

Doctoral dissertation

Examination of the pharyngeal airway space and sleep-breathing changes post-mandibular setback

(下顎骨後方移動術における咽頭気道形態および睡眠
呼吸変化の評価)

Koji Iwai

Biomedical Sciences Major, Doctoral Course
Graduate School of Biomedical & Health Sciences
Hiroshima University

AY2019

Chief academic supervisor : Professor Kotaro Tanimoto
(Graduate School of Biomedical and Health Sciences, Department of
Orthodontics and Craniofacial Developmental Biology)

Table of Contents

1	Introduction.....	7
2	Aim.....	10
3	Materials and methods.....	11
3.1	Subjects.....	11
3.2	Statistical analysis.....	13
4	Procedure I, Cephalometric analysis.....	14
4.1	Radiographic examination.....	14
4.2	Reference anatomical landmarks and plane.....	14
4.3	Measurements.....	16
4.3.1	Pharyngeal airway space.....	16
4.3.2	Soft palate.....	19
4.3.3	Dento-skeletal analysis.....	20
5	Procedure II, MSCT (Multislice computed tomography) analysis.....	21
5.1	Radiographic examination.....	21
5.2	Measurements.....	22
6	Procedure III, At-home sleep monitoring and daytime sleepiness survey.....	27
6.1	The portable sleep monitor.....	27
6.2	Signals.....	29
6.3	The Epworth Sleepiness Scale (ESS) survey.....	30
7	Results.....	32
7.1	Dento-skeletal changes.....	32
7.2	Cephalometric analysis of the pharyngeal airway morphology.....	33

7.3	MSCT analysis of the pharyngeal airway morphology.....	36
7.4	Assessment of at home sleep monitoring and daytime sleepiness survey.....	39
7.4.1	At-home sleep monitoring.....	39
7.4.2	ESS survey.....	41
8	Discussion.....	43
9	Summary.....	52
10	Conclusion.....	54
11	References.....	55
12	Complimentary materials.....	64
13	Figure legends.....	65