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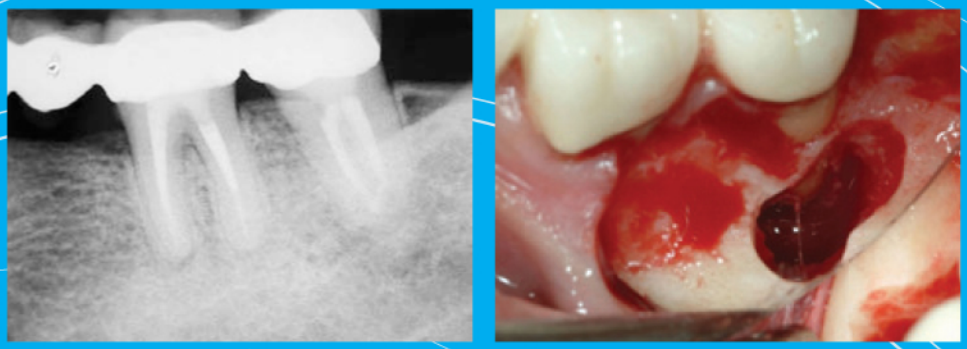

Periapical surgery of the mandibular 2nd molar

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Journal of the Korean Academy of Endodontics

Volume 13, No. 1 March 2012

Program & Abstracts

2012 Spring Scientific Meeting (the 41th) of Korean Academy of Endodontics
The 10th JEA-KAE Joint Meeting

SETEC, Seoul, Korea
March 24 (Saturday) - 25 (Sunday), 2012

The Korean Academy of Endodontics

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President's Welcome

As the President of Korean Academy of Endodontics (KAE), I would like to welcome our members, JEA members, and fellow dentists to the 41th Annual meeting of KAE and the 10th JEA-KAE Joint Meeting held in Seoul, the capital of Korea.

This meeting is especially meaningful as it is the first meeting held after the recent official ratification of our academy as we celebrate this accomplishment.

The scientific program includes various up-to-date topics in clinical endodontics and endodontic research.

Current issues including the use of microscopes, reciprocating files, and CAD/CAM technology will be reviewed. Clinical issues such as regenerative endodontics, digital and microscopic dentistry, and prognosis of endodontic will also be discussed. In addition, do not miss the invited and special lectures by Dr. Yasuhisa Tsujimoto of Japan, Prof. Euiseong Kim of Korea, Prof. David Sonntag of Germany, Prof. Se-Hee Park of Korea, Dr. Asgeir Sigurdsson of the U.S, and Prof. Seok-Woo Chang of Korea. Poster presentations of microscopic endodontic cases are also in the program.

To our Japanese colleagues I would once again like to extend our warmest welcome and hospitality, and we will do our best to make your stay in Korea enjoyable.

I would also like to thank my fellow committee members who have shown selfless dedication to our academy and made this meeting possible.

Last but not least, we appreciate the continual support of Dentsply Korea, Shinhung Co., Meta Biomed, B& L Biotech, and other booth contributors.

Let us all enjoy the two days full of endodontic enrichment.

Tae-Seok Oh

President of the Korean Academy of Endodontics

Schedule of the Events

2012 Spring Scientific Meeting (the 41th) of Korean Academy of Endodontics
The 10th JEA-KAE Joint Meeting

March 24 (Sat) : March 25 (Sun)
SETEC, Seoul, Korea

March 24 (Sat)

13:00 : 13:10	Opening Ceremony
13:00 : 17:00	Poster Session
13:30 : 14:15	Current Issue I
	Clinical application of microscope (Dr. Sang-Jin Lee)
14:25 : 15:15	Current Issue II
	Clinical application of reciprocating file (Dr. Dong-Ryul Shin)
15:10 : 15:40	Poster & Booth, Microscope and instrumentation Hands-on
15:40 : 15:50	Ceremony for the 10th Anniversary of JEA-KAE Joint meeting (Prof. Hideaki Suda)
15:50 : 16:40	Invited Lecture I
	Microscopic Endodontic Therapy and Education in Japan (Prof. Yasuhisa Tsujimoto)
16:50 : 17:40	Current Issue III
	CAD/CAM restoration in the future (Dr. Jung-Bon Moon)
17:50 :	Welcome reception (JEA-KAE, poster awarding for JEA)

March 25 (Sun)

09:00 : 12:00	Poster session
09:10 : 10:25	Clinical Issue I
	The coming era of regenerative endodontics (Dr. Shin-Young Kim)
	Clinical Issue II
	Digital Dentistry and Microscopic Endodontics (Dr. Dong-Kyun Lee)
	Clinical Issue III
	Prognostic factors of endodontic surgery with microscope (Dr. Minju Song)
10:25 : 10:50	Booth, Microscope and instrumentation Hands-on
10:50 : 10:35	Invited Lecture II
	Outcomes of Endodontic Microsurgery (Prof. Euiseong Kim)

10:40 : 12:40	Special Lecture I
	Reciprocation with NiTi Instruments (Prof. David Sonntag)
12:40 : 13:55	Lunch
13:55 : 14:40	Invited Lecture III
	Glide path in modern root canal treatment (Prof. Se-Hee Park)
14:40 : 14:50	Coffee break / Booth
14:50 : 15:50	Special Lecture II
	WaveOne - The final Wave (Dr. Asgeir Sigurdsson)
15:50 : 16:20	Booth, Microscope and instrumentation Hands-on
16:20 : 17:05	Invited Lecture IV
	Endodontic bioactive cements for multi-purpose (Prof. Seok-Woo Chang)
17:05 : 17:15	Closing, Poster awarding for Korean

Register's Note

The registration area locates in front of the main hall and will be open during the following hours; Saturday March 24th 13:00 ~ 16:00 and Sunday March 25th 09:00 ~ 16:00.

If you are a pre-register, your name badge and Program and Abstracts of the 41th Spring Scientific Meeting of KAE will be also given at the same place. Please wear your badge at all times during the meeting.

P1

The use of microscope in root canal treatment of perforated tooth: A case report

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I. Introduction

Perforation occurs no matter how carefully the tooth is accessed for root canal treatment. Pulpal floor perforations adversely affect the prognosis of teeth. Conventional equipments including operating microscope and ultrasonic devices are useful for the repair of iatrogenic pulpal floor perforations. This case report shows successful treatment of perforated tooth using mineral trioxide aggregate (MTA) and microscope.

II. Case Presentation / Materials and Methods

1. Sex/age: M/15
2. Chief Complaint: Referred from Local Clinic for repair of pulpal floor perforations on #46
3. Past Dental History: Root canal treatment at local clinic (4 days ago)
4. Present Illness: The MB and ML canal was not prepared and two pulpal floor perforations near the MB and ML canal orifices.
5. Diagnosis: Incomplete root canal treatment with pulpal floor perforations on #46
6. Treatment plan: Repair of pulpal floor perforations and root canal treatment on #46

III. Conclusions

Successful treatment of perforated tooth depends on the identification and sealing the damaged site. The microscope is essential for the exploration of root canals and the careful handling of sealing materials in order not to extrude. In this case, pulpal floor perforated tooth was successfully treated using MTA and microscope.

P2

The use of the surgical microscope to locate root canals

So-Ra Park, Se-Hee Park, Kyung-Mo Cho , Jin-Woo Kim*

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I. Introduction

With illumination and adjustable magnification, the surgical microscope has become a most useful adjunct to both surgical and nonsurgical endodontics. Locating canals is perhaps the most obvious use of the surgical microscope. Calcified canal, missed canal, canals blocks by restorative materials are all addressed easily by the skillful use of surgical Microscope. This case report presents the use of the surgical microscope to locate root canals

II. Case Presentation

Case1>

1. Sex/age: M/36
2. Chief Complaint: Referral from private dental clinic due to calcified canal on #46
3. Past Dental History: Root canal treatment on #46 twenty years previously
4. Present Illness: per (+) pal (+) mob (-) crown fractured state
5. Impression: Acute periapical periodontitis, Pulpal calcification on #46
6. Tx Plan: Endodontic treatment on #46

Case2>

1. Sex/age: M/56
2. Chief Complaint: referral from private dental clinic for distal canal detection on #46
3. Past Dental History: Root canal treatment on #46 six months previously
4. Present Illness: per (+) mob (-) missed distal canal
5. Impression: Acute periapical periodontitis, previously treated on #46
6. Tx Plan: Endodontic retreatment on #46

III. Conclusions

The surgical microscope enhances the potential to carry out effective retreatment procedures by aiding in the detection of untreated root canal by removing the “guess work” in endodontics.

P3

Treatment option for extruded intracanal medicament during the root canal treatment

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Chonnam National University, Gwangju, Korea

I. Introduction

In endodontic treatment calcium hydroxide has been applied as an inter-appointment intracanal medicament, and has become a common therapeutic measure for the elimination of remaining bacteria after chemomechanical preparation and the promotion of healing of apical periodontitis. However, several studies state that any extrusion of intracanal medicaments in the periradicular tissues or anatomic regions during root canal treatment may cause adverse reactions. In this case report, we report the treatment option for extruded intracanal medicament during the root canal treatment.

II. Case Presentation

1. Sex/age: F/21
2. Chief Complaint: Toothache on #36
3. Past Dental History: Previous Root canal treatment on #36 three months ago
4. Present Illness: fistula (-) / per (+) pal (-) mob (2) / Temporary filling state
5. Impression: Chronic apical periodontitis on #36
6. Tx Plan: Root canal treatment and Intentional replantation on #36

III. Conclusions

The calcium hydroxide should be applied with caution due to the possible extrusion of the material in teeth with an open apices, and in case of adverse reactions, surgical treatment can be an alternative.

P4

Unusual ectopic location of apical foramen in maxillary central incisor

Ga-Yeon Jang, Su-Jung Park, Kyung-San Min*

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I. Introduction

Among all teeth in a permanent dentition, maxillary central incisor has the most standard anatomical morphology, with the smallest percentage of variation. Generally, it has a straight main canal and the apical foramen is usually located within 1 mm from the root apex. In some cases, however, dental clinicians encounter unusual anatomical morphologies of this tooth in terms of apical foramen location This case report describes the unusual ectopic location of the apical foramen in a maxillary central incisor, more than 3 mm distant from the root apex.

II. Case Presentation

1. Sex/age: F/36
2. Chief Complaint : sinus tract formation on #11
3. Past Dental history : endodontic treatment initiated on #11 at private dental clinic 1 month previously
4. Present Illness : per (-), mob (-), sinus tract (+), discoloration on #11
5. Impression : chronic suppurative periapical periodontitis on #11
6. Treatment plan : nonsurgical endodontic treatment on #11

III. Conclusions

A thorough knowledge of root anatomy generally and of the apex region particularly, is crucial for a long term successful endodontic treatment. Generally, the apical foramen does not make its exit at the root apex itself, but rather slightly shorter. Many literatures describe the situation of an apical foramen exiting 0.5 - 3 mm shorter than the root apex. However, it is very rare for the apical foramen ending to have a larger distance than 3mm from the root apex. This case report describes a unique apical foramen location in a maxillary central incisor. It also highlights the possible influence of Hertwig's epithelial root sheath (HERS)' growth rate in the anatomical morphology of the root canal and location of apical foramen.

P5

Mandibular first molar with six separated canals

Hee-joon Kwon, Il-Young Jung*
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I. Introduction

Generally, three or four canals are observed in mandibular 1st molar. However, the anatomy of root canal is various and sometimes six or seven canals are located in mandibular 1st molar. Using microscope is essential to find out hidden canals and to raise success rate of root canal treatment. This case is a good example of root canal treatment on mandibular 1st molar using microscope.

