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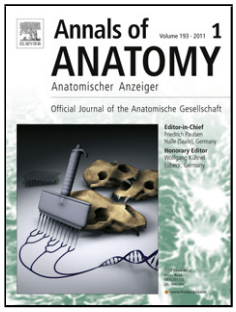

Title: Introducing a simple method of maxillary sinus volume assessment based on linear dimensions

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Introducing a simple method of maxillary sinus volume assessment based on linear dimensions

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Abstract: Measuring sinus volume in a general practice clinic is a complex and time-consuming procedure, requiring experience in the use of radiological methods. In the presented research, the automatically estimated maxillary sinus volume was compared with maxillary sinus volume assessed with mathematical formulas used to calculate the volume of spheres and pyramids. The starting point for the statistical analysis were specific measurements of the sinuses. We wanted to discover which geometric shape has the volume that is nearest to the automatically estimated volume.

The study was performed using samples of CT scans of pediatric patients age 1 to 17. The dimensions (maximal width, maximal height, maximal length) were used for manual calculations. For the automatic volume calculation, the CT Image Segmentation algorithm (Syngo Via for Oncology, Siemens) was used. Pearson's correlation coefficient was applied to analyse the interrelationship between automatically and manually calculated volume of maxillary sinus. It was statistically established that the "sphere", "pyramid" and "mean" manually calculated maxillary sinus volume were accurate and strongly correlated with the automatically estimated maxillary sinus volume. The volume of the sphere corresponds better with the automatic measurements than the volume of the pyramid. The variations are significant and they were made reliable with the application of a statistical test. It is quick and

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