Pulp Biology and Endodontics

1. Staffs and Students (April 2010)

Professor    Hideaki SUDA
Associate Professor    Chihiro KOBAYASHI, Mitsuhiko SUNAKAWA
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Graduate Student    Carlos Gabriel ADORNO-QUEVEDO,
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                      Bolortuya GOMB, Uraiwan CHOKHECHANACHAISAKUL,
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                      Ying LI, Kei KOMATSU,
                      Kana MIYARA, Mioko YAMAMOTO,
                      Ahmed Osama JAMLEH, Jindan PIAO,
                      Kazuto HURUHATA

2. Purpose of Education

The aim of the course is to train and educate graduate dental students so that they can act as leading clinical scientists, researchers or practitioners of endodontics in the world. Since recent progress of pulp biology and endodontics is remarkable, the students are educated to acquire the newest knowledge on modern endodontology and its related subjects, such as pulp biology, neuroscience, bacteriology, immunology and material sciences, and are trained to master the newest technology of endodontics. All the students are asked to add new findings to the field of endodontics based on their own original research. The graduates from this course are expected to disseminate new principles and techniques on endodontics among general dental practitioners and endodontic specialists.

3. Research Subjects

1) Defense systems in the dental pulp
2) Elucidation of periapical pathosis and regulation of periapical bone destruction
3) Developmental mechanisms of dentin/pulp complex and horizon of its regeneration
4) Root canal irrigation
5) Development of the new apex locator
6) Strain of the root canal dentin
7) Application of medicine to endodontics
8) Safety control in dentistry
9) Application of laser to endodontics
10) Analysis of nickel-titanium endodontic instruments
11) Electrophysiological approach to cell-to-cell couplings between odontoblasts
12) Diffusion through enamel and dentin
13) Lymphangiogenesis in the dental pulp
14) Neuro-scientific research for dental pain
15) Logistic regression equation to screen for vertical root fractures using cone-beam CT (3DX)
16) Global Center of Excellence (GCOE) Program
   “International Research Center for Molecular Science in Tooth and Bone Diseases”
17) Molecular biological approach to the alveolar bone resorption associated with pulpal diseases
18) Sealing ability of temporarily filling and retrofilling materials
19) Application of optical coherence tomography
4. Clinical Services

Pulp Biology and Endodontics is in charge of the Endodontic Clinic in our Dental Hospital, and offers the global standard of endodontics to our patients. The representative treatments provided in our clinic are as follows:

- Diagnosis and treatment of pulpal and periapical diseases
- Protective procedures for the dental pulp
- Nonsurgical endodontic treatment
- Surgical endodontic treatment
- Bleaching discolored teeth
- Restoration of endodontically treated teeth

The latest development of endodontics is remarkable as seen in root canal instrumentation by super-elastic NiTi rotary files, root canal length measurement with newly developed electronic apex locators, diagnosis by cone beam computed tomography, and microendodontics by using a surgical microscope. Especially, microendodontics has dramatically changed conventional “blind” endodontics into more predictable endodontics by efficient and reliable procedures under a lightened and magnified view. Also, we seek to provide evidence-based endodontic treatment based on our clinical research.

5. Publications

Original articles