Does the Timing and Method of Rapid Maxillary Expansion Have an Effect on the Changes in Nasal Dimensions?

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Abstract: The aim of this study was to assess the effects of rapid maxillary expansion (RME) and surgical assisted rapid maxillary expansion (SARME) on nasopharyngeal area. The study group consisted of 30 subjects in the permanent dentition who had both maxillary constriction and a posterior cross-bite. The patients were divided into two groups, RME and SARME. The subjects in the RME group consisted of 15 patients (eight girls, seven boys) whose average age was 12.1 ± 1.1 years. The SARME group also consisted of 15 patients (eight boys, seven girls) whose mean age was 18.4 ± 1.4 years. An acrylic bonded RME appliance was used in both groups. Surgery was performed using lateral cortical osteotomies in the SARME group. The nasopharyngeal and respiratory area was determined using a digital planimeter on lateral cephalometric radiographs taken before and after RME. Nasal cavity width was evaluated on postero-anterior radiographs. Nasal dimension was measured using planimeter measurements of the respiratory and nasopharyngeal areas before and after treatment. The data obtained were analyzed using SPSS. Comparisons within the groups were carried out with paired t-tests and comparisons between the groups were with a Student’s t-test. In both groups, the respiratory area and the ratio of the respiratory area to nasopharyngeal (RA/NA) area increased following RME. There were no statistically significant differences between the groups. Nasal cavity width and maxillary width also increased, but the difference between the groups was not significant. Following RME, various differences in both the maxilla and surrounding bones occurred and nasal width increased with a decrease in nasal airway resistance. At the end of treatment there were increases in the width of the nasal floor near the midpalatal suture and nasal cavity. As the maxillary structures separated, the outer walls of the nasal cavity moved laterally resulting in an increase in internasal volume. Nasal resistance decreased and respiratory area increased in patients treated with RME. (Angle Orthod 2002;72:118–123.)

Key Words: Rapid maxillary expansion; Surgically assisted rapid maxillary expansion; Nasal dimension; Planimeter