



The 11th Conference of Asian International Association of Dental Traumatology

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March 29-30th, 2025

The President of 11th AADT | Prof. Toru Yanagawa

Conference Secretariat,

Executive Committee Chairman, Dr. Fumihiko Uchida

OUTLINE

Name

The 11th Conference of Asian International Association of Dental Traumatology

Dates

March 29-30th, 2025

Venue: Held in Journal

**121 Conference Room, Institute of Clinical Medicine, University of Tsukuba
1-1-1 Tennodai, Tsukuba, Ibaraki 305-8575 Japan**

President

Toru Yanagawa (Institute of Medicine, The University of Tsukuba)

**Conference Secretariat,
Executive Committee Chairman**

Fumihiko Uchida (Institute of Medicine, The University of Tsukuba)

Message from the President of JADT and AADT



There are three Academic Associations in the field of dental traumatology in the world: International Association of Dental Traumatology (IADT), Japan Association of Dental Traumatology (JADT) and Asian International Association of Dental Traumatology. They respectively expand clinical assessment based on the basic and clinical sciences from education, research work and clinical permeance.

Due to the world increased infection of COVID-19, on other hand, the 10th Conference of AADT, 2023 which had been scheduled to be held in India was unfortunately and suddenly forced to change to a form of the paper presentation at Okayama University, Japan. It goes till now on a rampage in the world. The 11th Conference of AADT 2025, therefore, was decided to be held in the form of the paper presentation on the special issue of AADT organized by Prof. Toru Yanagawa, Tsukuba University, Ibaraki, Japan. Although it will be basically analogous to that in Okayama University 2023, please pay attention to the information from Prof, Yanagawa for the actual way of paper presentation in detail such as the format.

Finally, I wish to do “SCIENCE” of Dental traumatology by discussing through the proceeding in the program as you look at in this booklet. Several awards by competition will be prepared and I would say to you “good luck”.

I eagerly hope the early end of COVID-19 to enjoy meeting together and discussing dental traumatology with you all.

Thank you

Mitsutaka Kimura, DDS, Ph.D

President, Japan Association of Dental Traumatology

President, Asian International Association of Dental Traumatology

Message from the President of 11th AADT



Due to the COVID-19 epidemic and continuing geopolitical risks, and for the safety of our members, The 11th Conference of Asian International Association of Dental Traumatology will once again be held in Tsukuba, Japan.

The purpose of AADT is to advance and develop the treatment of oral trauma and to improve the knowledge of its members through the promotion of medical practice and research. In recent years, academic activities have been stagnant due to COVID-19, and although COVID-19 infection has gradually disappeared, I feel that there is still a great deal of mental burden as a healthcare professional with regard to the risk of infection. However, we are holding this conference in the hope of providing as much information as possible on trauma dentistry.

Since the conference president is a Dual Degree Oral and Maxillofacial Surgeon who is board certified as both a medical doctor and a dentist, the theme of this year's conference focused on the biological side reactions that accompany traumatic injuries.

I hope that this conference will provide participants with an opportunity to consider trauma dentistry from a new perspective, and I would like to extend my greetings from the president of this conference.

Prof. Toru Yanagawa, DDS, MD, Ph.D.

The president of 11th AADT

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Prof. Toru Yanagawa, DDS, MD, Ph.D. (Japan)

Department of Oral and Maxillofacial Surgery, Institute of Medicine, University of Tsukuba

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Prof. Tomoko Yamazaki, MD, DDS, Ph.D. (Japan)

Department of Head and Neck Oncology Division, Saitama Medical University
International Medical Center

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Prof. Yuichi Hasegawa, MD, Ph.D. (Japan)

Department of Hematology, Institute of Medicine, University of Tsukuba,
Deputy Director, Ibaraki Prefectural Central Hospital

Special Invited Lecture

From pulpal nerve signals to cerebral projections: The roles of synapse scaffolding molecules

Prof. Katsuhiko Tabuchi, MD, Ph.D. (Japan)

Department of Molecular and Cellular Physiology, Shinshu University School of Medicine, Department of Neuroinnovation, Institute for Biomedical Sciences, Interdisciplinary Cluster for Cutting Edge Research, Shinshu University

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Department of Oral and Maxillofacial Surgery, Tsukuba Central Hospital

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Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore. Pakistan

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Dr. Shohei Takaoka, DDS, Ph.D. (Japan)
Department of Oral and Maxillofacial Surgery, University of Tsukuba Hospital.

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Ph.D. Graduate Student, Department of Molecular & Cellular Physiology, Shinshu University School of Medicine

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Dr. Satoko Kakino DDS, Ph.D.(Japan),
Department of Pediatric Dentistry / Special Needs Dentistry, Institutes of Science Tokyo,

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Department of Oral and Maxillofacial Surgery, Insutitute of Medicine, University of Tsukuba.

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Dr. Keiji Shinozuka DDS, Ph.D. (Japan)
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President's Address

Finding Breakthroughs in Dental Traumatology in the New Era.

Toru Yanagawa, DDS, MD, Ph.D.

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Summary: In dental traumatology, we have continued to analyze traumatic injuries to teeth from various perspectives, including conservative restorative dentistry, prosthodontics, endodontics, periodontics, and dental material science, with a primary focus on traumatic dental injuries. As a result, we can now achieve a high degree of success in salvaging injured teeth and preserving decayed teeth.

