



# Impacts of Anatomical Variations of Galenic Venous System on Surgical Management for Pineal Region Lesions

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## Introduction

To investigate the anatomical variations of the galenic venous system using three-dimensional computed tomography venography (3D-CTV) and to evaluate their impact on surgical management of pineal region lesions.

## Methods

The galenic vein (GV), internal cerebral vein (ICV), basal vein (BV), internal occipital vein (IOV) and precentral cerebellar vein (PCV) of 60 adult brains were measured on 3D-CTV images, and the angle between the straight sinus and GV, the shape between the bilateral ICVs, and the variations of the BV, IOV and PCV were analyzed.

## Results

The mean diameter of the GV was  $4.7 \pm 1.5\text{mm}$  with a mean length of  $10.30 \pm 4.2\text{mm}$ ; the mean diameter of ICV was  $2.56 \pm 0.37\text{mm}$  with a mean length of  $35.1 \pm 2.9\text{mm}$ ; the mean diameter of BV was  $2.20 \pm 0.2\text{mm}$  with a mean length of  $35.3 \pm 6.5\text{mm}$ ; the mean diameter of IOV was  $1.64 \pm 0.5\text{mm}$  with a mean length of  $12.3 \pm 5.5\text{mm}$ ; the mean diameter of PCV was  $1.40 \pm 0.3\text{mm}$  with a mean length of  $5.8 \pm 2.5\text{mm}$ . The angles between the straight sinus and the GV included acute angle (95%) and obtuse angle (5%), with an average angle of  $75.20 \pm 10.5^\circ$ . The shapes between the two ICVs were subgrouped into three types: rhombus shape (60%), hairpin shape (35%) and parallel shape (5%). The BV flowed into either the GV (80%) or the ICV (20%). The IOV flowed into either the GV (80%), the ICV (10%) or the BV (10%). Some of the BVs, IOVs and PCVs were enlarged in diameter.

## Conclusions

Great anatomical variations were found in the galenic venous system. Preoperative understanding on the anatomical variations of the galenic venous system and its position relationship with the lesions based on 3D-CTV is of great significance for selection of surgical approaches for management of pineal region lesions.

