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## AIM OF THE STUDY

To study the effect of force magnitude on the permanent upper canines in cervical headgear (CHG) therapy.

## SUBJECTS AND METHODS

Subjects with Class II or end-to-end molar relationship, mixed dentition and moderate crowding to be treated with CHG were recruited for the study. Patients were allocated to light (L, 300 g) or heavy (H, 500 g) force in the CHG. Adjustment in the CHG was made while patient was sitting and looking straight ahead. The inner bow of the CHG was expanded (3-4 mm) and the long outer bow bent upwards 10-20° in relation to the inner bow. Patients were asked to wear CHG for 10 hours/day. CHG use was controlled and adjusted every 6-8 weeks till end of the study at 10 months. Adherence to instructions and force magnitude in CHG use was monitored by an electronic module (Smartgear, Swissorthodontics, Switzerland). Panoramic radiograph was taken before (T1) and after (T2) the treatment. The angle between long axis of the permanent upper canine to condylar line (Angle 3/Co) and to midline (Angle 3/Mid) were measured on both sides. Mann-Whitney U- test and Wilcoxon test were used for statistical analysis. This study is based on 40 children, 15 male and 25 female; L group: n=22, mean age 9.7 ±0.7 years; H group: n=18, mean age 9.9 ±0.7 years.

## RESULTS

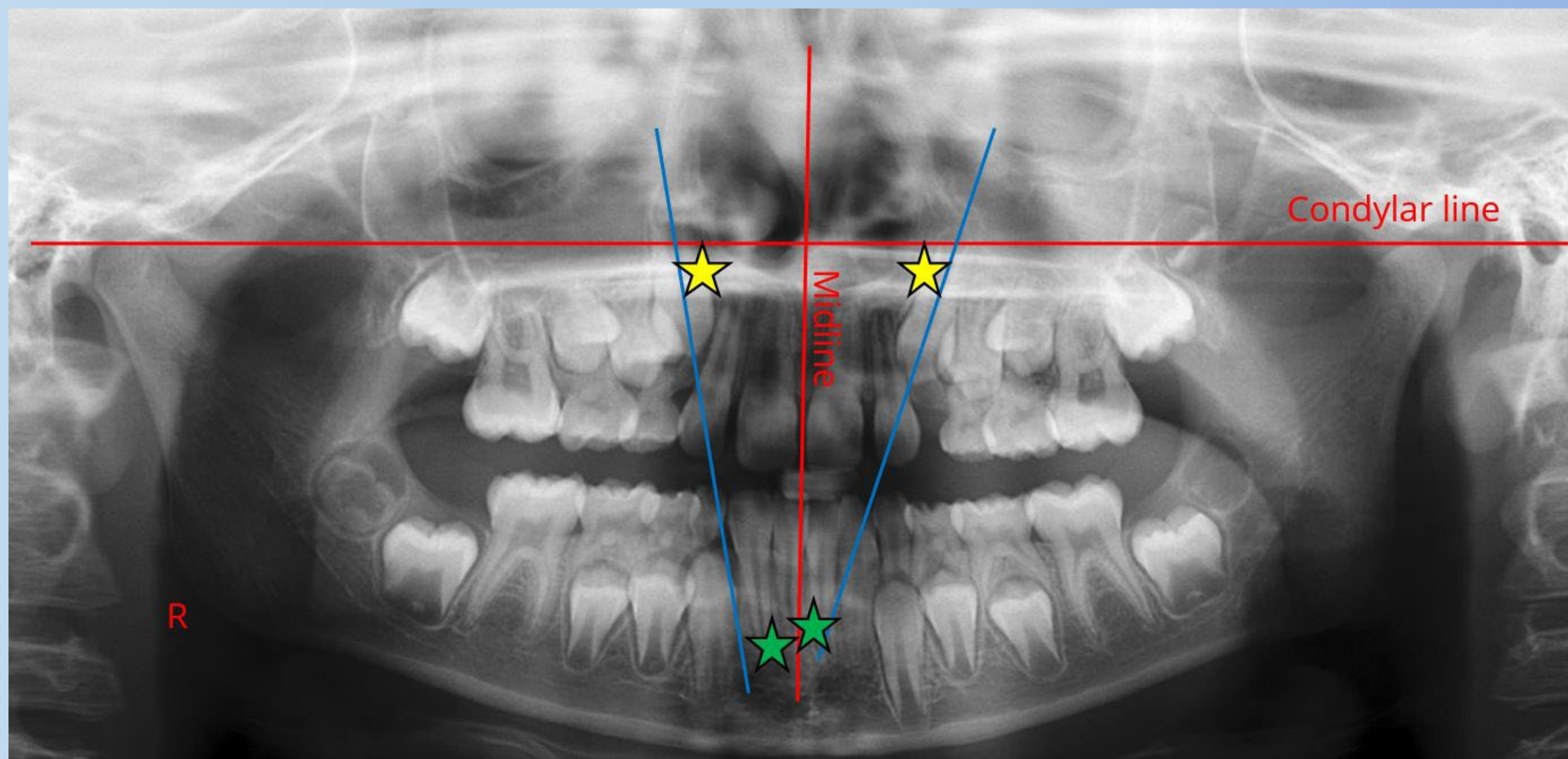
Children in the L group used CHG statistically significantly more than in the H group (10.0 h ±1.5h, and 8.3 h ±2.1h, respectively, p=0.002). At T1 and T2 no statistical difference was found between the groups. During T1-T2 on the right the Angle 3/Co increased by 7.3°± 6.5°; p=0.000 and 8.2°±6.2°; p=0.000 and on the left by 7.0°±7.5°; p=0.000 and 6.6°±6.3°; p=0.001 in L and H groups; respectively. The Angle 3/Mid decreased on the right by -4.6°±6.7°; p=0.012 and -5.4°±5.3°; p=0.002 and on the left -5.5°±6.0°; p=0.000 and -4.1°±7.2°; p=0.031 in L and H groups; respectively.

