ACOMFR 2024 Kaohsiung

The 14th

Asian Congress of Oral and Maxillo-Facial Radiology

CUTTING EDGE-TECHNOLOGY IN DENTAL IMAGE

Abstract Book

ACOMFR 2024

June 13th–15th, 2024 (Thu.-Sat.)

Venue: KMU International Convention Center

TAIWAN ACADEMY OF ORAL AND MAXILLO-FACIAL RADIOLOGY SINCE 2000

ACOMFR 2024 Kaohsiung

AAOMFR since 2013

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Congress Information

Congress:

The 14th Asian Congress of Oral and Maxillo-Facial Radiology

Date:

June 13th-15th, 2024

Venue:

KMU International Convention Center

Organizer:

Taiwan Academy of Oral and Maxillofacial Radiology(TAOMFR)

Co-Organizers:

Kaohsiung Medical University

China Medical University

Funding:

教育部

衛生福利部 Ministry of Health and Welfare 促進全民健康與福祉

NSTC 國家科學及技術委員會 National Science and Technology Council

高雄市政府

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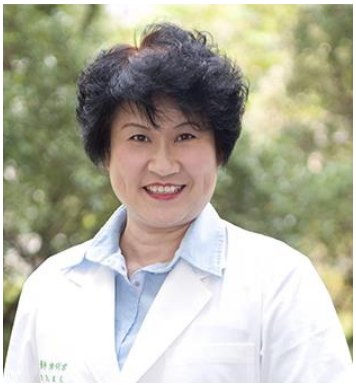
Welcome Messages

Dear Fellow AAOMFR Members and Colleagues, I would like to express my gratitude to the President Ming-Gene Tu for hosting the 14th ACOMFR. Meanwhile, the Asian Academy of Oral and Maxillofacial Radiology (AAOMFR) was established in 2013 and currently has nearly 1,000 members. Due to the pandemic of COVID-19, the 14th ACOMFR will be held locally in six years since the 12th ACOMFR held in Mumbai from September 6th to 9th, 2018. I am looking forward to meeting everyone face-to-face in a while.

Junichi Asaumi
AAOMFR Secretary General

We are expecting you visit us and attend the 14th ACOMFR, although you might have visited our city on 2017 IADMFR or other meetings that was 23 years ago 4th ACOMFR. Time is running fast; Kaohsiung is changed a lot. Some 3 new buildings, new Department stores, easy light train were established, academic papers were changed too, etc…. However, most important thing is the good relationship is not changed, our warm hearts are not changed; God's Love is never changed…..

Li-Min Lin
President of 21st ICDMFR, Advisor of 14th ACOMFR



Ming-Gene Tu,
DDS., MS., PhD.
President of 14th ACOMFR

Greetings! On behalf of the president of the 14th Asian Congress of Maxillo-facial Radiology (ACOMFR), it is a great honor and privilege for us to be awarded the opportunity to host the 14th ACOMFR at Kaohsiung, Taiwan from June 13th to 15th, 2024. Themed —Cutting-edge Technology in Dental Imaging. We are excited to be collaborating with many interdisciplinary and leading experts. The scientific program comprises a wonderful array of international and domestic invited speakers. The most up-to-date research, diverse topics of interest, and educational events are explored. Thank you for supporting us in every step of our journey towards success. We look forward to welcoming you in the 14th ACOMFR!

Congress Organizers

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Past Asian Congress of Oral and Maxillo-Facial Radiology (ACOMFR)

1st ACOMFR : 1996.5.29-5.31, Tokyo, Japan
President : Professor Takehito Sasaki, Tokyo Medical and Dental University

2nd ACOMFR : 1998.6.11-6.13, Seoul, Korea
President : Professor Tae-Won Park, Seoul National University

3rd ACOMFR : 2000.7.7-7.9, Beijing, China
President : Professor Xu-Chen Ma, Peking University

4th ACOMFR : 2002.6.14-6.16, Kaohsiung, Chinese Taipei
President : Professor Li-Min Lin, Kaohsiung Medical College

5th ACOMFR : 2004.12.15-12.17, Bangkok, Thailand
President : Assistant Professor Anonknart Bhakdinaronk, Naresuan University

6th ACOMFR : 2006.12.8-12.10, Bangalore, India
Chairman : Professor Kikkeri S. Nagesh, R.V. Dental College

7th ACOMFR : 2008.11.20-11.22, Nara, Japan
President : Professor Tomohiro Okano, Showa University

8th ACOMFR : 2010.11.14-11.16, Seoul, Korea
President : Professor Jae-Duk Kim, Chosun University

9th ACOMFR : 2012.9.14-9.16, Xi' an, China
President : Professor Zuyan Zhang, Peking University

10th ACOMFR : 2014.11.20-11.22, Bali, Indonesia
President : Professor Suhardjo Sitam, Bandung University

11th ACOMFR : 2016.11.10-11.12, Chiang Mai, Thailand
President : Associate Professor Karune Verochana, Chiang Mai University

12th ACOMFR : 2018.9.6-9, Mumbai, India
President : Associate Professor Sunali Khanna, Nair Hospital Dental College

13th ACOMFR : 2022.6.3-4, on-line meeting, Japan
President : Professor Yoshinori Arai, Nihon University

The Congress Venue

The International convention center,

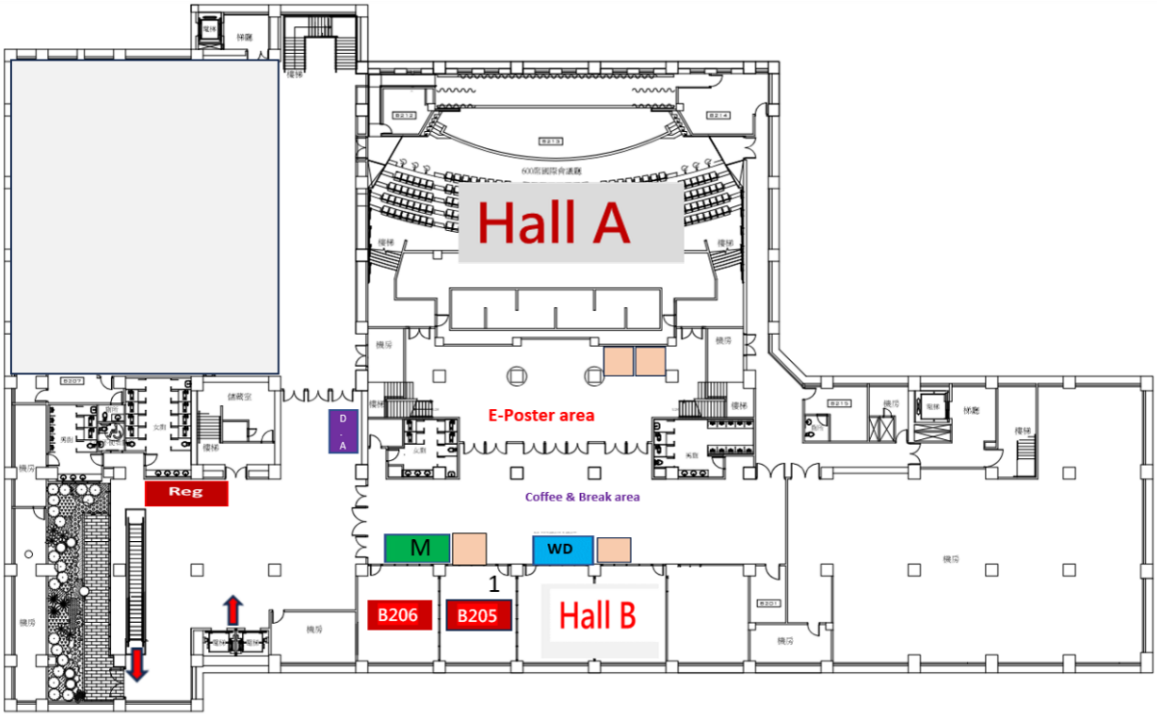
Kaohsiung Medical University / B2 floor

Slide review room: **Room B205**

Invited speakers' lecture: **Hall A**

Oral presentation: **Hall B**

AAOMFR board meeting: **Room B206**



Program at a Glance

Date	June 13 (Thursday)-Day 1				June 14 (Friday)-Day 2			June 15(Saturday)-Day 3	
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08:00-08:35	**Registration (08:00-16:00)**				**Registration (08:00-16:00)**			**Registration (08:00-11:00)**	
08:35-09:00	**Opening Ceremony**								
09:00-10:00	**A-01 Rose Ngu**				**A-09 Jie Yang**	**Oral O021-026**	**Poster P023-043**	**A-16 Hua-Hong Chien**	**Poster P068-090**
10:00-10:50	**A-02 Junichi Asaumi**				**A-10 Akitoshi Katsumata**			**A-17 Jeffrey Coil**	
10:50-11:10	**Coffee break**				**Coffee break**			**Coffee break**	
11:10-12:00	**A-03 Takashi Kaneda**	**Oral O001-006**	**AAOMFR Board Meeting**		**A-11 Min-Suk Heo**	**Oral O027-032**		**A-18 Shumei Murakami**	
12:00-12:50	**A-04 Hiroshi Watanabe**				**A-12 Sam Sun Lee**			**A-19 Hsinhua Lee**	
12:50-13:50	**Lunch**				**Lunch**			**Closing Ceremony/ Lobby Buffet**	
13:50-14:40	**A-05 In-Woo Park**	**Oral O007-013**		**Poster P001-022**	**A-13 Ying-Hui Su**	**Oral O033-037**	**Poster P044-067**	**TAOMFR Assembly**	
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15:50-16:40	**A-07 Yoshinori Arai**	**Oral O014-020**			**A-15 Yunn-Jy Chen**				
16:40-17:30	**A-08 Chung-Hsing Li**				**General Assembly**				
17:10-19:00									
18:30-20:30	**Welcome Party** **Hi-Lai Arena 9th Floor- Room BCD (鶴銀寶廳)**				**Gala Dinner** **Kaohsiung Marriott Hotel 10F- Meeting Room C**				

Daily program

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Date	June 13 (Thursday)-Day 1		
Venue	**Hall A**	**Hall B**	**Exhibition Area**
08:00	**Registration (08:00-16:00)**		
08:35-9:00	**Opening Ceremony** Emcee: Mr. Po-Shu Huang		
09:00-10:00	**A-01 Rose Ngu** Top Tips You Should Know to be a Great Radiologist! M Lin-Min Lin		
10:00-10:50	**A-02 Junichi Asaumi** MRI Imaging Analysis in the Oral and Maxillofacial Region M Peggy Lee		
10:50-11:10	**Coffee break**		
11:10-12:00	**A-03 Takashi Kaneda** MRI and CT of the Maxillomandibular Region : What the Oral Radiologists need to Know M Jie Yang	Oral Presentation Session #1 11:10 O-001 11:25 O-002 11:40 O-003 11:55 O-004 12;10 O-005 12:25 O-006 M Peggy Lee	
12:00-12:50	**A-04 Hiroshi Watanabe** Imaging of the Mandibular Canal M Jing-Hui Cheng		
12:50-13:50	**Lunch**		
13:50-14:40	**A-05 In-Woo Park** Interesting Textbook Cases Easily Encountered in Dental Clinics M Ming-Gene Tu	Session #2 13:50 O-007 14:05 O-008 14:20 O-009 14:35 O-010 14:50 O-011 15:05 O-012 15:20 O-013 M Akitoshi Katsumata	Poster Presentation Session #1 P001-P022 15:10 ~ 16:10 M Ching-Hung Chung
14:40-15:30	**A-06 Masahiro Iikubo** Interactive Relationship between Oral Conditions and Systemic Diseases M Wen-Chen Wang		
15:30-15:50	**Coffee break**		
15:50-16:40	**A-07 Yoshinori Arai** From Ortho Pantomography to the Latest CBCT for X-ray Elevation Angle Variable Method M Junichi Asaumi	Session #3 15:50 O-014 16:05 O-015 16:20 O-016 16:35 O-017 16:50 O-018 17:05 O-019 17:20 O-020 M Sam Sun Lee	
16:40-17:30	**A-08 Chung-Hsing Li** Growing Patients- cephalometric Craniofacial Features, a Brief Overview M Yu-Jen Chang		
18:30-20:30	**Welcome Party**		

M Moderator | Invited Speaker | Oral Presentation | Poster Presentation

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Date	June 14 (Friday)-Day 2		
Venue	**Hall A**	**Hall B**	**Exhibition Area**
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09:50-10:40	**A-10 Akitoshi Katsumata** Deep Learning and Artificial Intelligence in Dental Radiology M In-Woo Park		
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11:00-11:50	**A-11 Min-Suk Heo** Artificial Intelligence in Dentistry: the Current Status and Considerations M Yoshinori Arai	Session #5 11:00 O-027 11:15 O-028 11:30 O-029 11:45 O-030 12:00 O-031 12:15 O-032 M Hiroshi Watanabe	
11:50-12:40	**A-12 Sam Sun Lee** Correlation Between Laboratory and Clinical Imaging Quality Assessments for Panorama and CBCT Images M Hui- Er Lee		
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13:50-14:40	**A-13 Ying-Hui Su** CBCT-Derived Digital Information and AI Applications in Endodontics Clinical Practice M Hua-Hong Chien	Session #6 13:50 O-033 14:05 O-034 14:20 O-035 14:35 O-036 14:50 O-037 M Jeffrey Coil	Poster Presentation Session #3 P044-P067 15:10 ~ 16:10 M Lien-Yu Chang
14:40-15:30	**A-14 Peggy Lee** Temporomandibular Disorder: Imaging's Role in Understanding Progression M Dai-Chien Chen		
15:30-15:50	**Coffee break**		
15:50-16:40	**A-15 Yunn-Jy Chen** Screening Images for Orofacial Pain M Shin-Yu Lu, Yu-Heng Lin		
16:40-17:30	**General Assembly** M Junichi Asaumi		
18:30-20:30	**Gala Dinner**		

M Moderator | Invited Speaker | Oral Presentation | Poster Presentation

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Date	June 15 (Saturday)-Day 3	
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09:50-10:40	**A-17 Jeffrey Coil** Use of CBCT in Clinical Decision Making in Endodontics M Cheng-Mei Yang	
10:40-11:00	**Coffee break**	
11:00-11:50	**A-18 Shumei Murakami** Current Radiation therapy for Oral Cancer M Rose Ngu	
11:50-12:40	**A-19 Hsinhua Lee** Magnetic Resonance Imaging-guided Radiotherapy for Head and Neck Cancer M Ming-Yii Huang	
12:40-13:40	**Closing Ceremony**	
13:40-14:40	**TAOMFR General Assembly** **中華民國口腔顎顏面放射線學會第九屆第一次會員大會** M Wen-Chen Wang	

M Moderator Invited Speaker Oral Presentation Poster Presentation

Invited Speakers

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A-04	12:00-12:50	Hiroshi Watanabe	Japan	Imaging of the Mandibular Canal	22
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A-06	14:40-15:30	Masahiro Iikubo	Japan	Interactive Relationship between Oral Conditions and Systemic Diseases	24
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Oral Presentation

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Invited Speaker(A-01)

09:00-10:00, June 13 / Hall A

Top Tips You Should Know to be a Great Radiologist!

Prof. Rose Ngu

King's College London Dental Institute

Abstract :

This lecture will cover various imaging modalities that is all in a day's work of a dental maxillofacial radiologist.

- Salivary gland diseases and intervention with various clinical situation.
- Usage of US in various scenarios in dentistry and head and neck.
- CBCT
- Interactive session
- Case based reviews
- Interesting cases
- What happens if you are out of your depth?
- Top tips from a radiologist with 20 years' experience

Keywords : Ultrasound, CBCT, Interesting cases, Salivary glands, Head and Neck

Invited Speaker(A-02)

10:00-10:50, June 13 / Hall A

MRI Imaging Analysis in the Oral and Maxillofacial Region

Prof. Junichi Asaumi

Okayama University

Abstract :

Among the modality of diagnosis, CT/MRI has proved to have excellent ability in demonstrating normal anatomy and pathologic processes in the head and neck region. Whereas CT best depicts bone structures, MRI is superior to CT in evaluating soft tissues. The contents of bone lesions may also be better visualized on MRI. Here, I would like to consider if we can additional information for differential diagnosis in the lesions of the maxillofacial region using MRI or not. I will show the below objectives.

Odontogenic cysts in the jaw bones

1. Radicular cysts
2. Dentigerous cysts
3. Odontogenic keratocysts Other cysts in the jaw bones
4. Nasopalatine duct cysts Pseudocysts
5. Simple bone cysts
6. Aneurismal bone cysts

Odontogenic benign tumors in the jaw bones

1. Ameloblastoma
2. Adenomatoid odontogenic tumor
3. Odontogenic myxoma / myxofibroma
4. Odontogenic fibroma

Vascular anomalies Malignant tumors in the oral and maxillofacial region

1. Squamous cell carcinoma
2. Malignant lymphoma
3. Solid type primary intraosseous squamous cell carcinoma of the mandible
4. Ameloblastic carcinoma primary type
5. Neuroendocrine Small Cell Carcinoma

The assessment of MRI may prove to be a valuable non-invasive method for assessing information in the oral and maxillofacial region.

Invited Speaker(A-03)

11:10-12:00, June 13 / Hall A

MRI and CT of the Maxillomandibular Region : What the Oral Radiologists need to Know

Prof. Takashi Kaneda

Nihon University School of Dentistry at Matsudo

Abstract :

Diagnostic imaging of the maxillomandibular region is an important subsection of the head and neck radiology. Lesions developing within the maxillomandibular region can arise from the dental elements, bone, nerves, or blood vessels.

In the diagnostic imaging of the maxillomandibular region, it has been common clinical practice initially to use plain radiography including an intra- or extraoral technique and panoramic radiography. In recent years, computed tomography (CT) and magnetic resonance imaging (MRI) have been used widely to image these lesions, and they have proved effective for differential diagnosis and determination of the extent of lesions.

CT has many advantage such as excellently the degree of bone resorption, osteosclerosis, cortical bone swelling, desutruction, detect of the calcifications. In contrast, MRI is so different imaging modalities comparing with other radiological modalities. In advantage, no ionizing radiation. MRI depend on the proton density of hydrogen in tissues such as water or lipid contents and effective in differentiation between cysts and tumors, detection of abnormal bone arrow, evaluation of infiltration of malignant tumors in the maxillomandibular region and surrounding soft tissue.

My presentation is 1) to discuss the use of CT and MR imaging technique of the maxilla and mandible, 2) to demonstrate normal anatomy of the maxilla and mandible, interpretation of images, characteristic findings of CT and MR imaging, 3) to discuss the advanced imaging including diffusion MR imaging and AI (artificial intelligence) for the maxillomandibular region.

Keywords : Diagnostic imaging, CT, MRI, Diffusion MR imaging, Differential diagnosis

Invited Speaker(A-04)

12:00-12:50, June 13 / Hall A

Imaging of the Mandibular Canal

Prof. Hiroshi Watanabe

Tokyo Medical and Dental University

Abstract :

The mandibular (inferior alveolar) canal is an important anatomical structure, which contains the inferior alveolar nerve, artery, and vein. The inferior alveolar nerve is a branch of the trigeminal nerve that controls sensation in the lower teeth and surrounding tissues, and the inferior alveolar artery is a branch of the maxillary artery. The mandibular canal extends between the mandibular and mental foramen through the lower part of the mandibular body; however, it may occasionally run in close proximity to the molar root apex. Several studies have investigated the association between an impacted third molar and the mandibular canal and highlighted several signs that are useful to prevent unexpected bleeding or nerve paralysis. Computed tomography (CT) or cone-beam CT (cross-sectional images) can clearly delineate the course of the mandibular canal and show its corticated borders. However, identification of the mandibular canal may occasionally be challenging in a few patients in whom its appearance is similar to that of cancellous bone patterns. In such cases, it is necessary to identify the mandibular canal on a sagittal panoramic view, followed by a secondary search in a para-axial view using a guide function or reference line. We observed that magnetic resonance imaging (MRI) accurately shows the structures within the mandibular canal, including the neurovascular bundle using three-dimensional (3D)-volumetric interpolated breath-hold examination (VIBE) sequences, and CT/MRI fusion images are useful to outline the course of the mandibular canal. Additionally, the 3D-VIBE sequence was useful to accurately identify a bifid mandibular canal and many nutrient canals branching from the mandibular canal. In this lecture, I will present various imaging features of the mandibular canal.

Invited Speaker(A-05)

13:50-14:40, June 13 / Hall A

Interesting Textbook Cases Easily Encountered in Dental Clinics

Prof. In-Woo Park

Gangneung-Wonju National University

Abstract :

Recently, many clinical lectures in the dental imaging field have done a lot of implant-related imaging lectures but there are not many general image interpretation lectures. Accordingly, I would like to talk about image interpretation of interesting textbook cases that are easily encountered in dental clinics.

If unfamiliar radiological findings are observed during patient treatment, it must first be confirmed whether the findings are normal or pathological. Once a lesion is identified, an appropriate treatment plan must be developed. Among these, the most basic and important step is the distinction between normal and pathological findings.

There are many more diverse images reading errors that are easily encountered in clinical practice, but through the cases introduced here, I hope to take the time to share with you how we can avoid experiencing the same reading errors.

Keywords : dental image, interpretation, normal, pathologic

Invited Speaker(A-06)

14:40-15:30, June 13 / Hall A

Interactive Relationship between Oral Conditions and Systemic Diseases

Prof. Masahiro Iikubo

Tohoku University

Abstract :

Over the past two decades, the links between oral and general health have been increasingly recognized. Mounting evidence indicates oral bacteria increase the risk of pneumonia in the elderly or contribute to postoperative complications. At Tohoku University Hospital, the Division of Perioperative Oral Management is responsible for the oral management of all inpatients in the medical division. As the director of both the division of Oral and Maxillo-facial Radiology and the division of Perioperative Oral Management, I examine the oral condition and radiographic images of patients who stay in the hospital to receive medical treatments such as surgery, medication therapy, and radiation therapy. I would like to introduce and explain my working role at Tohoku University Hospital, and demonstrate the importance of oral management based on radiographic readings for such patients.

It is well known that some systemic diseases are caused by oral diseases because of the presence of many chronic infection foci in the jaw bones, such as apical periodontitis and periodontal diseases. On the other hand, partial symptoms of the systemic disease often appear in the mouth. As such, oral and maxillofacial radiologists need to understand the interactive relationship between oral diseases and systemic diseases, because the jaw bones are susceptible to genetic and hormonal influences. Therefore, I would like to present some cases that indicate an interactive relationship between oral conditions and systemic diseases; I will then introduce my recent research developed from such experiences.

I am looking forward to discussing about the oral and maxillofacial radiographic examinations for patients with systemic diseases with everyone.

Keywords : oral conditions, systemic diseases, perioperative oral management

Invited Speaker(A-07)

15:50-16:40, June 13 / Hall A

From Ortho Pantomography to the Latest CBCT for X-ray Elevation Angle Variable Method

Prof. Yoshinori Arai

Nihon University School of Dentistry

Abstract :

X-rays were discovered by Dr. Roentgen in 1895. Nihon University School of Dent, Department of Oral and Maxillofacial Radiology was established by Professor Noboru Teruuchi in 1924. This year marks the 100th anniversary.

During this time, we have developed Ortho Pan tomography, digital systems, and Limited volume and High resolution CBCT. It has been 25 years since clinical application began in December 1997 at the Department of Dental Radiology, Nihon University School of Dentistry, Dental Hospital.

Let's look back at this history. Furthermore, we will introduce the latest CBCT which is X-ray elevation angle variable method with Metal Artifact Redaction.

Keywords : Ortho Pan tomography, Digital systems, CBCT, Elevation angle, MAR

Invited Speaker(A-08)

16:40-17:30, June 13 / Hall A

Growing Patients- cephalometric Craniofacial Features, a Brief Overview

Prof. Chung-Hsing Li

Tri-Service General Hospital

Abstract :

To date, the role of genes and the environment in the etiology of malocclusion has been a topic of debate. The interaction between genetic and environmental factors starts at birth and continues till the end of life. A better understanding of the relative effects of genes and environment on dentofacial and occlusal parameters should enhance our knowledge of the etiology of orthodontic disorders and the possibilities and limitations of orthodontic treatment.

Each malocclusion has its characteristic slot in the genetic and environmental spectrum. Understanding the relationship between facial form, growth, and malocclusions is an important issue in orthodontic treatment. The great variations in growth mix and head form, population differences, and sex dimorphic variations result in a bewildering spectrum of facial types.

Cephalometric analysis is used to evaluate facial growth, to study the anatomical relationships within the face, and as a routinely used tool for treatment planning in orthodontics and craniomaxillofacial deformity surgery. A standard cephalometric assessment is based on 2D radiographic images taken in either the sagittal (lateral cephalogram) or coronal planes (posteroanterior cephalogram), where multiple landmarks, lines, and angles are identified to quantify vertical and horizontal relationships in the face.

Currently, the most angular and linear measurements are as follows: SNA, SNB, ANB, FMA, MP-FH, UI-NA, L1-MP, S-N, Co-Pt. A, Co-Gn, N- ANS…etc. SN-GoGn and FMA were found to be the most reliable indicators, whereas LAFH and TAFH are the least reliable indicators in assessing facial vertical growth patterns. Current evidence on the reliability of growth indicators in the identification of the pubertal growth spurt and efficiency of functional treatment for skeletal Class II malocclusion, the timing of which relies on such indicators, is highly controversial. In the face of so much information and uncertain factors and conclusions, it is very important to understand craniofacial features.

Keywords : Growing patient, cephalometry, gene, environment

Invited Speaker(A-09)

09:00-09:50, June 14 / Hall A

Current Status and Prospect of Oral and Maxillofacial Radiology-into AI and MRI age?

Prof. Jie Yang

Temple University

Abstract :

Oral and maxillofacial radiology (OMR) is a fast-growing dental specialty. Over the past twenty years, OMR has successfully evolved from analog to digital imaging, from 2D intra-oral and extra-oral images to 3D cone-beam computed tomography (CBCT). Recent years, Artificial intelligence (AI) and deep learning has proven to improve the quality of care in the all dental specialties by using image detection, classification, and segmentation. The arduous work of researchers for several decades has resulted in the evolution of AI, aka machine intelligence in dental charting, osteoporotic screening, caries, bone loss, apical and other lesion detections, as well as implant identifications. The latest development of generative AI will further broaden AI applications in OMR and dentistry, expedite image analysis/report and improve treatment outcome. Based on the current status AI will potentially benefit patients, oral and maxillofacial radiologists, and other dental specialists.

The other major prospect of OMR is the development of dental-dedicated MRI (ddMRI). As we all know, traditional 2D and 3D images have been focused on hard tissues of tooth and its surrounding bony structures. Latest development of ddMRI would potentially image both soft and hard tissues in oral cavity. The soft tissues, such as pulpal, neuro-vascular, mucosal, and muscular structures, are not seen on our traditional dental radiographs. This lecture will present the latest development, research, and potential clinical applications of dental AI and ddMRI in oral and maxillofacial imaging and dentistry.

Keywords : Artificial intelligence (AI); Deep Learning; Generative AI; cone-beam computed tomography (CBCT); dental-dedicated Magnetic resonance imaging (ddMRI)

Invited Speaker(A-10)

09:50-10:40, June 14 / Hall A

Deep Learning and Artificial Intelligence in Dental Radiology

Prof. Akitoshi Katsumata

Asahi University

Abstract :

The application of artificial intelligence (AI) based on deep learning in dental diagnostic imaging is increasing. Several popular deep learning tasks have been applied to dental diagnostic images.

Classification tasks are used to classify images with and without positive abnormal findings or to evaluate the progress of a lesion based on imaging findings. As the altered morphology of mandibular cortex on panoramic radiographs is significantly correlated with osteoporosis, AI is used for classification of the mandibular cortex morphology.

Region (object) detection tasks have been used for tooth identification in panoramic radiographs. This technique is useful for automatically creating a patient's dental chart. Some of these techniques have been developed and already deployed for practical use.

The segmentation task in deep learning is a technique that divides an image into objective segments. In semantic segmentation, the objects to be selected are distinguished from the background and other objects using different colours. In instance segmentation, it is possible to identify and separate individual instances of the same class of objects. This procedure may be suitable for teeth identification in panoramic radiographs with a clear view. Deep learning methods can also be used for detecting and evaluating anatomical structures of interest from images.