II. Case Presentation

A 29-year-old male was referred from local clinic for searching canals on mandibular right 1st molar. He didn't appealed pain and separated file in second mesiolingual canal was observed on periapical view. So I diagnosed the tooth as previously initiated tooth with normal apex. At first visit, I found five canals including second distobuccal canal. At second visit, I found another canal separated form mesiolingual canal. Totally, six separated canals were located in this tooth. A fractured file could not be removed but bypassed. At sixth visit, canal filling was done.

III. Conclusions

Complete finding of root canals is the key factor of successful endodontic treatment. It can be achieved by using microscope during endodontic treatment. Therefore, microscope is not an option, but an essential instrument for root canal treatment.

P6

Endodontic treatment of C-shaped canals in maxillary molars

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I. Introduction

According to many endodontic literatures, a C-shaped root canal is most frequently seen in the mandibular second molar. The occurrence of C-shapes in maxillary molars, however, has only been described in a limited number of case reports. This solitary report suggests that C - shaped configuration is rare but obviously exist in maxillary molars.

II. Case Presentation

<Case 1>

1.Sex/age: F/46

2. Chief Complaint (C.C): dull pain on #27

3. Past Dental History (PDH): intermittent dull pain on #27 when biting, started 1 year ago

4. Present Illness (P.I): per(+) pal(+) mob (1) cold(-) EPT(∞/64) PD(533/833)

5. Impression: Acute apical abscess / endo-perio lesion(true combined lesion)

6. Tx Plan: Root canal treatment on #27

<Case 2>

1.Sex/age: F/15

2. Chief Complaint (C.C): referral from Dep. Orthodontics due to multiple caries.

3. Past Dental History (PDH): intermittent sharp pain on #16

4. Present Illness (P.I): per(-) pal(-) mob (0) PD(WNL) / occ. C2 caries

5. Impression: reversible pulpitis due to occ. caries

6. Tx Plan: caries tx.(RCT, if needed)

III. Conclusions

The preoperative awareness of potential anatomic variations is essential for the success of the endodontic treatment.

P7

Use of an intracanal fiber post to reinforce a horizontally fractured root

Jae Hwan Hyun, Il-Seok Lee, Jung Hong Ha, Myoung Uk Jin, Young Kyung Kim, Sung Kyo Kim*
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I. Introduction

Horizontal root fractures are relatively uncommon among dental traumas, comprising 0.5 to 0.7% of the injuries affecting the permanent dentition. In recent clinical studies, fractures of the middle third of the root were the most frequent, while fractures of the apical and cervical thirds occurred with equal frequency. If the fracture line is situated near the cervical third of the root, the coronal fragment will become quite mobile. To stabilizing the coronal fragment, intraradicular splinting with a fiber post can be considered. These case reports present the use of intracanal fiber post to reinforce maxillary incisors with a horizontal root fracture.

II. Case Presentation

Case 1>

1. Sex/age: M/21
2. Chief Complaint: root fracture due to blow out
3. Past Dental History: N-S
4. Present Illness: #12-21 arch-wire splint state
   tooth discoloration on #11
   #11 per (+) pal (+) mob (2) cold (-) EPT (∞/64)
5. Impression: horizontal root fracture on #11
   necrosis of pulp on #11
6. Tx. Plan: root canal treatment on #11

Case 2>

1. Sex/age: M/23
2. Chief Complaint: tooth fracture due to slip down
3. Past Dental History: N-S
4. Present Illness: #21 per (+) pal (+) mob (1) cold (+) EPT (32/64)
   crown fracture with pulp exposure
5. Impression: crown fracture with pulp exposure on #21
6. Tx. Plan: root canal treatment on #21

III. Conclusions

Many techniques have been proposed for the treatment of horizontal root fractures of necrotic pulp. Intracanal fiber post was used to reinforce maxillary incisors with a horizontal root fracture in the present cases. Intracanal fiber post may be considered as one of the treatment methods. Correct diagnosis, clinical management and follow-up are essential for the success of treatment.

P8

Two palatal roots of maxillary second molar : A Case report

Min suh Kang, Ho keel Hwang*
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I. Introduction

Endodontic treatment aims at eliminating bacteria from the entire root canal system and preventing reinfection. However, because of the morphological abnormalities of human teeth, this may not always be possible. The common root canal anatomy of maxillary second molars has been described as 3 roots with 3 canals. Most earlier studies have reported 1 palatal root with 1 canal. But, there have been clinical case reports that demonstrate maxillary second molars with 2 palatal roots.

The purpose of this case report is to describe the unusual root canal anatomy of maxillary molars with 2 separated palatal roots and the endodontic treatment procedure for these teeth.

II. Case Presentation

Case 1>

1. Sex/age: F/57
2. Chief Complaint: Refered from LDC for endo tx. (Calcified canal of #27)
3. Past Dental History: Endo tx.(L/C)
4. Present Illness: per (-) hot (-)cold (-)bite(-)mob(0) /PD(5mm on distal)
5. Impression: Necrosis of the pulp(calcified canal)
6. Tx Plan: Root canal treatment on #27

Case 2>

1.Sex/age: M/43
2. Chief Complaint: Pain with biting
3. Past Dental History: Endo tx. and Crown restoration of #27
4. Present Illness: per (+) hot(-)cold(-)bite(+) mob (0)/PD(12mm on distal)
5. Impression: Periradicular periodontitis(Necrosis of the pulp)
6. Tx Plan: Retreatment endodontics on #36

Case 3>

1.Sex/age: F/49
2. Chief Complaint: Dental caries on #27
3. Past Dental History: Am. restoration of #27
4. Present Illness: per (-) hot(-)cold(-)bite(-) mob (0)
5. Impression: Interproximal caries on #27
6. Tx Plan: Caries control (Restoration or Endo Tx.)

Case 4>

1.Sex/age: F/46

2. Chief Complaint: Spontaneous pain of #27 for several days

3. Past Dental History: Crown restoration of #27 (2 years ago)

4. Present Illness: mob(-), per(+), hot(-),cold(-),bite(+), PD (5mm on distal)

5. Impression: Irreversible pulpitis with symptomatic apical periodontitis

III. Conclusions

Understanding of anatomical variation is necessary for successful root canal treatment. Radiographic examination, wide access cavity, microscope, experience of operator are also necessary for adequate evaluation of root canal anatomy and successful treatment.

P9

Multidisciplinary approach to the treatment of a complicated crown-root fracture in permanent teeth

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I. Introduction

Epidemiological statistics revealed that crown-root fractures represent 5% of dental injuries. But the treatment of complicated crown-root fractures of permanent teeth is often compromised by fractures that are well below the gingival margin and/or bone. Treatment options for such cases include orthodontic or surgical extrusion, gingivectomy and osteotomy/osteoplasty, intentional replantation and extraction. This clinical report describes the multidisciplinary management of a complicated crown root fracture of permanent anterior teeth.

II. Case Presentation

<Case 1>

1. Sex/age: F/16
2. Chief Complaint: My anterior tooth is broken last night.
3. Past Dental History: Pulp extirpation state on #11 (E.R)
4. Present Illness: Crown fracture on # 11 with pulpal involvement, and P/R(++), Mo(-)
5. Impression: Crown-root fracture on #11 with pulpal involvement
6. Tx Plan: Intentional Replantation on #11

Case 2>

1. Sex/age: M/16
2. Chief Complaint: My anterior tooth is broken two days ago.
3. Past Dental History: N/S
4. Present Illness: Crown fracture on # 22 with pulpal involvement, and P/R(+), Mo(+)
5. Impression: Crown-root fracture on #22 with pulpal involvement
6. Tx Plan: Orthodontic extrusion on #22

III. Conclusions

The key factors in a successful functional and esthetic rehabilitation of complicated crown-root fracture are multidisciplinary approached, which involves surgeries, endodontics, orthodontics, periodontics, and prosthodontics.

P10

Management of immature permanent teeth with periapical disease

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I. Introduction

An immature tooth with pulpal necrosis and apical periodontitis presents a unique challenge to the endodontist. Endodontic treatment options consist of apexification, apical barriers, or more recently, revascularization. Following cases present successful MTA apexification of immature permanent teeth even as a second option for failed revascularization.

II. Case Presentation

Case 1>

1. Sex/age: F/16
2. Chief Complaint: buccal gingival swelling on #33
3. Past Dental History: gingival curettage on #33
4. Present Illness: sinus tract formation(+), per(-), mob(-), EPT(-)
5. Diagnosis: Chronic periapical abscess on #33
6. Tx.Plan: pulp revascularization or MTA apexification

Case 2>

1. Sex/age: F/30
2. Chief Complaint: sinus tract formation on #15
3. Past Dental History: resin filling on #15 3 years ago
4. Present Illness: sinus tract formation(+), per(-), mob(-), EPT(-), PD(WNL)
5. Diagnosis: Chronic periapical abscess on #15
6. Tx.Plan: MTA apexification

III. Conclusions

Discreet selection of proper material and treatment option is essential to treat immature permanent teeth with periapical disease.

P11

Diagnosis and treatment of cemental tear

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I. Introduction

A cemental tear is defined as a complete or incomplete separation within the root surface, along the cementodentinal interface or along an the incremental line.(Leknes et al. 1996) It is a rare and sometimes under-diagnosed periodontal condition, as it is often accompanied by a localized periodontal defect. Therefore, comprehensive clinical and radiographic examination is important for early diagnosis and treatment.

II. Case Presentation

A 71-year-old female outpatient had a complaint of discomfort and gum boil on the maxillary left incisor area. The patient suffered a concussive injury on the area of maxillary anterior teeth 5 months ago. Generalized periodontal pockets of 3~4mm were initially detected, and on a closer examination, a narrow, 7mm-deep pocket on the mesiopalatal aspect or the tooth was also found. During Clinical examination, a sinus tract was traced with gutta-percha cone. Gutta-percha cone was traced to the mesial bone defect and prickle-like radiopaque structure on the mesial of tooth was also noted. Drawing conclusions from aforementioned facts, it was diagnosed as cemental tear. In the next session, the root fragment was removed, and the localized defect was treated by open flap debridement along with root planing.

III. Conclusions

Cemental tears may present a diagnostic challenge. It is different from vertical root fracture, and hence clinical and radiographic examinations and history taking are essential for the differential diagnosis. Cemental tears can be successfully treated with conventional periodontal surgical debridement.

P12

Transplantation of Immature tooth

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I. Introduction

Autotransplantation is a viable option for replacing a missing tooth when a donor tooth is available. The maintenance of the healthy pulpal tissue of immature tooth and good adaptation with healthy periodontal cells are the most important considerations form a successful tooth transplant. This case observed the mid- and long-term progress of the autotransplanted teeth with immature root apex.

II. Case Presentation

Case 1>

1. Sex/age: F/13
2. Chief Complaint: Gingival swelling on #37
3. Past Dental History: Vertical root fracture with deep caries
4. Present Illness: fistula (+) / per (+) pal (+) mob (2)
5. Impression: Periapical abscess with vertical root fracture on #37
6. Tx Plan: Autotransplantation #38 to #37

Case 2>

1.Sex/age: M/17

2. Chief Complaint: Referral from LDC due to periapical lesion on #37
3. Past Dental History: Previously root canal treatment on #36 ten years ago
4. Present Illness: per (+) pal (+) mob (++))
5. Impression: Periapical abscess with vertical root fracture on #37
6. Tx Plan: Autotransplantation #38 to #37

III. Conclusions

The maintenance of the healthy pulpal tissue of immature is the most important considerations form a successful tooth transplant with vital root apexogenis.