However, while standard treatment protocols for traumatized teeth are well established, the biological aspects of trauma have evolved. For example, Japan is now facing a super-aging society and the so-called “2025 problem,” where the baby boomers born between 1947 and 1949 are reaching the age of 75 or older, bringing the elderly population to an estimated 35 million. Traumatic dental injuries no longer involve only younger individuals but increasingly affect older adults, whose injuries present unique challenges. Elderly patients experience different fall patterns compared to younger individuals, often have impaired bone regeneration due to the use of anti-resorptive agents, and may face difficulties in controlling bleeding due to antithrombotic medications. These factors necessitate a different approach to dental trauma management compared to younger patients. As the demographics of trauma patients shift, new treatment strategies for dental trauma must be considered.

In response to these changes, we must ask: what competencies should dentists develop, and what kind of dental system should be established? In Japan, dental education has evolved to include more programs shared with medical doctors, but what should be the focus of these interdisciplinary programs? Furthermore, since dental trauma often occurs in emergency situations, how should dentists collaborate with emergency physicians? Additionally, from a research perspective, it is becoming increasingly important to move beyond the structural and clinical aspects of dental injuries to explore deeper molecular biological mechanisms and the potential application of regenerative medicine.

This year’s conference focuses on the biological response to trauma, led by a conference president who is a dual-degree oral and maxillofacial surgeon, board-certified as both a physician and a dentist.

We hope that the President’s Lecture will offer new perspectives and breakthroughs in the treatment of traumatic dental injuries for all conference participants.

Key Words: Dental traumatology, 2025 problem, Super-aging society

Brief CV

1999-2010: Assistant Professor, Department of Oral and Maxillofacial Surgery, Institute of Medicine, University of Tsukuba.

2010-2018: Associate Professor, Department of Oral and Maxillofacial Surgery, Institute of Medicine, University of Tsukuba.

2018-present: Professor, Department of Oral and Maxillofacial Surgery, Institute of Medicine, University of Tsukuba. Ibaraki Clinical Education and Training Center, University of Tsukuba Hospital.

Keynote Speech

The Importance of Medical-Dental Cooperation in the Treatment of Head and Neck Cancer

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Summary: Treatment for head and neck cancer is broadly divided into surgery, chemotherapy and radiotherapy, and these are often combined. Treatment can cause a variety of acute and late oral adverse events, and if these are not adequately controlled, it can lead to treatment interruption and a decline in quality of life.

Appropriate oral management before cancer treatment can reduce oral complications and lead to successful treatment. For this reason, it is desirable to refer patients to a dentist and provide guidance on oral management and self-care from before treatment.

This summarizes the oral adverse events of anticancer drug therapy and chemoradiotherapy in head and neck cancer, their supportive care, and the importance of medical-dental collaboration. The head and neck regions are area where important organs that are involved in functions such as speech, articulation, chewing, swallowing, and breathing, as well as senses such as smell, taste, sight, and hearing, are concentrated. Treatment decisions are made with consideration for organ preservation and quality of life, as well as aiming for a cure.

The risk factors for head and neck cancer are drinking alcohol and smoking, and they are involved in 80% of all head and neck cancers ¹⁾²⁾. In addition, in recent years, there has been a rapid increase in HPV-related oropharyngeal cancer, which is highly sensitive to anticancer drugs and radiation, but the prognosis is poor in cases where the patient has a history of smoking ¹⁾.

In cancer treatment, regardless of whether it is head and neck cancer, it has already been shown that maintaining appropriate oral management maintaining good oral hygiene has been shown to reduce the incidence of postoperative infections such as wound infections and aspiration pneumonia, as well as mucositis caused by anticancer drug treatment and radiotherapy ³⁾⁴⁾.

These days, various anticancer drugs, molecular target drugs, and immune checkpoint inhibitors have been launched. As the basic oral management techniques remain the same, it is essential to provide education to healthcare professionals other than dentists and dental hygienists, as well as to cancer patients.

There are a wide range of cases that should be referred to a dentist before cancer treatment, including cases that will undergo surgery under general anesthesia, patients undergoing chemotherapy, cases that are scheduled to undergo hematopoietic stem cell transplantation, cases that will undergo radiation therapy to the mouth, and cases that are scheduled to use bisphosphonate agents. In cases where (chemo)radiotherapy is administered for head and neck cancer, there is an increased risk of mucositis, salivary gland damage, abnormal taste, dry mouth, rampant caries, worsening of periodontal disease, and jaw necrosis. If self oral care of saliva is not working due to dry mouth caused

by salivary gland damage, this can lead to tooth decay ^{5) 6) 7)}. Therefore, after treatment has ended, regular oral management by a specialist is required.

