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## **RETROSPECTIVE EVALUATION OF THERAPEUTIC OUTCOMES OF FUNCTIONAL APPLIANCES COMBINED WITH HEADGEAR**

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### **ABSTRACT**

Functional appliances were developed to correct mainly Class II malocclusions in growing children but the influence of those appliances on craniofacial growth is still controversial, even when used in combinations with headgear. The aim of this retrospective study was to investigate skeletal, dental and tegumental cephalometric modifications induced by Teuscher activator. This study was accomplished in a mixed dentition sample of Class II malocclusions subjects with mandibular retrognathism. This appliance was effective in treating growing patients with mandibular deficiency: the correction of Class II malocclusions was an arrangement of skeletal and dentoalveolar changes and led to the improvement of soft tissue facial profile.

**Keywords:** activator, headgear, orthopaedics, Class II, cephalometry, treatment outcome.

### **INTRODUCTION**

Teuscher activator is a variety of functional appliance combined with extraoral forces. The action of these “orthopedic” appliances is based on producing muscle stretching by holding the mandible anteriorly positioned, in order to stimulate condylar growth. The association of headgear intends to restraint sagittal and vertical maxillary growth. (Pfeiffer and Grobety, 1982) The correction of Class II division 1 malocclusion using this combined device produces a restriction of anterior maxillary growth, an inhibition of anterior and vertical displacement of maxillary teeth, condylar remodelling and a muscle pattern improvement. (Janson *et al.*, 2004) Regarding the control of posterior vertical dimension, data reported in literature show a variability of responses. (Williams and Melsen, 1982; Dermaut *et al.*, 1992; Basciftci *et al.*, 2003; Marsan, 2007)

The aim of this clinical trial was to investigate the outcomes of orthodontic treatment with Teuscher appliance, an activator in combination with a high-pull headgear in patients with Class II malocclusion with mandibular retrognathism. An evaluation of skeletal, dentoalveolar and soft tissue profile impact was performed.

The sample was selected from a single orthodontic office and comprised 30 patients in late mixed dentition. They were divided in two groups: group 1 comprised 20 individuals, 10 females and 8 males treated with Teuscher activator and, for comparison purposes, the group 2, a control group of 12 untreated subjects. Treatment progress was documented with cephalograms taken before (T0) and after (T1) the functional treatment. In the control group radiographs were obtained at the start (T0) and after a period of observation (T1). Statistical

analysis was undertaken and intra-group measurement relations were determined by Wilcoxon test and inter-group relations by analysis of variance using SPSS® statistical software.

## RESULTS AND CONCLUSIONS

The preliminary results suggest, as skeletal effects, an inhibition of maxillary growth and a stimulation of mandibular growth. Those outcomes are in accordance with previous studies. (Janson *et al.*, 2004; Marsan, 2007; Ozturk and Tankuter, 1994) Also in agreement with Ozturk and Tankuter (1994) and Turkkahraman and Sayin (2006) dentoalveolar effect suggested a retrusion of upper incisors, a correction of the dental Class II malocclusion and a decrease of overjet and overbite. The soft tissue profile changes seemed to be related to the modification of facial convexity and to an increase in lower face height, as described by Singh and Thind (2003).

Therefore, this activator combined with high-pull headgear is effective in treating growing patients with mandibular deficiency: Teuscher appliance corrected Class II malocclusions relating skeletal and dentoalveolar changes and leading to an improvement in soft tissue facial profile.

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