Posterior interhemispheric transprecuneus gyrus approach

The objective of a study was to compare transcortical and posterior interhemispheric approaches to the atrium using a combined approach of white matter fiber dissections and MR tractography.

Ten cerebral hemispheres were examined and dissected from the lateral-to-medial surface and from medial-to-lateral surface with special attention to the white matter tracts related to the atrium. MR tractography was used to demonstrate the 3D white matter fibers relationships to the atrium of the lateral ventricle and compared to cadaveric dissection results.

The atrium was related laterally to the superior longitudinal fasciculus II &III, middle longitudinal fasciculus, arcuate fasciculus, vertical occipital fasciculus, and sagittal stratum. Medially it is related to the superior longitudinal fasciculus I , cingulum, sledge runner, and forceps major.

A combined approach of cadaveric white matter fiber dissections and MR tractography were used to describe the main white matter tracts related to the posterior interhemispheric approach and the transcortical approach, providing an in-depth understanding of the threedimensional anatomy of white matter fibers and the atrium. In the present study, among approaches examined, the posterior interhemispheric parasplenial transprecuneus approach placed fewer eloquent tracts at risk; however, traversing the sledge runner and the forceps major is unavoidable by this approach [1)].

The posterior interhemispheric transprecuneus approach is one of the surgical routes that has been suggested to reach the atrium of the lateral ventricle. It has the advantage of avoiding the disruption of the optic radiations; however, it has a narrow working area that at times makes the execution of this approach rather challenging.

A modification of the approach that might create a better surgical angle and a wider corridor by accessing the atrium from the contralateral side after transection of the falx, named this new approach the “posterior interhemispheric transfalx transprecuneus approach.” [2)].

1)
Muftah Lahirish IA, Middlebrooks EH, Holanda VM, Batista-Quintero R, Luís F, Neto MR, Parraga RG, de Olivieira E. Comparison between transcortical and interhemispheric approaches to the atrium of lateral ventricle utilizing combined: White matter fiber dissections and MR tractography. World Neurosurg. 2020 Mar 5. pii: S1878-8750(20)30436-8. doi: 10.1016/j.wneu.2020.02.161. [Epub ahead of print] PubMed PMID: 32147552.
2)
Wang S, Salma A, Ammirati M. Posterior interhemispheric transfalx transprecuneus approach to the atrium of the lateral ventricle: a cadaveric study. J Neurosurg. 2010 Nov;113(5):949-54. doi: 10.3171/2010.1.JNS091169. Epub 2010 Feb 12. PubMed PMID: 20151777.