Key Words: Head and neck cancer, Oral care, Medical-Dental Cooperation

Brief CV

2006 -2009: Iwate Prefecture Central Hospital

2009-2015: National Cancer Center Hospital of East

2016-2019 : Miyagi Prefecture Cancer Center

2021-present: Saitama Medical University International Medical Center

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Educational Lecture

How does Bleeding stop after Dental trauma? -Mechanism of Hemostasis-

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Summary: Hemostasis functions primarily with platelets and coagulation. It is platelets that first adhere to injured vessels. Platelets bind to structures such as collagen and laminin expressed outside of blood vessels via von Willebrand factor. Platelets bound to von Willebrand factor become activated, platelet glycoprotein IIb/IIIa changes its structure, and platelets begin to bind to each other via fibrinogen. This is primary coagulation. On the other hand, tissue factor flows into the broken vessels and together with activated coagulation factor VII, triggers extrinsic coagulation pathway. Platelets supply abundant phospholipids and Ca ions to the site of coagulation, and an avalanche of coagulation factors is activated one after another, finally forming a strong secondary coagulation with fibrin clinging to the platelets. The key to hemostasis is compression to stop intravascular blood flow and protect the clot that is forming. Fibrinolysis is a function that contributes to bleeding. Fibrinolysis is the process of dissolving a clot that has formed. Plasmin plays a central role, and tranexamic acid binds to the lysine-binding site of plasmin and inhibits plasmin from degrading fibrin. Plasmin activity is increased in stomatitis, and tranexamic acid is effective in hemostasis of stomatitis-related bleeding. Compression and anti-fibrinolysis play effectively in oral bleeding area.

Key Words: Hemostasis, Coagulation factor, Platelet anti-fibrinolysis

Brief CV

1996-2009: Assistant Professor, Department of Oral and Maxillofacial Surgery, Institute of Medicine, University of Tsukuba.

2009-2019: Associate Professor, Department of Transfusion Medicine, Institute of Medicine, University of Tsukuba.

2019-present: Professor, Department of Hematology, Institute of Medicine, University of Tsukuba. Ibaraki Clinical Education and Training Center, University of Tsukuba Hospital.

Special Invited Lecture

From Pulpal Nerve Signals to Cerebral Projections: The Roles of Synapse Scaffolding Molecules



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Summary: Sensory information from the dental pulp is transmitted via the trigeminal nerve to the brainstem, where it is processed and relayed to higher brain regions, including the thalamus and cerebral cortex. This pathway plays a crucial role in the perception of orofacial sensory stimuli, including pain. Synaptic scaffolding molecules are key regulators of neuronal communication along this pathway, ensuring the proper formation and function of synapses. Among these molecules, CASK (Calcium/Calmodulin-dependent Serine Protein Kinase) is a member of the MAGUK family that plays a critical role in synaptic organization and neural circuit function. While CASK is known to interact with Neurexin and Neuroligin to regulate synapse formation and neurotransmission, its specific role in cortical circuits remains an area of active investigation. My research focuses on the function of CASK in the cerebral cortex, where it contributes to synaptic stability, plasticity, and information processing. In this lecture, I will first provide an overview of the neural transmission pathway from the dental pulp to the cerebral cortex. I will then focus on the role of CASK in cortical synapses, discussing its molecular interactions, functional significance, and potential implications for neurodevelopmental and neurological disorders. Understanding how CASK regulates cortical circuits may offer new insights into the mechanisms of sensory processing and synaptic dysfunction in both physiological and pathological conditions.

Key Words: CASK, MAGUK family protein, Synapse, Intracellular signaling, Neural circuit

Brief CV

2005–2007: Assistant Instructor, University of Texas Southwestern Medical Center

2007–2008: Instructor, University of Texas Southwestern Medical Center

2008–2009: Research Associate, Stanford University School of Medicine

2009–2012: Associate Professor, National Institute for Physiological Sciences, Japan

2012–Present: Professor, Shinshu University School of Medicine

Symposium

S-1

Can Dental Traumatology be analyzed based on Genetic Factors? - CASK's Deletion Causes Cell Death and Promotes Reactive Oxygen Species in Cerebellum Granule Cells by Activating JNK Signaling -



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Objects: Microcephaly with pontine and cerebellar hypoplasia (MICPCH) is a severe neurodevelopmental disorder caused by the deficiency of the X-linked gene CASK (calcium/calmodulin-dependent serine protein kinase) affecting brain development, dental abnormalities, including potential issues with tooth size, shape, alignment, and facial dysmorphism. Studies on how CASK interacted with MICPCH and its mechanism in neurodevelopmental disease are still limited, causing difficulty in treating such diseases. In this study, we investigated CASK's role in transcriptome regulation and pathological development, to provide new insights for neurodevelopmental disease studies.

Materials and Methods: We performed comprehensive analyses on primary cerebellar granule (CG) cell culture using floxed CASK (CASK^{flox/flox}) mice infected with iCre by the immunocytochemistry *in vitro*. We collected samples and performed RNA sequencing, Real time-qPCR and Western blotting to identify specific molecular pathways. In addition, we performed stereotactic cerebellum injection into cerebellum of the heterozygous CASK KO; Hprt-eGFP mice (CASK^{+/-Hprt-eGFP/+}) with JNK inhibitor (JNK-IN-8) and performed behavior analysis on those mice *in vivo*. By using Hprt-eGFP mice, we separated CASK- or CASK+ X chromosomes activated cerebellar cells and conducted with immunohistochemistry analysis.

Result: From analyses, we found that knockout of CASK in CG cells caused apoptosis by activating intracellular Jun N-terminal kinase (JNK) signaling and promoting reactive oxygen species (ROS) pathway-related gene expression *in vitro*. By using inhibitors, especially the JNK-IN-8, the CG cell survival rate was significantly increased. Compared to the CASK^{+/+Hprt-eGFP/+}, the CASK^{+/-Hprt-eGFP/+} showed cerebellum developmental defects, mobility and behavioral abnormalities *in vivo*. By further investigation, injection of JNK-IN-8 into the cerebellum of CASK^{+/-Hprt-eGFP/+} mice improved cerebellar development and function, decreased mobility abnormalities and reduced abnormal behavior.

