White matter dissection

see Fiber tract.

Techniques

The Klingler method for white matter dissection revolutionized the study of deep cerebral anatomy. Although this technique made white matter dissection more feasible and widely used, it still presents some intrinsic limitations.

Latini et al evaluated the quality of different methods for specimen preparation based on an intra-carotidal formalin perfusion fixation process. Ten post-mortem human hemispheres were prepared with this method and dissected in a stepwise manner.

The homogeneous and rapid fixation of the brain allowed documentation of several fine additional anatomical details. Intra-cortical white matter terminations were described during the first stage of dissection on each specimen. No limitations were encountered during dissection of the major associative bundles. On the contrary, the quality of the fixation of the specimens made it possible to isolate them en bloc. One of the most complex and deep bundles (accumbo-frontal fasciculus) was dissected without technical limitations. Deep vascular structures were very well preserved and dissected within the white matter until their sub-millimetric terminations.

Short time for preparation, a more homogeneous fixation, no technical limitation for a detailed description of superficial and deep white matter anatomy, the possibility to dissect with a single technique the fibre organization and the white matter vascular architecture are the advantages reported with the perfusion fixation.

These results provide encouraging data about the possibility to use a perfusion fixation process, which may help in improving the quality of white matter dissection for research, didactic purposes and surgical training [1) 2)].

Fiber dissection studies of the cerebrum have focused on the lateral surface. No comparable detailed studies have been done on the medial and inferior surfaces. The object of a study was to examine the fiber tracts, cortical, and subcortical structures of the medial and inferior aspects of the brain important in planning operative approaches along the interhemispheric fissure, parafalcine area, and basal surfaces of the cerebrum [3)].

1)
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2)
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3)
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doi: 10.1016/j.wneu.2016.05.016. [Epub ahead of print] PubMed PMID: 27184897.