free amino acid in the body and is transported into cells by specific transporters, which are system ASC transporter (ASCT)2, L-type amino-acid transporter (LAT)1, and 4F2 heavy chain (4F2hc). It is unclear whether these transporters are localized in the dental pulp and periodontal ligament (PDL). Moreover, glutamine plays an important role as an alternative source of energy through glutaminolysis and this is relevant because glucose is usually the main source of energy in the cells. In addition, both glutamine and glucose influence the activation of the mTOR signaling pathway, which plays an essential role in the regulation of cellular metabolism, growth and protein synthesis.

Aim/objectives: To evaluate whether glutamine is involved in dental pulp tissue and PDL, we investigated the localization of glutamine transporters and the function of ASCT2 that uptakes glutamine using siRNA analysis.

Materials and Methods: Immunohistological and real-time PCR analyzes of ASCT2, LAT1/4F2hc, and mTOR were performed in Wistar rats after 1-14 days of pulpotomy. Real-time PCR analysis and alkaline phosphatase assay were performed on osteogenic differentiation marker genes (*Runx2, Col1a1, Alpl, Sp7, Bglap*) and mTorc1 using PDLSCs in which ASCT2 was knocked down with siRNA.

Results: The transporters ASCT2 and LAT1/4F2hc were detected in odontoblasts and nerves in the normal pulp, demonstrating positive reactions in odontoblast-like cells post-pulpotomy. Furthermore, in response to the wound healing process in the dental pulp mRNA expression of ASCT2, LAT1/4F2hc, and mTOR peaked at 5 days after pulpotomy. In addition, the expression of osteogenic markers in PDLCs was also affected by siRNA-mediated suppression of the ASCT2 transporter.

Conclusion: ASCT2 and LAT1/4F2hc are localized in the dental pulp and periodontal ligament and these glutamine transporters may be involved in pulpal wound healing. In addition, knockdown ASCT2 in periodontal ligament cells affected on osteogenic differentiation.

Keywords: Glutamine, ASCT2, LAT1, 4F2HC, Glucose, mTORC1.

Viability of Palatal Sub-Epithelial Connective Tissue Graft Harvest: A Pilot Study

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Palatal sub-epithelial connective tissue graft (CTG) is widely used for soft tissue augmentation. However, information regarding its vitality is scarce.

Aim/objectives: To elucidate the vitality and graft contraction of CTG after harvesting at different time points using PrestoBlue®.

Materials and Methods: Ten patients underwent soft tissue graft treatment were included. An additional 4-mm CTG was taken from the palate. The biopsy sample was incubated in PrestoBlue® solution at 20(T1), 40(T2), 60(T3), 90(T4), 120 minutes(T5), and 24 hours(T6). The intensity of fluorescent values and graft area were recorded and compared using related samples Friedman's Two-Way Analysis of Variance by Ranks. It represents the vitality and contraction.

Results: Changing of the intensity of fluorescence values and graft area were observed. Significant differences (p-value = 0.05) were observed between average fluorescent intensity values of T1 with T4 and T5, T2 with T5, T3 with T5, T4 with T6, and T5 with T6. The percentage change was calculated using the initial area at T1, which had a significant difference (p-value = 0.05) compared to T2 at T4.

Conclusion: Traditional understanding of CTG treatment suggests that the graft should be placed into the recipient area immediately to prevent graft death and failure. However, our study has shown that the vitality of the graft gradually increases for up to 120 minutes. Therefore, we conclude that the CTG can survive for at least 120 minutes in sterilized normal saline solution. As a result, the technique should be modified, and the graft should be taken first to allow for prepare necessary recipient site. Nevertheless, it is essential to note that the graft area was significantly reduced at 90 minutes. The clinician should conduct a comparison analysis of the optimal duration, in order to ensure the best possible outcome.

Keywords: vitality, connective tissue graft, PrestoBlue®, contraction

Building a Sustainable Future in Dentistry: Education as a Catalyst for Change

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Initiating the education of dental students in environmental conservation initiatives and actions is essential today to ensure that future dentists are equipped with the knowledge and skills necessary to contribute to sustainable dental practices.

Aim/objectives: The objective of the project conducted at the Faculty of Dentistry of "Carol Davila" University of Medicine and Pharmacy in Bucharest was to elevate awareness regarding sustainability in dentistry and to equip students with the mindset and tools necessary to embrace sustainable approaches in their future dental careers.