Generative AI is a category of AI techniques that involves creating or generating new content such as text and images. A valuable application of generative AI in dentistry is the creation of a patient's dentition and facial features, which are targeted for improvement by prosthetic or orthodontic treatment. Furthermore, generative AI based on natural language processing can automatically create written reports from the findings of diagnostic imaging.

Invited Speaker(A-11)

11:00-11:50, June 14 / Hall A

Artificial Intelligence in Dentistry: the Current Status and Considerations

Prof. Min-Suk Heo

School of Dentistry, Seoul National University

Abstract :

Artificial intelligence (AI) has been one of the most popular studies and AI is making significant advancements in various fields. Recently there have also been many studies in oral and maxillofacial radiology field. In the field of dentistry, AI has primarily been researched in areas such as automatic pathologies diagnosis, segmentation of anatomical structures, forensic dentistry, cephalometric analysis, image quality improvement, and bone quality evaluation in the field of oral and maxillofacial radiology. Many studies related to AI have been conducted up to now, but it might be in the early stages, and further advancements are expected in AI research in the future. This presentation would introduce the current state of AI research conducted in dental field so far and considerations related with AI research in dentistry.

Keywords : Artificial Intelligence; Radiology; Dentistry

Invited Speaker(A-12)

11:50-12:40, June 14 / Hall A

"Correlation between Laboratory and Clinical Imaging Quality Assessments for Panorama and CBCT Images".

Prof. Sam Sun Lee

Seoul National University

Abstract :

Several studies that have been performed will be presented/ The studies performed to evaluate the image quality of panorama and CBCT.

We made clinical and laboratory phantoms to study the image quality of panoramic images. The correlation between the spatial resolution of panoramic radiography and ball distortion rate was identified, and the minimum standard for ball distortion rate using a panoramic ball phantom was established. Another panoramic resolution phantom was fabricated and used to evaluated the panoramic horizontal and vertical resolution, reflecting panoramic unique characteristics. The shape of the Image layer, contrast, and spatial resolution were obtained using the phantom, and the diagnostic ability of various lesions was investigated through clinical phantoms' imaging obtained in each exposure condition. Using CBCT phantoms, we measured the values of various factors such as modulation transfer function and contrast-to-noise ratio under various conditions, and examined the relationship between these values and clinical image quality. Finally, we will discuss the need for oral and maxillofacial image quality assessment programs and supports by institutions, or nations.

Keywords : Oral and Maxillofacial, panoramic, CBCT, imaging, quality

Invited Speaker(A-13)

13:50-14:40, June 14 / Hall A

CBCT-Derived Digital Information and AI Applications in Endodontics Clinical Practice

Prof. Ying-Hui Su

Kaohsiung Medical University Memorial Hospital

Abstract :

In contemporary endodontic practice, CBCT is pivotal for diagnosis and treatment planning. Alongside traditional technologies, such as nickel-titanium instruments, ultrasonic devices, and microscopes, CBCT enhances precision in root canal procedures and apical surgeries. Despite the reliance on clinicians' senses, additional techniques like static navigation, dynamic navigation, and 3D printing optimize the use of 3D CBCT images, enabling precise localization of calcified root canals and accurate determination of root apex positions.

This presentation explores the comprehensive integration of 3D Imaging Technology with existing microscopes and ultrasonic devices in endodontics. Topics include static navigation (guided endodontics) for localizing calcified root canals, positioning during apical surgery, and coordination with a piezotome. The discussion also encompasses dynamic navigation for challenging root canal treatments and localization in apical surgery.

Furthermore, the presentation addresses distinctions between these technologies and explores the application of artificial intelligence to convert CBCT images into 3D root canal models. The aim is to showcase how these advancements can significantly impact the field of Clinical Endodontics in modern practices.

Keywords : Guided endodontics, Dynamic navigation, Artificial intelligence, CBCT, Digital Information

Invited Speaker(A-14)

14:40-15:30, June 14 / Hall A

Temporomandibular Disorder: Imaging's Role in Understanding Progression

Prof. Peggy Lee

University of Washington

Abstract :

Temporomandibular Disorder (TMD) is a multifaceted condition that involves muscles, articular disc and/or bony components of the TMJ. Previous studies have suggested a potential association between degenerative changes in the condyle and more advanced disc displacement or limited disc motion. However, the chronological relationship between disc displacement/derangement and degenerative bone changes remains unclear.

This presentation begins with an overview of the selection and findings of imaging modalities in TMD patients, including panoramic radiography, computed tomography (CT), and magnetic resonance imaging (MRI). Clinical and image data analysis of TMD patients who underwent long term follow up will be presented. CT and MRI data from TMD patients over the course of 7-9 years were reviewed. Key points include the recognition of osseous and soft tissue structural changes over time, the correlation between imaging findings and clinical outcomes, and an investigation into whether the presence of unilateral disc displacement or unilateral degenerative changes increased the risk of contralateral disc displacement or the development of degenerative changes. The relationship between TMJ disc disorders and osteoarthritic changes will be discussed. The presentation concludes with the challenges and limitations that are inherent in the interpretation of long-term progression data derived from CT and MRI.

By the end of this presentation, attendees will gain a deeper understanding of how imaging can serve as a powerful tool in understanding the dynamic of Temporomandibular Disorder. This knowledge will facilitate better-informed, monitor, treatment strategies and improve the long-term management of TMD patients.

Keywords : TMD, disc displacement, osteoarthritis, MRI, CT

Invited Speaker(A-15)

15:50-16:40, June 14 / Hall A

Screening Images for Orofacial Pain

Prof. Yunn-Jy Chen

National Taiwan University Hospital

Abstract :

Pain in the orofacial regions is often seen in the daily dental practice. Among them, except dental pain, musculoskeletal pain is mostly seen. In orofacial region, the musculoskeletal pain is mainly rising from temporomandibular joint and cervical spine. For screening purpose, panoramic and lateral cephalometric images might provide valuable information, if evaluated properly. In this presentation, I will illustrate how to read them based on projection geometry and pathophysiological bases of the associated pain.

Keywords: Orofacial pain, temporomandibular, cervical spine, panoramic,
lateral cephalometric

Invited Speaker(A-16)

09:00-09:50, June 15 / Hall A

Strengths and Weaknesses of an In-office 3D-printed Implant Surgical Guide

Prof. Hua-Hong Chien

Medical University of South Carolina

Abstract :

Nowadays, the placement of dental implants is a common procedure done in most dental offices. Ideal implant placement not only achieves maximum esthetic and functional outcomes but also diminishes possible surgical complications. Guided implant surgery is a cutting-edge and precise technique for implant placement. It refers to the process of digital planning, surgical guide fabrication, and implant placement using the custom-made guide.

In-office 3D printing technology has become increasingly popular in digital dentistry. Stereolithography is a powerful 3D printing technology which utilizes a liquid photopolymer resin cured by a UV laser to create highly accurate dental devices, such as an implant surgical guide. The digital workflow for in-office printing of a surgical guide starts from a CBCT and intraoral scanning. Then, the intraoral scan is imported into a software program and merged with the CBCT image data to simulate the implant position, direction, and depth, for which the surgical guide is to be designed. However, substantial errors can occur at each of these individual steps and can accumulate, significantly impacting the final accuracy of the implant placement with potentially disastrous deviations.

This presentation aims to summarize information on the accuracy and efficacy of static guided implant surgery with special emphasis on the strengths and limitations of a stereolithographic surgical guide produced using in-office 3D printing technology.

Furthermore, clinicians should recognize the limitations/weaknesses of an in-office fabricated implant guide so surgical complications can be minimized.

Invited Speaker(A-17)

09:50-10:40, June 15 / Hall A

Use of CBCT in Clinical Decision Making in Endodontics

Prof. Jeffrey Coil

University of British Columbia

Abstract :

This presentation will highlight the use of Cone Beam Computed Tomography (CBCT) information in decision making for diagnosis, treatment options and recommendations, and assessments of post-treatment outcomes. Cases will be used to demonstrate how CBCT has strongly influenced clinical endodontic decision making.

Additionally, CBCT can aid in the differentiation and management of endodontic failure and failure of endodontically treated teeth. This presentation will describe the difference between these two types of treatment failure.

Participants will learn how to provide an appropriate endodontic clinical examination, assess radiographic images of endodontically treated teeth, including CBCT images. Discussion will include how this information will inform your diagnosis and treatment planning decisions, in order to provide patients with treatment options.

Keywords : CBCT endodontics diagnosis treatment assessment

Invited Speaker(A-18)

11:00-11:50, June 15 / Hall A

Current Radiation Therapy for Oral Cancer

Prof. Shumei Murakami

Graduate School of Dentistry, Osaka University

Abstract :

Since the oral cavity has many functions, when cancer occurs in the oral cavity, it is desirable to treat it as conservatively as possible. From this perspective, expectations are high for radiotherapy.

In this lecture, I will first give an overview of radiation therapy used for oral cancer. In external radiation therapy, a large linear accelerator generating X-rays and electrons is used with IMRT and IGRT techniques. Stereotactic radiation therapy includes cyber-knife (using X-rays) and gamma-knife (using gamma rays). Heavy particle therapy (using protons or carbon ions) may be categorized as external radiation therapy.

Small-source radioisotope therapy is increasingly being used as a radical treatment for oral cancer. It can be divided into interstitial brachytherapy, mold brachytherapy, and intracavitary brachytherapy. Interstitial brachytherapy is often used for tongue cancer, and mold brachytherapy is used for superficial gingival cancer.

BNCT (boron neutron capture therapy) can be a highly effective radiotherapy with few complications when certain conditions are met. In the BNCT, alpha rays emitted by nuclear reaction between boron and neutron damage DNAs in cancer cells.

Finally, I would like to discuss the current status of internal radiotherapy using alpha rays.

Keywords : Radiation therapy, Oral cancer, Interstitial brachytherapy

Invited Speaker(A-19)

11:50-12:40, June 15 / Hall A

Magnetic Resonance Imaging-guided Radiotherapy for Head and Neck Cancer

Prof. Hsinhua Lee

Kaohsiung Medical University

Abstract :

Head and neck cancer, an immensely destructive ailment, accounts for over 890 thousand fresh cases each year and is responsible for more than 450 thousand fatalities worldwide annually. Radiation therapy (RT), whether used alone or in conjunction with other treatment approaches, possesses significant potency in managing tumors, primarily constrained by the adverse effects on surrounding healthy tissues. RT is one of the main treatments in head and neck patients that offers clinical benefits. It demonstrates biological impacts within a short timeframe ranging from hours to weeks after exposure, inducing substantial genetic harm that breaks double strands in both nuclear and mitochondrial DNA, as well as impeding cellular division and replication.

It has been challenging that radiotherapy may cause unwanted radiation-induced complications. A mounting body of evidence strongly supports the supplementation of image guided radiotherapy (IGRT). Until recently, image guidance was only performed prior to RT without simultaneous tumor tracking. Now magnetic resonance imaging-guided radiotherapy (MRgRT) enables Radiation Oncologists to actually see the targets in relation to surrounding normal tissues when the patient is on the treatment table. Immediately after inspecting anatomical changes, they are able to execute a whole new set of treatment plan according to geographical variability at that specific RT fraction. MRgRT offers not only novel planning types, such as online adaptation, but also better image guidance due to superior soft tissue contrast.

MRgRT reduces the unnecessary radiation dose to normal tissue by smaller treatment margins and facili tates visualization of the anatomical sites especially in oral cavity.

Keywords : Radiotherapy; IGRT;magnetic resonance imaging-guided radiotherapy;head and neck cancer;oral cancer

O-001

Bibliometric Analysis of Articles on the Use of Artificial Intelligence in Dental Implant Applications

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Objective: This study was conducted to determine the trend of research in the field of dental implants. In the research, artificial intelligence studies on dental implants published in the Web of Science database on February 21st 2024 were examined**. Materials and Methods:** 50 studies titled 'dental implant' and 'artificial intelligence' conducted between 2014 and 2024 in the Web of Science database were evaluated with bibliometric analysis. Biblioshiny was used for bibliometric analysis. **Results and Discussion:** As a result of the analysis, the most studies were conducted in the "Dentistry" category, 240 authors worked on this subject, 186 keywords were used, 1803 references were used, 42 sources were used, the annual growth rate was 7.18%, 39 of the studies were articles and 11 of them were articles. It has been observed that the article is in early access status. It was concluded that most studies were carried out between 2019-2021. It was observed that most articles were published in the journal Int J Oral Maxillofac Implants. **Conclusion:** Bibliometric research both reveals the current scientific status of the topics discussed and gives insight into their development in the process, therefore they are valuable research. The findings serve as a guide for future research in the field of artificial intelligence use in dental implant applications.

Keywords: Dental implant, Bibliometric analysis, Web of science database

Funding: none

O-002

ForensicNet: Automatic and robust estimation of chronological age and sex from panoramic radiographs using a multi-task deep learning network

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Objective: Sex and chronological age estimation are crucial in forensic investigations and research on individual identification. Although researchers have proposed manual methods for sex and age estimation, these processes are labor-intensive, time-consuming, and error-prone. The purpose of this study was to estimate sex and chronological age from panoramic radiographs automatically and robustly using a multi-task deep learning network (ForensicNet). **Materials and Methods:** ForensicNet comprises a backbone and both sex and age attention branches to learn anatomical context features of sex and chronological age from panoramic radiographs and enables the multi- task estimation of sex and chronological age in an end-to-end manner. To mitigate bias in the data distribution, we built our dataset using 13200 images with 100 images for each sex and age range of 15–80 years. **Results and Discussion**: The ForensicNet with EfficientNet-B3 exhibited superior estimation performance with mean absolute errors of 2.93±2.61 years and a coefficient of determination of 0.957 for chronological age, and achieved accuracy, specificity, and sensitivity values of 0.992, 0.993, and 0.990, respectively, for sex prediction. The network demonstrated that the proposed sex and age attention branches with a convolutional block attention module significantly improved the estimation performance for both sex and chronological age from panoramic radiographs of elderly patients. Consequently, it is expected that ForensicNet will contribute to the automatic and precise estimation of both sex and chronological age from panoramic radiographs.

Keywords: Sex and age estimation, Panoramic radiograph, Deep learning, Multi-task learning **Funding:** This study was supported by Grant No. 02-2022-0220 from the SNUDH Research Fund and the National Research Foundation of Korea (NRF) Grant funded by the Korean Government (MSIT) (No. 2023R1A2C200532611). This study was also supported by a Korea Medical Device Development Fund Grant by the Korean government (Ministry of Science and ICT; Ministry of Trade, Industry, and Energy; Ministry of Health and Welfare; Ministry of Food and Drug Safety) (Project Number: 1711194231, KMDF_PR_20200901_0011, 1711174552, KMDF_PR_20200901_0147).

O-003

Anatomy-guided Latent Diffusion Model for Few-shot Medical Image Segmentation

Sang-Heon Lim[1,†], Su Yang[2,†], Jiyong Han[1], SuJeong Kim[1], Da-El Kim[1], Jo-Eun Kim[3], Kyung-Hoe Huh[3], Sam-Sun Lee[3], Min-Suk Heo[3], Won-Jin Yi[1,2,3*]

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Objective: The acquisition of expert annotations for medical imaging is a resource-intensive task, demanding significant time and financial investment. To mitigate these challenges, the use of diffusion models for image synthesis has gained traction in the medical imaging domain. This study introduces a pre-trained latent diffusion model (LDM) as an anatomical editor for panoramic radiographs (PANs) with the goal of editing anatomical structures in unlabeled PANs, thus facilitating the use of pre-existing labels and obviating the need for manual annotations. **Materials and Methods:** The study utilized a labeled dataset comprising 2,100 PANs and an unlabeled dataset containing 5,163 PANs. The unlabeled dataset served as the training set for the LDM. Our approach leverages the LDM to edit anatomical structures in unlabeled PANs, generating a synthetic dataset. Annotations from the labeled dataset were employed to selectively modify anatomical features in the unlabeled PANs. The efficacy of the synthetic dataset was assessed using a segmentation model for downstream evaluation. Data configurations compared included: (1) solely real dataset (n=210), (2) combined real and synthetic dataset (n=4,410), and (3) exclusively synthetic dataset (n=4,200). **Results and Discussion**: The analysis revealed that models trained solely on real data achieved an average dice similarity coefficient (DSC) of 0.447±0.172. In contrast, models trained exclusively on synthetic data and those trained on a combination of both datasets exhibited improved performance, with average DSCs of 0.661±0.154 and 0.643±0.149, respectively. Our results indicate a significant improvement in the performance of the downstream segmentation network when incorporating the LDM-based synthetic dataset in training dataset.

Keywords: generative AI, anatomy structure editing, diffusion model, few-shot image segmentation
Funding: This study was supported by Grant No. 02-2022-0220 from the SNUDH Research Fund and the National Research Foundation of Korea (NRF) Grant funded by the Korean Government (MSIT) (No. 2023R1A2C200532611). This study was also supported by a Korea Medical Device Development Fund Grant by the Korean government (Ministry of Science and ICT; Ministry of Trade, Industry, and Energy; Ministry of Health and Welfare; Ministry of Food and Drug Safety) (Project Number: 1711194231, KMDF_PR_20200901_0011, 1711174552, KMDF_PR_20200901_0147).

O-004

Sample Preparation Pitfalls: An artificial intelligence training for lower impacted third molars detection

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Introduction: Artificial intelligence (AI) training relies heavily on a good sample preparation for a suitable dataset in both quantitative and qualitative aspects for machine learning. This study reports pitfalls in panoramic selection for supervised learning to detect lower third molars. **Materials and methods:** NASNet (Neural Architecture Search Network) was utilized for the detection task in a full panoramic view. Each panoramic image was automatically divided into left and right segments, and the left one was horizontally-flipped for the training or evaluation. Afterward, re-flipping back to its original position on the left-side was performed. A set of 2142 sites in panoramic radiographs with good positioning and various tooth classifications were organized and divided into training, validation and test sets (1141:157:1150 sites or 57.64:6.41:46.98 percents). Incorrected results were manually evaluated for AI's possible flaws. **Results and Discussion:** The prevalence of tested images was 0.90. Sensitivity and specificity were 0.94 and 0.97, respectively. Four false-positive and 62 false-negative areas were revealed. Majority of false missing judgment seemed to relate to the focus at retro-molar region; as those deep-class II or class III impactions were missed. Other mistakes involved superimposing relative radiopaque soft tissue shadow. The responsible rationale might be the obvious imbalance between presence and absence of the teeth since all images contained at least one lower wisdom tooth. Therefore, despite the main objective of tooth finding, the importance of negative control could not be overlooked.

Keywords: artificial intelligence, data preparation, accuracy

Funding: none

O-005

A Study on Segmentation of Resin Restorations and Metal Crowns in Panoramic Radiographs Using Deep Learning

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Objective: This study aims to segment resin restorations and crowns in panoramic radiographs to evaluate network performance and provide guidance for rapid diagnosis and treatment planning. **Materials and Methods:** We are utilizing 912 panoramic X-ray images along with their annotated labeling data. The labeling process was conducted by students from a dental university and subsequently validated by specialists. We are building a model based on DeepLabv3+ for semantic segmentation and evaluating its performance using accuracy, Intersection over union (IoU), and Mean BF-Score. **Results and Discussion:** The accuracy for crowns and resin-based restorations is 0.96 and 0.91, respectively. The IoU values are 0.75 and 0.07, while the Mean BF-Score is 0.86 and 0.39, respectively. Crowns, characterized by relatively consistent sizes and clear images, achieved accurate results. However, resin-based restorations, with their inconsistent and small sizes, yielded lower accuracy and poorer segmentation. Due to the limited availability of data in the dental field compared to other disciplines, enhancing the dataset with more samples of resin-based restorations could enhance the results. Additionally, various data augmentation techniques are necessary. While numerous studies have focused on accurately segmenting larger structures like teeth, alveolar bone, sinuses, and implants, there is a shortage of research on smaller structures like resin-based restorations, leading to suboptimal outcomes. Thus, overcoming data limitations and conductingnetwork research tailored to the dental field is crucial.

Keywords: Artificial intelligence, Deep learning, Dental radiology

O-006

Machine learning model for prediction of TMJ disc displacement using radiomics of CBCT data

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Objective: In this study, we aimed to develop a machine learning model that predicts disc displacement using only cone-beam computed tomography (CBCT) condyle head images through radiomics analysis. **Materials and Methods:** From December 2018 to December 2022, 86 patients with temporomandibular joint(TMJ) disorders, who visited Yonsei University Dental Hospital, underwent MRI examinations and CBCT. An oral radiologist interpreted disc displacement on MRI and collected 160 patients' CBCT data, including 40 normal cases, 40 cases of reducible disc displacement, and 80 cases of non-reducible disc displacement. Experts manually defined the condyle as the region of interest on CBCT images and 132 radiomics features were extracted using software. Machine learning-based Random Fores (RF) and XGBoost models were built to classify normal and reducible disc displacement (Group A) and non-reducible disc displacement (Group B).The performance of the classification models developed in this study was evaluated by calculating accuracy, sensitivity, specificity, and are under curve (AUC) values. **Results and Discussion:** The RF model classified Group A and Group B with an accuracy of 74.47%, sensitivity of 86.96%, and specificity of 62.5%. The XGBoost model achieved an accuracy of 72.34%, sensitivity of 69.57%, and specificity of 75%. Comparing the AUC values of the two models, the RF model was 0.80, higher than the XGBoost model's result of 0.77. Both models classified groups with over 70% accuracy, demonstrating the potential to predict non-reducible TMJ disc displacement through quantitative analysis using only CBCT images.

Keywords: temporomandibular joint, temporomandibular joint disc, cone-beam computedtomography, radiomics, machine learning

Funding: This work was supported by Korea Institute for Advancement of Technology (KIAT) grant funded by the Korea Government(MOTIE) (P0019248)

O-007

Evaluation focusing on the margins of cervical lymph nodes in CT radiomics machine learning models for preoperative prediction of their metastasis in oral squamous cell carcinoma.

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Objective: Various factors such as size, short diameter, long to short axis ratio and existence of central necrosis or focal defect etc. have been proposed as indicators for image evaluation of cervical lymph node metastasis in oral cancer, and have been accepted clinically. Although these indicators have made great contributions to decide staging and treatment plan, we have often encountered clinical situations in which it is difficult to assess the presence or absence of metastasis. In recent years, a new image research method called radiomics analysis has been attracting attention. There have been many reports on the usefulness of a combination of radiomics and machine learning models for predicting cervical lymph node metastasis of oral squamous cell carcinoma. In the present study, we hypothesized that the accuracy of CT radiomics machine learning model for preoperative cervical lymph node metastasis prediction would be improved by focusing on the margins of the lymph nodes, and compared the diagnostic accuracy when segmenting the entire lymph node. **Materials and Methods:** Cervical lymph nodes with histopathologically confirmed metastasis/non- metastasis obtained from cases of oral squamous cell carcinoma for which primary tumor resection and neck dissection were performed at Niigata University Medical and Dental General Hospital were subjects of this retrospective study. This study was approved by the Niigata University Ethics Committee. **Results and Discussion:** In this study, 60 subjects were included, and 449 lymph nodes were segmented and radiomics features were extracted from these subjects, of which 370 were metastaticlymph nodes and 79 were non-metastatic lymph nodes. When we constructed a machine learning prediction model by selecting the extracted radiomics features and verified its diagnostic accuracy, we found that the machine learning model composed of features obtained by segmenting only the margin had a better diagnosis.

Keywords: Radiomics, Oral squamous cell carcinoma, machine learning model, lymph nodemetastasis
Funding: No funding

O-008

A prototype of simulated tongue cancer phantom for training of intraoral sonography

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Objective: To popularize the intraoral sonography for early stage tongue cancer, we decided to produce a simulated tongue cancer phantom prototype for training of oral surgeons and perform image evaluation using various ultrasound diagnostic equipments. **Materials and Methods:** We ordered Kyoto Kagaku Co. Ltd to manufacture a simulated tongue cancer phantom assuming early stage tongue cancer. To imitate the normal tongue mucosal structure, we created a three-layered structure consisting of the mucosal epithelial layer, submucosal layer, and muscular layer from the surface. The simulated cancer region was processed so that it was demonstrated as a shallow wedge-shaped hypoechoic structure with irregular margins that was continuous with the mucosal epithelial layer in the center of the phantom. The ultrasound diagnostic equipment used were GE's three and Fujifilm's two machines. A 3 mm thick polymer acoustic coupling material was used as the acoustic passing medium between the probe and the scanning surface. Using simulated tongue cancer phantoms of T1 and T2 types, we measured the thickness of the normal mucosal epithelial layer and submucosal layer in the simulated cancer area and the surrounding four mucosal areas on the front, back, left, and right sides. **Results and Discussion:** The simulated mucosal epithelial layer, submucosal layer, and muscular layer were clearly separated with each equipment, and the thickness of the simulated mucosal epithelial layer and simulated submucosal layer can be measured in both T1 and T2 types. In addition, with any equipment, we were able to depict the simulated cancer area as a hypoechoic area with irregular margin for both T1 and T2 types, and measure its thickness. It was concluded that the normal oral mucosal structure and squamous cell carcinoma developing in the oral mucosa could be simulated, and it was considered effective for use in intraoral sonography training for oral surgeons.

Keywords: ultrasound diagnosis, intraoral sonography, tongue cancer, layer structure, phantom
Funding: JSPS KAKENHI Grant Number JP21K10064 and Crowdfunding J23F0008.

O-009

Correlation between Fractal Properties of Pre-operative Bone Trabeculae and Insertion Torque

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Objectives: Insertion torque(IT) represents a primary implant stability at fixture installation that cannot be predicted pre-surgically. Fractal dimension(FD) is a radiographic quantitative analysis for bone complexity, which might be use to predict insertion stability at the time of treatment planning. This investigation investigated the correlation between FD and IT. **Materials and methods:** Twenty-seven subjects, receiving 18-maxillary and 34-mandibular implant placement at Faculty of Dentistry, Chulalongkorn University between 2013-2017, were screened according to study criteria. Demographic data and details of implant treatment were retrieved. CBCT within 6-months prior to implantation were reconstructed into cross-sectional slices for FD calculation, while imaging-related variables were documented. Significant affecting factors to IT were inspected using univariate analysis. A correlation between IT and FD with confounding factors was re-analyzed with multiple linear regression. **Results and Discussion:** IT-values range from 10 to 45 Ncm (maxillary mean of 30.83±8.090; mandibular mean of 29.85±10.261). FD values range from 0.7587 to 0.9979 (maxillary mean of 0.8780±0.0559; mandibular mean of 0.8763±0.0550). No IT-related confounding factor was found. Significant correlation between IT and FD was revealed only in the mandible as: IT = 92.168–71.112(FD)—R^2=0.145, p=0.026. It was proposed that the implant stability prediction, using FD, should be separate into maxillary and mandibular group. Possible explanation is the difference in trabecular structure. As maxillary trabeculae tend to be finer and grainier, resulting in higher trabecular numbers and complexities, the FD value increases. Mandibular trabeculae with opposing coarser and thicker natures, similar to a linear structure discloses less complexity and FD values.

Keywords: bone trabeculae, cone-beam computed tomography, dental implant, fractal dimension, insertion torque

Funding: none

O-010

AI Segmentation for Vertical Root Fracture for Endodontically Treated Tooth in Micro Computed Tomography Image

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Objective: Vertical root fractures (VRF) occur in teeth that have had root canal treatment years ago. VRF manifest as longitudinal fractures along the root, often accompanied by inflammation of the periodontal tissue, leading to swelling and acute apical abscesses. Nowadays, tooth extraction is theonly option for VRF. However, if we can estimate the three-dimensional location and shape of the VRF, there may be alternative treatments to avoid tooth extraction. **Materials and Methods:** We utilized micro-CT images of VRF teeth for our study. Root fracture detection was treated as a binary pixel-wise classification task. We employed a feature pyramid and a hierarchical boosting deep learning neural network. The network is designed with a top-down architecture, incorporatingcontext information layer by layer from top to bottom. This architecture combines low-resolution, semantically strong features with high-resolution, semantically weak features through a top-down pathway and lateral connections. The result is a feature pyramid with rich semantics at all levels, quickly built from a single input image scale. **Results and Discussion:** 1,200 micro-CT images from a single tooth were used, allocating 70% for training, 10% for validation, and 20% for testing. Manual labeling was applied to create fracture masks for training. Detection was performed on each CT slice and final 3D shape can be visualized on CTVox software. Average intersection of union (AIoU), and recall over threshold curves were employed asperformance metrics.