Conclusions: These results suggest that JNK-IN-8 suppresses CASK-deletion-induced cell death and the ROS pathway in CG cells, with promising therapeutic implications for neurodevelopmental disorders in future.

Key Words: CASK, MICPCH, Apoptosis, Reactive oxygen species, JNK signaling

Brief CV

2013-2018: Hebei North University

2018-2022: Ph.D Course, Department of Molecular and Cellular Physiology, Shinshu University School of Medicine, Matsumoto, Japan

2018-present: Researcher, Department of Molecular and Cellular Physiology, Shinshu University School of Medicine, Matsumoto, Japan

S-2

A Novel Chondrogenic Differentiation Method using Human Dental Pulp Stem Cells for Reconstruction after Maxillofacial Trauma

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Objects: Autologous tissues such as free flap grafts, blocked bone grafts, rib cartilage and auricular cartilage grafts have been used to treat tissue defects following maxillofacial trauma. However, these methods cause invasion of other healthy sites. Our group has focused on Human dental pulp stem cells (DPSCs) and has gained much knowledge about bone regeneration. Therefore, as the next step, we aimed to establish a novel three-dimensional regenerative cartilage therapy with mechanical strength. In this study, we explored a simple and inexpensive method to induce differentiation of DPSCs into chondrocytes. Human dental pulp stem cells (DPSCs) are now considered a type of mesenchymal stem cells and exhibit higher clonogenic and proliferative potential than bone marrow stem cells. Therefore, we hypothesized that human dental pulp stem cells, which have higher proliferative capacity than bone marrow mesenchymal stem cells, could be a new stem cell source for three-dimensional cartilage regeneration. Several studies have shown that a thienoindazole derivative small compound TD-198946 (TD) induces chondrogenic differentiation of mesenchymal cells. In our previous studies, we investigated whether chondrogenic differentiation could be enhanced by the use of TD in the currently known chondrogenic differentiation induction medium. The optimal concentration of TD was 10^{-7} M. Our previous chondrogenic medium is costly and complicated because it contains seven additives, including two growth factors. Therefore, we hypothesized that the benefits of TD could be maximized by simplifying the medium more. The aim of this study is to establish a highly efficient and low-cost method to induce DPSCs into chondrocytes as a cell source.

Materials and Methods: DPSCs were obtained from dental pulp of premolars or third molars from 24 to 45-year-old patients and cultured in normal medium (NM, control) and chondrogenic medium with/without TD (C, C+TD) for 14-28 days. All procedures of the present experiments were approved by the ethics committee of the Tokyo Women's Medical University (ethics permission #2021-0039). Previous chondrogenic mediums were expensive and complex. Therefore, with reference to other reports, we decided to use a simple medium. This new chondrogenic differentiation medium consists α -MEM with 5% FBS, 10 ng/mL transforming growth factor (TGF)- β 1, 100 nmol/L dexamethasone, 6.25 μ g/mL insulin, 50 nmol/L ascorbic acid-2-phosphate, 110 mg/L pyruvate sodium. In addition, a completely new growth factor-free TD-only medium was also tested. GF-free medium was prepared from DMEM/F12 with 5% FBS and The GF-

free medium consisted of DMEM/F12 with 5% FBS, 10 µg/ml insulin-transferrin-selenite X (ITS-X) and 100 nmol/L (10⁻⁷ M) TD only.

Result: Real-Time Quantitative Reverse Transcription PCR (RT-qPCR) results showed that chondrogenic medium supplemented with TGF-B and TD (10⁻⁷M) effectively increased gene expression levels of col2a1 and aggrecan, that are chondrogenic differentiation markers. However, expression of sox-9 was not stable. In contrast, the expression of genes related to chondrogenesis was higher in the GF-free group than in the TGFβ group, especially on day 14. In Col1A, Col2A, and ACAN, expression tended to be higher in GF-free, C+TD, C, and Control, in that order. Sox6 and Sox9 were unstable and some were lower than Control.

Conclusions: These results suggest that TD-induced DPSCs are a useful cell source for cartilage regenerative medicine. Furthermore, our novel method successfully induced chondrocyte differentiation without the use of conventionally used bFGF or TGF-B. However, the results of sox-9 varied from cell line to cell line, suggesting that further studies, such as protein-level analysis, are needed.

Key Words: Human dental pulp stem cells (DPSCs), Cartilage regeneration, Chondrogenic differentiation

Brief CV

2009-2016: Assistant Professor, Department of Oral and Maxillofacial Surgery, University of Tokyo.

2016-2018: Assistant Professor, Department of Oral and Maxillofacial Surgery, University of Gunma.

2018-2020: Assistant Professor, Department of Oral and Maxillofacial Surgery, Tokyo Medical University

2020-2022: Associate lecturer, Department of Oral and Maxillofacial Surgery, Tokyo Women's Medical University

2022-present: Lecturer, Department of Oral and Maxillofacial Surgery, Tokyo Women's Medical University

S-3

Clinical Indications for the Bioabsorbable Plating System in Oral and Maxillofacial Surgery.