Materials and Methods: The "For Sustainability in Dental Medicine" project ran from July to December 2022 and engaged eleven faculty members and four students. It encompassed four key activities. Initially, a questionnaire was disseminated to students across all six years of study at the faculty. Subsequently, five university staff members, including the Dean, participated in the Association in Dental Education in Europe (ADEE) 2022 Meeting in Palma de Mallorca, Spain. Additionally, two workshops were conducted in Romania, one held in the Danube Delta in September 2022 and the other in Sinaia in November 2022, each attracting 35 participants.

Results: The results were significant, with 469 students from the faculty responding to the Type form questionnaire. Preliminary findings were presented at various national and international scientific events. The workshops featured interactive presentations, fostering meaningful discussions between students and faculty. Notably, contests such as "What does a sustainable clinic look like?", "Eco Challenge," and "Sustainability Quiz" were highly valued by the students.

Conclusion: The project profoundly impacted both students and faculty members, facilitating a deeper understanding of sustainability in dental education and practice. The insights from the questionnaire responses will inform future teaching activities, while the workshops provide invaluable experiential learning opportunities for students and faculty members.

Keywords: dentistry, dental students, sustainability, sustainable dental practice

Student's Workshops on Didactic Tools Production Through Digital Workflow in Dentistry

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: The introduction of digital workflow is one of the most important challenges facing dentistry today. The need for students to become familiar with this new way of working, as well as the need for student involvement in the production of some of the items needed for learning.

Aim/objectives: Production of own teaching materials by students through digital workflow. To train dental students with the conception, design and production stages of parts produced by 3D printing technology.

Materials and Methods: From June to September 2023 in the Laboratory of Digital Techniques in Dentistry of our faculty, a number of 60 students spread over all years of study of the Faculty of Dentistry have been involved in computer-aided design (CAD), production through various 3D printing systems (CAM) and finishing of parts intended for the conduct of teaching activities. Students were trained on new digital techniques in dentistry.

Results: The following products were produced: 70 pieces of teeth with 4:1 magnification for the study of dental morphology for first year students.800 pieces of teeth (designed molars with class I a cavities) for the study of the necessary preparations for the application of dental fillings, the study of the techniques for the application of dental fillings, intended for third year students.400 tooth fillings (28 teeth/unit) for the study of the fitting of artificial teeth, intended for second year students.

Conclusion: Involving students under the guidance of teachers in the production of the didactic models is an advantage for understanding learning needs. In addition to this advantage, the students had the opportunity to become familiar with digital working techniques, scanning, CAD- CAM and 3 D printing, from the first years of the faculty, so that in the clinical higher years they are familiar with these techniques.

Keywords: digital workflow, teaching models, student involvement

Effectiveness of Implant Supported Prosthesis in Unilateral Free-end Case

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: In conventional removable partial denture designs, major connector extends across both sides of the dental arch especially in unilateral or bilateral free end cases. Some patients find these large appliances difficult to tolerate and instead choose fixed prostheses. But fixed partial dentures might not be the best choice for these individuals. Finally, these patients prefer to rely solely on their remaining natural teeth for chewing rather than using a removable denture with major connector. As a consequence, complications such as overeruption, drifting, and tilting are arisen. In such cases, an implant-supported prosthetic restoration is often the most suitable treatment option. Although, bone resorption following tooth loss is a continuous and unpredictable process, posing a significant challenge in implant placement. Posterior regions of the jaws experience more resorption compared to the anterior, with the mandible being more affected. Various techniques, including the alveolar ridge split technique, are commonly used for horizontal augmentation of narrow ridges.

Aim/objectives: The case aimed to assess the masticatory performance of patients both before and after receiving dental implant therapy, utilizing chewing gum as a means of evaluation and determining satisfaction through subjective questionnaires.

Materials and Methods: In recent case report, a patient with a unilateral free end with narrow alveolar ridge underwent treatment involving the splitting of the ridge, followed by simultaneous implants placement.

Results: The change in red color values of the chewing gum consistently indicated improved masticatory performance with higher patient satisfaction levels.

Conclusion: The case report indicates that rehabilitation with implant-supported prosthesis after the ridge split technique, can significantly enhance clinical effectiveness. These benefits empower patients to confidently engage in daily functions and experience an enhanced quality of life. Consequently, this treatment approach emerges as a highly effective option for managing unilateral free-end cases.