Keywords: vertical root fracture, VRF, pixel-wise classification, micro computed tomography, feature pyramid, deep neural network.

O-011

The Prevalence Head of Condyle Changes Position Found in RSGMP Radiology Installation of Hasanuddin University Makassar after the Covid- 19 Pandemic in 2022

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Objectives: This research is aimed to determine the prevalence of changes position the head of the condyle found in the radiology installation RSGMP Unhas Makassar after the Covid-19 pandemic. **Materials and Methods:** This research is using descriptive observational study through panoramic radiographic photo data in March-September 2022, then the results are entered into distribution tables and graphs. **Results and Discussion:** The result showed the cases of changes position the head of the condyle in terms of panoramic radiographic examination were found to be the most frequent in women, as much as 63.6%. Based on age, the most common occurrence was in the adult age group as much as 47.7% and the most commonly found change in the position of the head of the condyle was bilaterally as much as 51.1%. Cases of changes in bilateral head of condyle position based on gender most commonly occur in women as much as 32.9%, and based on age group most occur in adults as much as 25%. **Conclusion:** The prevalence of cases changes position the head of the condyle is found most frequently in women and in the adult age group with the most common conditions being in the form of bilateral abnormal positions.

Keywords: head of condyle, bilateral, panoramic, covid-19

O-012

The Effect of Dental Metal Artifacts on PET/CT Quantification: Phantom Experiments for PET Imaging Conditions

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Objective: This study was to determine the effect of the metal artifacts caused by different amounts of metal prostheses on the quantification of positron emission tomography (PET) imaging. **Materials and Methods:** A phantom consisting of the maxilla, mandible, and cervical spine was fixed within a cylindrical water-bath phantom, and a sphere phantom (20, 10, 8, 6 mm-diameter), a simulated tumor, was fixed so that its center was adjacent to the crown of the left lower first molar. The ^{18}F-fluorodeoxyglucose solution was injected at a sphere phantom (T) to background (BG) radioactivity concentration ratio of 4:1. Removable dental metal crowns were placed in the following two difference conditions in the mandible. Unilateral-metal condition; unilateral second premolar to second molar. Full-metal condition; bilateral second premolar to second molar and anterior teeth. A PET/CT imaging was performed using a silicon photomultiplier PET/CT scanner (Discovery MI, GE Healthcare) with a 30-minute scanning time of a three-dimensional mode and CT imaging and PET reconstruction were performed under the same as clinical conditions. The T and BG standardized uptake value (SUVs) were measured, and SUV_{max}, SUV_{mean}, and SUV_{peak} were obtained. **Results and Discussion:** The smaller the sphere phantom diameter, the smaller the SUV. In both conditions, the SUV was overestimated. Overestimation in the Unilateral-metal condition was more than that in the Full-metal condition. Furthermore, the shorter the acquisition time, the greater the tendency. These effects were greater for the SUV_{max} than for the SUV_{mean} andthe SUV_{peak}.

Keywords: positron emission tomography, metal artifacts, quantification, standardized uptake value
Funding: None

O-013

Diagnostic Error of Novice Clinician and Oral and Maxillofacial Radiologist in Panoramic Radiography

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Objective: To examine the diagnostic error of panoramic radiography between novice clinicians and oral-maxillofacial radiologists, and to analyze the error rate depending on different types of lesions. **Materials and Methods:** Panoramic images with maxillofacial lesions in Yonsei University Dental Hospital were collected. Only cases confirmed by pathologists were included. Lesions were classified into five categories: (1) cyst, (2) benign tumor, (3) malignancy, (4) inflammation, and (5) fibro- osseous lesions. The diagnostic error rate was defined as inconsistency of interpretation with pathologic report and fail of lesion detection. The error rate between oral- maxillofacial radiologists and novice clinicians was analyzed. **Results and Discussion:** The total number of cases included in this study was 274. Among specialists, diagnosis of 27 cases (9.85%) was inconsistent with the pathological report. Novice clinicians failed to detect the lesions in 10 cases, and 42 cases were incorrectly diagnosed, resulting in an error rate of 18.98%. Diagnostic error of specialists ranged between 2.6% to 26.7% according to lesion types, while novice clinicians showed a significant variation in diagnostic errors, ranging from 9.8% to 60%. Particularly, an error rate of 60% was reported in diagnosing malignant lesions which indicates a higher possibility of misdiagnosis due to lack of experience in identifying malignancies. **Conclusions:** Novice clinicians not only failed to completely detect lesions on panoramic radiographs but also showed a notably high error rate in detecting malignant lesions. Therefore, second opinion form oral-maxillofacial radiologists would be crucial as well as further education on interpretation of panoramic radiography.

Keywords: panoramic radiography, diagnostic error, diagnostic imaging, radiologist, specialist

O-014

Sella Turcica Morphology Using Lateral Cephalometry in Orthodontic Patients 12-15 Years Old

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Objective: To investigate morphological variations of the sella turcica using lateral cephalometry radiographs between male and female patients 12-15 years old with class 1 and 2 Angle malocclusion. **Materials and Methods:** The analytical research design was done for thirty lateral cephalometry radiographs and analyzed with Image J program open-source software. The length, thickness, and diameter of sella turcica were measured and classified based on the classof 1 and 2 Angle malocclusion. **Results and Discussion:** From the 30 samples, 28 class I malocclusions (types 1, 2, and 3) and 2 class II divisions 1 were found. The Sella turcica bridgeswere found in three (10 %) of class I (two in class I type 1, one in class I type 2). All sella turcica bridges were found in females. No subject in class II had sella turcica bridges. Most studies show that 73.33 % of the subjects had a normal morphology, and the oblique wall was 16.66%. The sella turcica is an important structure to makes a good source of diagnostic information associated with the pathology of the pituitary gland. Mineralization of the interclinoid ligament of sella turcica is called sella turcica bridges. **Conclusions:** Most sella turcica bridges were found in the subject females with Angle class I type 1 (10 %). Most of sella turcica showed U-shaped(normal morphology) is 73.33%, and subsequently, the oblique wall was 16.66%.

Keywords: sella turcica bridges, lateral cephalometry

Funding: This research is funded by the Universitas Padjadjaran through Lecturer ResearchCompetency Programme 2023 (Riset Kompetensi Dosen Universitas Padjadjaran, RKDU).

O-015

Description of the Tooth Ancient Pawon Man from CBCT and Histology Examination

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Objective: To investigate description of the tooth ancient pawon man (ancient humans native West Java, Indonesia from 5000-9000 BP) from CBCT and histology examination. **Materials and Methods:** The descriptive research design was done for three ancient human teeth analyzed by CBCT and histological examination. CBCT analysis is carried out in sagittal, axial and coronal views to carry out qualitative and quantitative measurements. Histological examination is carried out by making preparations and analyzing them using a microscope Measurement results are analyzed and displayed in descriptions. **Results and Discussion:** The results of CBCT analysis of pawon man's teeth showed qualitatively a high density value and quantitatively showed a larger tooth morphology size compared to modern humans. The thickness of the enamel is smaller while the thickness of the dentin layer is thicker. The pulp chamber showed a small cavity/is constricted. The results of the histology examination showed that the dentin tubules were not clear, tended to be larger, but resembled the dentin of modern human teeth. The histology of the enamel cannot be seen clearly. **Conclusions:** The results of analysis from CBCT and histology examination showed that pawon man teeth are denser and larger than modern human teeth.

Keywords: Ancient human teeth, CBCT, histology, pawon man

Funding: This research is funded by the Universitas Padjadjaran through Lecturer ResearchCompetency Programme 2024 (Riset Kompetensi Dosen Universitas Padjadjaran, RKDU).

O-016

Age Differences in Brain Activations Due to Salty Taste: Functional MRI and Time-intensity Sensory Evaluation

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Objective: It remains unclear how older adults perceive the intensity of salty taste in the mouth andbrain. We hypothesized that the perception of salty taste intensity is lower in older adults than young adults. **Materials and Methods:** Participants were 77 healthy adults: 31 older (60-81 years) for time- intensity sensory evaluation, 34 older (60-76 years) for functional magnetic resonance imaging (fMRI) and 43 young (21-39 years). The taste stimuli consisted of 0.3 and 0.5 M NaCl solutionsprepared with distilled water. Our research project is comprised of two sequential experiments, which were (1) dynamic sensory evaluations of taste perceptions in the mouth and (2) fMRI to elucidate brain activations by taste. (1) A time-intensity sensory evaluation, in which the solutions were delivered to participants' tongue through a custom-made delivery system while, they recorded dynamic taste intensities on a hand-held meter. (2) FMRI for tastes was performed under the same condition as a time-intensity sensory evaluation. Image pre-processing and data analysis were performed using the Statistical Parametric Mapping 12 software package (Wellcome Centre for Human Neuroimaging, London, UK). Region of interest (ROI) analysis was conducted, and statistical threshold was set at $p < 0.05$. **Results and Discussion:** Regarding time-intensity sensory evaluation, it shows that older adults' perception of taste intensity slowly increases and remains lower than that of young adults. As for brain activation, we observed lower activations in the insula and thalamus in the older adults, thanthat in the young adults.

Keywords: fMRI / taste / sensory evaluation / brain activation / aging

Funding: JSPS KAKENHI (Grant Number JP17H04423, JP21K21100, JP22H00955), Grants from the Society for Research on Umami Taste, Tokyo Dental College Research Grant (Well-being Project).

O-017

Bibliometric Analysis of Articles Regarding Artificial Intelligence for Dental Age Estimation on Panoramic Images

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Objective: Bibliometric research is a valuable type that reveals the current scientific status of the topics discussed and gives an idea about their development in the process. The study aims to perform a bibliometric analysis of studies using artificial intelligence to estimate dental age on panoramic images. **Materials and Methods:** The research was examined in the Web of Science database on February 26th, 2024**.** The keywords "artificial intelligence" OR "deep learning" OR "machine learning" AND "age estimation" OR "dental age" OR "age determination and "orthopantomography" OR "panoramic image" OR "panoramic'' in all fields were used for the study. Out of 58 articles, 23 irrelevant articles were eliminated, and the study was conducted on 25 articles between 2014 and 2024 in the Web of Science database. Biblioshiny was used for bibliometric analysis. **Results and Discussion:** As a result of the analysis, most studies were conducted in the Computer Science (6) and Dentistry (5) categories, 122 authors worked on, 84 keywords, 798 references, 21 sources were used, the annual growth rate was -15,91%, most studies were carried out in 2022 (13) and most articles were published in Scientific Reports (3). **Conclusion:** In recent years, it has been observed that age estimation with artificial intelligence on panoramic images has lost its popularity. This may be due to the increasing popularity of CBCT age determination.

Keywords: Dental age estimation, bibliometric analysis, artificial intelligence, panoramic.
Funding: none

O-018

Bibliometric Analysis of Fractal Analysis Applications in Dentistry

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Objective: This study was conducted to determine the trend of research using fractal analysis application in the basic field of dentistry. In the research, studies on fractal analysis applications published on February 26th, 2024 in the Web of Science (WOS) database were examined. **Materials and Methods:** A search was made in the WOS database using the keywords 'fractal analysis' OR 'fractal dimension' AND 'dentistry' in the all fields option and 531 results were found. According to years, 479 articles were reached in 79 different fields, the timespan was 1982-2024. When WOS categories were filtered as 'Dentistry Oral Surgery Medicine' and document types were filtered as 'Article', 247 articles were accessed, the oldest of which was in 1992 and the newest in 2024. Biblioshiny software was used for bibliometric analysis of data exported from the WOS database in 'Bibtex' format. **Results and Discussion:** As a result of the analysis, 247 articles written on fractal analysis in dentistry between 1992 and 2024 showed that 836 authors worked, 464 keywords were used, 5498 references were used, 65 sources were used, the annual growth rate was 4.43%. It was observed that the most articles (30/247) were published in the 'Oral Radiology' journal and most of the articles were published in 2022 (40/247). **Conclusion:** Bibliometric studies are valuable in terms of providing evidence-based monitoring of the development of research on that topic over time. Although the subject of fractal analysis in dentistry has been studied for approximately 30 years, it still maintains its popularity.

Keywords: Bibliometric analysis, fractal analysis, dentistry

Funding: none

O-019

Study of MRI artifacts using two titanium samples

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Objective: To measure the volume and investigate the shape of susceptibility artifact when two metals are placed close together on an MRI image. **Materials and Methods:** Two cylindrical pure titanium samples with a diameter of 4 mm and a length of 10 mm. MRI images were taken using theSE and GRE methods while changing the distance between samples to 0, 1, 2, 4, 8, 16, and 32 mm. Axial cross-sectional images were taken with the long axis of the cylinder parallel to the direction of the main magnetic field. **Results and Discussion:** In the GRE method, when the distance between samples was 32 mm, the artifacts from each sample were independent; when it was 16 mm,they partially overlapped, and when the distance was 4 mm or less, they were utterly merged into one artifact. The volume of the artifact at that time ranged from 9-12 cm^3. No significant relationship was observed between the volume of the merged artifact and the distance between samples.

Keywords: MRI, artifact
Funding: Nil

O-020

Comparing Image Quality of Complementary Metal-Oxide-Semiconductor and Direct X-Ray Photon Detection Intraoral Digital Sensors

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Objective: To compare image quality parameters of complementary metal-oxide-semiconductor (CMOS) and direct x-ray photon detection (DXPD) digital intraoral detectors. **Materials and Methods:** Radiographic images of a digital dental quality assurance phantom were taken at incremental exposures using a direct current x-ray source with 60 kVp and 7 mA to determine the optimal exposure, latitude, spatial resolution, and low contrast perceptibility of two CMOS and two DXPD detectors. Each parameter was evaluated by two raters twice. **Results and Discussion:** Average optimal exposure of CMOS was 0.8 seconds and DXPD was 0.9. Latitude of CMOS and DXPD were identical, exceeding 8.33. Highest spatial resolution of CMOS was 12 lp/mm and DXPD was 10.6. Low contrast perceptibility of CMOS was 6 and DXPD was 5.5. In DXPD, photons are absorbed in a semiconductor material where an electrical charge is generated directly without the use of an intermediate scintillator or visible light conversion as CMOS does. Thus, the potential benefits of DXPD over CMOS include decreased sensor thickness, increased contrast-to- noise ratio, increased dose efficiency. **Conclusions:** CMOS and DXPD detectors present comparable image quality parameters, with CMOS showing slightly better performance in spatial resolution and low contrast perceptibility. However, DXPD offers reduced thickness and size. More objective, advanced parameters including noise power spectra and modulation transfer function willbe discussed.

Keywords: direct x-ray photon detection, photon counting, CMOS, digital sensor, image quality
Funding: Cao Group, Inc.

O-021

Utilizing A Computer-Aided Diagnostic System In Periapical Radiography For Diagnosis Endodontic Teeth Vertical Root Fracture

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Objective: Diagnosing vertical root fractures (VRF) in endodontically treated teeth poses a clinical challenge. Radiological images and clinical symptoms are often crucial evidence for making an accurate diagnosis. The aim of this retrospective study is to investigate teeth that underwent endodontic treatment several years ago but developed chronic apical periodontitis a few years after the procedure. We diagnosed these teeth with vertical root fractures based on changes in alveolar bone morphology and image quality observed at different time intervals. **Materials and Methods:** We collected data from 79 cases of teeth diagnosed with chronic periapical inflammation over the past 12 years. However, only 50 cases, including 19 cases of VRF, were included in this study. Two periapical X-ray images were selected from each case: one from the initial root canal treatment performed many years ago, and the other from a recent root canal retreatment. This resulted in a total of 100 images being included in the experiment. Four dentists independently evaluated each image, randomly assigning visual assessments to seven areas (Z1-Z7) based on the alveolar bone around the root. Quantitative analysis algorithms were employed to determine the image values for these areas. The PAI index revealed no significant differences between these cases. **Results and Discussion:** All cases of vertical root fracture (VRF) exhibited changes in the alveolar bone surrounding the root, spanning from Z1 to Z7 (excluding Z4) across different time intervals. The Chi-Square test indicated a significant difference in periapical radiographic images (p-value < .05). However, quantitative analysis revealed no statistically significant differences in the alveolar bone at the root apex. The study suggests that applying quantitative survey algorithms to periapical radiographic images may assist in diagnosing VRF in teeth.

Keywords: Vertical root fracture (VRF), Digital X-ray image, Cone-beam computed tomography (CBCT), Periapical Index, , Zoning index quantitative mode

Funding: The authors gratefully acknowledge the financial support from the Cardinal Tien Hospital (CTH-110-3-1-057) and National Science and Technology Council (MOST 111-2314-B-567-001)

O-022

Using Innovative Device Scooting Impacted Third Molar Away from the Inferior Alveolar Nerve- Cases Report

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Introduction: Horizontal impactions of mandibular third molar (TM) can cause serious problems, including an increased risk of adjacent tooth caries, pericoronitis, odontogenic cystic change or tumor transformation, etc. However, the odontectomy for such impactions carries the risk of complications like nerve damage, dry socket, severe post-operative pain and bleeding, and a prolonged bone recovery time of the extraction socket. The innovation of Kyola Distraction System (KDS) adresses the aforementioned problems well. **Case Presentation:** This case series reports on the use of KDS for the removal of deeply impacted mandibular TM, the approximation of positioned close to IAN was revealed by panoramic film and cone beam computed tomography (CBCT). The Kyola Distraction Bracket Unit (KDBU) was applied to the adjacent teeth of the impacted TM. Under local anesthesia, incision and flap elevation was made. Coronectomy was done to the impacted TM. Kyola Distraction Wiring Unit (KDWU) with orthodontic elastic was applied to the remaining part of the TM. Both Kyola Distraction Units were connected with orthodontic elastic. After 2-8 weeks, apices of impacted TM were clearly seen to have gradually moved away from the IAN in the panoramic film. Removal of the remaining part of the distracted TM was done after the distraction. Patient received minimal pain without major complication through the whole treatment. **Discussion:** In this case series reports, KDS helped the general condition for the removal of horizontal impaction and relieve the anxiety of patient.

Keywords: orthodontic distraction, horizontal impaction, mandibular third molar, dental extraction, surgical complication, panoramic film.

Funding: nil

O-023

Rheumatoid Arthritis: Quantitative Assessment of the Masticatory Muscles Using Diffusion-Weighted Magnetic Resonance Imaging

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Objective: The objective was to investigate the association between rheumatoid arthritis (RA) and masticatory muscles by analyzing the apparent diffusion coefficient (ADC) obtained from diffusion-weighted magnetic resonance imaging (DW-MRI). **Materials and Methods:** This study was approved by the Ethics Committee of the our university (EC15-12-009-1). In this retrospective study, we analyzed data from 38 patients who underwent MRI examinations at our hospital from August 2006 to March 2023. We also included a control group consisting of 41 patients with normal TMJs who were examined during the same time frame. To compare the ADC values of the masticatory muscles between the two groups, DW-MRI was employed. **Results and Discussion:** RA patients exhibited significantly higher mean ADC values in the medial and lateral pterygoid muscles compared to the control group. The study findings revealed increased ADC values in the masticatory muscles of patients with RA, indicating potential alterations in these muscles. These are thought to be caused by the weakening of the chewing muscles, a decrease in muscle cell density, and inflammation associated with conditions such as rheumatoid polymyositis. In conclusion, the study revealed a notable distinction in the condition of the masticatory muscles between patients with RA and the control group, implying that the ADC measured through DWI holds promise for evaluating the association between masticatory muscles and RA. Furthermore, these findings suggest that DWI could serve as a valuable tool in identifying the presence of RA.

Keywords: rheumatoid arthritis, masticatory muscles, apparent diffusion coefficient, diffusion-weighted magnetic resonance imaging

O-024

Radiological Finding of Elongated Styloid Process: A 5-year Retrospective Study Based on Panoramic Radiographs

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Objectives: This retrospective study aimed to provide data of the elongated styloid process in patients at Hasanuddin University Dental Hospital during the previous five years using panoramic radiography. **Materials and Methods:** This cross-sectional study evaluates 234 digital panoramic radiographs collected consecutively from archive records, comprising males over 14 year and females over 12 year from 2018 to 2023. The elongated styloid process was examined using calibrated panoramic data on the open-source ImageJ platform. **Results and Discussion:** From all radiograph data that met the inclusion criteria revealed that the elongated styloid process was more prevalent in females, at 55.47%. The 26-45 age group is the most likely to develop this condtions, with type 1 accounting for 83.20% of all cases. The findings in this study align with the global incidence of elongated styloid process cases of approximately 4% of the population. This can be used as new initial data to propose estimates of the incidence of this case, especially in the Indonesian population, starting from a minor scale at Hasanuddin University Dental Hospital. **Conclusion:** Data on the elongated styloid process obtained via panoramic radiography at the Hasanuddin University Dental Hospital indicates a sufficient number from all of the patients who underwent panoramic examination in the previous five years. This may provide preliminary data for future research regarding the finding of an elongated styloid process.

Keywords: elongated styloid process, panoramic radiograph

O-025

CBCT Radiographic Odyssey: A Comprehensive Exploration of Impaction Cases in Oral Maxillofacial Radiology—Insights from the Indonesian Landscape in 2023

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Introduction: Cone Beam Computed Tomography (CBCT) has revolutionized oral maxillofacial radiology, providing detailed three-dimensional images crucial for diagnosing impaction cases. **Case Presentation:** This study delves into impaction cases observed in Indonesia during 2023, employing meticulous examination protocols and advanced CBCT imaging. Diverse impaction patterns across the oral and maxillofacial region were analyzed, highlighting the unique characteristics of the Indonesian demographic**. Results:** CBCT emerged as an indispensable tool, offering precise visualization of impacted structures and guiding tailored treatment plans. Variations in impaction patterns within the Indonesian population underscored the importance of region-specific considerations in oral maxillofacial radiology**. Conclusion:** Our findings emphasize the pivotal role of CBCT in advancing the understanding of impaction cases. The insights gleaned from the Indonesian landscape in 2023 contribute valuable knowledge to the global body of oral maxillofacial radiology, guiding clinicians in effective impaction management.

Keywords: cbct, impaction cases, oral maxillofacial radiology, diagnostic imaging, indonesia
Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors and is open for any collaboration in the future.

O-026

Non-surgical root canal retreatment of fusion tooth with multiple dens invaginatus after failed regernative procedures

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Introduction: Regenerative procedure has been widely used to achieve apical closure and thicken root canal wall of teeth with immature apical formation. Treatment failure due to multiple factors has been noted clinically. Non-surgical root canal retreatment provide another chance for these teeth to be preserved. **Case Presentation:** This is a case of fusion upper right lateral incisor and canine with mesial, central and distal dens invaginatus. Initial endodontic treatment was done in 2017 after patient experienced facial swelling. Malformation of the tooth with immature apex was found. Apical and lateral radiolucency along the mesial side of the tooth was noted. Remaining vital tissue was seen under microscope at the apical portion of main canal. Biodentin was placed in the central dens invaginatus to allow root canal thickening and apical closure. Tooth was restore with composite resin after endodontic treatment. Tooth remained asymptomatic for 6 years until lateral lesion was found at the apical end of mesial dens invaginatus. First retreatment was done, but lesion remained the same. Patient experienced another episode of facial swelling 4 months after retreatment of mesial dens invaginatus. No other source of infection could be identified except a 2mm x3mm apical radiolucency. Another retreatment was done through central dens invaginatus. Root canal debridement between main canal and multiple dens invaginatus cannot be complete. Hydraulic filling technique was choosen to allow sealer flow into dead space inside root canal. Tooth again remained asymptomatic and normal in function until now., **Discussion:** In this case report, nor-surgical root canal retreatment was performed on tooth previous treated with regenerative procedure. Complete apical and coronal seal remains key factor for successful outcome.

Keywords: dens invaginatus, regenerative procedure, retreatment

O-027

Navigation-assisted Surgery for Treatment of Benign Tumor: A Case Report

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Introduction: Ameloblastoma, a rare benign epithelial odontogenic tumor, ranks among the most commonly encountered clinically significant and potentially life-threatening odontogenic tumors. Its occurrence does not exhibit a gender predilection, although racial predilections remain a matter of controversy. Typically, around 70% of ameloblastomas manifest in the molar and ramus region, with 85% in the mandible and 15% in the maxilla, predominantly affecting the posterior region. The standard treatment for ameloblastoma involves marginal resection with a recommended free margin of 1 to 2 centimeters, a procedure that may result in facial defects. To ensure the preservation of the patient's facial aesthetics, a minimally invasive approach is deemed necessary. **Case Presentation:** In August of 2023, a 33-year-old female sought assistance at our Outpatient Department (OPD) following several days of right facial swelling. A panoramic radiograph revealed a radiolucency in the right mandibular ramus, prompting suspicion of ameloblastoma or odontogenic keratocysts (OKC) based on the lesion location and radiographic features. Subsequently, marsupialization was performed in September, leading to a gradual reduction in the size of the radiolucent area over the next 6 months. Our upcoming plan includes navigation-assisted surgery scheduled for this April to undertake tumor enucleation, bone trimming, accurate diagnosis, and excision of affected tissues. **Discussion:** Utilization of radiographic imaging serves not only in preoperative diagnosis but also aids in anatomical navigation for surgical planning both before and during navigation-assisted procedures. Such an approach aims to facilitate informed decision-making by healthcare providers while simultaneously reducing procedural risks and potential complications.

Keywords: Odontogenic tumors, Navigation

O-028

Maxillary Dentigerous Cyst in Pediatric Patient: A Misdiagnosed Case on Radiographic Examination

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Introduction: Dentigerous cysts (DCs) are odontogenic cysts attached to the cervical region of an erupted tooth and enclosing the crown. The cause of DCs remained unidentified, which present in theage twenties or thirties, but rarely found in childhood. Radiographic appearance of DC is a well-circumscribed, unilocular, symmetric radiolucency around the crown of an impacted tooth. Orthopantomogram (OPG) and CBCT used to assist clinical diagnosis, but the histopathological examination still required to establish a definitive diagnosis. **Case Presentation:** A 9-year-old girl came with complaining a lump in her gums, the upper right canine didn't erupt and swelling on the right side of the face since 3 months ago. The lump gradually increasing in size and asymptomatic. Extraoral shows facial asymmetry on the right face. OPG and CBCT revealed the right canine was impacted with a large homogenous radio-intermediate lesion, unilocular, irregular semi-ovoid with well-defined border. The lesion fill the cavity of right maxillary sinus, with extend superoinferiorly to orbital floor, also causes displacement of teeth 12-53-14-15. It indicates a benign odontogenic tumor, mainly like unicystic ameloblastoma (UA) or ameloblastic fibroma (AF). **Discussion:** A large radio-intermediate lesion associated with impacted tooth may indicate a cyst or tumor. In this case, final diagnosis leads to a DC as the result of histopathological examination. UA and AF are often mimicking DC, appears as a unilocular radiolucency, usually shows well-defined sclerotic border and also associated with impacted tooth. Thus, to avoid misdiagnosis, it is important to consider the findings of other supporting examinations.

Keywords: dentigerous cyst, benign tumor, impacted tooth, misdiagnosis, radiographic examination

O-029

CBCT Analysis of Granular Pattern of Fibrous Dysplasia in Maxilla: A Case Report

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Introduction: Fibrous dysplasia is a benign and uncommon bone disorder that arises from a mutation in the GNAS gene, replacing normal bone with fibrous tissue and abnormal (woven) bone. This condition can affect any bone in the body, including the maxilla, which is part of the upper jaw. The characteristic granular pattern observed in CBCT radiographs of fibrous dysplasia in the maxilla presents unique diagnostic challenges and opportunities, enabling clinicians to distinguish it from other maxillofacial pathologies with similar radiographic appearances. **Case Presentation:** A 50- year-old woman came to the Hasanuddin University Dental Hospital with the chief complaint of a lump on the gum in the right upper jaw, resulting in asymmetrical facial swelling and firmness. Based on the patient's history and clinical findings, a provisional diagnosis of ossifying fibroma and fibrous dysplasia was given. The CBCT revealed an aggressive unilocular lesion with a granular pattern of trabeculae that expanded the cortical bone in the buccal to the posterior side of the right maxilla. The lesion also extended to the right maxillary sinus towards the buccal. A histopathological examination is performed to integrate the results of the radiograph. Histologically, the lesion showed a proliferation of dense fibroblast cells with mild nuclear atypia consisting of spindle nucleus cells, spindle plump, and there was bone trabecular stroma without lined osteoblastic rimming. **Discussion:** In this case report, radiographs and histopathologic tests are needed to support a specific diagnosis of fibrous dysplasia and determine the appropriate treatment.

