English 学内発表会

An Opportunity to Improve Your Oral Presentation Skills

日　時：平成 25年 3月 8日（金）　午後5時〜

会　場：日本歯科大学新潟生命歯学部　アイヴイホール

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会　場：日本歯科大学新潟生命歯学部　アイヴイホール
発　表：10分、質疑応答：5分

【Opening address】17:00~17:05

【Oral presentation session 1】17:05~17:25
Chairperson：Prof. TSUCHIMOCHI Makoto
1. Correlation of mandibular impacted tooth and bone morphology　determined by cone beam computed topography on a premise　of third molar operation
M. A. Momin　・R. Asaumi・T. Kawai・T. Yosue
Department of Oral and Maxillofacial Radiology, The Nippon Dental University School of Life Dentistry at Tokyo

【Oral presentation session 2】17:30~17:50
Chairperson： Prof. SANO Kimito
2. Dexmedetomidine extends the local anesthetic effective time of lidocaine without hemodynamic changing.
Tsutsui Y and Sunada K
Dept. of Anesthesiology, The Nippon Dental University School of Life Dentistry at Tokyo

【Oral presentation session 3】17:55~18:15
Chairperson：Prof. IGARASHI Masaru
3. *In vivo* tissue formation of mesenchymal stem cells derived from human extracted teeth.
Tamaki Y [1], Nakahara T [1], Ishikawa H [2], Sato S [3,4]
Department of Developmental and Regenerative Dentistry[1], Department of NDU Life Sciences[2], School of Life Dentistry at Tokyo, Department of Periodontology[3], Division of Cell Regeneration and Transplantation, Advanced Research Center[4], School of Life Dentistry at Niigata, The Nippon Dental University

【Oral presentation session 4】18:20~18:40
Chairperson：Assoc. Prof. KITAJIMA kayoko
4. Direct pulp capping effect with synthetic peptide derivatives (pA, pB) of dentin matrix protein 1 (DMP1) on exposed pulp in rat
Suzuki M, Taira Y, Kato C, Yamauchi J, Katoh Y, Shinkai K, Sasagawa I[2], Tsubokawa N[3]
Department of Operative Dentistry, The Nippon Dental University School of Life Dentistry at Niigata

【Oral presentation session 5】18:45~19:05
Chairperson：Prof. SHINKAI Kouichi
5. SEM observation of dentin walls after retropreparation
Arai K[1], Yanada R[2], Matsuda K[2], Kitajima K[1], Igarashi M[1]
[1] Department of Endodontics, School of Life Dentistry at Niigata, The Nippon Dental University
[2] Advanced Operative Dentistry・Endodontics, Graduate School of life Dentistry at Niigata, The Nippon Dental University

【Closing address】19:05~19:10

1. Correlation of mandibular impacted tooth and bone morphology determined by cone beam computed topography on a premise of third molar operation.

M. A. Momin ・R. Asaumi・T. Kawai・T. Yosue
Department of Oral and Maxillofacial Radiology, The Nippon Dental University School of Life Dentistry at Tokyo,

Introduction:

The extraction of a lower impacted third molar tooth is one of the most common oral surgical operations, yet many postoperative complications cause dysaesthesia as a result of damage to the inferior alveolar nerve (IAN) or lingual fracture of the mandible. Several factors increase the likelihood of developing these complications, including deeply impacted teeth, less experienced surgeons, the use of burs to remove bone, and the relationship between tooth roots and the mandibular canal. As well as determining the morphology of the mandible, it is necessary to preoperatively evaluate the radiographic relationship between the mandibular canal and impacted third molars.

A Cone beam computed tomography (CBCT) is a more accurate imaging modality for determining the relationship of the third molar to the mandibular canal.

The aim of this study was to determine the width and morphology of the mandible in the impacted third molar region, and to identify the location of the mandibular canal prior to planning impacted third molar operations.

Materials and Methods:

The CBCT data of 87 mandibular third molars from 62 Japanese patients were analyzed in this study. The width of the lingual cortical bone and apex-canal distance were measured from cross-sectional images in which the cortical bone was thinnest at the lingual side in the third molar region. These images were used for measuring the space (distance between the inner border of the lingual cortical bone and outer surface of the third molar root), apex-canal distance (distance from the root of the third molar tooth to the superior border of the inferior alveolar canal) and the cortical bone (width between the inner and outer borders of the lingual cortical bone). We classified the impacted third molar into three types from the cross-sectional images: type A, vertical, type B, horizontal, and type C, angular. The morphological shape of the mandible at the third molar region was then classified as: type D, round shape, type E, lingual extended, and type F, lingual concave.