P13

Endodontic treatment of a maxillary lateral incisor dens invaginatus

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I. Introduction

Dens invaginatus is a developmental anomaly resulting from epithelial invagination of the tooth crown before occurrence of calcification, It shows multiple morphological variations of crown and root formation. This leads to caries, pulpal and periodontal involvement with necrosis. Therefore, early diagnosis and prevention are utmost important. Maxillary permanent lateral incisors are the most commonly involved teeth. There may also be an associated talon cusp or grooving of the palatal enamel, coincident with the entrance of the invagination. Because of abnormal anatomical configuration, it is too difficult to treatment these teeth. In the present cases, endodontic treatment of a maxillary lateral incisor associated with periapical lesion or talon cusp.

II. Case Presentation

<Case 1>

1. Sex/ Age : M/14
2. Chief Complaint (C.C) : feel pain at frontal tooth
3. Past Dental History (PDH) : N. S.
4. Present Illness (PI) : EPT(-) / cold(-) / Mob(-) / sinus tract (+) / pal(+) / swelling (+) on #12
5. Impression : pulp necrosis on #12, symptomatic apical periodontitis
6. Tx. Plan : Non-surgical root canal treatment

<Case 2>

1. Sex/ Age : M/21
2. Chief Complaint (C.C) : refer from department of orthodontics
3. Past Dental History (PDH) : orthodontic treatment
4. Present Illness (PI) : EPT(-) / cold (-) / Mob(+) / sinus tract(-) / pal(-) / swelling(-)
   root external resorption, talon cusp and dens invaginatus, root canal calcification on #12
5. Impression : pulp necrosis on #12, Asymptomatic apical periodontitis
6. Tx. Plan : Non-surgical root canal treatment

III. Conclusions

The lack of knowledge about possible root canal anatomical configurations can cause a disadvantage for dentists, resulting in an unsuccessful endodontic treatment. A careful clinical and radiographic examination should be conducted to identify dens invaginatus. Non-surgical root canal treatment of the invaginated canal proved successful in promoting the healing of an associated pulp necrosis and sinus tract.

P14

Nonsurgical Endodontic Treatment of Dens Invaginatus with Operating Microscope : Case Report

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I. Introduction

Endodontic treatment for teeth that exhibit the dental anomaly, dens invaginatus, can be difficult due to the bizarre anatomy and relative inaccessibility of the diseased pulp tissue. The use of the dental-operating microscope and ultrasonic instrumentation has provided new capabilities for visualizing and dealing with anomalies. Removal of the entire anomalous structure and pulp tissue was possible, and predictable conventional orthograde obturation would be accomplished. This case report describes the treatment of dens invaginatus, employing the dental-operating microscope and the ultrasonic instrument.

II. Case Presentation

1. Sex/age: M/35
2. Chief Complaint (C.C): discomfort due to tenderness on #12
   (Referred from local clinic for endodontic treatment of #12)
3. Past Dental history (PDH): previous incomplete RCT on #12 (10 years ago)
4. Present Illness (P.I): #12 per (+), pal (+), swelling (-), sinus tract (-), mob (1),
   periodical radiolucency (+)
5. Impression : Chronic apical periodontitis with dens invaginatus (Oehlers' type Ⅱ) on #12
6. Treatment Plan : conventional RCT of #12 using ultrasonic under microscope

III. Conclusions

The use of the dental-operating microscope and the ultrasonic instrumentation should increase the success rate for nonsurgical treatment of anomalous structure and pulp recesses. Despite the complex anatomy of dens invaginatus, nonsurgical endodontic treatment was performed successfully and healing was achieved without any need for further surgical intervention at follow-up examination after 3 month.

P15

Evaluation of removal of smear layer using ultrasonic tips in various conditions

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[2]*Research Institute of Oral Science, Nihon University School of Dentistry at Matsudo*

I. Introduction

In recent endodontic therapy, EDTA and NaOCl are used to removing the smear layer caused by root canal shaping. However, there are reports that EDTA and NaOCl solution irritates periapical tissue, and led to the serious accident. Therefore, we have to establish for removing smear layer without danger irrigants. The aim of this study was to determine whether the smear layer and smear plugs can be reduced when the root canal is shaped by a smooth surface ultrasonic tip with water and making contact with the root canal wall.

II. Case Presentation

Forty extracted human single root teeth were prepared for this study. The smear layer was removed from selected single root specimens with 15% EDTA, and irrigated with 2.5% NaOCl and pure water. The ultrasonic tip was slightly (5 - 10 g) pressed onto the canal wall and moved vertically directly over the long axis for 5 seconds. In experiment-1, 20 specimens were shaped using a diamond-tip (DT, Ultrasonic diamond tip 3-F, Mani, Japan) with water on power-3. Next the specimens were shaped using a stainless steel-tip (ST, Ultrasonic end tip #25, Mani, Japan) on power-1, 2 or 3. The surfaces of the root canal and torn surface were observed using SEM and scored. In experiment-2, 20 specimens were shaped using DT with water on power-3. Then, the samples were shaped using ST with water on power-1, 2 or 3. The surfaces of the smear layer and torn surface were observed using SEM and scored. Data were analyzed statistically using an ANOVA and Tukey's test at 1% significance level.

III. Results

In experiment-1 and -2 the smear layer score tended to decrease with the decreasing ultrasonic power. There was significant difference in the presence of the smear layer between control and all groups, power-1 and -3, and power-2 and -3 with water and ST in experiment-1 ($P < 0.01$), and there was significant difference in the presence of the smear layer between power-1 and -3 with water and ST in experiment-2. ($P < 0.01$) The smear layer could be decreased by this method; however smear plugs could not be decreased.

IV. Conclusions

The smear layer can be reduced when the root canal is shaped by ST with water and slight contact (5-10 g). However, smear plugs were not removed using ultrasonic tip with water, consequently, a low concentration of chelating irrigants may be needed to completely remove the smear layer and smear plugs.

P16

Relationship between the generated singlet oxygen by low level laser irradiation and bactericidal effect of Enterococcus faecalis

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Department of Endodontics, Nihon University School of Dentistry at Matsudo, Chiba, Japan

I. Introduction

Photodynamic therapy (PDT) was discovered accidentally at the beginning of the 20th century. PDT is based on the concept that a nontoxic photosensitizing agent as a photosensitizer (PS) can be preferentially localized in certain tissues and subsequently activated by light of appropriate wavelength to generate singlet oxygen ($^1O_2$) and reactive oxygen spieces that are cytotoxic to target cells. In dentistry, several studies also have shown the effectiveness of PDT against oral bacteria. *Enterococcus faecalis* (E.*f*) has been the most frequent species associated with post-treatment apical periodontitis. Therefore, many studies have been reported about PDT to E.*f*. However, there is no report about both amount of generated $^1O_2$ on PDT and bactericidal effect of E.f. The aim of this study is to investigate the relationship between the amount of generated $^1O_2$ by PDT and bactericidal activity.

II. Materials and Methods

Methylene blue (MB, Wako) was used as a PS, a diode laser (660 nm, 200 mW) was used as a light source. The generated $^1O_2$ by the light excitation of MB was measured using electron spin resonance (ESR).

Ex1) Determination of the optimal MB concentration In concentration of 0.001-1.0 w/v% MB, the $^1O_2$ generation by PDT was examined using ESR.

Ex2) Bactericidal effect of E.*f* A standard suspention of E.*f* (JCM5803T) containing 10^8 viable cell/ml was prepared. MB was added to suspented E.*f*, then mixture was irradiated for 0-30 min. CFU was measured after 24hrs.

III. Results

When MB was irradiated by laser, the amount of generated $^1O_2$ increased depending on the irradiation time. The $^1O_2$ was the most generated from 0.01% MB *(Ex1)*. CFU decreased depending on the amounts of $^1O_2$. Furthermore, when more than 26 μM of generated $^1O_2$, bactericidal effect of 99.99% was obtained *(Ex2)*.

IV. Conclusions

It is suggested that more than 26 μM of the amount of $^1O_2$ need for the sufficient bactericidal effect of E.*f* by PDT.

P17

Isolation of stem cell marker positive epithelial like cells derived from PDL and observation of morphologic character after cell culture

Kitajima Kayoko, AraiI Kyoko, Igarashi Masaru
Department of Endodontics, School of Life Dentistry at Niigata, The Nippon Dental University

I. Introduction

Epithelial cells in periodontal ligaments (PDL) are considered to contribute to the development of radicular cysts. The purposes of this study were to isolate stem cell marker positive epithelial like cells which were eliminated blood endothelium cells derived from PDL and to observe morphologic character after cell culture.

II. Materials and Methods

Epithelial cells were obtained from the PDL of porcine primary teeth. Those cells obtained from the cervical third root, the middle third root and the apical third root were initially cultured. The epithelial cells harvested at the second or third passage were suspended with HBSS and were isolated using CD31 and CD44 by flow cytometry (BD VantageTM SE. Japan BD Co.). Isolated CD31low/ CD44high cells were analyzed the proportion of side population to main population at each root parts. Isolated CD31low/ CD44high cells were observed morphologic character after cell culture.

III. Results

Side Population cell fractions were confirmed in cells derived from PDL isolated by flow cytometry after labeling using CD31 and CD44. The proportions of the cells in side populations against main population of CD31low/ CD44high cells were 5% at the cervical third root, less than 1% at the middle third root and the apical third root. Serious colony formations were observed on the passage of cells obtained from CD31low/ CD44high cell fractions. These morphologic characters were reticulum with spherical structure as if some kinds of stem cells colony. These characters were different from the colony of epithelial cells like flagstones.

IV. Conclusions

It was suggested that stem cell like cells contain in the cells derived from PDL.

A part of this work was supported by Grant-in-Aid for Scientific Research(C) (21592435).

P18

Histological observations of engrafted organotypic cultures using epithelial cells and fibroblasts derived from PDL

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[2]*Advanced Operative Dentistry - Endodontics, Graduate School of Life Dentistry at Niigata, The Nippon Dental University*

I. Introduction

The organotypic culture is a three-dimensional culture using collagen gel and reconstructs like skin and mucosa. The purpose of this study was to observe histologically the healing process after engraft of the organotypic culture using epithelial cells and fibroblasts derived from periodontal ligament (PDL).

II. Materials and Methods

Epithelial cells and fibroblasts were obtained from the PDL at the middle third root of porcine primary teeth. The fibroblasts were incorporated into a collagen gel, and the epithelial cells were added upon the collagen culture on the following day. The gels were lifted up onto nylon sheets and were incubated under an air/medium interface for one week. Twenty nude -mice (Japan SLC Corp.) that were five weeks old were used for transportation. A ø 1cm fenestration was made at the mouse back skin under general anesthesia, and a cultured tissue was engrafted on the subcutaneous tissue. A ø14.5mm polystyrene hemisphere cap was adhered and sutured to protect from the traumatic irritants. Controls without graft were also observed

The resulting tissues were collected after 1, 3, 7days and 2 weeks. The graft and peripheral intact tissues were obtained and fixed in 10% neutral formalin. The 6 m paraffin-embedded sections were stained with H-E and immunity.