Keywords: implant-supported prosthesis, alveolar ridge-split technique, unilateral free-end case, masticatory performance, patient satisfaction

The Influence of The Hardness of Gummy Jelly and the Maximum Occlusal Force of the Individuals on the Muscle Activity

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Abstract

Background: With the glowing older population, chewing training is useful to improve oral function and prevent oral frailty. Although various training methods have been reported, limited research has explored how to personalize the level of resistance.

Aim/objectives: This study aimed to examine the relationship between the hardness of gummy jelly or maximum occlusal force, and the muscle activity.

Materials and Methods: Participants of this study were 7 young people (six women, one man; mean age 27.0 ±3.5) and 10 old people (10 women; mean age 78.9 ± 8.4) wearing removable dentures. The participants consumed 3 types of gummy jellies which hardness were soft, medium, and hard. We measured by maximum occlusal force, number of chewing cycles until swallowing the gummy jelly, and masseter muscle activity by electromyograms (EMG) during chewing cycles. The % maximum voluntary contraction (MVC), which evaluated the muscle activity at measuring maximum occlusal force, was calculated. To compare the differences in number of chewing cycles and muscle activity among the gummy jellies, the Friedman test and Wilcoxon signed-rank test with Bonferroni correction was used. The relationship between maximum occlusal force, number of chewing cycles, and muscle activity was assessed using Spearman's rank correlation coefficient. The significance level was set at 5%.

Results: The study showed that the hardness of gummy jellies became harder, number of chewing cycles was increased, and the muscle activity was increased. For low maximum occlusal force participants, the number of chewing cycles increased (soft: rs=-0.75, medium: rs=-0.79, hard: rs=-0.79), and the muscle activity was increased (soft: rs=-0.55, medium: rs=-0.61).

Conclusion: The hardness of the gummy jelly and the maximum occlusal force of the individuals were shown to influence the muscle activity or number of chewing.

Keywords: bite force, chewing training, gummy jelly, muscle activity

June 1, 2024 (Saturday) 12.30 – 15.00: P2-10

Effect of Difference in Aroma Content of Gummy Jelly on Swallowing Threshold

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Chewing is a physiological process to comminute food and trigger the swallowing reflex, which is described as reaching the swallowing threshold. Retronasal aroma is released from the comminuted food to the nasal cavity via the pharynx and is perceived as the flavor. However, the relationship between retronasal aroma and the swallowing threshold is poorly understood.

Aim/objectives: We investigated changes in retronasal aroma and swallowing threshold by the standardized gummy jelly with different aroma content.

Materials and Methods: The participants in this study were 30 volunteers (female: male = 15:15; age, 26.4±3.4 years). The test food was an orange-flavored gummy jelly standardized for masticatory performance assessment, and the aroma content was adjusted to four types: 0%, 50%, 100%, and 150%. An odor sensor was put at the nostrils to measure intensity of retronasal aroma over time, and a wireless surface electromyography system were used to count chewing cycles and monitor swallowing. Participants ingested each of the four types of gummy jelly three times, for a total of 12 trials. The maximum aroma intensity during chewing, the number of chewing cycles and the chewing time at the swallowing threshold were compared between each type of gummy jelly.

Results: The maximum aroma intensity increased significantly as the flavor content increased. The number of chewing cycles and chewing time at the swallowing threshold were significantly prolonged at 150% aroma content compared to 50% and 100% aroma content.

Conclusion: These findings suggested that increasing the aroma content of food may increase the intensity of retronasal aroma and prolong the number of chewing cycles and chewing time to reach the swallowing threshold.

Keywords: flavored-gummy jelly, retronasal aroma, swallowing threshold, chewing cycles

Shear Bond Strength of Silver Diamine Fluoride Applied Dentine Comparison Between Glass Ionomer Cement and Resin Composite

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Type of presentation: ☐Oral Presentation ■ Poster Presentation

Abstract

Background: Silver diamine fluoride (SDF) is one of the methods to prevent tooth decay during the active stage of caries development because it possesses the property of inhibiting the progression of caries in the dentine. However, carious lesions that have undergone treatment will appear as dark and hard surfaces, affecting in the restoration process.