Keywords: fibrous dysplasia, granular pattern, CBCT

O-030

Unilateral Ossifying Fibroma in Mandible of 29-year-old Female: A Case Report

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Introduction: Ossifying fibroma (OF) is classified as a benign bone neoplasm, rare, and characterized by replacement of the normal bone on jaw with fibrous tissue. Fibrous tissue that contains varied amounts of bone or cementum resembling calcified tissue. OF is the most common fibrous tumor, it grows slowly in intrabony mass which is appear often asymptomatic and rarely cause facial asymmetry in mandible. On radiograph imaging showed as radiolucent-radiopaque well- defined lesion and caused expansion approximately equal in all directions. **Case Presentation:** This paper reports an ossifying fibroma affected a 29-year-old female patient who presented to with a painless hard swelling on her left side of mandible. CBCT exams showed a radiolucent-radiopaque mixed lesion in the region of tooth 33 to distal tooth 38 that extends inferiorly and buccally, unilocular, well-defined, with a size ± 54.3 x 31.8 mm, with an average density of radiolucent areas 58.5 to 83.5HU and average density of radiopaque area 419.3 to 610.0 HU. Incisional biopsy was performed, the tumor mass consists of hyperplastic growing spindle-shaped cells, compacted, arranged in fasciculus. A fibrous tissue was observed, osteoclast like giant cell accompanied by blood vessel dilatation, also appears woven bone with osteoblastic rimming. There is no sign of malignancy. **Discussion:** Radiography and HPA features can provide a characteristic picture, which can help diagnose the case. Surgery was performed in order to completely remove the lesion. Post-operative recovery was withoutcomplications or any signs of recurrency.

Keywords: cbct, ossifying fibroma, mandible, fibrous

Funding: -

O-031

A Case Report: A Rare Case of Unicystic Plexiform Ameloblastoma in a 25-Year-Old Male

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Introduction: Ameloblastoma is a benign, slow-growing odontogenic tumor arising in the mandible and maxilla. It is characterized by a locally invasive and significant recurrence rate. A CBCT radiograph shows a well-defined radiolucent lesion with sclerosis margins and is usually associated with tooth migration. **Case Presentation:** A 25-year-old male patient complained of experiencing swelling in the lower left jaw for one year with intermittent pain symptoms. The doctor suspected that the swelling was an abscess due to necrosis of tooth 36, so on that day, tooth 36 was extracted. A week after extraction and medication, the swelling did not decrease. The doctor referred for a panoramic and CBCT with suspected left mandibular ameloblastoma. The result shows a well-defined radiolucent lesion of unicystic and thin-corticated soft tissue mass at the 37 regio of the mandibular ramus sinistra that extends to the mandibular ramus associated with the impaction of tooth 38, causing trabecular bone and buccal-lingual cortical bone destruction. Microscopic examination revealed anastomosing hyperplastic cells and no signs of malignancy. **Discussion:** In this case report, it was confirmed by histopathologic examination that the unicystic radiolucent lesion with sclerotic margins was a plexiform ameloblastoma, which is a rare case.

Keywords: ameloblastoma plexiform, unicystic, mandible, cbct

Funding : -

O-032

Bilateral Dentigerous Cyst Mimicking Radicular Cyst Associated with Dens Invaginatus in the Lateral Maxillary Incisor

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Introduction: Dens invaginatus, a developmental anomaly, results from infolding in the crown or root's surface. The thin layer of discontinuous dentine and enamel that lines the dens invaginatus often allows irritants or microbes to enter the pulp directly, which frequently results in the development of pulpal and periapical pathology, including cysts. Radiographic findings of dentigerous cysts show a unilocular radiolucency with well-defined thin radiopaque border around the crown of the unerupted teeth, while the radicular cysts appear as radiolucent lesions in the periapical region that are round or pear-shaped. **Case Presentation:** A 21-year-old female was referred to the Dental Radiology Unit of RSGM Unpad for a CBCT examination with an initial diagnosis of dentigerous cysts in the left maxillary region. Intraoral examination revealed swelling of the left palate and a talon cusp on crown left maxillary lateral incisors. The CBCT examination showed a well-defined corticated radiolucent lesion, bilateral, the size of the lesion on the left side being larger and more invasive than the right. Invagination was also seen in both left and right upper lateral incisors, so a radiodiagnosis of a radicular cyst with dens invaginatus was established. However, histopathological examination revealed a dentigerous cyst with non-specific inflammation. Treatment includes enucleation of the left cyst, extraction of tooth 22, as well as root canal treatment of anterior upper teeth. After 3-month follow-up panoramic examination showed bone healing in the former lesion. **Discussion:** This case presents a dentigerous cyst that may develop from dens invaginatus of the lateral maxillary incisor.

Keywords: dentigerous cyst, radicular cyst, dens invaginatus, dens in dente, cbct

Funding: -

O-033

The Radiographic Characteristics of Condylar Osteochondroma Using CBCT and CT Scan: A Rare Case Report

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Introduction: Osteochondroma (osseocartilaginous exostosis) is one of the most common benign bone tumors of the axial skeleton but is rare in the mandibular condyle. Radiological examination of CBCT and CT scans can show the characteristics and location of condylar osteochondroma. **Case Presentation:** A 26-year-old woman was referred to the Dentomaxillofacial Radiology Installation of the Dental Hospital. The complaint began with the patient feeling that the lower jaw was tilted and the teeth were crowded, and orthodontic treatment was performed. Nine years later, the face felt asymmetry, and then CBCT and CT-Scan examinations were performed. Common manifestations included facial asymmetry, hypomobility, malocclusion, and joint dysfunction. Cone beam computed tomography (CBCT) revealed a radiopaque mass, irregularly shaped, and a mushroom-shaped outgrowth from the condylar process. The 3D CT-Scan showed a solid mass (resembling a cauliflower shape) originating from the condyle; the cortex and medulla of the lesion were in continuity with the parent bone structures. Histopathological examination results showed that a cartilaginous cap consisting of hyperplastic chondrocyte cells was seen. No malignancy was seen. **Discussion:** In this case report, condilectomy until neck of condyle therapy is successful, and radiographic features of the CBCT and CT-Scan can provide a typical characteristic picture so as to help establish the diagnosis accurately.

Keywords: osteochondroma, condylar, cbct, ct-scan

Funding: -

O-034

An Unusual Occurrence Pleomorphic Adenoma in the Hard Palate: A Case Report and Literature Review

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Introduction: Pleomorphic Adenoma (PA) is a mixed tumor consisting of epithelial and myoepithelial cells with varied morphological patterns, surrounded by a fibrous capsule. Salivary gland tumors are rare, consisting of 3% of all neoplasms in the head and neck area, most benign (65- 70%). **Case Presentation:** An 18-year-old patient complained of a soft tissue mass on the right sideof the palate one year ago. The results of the intraoral examination revealed a soft tissue mass on the right palatal measuring (2 x 3 cm) pain on palpation, and hyperemia without any ulcers or bleeding points. The Cone Beam Computed Tomography (CBCT) examination was carried out based on limited information from the panoramic results, these results showed the growth of a soft tissue lesion measuring (16 x 27 mm) with the expansion of a hyperdense appearance in the right maxillary sinusspace attached to the floor of the sinus. On the multiplanar reconstruction (MPR) images, the lesion appears without perforation on the wall and floor of the sinus. However, there is a perforation in the palatal bone and the incidental finding deviation of the right concha bullosa. The histopathological diagnosis was also suggestive of pleomorphic adenoma. **Discussion:** In this case report, the diagnosis of pleomorphic adenoma is based on clinical examination, radiography, and histology. The development of CBCT modality can provide three-dimensional reconstruction, making assessing the extent of lesions in the maxilla easier. Conventional imaging may be inadequate for lesions in the maxilla because of its limitations in providing three-dimensional objects.

Keywords: pleomorphic adenoma, diagnosis, cone beam computed tomography (CBCT)

Funding: -

O-035

Unique Rosette Pattern in Osteoblastoma of the Jaw: A Case Report

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Introduction: Osteoblastoma of the jaws is a rare benign tumor, characterized by osteoid and remodeled woven bone formation with the presence of numerous osteoblasts. Thai prevalence of this disease was 0.08% of all pediatric oral lesions or 0.31% of all pediatric tumors. Common radiographic features are well-defined radiolucent or mixed radiopaque-radiolucent lesions. This case report presents a distinct radiographic feature of rosette or swirling pattern within the radiopaque mass, which has not previously been reported with this disease. **Case Presentation:** A 26-year-old Thai female presented with chief complaint of post-filling hypersensitivity at lower right second molar for three months. No known underlying disease nor allergy was reported. Clinical examinations found normal oral mucosa and underlying bone, while some pain upon palpation of the first and second molars was noted. Both conventional and cone beam computed tomography (CBCT) radiographs revealed a well-defined round mixed radiolucent radiopaque lesion in rosette-pattern at the affected site. Thinning of buccal and lingual cortex and engulfing of inferior alveolar canal were revealed. Incisional biopsy was performed, and osteoblastoma was confirmed. The patient was managed by total enucleation, and outcome of the treatment was satisfied. **Discussion:** The rosette (swirling) pattern has never been reported as radiographic appearance of internal radiopaque mass in osteoblastoma. Further data collection for this radiographic pattern is warranted for future reference.

Keywords: bone neoplasm, jaw bones, mandible, osteoblastoma, rosette, radiographic pattern
Funding: none

O-036

A Stage IV Gingival Squamous Cell Carcinoma in a Patient with Neurofibromatosis Type I: A Case Report

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Introduction: Neurofibromatosis type I (NF1) is an inherited disorder associated with a genetic predisposition to cancer, particularly mesenchymal tumors. Despite its well-established link to malignancy, cases of oral squamous cell carcinoma in NF1 patients are infrequent in English literature. This report presents a unique case of advanced squamous cell carcinoma of the gingiva in a 52-year-old female with NF1. **Case Presentation:** A 52-year-old female with NF1 presented to our clinic with a chief complaint of a non-healing wound on the left maxilla following tooth extraction performed one month prior. Clinical examination revealed an ulcerative mass on the left upper gingiva and hard palate, with exposure of the maxillary bone. Biopsy results confirmed squamous cell carcinoma. Imaging studies, including a whole-body bone scan and MRI, revealed a significant tumor involving the left hard palate, floor of the maxillary sinus, left lateral nasal cavity, and medial pterygoid muscle. Additionally, an enlarged lymph node was noted in the left neck, along with numerous neurofibromas. **Discussion:** Managing squamous cell carcinoma in NF1 patients poses several challenges. In this case, a comprehensive treatment approach was pursued, comprising induction chemotherapy, surgical ablation, and adjuvant chemoradiotherapy. Despite the complexity of the treatment regimen, the patient achieved a favorable pathological outcome and remained disease-free during a 4-year follow-up period. However, interpreting imaging findings, particularly distinguishing between lymph nodes and neurofibromas on MRI, proved challenging. This case underscores the importance of evaluation and individualized treatment strategies for NF1 patients presenting with oral squamous cell carcinoma.

Keywords: Neurofibromatosis, Oral squamous cell carcinoma, Pathogenesis.

O-037

Mandibular Reconstruction with Resectioned Diseased Segment of Ameloblastoma using a Prefabricated 3D Printing Surgical Guide

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Objective: This case underscores the potential of combining surgical precision, autoclave sterilization, and tissue engineering in mandibular reconstruction, offering significant benefits in recovery and functional and aesthetic outcomes. **Materials and Methods:** We present a technique for mandibular reconstruction in a 22-year-old nurse with ameloblastoma. Initial treatments, including dredging and marginal resection, failed. A definitive segmental resection was conducted with a cone beam CT-derived 3D printed guide and piezo blade. The diseased mandibular segment, post-resection, underwent autoclave treatment and was reconstructed with an autogenous iliac cancellous bone graft and platelet-rich fibrin, fixed with mini-plates. **Results and Discussion:** Postoperatively, the patient received oral antibiotics and underwent hyperbaric oxygen therapy, showing excellent recovery without complications. The reconstruction integrated tissue engineeringprinciples, using the autoclaved segment as a scaffold, bone graft as cells, and fibrin as growth factors, in an optimized environment provided by hyperbaric oxygen.

Keywords: ameloblastoma, surgical guide, 3D model, mandibular reconstruction, tissueengineering, bone grafting

Funding: none.

P-001

Computed tomography analysis of the thickness of the buccal fat pad to detect diabetes mellitus

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Objective: Diabetes mellitus (DM) is associated with various complications, including retinopathy, nephropathy, neuropathy, and cardiovascular disease. However, the detection of DM based on findings from head and neck imagingremains challenging. Therefore, this study aimed to quantitatively evaluate the thickness of the buccal fat pad using computed tomography (CT) for the purpose of detecting DM. **Materials and Methods:** This retrospective study included 243 patients (93 men, 150 women; mean age, 59.3±12.6 years; range, 17–86 years). DM was defined based on the diagnostic criteria of the American Diabetes Association, with glycosylated hemoglobin (HbA1c) levels ≥ 6.0%. Patients with type 1 DM, those with tumor related lesions in the head and neck fat pads, and those with CT images showing metal artifacts were excluded from this study. The thickness of the buccal fat pad was manually measured from the maximum prominence of the cheek on axial CT images to the point closest to the masseter muscle. Spearman's correlation coefficient was used to examine the correlation between buccal fat pad thickness and HbA1c levels. Receiver operating characteristic (ROC) curves were used to determine the cut-off value for detecting DM. **Results and Discussion:** A positive correlation was observed between the buccal fat pad thickness and HbA1c levels. ROC analysis revealed that a buccal fat pad thickness of ≥ 10.875 mm indicates DM, demonstrating high sensitivity (82.2%). **Conclusions:** Our results demonstrate the relationship between the buccal fat pad thickness and HbA1c levels. Thus, DM can bedetected based on the buccal fat pad thickness on CT images.

Keywords: Diabetes mellitus, HbA1c, Buccal fat pad, Computed tomography

P-002

The Prevalence and Distribution of Supernumerary Teeth Identified Through Panoramic Radiographic Imaging

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Objective: Supernumerary teeth, characterized by an excess number beyond the normal dentition, manifest in various types including mesiodens, peridens, paramolar, and distodens based on their location. This study aims to assess the prevalence and distribution of supernumerary teeth in panoramic radiographs sourced from patients at the Universitas Airlangga Dental Hospital in Surabaya, Indonesia, exploring associations with age, gender, and specific tooth location. **Materials and Methods:** A descriptive cross-sectional study from the radiographic analysis of 2069 panoramic radiographs conducted in 2023 (916 males and 1153 females), spanning ages from 4 to 93 years old with percentage result. **Results and Discussion:** The prevalence of supernumerary teeth in panoramic radiographs was found 2.7% (56 cases). Peridens were the most frequent, accounting for 46% (26 cases), followed by mesiodens at 25% (14 cases), distodens at 7.14%, and paramolar at 7.14%. Females exhibited a higher prevalence (63.46%) compared to males (36.54%). The distribution of cases was predominantly in the mandible (57.14%) rather than the maxilla (42.86%). Among age groups, supernumerary teeth were found most in adults aged 18-40 years (63.6%), followed by adolescents aged 12-18 years (22.7%), children aged 6-12 years (18%), and late adults over 40 years
old (4.5%).

Keywords: supernumerary teeth, panoramic radiographs
Funding: none

P-003

Assessments of Mandibular Condylar Morphology and Width by Cone-Beam Computed Tomography in a Taiwanese Population

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Objective: The purpose of this study was to evaluate the morphology and measure the width of normal mandibular condyle using cone-beam computed tomography (CBCT). **Materials and Methods:** A total of 86 temporomandibular joints in 43 subjects (20 females and 23 males) with age range of 20 to 49 years were examinedprospectively on CBCT images. The CBCT images were imported into the medical imaging software to evaluate and measure the condyle on coronal sections. The mandibular condylar morphology was classified as round, convex, flat, and angled; besides, the condylar width was determined by measuring the length of the line connecting the most lateral and the most medial mandibular condyle point. Furthermore, condyle morphology was assessed according to age, gender, and side. **Results and Discussion:** From the measurement results, the condylar morphologies were analyzed as convex and angled in 33.72%, round in 23.26%, and flat in 9.30% ofthe cases. There was no significant difference between condyle shape and gender, but the convex and angled shapes were the most common in both genders, and the round shape was more obvious in males than females; the flat type was less prevalent to show bilateral symmetrical shapes than other varieties. The condyle mean of width measuring was 17.88 mm in age group 20 to 29, comparable to 18.46 mm and 18.52 mm in age groups 30 to 39 and 40 to 49 years, respectively. Furthermore, the condylar width showed statistical significance in females but was not statistically related to males and group age.

Keywords: Cone-beam computed tomography, mandibular condyle, temporomandibular joint, condyle morphology, condyle width

P-004

A Retrospective Study Of Accessory Mental Foramen Using Cone-Beam Computed Tomography Images Of Southern Taiwanese

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Objective: The present study was aimed to investigate the accessory mental foramen (AMF) using cone-beam computed tomography (CBCT) images of southern Taiwanese patients. **Materials and Methods:** The CBCT images of 622 subjects were accessed in this investigation by one oral and maxillofacial radiologist. The mental foramens and AMFs were studied. The number and position of AMFs were observed and statistically analyzed. **Results and Discussion:** We found 75 AMFs in 70 patients with 66 cases of unilateral presence (right: 35; left: 31) and 4 cases of bilateral presence. Only one case exhibited 2 AMFs in one hemimandible (right). The most frequently located position of AMFs was posterior and inferior to the mental foramen. The AMFs were observed in 11.57% of subjects in this study. Unilateral presence and 1 AMF were far more common than bilateral presence and multiple AMFs.

Keywords: accessory mental foramen, anatomic variation, cone-beam computed tomography
Funding: Nil.

P-005

Comparison of ChatGPT, Google Bard, and Microsoft Copilot in Answering Oral Radiology Questions

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Objective: The aim of this study is to evaluate and compare the performance of ChatGPT, Google Bard, and Microsoft Copilot in answering text-based multiple-choice oral radiology questions asked in the Dental Specialty Admission Exam conducted in Turkey. **Materials and Methods:** Text-based multi-choice questions were gathered from the open-source question bank of the Turkish Dental Specialty Admission Exam for the years 2012-2021 (https://www.osym.gov.tr/TR,15070/dus-cikmis-sorular.html). Each of the 123 questions, which had five choice and one correct answer, was included in the study. The knowledge levels of ChatGPT, Google Bard, and Microsoft Copilot were compared. Descriptive statistics, Kruskal Wallis, and Cochran's Q test were applied. **Results and Discussion:** The accuracy rates of chatbots are statistically significant (p=0.000). The highest accuracy, at 61.8%, is provided by Google Bard. While the accuracy rate for ChatGPT is 43.9%, it is 41.5% for Microsoft Copilot. There is a statistically significant difference in the word counts of the provided responses, with Google Bard having the highest and ChatGPT the lowest word count (p=0.000). Statistically significant differences were also observed in response times. The fastest response was generated by ChatGPT, while the slowest response was from Microsoft Copilot (p=0.000). With the highest accuracy rate and acceptable response speed among the three chatbots, Google Bard surpasses the others. However, considering the low accuracy rates of all three chatbots, it can be stated that they can only provide support to oral radiology education by developing scientific content databases specific to oral radiology.

Keywords: chatGPT, bard, copilot, oral radiology, question

Funding: There is no funding to declare.

P-006

Comparison of Trabecular Bone Structural Parameters between CBCT and Contrast-Improved CBCT Based on Deep-Learning

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Objective: In order to measure the structures of the trabecular bone in maxilla and mandible in CBCT images, a binarization process is required, but the reliability of the extracted information can be affected by various threshold settings. Therefore, the objective in this study is to validate the reliability and robustness of measurements for trabecular bone structural parameters using contrast-improved CBCT image based on deep learning, by applying the method to clinical data from actual patients. **Methods:** Contrast-improved CBCT (CI CBCT) images were generated from MDCT and CBCT data of 30 patients. Cycle GAN and U-Net were utilized to improve image contrast and reduce noise. Four regions of interest in maxillary and mandibular alveolar bone were analyzed. Analysis was focused on the extent to which binarized images were affected by variation of thresholds. Five bone structural parameters (BV/TV, Tb.Th (mm), Tb.Sp (mm), Tb.N (1/mm), and BS/BV (1/mm)) were assessed using various statistical analyses. **Results:** The ICCs were higher in CI CBCT images than CBCT images for all parameters and regions. In the Bland-Altman plot, the agreements within the binarized images in all parameters were improved in CI CBCT. In the linear regression analysis of mean parameter values across groups, the absolute values of slopes in all parameters were lower in CI CBCT images. RMSE, MAE, and MAPE were lower in CI CBCT images than CBCT images for all parameters and regions. **Conclusion:** Deep learning-based CI CBCT images verified improved reliability and robustness of measuring bone structural parametersin the maxillo-mandibular region.

Keywords: maxillo-mandibular trabecular bone, bone structure analysis, binarization, image pre-processing, deep learning.

P-007

Radiomics for Prediction of Medication-related Osteonecrosis of the Jaw by CT Images

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Objective: Medication-related osteonecrosis of the jaw (MRONJ) caused by bone resorption inhibitors is not very common, however, when it does develop, it is difficult to treat and often reduces the quality of life of the patient. The purpose of this study is to predict the development of MRONJ by performing a radiomics analysis of factors that cause osteonecrosis of the jaw using CT images. **Materials and Methods:** Patients diagnosed with MRONJ in one side of the mandible at Hiroshima University Hospital who had undergone CT prior to receiving the medication were included in the study. Segmentation of the MRONJ-affected and non-affected sides was performed from CT images before medication, and image features were extracted from each site. Radiomics analysis was used to extract and quantify the following image features in the region: 14 shape, 18 histogram-based, 75 texture-based (features related to texture), and 744 wavelet features (features related to histogram and texture), for a total of 851 extracted image features. Least absolute shrinkage and ion operator（LASSO）regression analysis was performed on the extracted image features, and 37 image features were selected. The prediction model was developed by machine learning (neural network), and the model was evaluated by sensitivity, specificity, AUC based on ROC curve. This study was approved by the Hiroshima University Ethics Committee (registration number E2023-0269). **Results and Discussion:** The sensitivity, specificity, and AUC in the validation group were, respectively, 0.800, 0.600, and 0.880 for the neural network model. Radiomics analysis and machine learning models using CT images could predict MRONJ with high accuracy.

Keywords: medication-related osteonecrosis of the jaw, radiomics, machine learning
Funding: None

P-008

An Artificial Intelligence for Assesing Jaw Bone Quality and Quantity in CBCT (Literature Review)

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Objectives: This paper aims to provide information about the development of various types of AI (artificial intelligence) subfields in various fields of dentistry, including the relationship between AI, bone quality, and quantity. **Materials and Methods:** A literature review included articles using AI and jaw bone quality and quantity using cone beam computed tomography (CBCT). The source articles were obtained from PubMed and Google Scholar search results using the keywords "artificial intelligence," "dentistry," "radiology," and "cone beam computed tomography". There are 32 articles collected, then searched for those that fit the inclusion criteria, namely the modalities included in the discussion are CBCT in the dentomaxillofacial area, the year of publication is limited between 2012 and 2023, written in English, free access, full text, and indexed by Scopus Q1 and Q2, related to bone quality and quantity. **Results and Discussion:** From the 32 articles obtained, only eight articles met the exclusion and inclusion criteria. Several studies use various AI methods in applying various fields of science in dentistry; the most discussed are implants, endodontics, and periodontal tissues. There have been few articles on artificial intelligence and its relationship to the quality and quantity of jaw bone using CBCT modalities. **Conclusions:** Evaluation of jaw bone quality and quantity using CBCT promises to be a promising discovery for early detection of a pathological condition related to jaw bone quality and quantity, resulting in a more appropriate and efficient treatment plan.

Keywords: Cone beam computed tomography, bone quality, bone quantity, artificialintelligence

P-009

Implant Fixture Location Planning Based On Artificial Intelligence

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Objective: In this study, we evaluated the effectiveness of AI-based implant fixture position prediction using machine learning algorithms, to improve the precision and predictability of dental implant procedures. **Materials and Methods:** 57 cases of CBCT data of patients with single tooth missing before implant surgery is collected and labeled a total of 6 3D landmarks using artificial intelligence, considering the depth of the implant fixture, buccolingual width, and distance from adjacent teeth. The labeling accuracy of AI is compared with the three-dimensional landmark labeling of a periodontist's implant placement plan. **Results and Discussion:** As a result of calculating the root mean squared error (RMSE) between the artificial intelligence's landmark detection results and the clinician's landmark labeling results in the evaluation dataset, the average distance error was 1.07 ± 0.55 mm and angular error was 2.12 ± 1.09 degree for 19 data cases. Implant fixture positioning using AI is expected to serve as a major tool in achieving unprecedented levels of procedure predictability, reproducibility, and precision in the field of implantology.

Keywords: AI, artificial intelligence, algorithms, planning

P-010

Deep learning for the computer-aided detection of root fusion of maxillary second molar in cone beam computed tomography

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Objective: The aim of the presentation is to develop a deep learning model to automatically clarify the classification of root morphology of maxillary second molar. Having thorough knowledges of configurations and variations of the root morphology plays an important role in success of dental treatment. Maxillary second molars are often very complicated due to the innermost position, root fusion and complex root canal morphology. Cone beam computer tomography (CBCT) provides three-dimensional anatomy of teeth, and is often being used clinically when complicated morphology was suspected. Computer-aided detection (CAD) and diagnosis provides an unbiased "second opinion" to the image interpreter. And with the deep learning algorithms in image-based applications, artificial intelligence (AI) provides better assistance to clinicians. **Materials and Methods:** Model training and validation were performed on 170 available CBCT images containing maxillary second molar which was segmented in every 0.2 mm by layer. And after the processing of segmented image, we apply ResNet50 for model training which was trained to clarify seven types of root fusion. **Results and Discussion:** The results showed the total accuracy of the model was 91.8% and variant in different types of root morphology. Most of the maxillary second molar had no fusion, and some types of the root fusion such as type 4 were very rare. The sample size affected the training of the model on this type of the root fusion. Some types of fusion were very alike and hard to interpretate even by experience clinicians, annotators and the deep learning model. And sometimes there are 2 to 3 types of fusion in one root. The above findings may suggest that we need to consider a different classification of root fusion on maxillary second molar with the assist of deep learning model.

Keywords: maxillary second molar, root fusion, deep learning, cone beam computed tomography
Funding: Ditmanson Medical Foundation Chia-Yi Christian Hospital

P-011

Can Deep Learning Be Helpful In Classifying Adult Age Group With Cropped Radiographs?

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Objectives: Compared to age estimation in children and adolescents, determining adult ages using dental radiographs remains a significant challenge. This study evaluated the efficacy of deep learning models in classifying adult age groups based on entire and partial panoramic radiographs (OPGs). **Materials and Methods:** We analyzed 785 OPGs from patients aged 20-85 years, categorized into 2-classess (30-year intervals), 4-classes (15-year intervals), 6-classes (10-year intervals), and 12-classes (5-year intervals). Four deep learning models (SqueezeNet, VGG19, ResNet152, and EfficientNet) were trained on three groups: entire OPGs (Group 1), left-sided cropped OPGs (Group 2), and right-sided cropped OPGs (Group 3). We compared model accuracies for each group using entire, left-sided, and right-sided cropped images. **Results and Discussion:** All groups achieved similar mean validation accuracies across classifications, with decreases for larger class numbers. For the 2-, 4-, 6-, 12-classes, the highest validation accuracies were: 92.85%, 80%, 75.66%, 69.11% in Group 1; 92.05%, 74.39%, 75.24%, 68.17% in Group 2; and 92.80%, 79.51%, 74.15%, 61.76% in Group 3. Notably, both right and left cropped OPGs yielded comparable accuracies. Among models, VGG19 displayed the highest validation accuracies (Group 1, 92.85%; Group 2, 92.05%; and Group 3, 92.80%). Deep learning models demonstrate promising potential for adult age classification using both entire and cropped OPGs, suggesting the possibility of utilizing separate sides of the radiograph while maintaining accuracy.

