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## **Nasal airway measurements in children treated by rapid maxillary expansion.**

**[Compadretti GC](#), [Tasca I](#), [Bonetti GA](#).**

Department of Otorhinolaryngology, Imola Hospital, Imola, Italy. [giacomoceroni@libero.it](mailto:giacomoceroni@libero.it)

**BACKGROUND:** Rapid maxillary expansion is an orthodontic procedure that is commonly used to widen the maxilla. It is generally admitted that this technique is effective to correct palate narrowing, whereas there has not been agreement on the effect of this procedure in nasal parameters. The availability of a reliable and objective technique to assess the geometry of nasal cavities, such as acoustic rhinometry, stimulated the present investigation. **METHODS:** Twenty-seven children, undergoing rapid maxillary expansion, were evaluated by rhinomanometry and acoustic rhinometry. Postero-anterior radiographs were taken in 15 patients for cephalometric measurements. Examinations were performed before expansion treatment and after 12 month follow-up and compared to the measurements obtained from an untreated control group. **RESULTS:** With regard to rhinomanometry, we recorded a significant reduction in nasal airway resistance (NAR) after the orthodontic procedure only in decongestion. Using acoustic rhinometry, we found a significant increase in total minimum cross-sectional areas (TMCA) and total nasal volume (TNV) after the expansion both in basal and decongested conditions. Also, nasal cavity width and interzygomatic distance had a significant mean increase after the treatment. Comparison of measures between the control group and the treated group showed that the increase in TMCA and TNV, as well as the decrease in NAR, were significantly greater in the treated group in both basal and decongested conditions. **CONCLUSION:** We demonstrated that rapid maxillary expansion is an effective procedure in widening nasal cavities with respect to an untreated control group and that the reported improvement in nasal breathing after palatal expansion, is a consequence of an increase in nasal size.

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