Aim/objectives: This study aimed to evaluate the shear bond strength of glass ionomer cement compared to resin composite using universal adhesive system on SDF-treated dentine.

Materials and Methods: Thirty-six extracted molars were cross-sectioned by a low-speed diamond blade to expose the dentin surface. All specimens were immersed in a decalcifying solution for 24 hours. Then, the specimens were randomly divided into four groups (N = 9 for each group). Groups 3 and 4 were treated with SDF on the exposed dentine and left for 7 days. Groups 1 and 3 were restored with glass ionomer cement to a thickness of 2 mm., while groups 2 and 4 were restored with universal adhesive and resin composite to the same thickness. All restored specimens were subjected to shear bond strength measurement using a universal testing machine at a crosshead speed of 1 mm. per minute. The data were statistically analyzed using one-way ANOVA and Tukey's HSD test ($\alpha = 0.05$).

Results: The shear bond strengths of all sample groups were 10.18±2.52, 7.20±1.41, 7.59±1.41, and 6.23±1.73 MPa, respectively. The shear bond strength of Group 1 was significantly higher than that of the remaining groups. Furthermore, there was no significant difference between Group 3 and Group 4.

Conclusion: SDF-treated teeth can also be restored with a universal adhesive system and resin composite as an alternative to glass ionomer cement with a comparable shear bond strength.

Keywords: glass ionomer cement, shear bond strength, silver diamine fluoride, resin composite, universal adhesive

June 1, 2024 (Saturday) 12.30 – 15.00: P2-12

Artificial Intelligence in Radiology

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: AI has influenced medicine in countless ways and medical imaging is at the forefront of technological transformation. From early stage diseases identification through image segmentation and quantification to real time imaging during surgery, it has been a deal breaker for diagnosis, treatment planning and the treatment of life threatening diseases.

Aim / objectives: This review explores the innovations, applications and challenges of AI in medical imaging.

Materials and Methods: Artificial Intelligence (AI) termed by John McCarthy in 1995 refers to "the science and engineering of making intelligent machines". The first reports of AI use in radiology date back to 1992 when it was called "Computer-Aided Detection". AI was first applied in radiology to detect microcalcifications in mammography in 1992. In 2012, a Dutch researcher, Lambin P, proposed the concept of "Radiomics" for the first time and defined it as "extraction of large number of image features from radiation images with a high throughput approach".

Results and Discussion: With AI deep learning models, trained on large datasets are capable of recognizing complex patterns and features that may not be readily discernible to human eye, increasing the accuracy of pathology diagnosis. AI systems analyze medical images with speed and precision which helps in early diagnosis of the disease. AI can perform image segmentation and quantification which helps to delineate structures of interest within medical images such as tumors, blood vessels or cells. This helps to precisely target areas for intervention, optimize surgical procedures and deliver target therapies. By combining pre-operative imaging with real time imaging during surgery, AI algorithms can provide surgeons with augmented visualization, navigation assistance and decision support.

Conclusion: A question mark still hangs over for who should be liable if AI makes an error. Whilst AI based medical imaging has shown potential in augmenting clinicians' performance, false positives happen.

Keywords: Artificial Intelligence, Medical Imaging

June 1, 2024 (Saturday) 12.30 – 15.00: P2-13

Inhibitory Roles of Agmatine on Anxiety-Like Behaviors and Brain Responses Associated with Masseter Muscle Pain in Male Mice

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Chronic pain in the deep craniofacial region is comorbid with increased anxiety and managing anxiety is crucial in alleviating chronic pain. Evidence suggests that nutritional intervention is effective in improving chronic pain. However, it is unclear whether such approaches reduce anxiety-like responses in cases of deep craniofacial pain.

Aim/objectives: This study assessed the impact of Agmatine (AGM), a component found in rice-fermented foods like sake lees, on anxiety-like behaviors and neural responses in the brain associated with masseter muscle (MM) inflammatory pain in mice.

Materials and Methods: MM pain model was developed through unilateral MM injection of Complete Freund's Adjuvant (CFA). Therapeutic administration of AGM for 10 days following CFA or preventive administration for 10 days before CFA was conducted. Anxiety was evaluated between Days 1 and 10 after CFA using Dark/Light Box, Social Interaction, Open Field, and Elevated Plus Maze tests. On Day 12 the FosB and acetylated histone H3 (aH3) immunoreactivities in the anterior cingulate cortex (ACC) and insular cortex (IC), well-known areas involved in anxiety and pain processing, were quantified in MM pain mice with or without AGM. Data were compared with sham mice subjected to the corresponding treatments.

