Advanced Course in Dental Medicine VIII

Lecture Academic year 1,2 credits 1

[Keywords] tooth movements, bone remodeling, bone formation, bone resorption

[Academics] Separately known

[Course aims]
When a force above a certain intensity is exerted on a tooth over a certain period of time, bone remodeling occurs in the alveolar bone around the tooth, and the tooth migrates in the direction of the action of the force. Generally, bone resorption occurs on the side that corresponds to the direction of the action of the force (the pressured side), whereas bone formation occurs on the side opposite to that of the direction of the action of the force (the traction side). Orthodontic tooth movements develop as a result of a complex reaction of various cells present in periodontal tissues in response to the orthodontic force.
The purpose of this course is to deepen basic understanding of the biology of tooth movements by performing animal experiments on the reaction of periodontal tissues to orthodontic force.

[Course objectives]
The goals of this course are for the student to be able to:
1. Explain the roles of the cells present in periodontal tissues that are involved in tooth movements, as well as their response to the orthodontic force.
2. Deal with experimental animals (induction of anesthesia, procedures involved in euthanasia) as well as carry out proper management during surgery.
3. Conduct experiments on tooth movements.
4. Understand the basic principles of the sample fixation procedure, decalcification, as well as the preparation of paraffin sections needed in the preparation of tissue samples; be able to prepare tissue samples.
5. Explain the changes in periodontal tissue-related cells on the basis of tissue samples.

[Course content]

Class	Theme	Content	Academics
1	Principles and features of tooth movements		
2	Procedures used in animal experiments on tooth movements		
3	Methods of preparation of decalcified tissue samples		
4	Methods of observation of decalcified tissue sample		
5	Methods of preparation of undecalcified tissue samples		
6	Method of observation of undecalcified tissue samples		
7	Actual data processing		
8	Simulations for the preparation of conference presentations and thesis presentations		

[Class implementation method]
Combination of face-to-face learning and distance learning
Class implementation depends on the implementation policy of each department (graduate school) or school.

[Grading policies]
Attendance status, submissions

[Textbook]
Will be indicated during class.

[Reference book]

Same as above

[Preparation for course]
Students are expected to conduct a search for reference literature on a personal research topic among articles published in Japan and abroad.