Keywords: age determination, artificial intelligence, panoramic radiograph, forensic dentistry, classification accuracy

Funding: None

P-012

Software-Assisted CBCT Interpretation in Volumetric Maxillary Sinus

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Objective: This article aims to identify volumetric maxillary sinuses using cone beam computed tomography (CBCT). **Materials and Methods:** A literature review included articles on sinus volumetrics maxillary using CBCT. Journals obtained from search results from PubMed and Google Scholar use the keywords "Maxillary Sinus Volumetrics," "Cone Beam Computed Tomography," and "Maxillary Sinus Volumetrics." The inclusion criteria used articles published within the last ten years, articles indexed in Scimago Journal Ranking with Q1-Q3 ranks, and articles with observational and experimental study designs. **Results and discussion:** From 9 articles with observational study designs that met the criteria, the average volume of the maxillary sinus was found to be 20.279 cm^3 – 31.62 cm^3. There are various methods for measuring the volume of the maxillary sinus, such as manual segmentation methods or with the help of software and geometric methods using the pyramid formula or ellipse formula. The segmentation method is the most accurate and reliable method of calculating the maxillary sinus volume compared with geometric calculations. The method is supported by software available on the market, such as Mimics, ITK-Snap, OsiriX, Dolphin 3D, InVivo Dental, and On-demand 3D. ITK-SNAP software is the easiest to use and is recommended because it allows for performing regional segmentation for active contours of anatomical structures from various CT, MRI, and projection results CBCT, while MIMICS has the lowest error rate among other software. **Conclusions:** Maxillary sinus volumetrics using CBCT shows promising potential in determining treatment plans and can serve as an alternative to CT projection.

Keywords: maxillary sinus, cone beam computed tomography (CBCT), computer applicationsoftware.

P-013

Accuracy and Reliability of Software in Volumetric Measurement with 3- Dimensional Segmentation of the Upper Airway Using CBCT Imaging: A Scoping Review

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Objective: The aim of this paper is to review the literature assessing the accuracy and reliability of post-processing software in 3D CBCT reconstruction for volumetric measurement and segmentation of the upper airway (UA). **Materials and Methods:** A comprehensive literature review was conducted on two databases, PubMed and Scopus, the search keywords used are "Cone Beam CT","airway", "software", "volume", "volumetric", and "segmentation". The inclusion criteria for the selected articles include the year of publication from 2012 to 2023, written in English, discussing software, free-accessible, full-text, and indexed Q1 to Q3 by Scopus. The exclusion criteria are literature review study designs, studies not conducted for upper airway volume evaluation, and the use of imaging modalities other than CBCT. Selection based on title screening as well as inclusion and exclusion criteria resulted in six articles. **Results and Discussion:** Various post-processing software for CBCT data have been developed for measuring volumetric evaluation of upper airway and used in selected journals include Amira® , 3Diagnosys® , OnDemand3D® , Dolphin3D, ITK-Snap, Dolphin Imaging® , Mimics Research, Romexis® , NemoStudio® , Invesalius, 3D Slicer, and Seg3D. Each article discusses the reliability and accuracy of software used for the evaluation of upper airway and each software displays different user interfaces, tools, and commands during CBCT data processing and analysis. All 3D CBCT reconstruction software used in this paper show results as a reliable and accurate measuring tool of volume, minimum cross-sectional area (mCSA), and upper airway length. **Conclusions:** CBCT is an accurate and reliable tool for upper airway evaluation.

Keywords: cone-beam ct, upper airway, computer software

P-014

The Jaw Lesions and Medication-Related Osteonecrosis of Jaw in Multiple Myeloma Patients

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Objective: Myeloma jaw lesions are not uncommon. The study aimed to investigatethe jaw lesions and medication-related osteonecrosis of jaw (MRONJ) in multiple myeloma (MM) patients. **Materials and Methods:** One hundred and twenty-two consecutive newly-diagnosed MM patients seeking dental care at Kaohsiung Chang Gung Memorial Hospital was examined according to jaw lesions with complete follow-up data. **Results and Discussion:** Median age of the patients was 67.8 years. Median survival was 37.9 months for 43 (35.2%) patients with jaw lesions and 57.4 months for 79 patients without jaw lesions. 1-year, 5-year and >7-year overall survival rates for patients with jaw lesions versus patients without jaw lesions were 94.9%, 67.2%, 56.7% vs 83.7%, 51.8%, 26.8% respectively. Patients with jaw lesionshad the worse survival (P=0.03). Jaw lesions involved the mandible more often than the maxilla and stopped progressing during remission, but did not repair. Most jaw lesions were asymptomatic and showed various radiographic features including multiple small indistinct to clear-cut punched-out lesions, multilocular soap-bubble lesions or single large irregular osteolytic lesion. Moreover, 18.6% of them primarily comprised generalized osteoporosis. Long-term monthly antiresorptive therapy changed the radiographic patterns of jawbones and induced MRONJ developing in16.7% (8/48) of patients. Five (62.5%) MRONJ sites spontaneously occurred without local risk factors. Antiresorptive drugs at less frequent dosing regimen are crucial tominimize spontaneous MRONJ. Nearly one-third of MM patients develop osteolytic jaw lesions that seem to be associated with poorer survival. Jaw lesion is an independent prognostic predictor of survival in myeloma.

Keywords: Multiple Myeloma, Jaw Lesions, MRONJ

P-015

Relationship between Nodal Metastasis and MRI Radiomics Features in Patients with Tongue Squamous Cell Carcinoma

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Objective: This study aimed to predict the risk of neck metastasis in patients with tongue squamouscell carcinoma by performing radiomics analysis on preoperative MR images. **Materials and Methods:** A total of 121 patients with primary tongue cancer were enrolled. The presence or absence of neck metastasis through at least 1 year of follow-up was assessed. Fat- suppressed T2-weighted images were used; their signal intensity was normalized and they were converted to 8-bit images. Two observers manually set the volume of interest on the tumor site using 3D Slicer software, and 107 image features were extracted. Analysis was performed on those meeting two criteria: significant differences between patient groups with or without neck metastases according to the Mann–Whitney U test, and good intra- and interobserver agreements as determinedby intraclass correlation coefficients above 0.9. In addition, two features with cutoff values determined to be highly useful in diagnosing neck metastases were selected using receiver operatingcharacteristic analysis. **Results and Discussion:** Neck metastases were identified in 46 of 121 cases, and 25 associated features were extracted. Using the combined criteria of first-order energy and gray-level co- occurrence matrix joint entropy, 91.3% of cases in which the values of both criteria were greater than the cutoffs had neck metastases, while 79.2% of those with both values below the cutoffs had no neck metastases. **Conclusions:** Although further validation with prospective studies is needed, MRI texture analysis of the primary tumor may be helpful in predicting neck metastasis in patients with tongue squamouscell carcinoma.

Keywords: radiomics, texture analysis, lymph node metastasis, magnetic resonance imaging,tongue squamous cell carcinoma

Funding: This work was supported by JSPS KAKENHI Grant Number 22K10115 and 23H03097.

P-016

Clinical and Radiological Features of Malformed Mesiodens in the Nasopalatine Canal: An Observational Study

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Objective: This study aims to investigate the morphological changes that occur when mesiodens are located within the nasopalatine canal, as well as clinical characteristics. **Materials and Methods:** Clinical records and CT images of the patients who had mesiodens in the nasopalatine canal were analyzed retrospectively. In addition to demographic information, clinical symptoms and complications associated with the extraction were recorded. The number, direction of impaction, size, and malformation (elongation, fusion, dilaceration) were analyzed using the CT images. **Results and Discussion:** 38 mesiodens within the nasopalatine canal were found in 32 patients. Supernumerary teeth showed characteristic features of thin and elongated shape in the canal (narrow width and elongation were shown in 96.6%, 53.3% of the patients). Fusion was found in 4cases, and dilaceration in 12 cases. Two cases of complications after extraction were asymptomatic tooth remnants, not a neurologic complication. Only five mesiodens could be detected in the nasopalatine canal on panoramic images. **Conclusion:** A majority of the mesiodens within the nasopalatine canal had malformation, and this could be effectively diagnosed through three- dimensional imaging analysis.

Keywords: mesiodens, nasopalatine canal, morphology, cone-beam computed tomography, complication

Funding: Not applicable.

P-017

Radiographic analysis of osteoblastoma in the jaws

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Objective: This study aimed to analyze radiographic findings of osteoblastomas occurring in the jaws for making the proper differential diagnosis of lesions. **Materials and Methods:** A retrospective study of the cases histopathologically diagnosed as osteoblastoma from January 2012 to December 2023 was performed. Then, the radiographs of these cases were retrieved from the archive. The following radiographic features were evaluated: location, margin (smooth/scalloped), border (ill-defined/well-defined), density (radiolucent/radiopaque), bone expansion, tooth displacement, root resorption. **Results and Discussion:** There were only 5 patients (4 females, 1 male) with osteoblastomas in the jaws identified in this study. The age ranged from 16 to 69 years old (mean 47.2). All osteoblastomas were located in the mandible (1 anterior, 2 posterior, 1 anterior to posterior, and 1 ramus region). A lesion showed radiopacity with radiolucent rim, 3 lesions showed radiolucency with internal radiopacity, and a lesion at the ramus showed radiopacity mimicking osteoma. Most cases (4/5) showed bone expansion. Neither tooth displacement nor root resorption of the involved teeth was seen. This study showed detailed radiographic features of osteoblastomas which is a rare tumor occurring at the jaw. This might help in rendering the differential diagnosis of this lesion.

Keywords: osteoblastoma, jaws, radiograph, diagnosis

P-018

Assessment of Carotid Artery Calcifications Through Digital Panoramic Radiographs of Indonesian Patients

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Objective: To evaluate the prevalence of carotid artery calcifications (CACs) on digital panoramic radiographs of Indonesian dental patients. **Materials and Methods:** Panoramic radiographs of 2.077 patients who received dental treatment between Januari – December 2023 at Airlangga University, were collected (male, n = 748, 36,0%; female, n = 1.329, 64,0%). Patients were aged 4–93 years (mean age, 33 years). Digital imaging technology was utilized to acquire the radiographs, which were subsequently analyzed by two trained examiners. They focused on identifying radiopaque images within the C3 and C4 cervical vertebrae region. The prevalence of CACs was stratified into two groups based on the side of occurrence (unilateral or bilateral) and shape (single, scattered/spread, vessel-width-defining, or vessel-outlining). Statistical outcomes were analyzed based on their association with sex and age. **Results and Discussion:** The prevalence rate of CACs was 20,61% (n = 428). We identified unilateral (n = 135, 31,54%) and bilateral (n = 293, 68,46%) calcifications. Shape of CACs : single (n = 82, 19,16%), scattered (n = 93, 21,73%), vessel-width-defining (n = 76, 17,76%), and vessel-outlining (n = 177, 41,36%). Prevalence and sex (82 males, 346 females) were statistically significant ($p < 0.05$). We observed calcifications predominantly in patients aged 50-60 years. **Conclusions:** Physicians and dentists need to be mindful of the potential existence of carotid artery calcifications in digital panoramic radiographs. Providing extra attention to asymptomatic patients in their fifties or sixties is crucial for enhancing vascular disease risk management, as panoramic radiographs can aid in diagnosis.

Keywords: carotid artery, carotid calcifications, panoramic radiographs, prevalence

P-019

Investigation of the Usefulness of Scintigraphy in Salivary Gland Imaging in Sjögren's Syndrome

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Objective: To evaluate the usefulness of scintigraphy in salivary gland imaging for Sjögren's syndrome (SS) in comparison with other examinations. **Materials and Methods:** After salivary volume measurement, ultrasonography, scintigraphy, parotid sialography, serology, and histopathology were performed in suspected SS patients. The final diagnosis was obtained in 205 patients (176 females and 29 males, 119 positive cases for final diagnosis). The dynamic curves of scintigraphy of the parotid and submandibular glands were quantitatively analyzed on uptake rate, uptake velocity, maximal accumulation, excretion rate, excretion upon stimulation, excretion velocity, and excretion upon stimulation. Sensitivity, specificity, and accuracy for the final diagnosis were determined based on the results and compared with other tests. Ultrasonography was performed by two diagnosticians using randomly ordered one set each of B-mode images of the parotid and submandibular glands. **Results and Discussion:** Sensitivity, specificity, and accuracy of scintigraphy alone were 72.3%, 91.9%, and 80.5%, respectively, when diagnosis was based on the excretion rate of the submandibular gland, which contributed most to diagnosis in the quantitative analysis. They were slightly lower than those of ultrasonography. When the decrease in salivary volume was taken into account according to the Japanese diagnostic criteria, the results for scintigraphy were 54.6%, 96.5%, and 72.2%, respectively, showing an increase in specificity, but a marked decrease in sensitivity and positive diagnosis rate. **Conclusions:** It was suggested that the submandibular gland excretion rate is most important in the diagnosis of SS on salivary gland scintigraphy, and that decreased saliva volume should not be taken into account.

Keywords: scintigraphy, ultrasonography, Sjögren's syndrome, salivary gland, diagnosis
Funding: JSPS KAKENHI Grant Number JP24592835

P-020

Evaluation of CT findings in squamous and non-squamous carcinomas of the maxillary sinus

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Objective: To evaluate the CT imaging findings of squamous and non-squamous cell carcinomas. **Materials and Methods:** Materials were 22 cases of maxillary sinus malignancy where the primary lesion was located within the maxillary sinus and extended into three or more walls of the sinus with a diagnosis of maxillary malignancy, CT performed, and histopathological diagnosis obtained. The evaluation criteria were the primary location of the mass, the presence or absence of an air- containing cavity, bone changes in the anterior, posterior, and medial walls of the maxillary sinus, extension to other paranasal sinuses and the presence or absence of infiltration into the orbit. Bone changes in the maxillary sinus wall were classified into four types: destruction, expansion, permeation, and thickening. These imaging features were classified into squamous cell carcinoma (SCC) and other malignancies (non-SCC), and their respective characteristics were evaluated. **Results and Discussion:** 11 SCCs and 11 non-SCCs were included. SCCs tended to occupy more maxillary sinuses than non-SCCs, with a concomitant reduction in the air-containing space. Bone changes tended to be more destructive in SCC and more penetrating in non-SCC. Bone thickening was observed in SCC. Extension into the ethmoid sinus was more common in SCC, with extension into other sinuses in non-SCC. Invasion into the orbit was more common in non-SCC and tended to extend upwards. SCC may be present if there is bone destruction or bone thickening, and non-SCC if there is no main seat in the sinus or if there are penetrating bone changes.

Keywords: maxillary sinus, squamous cell carcinoma, non-squamous cell carcinoma, CT
Funding: No funding was received.

P-021

The Frequency and Distribution of Periapical Idiopathic Osteosclerosis on Panoramic Radiographs

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Objective: Periapical idiopathic osteosclerosis, referred to as enostosis or dense bone island (DBI), is identified by its uniformly radiopaque appearance without a specific pattern. However, occasionally, there may be areas with more radiolucent patches, which can vary based on the form and thickness. Idiopathic osteosclerosis (IO) are similar to exostoses but occur internally. They are compact bone growths that develop within cancellous bone. This study is to determine the frequency of idiopathic osteosclerosis using panoramic radiographs and to analyze its association with gender, age, and location. **Materials and Methods:** This cross-sectional study, using a quantitative approach, examined 860 panoramic radiographs from patients (38.3% male and 61.7% female) aged 4 to 93 years (mean age 33.2 years) who visited the Department of Dental Radiology, Faculty of Dentistry, Airlangga University between January 2023 and June 2023. **Results and Discussion:** Among the 860 patients, 79 (9.1%) patients were found to have idiopathic osteosclerosis, with 97.4% of cases located in the mandible. Additionally, 20.3% of patients presented with multiple IO lesions. About 45 (57%) among females and 34 (43%) among males. Most commonly observed in the 15-64 age group, with the majority of the lesions being distinct from the root apices and lamina dura. Idiopathic osteosclerosis can manifest at any age and in any location within the jaw, without a specific gender predilection. Treatment for IO is generally unnecessary beyond diagnosis. The exclusive detection of these lesions in panoramic radiographs highlights the critical role of thorough radiographic evaluation in dental examinations.

Keywords: dense bone island, idiopathic osteosclerosis, panoramic radiographs
Funding: none

P-022

The Occurrence and Dispersion Of Charm Needles 'Susuk' Detected In The Jaw Through Panoramic Imaging

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Objective: Certain radiographic observations might reveal unusual or distinctive outcomes due to cultural customs or particular beliefs within a community. Among these practices is the utilization of charm needles, also known as 'susuk'. The occurrence of susuk detections has risen alongside the utilization of diagnostic radiography in both dental and medical fields. It is important for a radiologist to understand the presence of susuk to prevent misunderstandings in radiographic interpretation and to prevent incorrect diagnosis and mismanagement of cases. The objective of this study was to ascertain the prevalence of charm needles in panoramic radiographs across different age groups, genders, and locations at Universitas Airlangga Dental Hospital in Surabaya, Indonesia. **Materials and Methods:** Based on descriptive cross-sectional study using a quantitative technique, the radiographic analysis of 2069 panoramic radiographs in 2023 (916 males and 1153 females), ages ranged from 4-93 years (mean age 33.2 years). **Results and Discussion:** The prevalence of charm needle in panoramic radiographs was 2,36% (49 cases). It was found more in females 75,5% (37 cases) than males 24,44% (12 cases). The age-based breakdown reveals no instances among children (0-16 years), 4 cases among young adults (17-30 years), 18 cases among middle-aged adults (31-45 years), and the highest incidence of 27 cases among older adults (above 45 years). The prevalence of cases was predominantly observed in both the mandible and maxilla, accounting for 53.06% (26 cases), compared to solely in the mandible at 28.57% (14 cases) and in the maxilla at 18.36% (9 cases).

Keywords: charm needle, susuk, panoramic radiograph

Funding: none

P-024

Comparative Analysis of Intraosseous Cysts: A Cone-Beam Computed Tomography Study on Morphological Parameters

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Objective: Generally, intraosseous jaw cysts can be classified into three categories: periapical cysts, dentigerous cysts, and odontogenic keratocysts. This study aims to use cone beam computed tomography in dentistry to measure the differences in cyst parameters among different types of cysts. **Materials and Methods:** One hundred patients with jaw bone cysts aged between 21 and 72 (50 males and 50 females) were collected from the dental department of a hospital affiliated with China Medical University. CBCT images were taken using a Promax 3D Max machine (Planmeca, Helsinki, Finland) with a scanning resolution of 200 μm. The patients' dental CBCT images were input into the medical imaging software Mimics (Materialise, Leuven, Belgium) to locate the teeth where the cysts were present, create a 3D model of the cysts by masking their locations on different sections, and measure three parameters of the cysts: (a) whether the cyst penetrated the cortical bone layer on the lingual or buccal side; (b) the volume of the cyst; and (c) the grayscale brightness value of the cyst. Three classifications of the cysts for each patient were obtained by examining pathological sections of the cysts. The study aimed to compare the differences in occurrence rates of the three cyst classifications and the differences in cyst parameters (volume and grayscale brightness value) among the three classifications. One-way ANOVA and Scheffe's post hoc test pairwise comparisons were planned for statistical analysis. **Results and Discussion:** The cortical bone of the cheek side is more evident in the case of a periapical cyst and a dentigerous cyst being squeezed out, compared to a radicular cyst and an odontogenic keratocyst. There is a significant difference in grayscale brightness values between radicular cysts and dentigerous cysts, with the average grayscale brightness value being smaller than that of radicular cysts and odontogenic keratocysts. However, there is no significant difference in volume among the three types of odontogenic cysts. Clinical dentists may be able to differentiate between periapical cysts and two other types of cysts (periapical granulomas and dentigerous cysts) by using grayscale values and squeezing the buccal cortical bone.

Keywords: odontogenic cyst, cone beam computed tomography, image analysis, pathologicalsections

Funding: This study was supported by the National Science and Technology Council (112-2813-C-039-005-E)

P-025

Disparities in Tongue Cancer Thickness between US and CT are Predictive Indicator for Malignancy Grades

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Objective: The objective of this investigation is to elucidate whether variances in the thickness of tongue cancer as observed between intraoral ultrasonographic (US) and contrast-enhanced computed tomography (CT) images correlate with the histopathological grade of tumor malignancy. **Materials and Methods:** Eighteen cases of T1N0M0 and T2N0M0 oral squamous cell carcinoma (OSCC) of the tongue, with a follow-up period exceeding one year, were retrospectively enrolled. Sixteen cases yielded satisfactory data, encompassing intraoral US, contrast-enhanced CT images. The Cellular Dissociation Grade (CDG), predicated on tumor budding grade and cell nest size, were evaluated to assess the histopathological grades of tumor malignancy. **Results and Discussion:** The tumor thicknesses (TT) measured via contrast-enhanced CT exceeded those measured via intraoral US. Discrepancies between intraoral US thickness and contrast-enhanced CT thickness were more pronounced in cases with lower tumor budding grades than in those with higher budding grades. Analogously, such discrepancies in image-measured TT were more significant in cases with larger nests compared to those with smaller nests. The incidence of delayed nodal metastasis was associated with minimal TT disparities between CT and US. The assessment of variances in TT between intraoral US images and contrast-enhanced CT images proves valuable in predicting histopathological grades of tumor malignancy.

Keywords: tongue cancer, intraoral ultrasonography, ct, tumor malignancy grade

Funding: This research was supported by a Grant-in-Aid for Scientific Research.

P-026

A Study on overcorrection of PET/CT images in the oral cavity: relationship with dental metal prostheses and metal artifacts on attenuation correction CT

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Objective: Positron emission tomography (PET) images are reconstructed using CT-based attenuation correction (AC). This study aimed to clarify the relationship between overcorrection of uptake and dental metal prostheses in the oral cavity of PET/CT images **Materials and Methods:** We retrospectively reviewed thirty-eight patients (25 men and 13 women, mean age 67.2 years) who underwent F-18 fluorodeoxyglucose (FDG)-PET/CT examination for head and neck tumors. All patient were imaged using PET/CT scanner (TruePoint Biograph 40, Siemens Medical Solutions; Discovery MI, GE Healthcare) and panoramic radiography (Veraviewepocs, Morita Corp.). A spiral CT scan and a PET scan performed, and PET images were reconstructed using the iterative algorithms or the block sequential regularized expectation maximization. Two board-certified radiologists with expertise in PET/CT interpretation reviewed PET images and determined that overcorrection was positive if nodular FDG uptake was greater in the post-AC PET image than in the pre-AC PET image. We measured the number and location of dental metal prosthetic teeth, the area of metal artifacts (bright and dark band artifact), its area ratio, and mean CT value. **Results and Discussion:** We found overcorrection in 14 of the 38 patients (36.8%). The number of metal prosthetic teeth, the location of dental metal positions, mean CT value, the bright band artifact area, and the ratio of the bright band artifact area were significantly higher in the overcorrection positive cases. With regard to the tendency of the above overcorrected positive cases, the scanner was divided into two categories: that with a strong tendency and that without a tendency.

Keywords: positron emission tomography, metal artifacts, attenuation correction, overestimation
Funding: None.

P-027

The Prevalence of Positioning Errors on Panoramic Radiograph in Pediatric Patients

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Objective: Panoramic radiograph serves as a valuable diagnostic aid in pediatric patients, yet it presents several unique challenges compared to adult patients. Improper positioning of the patient diminishes the diagnostic quality of panoramic radiograph. The objective of the study was to ascertain the prevalence of positioning errors on panoramic radiographs in pediatric patients and to investigate any correlation between these findings and the age of the subjects. **Materials and Methods:** A cross-sectional study using secondary data in the form of 165 panoramic radiographs, ages ranging from 4-18, taken from Universitas Airlangga Dental Hospital in 2023. **Results and Discussion:** 95 panoramic radiographs (57.6%) were error-free and 70 panoramic radiographs (42.4%) were with positioning errors. The prevalence of positioning errors found in panoramic radiographs were patient head is twisted or tilted 35.7% (25 cases), incorrect lip position 34.3% (24 cases), chin position were tipped too high 12.8% (9 cases), the patient moves 8.6% (6 cases), chin position were tipped too low 4.3% (2 cases), and incorrect tongue position 4.3% (2 cases). The analysis findings indicate that there is a notable prevalence of positioning errors on panoramic radiographs in pediatric patients, which diminishes its diagnostic value. Typically, pediatric patients struggle to follow instructions throughout the examination, leading to a significant number of radiographs that are non-diagnostic for the radiologist.

Keywords: positioning errors, panoramic radiograph, pediatric.
Funding: None

P-028

Contrast-to-Noise Ratio and Square-Wave Response Function of Dual Imaging Plate Intraoral Radiography

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Objective: The ALARA principle requires intraoral radiography using imaging plates (IPs) to minimize radiation exposure without compromising spatial resolution. This study aimed to compare the contrast-to-noise ratio (CNR) and spatial resolution of a single IP (SIP) with those of a dual IP (DIP), which produces a merged image from two IPs packed in one protective bag. **Materials and Methods:** An aluminum step phantom and a line pair gauge were imaged to measure the CNR and square-wave response function (SWRF), respectively. Sixteen DIPs and 16 SIPs were exposed using a tube voltage of 70 kV, a tube current of 6 mA, a focus–IP distance of 40 cm, and exposure times of 0.1, 0.2, and 0.4 s. After exposure, all IPs were digitized. In the DIP method, the images obtained from two IPs were aligned using the method of least squares, then a DIP image was created by averaging the respective pixel values of the aligned images. The CNR and SWRF were calculated using ImageJ (NIH, Bethesda, MD, USA) for both DIP and SIP images at each exposure time. **Results and Discussion:** The CNR of the DIP was 1.22, 1.17, and 1.18 times that of the SIP for 0.1, 0.2, and 0.4 s exposure times, respectively. There was no obvious difference in the SWRFs of the DIP and SIP. The additional time required to process two IP images is an issue. **Conclusion:** Compared with the SIP, the DIP results in a higher CNR without sacrificing spatial resolution, evenwith low-dose exposure.

Keywords: contrast-to-noise ratio, imaging plate, intraoral radiography

Funding: This study was supported by Sato Fund, Nihon University School of Dentistry（SATO-2023-20）.

P-029

Age-related changes in mandibular impacted third molar root using CT

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Objective: The mandibular impacted third molar extraction is one of the most commonly surgical procedures in clinical situation. Further, the morphology of the tooth root influences the difficulty of tooth extraction. Therefore, preoperative evaluation of root morphology is crucial for clinician. However, there is few studies investigating age-related changes in the morphology of the mandibular impacted third molar root. The purpose of this study was to assess age-related changes in morphology of mandibularimpacted third molar root using computed tomography (CT). **Materials and Methods:** This study was approved by the Institutional Review Board (EC22-012). Three hundred fifty-sixpatients with mandibular impacted third molar (146 males and 210 females, age range 17-80 years) who underwent CT in our hospital from April 2016 to March 2021 were included. The presence or absence of root curvature, adhesion, and hypertrophy was investigated using CT. Age-related changes in root morphology were evaluated using Mann-Whitney U test. **Results and Discussion:** The group with root adhesion was significantly older than the group without adhesion (p<0.05). In addition, the group with roots hypertrophy was significantly older than the group without root hypertrophy (p<0.05). This study suggested that the morphology of the mandibular impacted third molar root changeswith age.

Keywords: age-related change, computed tomography, root curvature, root adhesion, roothypertrophy

P-030

Risk assessment of periodontal disease using the mandibular cortical index on the panoramic radiograph

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Objective: Currently, some studies have been reported investigating the relationship between mandibular cortical index (MCI) in panoramic radiographic images and bone quality in whole body. However, there is few reports on apply MCI for risk assessment of periodontal diseases. The purpose of this study was to assess the risk of periodontal diseases using MCI. **Materials and Methods:** This prospective study was approved by the Institutional Review Board (EC21-006). The study included 112 cases who underwent basic periodontal examinations and panoramic radiography at our hospital between April 2007 and March 2021. MCI evaluation and classification below the mental foramen on the images were performed (Group I: Type I, Group II: Types II and III). Probing pocket depth (PPD) was assessed as the deepest PPD among the examined teeth. The relationship between MCI classification (Group I and Group II) and PPD (≥4mm and <4mm groups) in all 112 cases was examined using Fisher's exact test. **Results and Discussion:** Group I had a higher proportion of cases with the PPD <4mm, while Group II had a higher proportion with PPD ≥4mm (P<0.05). This study found that in groups with resorption in the mandibular cortical bone, there is a tendency for PPD to be deeper. This indicate that MCI values had potential for risk assessment.

