

Morphometric parameters for nasal septum deviation identification in CBCT data

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Advances in the upper airway imaging allow to better evaluate and understand their morphology, pathology and mechanics [1].

In particular, Cone beam CT technology (CBCT), with its isotropic spatial resolution, undistorted images, X-ray lower radiation exposure, versatility and relatively low cost, takes over other imaging modalities [2].

The purpose of this study is to evaluate whether CBCT scans can be valuable tools for the extraction of quantitative parameters to confirm the deviation of the nasal septum in a specific patient. First, we assessed the difference in angle of septal deviation, calculated as proposed by Orhan et al., among a control group and a patient group [3]. Subsequently, we evaluated the percentage difference between the volume of the upper airways in the right side and left side of the nose in the same sample.

The measurements were performed on 23 CBCT scans of Caucasian adult women, divided into 7 control subjects and 16 patients.

The results demonstrate that there is a significant difference both in the deviation angle ($p < 0.05$) and in the volume difference between healthy and patient subjects ($p < 0.001$). Duplicate measurements of the deviation angle and the volume found no significant difference ($p > 0.05$); random errors explained 0.77% (angle) and 0.99% (volume) of the sample variance. Paired Student's *t* tests were used for comparisons.

In particular, the volume difference appears to be less sensitive to the presence of isolated cartilaginous ridges that increase the angle of deviation even if the septum is not pathological. This makes it more suited to the identification of this pathology. The obtained outcomes are encouraging and it is advisable to continue the study on a larger sample.

References

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Keywords

Nasal septum deviation, CBCT, Upper airway.