THE OPTIC RADIATIONS PERSPECTIVE UNDER THE WHITE FIBER DISSECTION TECHNIQUE AND MRI TRACTOGRAPHY

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Objective: To define the three-dimensional (3D) relationships between the optic radiations and the temporal horn and superficial anatomy of the temporal lobe by using the Klingler white matter fiber dissection technique and MRI tractography. This knowledge is paramount for mesial temporal lobe surgery, principally in selective amygdalohippocampectomy. Methods: Fifteen human cadaveric hemispheres were dissected by one of the authors in two different microsurgical laboratories by using a modification of the method described by Klingler. Wooden spatulas were used to strip away the deeper layers of white matter progressively in a lateromedial direction, and various association, projection, and commissural fibers were demonstrated. Special attention was given to the optic radiation and to the sagittal stratum of which the optic radiation is a part. Results: The optic radiation covered the entire lateral aspect of the temporal horn as it extends to the occipital horn. The anterior tip of the temporal horn was covered by the anterior optic radiation along its lateral half. The entire medial wall of the temporal horn was free from optic radiation fibers, except at the level at which these fibers arise from the lateral geniculate body to ascend over the roof of the temporal horn. The superior wall of the temporal horn was covered by optic radiation fibers. The entire inferior wall of the temporal horn was free from optic radiation fibers anterior to the level of the lateral geniculate body. Conclusions: The study of optic radiations through fiber dissection technique is paramount to understanding the complex anatomical knowledge necessary in mesial temporal lobe procedures, such as selective amygdalohippocampectomy.