Effects of a Modified Acrylic Bonded Rapid Maxillary Expansion Appliance and Vertical Chin Cap on Dentofacial Structures

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Abstract: The aim of this study was to determine the sagittal, transverse, and vertical effects of a modified acrylic bonded rapid maxillary expansion (RME) device used with a vertical chin cap on dentofacial structures. The study group consisted of 34 patients (25 girls and 9 boys) who were selected without regard to their skeletal class and gender. All subjects had permanent dentition (mean age, 12.7 years) and needed maxillary expansion. Study Group I (RME only) was composed of 17 subjects, and study Group II (RME with vertical chin cap) was composed of 17 subjects. Twenty-nine measurements were made on the patients’ cephalometric films and plaster models. The means and standard deviations for linear and angular cephalometric measurements were analyzed statistically, and intragroup and intergroup changes were evaluated by paired and Student’s t-tests using SPSS 10.1 for windows. We found that the maxilla moved anteriorly relative to the anterior cranial base. The nasal width, maxillary width, intercanine width, mandibular intermolar width, maxillary intermolar width, and overjet all increased, while the upper molars tipped buccally in both groups. In Group I, the mandible rotated posteriorly, the lower anterior facial height increased, and the overbite decreased. These effects were reduced in Group II. We conclude that the vertical chin cap is an effective appliance for preventing the adverse vertical effects of RME in patients with a crossbite and a vertical growth pattern. (Angle Orthod 2002;72:61–71.)

Key Words: Rapid maxillary expansion; Bonded RME appliance; Chin cap