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学位論文名	**Changes in Dentofacial Morphology in Skeletal 3 Children Treated by a Modified Maxillary Protraction Headgear with a Chin Cup:A longitudinal cephalometric appraisal** **（骨格性3級を呈する思春期女子の顎顔面形態に対する上顎前方牽引装置の効果）**
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論文内容の要旨

Introduction

Patients who reveal skeletal 3 malocclusion have been reported to show recessive growth of the maxilla or combination of the recessive maxilla and the excessive mandible. Previous studies have shown that use of a maxillary protraction headgear (MPH) can provide favorable treatment results. To date, however, there have been no human studies, on a longitudinal basis, which investigated optimum timing for use of the MPH during pre-adolescent to adolescent periods to stimulate sufficient forward displacement of the maxilla. The purpose of the current report was to investigate cephalometrically possible orthopedic effects of a modified maxillary protraction headgear with a chin cup on dentoskeletal morphology in skeletal 3 female patients before and during the pubertal period and to discuss the optimum timing for applying the MPH appliance.

Materials and Methods

Sixty-one patients were divided into three groups, the pre-pubertal (7−10 years, n=20), the mid-pubertal (10−12 years, n=22) and the late-pubertal (12−15 years, n=19) groups. The mean ages at completion of the MPH use were 8.9, 11.3 and 13.3 years for the aforementioned three test groups, respectively. The average treatment time was 1.1, 1.0 and 1.4 years for each of these groups. Patients wore either a lingual arch appliance or an edgewise archwire and they were protracted from the upper canine area by intraoral elastics, while extraoral elastics was used with a chin cup. The MPH was applied eight hours per day. Lateral cephalograms at the start and completion of use of the MPH were collected. Longitudinal record sets of subjects with acceptable good occlusion were used as the control. To understand morphologic characteristics of dentoskeletal structures of the test groups before treatment, profilograms with calculated means and SDs of the X-Y coordinates for each cephalometric landmark for the initial records were compared with those of the control group. To evaluate possible treatment effects by the MPH appliance, annual differences were calculated from the paired records for each of 21 dentoskeletal variables in the test groups and compared to those of the control group.

Results

All three test groups revealed a smaller maxilla, a larger mandible with retroclined lower anteriors and proclined upper incisors at the start of the MPH treatment when compared with the corresponding control group. As for the annual differences, the values of mean ± 1 SD in the test groups showed that the pre- and the mid-pubertal groups revealed significant increases in both the ∠S-N-A (1.51°±1.16°, $p<0.01$ and 2.04°±1.51°, $p<0.001$) and the maxillary length (Ptm-A／PP : 2.16mm±1.17mm, $p<0.01$ and 2.30mm±1.99mm, $p<0.01$), while the late-pubertal group showed a less significant increase in the ∠S-N-A (0.94°±1.10°, $p<0.05$) alone. The decreased ∠S-N-B (−2.11°±2.08°, $p<0.001$ and −1.21°±2.05°, $p<0.01$) increased ∠A-N-B (3.62°±1.87°, $p<0.001$ and 3.25°±1.91°, $p<0.001$) and ∠SN-MP (1.88°±2,62°, $p<0.01$ and 1.59°±2.54°, $p<0.01$) in along with increases in the total face height (5.79mm±3.64mm, $p<0.01$ and 6.01mm±2.84mm, $p<0.001$) and the lower face height (3.12mm±2.93mm, $p<0.05$ and 4.07mm±2.74mm, $p<0.001$) of the pre- and the mid-pubertal groups accounted for the backward and downward rotation of the mandible.

Conclusion

The results suggest that more apparent orthopedic effects of the MPH on dentoskeletal morphology are obtained in young females when it is applied before or during acceleraion of the pubertal growth spurt than late-pubertal growth period.

論文審査の結果の要旨

本研究は，骨格性３級の下顎前突を呈する女子につき，思春期のどの時期に上顎前方牽引装置を使用するのが顎顔面形態の改善に対して最も効果的かを側面位頭部Ｘ線規格写真を用いて経年的に検討したものである。

その結果，思春期以前および思春期前期から上顎前方牽引装置を使用するのが最も効果的であり，思春期後期では顎顔面形態の改善に寄与する所が少ないということが明らかとなった。この治療効果は上顎部の前後径のより大きな成長発育と下顎骨の後下方への回転によるものであった。

本研究で得られた知見は，従来知られていなかった上顎前方牽引装置の有効性とその最適な使用時期を初めて明らかにしたものであり，骨格性下顎前突症患者の治療についてきわめて有効な指針を与えるものである。したがって，本研究は博士（歯学）の学位請求に十分値する業績であると認める。