

The connectivity and anatomy of the posterior hippocampal commissure in Humans

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Objective

The commissura fornicis is considered an important interhemispheric propagation pathway of mesiotemporal epileptic seizures. Although it forms an integral element of classical human anatomical teaching, its structural existence and functional relevance in humans is not scientifically proven, but characterized by contradictory research results. Our preliminary research results, based on microsurgical fiber dissections of human cerebral preparations *ex vivo* and the analysis of histological sections, speak against the existence of such a fiber connection between the fornices. The aim of our work is the definitive clarification of the question of existence of a human commissura fornicis by means of a multimodal morphological approach.

Methods

The macroscopic analysis is based on systematic microsurgical fibre dissections in six human cerebral specimens using Klingler's method. The microsurgical dissections are performed from inferior to superior and from superior to inferior. For microscopic analysis we use selected conventional histological staining (*H&E, GFAP, myelin staining (Klüver-Barrea / Luxol-Fast Blue), neurofilament and Bielchowsky silver staining*), specific immunohistochemical methods (*Fluoro-Myelin*), highly sensitive lipophilic axonal neurotracers (*DiD, DiO, DiI*) and tissue clearing with 3D imaging (*CLARITY*). This is complemented by high-resolution diffusion tensor imaging (DTI) using a 7T MRI.

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