Acoustic Rhinometry for Evaluation of Velopharyngeal Function in Preschool Children Post Palatoplasty

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Purpose: To assess the feasibility of acoustic rhinometry for the evaluation of velopharyngeal function in preschool children by detecting changes in nasal cavity volume (NV) and minimal cross-sectional area (MCSA) after palatoplasty.
Materials and Methods: Sixty-one preschool children with incomplete cleft palate who underwent Sommerlad palatoplasty were examined by acoustic rhinometry. MCSA, distance of the MCSA from the nostril(DMCA), NV, and nasopharyngeal volume (NPV) were measured. Patients were grouped according to velopharyngeal state and lateral cephalographic findings.
Results: MCSA, NV, and NPV showed a meaningful difference between the experimental and control groups. DMCA in the experimental group (7.09 1.33 mm) was not markedly different between the 2 sides. NV, NPV, and MCSA in the velopharyngeal insufficiency (VPI) subgroup were obviously larger than those in the velopharyngeal competence (VPC) and marginal VPI subgroups. NV in the VPC group showed no relevant difference from that in the control group. No relevant difference in MCSA, DMCA, and NPV was observed among the 3 subgroups at radiographic evaluation. NV in the noncontact group was markedly larger than in the control group. The curve showed marked constriction in the anterior part but an elevation in the posterior part, especially at a distance of 7.09 cm.
Conclusion: Acoustic rhinometry is a rapid, noninvasive, and reproducible method that can be used in lieu of lateral cephalography for quantitative evaluation of the NVand MCSA. It can be used to assess post-operative velopharyngeal function in children and has good adaptability.