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Bioabsorbable plating systems are increasingly being used as alternatives to metal plating systems for the treatment of oral and maxillofacial fractures, including fragment fixation in orthognathic surgery. This article provides an overview of postoperative infections, precautions, and experience with bioresorbable bone graft systems such as Lactosorb®, SonicWeld Rx®, and Fijosorb MX® since 2008, including their use in infant fractures.

A mid- to long-term clinical evaluation was conducted on 51 patients treated with Lactosorb®, a PGA-co-PLLA composite, for facial fractures. The cohort included 43 males and 7 females ranging in age from 2 to 86 years. Of these, 47 had multiple facial fractures, 2 had orbital floor fractures and 2 had jaw deformities. A total of 168 plates/meshes and 725 hex hed screws were used. Postoperative complications included infections in 5 patients (10%), which occurred 1 to 8 months after surgery. These were successfully treated with incision, drainage, or removal of the plating systems. Plate exposure was observed in 2 patients (4%). In 2 of the 5 cases of infection, symptoms were evident 8 months postoperatively, suggesting that obstruction of the resorption process may contribute to infection. However, the complication rates were comparable to those of titanium plates. Overall, Lactosorb® proved to be a safe and effective bioresorbable bone grafting system for cranio-maxillofacial applications.

In addition, SonicWeld Rx® has recently been used for nasomaxillary buttresses in Le Fort I maxillary orthognathic surgery. Unlike previous systems, it eliminates the need for tapping to create threaded holes, simplifying and reducing the length of the procedure.

For mandibular fractures, bioresorbable plating systems may be less robust than metal plates. However, due to concerns about the patient's environment and a history of multiple injuries, we chose Fijosorb MX® for open reduction and fixation of a mandibular fracture in a 2-year-old child. The injury occurred after a fall from a second story window, approximately 3 meters to the ground. The patient was brought to a local hospital by a neighbor. Initial examination revealed a laceration extending from the right lower lip to the mandible area, penetrating the orbicularis oris and buccalis muscles, with oral cavity involvement. CT imaging revealed a mandibular fracture between the right lower AB and bilateral articular process fractures. Previous trauma included a stroller accident in April 201X, a fall down 20 stairs in August 201X, and a scalding injury in January 201X+2. Under general anesthesia, the teeth were ligated and fixed between the right and left mandibular condyles. The mandibular inferior margin and two superior sites were stabilized with Fijosorb MX®. Bilateral articular process fractures were treated conservatively. Postoperatively, the patient exhibited mild occlusal deviation on the right side, but was discharged 10 days later without functional problems. The mandibular deviation improved and the dental ligature was removed after approximately one month. Maxillofacial fractures in young children are rare due to close parental supervision. There

are few reports of treatment with strong fixation in this age group. Traditionally, conservative methods have been preferred because rigid fixation may interfere with the development of the jawbone and inhibits tooth embryo growth. However, recent evidence suggests that bioabsorbable plating systems can provide effective fixation without compromising growth, underscoring the importance of careful treatment selection.

Key Words: Bioabsorbable plating system, Oral and maxillofacial fractures, Mid- to long-term clinical evaluation, Orthognathic surgery

Brief CV

2003-2006: Assistant Professor, Oral and Maxillofacial Surgery, Department of Oral Restitution, Division of Oral Health Sciences, Graduate School, Tokyo Medical and Dental University

2007-2013: Chief, Department of Oral and Maxillofacial Surgery, Yokkaichi Municipal Hospital

2013-2017: Associate Professor, Department of Oral and Maxillofacial Surgery, Institute of Medicine, University of Tsukuba.

2017-2018: Chief, Department of Oral and Maxillofacial Surgery, Toyokawa Municipal Hospital

2018-2019: Chief, Department of Oral and Maxillofacial Surgery, Toyota-Wakatake Hospital

2019-present: Associate Professor, Department of Oral and Maxillofacial Surgery, Aichi-Gakuin University

S-4

Oral Assessment of Osteoporosis Patients in the Osteoporosis Liaison Service (OLS).

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Object: Osteoporosis predisposes patients to traumatic fractures, and the number of patients treated with bone resorption inhibitors for prevention is increasing. There have also been reports of drug-related osteonecrosis of the jaw with bone resorption inhibitors. There are still few published reports on the oral conditions of osteoporotic patients. In order to prevent re-fracture, we established the Osteoporosis Liaison Service (OLS) Committee in August 2018 under the collaboration of various professions, and our department has been evaluating the oral cavity of patients with osteoporosis. In this report, we describe the oral status of patients with osteoporosis.

Material and Methods: Of 585 patients with vertebral fractures and proximal femur fractures admitted to our hospital and intervened with OLS from August 2018 to December 2021, 451 patients with dental intervention were included. Gender, age, mean number of remaining teeth, the number of patients who were candidates for tooth extraction, the number of patients who underwent tooth extraction, and treatment details were investigated retrospectively from the medical records.

Results: The 451 subjects were 94 males (mean 78.5 years) and 357 females (mean 83.2 years). The mean number of remaining teeth was 13.4. 44.3% (200 patients) of the patients were diagnosed as requiring tooth extraction before medication, and 22.4% (101 patients) actually underwent tooth extraction. 21.9% (99 patients) of the patients underwent tooth extraction. 21.9% (99 patients) did not give consent for tooth extraction. As for treatment, oral care was provided to all patients. Denture-related treatment was performed in 14.6% (66 patients) and caries treatment in 2.4% (11 patients).