Results:

The means of the space, apex-canal distance and lingual cortical width were 0.31, 1.99, and 0.68 mm, respectively. Impacted third molar teeth (types A–C) were observed at the following frequencies: type A (angular) 37 %; type B (horizontal), 42 %; type C (vertical), 21 %. The morphology of the mandible at the third molar region (types D–F) was observed as: type D (round), 49 %; type E (lingual extended), 18 %; and type F (lingual concave), 32 %.

Conclusions:

The width and morphology of the mandible with impacted teeth and the location of the mandibular canal at the third molar region could be clearly determined using cross-sectional CBCT images.

2．Dexmedetomidine extends the local anesthetic effective time of lidocaine without hemodynamic changing.

Tsutsui Y and Sunada K
Dept. of Anesthesiology, The Nippon Dental University School of Life Dentistry at Tokyo

Introduction:

Normally, we use vasoconstrictors such as adrenaline to extend local anesthetic effective time. However, the vasoconstrictors occasionally produce unacceptable cardiovascular side effects such as hypertension and tachycardia. Therefore safer and more effective new local anesthetic medicines are required. Recently there are reports that Dexmedetomidine (DEX) extend the effective time and enhances the local anesthetic effect of lidocaine. However, little work has been done to elucidate hemodynamic effect of lidocaine combined with DEX. Thus we studied whether DEX changes hemodynamic effect and anesthetic effect of lidocaine or not.

Materials and Methods:

All experiments were performed with adult male Wistar rats (weight, 250–350 g). We used the tail cuff method to measure blood pressure (BP) and heart rate (HR). Additionally, we use the plantar test to measure anesthetic effective time. The paw withdrawal latency was measured from the start of stimulation till the paw movement. Two percent lidocaine or/and DEX (0.5µg/kg) was injected into intraperitoneally or subcutaneously. Intraperitoneally injection was used to measure hemodynamic changing. Subcutaneously injection into plantar was used to measure local anesthetic effective time.

The paw withdrawal latency data were statistically analyzed using paired *t*-test. The data of BP and HR were statistically analyzed using repeated measure ANOVA. When differences were significant, Dunnett's test was performed to assess the differences in the means of basal BP and HR. P-value < 0.05 was considered significant.

Results:

The paw withdrawal latency was significantly extended by the 0.5µg/kg DEX plus 2% lidocaine injection. Furthermore, the systolic BP, diastolic BP and HR were not changed by the 0.5µg/kg DEX plus 2% lidocaine injection. All results were compared with 2% lidocaine.

Conclusion:

DEX extends the local anesthetic effective time of lidocaine without any hemodynamic changing. Lidocaine combinations with DEX may become a new local anesthetic medicine without important side effects.

3. *In vivo* tissue formation of mesenchymal stem cells derived from human extracted teeth.

Tamaki Y [1]), Nakahara T [1]), Ishikawa H [2]), Sato S [3,4]
Department of Developmental and Regenerative Dentistry[1]), Department of NDU Life Sciences[2]), School of Life Dentistry at Tokyo, Department of Periodontology[3]), Division of Cell Regeneration and Transplantation, Advanced Research Center[4]), School of Life Dentistry at Niigata, The Nippon Dental University

Introduction:

In the previous *in vitro* study, we isolated and characterized mesenchymal stem cells derived from the dental pulp (DPSC), periodontal ligament (PDLSC), apical papilla (APSC) and dental follicle (DFSC) of mature and immature teeth. All of the dental stem cells (DSCs) showed almost identical properties in terms of gene expression profiles and multidifferentiation potentials such as osteogenic, adipogenic and neurogenic lineages. On the other hand, their clonogenic and proliferative potentials were significantly different as follow: DFSC > APSC > PDLSC > DPSC. Our objective of this study is to investigate the tissue forming potential *in vivo* through the transplantation experiments.

Materials and Methods:

DSCs were cultured in a standard growth medium consisting of DMEM/F12 containing 15% FBS. Approximately 1.0×10^6 cells of each cell types of DSCs (passage 3) were mixed with 40 mg of hydroxyapatite powder (HA) and collagen gel just prior to transplantation. The cell-scaffold construction was transplanted subcutaneously on the dorsal surface of immunocompromised mouse (CB17. Icr-scid female, 6-week-old). The scaffold mixture without cells was implanted in a same manner as the control. For histological examination, the samples were collected 16 weeks after the transplantation and were fixed with 10% neutral buffered formalin. They were then decalcified, embedded in paraffin, and cut into serial sections (5 μm). The specimens were stained with hematoxylin and eosin and Masson's trichrome. To examine the formed tissue, immunohistochemistry was performed using antibodies against human specific vimentin, periostin, dentin sialoprotein (DSP), and bone sialoprotein (BSP). The primary antibody was omitted during immunostaining as a negative control.

