Longitudinal analysis of palatal volume in unilateral cleft lip and palate children

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Cleft lip and/or palate are among the most frequent congenital craniofacial defects, which every year affect one in 500-700 newborn worldwide (1,2). The aim of this study was to analyze the effect of orthopaedic and surgical treatments on the palatal size and shape of patients with unilateral cleft lip and palate (UCLP). Ninety-six palatal casts from 32 neonatal patients, attending the Fundacion Clinica de Noel (Colombia) were analyzed through a stereophotogrammetric system. The analysis was carried out before (mean age 10.5 days, SD 4.8) and after (mean age 83.3 days, SD 6.6) orthopaedic treatment (performed with acrylic plates) and after cheiloplasty (mean age 317.1 days, SD 44.2). Volumes of the greater and the minor alveolar segments were evaluated through a new measurement protocol. Intra and inter operator repeatability was evaluated using paired Student's t test. In order to investigate differences between alveolar segments and time, volume measurements were compared with a repeated two-way analysis of variance (ANOVA). No significant differences between repetitions, both intra and inter operator, were found (p>0.05). Random errors explained 3.7% of the sample variance. On the other hand, significant differences in volume measurements were found both in alveolar segment and time (p<0.01). Before orthopaedic treatment, the smaller palatal segment had a mean volume of 0.52 cm^3 (SD 0.23), and the greater of 0.9 cm^3 (SD 0.40); after orthopaedic treatment, the mean volumes were 0.58 cm^3 (SD 0.25), and 1.09 cm^3 (SD 0.43). After surgery, mean values of 0.73 cm^3 (SD 0.28) and 1.31 cm^3 (SD 0.52) were measured. Results suggest that a three-dimensional stereophotogrammetric system is a repeatable and reliable method to evaluate palatal casts of patients with UCLP. Obtained data offer a preliminary quantitative information about the changes occurring in maxillary arches of UCLP patients after orthopaedic treatment and surgery. Further investigation is required to increase the frequency of evaluations and the number of patients.

References

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Keywords