III. Results

The engrafted tissue at one day after engrafting showed the several epithelial layers at the surface and slight inflammation at subcutaneous tissue. However the dividing lines between the culture and skin after three days were indistinct and the inflammation was no existed, severe inflammation was seen in the engrafted tissue. The inflammations were not seen on the 1,3 and 7 days after on control group.

IV. Conclusions

The organotypic cultures using epithelial cells and fibroblasts derived from PDL showed the inflammation at the peripheral region after the transplant and the reactions disappeared in a short period and the engrafted tissues were taken well.

A part of this work was supported by Grant-in-Aid for Scientific Research (C) (21592434).

P19

Retreatment of Root Canals Using Intracanal Endoscope in Combination with Er:YAG Laser

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I. Introduction

The combined therapy of the intracanal endoscope (IE) and Er:YAG laser was performed for the endodontic retreatments such as the removal of fractured instruments and apical obstacles.

II. Case Presentation

The total diameter of the IE tip is 1.1 mm. IE is composed of a camera channel, a laser-fiber channel, a water channel, and several illuminating fibers. The quartz-fiber laser tip of 90 mm in length can be inserted through the laser-fiber channel.

In the first case, dentine around a fractured instrument was ablated using Er:YAG laser under endoscopic observation. Afterward, an ultrasonic device with an U-file was used to retrieve the broken instrument under observation.

In the second case, gutta-percha occluding the apical foramen was laser-ablated under endoscopic observation. Massive hemorrhagic pus flooded out from the periapical abscess.

The identical alignment of IE and laser fiber makes it easier to aim at a target more accurately, even from a two-dimensional endoscopic view. Additionally, because the endoscopic vision is conspicuous when the root canal is filled with water, the laser irradiation can be performed under water cooling, making the ablation procedure safer in a root canal treatment.

III. Conclusions

The use of Er:YAG laser under endoscopic observation allowed us to conduct a precise and minimal invasive treatment. This combined therapy might be promising in the solution of various endodontic problems.

P20

The combined effects of an Er:YAG laser and oxalate-based desensitizer on the occlusion of exposed dentinal tubules in vitro

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I. Introduction

Dentine hypersensitivity (DH) is characterized by a short sharp pain. The aim of this in vitro study was to evaluate morphologically the occluding effects of Er:YAG laser alone or Er:YAG laser in combination with an oxalated-based desensitizer on exposed dentinal tubules.

II. Materials and Methods

Bovine dentine plates treated with a 15% EDTA solution for 2 min were used as a test material. A handpiece of an Er:YAG laser device (Erwin AdvErl; Morita, Osaka, Japan) was fixed at approximately 30 mm from the specimen. In Group A, Er:YAG laser was irradiated for 30 or 60 s in a defocused mode at a pulse energy of 30 mJ and a repetition rate of 10 pulses per second, without air/water coolant. In Group B, an oxalate-based desensitizer (Super Seal; Phoenix Dental, USA) was applied before laser irradiation. All samples were observed with scanning electron microscopy (SEM; JSM-5400LV, JOEL, Japan) and laser microscopy (LM; VK8500, Keyence, Japan).

III. Results

In Group A, dentinal tubules were partially occluded by melting of peritubular dentine. In Group B, the crystalloid structures and melting layer were shown in dentinal tubules, resulting in the further occlusion. Laser microscopy revealed an undulated dentine surface by laser irradiation.

IV. Conclusions

These results suggest that defocused, low-level irradiation of Er:YAG laser is capable of occluding exposed dentinal tubules, and the effect is enhanced by pre-treatment with a desensitizing agent.

Clinical Issue 1

The coming era of regenerative endodontics

Sin-Young Kim
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Regenerative endodontic procedures can be defined as biologically based procedures designed to create and deliver tissues to replace diseased, missing and traumatized pulp-dentin complex. These tissues might be replaced with live, viable tissues of the same origin for the purpose of restoring normal physiologic functions of the pulp-dentin complex.

The field of regenerative endodontics is a new frontier in clinical practice. Information concerning the views of dental practitioners toward regenerative procedures is scarce, but it is essential to the widespread acceptance and delivery of regenerative procedures to dental patients.

The first step of this regenerative technique involves disinfection of the root canal with copious sodium hypochlorite irrigation and a combination of ciprofloxacin, metronidazole, and minocycline. After successful disinfection, the antibiotic paste is removed, and apical bleeding is induced into the canal to produce a blood clot. As a final step, the canal orifice is sealed with MTA, and a permanent coronal restoration is placed.

This procedures show a favorable outcome in immature necrotic teeth. It allows root thickening and lengthening to continue by the vital tissue. Dentists are supportive of using regenerative endodontic procedures in their dental practice, and they are willing to undergo extra training to provide new procedures. However, dentists also want more evidence for the effectiveness and safety of regenerative treatments.

Sin-Young, Kim

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Clinical Issue 2

Digital Dentistry and Microscopic Endodontics

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Mokpo Mir Dental Hospital, Mokpo, Korea

The root canal anatomy, very small world, is the most important factor of endodontic treatment. A size of the root canal system exceeds the bounds of ability of the naked eye. Magnifying devices help clinicians to distinguish the anatomic structures in the root canal system. The dental microscope is the only valuable magnifying tool in current endodontics. The others, such as, loupes, endoscope and Varioscope® have several limitations that restrict their use in endodontics. Although dental microscope is very useful in the office, it is old-mechanical, mobile-difficult and expensive. Such characteristics reduce their popularity.

A core of the digital dentistry may be digitization. Cone Beam CT is the sole way for three-dimensional digitization of the tooth anatomy in the present dental clinics. The three-dimensional digital images will facilitate the endodontic treatment. Additionally, digital data is an important addition to computer-assisted learning in endodontics education. For more applications, the dental microscope should be improved digitally.

Clinical Issue 3

Prognostic factors of endodontic surgery with microscope

Minju Song
Deptment of Conservative Dentistry, Yonsei University, Gangnam Severance Hospital, Seoul, Korea

The outcome of endodontic surgery and its predictors have been reported with success rates varying considerably from 37% to 91%. After microsurgical principles, which include the use of a dental operating microscope, were introduced, the success rate of endodontic surgery was reported to be approximately 90%. And the predictors affecting the clinical outcome of endodontic microsurgery might have changed.

The data was collected for patients with a history of endodontic microsurgery performed between August 2004 and December 2008, at least 1 year before being evaluated. After surgery, an operation record form was made with the preoperative, intraoperative and postoperative factors from clinical and radiographic measures. For statistical analysis of the predisposing factors, the dependent variable was the dichotomous outcome, i.e. success versus failure.

Of 907 cases, 491 were retained at follow-up. At the 0.05 level of significance, age, gender (female), tooth position (anterior), root filling length (inadequate), lesion type (endodontic lesion), root-end filling material (MTA and Super EBA) and restoration at follow-up appeared to have a positive effect on the outcome. Under the control of significant variables in logistic regression, the potential prognostic factors on the outcome were gender, tooth position, lesion type and root-end filling material.

This study did not show a significant difference between traditional apical surgery and endodontic microsurgery. Nevertheless, with endodontic microsurgery, it is likely that intraoperative factors affecting the outcome were reduced, and preoperative factors, particularly the tooth position, have a higher weight on the healing outcome than intra- and postoperative factors.

Minju Song

2006	DDS, College of Dentistry, Yonsei University
2006-2009	Internship & Resident, Department of Conservative Dentistry, Yonsei University Dental Hospital
2007-2009	MSD, Department of Conservative Dentistry, Graduate School of Dentistry, Yonsei University
2010-present	PhD, Department of Conservative Dentistry, Graduate School of Dentistry, Yonsei University
	Clinical lecturer, Department of Conservative Dentistry, Gangnam Severance Hospital, Yonsei University

Current Issue 1

Clinical application of Microscope

Sang-Jin Lee
Mirae Dental Clinic, Changwon, Korea

Dental operating microscope was introduced into endodontics to provide enhanced lighting and visibility. Microscope enhances the clinician's ability to remove dentin with great precision, thereby minimizing procedural errors. Numerous studies have shown that it also significantly improves the practitioner's ability to negotiate canals. Dental microscope makes canals easier to locate by magnifying and illuminating the grooves in the pulpal floor and by distinguishing the color differences of the dentin of the floor and walls. Since 2007, dental operating microscope was employed in my daily endodonitic procedures. The clinical application of microscope in endodontic treatment procedure and the cases will be presented in this lecture.

Sang-Jin Lee, DDS, MS, PhD

Graduate school, Pusan National University, MSD
Graduate school, Pusan National University, PhD
Representative, Changwon Masan Mirae Dental Clinic

Current Issue 2

Clinical application of Reciprocating File

Dong-Ryul Shin
Luden Dental Clinic, Seoul, Korea

Contemporary endodontic treatment is consistently being developed in success rate as well as operating convenience. After the advent of rotary Nickel-Titanium file, the result of canal shaping has significantly improved and operating convenience has also highly upgraded in the field of endodontics. Until today, Nickel-Titanium file has successively improved by morphological development and recently, evolved through surface treatment or changing metal properties. In order for operating convenience and economic feasibility, many file manufacturers tried to reduce the number of files used in a canal treatment. Lately, with the emergence of the file employing reciprocation motion, spotlighted is the technique to shape every root canal with the only one file. And this file is named 'one file system' since root canals can be shaped with the only one file. However, 'one file system' also shows certain drawbacks that it is difficult to use the file properly for whole types of root canal, in some cases, glide path should be formed and it is still challenging to actively remove dentinal collar on coronal one third. Therefore, this presentation will provide the proper way and suggestions to apply reciprocating file to the clinical field.

Dong-Ryul Shin, DDS, MSD, PhD

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Internship in Kyung-Hee University Dental Hospital
Residency in Department of Conservative Dentistry, Kyung-Hee University Dental Hospital

Current Issue 3

Clinical application of Microscope

Jung-Bon Moon
DDS Inc.

Recently many dental CAD/CAM systems are introduced in the market resulting in the change of clinical procedure. But because most of the systems are provided for the sake of profitability and/or convinience of vendors, not the users i.e dentists or dental technicians, consumers are usually disappointed after the purchase of the system even we grant they didn't or cannot ponder on the system in advance.

Most of the users expect to replace the conventional impression with digital impression using intra-oral 3D scanner in easy and accurate manner. Also they are eager to overcome the incorrectness of long span casting restorations. But the intra-oral 3D scanners supplied currently in the market is not sufficient to fullfil these requirements - the convinience and the profitability.

In case of Ethetic Treatment, material should be selected according to a case but more than about 95% of manufacturing machines are confined to zirconia block i.e those machines cannot manage various kind of materials.

In this instruction, the application of the dental CAD/CAM systems will be surveyed in the clinical case and the comparison among the systems will be done with the respect to the suitablity for the user expectations.

Jung-Bon Moon

CEO, DDS Inc.
Representative doctor of Time Dental office
Member of ISCD (International Society of Cerec Dentistry)
Member of Pusan implant research society

Invited Lecture 1

Microscopic Endodontic Therapy and Education in Japan

Yasuhisa Tsujimoto
Department of Endodontics, Nihon University School of Dentistry at Matsudo

Microscopic Treatment is becoming well known to many dentists in Japan. Microscopic treatment was started from 1990th in Japan. However, there have not been reported yet on how to it is used for education or how many dentists use Microscopes in Endodontic Department in Japan. In the spring of 2008, a questionnaire survey was conducted by Japan Association of Microscopic Dentistry (JAMD). Seventeenth questionnaire had sent to each Department of Endodontics of 29 dental schools or dental colleges in Japan. Consequently, in January of 2012, same questionnaire was sent to 29 dental schools or dental colleges in Japan. The results of questionnaire will be discussed and how Microscopes are used in education and treatment (including diagnosis) will be presented. In addition, I will be explain that Micro-endodontic therapy and education of our dental school, and our developed tool for Micro-endodontic therapy.