Results: MM pain mice increased anxiety-like behaviors, and therapeutic and preventive treatments with AGM attenuated these behaviors in MM pain mice, with no significant effects in sham mice. The inhibitory impact on anxiety was more pronounced with therapeutic administration compared to preventive administration. Moreover, MM pain mice showed elevated levels of FosB and aH3 immunoreactivities in the ACC and IC, which were decreased following both therapeutic and preventive AGM administration.

Conclusion: AGM has inhibitory roles on anxiety-like responses in MM pain conditions. These findings suggest that nutritional interventions using AGM-contained diets like Sake Lees exert beneficial roles in the improvement of negative emotions linked to deep craniofacial pain.

Keywords: agmatine, anxiety, pain, masseter muscle, mice, nutritional interventions

June 1, 2024 (Saturday) 12.30 – 15.00: P2-14

Engineering Epithelial Basement Membrane in a Tissue-Engineered Oral Mucosa: A Preliminary Study

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Basement membranes (BM) are protein-rich extracellular matrices that are essential for epithelial tissue structure and function. Biomimetic BM have paved the way for the development of *in vitro* models for tissues/organs. Although our research team has been successful in developing a tissue-engineered oral mucosa (TEOM), to date, incorporating epithelial BM onto the TEOMs is challenging. Recently, we found some RGD-containing peptides promote adhesion of oral keratinocytes (OKC) to collagen.

Aim/objectives: To examine the effect of one specific peptide (CPPP-RGDTFI) coating on the attachment between the epithelial layer and underlying scaffold in TEOM, and confirm the deposition of BM component by immunohistochemistry.

Materials and Methods: The protocol for obtaining human oral mucosa tissue samples was approved by the Niigata University IRB (Approval#2015-5018). Primary dissociated OKCs were plated and serially cultured. To examine the effect of peptidization, flat-surfaced collagen scaffolds (CollaWind) were first incubated with Maleimide linker, then RGD-containing CPPP-RGDTFI peptide to form covalent bond to Maleimide groups. Before seeding OKCs, non-peptidized and peptidized scaffolds were presoaked with PBS, type IV collagen or Laminin-332. TEOMs were fabricated according to our standard protocol and analyzed by histological and immunohistochemical examinations.

Results: When TEOMs were placed into the fixative, the epithelial layer developed on the peptidized scaffold presoaked with laminin-332 was remained attached. In contrast, the epithelial layers of other TEOMs were completely or partially detached from the underlying scaffolds regardless of peptidization and presoaking agents. The basal cells grown on the peptidized scaffold presoaked with laminin-332 were taller, expressed more α6-integrin and deposited laminin more and deeper than those on other scaffolds. These findings suggested the correlation between laminin deposition and epithelial adhesion to the scaffold, which avoids delaminating within TEOMs.

Conclusion: Our technique is capable of depositing laminin, one of the BM components, that mimic native epithelial BM.

Keywords: Oral mucosa, Tissue engineering, Fish-scale collagen, RGD-containing peptide, Laminin

June 1, 2024 (Saturday) 12.30 – 15.00: P2-15

Comparative Analysis of Gene Expression in Cultured Oral Mucosal Epithelial Cell Sheets Manufactured on Substrates with Different Physical Properties

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Autologous cultured oral mucosal epithelial cell sheets (COMECS) have been utilized to treat corneal epithelial disorders, such as bilateral limbal stem cell deficiency. The COMECS are transplantable onto corneal surface as a cell sheet manufactured in temperature-responsive culture dishes. In terms of mechano-sensing, the physical property of the corneal surface differs from that of a standard tissue culture dish.

Aim/objectives: We aimed to examine the gene expression profile of COMECS manufactured on substrates having different physical properties, and compare it before and after harvesting COMECS.