Keywords: periodontal disease, digital panoramic radiograph, mandibular cortical index

P-033

Surface Defect Evaluation of Terminated Photostimulable Phosphor Plate

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Objective: To evaluate surface defects found in terminated photosimulable phosphor plate (PPP) at the Department of Radiology, Faculty of Dentistry, Chulalongkorn University. **Materials and Methods:** Total of 323 dismissed PPP collected from 2 radiology clinics: academic (n=134, 41.49%) and hospital clinics (n=189, 58.51%) were included. The first clinic mainly operated by dental-students, while the latter ran by experienced dental-assistants and dental assistant-students. Both clinics utilized Rinn XCP® and Rinn snap-A-Ray Xtra® for parallel technique. Each PPP was exposed to 7 mA, 60 kVp, 0.2 sec at 35 cm source-to-object-distance, and exported in jpg format for further evaluation. The types of artifacts were classified as cracks, mid-plate cracks, circular-cracks, scratches, bitemarks, nail-pressured artifacts, edged-peel, smudges, dust-particle artifacts and others; additionally, their severity was scored as 0(none), 1(presence) and 3(predominantly presences). Furthermore, no more than 3 main reasons(s) for each plate rejection was identified. Descriptive and inferential analyses were applied. Confidential interval was set at 95%. **Results and Discussion:** The most-frequent surface defects is cracks(90.8%), followed by mid- line cracks(80.3%), scratches(67.7%), nail-pressured artifact(60.6%), circular-cracks(56.9%), smudges(49.8%), etc. The order of severity scores is exactly the same as frequency. The major reasons for discharging the plate were mid-line cracks, cracks and nail-pressured artifact. There is significant association between types of artifacts and types of clinics. ($p<0.05$)
Previous study stated that with presence of these artifact, diagnostic confidence decreased. In addition, understanding the causes of PSP discharge helps both clinicians and manufacturers by properly select or design imaging instruments to prolong PPP lifetime.

Keywords: artifacts, photostimulable phosphor plate, type
Funding: None

P-034

Contrast-to-Noise Ratio (CNR) of Photostimulable Phosphor Plate over 5-months Usage

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Objective: Consistent image quality is utmost desired, and can be affected by several factors; from patient characteristic, imaging equipment, exposure parameter and radiographic processing. This study aims to evaluate contrast and noise of photostimulable phosphor plate (PPP) itself at newly opened and at 5-month-in-service periods. **Materials and Methods:** Twenty-four new PPP were exposed with 16-steps aluminum step- wedge using constant exposure factor (7 mA, 60 kVp, 0.2 sec at 35 cm source-to-object-distance). After 5-month usage in the Radiology Clinic, Faculty of Dentistry, Chulalongkorn University, remaining 18 PPPs were still in operational condition, and were re-imaged in the same fashion. All radiographs were exported using jpg format, then opened and measured for grayscale using ImageJ software at step #2, 3, 13 and 14. A 1168-pixel circular region-of-interest was placed at three randomly positions within each step. Mean grayscale differences between step #2/3(low contrast-dark area), 13/14(low contrast-white area) and 2/14(high contrast area) were calculated, then divided by standard deviation as contrast to noise ratio (CNR). Wilcoxon signed rank analysis was conducted at 95% confidential interval. **Results and Discussion:** The mean contrast at low contrast-dark, low contrast-white and high contrast areas at newly-open and at 5-month-practice are 9.75--11.43, 9.89--7.44 and 113.97--88.08, respectively. Average CNRs change from 12.98 to 9.75 at low contrast-dark area, 7.80 to 9.90 at low contrast-white area and 101.58 to 113.97 for high contrast area. There is sufficient evidence to suggest that no CNR difference between new and used PPP at any contrast level.

Keywords: CNR, photostimulable phosphor plate
Funding: None

P-035

Patient Satisfaction at the Dental Radiology Installation, Dental and Oral Hospital of Jenderal Soedirman University, Indonesia

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Objective: The aim of this research is to provide accurate data regarding the satisfaction of Dental Radiology patients with the aim of being able to provide input to the management of the Dental and Oral Hospital, especially the Dental Radiology Installation, in order to improve services to the patients. **Materials and Methods:** The samples were customers of the Dental Radiology Installation at the Dental and Oral Teaching Hospital of JenderalSoedirman University, who were taken using a proportional sampling of 125 people. The data obtained were analyzed using one-way Anova processed with the SPSS program. **Results and Discussion:** Most respondents stated that they were very satisfied with the dimensions of reliability with a score of 90%, assurance with a score of 92%, tangible with a score of 95%, empathy with a score of 97% and responsiveness with a score of 98%. The conclusion of this research is that the Dental Radiology Installation Service at the Dental and Oral Teaching Hospital of Jenderal Soedirman University is very good, with very high satisfaction in all dimensions of satisfaction, namely reliability, assurance, tangible, empathy and responsiveness.

Keywords: satisfaction, dental radiology installation service, dental and oral teaching hospital, dimensions of patient care.

P-036

The Role of Radiography in Cases of Multiple Impaction Supernumery Teeth Non Syndrome; Literature Review

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Objective: to assess the role of radiography in cases of multiple impacted supernumerary teeth non syndrome. **Materials and Methods**: The search was limited to articles written in English using the electronic databases Science Direct, Pubmed and Wiley Online using the PRISMA Guideline. Searches were conducted using subject headings; radiographic examination, multiple impaction, and non- syndromic supernumerary teeth. **Results and Discussion:** There are 30% of cases of non-syndromic supernumerary teeth evaluated which were found clinically and 70% radiographically as incidental findings. Multiple impacted supernumerary teeth can occur in several regions in the oral cavity and most are found as incidental findings through radiographic examination.

Keywords: Radiography, Multiple impaction, Supernumerary teeth non syndrome

P-037

Effect of TE-reduction on MR images

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Objective: To evaluate the effect of TE-reduction on susceptibility artifacts and image contrast. **Materials and Methods:** The pulse sequences used were the CSE, FSE, CGRE, and FGRE methods, with TR fixed at 500 ms and TE varied for imaging. Cubic gold-silver-palladium alloy, silver alloy, Type IV gold alloy, pure titanium with $10^3 mm^3$, and cylindrical pure titanium with 4 mm in diameter by 10 mm in length were used as samples. Pure water, olive oil, and Gd contrast medium were used as samples for signal intensity measurements. **Results and Discussion:** The volume of black artifacts (BA) was smaller for the CGRE and FGRE when TE was shortened. However, white artifacts (WA) were rarely observed in the CGRE and FGRE methods. On the other hand, the volume of BA and WA did not change when TE was shortened for the CSE and FSE. Shortening TE did not change the signal intensity of pure water and Gd contrast media, but increased the signal intensity of olive oil. Since the TR was fixed at 500 ms in this study, TE- reduction was considered to be the most promising means of reducing metal artifacts in T1- weighted images with a combination of short TR and short TE.

Keywords: MRI, artifact
Funding: Nil.

P-038

Investigation of recovery associated factor in mandibular nerve disturbance

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Objective: This study aimed to identify factors associated with recovery of mandibular nerve disturbance, and to predict the possibility of recovery tailored to patients experiencing nerve disturbance.
Materials and Methods: Patients who visited the dentist with symptoms of nerve disturbance from April 2015 to September 2019 were included. Variables influencing nerve disturbance recovery (age, sex, onset event of the symptom, affected area, imaging examination, and imaging findings) were defined. The correlation between patients and variables was analyzed using the Chi-square test (or Fisher's exact test). Patients' final recovery was further investigated forstatistically significant variables.
Results and Discussion: A total of 328 patients were selected. Ofthe variables associated with recovery, the onset event of the symptom (p=0.02) and imaging findings (p=0.04) were statistically significant. Among the significant variables, the highest proportion of patients (77.78%) recovered without symptoms of onset event and implant surgery showed the lowest (34.25%). Patients with no evident nerve disturbance on imaging findings demonstrated the highest proportion of recovery at 58.82%, and none recovered when there was clear evidence of nerve intrusion. While there was no variation based on the imaging modality, the imaging findings were significant. Therefore, both 3D imaging and precise interpretation by an oral radiologist are deemed essential factors in the recovery of patients with nerve disturbances.

Keywords: mandibular nerve injuries, radiology, nerve disturbance, recovery
Funding: This work was supported by the National Research Foundation of Korea (NRF) grantfunded by the Korea government (MSIT) (No. RS-2023-00245224).

P-039

A Temporal Analysis of Brain Activations in the Gustatory Related Areas

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Objective: To evaluate the effects of concentration of saline on the brain activation of gustatory areas by using time-resolved functional MRI to investigate the cognitive backgrounds of different sense of the taste depending on its concentration. **Materials and Methods:** 10 neurologically normal subjects participated in this study. A sequence of 15 sec-tasting, 6 sec-rinse and 9 sec-rest periods in one trial was repeated 20 times in a session. At the beginning of the tasting period, NaCl solution of either a lower (0.9%, L-NaCl) or a higher concentration (9.0%, H-NaCl) was applied onto the subjects' tongue. Functional data were obtained using a T2* weighted gradient echo EPI sequence on a 1.5T MRI scanner and statistical tests were performed using SPM12. The temporal analysis was performed using a set of onsets for event-related analysis for each sampling point at every 3 sec. **Results and Discussion:** In the previous studies, the human primary gustatory cortex area (PGA) was identified in the insula and the operculum. Bilateral insula activation was observed at tasting in H-NaCl condition and at tasting and rinse in L-NaCl condition. The peak coordinates of insular activation at tasting in L-NaCl condition located at more ventral regions. In operculum, similar activation pattern was observed. A human secondary gustatory cortex area (SGA) was assigned in the orbitofrontal cortex. Activation in SGA was observed at tasting and rinse in H-NaCland at tasting and rest at L-NaCl. The regions activated in tasting under H-NaCl conditions were close to those activated under L-NaCl conditions.

Keywords: functional MRI, gustatory sense, saline taste

Funding: JSPS KAKENHI

P-040

The treatment outcomes of postoperative radiotherapy for oral cancer patients

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Objective: The purpose of this study was to evaluate outcomes of the postoperative radiotherapy for oral cancer patients. **Materials and Methods:** We retrospectively reviewed 117 patients with high risk of recurrence who were treated with postoperative radiotherapy for oral cancer. Three patients underwent postoperative radiotherapy twice. The high risk of recurrence was defined as the presence of at least one histopathological finding as follows: positive or close margin, extracapsular tumor extension, multiple metastatic lymph node. Stage classifications were stage I (n=2, 1.7%), stage II (n=7, 5.9%), stage III (n=6, 5.1%), stage IVa (n=17, 14.5%) and IVb (n=88, 75.2%). 65 of the patients underwent concurrent chemotherapy. Median follow up was 18 months. The radiation techniques were three-dimensional conformal radiation therapy for 95 patients, intensity modulated radiation therapy for 22 patients and electron beam therapy for three patients. Total dose ranged from 48 to 70Gy (median dose was 60Gy). **Results and Discussion:** The 3-year loco-regional control (LC), disease-free survival (DFS), disease-specific survival (DSS) and overall survival (OS) rates were 85%, 42%, 75% and 70.4%, respectively. Postoperative radiotherapy is considered to be useful for oral cancer patients.

Keywords: postoperative radiotherapy, oral cancer
Funding: Nil

P-041

CT images of medication-related osteonecrosis of the jaw -Analysis of 777 cases

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Objective: Medication-related osteonecrosis of the jaw (MRONJ) is a refractory osteonecrosis that occurs as a side effect of antiresorptive agents. Position Paper 2023 of the Japanese Association of Oral and Maxillofacial Surgeons describes that surgery is the first-line treatment of MRONJ. However, the method for determining the extent of bone resection has not been clarified. In this study, we examined CT findings based on a large number of cases. **Materials and Methods:** Patients with MRONJ between 2011 and 2021 and whose CT was taken before treatment were included. CT findings such as osteolysis, osteolysis, periosteal reaction, mixed-type osteosclerosis (mixture of multiple small radiolucent areas within the osteosclerosis), and bone within bone were investigated. **Results and Discussion:** 777 patients were enrolled from 19 hospitals. The mean age was 78 years, 207 males and 570 females, 213 maxillary and 564 mandibular. 466 had osteoporosis and 311 had malignancy. 464 were treated with bisphosphonate, 218 with denosumab, and 95 had changed from bisphosphonate to denosumab. Separation of sequestrum was seen in 268 cases, periosteal reaction in 265, mixed osteosclerosis in 250, and bone within bone in 24. Bone resorption was completely absent in 27 cases. **Conclusions:** This is the first study to describe CT findings in a large number of MRONJ cases. Based on the results of the present imaging findings, we would like to further study the classification of MRONJ and how to determine the appropriate extent of bone resection. We also plan to examine MRI, SPECT-CT, and other imaging modalities.

Keywords: medication-related osteonecrosis of the jaw, CT, multicenter study
Funding: None.

P-042

Digital Considerations for Asymmetry Orthognathic Surgery

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Introduction: A combined approach employing orthodontic and orthognathic surgical treatment has been widely used as the preferred method to correct skeletal deformity in the orofacial region during past three decades. Orthognathic surgery allows orthodontists to improve facial form, for which orthodontic treatment alone would be ineffective. Meanwhile, orthognathic surgery enables clinicians to remedy the functional problems of malocclusion while improving external symmetry and esthetics. **Case Presentation:** Advances in imaging and computer modeling have led to significant improvements in the understanding of complex three-dimensional anatomy of dentofacial structures, along with the corresponding soft tissues. This three-dimensional assessment and corresponding surgical prediction provide surgeons with better insight into the correction of severe dentoskeletal issues. Three-dimensional simulation of volumetric data combining with physical manipulation of stereolithographic models allows clinicians to create the guiding plate for fixation of maxillomandibular bony structures. This approach can ensure the better reproduction of proposed simulation during surgery and mitigate many drawbacks associated with previous planning models. In my presentation, I will show that orthognathic surgery carried out to correct facial asymmetries does not comprise only one treatment protocol. **Discussion:** 3D virtual planning might be used for surgical planning, but it should also be used to diagnose the deformity, thus allowing for an analysis of the best-recommended possibilities for the orthodontic preparation that suits each individual case.

Keywords: orthognathic surgery, digital, simulation, asymmetry

P-043

Application of Computed Tomography in Surgical Planning for Orthognathic Surgery: A Case Report

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Introduction: Computed tomography (CT) technology has revolutionized orthognathic surgery by facilitating precise surgical planning and surgical stent design. We present a case of a 17-year-old male patient with skeletal Class III malocclusion, dental Angle's Class III, where CT was utilized for surgical planning and surgical stent design for orthognathic surgery. **Case Presentation:** The patient underwent bilateral extraction of the upper first premolars,followed by preoperative orthodontic treatment aimed at dental decompensation and relief of crowding dentition. After completing the preoperative orthodontic treatment, a CT scan was performed, and surgical planning was progressed with Rhino™ software. After completing the surgical design, surgical stents were fabricated using 3D printing technologybased on CT bone movement simulation. Also, pre-bending miniplates for LeFort I osteotomy fixation and genioplasty were fabricated before surgery. With the aid of this meticulous planning, orthognathic surgery was performed smoothly. Postoperatively, the patient achieved favorable outcomes with significant improvements in facial symmetry, occlusion, and functional outcomes. **Discussion:** CT-guided surgical planning and surgical stent design played crucial roles in the successful correction of skeletal Class III malocclusion, ensuring optimal surgical outcomes and patient satisfaction. At the same time, CT surgical planning and surgical stent enhancing surgical accuracy and efficiency compared to 2D imaging modalities. It provides detailed three-dimensional anatomical information, fostering improved communication between orthodontists and surgeons. This collaboration optimizes treatment outcomes and minimizes surgical risks, highlighting the superiority of CT over traditional 2D imaging in orthognathic surgery.

Keywords: Computed tomography, orthognathic surgery, orthodontic.
Funding: Nil.

P-044

Large Odontogenic Keratocyst with Mandibular Impacted Canine Encroaching Through The Midline

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Introduction: Odontogenic Keratocyst (OKC) arises from the rest of the dental lamina in the jaws when the odontogenesis process is incomplete. It can be found in various sizes, commonly seen in the posterior mandible, and associated with impacted teeth. The high recurrence causes difficulties in treatment planning. CBCT examination has an important role in determining the characteristics of OKC accurately. **Case Presentation:** A 45-year-old male patient with chief complaints of lower jaw enlargement from right posterior to anterior region, and tenderness in the lower right mandible sincetwo years ago. Intraoral examination shows no sign of inflammation, a palpable swelling, and elevated mouth floor. CBCT revealed a radiolucent lesion with a scallop border appearance, the lesion extended anteroposteriorly with minimal buccolingual expansion, encroaching through the midline ("tunneling" pattern). OKC was defined as radiodiagnosis in this case while simple bone cyst and dentigerous cyst were the differential diagnosis. The histopathology of the incision biopsy revealed OKC characteristics. **Discussion:** The scallop border appearance and tunneling pattern are the main characteristics of OKC. A simple bone cyst was defined as a differential diagnosis since the extension of the lesion which encroached through the midline of the mandible. Large-size OKC diagnosis is challenging, especially when impacted teeth are involved. CBCT and histopathology examination are needed to obtain an accurate diagnosis. Therefore, it can determine an accurate treatment plan to prevent a recurrence

Keywords: CBCT, Mandible, Odontogenic Keratocyst, OKC

Funding: None.

P-046

Maxillary Odontogenic Lesions: A Radiographic Case Series Examination of Benign Entities

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Introduction: Benign odontogenic tumors that arise only from the odontogenic epithelium include ameloblastoma, calcifying epithelial odontogenic tumor, squamous odontogenic tumor, and adenomatoid odontogenic tumor. The desmoplastic variety of ameloblastoma is rare and has distinct histological, imaging, and clinical features. Its unique appearance, potential aggression, and high possibility of misinterpretation make this instance notable. **Case Presentation:** The author reports two cases of benign odontogenic lesions in the anterior maxilla. A 44-year-old woman came to an oral-maxillofacial surgeon with a complaint of asymptomatic swelling of the left anterior region of the maxilla 15 years ago, which started gently but gradually increased over time. In the other case, a 50-year-old woman complained for 5 years about a little swelling in her left anterior maxilla that became larger over time without causing any discomfort or pain. The CBCT exam revealed a partially multilocular radiopaque mixed radiolucent lesion in the anterior maxilla, with margins that are both well-defined and ill-defined. Both display features of infiltrative, expansive, and moderately aggressive growths, leading to the erosion and perforation of the cortical plates in the buccal and palatal regions. Based on the biopsy results, both samples showed similar findings, specifically a benign odontogenic lesion without any atypic cells or malignancy, but with a tendency towards a desmoplastic ameloblastoma. Despite the various differential diagnoses, the selected approach to treatment is surgical resection. **Discussion:** These cases can help us comprehend the clinical characteristics of these patients and urge us to examine particular lesions as potential diagnoses.

Keywords: benign odontogenic tumor, desmoplastic ameloblastoma, squamous odontogenic tumor, CBCT

Funding: none

P-047

Sialolithiasis of the Parotid Glands: A Rare Case Report

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Introduction: Sialolithiasis is a condition where a calcified mass called sialolith or stone is formed within the duct of a major salivary gland. Approximately 85% of sialoliths occur within the submandibular salivary glands, while other cases of sialolithiasis were present in the parotid and sublingual salivary glands. This case report presents a rare case of sialolithiasis of the parotid gland. **Case Presentation:** A 42-year-old Thai male patient was referred to the Faculty of Dentistry, Chulalongkorn University with a chief complaint of protruded lower jaw. The patient denied any underlying disease and drug allergy. A panoramic radiograph revealed an incidental finding of a well-defined oval shaped radiopaque lesion located at the left condylar neck of the mandible. The patient had no symptoms. A cone-beam computed tomogram was taken, and presented calcification within the left parotid salivary gland. Based on the findings, sialolithiasis of the parotid salivary gland was diagnosed. Since patient denied any symptoms, no further treatment was provided, but consecutive follow-ups were suggested. **Discussion:** Sialolith of the parotid salivary gland is much less common compared to those of the submandibular salivary gland. With pure serous saliva component, formation of a calcified mass inside the parotid gland is rarely occurred. Several modalities of management are available depending on signs and symptoms presented by the patient, also by the size and site of the lesion.

Keywords: panoramic, parotid gland, sialolithiasis, sialoliths, salivary glands

P-048

Unusual Three Major Salivary Glands Depressions: 3 Case Reports

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Introduction: Salivary gland depression is a well-defined lesion appeared in radiographic images, which can be confused with other cysts and cyst-like lesions and tumors. The submandibular gland is the most common source of the depression, while other salivary glands are rare. This case report presents the depression of three major salivary glands: parotid, submandibular and sublingual salivary glands in three different patients. **Cases Presentation:** The first case presented an ovoid radiolucent defect at the neck of left condyle, mimicking a cyst/cyst-like lesion or a metastatic lesion. The defect was confirmed lately as a parotid gland depression. The second casewas two circumscribed radiolucent defects located at the right inferior border and angle of the mandible, and were defined as submandibular gland depressions. In the third case, firstly on a panoramic image, the patient presented a large radiolucent defect with well cortication, located at the lower right canine to premolars areas, whichwas suspected to be an odontogenic cyst or tumor. With the aid of cone-beam computed tomographic images, this defect was defined as a sublingual gland depression. **Discussion:** The findings of parotid and sublingual salivary gland depressions are more challenging than submandibular gland depressions in our clinical practice. Clinicians should concern about appropriate imaging modalities along with clinical examination to have the final diagnosis. In contrast, presence of a submandibular gland depression is less complicated in the diagnosis.

Keywords: cone beam CT, panoramic, salivary glands, salivary glands depression

P-049

Non-Syndromic Multiple Supernumerary Teeth: Case Report of 8 Impacted Supplemental Teeth found in CBCT

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Introduction: Single, double, or multiple anomalies in number of teeth, referred to as hyperdontia or supernumerary teeth, may manifest unilaterally or bilaterally in one or both jaws. Multiple supernumerary teeth are frequently related to craniofacial developmental disorders. Less than 1% of hyperdontia cases have several supernumerary teeth that are not syndromic. Cases with 8 impacted non-syndromic supernumerary teeth is extremely uncommon. This article aims to demonstrate the radiological findings of multiple supernumerary teeth in a non-syndromic patient. **Case Presentation:** A 22-year-old man was referred to Universitas Indonesia Hospital with chief complaint of unspecified pain in the lower jaw. CBCT examination showed 5 supplemental impacted teeth located in the upper jaw, and 3 impacted supplemental teeth in the lower jaw, accompanied with impaction of teeth 38 and 48. The case showed no association with any health condition and no sign of any craniofacial developmental disorder. The management of this case involved a two-step surgical procedure for gradual extraction, conducted under general anesthesia. **Discussion:** CBCT examination showed clear visualization of multiple impacted supernumerary teeth which gives highly valuable assistance to the dental surgeon in managing the treatment plan. Considering the level of difficulty and risk of fractures in the area of impacted supernumerary teeth bordering the buccal or lingual cortical plate, CBCT images helped visualize the accurate location and position of supernumerary teeth.

Keywords: supernumerary, radiography, impacted tooth

Funding: -

P-050

Radiographic Images of a Suspect Large Dentigerous Cyst in Pediatric Patient: A Case Report

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Introduction: Dentigerous cysts are odontogenic cysts that develop from the proliferation of the enamel epithelium and are associated with the crowns of unerupted teeth or supernumerary teeth. Dentigerous cysts are common in teenagers or young adults but rarely found in children. These cysts generally show common radiographic images, however, some may vary. **Case Presentation:** This paper reports a suspect large dentigerous cyst in pediatric patient. A 5-year-old boy with complaints of pain and swelling in the anterior upper jaw was referred to Universitas Indonesia Hospital's radiology department for a CBCT examination. The result showed a large corticated hypodense lesion pericoronal to teeth 21, 22, 23. The lesion was found with massive expansion in the buccal-palatal direction. Discontinuity of buccal cortices and external tooth resorption in the apical root of tooth 62 were found. The treatment plan for this case is cyst enucleation and odontectomy of teeth 21, 22 with possibility of odontectomy tooth 23 and extraction of teeth 51, 61, 62 with a possibility of extraction tooth 63. **Discussion:** Based on radiographic images, this lesion leads to a suspect radiodiagnosis of dentigerous cyst. As this lesion has locally aggressive characteristics, it may be related and representative of dentigerous cyst cases in children. However, histopathology examination is still needed to make a definitive diagnosis.

Keywords: dentigerous cyst, cone-beam ct, pediatrics

Funding: -

P-051

A Large Mixed-radiodensity Lesion in an 11-year-old Girl: A Case Report of an Ameloblastic Fibro-odontoma

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Introduction: An ameloblastic fibro-odontoma (AFO) is a tumor that shares the basic characteristics of an ameloblastic fibroma and is composed of both enamel and dentin. Usually seen in the early stages of infancy, AFO frequently presents as a painless swelling in the posterior region of the maxilla or mandible. It may cause the involved tooth to shift or block the surrounding tooth to erupt, usually the teeth in the affected area are vital. **Case Presentation:** An 11-year-old girl presented with swelling of the left mandible. The patient underwent Cone Beam Computed Tomography (CBCT) of the maxilla and mandible, and showed the presence of massive ameloblastic mass, owing the characteristic of mixed hyperdense and hypodense mass in the region of teeth 37- 42 (across the midline). Tooth 33 was displaced into the region of teeth 42, 41, teeth 34, 35 were displaced towards the inferior region of the mandibular cortex, with irregular shape, well defined boundaries, with internal structure of a calcified structure fused with surrounding hypodense areas. In some areas, the mass has pattern of ground glass appearance.**Discussion:** In this case report, CBCT examination showed a very important role to reveal the characteristic of ameloblastic mass which allowed features of ameloblastic fibro-odontoma to be recognized. However histopathology still has to be performed to obtained a definitive diagnosis. CBCT examination has excellent results to provide comprehensive diagnostic information in developing treatment plan as well as valuable assistance when performing precise hemimandibulectomy to prevent recurrence and install bridging plates and screws.

Keywords: Ameloblastic fibro-odontoma, Hemimandibulectomy, Cone Beam ComputedTomography.
Funding: -

P-052

Radiolucent Lesion Associated with Impacted Third Molar: An Odontogenic Keratocyst or Dentigerous Cyst?

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Introduction: An odontogenic cyst is a cyst that develops in the region of the tooth bearing area. Odontogenic keratocysts are one of the developmental odontogenic cysts believed to arise from the dental lamina. While dentigerous cysts are fluid-filled sacs that have formed over top of an unerupted tooth and arise as a result of proliferation of the reduced enamel epithelium. These two lesions show similar radiographic findings, namely a well-defined radiolucent area with demarcation of the corticated margin. The aim of this article is to present the radiological similarity between a radiolucent dentigerous cyst and odontogenic keratocyst in CBCT (cone-beam computed tomography) images. **Case Presentation:** This paper reports a radiolucent lesion associated with impacted third molar. A 45-year-old man came to the Dentomaxillofacial Radiology Department in Universitas Indonesia Hospital for a CBCT examination with a complaint of swelling in the right lower jaw. The images showed a corticated hypodense lesion in scalloped form located inferior to a horizontally impacted tooth 48. This lesion showed a minimal effect to surrounding structures. There was no root resorption nor displacement to the adjacent tooth. Treatment planning of this case includes radical curettage and histopathology examination of the tissue. **Discussion:** The radiolucent lesion is associated with third molar impacted lesion and has a clear appearance of scallop-form border which leads to a suspect of odontogenic keratocyst, however some locus showed features highly indicative of a dentigerous cyst. A histopathology examination is still required in order to provide a precise diagnosis.

Keywords: keratocysts, impacted tooth, radiograph, cone-beam computed tomography
Funding: -

P-053

Bone metabolic disorders in pediatric patients: key clues for early detection in dental imaging

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Introduction: Bone metabolic disorder refers to a disease caused by a variety of causes that break the balance between bone-forming and bone-removing activities. Bone metabolic disorders can affect pediatric patients and impact their oral health. Dental imaging, such as panoramic radiographs and cone-beam computed tomography (CBCT), can provide key clues for early detection of these disorders. Panoramic radiograph of pediatric patients is first screening tool for evaluation of tooth and jaw development in daily dental clinic. The aim of this report is to represent the imaging features of bone metabolic disorders of pediatric patients to identify and refer patients for appropriate medical care. **Case Presentation:** Bone metabolic disorders are attributed to disturbances in balance of serum concentrations of calcium and phosphate. These bone metabolic diseases include osteopetrosis, hyperoxaluria, oxalosis, Schimke Immuno-osseous Dysplasia, osteogenesis imperfecta, dentinogensis imperfecta, and Rickets. On dental imaging in bone metabolic disorders of pediatrics, such as panoramic radiograph, the following features should be checked; Generalized loss of follicular cortex or lamina dura of tooth, Generalized widening or obliteration of pulp chamber, Generalized sclerotic or osteopenic change of trabecular bone. I will present a representative panoramic image of each disease with an explanation. **Discussion:** Dental panoramic imaging can help with early diagnosis of bone metabolic diseases when patients visit dental clinic without being aware of a systemic condition. Especially, it is important to distinguish itfrom hematopoietic malignancy (such as leukemia, or lymphoma), which can appear similar and requires urgent treatment.