Yasuhisa Tsujimoto DDS, PhD

1979	Graduation, Nihon University School of Dentistry at Matsudo (NUDM)
1983	Completion, Nihon University Graduate School (PhD)
1983	Instructor, Department of Endodontics, NUDM
1986	Assistant Professor, Department of Endodontics, NUDM
1987-1989	Visiting scientist, Department of Inorganic Chemistry and Preventive Dentistry, Forsyth Dental Center, Boston, USA
2005-2007	Professor (part-time), Department of Conservative Dentistry, Matsumoto Dental College
2006	Associate Professor, Department of Endodontics, NUDM
2010	Clinical Professor, Department of Endodontics, NUDM
2011	President, Japan Association of Microscopic Dentistry

Award

2002, 2003	Suzuki Kensaku Prize (JEA Kanto)
2002	Dentsply Prize (The Japanese Society of Conservative Dentistry)
2003	Excellent Presentation Prize (Japan Academy of Color for Dentistry)
2004	Excellent Paper Prize (JEA)
2009	JEA Kanto Prize (JEA Kanto)

Invited Lecture 2

Outcomes of Endodontic Microsugery

Euiseong Kim
Department of Conservative Dentistry, Yonsei University, Seoul, Korea

Surgical endodontics is often a last resort when nonsurgical retreatment is impractical or unlikely to improve on a previous result. In recent years, modern techniques that includes the use of magnification tools, microinstruments, ultrasonic instruments, and more biocompatible filling materials has been introduced. These technical advances increase the success rate compared with the traditional root-end surgery, varying considerably from 74% to 92%. Among the many studies on clinical outcome of surgical endodontics, there are only few reports relating to endodontic microsurgery. In addition, most studies of endodontic microsurgery have been observed to success in the short term after surgery

Data were collected from patients in the Microscope Center, Department of Conservative Dentistry, Yonsei University between March 2001 and June 2005. After surgery, an operation record form was made and updated with the postoperative events whenever the patients were recalled periodically to assess the clinical and radiographic signs of healing. Patients were recalled every 6 months for 2 years and every year up to 10 years by telephone for the follow-up examination.

The overall success rate of cases in all classified groups was 91.5% up to five years follow-up which is short-term. The successful outcome for isolated endodontic lesions was 95.2%. In endodontic-periodontal combined lesions, successful outcome was 77.5%, suggesting that lesion type had a strong effect on tissue and bone healing. And the successful outcome of endodontic resurgery was 92.9%. The successful outcomes of endodontic microsurgery at long-term follow-up was 93.3% and most cases that were considered healed for short-term period stayed healed after more than 6 years.

Euiseong Kim

DDS, MSD, PhD from Dental College of Yonsei University
Internship and residentship program at the Department of Conservative Dentistry, Dental Hospital, Yonsei University
Graduate program at the Department of Endodontics, University of Pennsylvania
Secretary and Editor of KAE (Korean Academy of Endodontics)
Visiting scholar at the Department of Endodontics, University of Pennsylvania
At present Professor at the Department of Conservative Dentistry, Yonsei University
Specialist member of AAE (Association of American Endodontists)
Director of Academic Affair of KACD (Korean Academy of Conservative Dentistry)

Invited Lecture 3

Glide path in modern root canal treatment

Se-Hee Park
Department of Conservative Dentistry, College of Dentistry, Gangneung-Wonju Nationall University

Rotary Nickel-Titanium instruments have become mainstay for the modern root canal treatment. Although many NiTi systems are in the market, there are no systems to shape the canal just only using the rotary NiTi instruments. The 'Taper Lock' situation can be developed while the canal section is smaller than the dimension of the NiTi instruments, especially in severely curved, narrow canal. And it can make the separation of instruments. The risk of the 'Taper Lock' can be reduced by making a 'Glide Path'. The definition of 'Glide path' is a smooth radicular tunnel from canal orifice to physiologic terminus. It can decrease the chance of instrument separation.

This presentation will provide a concept of Glide path and its importance of using 'One-file reciproc system'

Se-Hee Park

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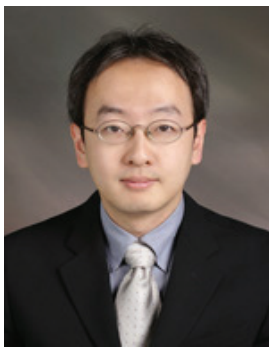
Internship; Gangneung-Wonju Nationall University Dental Hospital
Residency; Gangneung-Wonju Nationall University Dental Hospital

Invited Lecture 4

Endodontic bioactive cements for multi-purpose



Seok-Woo Chang
Department of Conservative Dentistry, the Institute of Oral Health Science,
Samsung Medical Center,
Sungkyunkwan University School of Medicine

Mineral trioxide aggregate (MTA) was introduced in 1993 and has been successfully used in perforation repair, root end filling, pulp capping, and so on, for more than 15 years. This clinical success of MTA is due to its good sealing ability and biocompatibility. MTA is mainly composed of lime (calcium oxide) and silica (silicate oxide). Its four major components are tricalcium silicate, dicalcium silicate, tricalcium aluminate, and tetracalcium aluminoferrite. It was reported that MTA has relatively long initial setting time (2h 45m) and incorporation of various additives can reduce setting time. Compressive strength of MTA was reported to increase with time and reaches approximately 100 MPa after 28 days. MTA has high alkalinity of pH 9-12.5 due to the formation of calcium hydroxide during its hydration reaction. MTA was reported to have better sealing ability than amalgam and IRM when it is used in perforation repair or root end filling. MTA is safe regarding cytotoxicity and genotoxicity and have potential to promote dental hard tissue formation. Recently, many mineral oxide or bioactive material is being developed worldwide and these products needed further investigation.

Curriculum Vitae

Seoul National University, School of Dentistry (DDS, 1999)
Seoul National University Graduate School, Department of Conservative Dentistry (MSD, 2002)
Seoul National University Graduate School, Department of Conservative Dentistry (PhD, 2010)
Full time lecturer, Department of Conservative Dentistry, School of Dentistry, Wonkwang University (2005.5-2007.3)
Clinical Assistant Professor, Department of Conservative Dentistry, the Institute of Oral Health Science, Samsung Medical Center (2007.3-2010.2)
Assistant Professor, Department of Conservative Dentistry, the Institute of Oral Health Science, Samsung Medical Center, Sungkyunkwan University School of Medicine (2010.3-)

Special Lecture 1

Reciprocation with NiTi Instruments

David Sonntag
Department of Conservative Dentistry, Periodontology and Endodontology, Düsseldorf University, Düsseldorf, Germany

In an evidence based lecture with videos and clinical cases Dr David Sonntag, one of the german's leading endodontists, gives a scientific and clincal overview of advantages and disadvantages of alternating motion with NiTi instruments. The lecture focus on the Reciproc Systems, one of the most recently invented systems for efficient root canal shaping. These instruments engage dentine to cut in a counterclockwise direction and disengange when the instrument rotates in opposite direction (smaller rotation). The end result, related to the degree of CCW and CW rotations is an advancement of the instrument in the canal. Combining the idea of the balanced force technique with an efficient instrument geometry the system provides the ability to maintain even severe curvatures and shape oval canals. Using Reciproc instruments is a really simple and safe way to prepare a root canal whilst complying with the highest quality requirement. Unlike other systems, Reciproc allows canals to be prepared with one single NiTi instrument in majority of cases. These instruments made of M-Wire with an S-shaped cross section offer a greater flexibility and resistance to cyclic fatigue than traditional nickel-titanium instruments. The extremely simple technique is one of the main advantages of this system. All instruments are used to full working length. The system consists of only three regressively tapered instruments up to ISO 50. Additionally these single-patient instrument avoid cross contamination between patients and failure due to fatigue.

The objective of the lecture is to gain a thorough understanding of the clinical application of rotary and alternating moving NiTi instruments. The presentation is designed for both general practitioners and endodontists. At the end of the lecture participants will have the theoretical background knwoledge to start using Reciproc instruments.

Dr. David Sonntag

graduated from the University of Marburg, Germany in 1998 and received his degree in Dentistry (Dr. med dent) in 2001. He is a specialist in Endodontics (2005) Certified Member of the European Society of Endodontolgy (ESE) and member other national and international Associations. After finishing his habilitation he became a private docent of Marburg University in 2008.

Currently Dr. Sonntag is the director of the Master Study Program in Endodontology at Düsseldorf University; Assistant Professor in the department of Conservative Dentistry, Periodontology and Endodontology at Düsseldorf University and works part time in his private dental office, limited to Endodontics in Marburg.

Dr. Sonntag has published in national and international journals and lectures both nationally and internationally. His major research interests include root canal preparation, decontamination of endodontic instruments and undergraduate dental education.

Special Lecture 2

WaveOne - The final Wave

Asgeir Sigurdsson
University of North Carolina

In this lecture the principles of endodontic instrumentation, treatment goals and outcome will be discussed in some details. Now it is possible, in many cased, to reach these goals with only one main reciprocating NiTi instrument, the new WaveOne file. In depth discussion will be given on the key design principles of the new file system and the M-wire metal alloy that is used in the WaveOne file. Emerging research supporting this new instrumentation approach will be presented and discussed. The discussion will also include presentation of a proper access preparation, irrigation protocol and how to choose the correct file for each case. At the end of the lecture a detailed presentation will be given on how to use the new WaveOne file in any clinical situation.

Born and raised in Reykjavik, Iceland. Graduated with cand. odont. degree from University of Iceland, Faculty of Dentistry in 1988. After one year in private practice in Akureyri, Iceland, moved to Chapel Hill, NC USA. Graduated from University of North Carolina (UNC) at Chapel Hill, School of Dentistry with certificate in endodontics and Master of Science degree in 1992 with emphasis on neurobiology and pain perception.
Full time faculty member at UNC School of Dentistry from 1992 until 2004, first as an assistant professor and then promoted to associate professor with tenure in 2000.
From 2004 an adjunct associate professor at UNC School of Dentistry. Appointed as the Graduate Program Director of Endodontics (specialty training) in 1997 and severed in that position until 2004.
In private endodontic practice in Reykjavik and UK. Appointed as Honorary Clinical Teacher in Endodontology, UCL Eastman Dental Institute, London UK in 2006.
Active in many professional organizations and is currently the immediate past-President of the International Association for Dental Traumatology (IADT).
Received in 1998 the Edward M. Osetek Educator Award, awarded by the American Association of Endodontists.

Periapical surgery of the mandibular 2nd molar : Case report

Yun-Jung Song
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ABSTRACT

Periapical surgery is a well-accepted technique used to salvage endodontically involved teeth that cannot be satisfactorily treated or retreated by nonsurgical conventional endodontic procedures. Endodontic surgery in the lower posterior teeth is perceived as difficult because the surgeon must often approximate the location of anatomical structures such as large blood vessels, the mental foramen, the mandibular canal, thick bony configuration. This case report describes the surgery of mandibular 2nd molar with microscopy. Case selection is an important factor to the periapical surgery of mandibular posterior teeth. From endodontic point of view, the thickness of buccal alveolar bone can be an obstacle in attaining good results of involved root because of accessibility and visibility.