Results:

Histological examination showed that the transplanted DSCs formed hard tissues on the surface of HA. Interestingly, DFSC and APSC formed the hard tissues greater than those of DPSC and PDLSC. In contrast, no hard tissue was observed in the control transplants. Immunohistochemistry showed that all of the transplants were entirely positive for vimentin and periostin antibodies, while they were partially positive for BSP and DSP antibodies. No positive immunoreactivities were observed in the control transplants.

Discussion and Conclusion

These results indicated that the DSCs mixing with HA and collagen gel could form hard tissue and were positively stained with the antibodies for bone/dentin matrix proteins. Moreover, they were also positive for human specific antibody, vimentin, suggesting that the hard tissue was formed by the transplanted DSCs. The present study demonstrated that human DSCs have a hard tissue forming potential. Notably, DFSC and APSC might have the greater capacity to regenerate hard tissue. This study suggests that immature teeth are an excellent cell source for hard tissue regeneration. Further studies are required to distinguish between dental stem cell characteristics.

4. Direct pulp capping effect with synthetic peptide derivatives (pA, pB) of dentin matrix protein 1 (DMP1) on exposed pulp in rat

Suzuki M, Taira Y, Kato C, Yamauchi J, Katoh Y, Shinkai K

Department of Operative Dentistry, The Nippon Dental University School of Life Dentistry at Niigata

Objective:
This study examined the wound healing process of exposed rat pulp when capped with experimental adhesive resin systems.

Materials and Methods:
Experimental adhesive resin systems for direct pulp capping were composed of primer-I (PI), -II (PII), -III (PIII), and an experimental bonding agent (EBE). PI was Clearfil SE Bond (CSE, self-etching adhesive system) primer (CSP) containing 5.0wt% $CaCl_2$. PII was PI containing nanofiller (Aerosil 380, hydrophilic fumed silica, specific surface area of 380 m2/g). PIII was CSP containing 5.0wt% compound of equal moles of pA and pB with synthetic peptides derived from dentin matrix protein 1 (DMP1). EBE was CSE bond containing 10wt% hydroxyapatite powder. PI was assigned to experimental Groups 1 and 3. PII was assigned to experimental Groups 2 and 3. PIII and EBE were assigned to all experimental groups. Control teeth were capped with calcium hydroxide preparation (Dycal). After direct pulp capping, all cavities were restored with a hybrid restorative resin composite (Clearfil AP-X). The rats were sacrificed after each observation period (14, 28, 56, and 112 days). The specimens were alternately stained with Mayer's H&E and the enhanced polymer one-step staining method on polyclonal anti-DMP1.

Results:
There were no significant differences among the experimental groups for all parameters in each postoperative period ($p > 0.05$, Kruskal-Wallis test). All groups showed initial reparative dentin formation at 14 days postoperatively and extensive reparative dentin formation at 28, 56, and 112 days postoperatively, similar to the dentin bridge formation of the control group. Groups 2 and 3 demonstrated high-quality dentin bridge formation, consisting of tubular-type dentin without intervention of pulp tissue.

Conclusion:
Addition of nanofiller to the primer was effective in promoting high-quality reparative dentin.

5. SEM observation of dentin walls after retropreparation

Arai K[1], Yanada R[2], Matsuda K[2], Kitajima K[1], Igarashi M[1]
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Objectives:

The aim of this study was to examine the differences of the smear layer in the walls of retro cavities and to observe the shape of dentin chips, during retropreparation using with diamond points, carbide burs or ultrasonic tips.

Materials and Methods:

The roots of extracted porcine deciduous molars were cut horizontally into pieces of about 5mm length each. 24 pieces were enlarged with ProTaper F3 and retroprepared as follows: ultrasonic tips with water supply in group 1, ultrasonic tips without water supply in group 2, diamond points with water supply in group 3, carbide burs with water supply in group 4. The roots were separated longitudinally and the surfaces of retrocavity were observed with SEM. Dentin chips during preparation were collected and observed with a phase contrast microscope. The area, perimeter, maximum length and diagonal width of dentin chips were measured with commercialized computer software and analyzed statistically.

Results:

Group 1 and 2 showed rough and irregular surfaces, though group 3 showed striated and group 4 was smooth in SEM. The smear layer and dentin chips stuck to walls of cavity observed slightly in Group 1 and 2, and also observed a lot in group 3. However, there was little smear layer in group 4. Dentin chips in group 2 were biggest but there was no significant difference between each group.

Discussion:

There are smear layer and dentin chips on walls of cavity in group 1, 2 and 3, it is considered that marginal leakage and bacteria remaining in smear layer cause poor prognosis on clinical use. Therefore it is necessary to remove the smear layer using agents such as EDTA.

Conclusions:

The smear layer and residual of dentin chips were hardly observed on the cavity wall by using the carbide burs in retropreparation, however, they observed when used other instruments. Therefore the smear layer and size of the dentin chips during retropreparation were different by preparation methods.