Keywords: bone metabolic disorders, pediatric patients, panoramic radiograph

P-054

Synovial Chondromatosis in the Temporomandibular Joint

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Introduction: Synovial chondromatosis is a benign condition characterized by development of cartilaginous nodules in the synovial tissue of the joint. It usually occurs in large joints, such as elbows, knees, and shoulders. It is an uncommon condition affecting the temporomandibular joint (TMJ). **Case Presentation:** A 41-year-old woman had a chief complaint of a 2-year duration of a left preauricular pain. She had a swelling in the left TMJ area with fluctuant in consistency, and tenderness. There was no history of trauma. No facial nerve paralysis or hearing disturbance was detected. A panoramic radiograph failed to reveal any calcifying lesions or bony destruction in the left TMJ region. Computerized tomography (CT) showed a mass with internal multiple small calcifications located anteriorly and laterally to the left condyle occupied left masticator space. Bony erosion at the glenoid fossa was observed. According to the clinical and imaging findings, apreoperative diagnosis of synovial chondromatosis was made. Under general anesthesia, the left TMJ was exposed using a preauricular incision. Removal several loose bodies and condyloplasty were performed. Histopathological examination of the specimen confirmed our diagnosis of synovial chondromatosis. Recurrence was not found after 14 months follow-up. **Discussion:** Withnonspecific symptoms of pain, swelling, crepitation, and no obvious changes on conventional images in many cases of synovial chondromatosis, advanced imaging, such as, magnetic resonanceimaging (MRI), CT are necessary and helpful in clinical diagnosis, treatment planning, and follow- up. However, the definitive diagnosis is based on histopathological examination.

Keywords: synovial chondromatosis, temporomandibular joint

P-055

Two cases of *de novo* myoepithelial carcinoma -focusing on MRI findings-

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Introduction: Myoepithelial carcinoma (MC) is an extremely rare malignant salivary gland tumour.It is estimated to occur in less than 2% of all salivary gland tumours. There are few reports on MRI of MC. In the present report, we describe two cases of *de novo* MC, focusing on MRI findings. **Case Presentation:** Case I: A 62-year-old woman presented with a complaint of swelling of the left palate. A painless, elastic-soft mass is observed in the left hard palate. MRI findings: The lesion showed intermediatesignal intensity (SI) on T1WI and homogeneous high SI on short tau inversion recovery (STIR), with marginal enhancement on contrast-enhanced T1WI (CE-T1WI). Time-intensity curve (TIC) showed a short time to peak and then a plateau. Case II: A 71-year-old man presented with a chief complaint of swelling of the left mandible. The mass was tender, indurated and mobile. MRI findings: The lesion were heterogeneous low to intermediate SI on T1WI and heterogeneous low to high SI on STIR. The interior of the lesion was contrasted heterogeneously on CE-T1WI. TIC showed a short time to peak and then gradually increased. **Discussion:** Malignant tumours are generally reported to show early contrast followed by a gradual attenuation pattern. In the present case, Case I was a cyst-like mass and Case II was a mass with irregular margins, but both showed a plateau or gradual enhancement after early contrast in TIC.This feature may be a point of differentiation from other malignancies.

Keywords: myoepithelial carcinoma, de novo, magnetic resonance imaging, time-intensity curve
Funding: No funding was received.

P-056

Non-Syndromic Bilateral Symmetrical Dentigerous Cyst associated with Cementoblastoma in Impacted Mandibular Third Molar – Report of an Unusual Case

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Introduction: Dentigerous cyst is the most common developmental odontogenic cyst, covering 11.4% to 35.5% of all odontogenic cysts. Radiographically often presents a unilocular radiolucent area around the crown of the impacted tooth surrounded by a well-defined sclerotic area. Cementoblastoma is relatively uncommon benign odontogenic tumor of mesenchymal origin. Usually found in young patients, characterized by the proliferation of tissue similar to cementum in juxtaposition with the tooth roots, commonly found in solitary form and usually develops along withthe roots of permanent teeth. We report an extremely rare case of non-syndromic bilateral symmetrical dentigerous cysts associated with cementoblastoma in impacted mandibular third molar. **Case Presentation:** A 32-year-old female patient without any syndromes came for a CBCT examination with indicated mandibular impacted third molar. CBCT images showed impacted tooth 38 and 48, surrounded by radiolucent lesion in both crown region from CEJ to CEJ, with a rounded-shaped, well-defined, and corticated border, causing resorption in cervical of distal root tooth 37. An irregular- rounded radiopaque mass was depicted in the apical region of distal root of tooth 38 and 48, with irregular internal pattern, well-defined and surrounded by radiolucent line, fused with the root, and contact with both mandibular canal. **Discussion:** Bilateral dentigerous cyst usually are associated with some of syndromes including cleidocranial dysplasia, maroteaux Lamy and Gorlin Goltz syndromes, therefore, in the absence of these syndromes and associated with bilateral cementoblastoma, the occurrence of this condition is extremely rare.

Keywords: Cementoblastoma, dentigerous cyst, mandible, odontogenic cyst, odontogenic tumors.
Funding: None.

P-057

Sinonasal Adenoid Cystic Carcinoma: A Case Report in Renal Osteodystrophy Patient

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Introduction: Sinonasal adenoid cystic carcinoma is one type of rare malignant neoplasms in paranasal sinuses which emerged within major and minor salivary glands. This malignancy is characterized by a deceptive growth pattern and propensity for perineural spread along major and minor nerves, involving the cranium base and intracranial expansion. Cone-Beam Computed Tomography (CBCT) provides a better 3D image of extension of sinonasal adenoid cystic carcinoma in hard tissue of oral and maxillofacial region. **Case Presentation:** A 33-year-old male patient came with chief complaints painless swelling in the hard palate for two months. Intraoral examination showed expansive swelling in the hard palate region teeth #14 to #24, with hard consistency, and gingival enlargement and erythema in posterior region of right and left maxilla. The patient had a history of hypertension and had been undergoing hemodialysis treatment for the past eight years. CBCT examination showed a hyperdense mass with well-defined border in left maxillary sinus which extended to osteomeatal complex. Meanwhile, thinning of cortices bone with granular pattern of trabecular bone in maxilla and mandible was found. **Discussion:** Sinonasal adenoid cystic carcinoma is more predominant within the maxillary sinus rather than other paranasal sinuses. In the low grade of this malignancy, it is seen as well circumscribed mass. According to the radiographic appearance, this case is consistent with sinonasal adenoid cystic carcinoma accompanied with bone changes caused by renal osteodystrophy. In this case, CBCT has important role in detecting and determining the extension of the lesion.

Keywords: maxillary sinus, malignant neoplasms, adenoid cystic, carcinoma, renal osteodystrophy, cone-beam computed tomography.

Funding: Faculty of Dentistry, Universitas Indonesia, Indonesia

P-058

A Radiography Image Shows A Unilocular Ameloblastoma On Mandible of A Pediatric Child: Case Report

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Introduction: This case report aims to document the discovery. The radiography image reveals the presence of unilocular ameloblastoma on the mandible of a pediatric patient. **Case Presentation:** A 15-year-old arrived at the dental Radiology section of RSGMP accompanied by his parents, bringing a panoramic referral letter. The patient presented with a complaint of a swelling in the right cheek that had been present for approximately one year. An extraoral examination showed that the face was asymmetrical due to an enlarged right submandibular area measuring approximately 10 x 9 x 2 cm. The area feels hard to the touch and does not cause any pain or crepitation. Intraoral examination showed the left mandible has an enlarged gingiva around teeth 46-48. The enlargement is hard and does not easily bleed. There is no pain upon palpation. Panoramic radiographic examination showed there is a unilocular radiolucent lesion on the posterior corpus of the dextral mandible surrounding the impacted tooth 48 extending towards the dextral mandibular ramus with an irregular shape and well-defined corticated edges. The lesion appears to destroy the inferior cortex of the dextral posterior mandible and mandibular ramus, as well as the coronoid processes. Upon CT scan, cystic, inflating lesions were seen along with thinning of the os cortex. **Discussion:** Based on the lesion's form and characteristics identified during panoramic radiography and CT-Scan evaluation, ameloblastoma was suspected in this casereport. Ameloblastoma was also detected during further histological examination.

Keywords: Unilocular Ameloblastoma, Panoramic Radiography, Pediatric Child

P-059

Comprehensive Diagnostic Approach for Temporomandibular Disorders: A Case Report

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Introduction: Temporomandibular disorders (DC/TMD) present multifactorial etiologies that pose various clinical conditions. This case report illustrates the diagnostic methods using functional examination and various radiographic assessments. **Case Presentation:** This is a 23 y/o female patient has experienced left temporomandibular joint discomfort for eight to nine years, aggravated by singing, eating, or speaking. Yawning triggers audible sounds. Recent exacerbation prompts a request for examination. Functional examination unveiled symptoms of arthralgia, myalgia, joint sounds, and restricted eccentric movements. Suspected disc anterior displacement with reduction was noted. Panoramic radiography revealed a 3 x 2.5 mm defect in the left condyle, possibly originating from the medial pole. Quadruple radiography depicted left condyle deformity, suggestive of degenerative arthritis. There was no limited anterior translation of the left TMJ compared to the right during mouth opening. MRI confirmed thinning and deformity of the left condyle, with chronic degenerative changes and a suspicious tear of the fibrocartilage in the left TMJ. There is no apparent anterior dislocation observed in either of the TMJ discs bilaterally. Conservative approaches such as Michigan splint therapy and physical therapy were given. A long- term follow-up was scheduled to monitor the response to treatment and determine the necessity for additional evaluation and interventions. **Discussion:** This case report stresses the importance of using different diagnostic methods for DC/TMD patients. Functional exams should be supported byimaging, including quadruple and panoramic radiography, which revealed irregularities in condylarcontour. Additionally, MRI findings indicated significant issues in the left TMJ, such as degenerative changes and suspected tears in the fibrocartilage. The combination of these diagnostictools is essential for accurate DC/TMD diagnoses.

Keywords: temporomandibular disorders, functional examination, panoramic radiography,quadruple radiography, MRI

P-060

Surgical Management of A Lateral Lesion With Intentional Replantation In A Maxillary Premolar

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Introduction: Although lesions originating from accessory canals frequently heal with simple conventional endodontic therapy, some lesions may need additional and different treatment. Information about the periapical status of a tooth is necessary for correct diagnosis and treatment plan. **Case Presentation:** In the present case, a 47-year-old female reported persistent pain on endodontically treated maxillary second premolar. Conventional radiographs revealed good quality restorations and normal periapical status. However, cone-beam computed tomography (CBCT) revealed a lesion on the labial side of the middle part of the root. The bone surrounding the apical apex was not resorbed and labial bone resorption did not reach the apex. The above findings suggested that the localized inflammation may be caused by a laterally localized accessory root canal. Intentional replantation was performed due to canal obstruction and projection of the root into the maxillary sinus. The accessory canal foramen was identified, drilled out and filled with mineral trioxide aggregate (MTA). At the patient's one-year recall visit, the lesion was resolved upon radiography. **Discussion:** Correct diagnosis and an adequate surgical approach are key factors for the successful management of anatomical variations. CBCT imaging is a sensitive and precise diagnostictool in endodontic cases.

Keywords: cone-beam computed tomography, accessory canal, intentional replantation

P-061

Panoramic Findings of Squamous Cell Carsinoma in the Mandible with Condylar Invasion: A Case Report

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Introduction: Radiolucent lesions of the jaw can occur in various forms. These lesions can represent anatomical variations or be inflammatory, benign to malignant lesion processes. The disease is a squamous cell carcinoma that arises within the jaw and develops from remnants of odontogenic epithelium, cysts, or pre-existing odontogenic tumors. In this case, using a panoramic radiograph to help confirm. **Case Presentation:** A female patient complained of enlargement in the lower jaw gum area and pain when chewing for ± 1 month. Initially, ± 2 months before the patient had a tooth extracted at the dentist, an enlargement appeared in the patient's mouth, the size of a pea. There is no history of salty fluid in the patient's mouth. Because the size was getting bigger, the patient took the initiative to go to the Community Health Center and was referred to RSGMP Hasanuddin University for a panoramic radiograph. The mandibular ramus was obtained until the right condyle was destroyed due to the lesion. Case management: general anesthesia, debridement + incisional biopsy, control bleeding and washing the surgical area, then treating open and covering surgical wound with a bandage. **Discussion:** In this case, panoramic view is the only support to see the characteristics of lesion expansion and is considered sufficient as a reference for patient management. However, establishing a definitive diagnosis still requires histopathological examination.

Keywords: panoramic radiography, squamous cell carcinoma, mandibular ramus, condyle

P-062

A Rare Entity of Parotid Gland Mass: Follicular Lymphoid Hyperplasia

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Introduction: Follicular lymphoid hyperplasia is characterized by an increased number and size of lymphoid follicles. It is presumed to be reactive proliferation associated with unknown antigenic stimulation, but its exact etiology is still unclear. The condition affects many locations of the body; only rarely is the oral and maxillofacial region involved. **Case Presentation:** A 15-year-old boy presented with a painless swelling in the right pre-auricular area, which had been aware of 2 weeks ago. Upon extraoral palpation, about 2 cm soft tissue mass was observed, accompanied by a clicking sound in the right temporomandibular joint region, but there was no mouth opening limitation. In enhanced computed tomography, well-defined and encapsulated homogeneous soft tissue lesion measuring 30×22 mm in size in the superficial area of the right parotid area was shown. Preoperativediagnosis was pleomorphic adenoma in the right parotid gland, based on clinical and imaging findings.The surgery was performed as a surgical excision. In postoperative biopsy, reactive follicular hyperplasia of the intraglandular lymph node located in the superficial area of the parotid gland was revealed. **Discussion:** This case presentation was aimed to help in the differential diagnosis of follicular hyperplasia in lymph nodes resembling benign lesions in the parotid gland through careful radiological and histopathological evaluations.

Keywords: parotid gland; lymph nodes; pseudolymphoma; tomography, x-ray computed;diagnosis, differential

P-063

A Panoramic Radiograph of Recurrent Ameloblastoma in an Adult Woman: A Case Report

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Introduction: Ameloblastoma is a benign odontogenic epithelial tumor that originates from tooth-forming tissue that does not undergo differentiation during the tooth-formation process. When the tumor is not completely removed during the original surgical surgery, ameloblastoma may be recurrent. **Case Presentation:** A 22-year-old female came to the Hasanuddin University Dental Hospital with the chief complaint of swelling in the left cheek since ± 6 months ago. He also complained of pain since ± 4 days ago. Complaints of pain come and go and get worse if pressed on the cheek area. Patient with a history of operation dredging 3 years ago. The panoramic radiograph revealed a multilocular radiolucent lesion-like a soap bubble appearance with an irregular shape and well-defined corticated margins destroying theinferior border of the left mandible. The results indicate that recurrence of ameloblastoma is possible. This radiographic revelation not only substantiates the clinical suspicion but also provides for subsequent therapeutic deliberations. **Discussion:** The treatment options for ameloblastoma include conservative surgical intervention. The panoramic radiograph was given before dredging and showed an unilocular radiolucent lesion with an irregular shape and well-defined corticated margins causing extensive root resorption. The possibility of recurrence will increase, highlighting the importance of clinical vigilance and periodic radiographic examination.

Keywords: ameloblastoma, panoramic, recurrent ameloblastoma

P-064

Features of Unilocular Ameloblastoma on Panoramic Radiograph of a Male Patient: Case Report

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Introduction: Ameloblastoma is a persistent and locally invasive tumor, it has characteristics of aggressive growth but benign. There is a tendency occur in males. As it grows, it can cause buccal and lingual bone expansion, root resorption, changes in tooth position and mandibular canal. **Case Presentation:** This paper reports a male patient who presented with a complaint of a lump on the mandible that was noticed since ± 4 years ago. Initially, the lump appeared on the right side of the mandible about the size of a rice seed and then increased. The patient come to Hasanuddin University Oral and Dental Hospital for further treatment. Radiologic examination revealed an irregular radiointermediate (soft tissue enlargement) at the interproximal of teeth 45 and 47. There was a unilocular radiolucent lesion on the posterior corpus of the dextra mandible with an irregular shape and well defined corticated edges. The lesion was seen urging the mandibular canal to the inferior cortex of the dextra mandible, and resorbing the apical roots of teeth 43 44 45 and displacement of tooth 46 to the inferior of tooth 47. the diameter of the lesion was 31.37 mm x 44.79 mm. **Discussion:** In this case report, based on panoramic radiograph, the characteristics and structure of the lesion can be seen which is suspected to be unilocular ameloblastoma, dentinogenic ceratocyst, odontogenic developmental cyst and dentigerous cyst so that further examination is needed to determine the appropriate treatment plan.

Keywords: Unilocular Ameloblastoma, Panoramic Radiograph, Male patient

P-065

Multi-Radiographic Examinations in The Diagnosis of Malignant Oral Squamous Cell Carcinoma: Two Case Reports

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Introduction: Effective diagnosis of malignant oral squamous cell carcinoma (SCC) is paramount for timely intervention and improved patient outcomes. This case report underscores the significance of employing multiple radiographic examinations in diagnosing such malignancies, facilitating comprehensive insights into tumor characteristics and aiding in precise management strategies. **Case Presentation:** A 68-year-old female patient referred Hasan Sadikin General Hospital Bandung presented with a non-healing mass on her left cheek for 6 months, initially confined to the oral cavity but progressively spreading outward. Provisional diagnosis indicated a malignant soft tissue tumor. CT-scan, ultrasound, and thorax imaging were performed. In the second case, a 78-year-old female patient visited a dental hospital for CBCT 3D radiographic examination after previous panoramic radiography examination. She had significant swelling on her left anterior lower lip and labial mucosa, with continuous pus discharge, pain, and a history of recurrent mouth sores. Despite seeking treatment from various doctors, a provisional diagnosis of a malignant lesion was made. Both cases had undergone histopathological examination, resulting in the final diagnosis of oral squamous cell carcinoma. **Discussion:** The integration of radiographic examinations, provides a comprehensive approach to diagnosing malignant oral squamous cell carcinoma (SCC) and its possibility of metastasis. Each imaging modality offers unique advantages in evaluating different aspects of the disease, enhancing diagnostic accuracy and guiding treatment decisions. These radiographic findings, combined with clinical and histopathological data, contribute to the accurate diagnosis and management of malignant oral lesions.

Keywords: Malignancy, oral squamous cell carcinoma, radiographic imaging

P-066

A Case of Heterotopic Ossification in the Maxillary Sinus

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Introduction: Heterotopic ossification (HO) is the formation of mature bone within extraskeletal soft tissues where bone does not typically exist. HO in the maxillary sinus is a rare condition. A case of HO in the maxillary sinus is reported**. Case Presentation:** A 22-year-old female patient visited with the chief complaint of discomfort in her right upper molar region and frequent nasal obstruction. On panoramic radiography, a bony nodule was suspected, and cone-beam computed tomography (CBCT) was performed for further evaluation. CBCT images showed multiple ovoid or flat bone structures in the inferior and lateral aspects of both maxillary sinuses. A trabecular pattern was observed within these bony lesions. Most of these lesions were separate from the maxillary sinus walls, but partially connected. Based on these findings, HO involving both maxillary sinuses was diagnosed. Therefore, no surgical removal was performed, and follow-up CBCT imaging 6 months later showed no significant changes in the lesions **Discussion:** When radiopaque calcified structures are observed within the maxillary sinus, antrolith and fungal ball should also be included in the differential diagnosis. In this case, the presence of mature bone made the differentiation straightforward. Although rare, HO in the maxillary sinus should be included in the differential diagnosis when radiopaque lesions are observed within the maxillary sinus.

Keywords: heterotopic ossification, maxillary sinus, antrolith, fungal ball

P-067

Panoramic Radiographic Features of Multilocular Ameloblastoma in the Mandible: A Case report

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Introduction: Ameloblastoma is a benign odontogenic neoplasm that arises from the remaining epithelium of the dental lamina and enamel organ (odontogenic epithelium). Panoramic radiography was conducted as a supporting examination to visualize ameloblastoma lesions. **Case presentation:** A female patient presented with a complaint of a lump on the lower left front gum that has been noticed for approximately 8 months. Initially, the lump was the size of a marble and soft when pressed, but it has been felt to enlarge to its current size. The patient has experienced intermittent pain for the past 2 days. Feeling disturbed by the increasing size of the lump on the gum, the patient was then referred to RSUD Lanto Dg. Pasewang and subsequently directed to RSGMP Unhas for further management. There is no history of drug or food allergies. There is nofamily history of similar complaints. There is no history of weight loss. The patient denies any systemic illnesses. There is no current cough, fever, flu, or diarrhea. Radiographic findings revealed a radiolucent lesion with a multilocular impression resembling a well-defined soap bubble; homogeneous radiolucency; extending to involve the left mandibular body to its inferior border cortex. **Discussion:** This case report aims to describe radiographically the appearance of an ameloblastoma lesion on panoramic radiography, manifesting as a radiolucent lesion with a multilocular impression, clearly depicted in this case.

Keywords: Ameloblastoma, multilocular, mandible, panoramic.

P-068

Sinistra Odontogenic Maxillary Sinusitis viewed from a Panoramic radiograph case report: A Case Report

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Introduction: The maxillary sinus, also called the Antrum of Highmore, is a sinus that is often infected. One of the reasons is because this sinus is the largest paranasal sinus and its shape varies in each individual. Nearly 30% of cases of unilateral maxillary sinusitis are caused by dental abnormalities. Maxillary sinusitis (acute or chronic) is defined as symptomatic inflammation of the maxillary sinus, usually caused by virus, bacterial, allergic or fungal rhinitis. **Case Presentation:** A male patient, aged 39 years, came to the ENT Polyclinic RSPTN Unhas with complaints of yellowish, foul-smelling snot coming out of his left nose since two months ago. Complaints are felt continuously and do not improve. Complaints are accompanied by dull pain in the left cheek and a feeling of fullness in the face. Patients also complain of headaches and nasal congestion, especially in the morning. Based on the history, physical examination, supporting examination in the form of panoramic radiology, the diagnosis was chronic sinusitis and odontogenic cause which extended to the ethmoid and frontal area**. Discussion:** Odontogenic sinusitis is one of the important causes of chronic sinusitis. The base of the maxillary sinus is the alveolar process wherethe roots of the maxillary teeth are, so that the maxillary sinus cavity is only separated by thin bone from the tooth roots. Panoramic radiographs are recommended to confirm the diagnosis because they are relatively commonly in various health services, low radiation exposure and affordable prices.

Keywords: Maxillary Sinusitis, Odontogenic Maxillary Sinusitis, Panoramic

P-069

Mucoepidermoid Carcinoma Unveiled: A Radiographic Journey for Diagnosis and Management of Oral Malignancies

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Introduction: Oral cavity malignancy remains a significant health concern worldwide, often necessitating radiographic evaluation for early detection and management. **Case Presentation:** This case report describes a 32-year-old female patient referred to Hasanuddin University Dental Hospital due to palate swelling. Panoramic examination revealed a 1/3 apical root remnant of the first left maxillary molar, accompanied by a well-defined unilocular radiolucent lesion with corticated margins, approximately 11 mm in diameter, pressing against the maxillary sinus floor. The patient underwent CBCT examination with an initial radiodiagnosis of radicular cyst, with differential diagnoses of unilocular ameloblastoma and pleomorphic adenoma. CBCT revealed a soft tissue lesion in the maxillary region extending supero-inferiorly involving the nasal turbinate base, causing destruction of the nasal cavity floor, and pressing against a portion of the maxillary sinus's inferior medial wall, as well as antero-posteriorly causing destruction of the left palatal bone. Additionally, radiopaque spots in the nasal cavity floor were suspected as bone fragments due to lesion pressure. **Discussion:** The CBCT findings suggested a suspected soft tissue tumor affecting the left palate with benign characteristics. Differentials included pleomorphic adenoma of the palate, squamous odontogenic tumor, and sinonasal inverted papilloma. Surgical excision was performed, and histopathological examination confirmed the diagnosis as mucoepidermoid carcinoma. **Conclusions:** While radiographic imaging aids in disease identification, a conclusive diagnosis often requires histopathological confirmation. Thus, it is important to note that radiographic examinations alone may not provide a definitive diagnosis of a disease, but they can contribute valuable information for patient management and further evaluation.

Keywords: CBCT, mucoepidermoid carcinoma, panoramic, radiographic assessment

P-070

Foam Sclerotherapy for the Treatment of Venous Malformation of the Tongue

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Introduction: Venous malformations (VMs) are a subtype of vascular anomalies, constituting approximately two-thirds of all vascular anomalies. Diagnosis of VMs primarily relies on clinical features and imaging studies. Due to the risk of bleeding associated with vascular lesions during biopsy, clinical examination and imaging are crucial for diagnosis. A multidisciplinary treatment approach is employed to manage vascular malformations based on their characteristics. Sclerotherapy is a safe and effective management option, particularly recommended as a first- choice treatments in the head and neck region. **Case Presentation:** We present a case with a large VM of the tongue who was successfully treated with foam sclerotherapy (Polidocanol) without complications. The patient experienced a significant bleeding event after eating candies and sought help in the emergency room. Following hemostasis, she was referred to our Oral and Maxillofacial Surgery Department for further evaluation. Physical examination revealed a sizable vascular lesion on the dorsal surface of tongue. Magnetic resonance imaging and angiography confirmed the lesion as a low-flow venous malformation. Considering the size and location of the lesion, sclerotherapy with foam sclerosant was recommended instead of surgical intervention. The procedure was successfully performed under general anesthesia, resulting in immediate partial shrinkage of the lesion. The patient reported post-operative pain at a Visual Analog Scale score of 2, with no other complications. **Discussion:** This case report highlights the importance of using multiple diagnostic tools to establish a proper diagnosis. Detailed examination combined with the use of new sclerosants has led to a safe and painless treatment without any complications.

Keywords: sclerotherapy, venous malformation, tongue

Funding: None.

P-071

Radiographic Finding of Active Chronic Inflammation Radicular Cysts on Maxilla and Mandible: A Case Report

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Introduction: Odontogenic cysts are generally divided into inflammatory and developmental types according to their etiology. Radicular cyst included in Inflammatory odontogenic cyst. Radicular cyst are common lesions in daily dental practice. Radicular cyst is a subtype of apical lesions, and its prevalence varies between various studies. **Case Presentation:** The aim of this case report is to report the finding of appearance on panoramic and cbct radiography of radicular cyst with active chronic inflammation on maxilla and mandible. A 58 years old male patient came to the Hasanuddin University Dental Hospital with the main complaint of swelling/ enlargement of gingiva maxilla dextra which had been felt since ± 1 month ago. The enlargement with spongy consistency on palpation, painful palpation (-) and did not bleed easily. The patient was referred to the radiology department for cbct radiography. **Discussion:** Panoramic radiographic examination showed a well- defined, oval-shaped radiolucent lesion in the maxilla dextra and in the mandibular sinistra. The panoramic radiograph revealed a odontogenic cyst at regio maxilla dextra suspect residual cyst and ossifying fibroma, odontogenic cyst at regio mandible sinistra suspect radicular cyst. These radiologic findings strongly suggest lessions involving the jawbone. Based on the characteristics and structure of the lesion observed through various radiographic examinations, odontogenic cyst were suspected. Histopathological examination confirmed the diagnosis and the result was radicular cyst with active chronic inflammation.