Key words: periapical surgery, posterior teeth, bony configuration

I. INTRODUCTION

Non surgical root canal treatment is a highly successful procedure. Also most failures of these treatments can be corrected by retreatment and apical microsurgery [1-2]. In the case of failures of nonsurgical root canal treatment, we consider non surgical root retreatment, apical microsurgery, replantation, follow-up, extraction etc. Periapical surgery is a well-accepted technique used to savage endodontically involved teeth that cannot be satisfactorily treated or retreated by

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nonsurgical conventional endodontic procedures [3-4]. Such as case, anatomic problems, procedural accidents requiring surgery, irretrievable materials in the root canal, persistent symptoms, horizontal apical fracture, biopsy we consider periradicular surgery [5]. On the other hand, anatomic factor such as proximity of maxillary sinus, medical complications, indiscriminate use of surgery, unidentified cause of treatment failure, we approach very carefully microsurgery. Caution should be exercised, specifically in periapical surgery of mandibular posterior teeth due to the potential damage of the mental and inferior alveolar neurovascular bundles [6]. The purpose of this paper is to consider some important anatomical and surgical factors related to periapical surgery in this region.

II. CASE REPORT

A 55-year-old female patient visited due to swelling and discomfort on lower left molar. These teeth were treated retreatment root canal and restored bridge 1year ago. In clinical examination, the #37 tooth was sensitive to palpation and percussion and had gumboil (Figure 1). In the radiographic image, the apex of left 2nd molar which showed c-shaped canal had radiolucency (Figure 2). The #37 tooth was diagnosed as chronic apical abscess and considered as follows: 1. Deficiency of remaining tooth structure, 2. possible crack of the root apex due to repeating re-treatment of C-shaped root canals, 3. Sound condition of the former prosthodontic treatment, 4. General condition of the patient being healthy. So we decided on operating microsurgery.

Figure 1. Gumboil of the mandibular 2nd molar

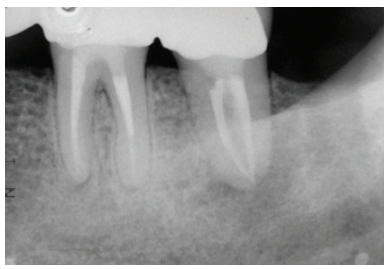

Figure 2. Radiolucency in the apex of the mandibular 2nd molar

Anesthesia was performed with buccal and lingual infiltration of 2% lidocaine HCl solution with 1: 100,000 epinephrine over the apices of the teeth to involve the entire surgical site. A full thickness flap was raised with a 15 scalpel blade to create flap. The exposed tissue was moistened with sterile saline throughout the surgical procedure to avoid dehydration of the bone and soft tissues. After retraction of the flap, perforation of the cortical bone was evident (Figure 3 and 4). The position of the apices was estimated, an assessment of the bony defect was made after the osteotomy was performed which was followed by curettage of the inflamed granulation tissue. Root-end resection was performed with a sterile tapered fissure bur. A micro mirror was used to examine the root-end with microscope. Root-end preparation was performed under microscope using ultrasonically diamond powered tips to depth 3mm. The root-

end was dried and retrograde filled with MTA (ProRoot; Dentsply, Tulsa, OK, USA) (Figure 5 and 6). Standard x-ray was taken to ensure that the MTA were filled sufficiently in the root-end (Figure 7). And then the surface of the cut root was cleaned with a cotton pellet dampened with sterile saline. The surgical site was closed with 4/0 absorbable suture (Chromic, AILEE CO., Korea) (Figure 8). Postoperative care was explained and ibuprofen 400 mg recommended for analgesia. Dressing was done after 1 day. The patient could not make it to the routine check up because the personal reason. And the patient revisited after 5 years to get treatment of other tooth. At the 5 years review the tooth was asymptomatic and a periapical radiograph revealed a favorable healing outcome (Figure 9 and 10).

Figure3. Reflection of flap showed bony perforation

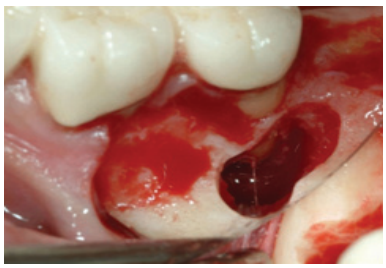

Figure 4. Performed bone preparation

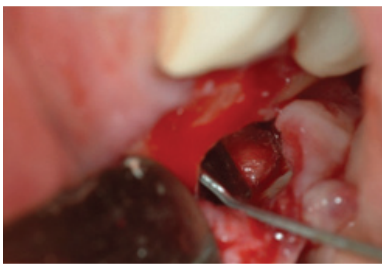

Figure 5. Observation of root-end

Figure 6. Retrograde filling with MTA

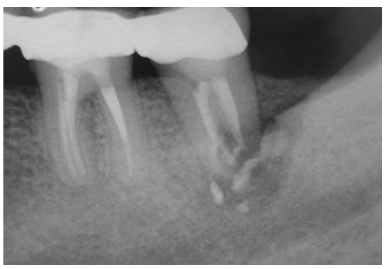

Figure 7. Radiograph after surgery

Figure 8. Sutured 5/o silk

Figure 9. After 5 years, intraoral photograph

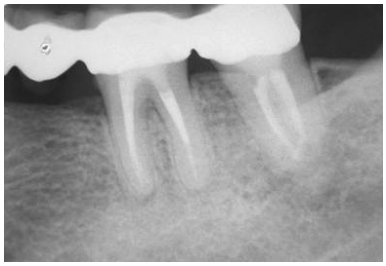

Figure 10. After 5 years, periapical radiograph

III . DISCUSSION

In recent, microsurgery in endodontic part shows highly success rates with microscope[7-8]. But inaccessibility of the surgical site owing to tooth locations, spaces such as maxillary sinus , bony configuration, proximity of neurovascular bundles may be contraindication or at least require caution or special approaches[9]. In this case, there was a careful consideration in surgical access because of a external oblique ridges associated with a second mandibular molar or apices contiguous with the mandibular canal. To some degree, the depth of the vesibular fornix may forecast the amount of difficulty that may be encountered during periapical surgery of the mandibular posterior teeth[9-10]. The depth of vestibular fornix varies and is limited by bony ridges or prominences in the mandibular molar area. If the vestibule fornix is deep, the overlying buccal alveolar bone will be thin. If the vestibule fornix is shallow, the buccal alveolar bone, overlying the root of mandibular posterior teeth, will be thick. This case vestibular fornix is relatively deep and able to approach the lesion.

Litter et al studied the relationship of the mandibular canal and the apices of mandibular teeth in 46 dried adult mandibles. They found in most cases that the canal was buccal to the second molar and lingual to the first molar[11]. Also Second premolars and second molars had the closest distance to the canal with a mean of 4.7 mm and 3.7 mm, respectively. With a mean of 6.9 mm, the apices of the mesial roots of the first molars were farthest from the canal. The distance from the buccal border of the mandible to the long axis of the tooth along the apical line is 2nd molar longer than premolar, 1st molar with a mean 11.1 mm 12.8 mm, 13.9 mm respectively[12]. Based on these research, it appears that the mandibular premolar as well as mandibular second molar are the most likely teeth to be involved in accidental damage to the mandibular canal during microsurery in endodontics.

This case report describes the surgery of mandibular 2nd molar with microscopy. Case selection is an important factor to the periapical surgery of mandibular posterior teeth. From endodontic point of view, the thickness of buccal alveolar bone can be an obstacle in attaining good results of involved root because of accessibility and visibility.

Acknowledgements: The author thank Dr. Lee Hak Chul for his assistance and Dr. Oh Wu Shik for his advice.

REFERENCE

1. Sundqvist G, Figdor D, Persson S, Sjogren U. Microbiologic analysis of teeth with failed endodontic treatment and the outcome of conservative re-treatment. *Oral surg Oral Med Oral Pathol Oral Radiol Endod* 1998;85:86-93.
2. Torabinejad M, Corr R, Handysides R, Shabahang S. Outcomes of nonsurgical retreatment and endodontic surgery: a systematic review. *J Endod* 2009;35:930-7.
3. Van Nieuwenhuysen JP, Aouar M, D'hoore W. Retreatment or radiographic monitoring in endodontics. *Int Endod J* 1994;27:75-81.
4. Hession RW. Long-term evaluation of endodontic treatment: anatomy, instrumentation, obturation - the endodontic practice triad. *Int Endod J* 1981;14:179-84.

5. Walton R, and Torabinefad M. *Principles and Practice of Endodontics*. 3rd ed. Saunders 2002:425-44.
6. Harris MH. Apicoectomy and retrograde amalgam in mandibular molar teeth. *Oral Surg Oral Med Oral Pathol* 1979;48:405-7.
7. Kim S, Pecora G, Rubinstein R. Comparison of traditional and microsurgery in endodontics. In;Kim S, Pecora G, Rubinstein R. *Color atlas of microsurgery in endodontics*. Philadelphia : W.B Saunders, 2001:5-11.
8. Carr GB. Surgical endodontics. In; Cohen S, Burns R, eds. *Pathways of the pulp*, 6th. Ed St Louis: Mosby, 1994:531-45.
9. Louis L, Skribner, Shovlin F, langeland K. Periapical surgery of mandibular posterior teeth: anatomical and surgical consideration. *J Endod* 1983;9:496-501.
10. Clarke MA, Bueltmann KW. Anatomical considerations in periodontal surgery. *J Periodontol* 1971;42:610-25.
11. Littner MM, Kaffe I, Tamise A, Dicapua P. Relationship between the apices of the lower molars and mandibular canals - a radiographic study. *Oral Surg Oral Med Oral Pathol* 1986;62:595-602.
12. Denio D, Torabinejad M, Leif K. Anatomical relationship of the mandibular canal to its surrounding structures in mature mandibles. *J Endod* 1992;18:161-165.

2012년 대한치과근관치료학회 정기 총회

개 회
국 민 의 례
회 장 인 사
회무 및 재무보고
감 사 보 고
사업계획 및 예산안
심 의
기 타 안 건
폐 회
회 무 보 고
정 기 이 사 회

회무 보고

정기 이사회

– 총무부

● 2011. 2차 이사회

일 시 : 2011. 7. 8 (금) 저녁 6시 30분
장 소 : 만복림
참석자 : 오태석, 최기운, 김성교, 황호길, 박동성, 김의성, 김진우, 정일영, 김미리, 박상혁, 신수정, 김현철, 최성백, 라성호

1. 학회 인준 신청 건
   1) 치의학회 회장이 주관한 미인준학회 회장들의 모임에 오태석 회장이 참가하여 논의된 사항을 보고하였고 향후 인준이 안 되었을 경우 최근 시행되고 있는 쌍벌제 등의 이유로 학회 행사 개최 자체가 매우 힘들어 질 수 있음을 설명.
   2) 관련학회 (보존학회)의 의견서를 일단 요청하기로 하며 의견서를 받지 못하더라도 인준 신청을 하기로 함.