Conclusion: Most of the osteoporotic patients were elderly, 44.3% of whom were indicated for tooth extraction and many of whom had poor oral health. There have been reports of osteonecrosis of the jaw due to the administration of bone resorption inhibitors, and it is recommended that teeth that can become a source of infection should be extracted. However, about half of the patients who were candidates for extraction refused to have their teeth extracted. Unfortunately, patients with osteoporosis have low awareness of the importance of dental treatment, and further educational activities are needed. It is reported that the number of cases of osteonecrosis of the jaw is higher in Japan than in other countries, and this is an issue that needs to be addressed in the future. The role of dentistry in OLS is very important.

Key Words: Osteoporosis, Oral Assessment, Tooth extraction

Brief CV

1988: Graduated from Nihon University School of Dentistry at Matsudo

1994: Completed Resident Course in Oral and Maxillofacial Surgery, University of Tsukuba Hospital

1994 - present: Assigned to the Department of Oral and Maxillofacial Surgery, Tsukuba Central Hospital~Currently Senior Chief

Podium Presentations

P-1

Tooth Avulsion in a Patient with Cochlear Implant: A Case Report



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Purpose: Is replantation of an Avulsed Permanent Incisor safe in patients with Cochlear Implant?

Case: A 12-year-old boy suffered a bicycle fall and had trauma to Maxillary Anterior Teeth on 25 May 2022 at 7:00 pm.

Present Medical History: The mother of the child suffered from Anti Phospholipid Syndrome. He was born Pre-Term at 7.5 months and weighed 1.2 kg. Developed Respiratory Distress Syndrome, Sepsis and Shock and remained on Ventilator for 22 days. He was treated with Gentamicin. Developed gentamicin-induced deafness in both ears. He received a Right Cochlear Implant at the age of 2.5 years.

History: The patient was brought to the EAR at SKMCH&RC at 9:00 pm on the day of injury. Sent back home after initial management. Tetanus Toxoid was not administered. The avulsed tooth was not sought. The patient was seen in the Dental Clinic almost 24 hours later.

Oral Findings: UR1 Extrusion 1mm, UR2 Concussion, UL1 Avulsion with Extra Alveolar time 24 Hours.

Treatment and Progress: Case discussed with Infectious Diseases Department at SKMCH&RC. Literature Reviewed. There was no evidence of Cochlear Implant infection or failure due to dental source. Permission for delayed replantation gained. Tetanus Toxoid Booster Administered. Injectable Co-Amoxiclav given as first dose. Delayed Replantation and Splinting were done as per IADT 2020 Guidelines. Endodontics UR1 and UL1 were initiated on 14th day and CaOH was placed. The splint was removed in 3 weeks. Obturations were completed in 4 weeks. UL1 followed up for 2 years and 5 months. Progressive Replacement Resorption (>50%) ensuing. 1mm Infra-occlusion UL1 at present.

Conclusion: Delayed Tooth Replantation in a patient with Cochlear Implant is a viable treatment option for tooth avulsion.

Key Words: Avulsion, Delayed Replantation, Cochlear Implant

Brief CV

Educational and Academic Qualifications:

1998: BDS (University of Karachi)

2011: FRACDS (Australia)

2021: FCGDent (UK)

Positions and Employment:

2012- 2021: Head of Department, Assistant/Associate Professor, Operative Dentistry, University College of Dentistry, University of Lahore. Pakistan

2012-Till to date: Visiting Consultant Dental Surgeon, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore. Pakistan

P-2

The Usefulness of Beta-estradiol in the Neural Induction of Human Dental Pulp Stem Cells.



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Objects: Numerous studies have explored the neural induction of dental pulp stem cells (DPSCs), a type of mesenchymal stem cell. However, unlike the well-established protocols for the neural induction of pluripotent stem cells, the methods and outcomes for neural induction of DPSC remain undefined. In this study, we utilized sex steroid hormones from an embryological standpoint to facilitate the neural induction of DPSCs.

Materials and Methods: Human DPSCs were cultured in a monolayer and differentiated into neural lineage cells using a neural induction medium enriched with β -estradiol and progesterone. Employing an ingenious pathway analysis based on microarray data, we identified key regulatory factors and elucidated the associated cell signaling pathways.

Result: Following neural induction, the resultant cell population comprised both GFAP-positive glial cells and MAP2-positive neurons. The top five master regulators, as predicted by the ingenious pathway analysis, were β -estradiol, prefoldin subunit 5, SRY-box transcription factor 2 (SOX2), actin-like 6A, and Hexamethylene bis-acetamide-inducible protein 1 (HEXIM1), listed in descending order of importance. SOX2 and HEXIM1 were predicted to function as inhibitors. The most prominent cell signaling pathway, identified through canonical pathway analysis, was the axonal guidance signaling pathway.

Conclusions: These findings underscore the potential utility of sex steroid hormones in promoting the neural differentiation of DPSCs.

Key Words: Dental pulp stem cells, Neural induction, Beta-estradiol. Sex steroid hormone

Brief CV

2014-2016: Department of Oral and Maxillofacial Surgery, University of Tsukuba Hospital.

