



P160 - Stereotactic Characterization of Anterior Nucleus of Thalamus - Cadaveric Study

A. Rainha Campos^{2,3}, *S. Ferreira*¹, *P. Pereira*⁴, *P. Henriques*², *L. Lucas Neto*^{2,5}, *A Gonçalves-Ferreira*^{2,3} and *A. Andrade*¹

¹Instituto de Biofísica e Engenharia Biomédica, Faculdade de Ciências da Universidade de Lisboa. ²Instituto de Anatomia, Faculdade de Medicina de Lisboa. ³Serviço de Neurocirurgia; ⁴Laboratório de Neuropatologia, Serviço de Neurologia; ⁵Serviço de Neurorradiologia, Hospital de Santa Maria-CHLN, EPE.

Resumen

Objectives: There is a growing interest on the Anterior Nucleus of Thalamus (ANT) as this seems to be a good target for stimulation in refractory limbic epilepsy patients. However, its Magnetic Resonance Imaging (MRI) is not always clear and stereotactic 3 dimensional atlases aren't available. The main purpose of this study was to identify the ANT in a cadaver brain and to build a 3D model in order to calculate its stereotactic coordinates.

Material and methods: A single block of a brain containing both thalamus, mammillary bodies and anterior and posterior commissures was studied. The block was cut in a cryomicrotome and the sections were photographed every 500 μm with a hi-resolution camera. After aligning the pictures in MatLab[®], a stack of images was created with ImageJ[®]. GIMP[®] was used to delineate ANT, mammillary bodies and mammillothalamic tracts of both cerebral hemispheres and Amira[®] used for segmentation, 3D reconstruction, calculation of volumes and determination of coordinates.

Results: Orthogonal views of the block were obtained from 3D reconstructed images with superimposed objects created. Measurements: AC-PC = 24.04 mm; ANT volume = 125.0 mm³ on the left side and 119.4 mm³ on the right. Left ANT X = -7.46; Y = 3.49; Z = 11.65; right ANT X = 8.27; Y = 2.73; Z = 13.20.

Conclusions: It is possible to create a stereotactic atlas of both hemispheres simultaneously using this method. To further validate and improve accuracy and for extrapolation of data to clinic applications, a brain MRI should be acquired before cutting the block and the study must be replicated with more brains.