Case Reports

Acta Neurochir (Wien)

. 2022 Apr;164(4):1095-1103.
doi: 10.1007/s00701-022-05167-0. Epub 2022 Mar 9.

The precuneal interhemispheric, trans-tentorial corridor to the pineal region and brainstem, surgical anatomy, and case illustration

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- PMID: 35266050

- DOI: 10.1007/s00701-022-05167-0

Abstract

Background: The pineal region and dorsal midbrain are among the most challenging surgical targets. To approach lesions in this region that harbor a superior to inferior long axis, we describe the basic steps of the precuneal, interhemispheric, trans-tentorial approach and illustrate anatomical landmarks of this established, but not so popular, surgical trajectory.

Method: To study the anatomical landmarks and safety of this approach, the neurovascular anatomy was studied on 22 sides of 11 formalin-fixed latex-injected anatomical specimens. A step-by-step dissection of the precuneal interhemispheric trans-tentorial approach and study of the key anatomical landmarks was performed. An illustrative clinical case of a pontomesencephalic cavernous malformation (CM) resected through this approach is also detailed.

Results: The mean distance from the transverse sinus to the most posterior cortical vein draining into the superior sagittal sinus was 6.4 cm. The mean distance from the calcarine sulcus to the most posterior cortical vein was 5.3 cm. Key steps of the dissection are as follows: craniotomy exposing the posterior aspect of the superior sagittal sinus (SSS), durotomy and gentle retraction of the SSS edge, dissection of the interhemispheric fissure, linear incision of

the tentorium that extends anteriorly to the incisura and lateral reflection of the tentorium, and arachnoidal dissection and exposure of the cerebellomesencephalic fissure.

Conclusion: The precuneal, interhemispheric, trans-tentorial approach affords excellent access to the falcotentorial junction, splenium, pineal region, quadrigeminal cistern, and dorsal pons once the cerebellomesencephalic fissure has been dissected.

Keywords: Brainstem surgery; Cadaveric dissection; Complex-cranial approaches; Interhemispheric; Pineal region; Step-by-step.