

## Contribución original

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### Fractal characterization of normal cerebral ventricles in t2-weighted magnetic resonance imaging

Caracterización fractal de ventrículos cerebrales normales en imágenes de resonancia magnética ponderadas en T2

## Abstract

**Introduction:** The fractal geometry describes adequately the irregularity of the natural objects such as the cerebral ventricles, which are irregular structures that can be characterized through the Box-Counting method.

**Objective:** This research aims to develop a new methodology of geometric characterization of the cerebral ventricles, based on the fractal geometry for the analysis of normal cerebral ventricles.

**Methods:** Based on the Box-Counting method, the fractal dimensions of the both lateral ventricles of a normal adult were obtained. Sequential cephalic-caudal 4mm axial slices were acquired on T2-WI, and the differences and similarities of the lateral ventricles were established using the Ventricular Intrinsic Mathematical Harmony.

**Results:** The fractal dimension of the left lateral ventricle had values between 1.0641 and 1.3599, and in the right lateral ventricle had values between 0.8931 and 1.3219.

**Conclusion:** A new morphometric measure of the cerebral ventricles was developed based on the fractal geometry for its use as an objective and reproducible measure.

### Keywords

brain, cerebral ventricle, fractal, fractal geometry, lateral ventricles.