Materials and Methods: The protocol for obtaining oral mucosa tissue samples was approved by the Niigata University IRB (Approval#2015-5018). Oral keratinocytes (OKCs) isolated from oral mucosa were serially cultured in a serum-free medium. P2 OKCs were plated onto three different type I collagen substrates: UpCell coated with type I collagen coating, Cell Campus (high-strength collagen fiber membrane), and Cellmatrix (n = 2) and cultured for 2 days. Young's moduli of those substrates are 3 GPa, 1.76 MPa, and 5 KPa, respectively. OKCs, at 100% confluency, were fed with 10% serum containing medium, and cultured for another 2 days. One COMECS developed on UpCell was harvested by reducing temperature. After mRNA was extracted, microarray analyses, followed by Gene Ontology (GO) analyses, were conducted.

Results: Compared with the COMECS manufactured on UpCell, differentially-expressed genes were detected when manufactured on substrates possessing lower Young's moduli and after harvested from UpCell, although those numbers were minor. GO-analyses revealed that specific biological processes were significantly affected by the difference in culture substrates. However, more sample number of COMECS is needed to increase the data reliability.

Conclusion: Our results indicated the physical properties could affect the quality of COMECS, suggesting some effects on the corneal wound healing after transplantation.

Keywords: COMECS, gene expression profile, GO-analysis, oral keratinocytes, mechano-sensing.

June 1, 2024 (Saturday) 12.30 – 15.00: P2-16

Changes in Extracellular Matrix Protein Composition and Their Gene Expression Profile During Osteoblast Differentiation

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Type of presentation: ☐ Oral Presentation ■ Poster Presentation

Abstract

Background: Bone augmentation is now a regular treatment in implant dentistry. However, unsatisfactory outcomes such as augmented bone atrophy still occur due to an incomplete understanding of bone biology. In bone, the extracellular matrix (ECM) provides the scaffold for the cells, so the relationship between the cells and ECM is crucial for bone formation and regeneration.

Aim/objectives: To better understand bone biology, we aimed to analyze the compositional changes of ECM proteins linked to their gene expression profile during osteoblast differentiation, which mimics the bone regeneration process to some extent.

Materials and Methods: A mouse osteoblast cell line (MC3T3-E1) was cultured, and an ECM-rich cell sheet was harvested at 1, 2, 3, and 4W. Samples were decellularized, solubilized by hydroxylamine in guanidine hydrochloride, and analyzed by liquid chromatography with tandem mass spectrometry. A comprehensive gene expression profile was investigated by using RNA-seq. Changes in protein composition and gene expression profile were analyzed by integrative bioinformatic approach.

Results: Proteomic analysis showed an increase in collagen composition while non-collagenous ECM declined as culturing time proceeded. According to enrichment analysis, highly expressed genes at 1W were associated with cell cycle, while those at 3-4W were associated with ECM. Genes encoding elastic fibers showed a strong time-dependent increasing pattern, indicating their important roles in ECM maturation.

Conclusion: Our integrated analysis of proteomic and gene expression profiles provides a fundamental comprehension of osteoblastic ECM, which has multiple roles in the bone regeneration process.

Keywords: Osteoblast, Extracellular matrix, Proteomics, Gene expression

June 1, 2024 (Saturday) 11.15 – 12.45: Deans Meetings

Name	University
Japan	
Prof. Makoto Inoue	Niigata University
Prof. Hiroshi Ogawa	Niigata University
Thailand	
Asst. Prof. Bundhit Jirajariyavej	Mahidol University
Asst. Prof. Narumanas Korwanich	Chiang Mai University
Prof. Pornchai Jansisyanon	Chulalongkorn University
Assoc. Prof. Songchai Thitasomakul	Prince of Songkla University
Prof. Pasutha Thunyakitpisal	Suranaree University of Technology
Asst. Prof. Ajiravudh Subarnbhesaj	Khon Kean University
Dr. Pongsapak Wongratwanich	Khon Kean University (Observer)
Assoc. Prof. Patcharawan Srisilapanan	Phayao University
Assoc. Prof. Peraya Puapichartdumrong	Naresuan University
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Prof. Endang Winiati	University of Indonesia
Asst. Prof. Nora Lelyana	Hang Tuah Surabaya University
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Vietnam	
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Taiwan	
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Nepal	
Prof. Manoj Humagain	Kathmandu University
Prof. Chandan Upadhyaya	Kathmandu University (Observer)
Dr. Samarika Dahal	Tribhuwan University Teaching Hospital
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Malaysia	
Prof. Zamri Radzi	Universiti Malaya

**Institution and Name are randomly described.*