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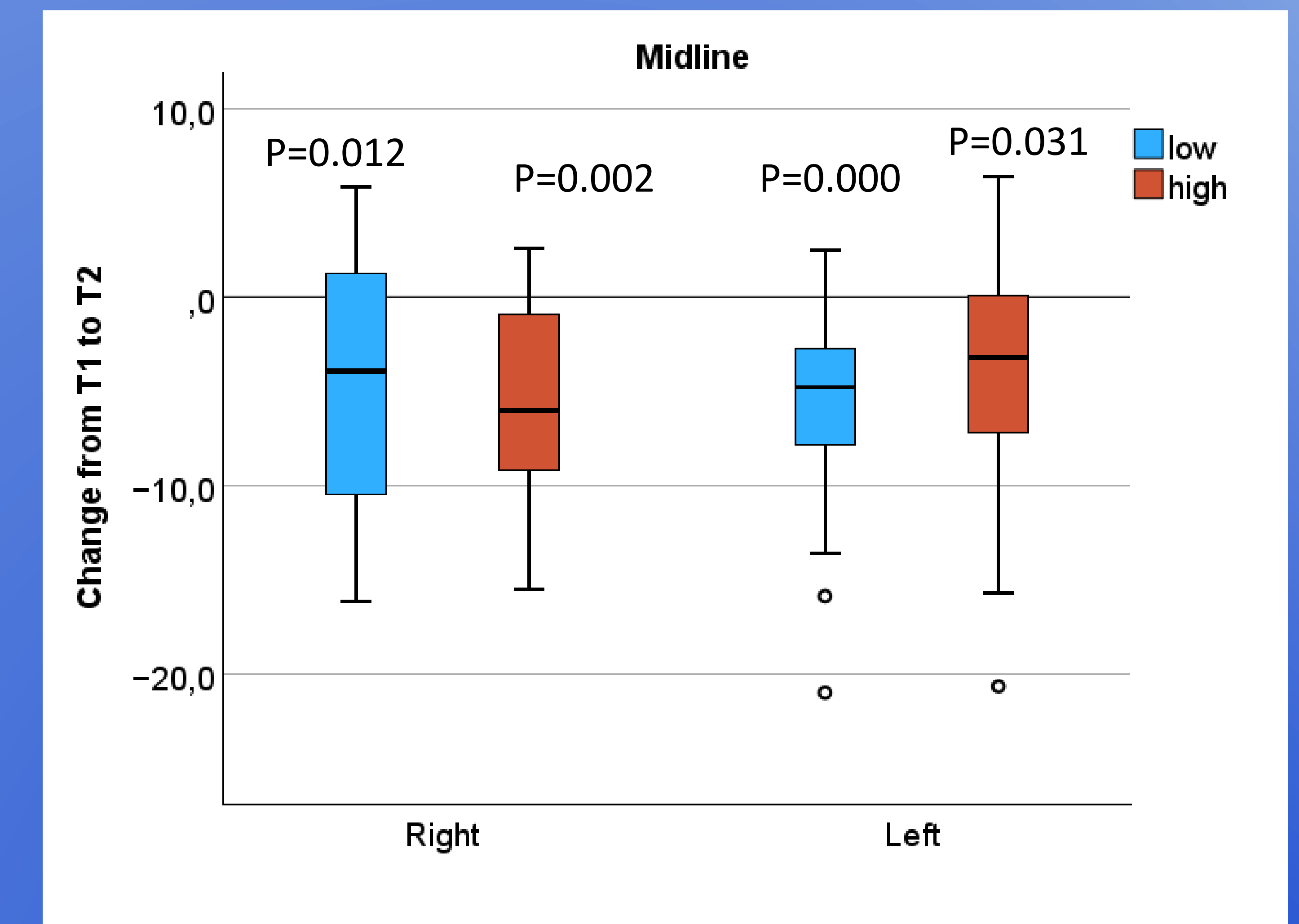
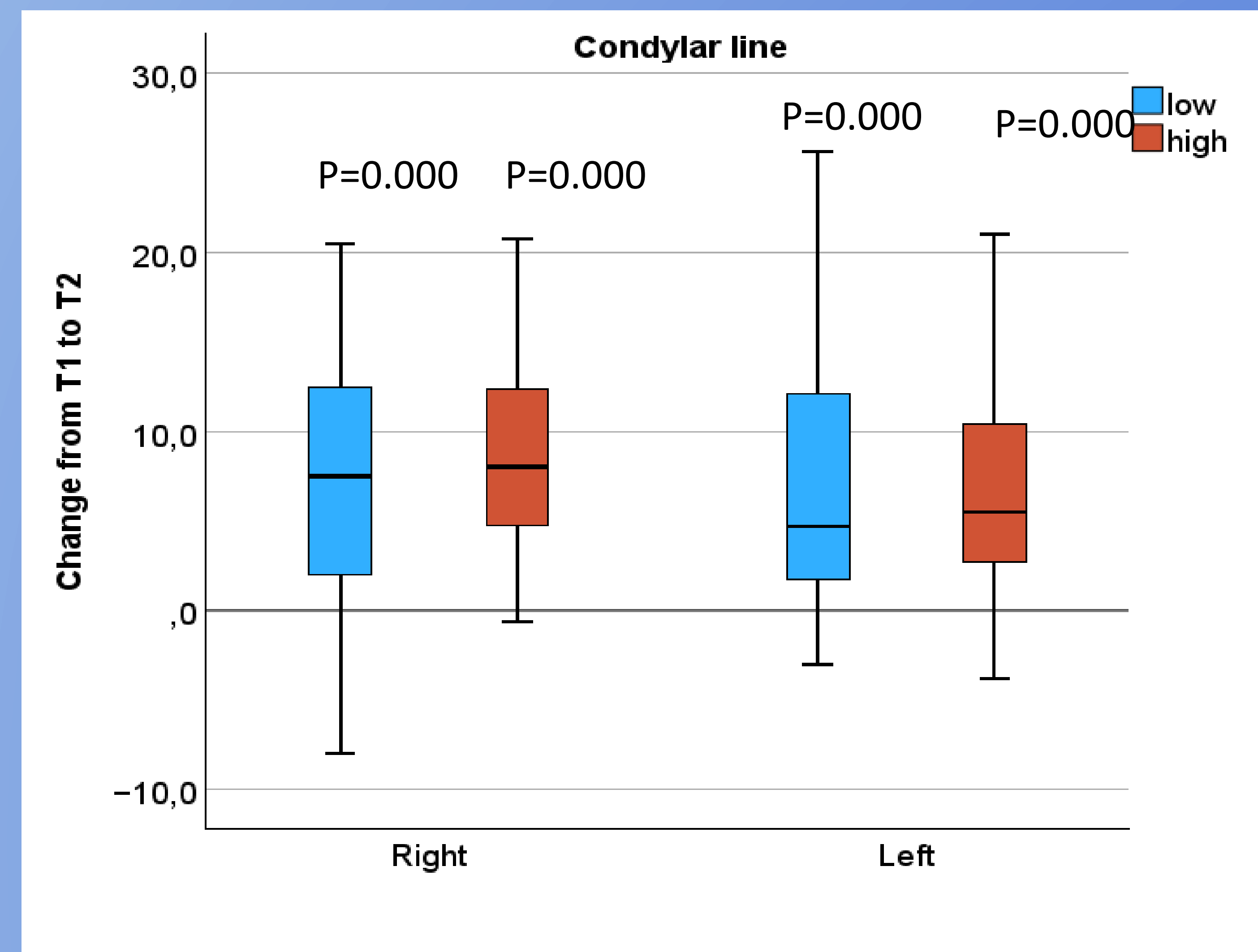
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**Figure 1.** Angulation of the upper canine was measured before and after the study according to Hadler-Olsen et. Al. (2018).



**Figure 2 and 3.** Position of the upper canine compared to condylar line and midline changed to more upright position during the CHG therapy. The change was statistically significant in both groups, but no difference was found between the groups.

## CONCLUSIONS

According to the panoramic analysis eruption path of the upper permanent canines changed to more upright position during the cervical headgear treatment without statistically significant difference between the groups in terms of force magnitude. Great individual variability was found in the position change of the canines in both force magnitude groups in the cervical headgear.