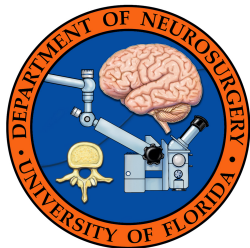




Does the superior petrosal vein exist in all human brains?: A unique anatomic specimen and venous considerations for posterior fossa surgery

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Introduction

Occlusion of the superior petrosal vein, one of the most constant and largest venous structures in the posterior fossa, may result in venous complications. The purpose of this study is to call attention to a unique variant in which the superior petrosal veins and sinus were absent unilaterally, and venous drainage was through the galenic and tentorial groups.

Methods

Anatomical dissection of one formalin-fixed adult head, in which the left superior petrosal vein and sinus were not present. Supplementary, a detailed analysis of venographic images of a patient without any identifiable superior petrosal vein or sinus.

Results

The superior petrosal veins, described as 1 to 3 bridging veins, emptying into the superior petrosal sinus, are the major drainage pathway of the petrosal group of posterior fossa veins. In the cases presented, the superior petrosal vein and sinus were absent and venous drainage was through the galenic and tentorial groups, including the lateral mesencephalic or bridging vein on the tentorial cerebellar surface.

Conclusions

In these unique cases, in which the superior petrosal sinus and veins are absent, care should be directed to preserving the collateral drainage through the galenic and tentorial tributaries. Although surgical strategies for intraoperative management and preservation of venous structures are still controversial, knowledge of the possible anatomical variations is considered essential to improving surgical outcomes.

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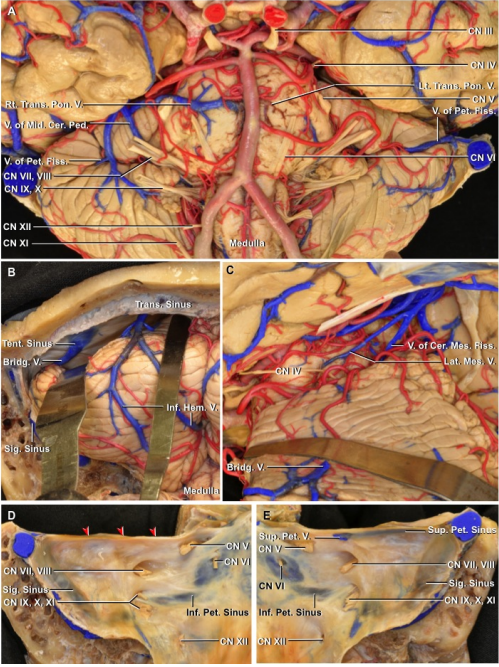
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Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the anatomy of posterior fossa veins, and 2) Discuss the venous complications of posterior fossa surgeries.

Cadaveric cerebellopontine angle with absence of the left superior petrosal veins and sinus.

Fig. 1 (Cadaveric Head)



In the left cerebellopontine angle, the superior petrosal vein and sinus were not identified, and their normal tributaries drained into the veins of the galenic and tentorial groups and the contralateral transverse pontine vein (A). The well-developed galenic and tentorial groups, including the lateral mesencephalic vein and a bridging vein on the tentorial surface, compensate for the absence of the petrosal group (B and C). After removing the cerebellum, the absence of the superior petrosal sinus and vein is visible in the left posterior fossa (red arrowheads, D). In the right posterior fossa, a single superior petrosal vein emptied into a superior petrosal sinus along the petrous ridge (E).

Venographic images and illustration

Fig. 2 (Venographic Images)

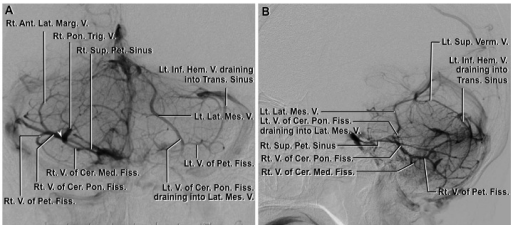
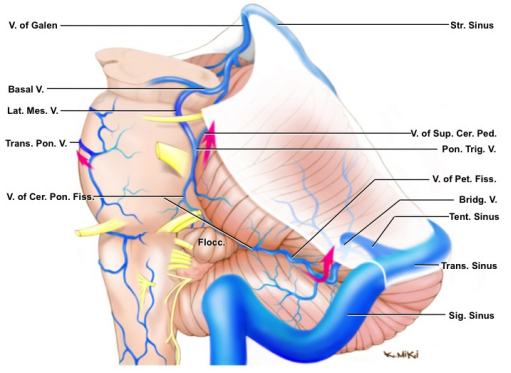


Fig. 3 (Illustration)



On the right side, the superior petrosal sinus and a single petrosal vein were clearly identified (white arrowhead). However, on the left side, the superior petrosal sinus could not be identified. The left vein of the cerebellopontine fissure drained directly into the tributaries of the vein of Galen through the well-developed lateral mesencephalic vein, and the left inferior hemispheric vein formed a bridging vein that drained through a short tentorial sinus into the transverse sinus (Fig. 2). The illustration shows that the area normally drained by the superior petrosal veins drained instead into the vein of Galen, tentorial sinus, and contralateral transverse pontine vein (red arrows, Fig. 3).