Surg Radiol Anat (2016) 38:275–276
DOI 10.1007/s00276-015-1546-0

LETTER TO THE EDITOR

The role of white matter dissection technique in modern neuroimaging: can neuroradiologists benefit from its use?

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Received: 25 July 2015 / Accepted: 6 August 2015 / Published online: 23 August 2015

Keywords White · Matter · Dissection · Neuroimaging

Abbreviations
DTI Diffusion tensor imaging
fMRI Functional MRI

Current literature has repeatedly stressed the significance of the detailed knowledge of brain white matter anatomy in modern neurosurgery [3]. Acquiring this knowledge refines both presurgical planning and surgical strategy to achieve maximal tumor resection with minimal postoperative neurological morbidity.

Interestingly, modern neuroimaging methods, such as DTI, have noninvasively mapped several white matter brain pathways and have also allowed the study of the spatial relationship of brain lesions to intrinsic fiber bundles. Hence, their role, not only in modern neurosurgery but also in the field of neuroscience generally, is deemed pivotal [2].

Even though these novel radiology studies are elegant and elective they are, thus far, prone to multiple artifacts due to the prominent "crossing" and "termination" problems [4]. Therefore, the exact configuration of fiber tracts and anatomical features that have been revealed by the traditional laboratory methods of anatomical dissection cannot be thoroughly resembled, at present, with these methods. This drawback is further accentuated when studying brain lesions with mass effect since the accuracy of the existing methods is decreased [5].

In this context, the white matter fiber dissection technique introduced by Klinger in 1935 and popularized by Yasargil in the intervening decades is a scientific procedure performed in neuroanatomy laboratories that aims in providing a thorough three-dimensional understanding of both the gray and white matter anatomy simultaneously [1, 3]. This technique, although complex and time consuming, is crucial in the formation of a proper intellectual concept about the accurate intrinsic brain anatomy and architecture. Therefore, neuroradiologists should be submitted to the aforementioned intellectual process to precisely resemble the white matter pathways of the normal and pathologic cerebrum. This is especially true since the accuracy of the entire procedure of reconstructing fiber tracts is largely dependent on the precise manual selection of the seed points. Hence, incorporating the white matter dissection technique in the basic training of neuroradiology can undoubtedly refine the results of these modern imaging studies and also enrich current knowledge about anatomo-functional brain connectivity.

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