Keywords: radicular cyst, odontogenic cyst, cbct, panoramic radiography

P-072

A Radiography Image Shows A Dentigerous Cyst in maxilla of A Young Child: Case Report

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Introduction: Dentigerous cysts are prevalent among odontogenic cysts found in the mouth, frequently detected as chance discoveries on dental X-rays or as painless lumps. They originate from leftover enamel epithelium near the top of a tooth that hasn't erupted or is impacted, adhering around the cementoenamel junction. **Case Presentation:** A 7-year-old child patient arrived at the dental Radiology section of Dental hospital accompanied by her parents. With complaints of swelling in the front left cheek area that has been felt for approximately 7 months. Initially, the patient was not aware of the swelling and only noticed it when it had already grown to its current size. There is no history of pain associated with the swelling. Approximately 3 months ago, the patient underwent an incision biopsy surgery at Dental Hospital. Around 1 month ago, the swelling burst and the patient felt salty fluid coming out of their mouth. There is no history of nasal congestion. There is no history of weight loss. There is no history of drug or food allergies. Other systemic illnesses are denied. Currently, the patient is not experiencing fever, flu, cough, or diarrhea. Panoramic radiographic examination showed there is Suspicion of a well-defined lesion with cystic characteristics suggestive of odontogenic cyst, differentials include dentigerous cyst around tooth 23 or periapical inflammatory cyst secondary to dental caries of teeth 63-65. The patient has also been examined with CBCT and CT scans, which results in the diagnosis. **Discussion:** Based on the lesion's form and characteristics identified during panoramic radiography evaluation, dentigerous Cyst was suspected in this case report. dentigerous was also detected during further histological examination.

Keywords: panoramic, cbct, dentigerous cyst,child, caries

Funding: If any, please mentioned here.

P-073

Extraskeletal myxoid chondrosarcoma in the parapharyngeal space: its rarity and diagnostic challenges

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Introduction: Extraskeletal myxoid chondrosarcoma (EMC) is a very rare disease that is a distinct entity from conventional chondrosarcoma. Pathological studies of EMC have often been reported with the goal of untangling its diagnostic difficulties. We report four cases of EMC in the parapharyngeal space that mimic neurogenic tumors, with a focus on imaging characteristics. **Case Presentation:** This report has clinical significance from the standpoints of (1) the locational rarity and (2) the imaging findings mimicking neurogenic tumors. The four patients (M: F = 1:3) complained of several symptoms, including swelling with or without pain, nerve disturbance, and motion limitation. However, these tumors were commonly centered on the parapharyngeal space on computed tomography (CT) and magnetic resonance (MR) images. The imaging characteristics were very similar to those of the neurogenic tumor: First, on CT images, these were presented as well-encapsulated lobulated masses without infiltrating or strongly pushing upon the surrounding bone tissue. On MR images, they were shown as homogeneous low on T1-weighted and high signal intensity on T2-weighted images. These factors are assumed to have been the cause of the difficulties in distinguishing between EMC and neurogenic tumors based on imaging characteristics. **Discussion:** We describe the imaging features of these four EMC cases and benign tumors, including neurogenic tumors, that commonly occur in the parapharyngeal space. The EMCs mimicking neurogenic tumors reported in this study can be helpful for radiologists to consider the possibility of malignancy in similar cases, albeit with a low probability.

Keywords: chondrosarcoma, diagnosis, magnetic resonance imaging, malignancy

Funding: This work was supported by Korea Institute for Advancement of Technology(KIAT) grant funded by the Korea Government(MOTIE) (P0019248).

P-074

Orthopantomogram (OPG) Overview of Odontogenic Keratocyst in the Right Mandible in an Elderly Patient: A Case Report

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Introduction: This case report aims to provide a radiographic overview of odontogenic keratocyst (OKC) in the right mandible of an 80-year-old female. **Case Presentation:** An 80-year-old female presented with a complaint of swelling in the lower right gum area, which she noticed approximatelytwo months ago. Initially, the swelling was the size of a marble but gradually increased in size over time. The patient has had a history of using dentures for about two years; however, she discontinued using them due to discomfort caused by sharp edges. She experienced occasional pain in the area over the past two months, prompting her to seek medical attention at Community Health Center Kasi Kasi. Subsequently, she was referred to RSPTN Unhas for further evaluation and management. MSCT examination revealed lobulated cystic lesions with thinning of the right mandibular bone measuring 3.66 cm x 2.23 cm x 2.35 cm, suggestive of ameloblastoma of the right mandible. Histopathological analysis concluded odontogenic keratocystic. **Discussion:** Diagnosing Odontogenic keratocysts (OKCs) relies on clinical, radiographic, and histopathological findings. Radiographic imaging, such as orthopantomogram (OPG) and multislice computed tomography (MSCT) scan, plays a crucial role in evaluating the extent and characteristics of the tumor.

Keywords: odontogenic keratocyst, orthopantomogram**,** multislice computed tomography

P-075

Identification of Anatomy Variations in Maxillary First Molars with Cone-Beam Computerized Tomography: A Case Report

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Introduction: Location and disinfection of all existing canals in the tooth plays an important role in root canal treatment. While most maxillary first molars have a normal morphology of a single palatal root, we should recognize that variations of a bifurcation canal in a palatal root and even a second palatal root do exist. **Case Presentation:** This paper reports a left maxillary first molar diagnosed with pulp necrosis. Initial treatment was performed but later discovered instrument separation during this visit. Cone- beam computerized tomography was taken for evaluation of the evaluation of the condition. In the CBCT image, an additional palatal root was also noted in the imagery. During the following visits, the second palatal root canal was found, and bypass of the separated instrument in the distal-buccal canal was performed. Canal enlargement and debridement were completed with files, and all four root canals (MB, DB, P1, P2) were obturated by warm-vertical compaction technique with gutta- percha and sealer, followed by temporary restoration of the pulp chamber. Upon 3 month's follow- up, the patient has no symptoms and signs, and radiographic image shows periapical healing in progress. **Discussion:** In this case report, anatomy variations and localization of the canal can be performed with the aid of CBCT. However, we should be aware of these variations by assessing the initial radiographs carefully to detect the anatomical variations of maxillary molars.

Keywords: maxillary first molar, palatal root, CBCT

P-076

Panoramic Image Show Post Dredging Ameloblastoma Cyst: A Case Report

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Introduction: Ameloblastoma is a benign odontogenic tumor that commonly affects the mandible. It presents challenges in diagnosis and management due to its infiltrative nature and high recurrencerates. We present the case of Mr. Darmawan, a 23-year-old male with a history of ameloblastoma plexiform in the right mandible who underwent previous surgical interventions and presented with complaints of enlargement and pain in the lower right jaw. **Case Presentation:** Mr. Darmawan presented with complaints of enlargement and pain in the lower right jaw, persisting for approximately two months. He had previously undergone incisional biopsy and stage I dredging in November and December 2022, respectively, with a diagnosis of ameloblastoma plexiform. Physicalexamination revealed asymmetry of the face with buccal swelling on the right side, measuring approximately 2 x 1.5 x 0.5 cm. There were no palpable or tender lymph nodes. Intraoral examination showed a defect in the buccal vestibule region of tooth 48, with hyperemia present. Preoperative investigations, including OPG X-ray and routine blood tests, were within normal limits. **Discussion:** Radiological imaging plays a pivotal role in the diagnosis, treatment planning, and follow-up of ameloblastoma. Panoramic radiography, such as the OPG X-ray performed in Mr. Darmawan's case, provides valuable insights into the extent and characteristics of the lesion. In the context of ameloblastoma, radiographic features typically include a multilocular radiolucency with well-defined borders, often described as a "soap bubble" or "honeycomb" appearance.

Keywords: ameloblastoma, dredging, panoramic

P-077

The Integral Role of Radiography in Dentistry: Diagnosis and Treatment Planning

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Introduction: Radiography stands as an indispensable tool in contemporary dentistry, serving as a cornerstone for precise diagnosis and strategic treatment planning. This paper delves into the critical significance of radiographic imaging techniques within the dental field, emphasizing their pivotal role in the identification of dental pathologies, evaluation of treatment alternatives, and facilitation of informed decision-making processes. Through a comprehensive examination of various radiographic modalities, including periapical radiography and panoramic radiography, this study elucidates their distinct advantages and applications across diverse clinical contexts. Moreover, the seamless integration of advanced imaging technologies with digital platforms hasushered in a new era of enhanced visualization, manipulation, and storage of radiographic data, revolutionizing dental practice. Additionally, the paper underscores the paramount importance ofimplementing radiation safety protocols and fostering ongoing education and training initiatives among dental professionals to ensure proficient interpretation and utilization of radiographic findings. Ultimately, this research underscores the indispensable role of radiography in dentistry, highlighting its pivotal contribution to precise diagnosis and optimal treatment outcomes. **Case Presentation:** A 62-year-old female presented to the dental clinic with complaints of persistent pain in the upper left posterior region. Clinical examination revealed a deep carious lesion involving tooth #25 (maxillary left second premolar) with the cavity extending to the level of the alveolar bone. Upon cold test, the tooth showed prolong sharp pain indicating irreversible pulpitis. Radiographic examination, including periapical and bitewing radiographs, revealed extensive caries with a radiolucency extending to the pulp chamber. Additionally, the radiographs showed evidence of the distal subgingival cavity was at alveolar bone level.There were two treatment plans proposed: 1. A multidisciplinary treatment approach involving periodontal surgery (crown lengthening), endodontic therapy, and prosthetic restoration. 2. Extraction of tooth#25 and followed by dental implant placement and prosthetic restoration. Patient decided to treat with option 1. **Discussion:** In this case report, the radiographic findings corroborated the clinical diagnosis of severe caries-induced pulptitis. The radiographic findings in this case played a crucial role in confirming the clinical diagnosis and guiding the treatment approach. Radiographs provided valuable information regarding the extent of the carious lesion, periapical involvement, and bone loss, which influenced the treatment planning and prognosis.One of the significant advantages of radiographs was their ability to visualize the extent of caries and its relationship with the pulp chamber. Furthermore, radiographs aided in assessing the extent of caries margin, which influenced the decision-making process regarding the need for periodontal intervention. In this case, the radiographic evidence of bone loss associated with the carious lesion at the bone level indicated thenecessity of crown lengthening to expose an adequate amount of tooth structure for restoration. Radiographs provided critical information regarding the extent of the carious lesion, periapical health, and bone loss, which guided the treatment approach, facilitated interdisciplinary communication, and ultimately contributed to achieving favorable treatment outcomes and preserving natural dentition.

Keywords: radiography, diagnosis, treatment planning
Funding: This research received no specific grant from any funding agency in the public or commercial.

P-078

Feature Image Panoramic Radiography in Ameloblastoma in 23 Years Old Male: A Case Report

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Introduction: Ameloblastoma is a benign oral cavity tumor originating from epithelium odontogenic that is often found. This tumor grows slowly but is aggressive, locally invasive, and potentially high for recurrence, malignant transformation, and metastasis. **Case Presentation:** In this case, a 23-year- old male patient reported complaints of gingival enlargement in the lower anterior dextra four months ago. At first, the tumor was as small as a corn kernel size, which transformed and got bigger and metastasis to the back of the lower jaw. Four lower jaw front teeth mobile. The enlargement easily bleeds if it is touched but is painless. Two months ago, the dentist removed the mobile front teeth and was given antibiotics and pain relievers. After the tooth was extracted, the patient felt the enlargement getting more extensive and was re-examined. There is no tumors or cancer in family history. No weight loss. No history of drug or food allergies. Systemic disease is unknown. The patient does not have coughs, colds, fever, and diarrhea. Panoramic radiographic image showed there is suspicion of radio intermediate image with a peripheral pattern of scalloped bone, showing that osseointegration is starting to form from the mandibular symphysis region to the right mandibular body. **Discussion:** In this case, panoramic radiography shows the characteristics and structure of the lesion, which is suspected to be ameloblastoma. Further examination is needed to determine the appropriate treatment plan.

Keywords: ameloblastoma, panoramic, mandible, male

Funding: -

P-079

Treatment Evaluation of Radicular Cyst and Fractal Dimension Analysis on Panoramic Radiograph: A Case Report

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Introduction: Radicular cyst is defined as a common inflammatory odontogenic cyst, which arises from epithelial rest of Malassez due to pulpal necrosis. Evaluation of post enucleation of radicular cyst could be assessed by using panoramic radiograph and fractal dimension (FD) analysis of trabecular bone. This study aimed to describe a case of radicular cyst and evaluation of treatment progress by using FD analysis on panoramic radiograph. **Case Presentation:** A 27 years old male patient came with a complaint of slowly enlarged swelling on the left mandible for a year. No pain in the swelling area. Panoramic radiographs revealed a well-defined unilocular radiolucency around the apex of 35, 36, 37 with corticated border. Radicular cyst was confirmed based on needle aspiration test, obtaining a yellow liquid. Radicular cyst treated surgically by enucleation. A serial panoramic radiograph using to evaluate treatment, six months after enucleation radiograph showing reduction of radiolucency and increasing of FD in lesion, it means that there was an osseous healing process. **Discussion:** Radiographically radicular cyst post-surgery ossification showed an increasing radiopacity of the lesion. Our present case showed that there was an increasing radiopacity on panoramic radiograph until six months post-surgery. FD measurement described bone architecture change and bone density, and the big FD value describe complex bone architecture with dense bone trabecular and a few porous. **Conclusions:** Assessment of panoramic radiograph and FD analysis of trabecular bone is a reliable imaging method for the treatment evaluation of radicular cyst and determination of ossification as well.

Keywords: Radicular cyst, enucleation, treatment evaluation, panoramic, fractal dimension

P-080

The role of radiological tools in Jael's syndrome cases management, Cases report and literature review

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Abstract: Jael's Syndrome (facial Impalement), quite rare in Taiwan, is potentially life-threatening. This kind of trauma give challenge to the doctors who managed the cases, due to it may possible associate with airways, vascular, ocular, ductal, neurological problems. We present two cases of facial penetration wounds admitted to Taipei Tzu Chi hospital emergency room with retained foreign bodies on their face. The first case was accidentally penetrated by a metal stick on patient's mid-face. The wound extended from right maxillary bone into right maxillary sinus, and then into skull base of sphenoid bone. The second case was injured by toy gunshot on right temporal area with retained bullet. Fortunately, there were no initial sequelaes from such an extensive injury on these two patients and no further complications at this moment after multidiscipline care. Radiological tools play an important role in Jael's syndrome case management. Choice of radiological diagnosis methods might be crucial due to inappropriate radiological assessment may increase the possibility of false-negative findings. Accurate selection and use of different radiological tools according to their characteristics will provide the best outcomes in the management of Jael's syndrome cases.

Keywords: Jael's Syndrome, Facial Impalement
Funding: If any, please mentioned here.

P-081

Recurrent Follicular Ameloblastoma of The Maxilla: A Case Report

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Introduction: Ameloblastoma, a primary bone tumor, is a benign odontogenic tumor characterized by slow growth but aggressive local behavior, often recurring. It predominantly affects the posterior mandible, with only around 15% of cases occurring in the upper jaw. Despite its benign nature, it can lead to functional impairments. Metastatic ameloblastoma, a benign variant with similar histological features, may manifest many years after initial diagnosis. Panoramic radiography is typically utilized to aid in confirming the diagnosis in such cases. **Case Presentation:** A 52-year-old female patient complained of a lump in the right upper jaw three months ago. Four years ago, a small lump appeared, and it became big. The patient has a history of surgery to remove a lump and extraction of a right maxillary tooth in 2021, with HPA results, namely ameloblastoma. History of tenderness in the area of the lump. There is a salty liquid coming out of the mouth. Panoramic and CT scan results showed A unilocular homogeneous radiolucent lesion, tending to be ovoid with well-defined edges a.r edentulous posterior right alveolar ridge extending superiorly towards the base of the right maxillary sinus and inferiorly towards the top of the alveolar ridge. **Discussion:** Ameloblastoma with a high tendency for recurrence is associated with conservative management. It may recur when the initial surgical procedure inadequately removes the entire tumor. In this case, pathological examination, panoramic, and CT scans referred to recurrent ameloblastoma.

Keywords: ameloblastoma, follicular, maxillary, panoramic radiography.

Finding: -

P-082

CBCT Finding of Osteolytic Lesion Associated with Unerupted Anterior Maxilla Permanent Tooth in a Child

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Introduction: The frequency of dentigerous cysts in children is reported to be low in dental literature. Treatment of dentigerous cysts is usually carried out using the enucleation method or marsupialization method. Clinically, dentigerous cysts typically do not cause symptoms and are sometimes discovered incidentally during radiographic examination. A dentigerous cyst, also known as a follicular cyst, is one of the developmental cysts formed in the crown portion of unerupted teeth. **Case Presentation:** An 8-year-old patient accompanied by her parents came to RSGMP Unhas complaining of a lump on the upper right jaw gum, but it has not been painful for approximately three months. CBCT examination revealed findings of an osteolytic lesion in the pericoronal area of tooth germ 11 with persistent periapical tooth 51 and 52, with a differential diagnosis of dentigerous cyst of tooth germ 11 with an eruption cyst that has extended into the bone and obstructed the eruption oftooth 11, radicular cyst with persistent tooth 51 or 52, delayed eruption of teeth 11, 12, 21, 22. The patient was then referred to the Hospital of Hasanuddin University for further management. There isno history of drug or food allergies. Other systemic illnesses are denied. Currently, the patient is not experiencing flu, cough, fever, or diarrhea. **Discussion:** Clinically, dentigerous cysts are generally asymptomatic, grow slowly, and involve unerupted teeth. Based on the CBCT examination results, it can provide information on the findings of lesions suspected to be dentigerous cysts in this case report.

Keywords: CBCT, osteolytic, tooth, child

Funding: -

P-083

Evaluation of Unilocular Ameloblastoma Management with Radiographic Approach: A Case Report

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Introduction: Ameloblastoma is a benign tumor of epithelial origin with mature, fibrous stroma but without odontogenic ectomesenchyme.1 It occurs in the upper and lower jaws. About 80% of ameloblastomas occur in the mandible, and the remaining 20% are in the maxilla**.**The purpose of this case report is to compare panoramic radiographic findings before and after surgical intervention in an adolescent patient with unilocular ameloblastoma in the left mandible. **Case Presentation:** A 20-year-old male patient complained of swelling in the lower left cheek that began to enlarge about oneyear ago. Upon arrival at the hospital, a panoramic examination revealed a homogenous radiolucent image with radiopaque margins in the irregularly shaped left mandibular body with internal septa extending involving the inferior mandible. The lesion caused resorption of the roots of teeth 35, 36, 37 and destruction of the posterior part of the left mandibular body, while the inferior border of the mandibular ramus remained intact. CT scan and histopathological results supported the suspicion ofameloblastoma. The patient was referred to Hasanuddin University Hospital for surgical intervention. **Discussion:** In this case, after two months, there were fragmented radiopaque images surrounded by radiolucent areas, extension into the left mandibular ramus, and bone healing has not returned to normal. Bone healing returns to normal after more than three months. Radiological findings can provide an assessment of bone healing.

Keywords: ameloblastoma, panoramic radiography, surgery

Funding: -

P-084

A Unique Complex Odontoma in the Maxillary Sinus with the Impacted Caninus: case report

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Introduction: Odontomas are odontogenic benign tumors composed of dental tissue. In rare cases, odontomas are associated with primary teeth, relatively rare in the anterior maxilla and generally asymptomatic. Complex odontomas are frequently located in the premolar and molar region of both jaws, but in this case it occurred in erupted tooth 63 and unerupted tooth 23. **Case Presentation:** A 24-year-old female patient presented with complaints of protrusion on the palate and left cheek. The patient has a history of intermittent pain in the area since ± 1 year ago. Intra oral examination, enlargement in the superior vestibulum area sinistra ar teeth 22-25 with palpation pain (+), hyperemic(-), soft consistency, the same color as the surrounding tissue, with a size of 2 x 1 x 0.8 cm, unerupted tooth 23. The Cone Beam Computed Tomography (CBCT) examination, multislicing view - sagittal view focused on the lesion of the sinistra maxilla showed an average lesion diameter (26.6 x 20.1 mm), the lesion appeared to be pushing tooth 23 superiorly approaching the lateral wall of the sinistra maxillary sinus, there was also visible resorption at the apical root of tooth 63. **Discussion:** Cone Beam Computed Tomography (CBCT) is the best technique of choice that can be considered in determining odontoma lesion boundaries, expansion, cortical bone thinning and perforation.

Keywords: odontoma, complex odontoma, CBCT

Funding: -

P-085

Lipoma of the Oral Cavity: A Case Report

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Introduction: Lipomas are a common soft tissue tumor. While lipomas most commonly occur in the subcutaneous tissue of the body, they can also develop in the oral cavity. Oral cavity lipomas are relatively rare compared to lipomas found in other parts of the body. In the oral cavity, they present as a soft, painless, slow-growing mass. **Case Presentation:** The case report presents a 39-year-old male who first came to our emergency room for the painful swelling of right cheek for 2 days. Physical examination showed swelling with tenderness and fluctuation of the right lower vestibule. Complete blood count and differential blood count revealed white blood cell elevation. Under the impression of cellulitis of the right lower buccal vestibule, the intraoral incision and drainage was done and medication was given for pain and infection control. The OPD follow up was arranged and the swelling was subsided but there was still a mass of right buccal mucosa about 5*3 cm2 in size with soft consistency. Incisional biopsy was done and showed ulceration of right buccal mucosa. Computed tomography (CT) with contrast revealed a fat-predominant lesion at right lower buccal vestibule space, suspected a lipoma. Surgical intervention of tumor total excision was undertaken general anesthesia smoothly. Final diagnosis was confirmed as lipoma of right buccal mucosa with the pathological report, which was corresponding to the finding of pre-operative CT examination. **Discussion:** Lipoma was a relatively uncommon diagnosis in the oral cavity and most are asymptomatic. In this case report, a patient with right buccal mucosa with secondary infection was presented. Diagnosis was established by pathological and radiological examination.

Keywords: Lipoma, Oral cavity

P-086

Pathognomonic imaging features of malignant neoplasm in Young Patient: A Case Report

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Introduction: Malignant jaw lesions in children, while uncommon in clinical practice, can cause functional impairment, cosmetic harm, and even death. Some of the malignant lesions can provide radiographic features that are specific enough to lead to a particular diagnosis. **Case Presentation:** A 12-year-old boy was referred for a panoramic radiography due to complaints of facial swelling, especially on the left side, and restricted mouth opening with pain. Extraorally, facial asymmetry appears due to enlargement of the left side of the face. Intraorally, the left-side buccal obliteration was seen with an ulcer on the posterior surface. The panoramic radiograph revealed ill- defined multifocal osteolytic lesions in the posterior mandibular region of the periapical teeth of 32-37, along with Garrington's sign up to the papilla of 38, which destroyed the crypt cortex and displaced the developing tooth in an occlusal direction. This finding was confirmed on CBCT examination with an expanding osteolytic lesion covering the entire mandible and maxilla, and sinusitis was found in the right maxillary sinus. Considering the clinical condition and radiographic findings, the patient was referred to the surgical oncology department for further observation. Through a series of examinations, the patient was diagnosed with a malignant tumor with a differential diagnosis of Ewing's Sarcoma and rhabdomyosarcoma. Unfortunately, before further treatment, the patient died. **Discussion:** When analyzing the imaging characteristics of the child's malignant lesion, focus on specific signs, such as the Garrington sign or afflicted tooth displacement to the occlusal surface, as pathognomonic features to directthe main suspect.

Keywords: ewing’s sarcoma, rhabdomyosarcoma, malignant neoplasm, young patient

P-087

A Case Report of Surgical Retreatment on Refractory Apical Periodontitis in an Immature Root

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Introduction: The aim of this report was to reexamine current treatment protocol for refractory apical periodontitis of immature roots. **Case Presentation:** A 15 year-old male came for a persistsinus tract on tooth 11 buccal gingiva. History showed that tooth 11had been avulsed and was replanted without follow-up when he was 8 years old. The sinus tract persist after endodontic treatment by family dentist due to painful swelling of maxillary anterior gingiva recently. After clinical examinations, the diagnosis of previously treated with chronic apical abscess was made on maxillary right central and lateral incisors. Radiography revealed immature root of tooth 11, radiopaque intracanal fillings in tooth 11, 12 with material extrusion and a 10 mm x 12 mm periapical radiolucency. Symptoms improved after 3 weeks of calcium hydroxide and followed by 6 weeks of triple antibiotics dressing, however, the subsequent regenerative endodontic procedure was failed. So, treatment was shifted to apexification, unfortunately, symptoms exacerbated at 15-month follow-up. Tooth 12 buccal vestibule swelling was noted and diagnosis of acute apical abscess was made. Onlytooth 12 underwent apicoectomy with MTA retrograde filling and guided tissue regeneration, and dentin-like structure formation found at tooth 11 apex. A foreign body was also found during surgery and histopathological reports showed extraradicular infection. After 9-month and 3-year follow-up, tooth 11 and tooth 12 remained complete healed. **Discussion:** This case reminded us the importance of proper management after dental trauma and refractory apical periodontitis in immature roots may require treatment approaches distinct from the current protocol.

Keywords: immature root formation, refractory apical periodontitis, regenerative endodonticprocedures, apexification, apical surgery, extraradicular infection

Funding: nil

P-088

A Long-term Follow-up of The Outcome After Conservative Surgical Treatment of Ameloblastoma: A Case Report

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Introduction: Ameloblastoma is a rare, benign epithelial odontogenic tumor, About 1% of all benign lesions in the oral cavity. However, it is also one of the most common clinically troublesome odontogenic tumors because of its high recurrence rate. There is no gender predilection, and racial predilection is most controversial. About 70% of this variant of the ameloblastoma occurs in the molar/ramus region, 85% in the in the mandible and 15% in the maxilla, especially in posterior area. One of major treatments for ameloblastoma is marginal resection of the affected jaw bone, with free margin of 1 to 2 centimeters. Nevertheless, it would cause patient's facial defects and self- confidence. Especially, those young vistims. **Case Presentation:** In order to preserve the patient's escomtic appearance and oral function, we chose conservative surgical treatment for those ameloblastoma patients. It is enucleation of the lesion plus trimming the surrounding affected bony wall by 1-2 mm. This method can significantly reduce the impact on patient's appearance and oral function. However, due to high recurrent rate, long-term follow-up is required after treatment. **Discussion:** In this article, we demonstrated the outcome of four cases of ameloblastoma which happened in young adult, who received the conservative surgical treatment. The longest follow-up is up to 20 years. Either MRI or dental cone-beam CT scan are used to evaluate the undermining tumor recurrence.

Keywords: Ameloblastoma, conservative, long-term follow-up

P-089

Perforation Management in Mandibular Molar: A Case Report

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Introduction: Perforation management in root canal is always a difficult issue in endodontic treatment. Due to various factors, such as: the time from perforation happened to repair, the size of perforation and location in root canal level, those factors can affect the prognosis of the tooth with perforation. **Case Presentation:** This paper reports a mandibular second molar with perforation at mesial root. Radiolucency lesion was found around the middle third of mesial root. Previously root canal filling was also noted. Conventional nonsurgical endodontic treatment was performed for root canal debridement. Then distal canal was filled with gutta percha, and mesial canal with perforation was filled with MTA. After treatment, the patient's symptoms improved significantly. In 13 months follow-up, the lesion healed with intact periodontal ligament and lamina dura. **Discussion:** In this case report, non-surgical root canal therapy combined with MTA endodontic repair successfully
treated perforation.

Keywords: Perforation, MTA, Prognosis, Repair

P-090

Multiple enamel pearls in maxillary molars -A case report

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Introduction: Enamel pearls is one of ectopic enamel which is located on the external surface of the root apical to and separated from the cemento-enamel junction(CEJ) with a exophytic globe appearance. It is easily mistaken for dental calculus in images, and may also be a hidden cause of periodontal disease. The prevalence of enamel pearls is highest in Asian, varies according to the population studied from 0.23%-4.82%, but multiple enamel pearls are not common. **Case Presentation:** Cone beam computed tomography (CBCT) was taken for a 42-year-old healthy female who required dental implantation after the extraction of her upper left second premolar. She has had orthodontic treatment, no any tooth discomfort was complained. The images showed that there were 2 small exophytic spherical protrusions at the mesial and distal root bifurcation areas of upper right second molar which resulted her periodontal bone loss. At the distal root bifurcation of upper left second molar, there was also a enamel pearl found below CEJ with normal periodontal bone level. **Discussion:** Tracing back her panorex and periapical radiographs taken 2 years ago, it may be that the patient's periodontal bone loss was not much at that time and the enamel pearls had not yet caused periodontal damage, so that it ignored. CBCT can resolve this dilemma easily and provide periodontal disease prevention in advance if possible.

Keywords: Enamel pearls, dental anomaly, CBCT