2. Workshop 건 : 교과서 제작 후에 갖기로 했던 모임을 8월 26과 27일, 이틀간 진행하기로 하며 장소는 일단 오크밸리를 먼저 알아보기로 함. 관련 교수님들에게 메일을 보내기로 함.

3. APEC 관련
   1) 김성교 교수가 이란에서 열린 APEC 학회 참가 보고를 하였고 우리 학회를 대표해서 간 것이기 때문에 항공권 가격을 지원하기로 함.
   2) 2013년 APEC 학술대회 건
      ㄱ) 학술대회장에 백승호 교수가 맡아줄 것을 부탁하기로 함.
      ㄴ) 2013년 3월 23일부터 24일 이틀간 하기로 하며 금요일에는 pre-congress course를 진행한다.
      ㄷ) 장소는 코엑스 1층을 우선적으로 섭외해 본다.
      ㄹ) 가을에 열리는 유럽 엔도학회에서 홍보할 수 있는 포스터를 제작하기로 함.
      ㅁ) 학회 타이틀과 keynote speaker 에 대한 논의를 하였음.

4. 국제이사 보고
   7월 30일에 열리는 일본학회에 포스터 전시 일정을 조정해달라는 협조 요청을 보냈음.

5. 재무이사 보고
   1) 춘계학회 결산 보고를 하였음.
   2) 회원 정리를 위해 아르바이트 학생을 고용하여 8월 말까지 마무리 할 예정임.

● 2011년 하계 workshop

일 시 : 2011. 8월 26일(금) ~ 27일(토)
장 소 : 오크밸리
참석자 : 오태석, 최기운, 김성교, 황호길, 박동성, 김진우, 이우철, 박상혁, 장석우, 박세희, 민경산, 이윤, 정일영

15:00 ~ : 숙소 Check-in
15:30 ~ 22:00 : 회의 및 석식

1. 교과서 편찬 사업 결과 보고 및 향 후 일정
2. 근관치료학회 학회 인준 건 진행상황 보고
3. 2012년도 사업계획 보고
4. 2013년 APEC 학술대회 준비 위원회 구성 논의

● 2011. 3차 이사회

일 시 : 2011. 9. 30 (금) 저녁 6시 30분
장 소 : 만복림
참석자 : 오태석, 황호길, 박동성, 정일영, 이우철, 김미리, 김현철, 민경산, 장석우, 최성백
크리애드측 2명 (최성환 이사 포함)

1. 2013년 APEC 회의 후속 준비
   1) 크리애드측 보고
   코엑스 계약서류와 관련하여 알아보는중, 코엑스측에서 처음과 달리 APEC 행사가 코엑스측에서 정해놓은 국제회의의 기준이 적합하지 않아, 연내 계약이 어렵다고 하여서, 현재 대한근관치료학회로 APEC 기간내에 그랜드볼룸을 가블럭 만 시켜 놓은 상황임.
   2) 예약을 위해서는 사업자등록증과 예약금이 필요하며 약 820만원 정도가 들어갈 것으로 생각됨.
   3)APEC 전체 예산 점검
   등록비 결정 및 부스 확보에 많은 노력을 기울여야 함.
   4) 예산 확보를 위해 전현직 회장들이 다방면으로 노력하기로 함.
   5) 크리애드에서 준비한 APEC 홈페이지 화면 초안 이사진들이 검토해서 결정함

2. 2012년 정기 학회 준비
   1) 일시 : 2012년 3월 24~ 25일 (양일간)
   2) 장소 : 코엑스 (예정) 코엑스 측에서 내년 3월 행사는 12월 말이나 접수 받는다고 해서 예약 확정하지 못함.
   3) 학술 대회 일정을 학술이사가 조속히 확정해서 검토하기로 함.

3. 2012년에 새로이 출범할 새 집행부에 대해 논의 하였음.

● 2012-1차 이사회

일 시 : 2012. 2. 3 (금) 저녁 6시 30분
장 소 : 만복림
참석자 : 오태석, 김성교, 황호길, 박동성, 김의성, 김진우, 이우철, 김미리, 박상혁, 김현철, 민경산, 장석우, 최성백, 라성호, 정일영

1. 춘계학회 관련
   1) 학술이사가 연자들의 사진을 취합하였고 치의신보와 세미나 리뷰에 광고 의뢰 하여 각각 전면광고와 삼단 광고를 1회씩 한다.
   2) 연자료 와 등록비 및 기타
      국내 연자료: 30만원 좌장비 : 10만원
      사전 등록비: 회원 5만원, 비회원 8만원, 현장등록 10만원
      부스 사용료: 100 만원 (Hands on 시행 시 50만원 추가), 필덴트 및 라이카 구두 신청
   3) 춘계 학회 시 진행 요원
      접수 : 연세대 전공의 / 강의실 및 기타 진행 : 장석우 교수와 부산대 전공의
   4) 정보통신 이사가 춘계학회용 포스터 보드, 업체 대여용 책상 및 의자 가계약 하였음.
   5) 총회 안건 : 재무이사가 연회비 (3만원) 와 평생회비 (30만원)을 상정한다.
   6) 한일 공동학회 10주년 기념 ceremony에 대해서 총무이사가 이승종 교수에게 문의하여 본다.
   7) 토요일 저녁 일본측과 같이 저녁 식사를 하기로 하며 이를 위해 장석우 교수가 한미리나 광양불고기 등의 장소를 알아본다.
   8) 신수정 교수와 장석우 교수가 세텍을 다시 답사하여 정확한 부스 개수, 핸즈온 장소 및 일본 측 휴게 장소 등이 가능한지도 알아본다.

2. 2013년 APEC 학술대회 (3월 23-24일)
   1) COEX와의 계약은 3월 중으로 끝내기로 하며 이를 위해 총무이사가 학회 사업자 등록증 발급 건을 알아 본다.
   2) 3월 안으로 Preliminary 안을 일차로 만들어 중국 등 회원국에 전달한다.
   3) 기타 보다 세밀한 학회 준비 timetable을 만들기 위해 2월 29일과 3월 1일에 걸쳐 대전 또는 유성에서 workshop을 갖는다.

3.해외학회 대표 연자 선정
   2013 IFEA 박상혁 교수
   2013 한일 공동 학술대회 유미경 경수
   2013 APEC 원로 교수님들을 우선적으로 초청하기로 함.

4. 정보통신 이사 보고 사항
   1) 홈페이지에 근치학회 회원명단 게시 하였음.
   2) 춘계학회 프로그램을 홈페이지에 업로드 예정
   3) 외국 연자용 춘계학회 홈페이지 개설 예정

– 학술부

춘계학술대회 회계 보고

2009–2010년도 일반회계결산 (2010.3.11. 現)

내 역	수 입	지 출
전기이월 **결산이자** **춘계학술대회 이월금** **엔도포름(덴츠플라이)**	**₩ 43,836,783** **₩ 253,380** **₩ 3,174,090** **₩ 2,388,038**	
APEC연자 항공료지원		₩ 345,900
IFEA 연회비(2010)		₩ 416,297
교과서 편집위원회		₩ 439,400
홈페이지 관리 ('09 03–'09 12)		₩ 1,000,000
이사회비		₩ 1,498,650
차기이월		**₩ 45,952,044**
계	₩ 49,652,291	₩ 49,652,291

2009–2010년도 기금결산

내 역	수 입	지 출
전기이월		
1. 연회비, 평생회비	₩ 33,387,227	
2. 교과서인세	₩ 15,379,698	
3. 08춘계학술대회 광주시 지원금	₩ 5,750,000	
가입비 (1명)	₩ 80,000	
실습책 및 교과서 인세	₩ 4,260,000	
만기이자	₩ 2,197,436	
차기이월		
1. 연회비, 평생회비 및 예금이자		₩ 35,664,663
2. 교과서인세		₩ 19,639,698
3. 08춘계학술대회 광주시 지원금		₩ 5,750,000
계	**₩ 61,054,361**	**₩ 61,054,361**

2012년도 사업 계획(안)

–총무부: 회원 배가 및 회원 정리
학회 인준 노력

–학술부: 2012년 3월 춘계 학술대회 및 한–일 공동 근관치료학회

–재무부: 회비납부 촉구 및 정리

–국제부: APEC (Iran) 및 JEA and KAE Joint Scientific Meeting 참가
AAE 참가 (2011. 4. San Antonio, Texas, USA)
ESE (2011.9, Rome, Italy)

–편집부: 교과서 발간 완료 및 실습책 개정판 준비
학회지 발행

–기획부: 회원을 위한 교육프로그램 개발

–정보통신부: 홈페이지 운영

–공보, 섭외부: 국내외 학회 홍보

2009–2010년도 기금결산

항 목	수 입	지 출
전기이월	₩ 45,952,044	
춘계학술대회 추계학술대회	₩ 5,000,000 ₩ 2,000,000	
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대한치과근관치료학회 회칙

제정 1991. 12. 3.

제1장 총칙

제1조(명칭) 본회는 대한치과근관치료학회(THE KOREAN ACADEMY OF ENDODONTICS)라 칭한다.

제2조(근거) 본회는 대한치과의사협회 정관 제 57조에 의하여 성립한다.

제3조(장소) 본회는 서울특별시에 본부를 두고 각 시도에 지부를 둘 수 있다.

제4조(목적) 본회의 목적은 근관치료학 및 그와 관련된 학술의 연구와 정보교환을 통해 치과근관치료학의 발전을 이룩하고, 회원 상호간의 친목을 도모함에 있다.

제2장 회원

제5조(구분) 본회의 회원은 정회원과 명예회원으로 구분한다.

1. 정회원은 대한민국의 치과의사로서 본회의 취지에 찬동하며 회원의 모든 의무를 이행하는 자로 한다.
2. 명예회원은 본회의 발전에 현저한 공이 있는 자로서 이사회의 추천을 받아야한다.

제6조(입회) 본회의 정회원으로 입회를 원하는 자는 소정의 입회원서를 제출하고 소정의입회금을 납부하여야 한다.

제7조(의무) 본회 회원은 본회의 회칙 및 의결사항을 준수해야 하며 본회 소정의 회비를 납부하고 제반사업 및 회무에 협력할 의무가 있다.

제8조(권리) 정회원은 선거권 치선거권 및 의결권을 가지며 본회의 제반사업에 참여할 권리를 갖는다.

제3장 사업 및 조직

제9조(사업) 본회는 제4조의 목적을 달성하기 위하여 아래의 사업을 행한다.

1. 정기학술집회 및 기타강연회
2. 근관치료의 증례 발표 또는 상호 교환
3. 각국 근관치료학회와의 국제교류
4. 국내 근관치료학 발전을 위한 사업추진
5. 회원 상호간의 친목 및 경조에 관한 사항
6. 기타

제10조(조직) 본회의 사업을 원활히 수행하기 위해 다음의 부서를 두고 다음의 사항을 관리한다.

가. 총무부: 서무, 기획, 기구확장 및 본회 목적을 달성하기 위한 기타사항
나. 학술부: 학회, 학술 집담회 및 교육사업
다. 공보부: 국외 학술지 구독 및 연구, 국제학회 참가 및 국외학자 초청 교류업무
마. 재무부: 예산 및 결산 편성, 재정대책, 회비 징수 및 보조금, 찬조금에 관한 사항
바. 섭외부: 대내외적 섭외활동 및 각종 행사진행
사. 편집부: 학회지 출판 및 국내학술지 구입업무
아. 보험부: 의료보험에 관한 사항
자. 기획부
차. 정보통신부
카. 평생교육부

제4장 임원

제11조(구성) 본회는 다음의 임원을 둔다

가. 회장 1명

나. 부회장 3명

다. 각부이사 1명씩

라. 평이사 약간명

마. 감사 2명

제12조(선출) 회장 및 감사는 총회에서 투표에 의해 다수 득표자로 선출하고 기타 임원은 회장이 임명한다.

제13조(임무) 1항 본회 회장은 본회를 대표하며 본회의 모든 업무를 관장한다.