2016-2017: Department of Oral and Maxillofacial Surgery, Tsukuba Gakuen Hospital.

2017-2022: Doctoral Program in Clinical Sciences, Graduate School of Comprehensive Human Sciences, University of Tsukuba.

2022-present: Department of Oral and Maxillofacial Surgery, University of Tsukuba Hospital.

P-3

A Case of Maxillary and Mandibular Fractures after High-energy Trauma treated with Open Reduction Internal Fixation and Dental Implants.



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Objects: Maxillofacial trauma caused by high-energy trauma often involves multiple fractures and associated tooth resorption, and it is difficult to restore both aesthetics and functionality. We report a case treated with comprehensive surgical and prosthetic treatment for maxillofacial trauma caused by high-energy trauma.

Case Report: A 34-year-old Japanese woman suffered trauma after falling from a great height following an argument with her boyfriend. She was initially treated at another hospital and then referred to the Department of Oral and Maxillofacial Surgery and the Department of Orthopedic Surgery at the University of Tsukuba Hospital. She had fractures of the left mandible, maxillary alveolar bone fractures, complete dislocation of both maxillary central incisors, a pubic bone fracture, and patellar fractures. Her medical history included alcoholic hepatitis and ovarian cysts. The pubic bone and patella fractures were treated conservatively by orthopedic surgeons. For the mandibular fracture, we performed open reduction and internal fixation (ORIF) under general anesthesia. After 6 months, the internal fixation plates were removed. It was planned to use dental implants to restore the missing bilateral maxillary central incisors. As the labial alveolar bone of the maxillary central incisors was lost, a block of donor bone was taken from the ramus of the mandible and grafted to the defective part of the labial alveolar bone in the maxilla. Six months later, the primary implant surgery (implant placement) was performed (Straumann BL Roxolid® ϕ 3.3, 10 mm), and one month later, the secondary surgery was performed. After placing the provisional restoration, the superstructure was attached two months later. The final prosthetic restoration has been in place for two years, and there have been no problems either aesthetically or functionally.

Conclusions: We report a favorable case treated with ORIF and dental implants for multiple fractures and complete dislocation of the teeth following high-energy trauma.

Key Words: High-energy trauma, Maxillofacial trauma, Fracture, Tooth dislocation, Dental implant.

Brief CV

2005-2011: Resident, Department of Oral and Maxillofacial Surgery, Institute of Medicine, University of Tsukuba Hospital.

2011-2014: Clinical staff, Department of Oral and Maxillofacial Surgery, Hasuda Hospital.

2014-2015: Clinical Fellow, Department of Oral and Maxillofacial Surgery, University of Tsukuba Hospital.

2015-2018: Clinical Assistant Professor, Department of Oral and Maxillofacial Surgery, University of Tsukuba Hospital.

2018-present: Assistant Professor, Department of Oral and Maxillofacial Surgery, Institute of Medicine, University of Tsukuba.

P-4

Pharmacological Effects of Serotonin-related Drugs on Dental Trauma caused by the Autistic Behaviors and Adult Neurogenesis.



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Objects: Autism Spectrum Disorder (ASD) is a group of developmental disorders characterized by deficits in social interaction and communication, along with restricted and repetitive behaviors, and have an impact on oral health such as dental caries, periodontal disease, and dental injuries. Both genetic and environmental factors contribute to ASD, including prenatal exposure to nicotine. Prenatal nicotine exposure (PNE) mice exhibited reduced adult hippocampus neurogenesis, increased anxiety, and diminished social novelty. This study utilized PNE mice as an autism mouse model to investigate the effects of anti-psychiatric drugs, such as fluoxetine, on adult neurogenesis and behavior.

Materials and Methods: In this study, we explored the effects of fluoxetine treatment on social behavior and adult hippocampal neurogenesis in PNE mice. Sociability and social novelty preference were evaluated using the three-chamber social interaction test. Adult hippocampal neurogenesis was assessed through BrdU and DCX immunofluorescence, which specifically identify newly generated and immature neurons.

Result: Fluoxetine-treated PNE mice showed more social novelty preference than vehicle-treated PNE mice and Fluoxetine rescued the loss of adult newborn neurons in the hippocampus of PNE mice.

Conclusions: These results suggest that serotonin-related drugs, such as fluoxetine, can improve social behavior in PNE mice, potentially by rescuing adult hippocampal neurogenesis. This mechanism provides insight into dental traumatology, and the potential therapeutic role of fluoxetine and similar drugs in the treatment of autism spectrum disorders.

Key Words: Autism spectrum disorder, Prenatal nicotine exposure, Fluoxetine, Adult hippocampus neurogenesis.

Brief CV

2016-2021: M.B., School of Clinical Medicine, Binzhou Medical University, Shandong, China.

2022-present: Ph.D., Department of Molecular & Cellular Physiology, Shinshu University School of Medicine, Nagano, Japan.

P-5

A Case of Intentional Replantation of A Young Permanent Incisor with Pulp Infection due to Abnormal Crown Morphology and Dental Trauma



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Introduction: Traumatic injury to young permanent teeth often results in abnormal root formation associated with inflammation of the pulp tissue. In this report, we describe the eight-year follow-up of subluxated young permanent teeth with abnormal crown morphology and tooth preservation by intentional replantation.

