

学 位 論 文 内 容 の 要 約

氏名	高山 明裕
論文題目	Changes in cross-sectional measurements of masseter, medial pterygoid muscles, ramus, condyle and occlusal force after bi-maxillary surgery(上下顎骨切り術後の咬筋、内側翼突筋、下顎枝、下顎頭、咬合力の断面測定値の変化の検討)
<p>Purpose: The purpose of this study was to examine changes in masseter and medial pterygoid muscles, ramus, condyle and occlusal force after bi-maxillary surgery in class II and III patients.</p> <p>Subjects and methods: The subjects consisted of 42 Japanese female patients (84 sides) with jaw deformities diagnosed as skeletal classes II and III, to exclude the gender difference. This was a retrospective factorial cohort study and informed consent was obtained from the patients. Conventional lateral cephalometric measurements were analyzed pre-and post-operatively, according to previous reports. All 42 patients underwent sagittal split ramus osteotomy with Le Fort I osteotomy. Twenty one class II cases were mandibular advancement and 21 class III cases were mandibular setback performed by the method reported previously. A high-speed, advantage-type CT generator (Aquilion One; Toshiba Medical Systems Corp, Tochigi, Japan) was used, similar to the method reported previously. CT measurements were performed using a similar method reported previously. The RL line was determined as the line between the most anterior points of the bilateral auricles at the plane parallel to the FH plane. Multi planner reconstruction can be established in the software such that the arbitrary plane can be moved parallel to the plane in which the RL line was determined. The horizontal plane above the mandibular foramen parallel to the FH plane was identified on the right and left sides, and the masseter and medial pterygoid muscles, and ramus were measured in each side preoperatively and at 1 year postoperative. Condyle was measured on each side in the plane parallel to FH where maximum area of the condyle was recognized (Simplant®, Materialise, Leuven, Belgium) and (Image J®, National Institutes of Health, ML, USA) the items listed below.</p> <p>Results: 3.1. CT measurements In class III, ramus area ($P < 0.0001$), ramus length ($P = 0.0054$), ramus width ($P < 0.0001$), masseter length ($P = 0.0122$), med pterygoid area ($P = 0.0021$) and med pterygoid length ($P = 0.0092$) increased significantly after 1 year. In class II, the area ($P = 0.0003$) and width of the masseter muscle ($P < 0.0001$) decreased significantly, while ramus length ($P = 0.0171$), masseter length ($P = 0.0107$) and med pterygoid width ($P < 0.0001$) increased significantly after 1 year. Preoperatively, class II was significantly larger than class III in ramus area ($P = 0.0050$), ramus width ($P = 0.0089$), masseter width ($P = 0.0068$), med pterygoid area ($P < 0.0001$) and med pterygoid length ($P < 0.0001$). However, class II was significantly smaller than class III in med pterygoid width ($P < 0.0001$). After 1 year, class II was significantly smaller than class III in the length of masseter muscle ($P = 0.0017$).</p> <p>Class II remained larger than class III in ramus width ($P = 0.0408$), and the square of medial pterygoid muscle after 1 year ($P = 0.0343$). In class III, condylar area ($P = 0.0181$) and masseter vertical length ($P = 0.0001$) increased significantly after 1 year. However, there was no difference in the condylar angle, thickness and width.</p>	

学位論文内容の要約（続紙）

氏名	高山 明裕
<p>In contrast, in class II, condylar angle ($P = 0.0369$), condylar width ($P = 0.0001$), and masseter vertical length ($P = 0.0191$) decreased significantly after 1 year. Class II was significantly larger than class III in condylar angle pre-operatively ($P < 0.0001$) and after 1 year ($P = 0.0006$), and class II was significantly smaller than class III in masseter direction angle pre-operatively ($P < 0.0001$) and after 1 year ($P = 0.0006$). After 1 year, class II was significantly smaller than class III in condylar thickness ($P = 0.0020$), condylar width ($P < 0.0001$), and condylar area ($P < 0.0001$). After 1 year, class II was significantly larger than class III in masseter vertical length ($P = 0.0005$), although there was no significant difference between classes II and III pre-operatively.</p> <p>3.2. Cephalometric analysis There were significant differences between classes II and III in SNB ($P < 0.0001$), Mandibular plane angle ($P = 0.0007$), and Overjet ($P < 0.0001$), pre-operatively. There were significant differences between classes II and III in SNB post-operatively ($P = 0.0142$).</p> <p>3.3. Occlusal force and contact area There was no significant difference between pre-and post-operative values in both classes II and III. Furthermore, there was no significant difference between classes II and III preoperatively and at 1 year post-operative.</p> <p>Discussion: When mechanical stress in the maxillo-facial region is calculated using a mathematical model, the force generated by the masticatory muscles, occlusal force and stress on the condyle are required in order to determine the equations. Although stress on the condyle and masticatory muscle force cannot be measured directly, occlusal force alone can be measured directly with a device. Therefore, it is very important to integrate the morphological data such as masseter and medial pterygoid muscles, ramus and condyle and the functional data such as occlusal force before and after orthognathic surgery.</p> <p>Conclusion: This study suggested that changes in the cross-sectional measurements of masseter and medial pterygoid muscles and the condyle differed between class II and class III patients, although occlusal force did not significantly change 1 year after surgery in both groups.</p>	