Dentoskeletal changes in Class II malocclusion patients after treatment with the Twin Block functional appliance

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Abstract

Objective: This prospective clinical study evaluated dentoskeletal changes in Class II malocclusion patients after treatment with the Twin Block functional appliance. **Methods:** The treatment group consisted of 19 subjects (mean age 9.5 years) and the control group consisted of 19 subjects (mean age 9.9 years) situated before pubertal growth spurt. Unpaired Student's t test showed the sample homogeneity at the beginning of the study. Initial (T1) and one year follow-up (T2) cephalometric radiographs were obtained for all subjects. Wilcoxon test and Mann Whitney test were used to evaluate changes intra and inter groups from T1 to T2. **Results:** A Class I molar relationship was achieved in 15 subjects of the treated group while no modification occurred in the control group. No significant effect was observed either in the maxilla or in the vertical pattern. A significant increase in total mandibular length and an anterior displacement of the mandibular position occurred in the treated group ($p<0.05$) as well as an overjet reduction, influenced by significant upper incisor retroclination and lower incisor proclination ($p<0.05$). **Conclusions:** Class II treatment with the Twin Block appliance in Brazilian patients showed skeletal and dental effects, including increase in mandibular length and incisors compensation, respectively.

Keywords: Class II malocclusion. Functional appliance. Growth.

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Editor's abstract

Facial profile and balance are directly influenced by the growth of facial bones. In case of disharmony between maxilla and mandible, orthodontic treatment during the pubertal growth spurt may reposition and improve their relation. Functional orthopedic appliances can be cited among the appliances that deliver orthopedic manipulation. The Twin Block (TB) is a specific functional appliance used in Class II mandibular deficiency treatment. Several studies in the literature had already assessed its effectiveness, but the samples were based on European and North American populations. Therefore, a question arises: "Would the results be the same in the Brazilian population?"

Based on this premise, the authors' proposal with the present study was to assess maxillomandibular skeletal and dentoalveolar changes with Twin Block (Fig 1) treatment in a Brazilian sample. A prospective randomized clinical study was then conducted with a sample involving 38 patients. Sample selection was based on the following inclusion criteria: Skeletal Class II (ANB > 4°); Class II molar relationship; overjet >6 mm, and absence of previous orthodontic treatment. The included individuals were in the phase preceding the prepubertal growth spurt. After the sample selection, it was randomly divided into two groups: The TB group, with 12 boys and 7 girls and the control group (CG), also with 12 boys and 7 girls. Cephalometric radiographs were obtained at the beginning of the study (T1) and after one year follow-up (T2). Wilcoxon and Mann Whitney tests were used to assess changes intra and intergroup from T1 to T2. A molar relationship correction was observed in 80% of the treated patients, while no changes were observed in the control group. No changes were observed in the maxilla or in the vertical growth pattern of the face. A significant increase in mandibular length and an anterior displacement of the mandible were observed in the treatment group ($p<0.05$), such as an overjet decrease, influenced by significant upper incisors retroclination and lower incisors proclination ($p<0.05$). The authors concluded that Class II malocclusion treatment with the Twin Block functional appliance presented skeletal and dental effects, including increase in mandibular length and incisors compensation, respectively.

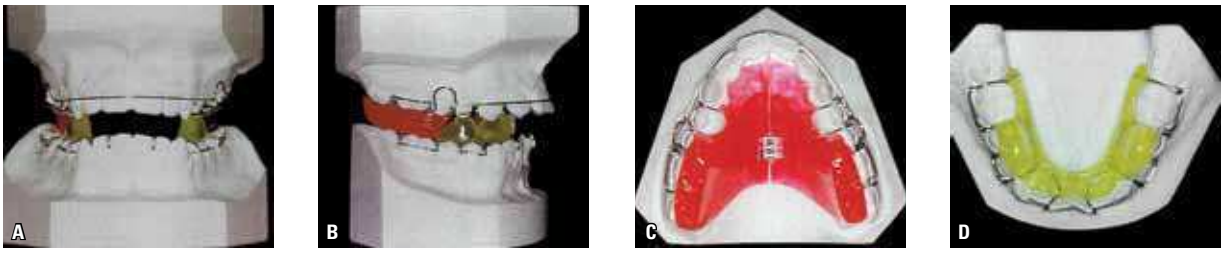

FIGURE 1 - Twin Block appliance design used in this study.

Questions for the authors

1) In the authors' opinion, under the methodological point of view, what are the negative and positive points of this study?

From the authors' point of view, the sample size was consistent, statistics was correct, and the main positive point was the fact that a prospective and randomized study was conducted. Previous systematic reviews showed that few studies used a correct methodology, especially regarding the fact of not being prospective or randomized. A negative point, as in all clinical studies, was related to missing cases of the sample during the follow-up.

2) The authors believe that there would be significant differences in cephalometric measurements at the end of orthodontic treatment and six months after therapy?

This evaluation is already being conducted, with a 10-year follow-up after pretreatment. A pilot study showed no statistical difference between one or two-phase treatment, after comprehensive orthodontic treatment, agreeing with previous findings, for example those from the University of North Carolina.

3) From the clinical point of view, what are the advantages of using the Twin Block functional appliance instead of extraoral appliances?

Basically, the Twin Block appliance would be more indicated for Class II mandibular deficiency malocclusion, whereas the headgear would be indicated for maxillary excess. In patients presenting severe esthetic deformities due to Class II malocclusion, the Twin Block appliance shows the advantage of improving self-esteem during treatment, since a bite reconstruction is promoted and facial improvement is observed. Clinically, probably due to this fact, a very good cooperation regarding the appliance wear was observed. Moreover, a unique Twin Block characteristic must be highlighted: Because of its separate upper and lower parts instead of a monoblock, it allows mandibular asymmetry corrections through the extension of one of the lower bite blocks.

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