Case report: The patient was a 7-year-old girl who suffered from subluxation of the right upper central incisor (#21). The injured tooth was turned outward because of the abnormal crown morphology with a well-developed incisor tubercle, making it difficult to close the lips; therefore, the tooth became re-injured twice within a year of the initial injury. Abnormal root formation was observed six months after the first injury. We suspected pulp infection in #21 based on an X-ray examination, but it responded to electric pulp testing (EPT) for six years after the injury. Seven years after the injury, there was no response to EPT, and bone resorption was observed on cone-beam CT; therefore, root canal treatment was initiated. Seven years and six months after the injury, intentional replantation was performed to completely remove the infected area of the root apex, and the sinus tract disappeared. Bone regeneration was observed six months after intentional replantation.

Discussion: In this case, pulp infection may have been caused by both the anatomical structure of the incisor tubercle and dental trauma. As root apex formation continued after the injury, it was suggested that the pulp was partially vital. The positive response to EPT, despite a long history of suspected pulp infection, was attributed to the strong pulp viability of the young permanent tooth and the resistance of the nerve fibers to inflammation. In this case, intentional replantation effectively preserved the tooth and alveolar bone during the growth period. It is necessary to prevent re-injury and monitor the long-term prognosis.

Key Words: Abnormal root formation, Intentional replantation, Young permanent teeth,

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2008: Clinical Fellow, Dental Hospital, Faculty of Dentistry, Tokyo Medical and Dental University (TMDU)

2015-2018: Assistant Professor, Department of Pediatric Dentistry, TMDU

2018-2024: Junior Associate Professor, Department of Pediatric Dentistry, TMDU

2024-present: Junior Associate Professor, Department of Pediatric Dentistry / Special Needs Dentistry, Institutes of Science Tokyo

P-6

A Case using ORB-03, a New Bone Regeneration Material, in A Bone Defect Created during Orthognathic Surgery.



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Objects: ORB-03, a new bone regeneration material, is comprised of 70% beta-tricalcium phosphate (β -TCP) and 30% poly L-lactide-co-glycolide (Rebossis® ORTHOREBIRTH Co. Ltd., Kanagawa, Japan), and has a cotton-like shape making it easy to operate. In this case study, we describe the favorable progress of a patient who received ORB-03 to treat a bone defect caused by orthognathic surgery.

Case: The patient was a 28-year-old woman who underwent a Le Fort I osteotomy and mandibular bilateral sagittal split osteotomy. The bone defect was filled with ORB-03, and cone-beam computed tomography (CBCT) was performed 6- and 12-months post-surgery to evaluate the bone. Although sufficient bone formation was not observed 6-months post-surgery, it was observed at 12-months after surgery. Additionally, visual inspection during plate removal confirmed good bone formation.

Conclusion: ORB-03 is a promising bone regeneration material with excellent operability and osteogenic ability that has osteogenic ability, even in the jawbone region.

Key Words: β -tricalcium phosphate, β -TCP/PLLA/PGA cotton-like fibre, Synthetic/artificial bone graft substitutes, Bone grafting, Rebossis

Brief CV

2014-2018: Assistant Professor, Department of Oral and Maxillofacial Surgery, Institute of Medicine, University of Tokyo Women's Medical University.

2018-2019: Clinical Assistant Professor, Department of Oral and Maxillofacial Surgery, University of Tsukuba Hospital.

2019-present: Clinical Lecturer, Department of Oral and Maxillofacial Surgery, University of Tsukuba Hospital.

P-7

Mandibular Cyst uncovered due to Maxillary Central Incisor Injury.

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Objects: The aim of this case report is to present a patient with a mandibular cyst discovered following an injury to the maxillary central incisor. The report also highlights the necessity of radiographs and CT imaging for a detailed diagnosis, even when symptoms appear mild.

Materials and Methods: A 29-year-old male patient presented with fractured maxillary central teeth and tooth subluxation. Although the symptoms seemed mild, a panoramic X-ray and cone-beam computed tomography (CBCT) were performed for a more comprehensive evaluation. The imaging revealed a well-defined radiolucent lesion in the mandibular region, suggestive of a cystic lesion, with a possible diagnosis of either a simple bone cyst or a dentigerous cyst. Further investigation, including a biopsy, is planned to confirm the diagnosis.

Result: Radiographic and CT findings revealed a well-defined radiolucent lesion in the mandible, consistent with either a simple bone cyst or a dentigerous cyst. However, as the lesion is still under evaluation, definitive treatment has not yet been initiated. The differential diagnosis remains under consideration, with a biopsy scheduled for histopathological confirmation.

Conclusions: This case underscores the importance of thorough diagnostic imaging, such as radiographs and CT scans, even in cases with mild symptoms. These imaging modalities can uncover underlying conditions, such as simple bone cysts or dentigerous cysts, that might otherwise remain undetected. Early and accurate diagnosis is critical to determining the appropriate treatment plan and preventing potential complications.

Key Words: Mandibular cyst, Potential complications, Dental trauma, Fractured teeth

Brief CV

2013-2015: Visiting Assistant Professor, University of Texas MD Anderson Cancer Center

2015-2016: Assistant Professor, Teikyo University School of Medicine

2017-2021: Assistant Professor, Nihon University School of Dentistry

2022-Present: Associate Professor, Nihon University School of Dentistry