2항 본회 부회장은 회장을 보좌하여 회무를 수행하여 회장 유고시 회장 직무를 대행한다.

제5장 고문 및 자문위원

제15조(구성) 본회의 직전회장은 명예회장이 되며, 약간명의 고문과 자문위원을 추대할 수 있다.

제16조(추대) 고문과 자문위원은 임원회에서 추대하며 사회적으로 덕망을 갖추고 전문지식을 갖춘 분을 추대하는 것을 원칙으로 한다.

제17조(임무) 고문은 본회의 정신적 지도자로서 본회 단결의 상징적 구심점이 되며, 자문위원은 회장단 및 각 임원의 자문에 응한다.

제6장 회의

제18조 본회의 회의는 정기총회, 임시총회, 이사회 및 소위원회로 한다.

제19조 정기총회는 매년 1회 개최하며, 예산심의, 결산심의, 임원선출 및 이사회에서 부의한 안건을 의결한다.

제20조 임시총회는 임원회의 결의 또는 1/3이상의 요청에 의해서 회장이 이를 소집한다.

제21조 이사회는 회장 또는 임원 과반수의 요구에 의해서 회장이 이를 소집한다.

제22조 소위원회는 이사회의 결의에 의해 구성할 수 있고 특별한 안건이나 학술연마를 위해 구성한다.

제7장 재정

제23조 본회의 재정은 다음 수입으로 충당한다.

가. 입회비 나. 연회비 다. 평생회비

라. 대한치과 의사협회의 보조금 마. 찬조금 및 기타

제24조 입회비, 연회비 및 평생회비는 임원회에서 결정하여 총회에서 인준을 받는다.

제25조 현금은 회장 명의로 금융기관에 예치하고 증서를 총무이사가 보관한다.

제26조 본회 회계연도는 정기총회일로부터 익년정기총회전일까지로 한다.

제8장 부칙

제27조 본회 회칙에 규정되지 않은 사항은 일반 관례에 준하되 이사회의 동의를 구한다.

제28조 본회 회칙은 공포일로부터 그 효력을 발생하며 대한치과의사협회의 인준과 동시에 가칭을 정식명칭으로 바꾼다.

대한치과근관치료학회지 투고규정

1. 투고자격

대한치과근관치료학회 회원, 근관치료학과 그 관련분야 연구자의 원저, 증례보고 및 종설 등을 게재한다.

2. 원고의 제출처 및 제출 시기

원고는 대한치과근관치료학회 편집장에게 제출한다. 원고의 제출 시기는 특별히 정하지 않으며, 원고가 제출된 순서와 재고 진행상황에 따라 본 학회지 일호의 분량이 넘는 경우에는 차호에 게재한다.

편집장에게 질문이 필요한 경우 연락처는 다음과 같다.

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www.endodontics.or.kr

3. 원고의 종류

본 학회지는 원저, 증례보고, 종설, 독자의견, 학회 소식 등을 게재한다. 위에 속하지 않은 기타 사항 및 공고 등의 게재는 편집위원회에서 심의 결정한다.

4. 연구윤리 및 책임

대한치과근관치료학회지는 인간 및 동물실험에 따른 연구윤리 문제에 대해 대한민국 교육인적자원부와 학술진흥재단의 연구윤리 가이드라인을 준수하며 이차 게재와 이중 게재에 대한 대한의학학술지편집인협의회의 지침을 준수한다. 본 학술지에 실린 논문을 포함한 제 문헌에서 밝히고 있는 의견, 치료방법, 재료 및 상품은 저자 고유의 의견과 보고이며, 발행인, 편집인 혹은 학회의 의견을 반영하고 있지 않으며 그에 부수되는 책임은 원저의 저자 자신에게 있다.

5. 원고의 언어

원고는 국문 또는 영문으로 한다. 초록은 반드시 영문으로 작성하고, 맞춤법과 띄어쓰기를 정확히 하여야 한다. 용어는 공식 학술 용어를 사용하며 이해를 돕기 위해 괄호 속에 원어나 한자를 기입할 수 있다. 국문 용어가 없을 경우 원어를 그대로 사용한다. 약어를 사용할 경우에는 본문 중 그 원어가 처음 나올 때 원어 뒤 괄호 속에 약어를 표기하고 그 이후에 약어를 사용한다. 초록에서도 동일하다. 표(table), 그림설명(figure legend), 참고문헌(reference)은 영문으로 한다.

6. 원고의 저작권

제출된 원고를 편집위원회에서 재고 및 편집함에 있어 당 원고가 본 학회지에 게재될 경우 저작권은 본 학회지에 있다.

7. 동의의 획득

연구 대상이 사람인 경우 연구의 성격, 과정, 위해성 등이 충분히 고지된 상태에서 연구 대상인 사람의 동의는 물론 연구윤리위원회(IRB)의 승인을 얻어야 하며 논문 투고 시 반드시 첨부하여 제출하여야 하고 투고 논문의 재료 및 방법에도 이에 관한 문구를 반드시 명시하여야 한다. 동물 실험이 포함된 경우에도 소속기관, 혹은 국가에서 정한 지침을 따라서 진행되었음이 명시되어야 한다. 이미 출판된 자료나 사진 등을 직접 인용할 경우 원 저자로부터 동의를 얻어야 한다. 아직 발표되지 않은 자료나 타 연구자와의 개인적인 의견 교환을 통해 입수한 정보를 인용할 경우 원 저자로부터 동의를 얻어야한다. 인식 가능한 인물 사진 등을 인용할 경우 당사자로부터 동의를 얻어야 한다. 원고의 제출 시 위 사항에 대해 본 학회지에서는 원고의 저자가 당사자의 동의를 획득한 것으로 간주하며, 이에 대한 책임은 원고의 저자 자신이 진다.

8. 원고의 구성

모든 원고는 독자의 편이를 위해 가능한 한 간결하게 기술하여야 한다. 이를 위해 표와 그림을 포함하여 원고의 분량은 원저의 경우 A4용지 25쪽, 증례보고의 경우 13쪽 이내로 제한한다. 단위와 기호, 그림, 표, 참고문헌 등의 표기법은 치과근관치료학회지의 예시를 참조하여 통일되게 작성한다.

1) 표지

제목 (국문투고 시 국문, 영문 모두 표기), 저자명, 학위, 직위, 책임저자 표기(*) 및 모든 저자의 소속을 표기하며, 하단에는 책임저자의 소속, 직위, 주소, 전화 및 전송 번호, E-mail 주소를 표기한다.

2) 초록

초록은 국문 또는 영문으로 작성하여 제출한다. 연구의 목적, 연구 재료 및 방법, 결과, 결론을 소제목으로 사용하여 국문 500자, 영문 250단어 이내로 간결하게 기술한다. 초록의 말미에는 6개 이내의 주요 단어 또는 key word를 국문 초록에서는 국문으로, 영문 초록에서는 영문으로 표기한다. 단, 국문 원고의 경우 영문 초록에는 제목, 저자명, 책임저자의 표기 및 그 소속이 별도로 영문으로 표기되어야 한다.

3) 서론

연구의 의의와 배경, 가설 및 목적을 구체적으로 기술한다. 이를 위해 다른 논문을 인용하되 서론의 기술에 필요하며 학계에서 인정되고 있는 필수적인 논문을 가급적 제한하여 인용한다.

4) 연구 재료 및 방법

재료와 술식 및 과정을 기술하며, 독창적이거나 필수적인 것만을 기술한다. 통상적인 술식 및 과정으로 이미 알려진 사항은 참고 문헌을 제시하는 것으로 대신한다. 상품화된 재료 및 기기를 표기할 때에는 학술적인 명칭을 기록하고 괄호 속에 상품의 모델명, 제조회사명, 도시, 국가명을 표기한다.

5) 결과

결과는 총괄적으로 기술하며 필수적이고 명확한 결과만을 제시한다. 표, 그림 등을 삽입하여 독자의 이해를 돕고, 결과의 기술을 간략하게 하며, 세부적인 수치의 열거는 표와 그림을 인용함으로써 대신한다. 국문 원고의 경우에도 표와 그림에 대한 설명의 언어는 영어로 하며 SI (Le système International d' Unités) 단위와 확대율 등을 정확히 표기한다. 표, 그림 및 그림설명은 별도로 작성하여 제출하거나 원고 내에 결과가 기술되는 면에 포함될 수 있으나, 칼라인쇄의 경우는 원고의 말미에 첨부할 수 있다.

6) 총괄 및 고안

서론의 내용을 반복하지 않도록 하고, 결과의 의미와 한계에 대해 지적하며, 편견을 줄이기 위해 타 연구의 결과와 어떻게 다른지 반대 견해까지 포함하여 기술한다. 마지막 단락에 전체적인 결론을 간략하고 명확하게 정리하고, 필요한 경우 연구의 발전방향을 제시한다.

7) 감사의 표시

연구비 수혜 내용과 저자 이외에 연구의 수행에 도움을 준 대상에 대한 감사의 내용을 참고 문헌 앞에 기술할 수 있다. 다만, 연구비 수혜 내용은 편집 과정에서 논문의 첫 페이지 책임저자 연락처 아래에 표기한다.

8) 참고 문헌

인용 순서대로 본문에서는 일련번호의 어깨번호를 부여한다. 본문에서 저자명을 표기할 때는 성만을 표기하며, 저자가 2인 이상인 경우 성 사이에 '과(와)' 또는 'and' 를 삽입하고, 3인 이상인 경우 제1저자의 성만을 표기하고 그 뒤에 ' 등 ' 또는 ' et al.' 을 표기한다. 참고 문헌은 영문으로 작성하며, 인용 잡지명의 약자는 Index Medicus의 예 및 통상적 관례에 따르고 양식은 기존의 학회지의 스타일에 따른다.

9) 기타

종설은 근관치료학에 관련한 특정 주제로 하되 개인적인 의견이 아니라 근거에 기반을 둔 결론을 도출하도록 한다. 증례 보고의 양식은 서론, 치료과정, 총괄 및 고안으로 하는 것을 권장한다. 독자투고란에는 근관치료학에 관련된 이슈에 대한 질문과 논평 등을 게재할 수 있다.

9. 원고의 제출 양식

원고는 워드파일에서 글자크기 10으로 작성하고, 원고 전체에 대해서, 2줄 간격으로 저장하여 학회논문투고관리시스템에 올리기 메뉴를 이용하여 제출한다. 표, 그림 등은 출판에 적합한 용량의 파일로 제출하며, 최소 300 dpi에서 5 cm × 5 cm 이상의 화질 (500 dpi 권장)을 가져야 하고, 별도로 제출할 경우에는 게재 순서와 저자명을 파일명에 명확히 표기되게 하여야 한다.

* 원고 투고시에 반드시 cover letter (설명 편지)를 제출하여야 한다. 이 편지를 통해 저자는 원고에 대한 설명과 저작권의 양도, 이해관계, 및 동의의 획득에 관련된 필요한 사항이 있는 경우 그 내용을 기술하고 저자 모두 서명하여 원고와 함께 제출한다.

10. 원고의 게재 결정

제출된 원고는 편집위원회에서 위촉한 2명의 학계의 권위자에게 재고 의뢰 후, 게재 여부 및 수정의 필요성을 결정한다. 원고의 게재 결정 후 저자 요청 시 게재예정증명서를 발급할 수 있다.

11. 게재료

원고가 본 학회지에 게재된 경우 게재료는 저자가 부담함을 원칙으로 한다.

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