## **Parietooccipital sulcus**



The parietooccipital fissure is an anatomical landmark that divides the temporal, occipital, and parietal lobes.

The parietooccipital sulcus is a vertical groove on the medial surface of each hemisphere.

Superiorly this sulcus continues onto the lateral surface of the hemispheres.

More than 40% of gliomas are located in these three lobes, and the temporal lobe is the most common location. The parietooccipital fissure is located just posterior to the medial temporal lobe, but little is known about the clinical significance of this fissure in gliomas.

Shibahara et al. investigated the anatomical correlations between the parietooccipital fissure and posterior medial temporal gliomas to reveal the radiological features and unique invasion patterns of these gliomas.

The authors retrospectively reviewed records of all posterior medial temporal glioma patients treated at their institutions and examined the parietooccipital fissure. To clarify how the surrounding structures were invaded in each case, the authors categorized tumor invasion as being toward the parietal lobe, occipital lobe, isthmus of the cingulate gyrus, insula/basal ganglia, or splenium of the corpus callosum. DSI Studio was used to visualize the fiber tractography running through the posterior medial temporal lobe.

Twenty-four patients with posterior medial temporal gliomas were identified. All patients presented with a parietooccipital fissure as an uninterrupted straight sulcus and as the posterior border of the tumor. Invasion direction was toward the parietal lobe in 13 patients, the occipital lobe in 4 patients, the isthmus of the cingulate gyrus in 19 patients, the insula/basal ganglia in 3 patients, and the splenium of the corpus callosum in 8 patients. Although the isthmus of the cingulate gyrus and the occipital lobe are located just posterior to the posterior medial temporal lobe, there was a significantly greater preponderance of invasion toward the isthmus of the cingulate gyrus than toward the occipital lobe (p = 0.00030, McNemar test). Based on Schramm classification for the temporal mediobasal tumors, 4 patients had type A and 20 patients had type D tumors. The parietooccipital fissure determined the posterior border of the tumors, resulting in a unique and identical radiological feature. Diffusion spectrum imaging (DSI) tractography indicated that the fibers running through the posterior medial temporal lobe toward the occipital lobe had to detour laterally around the bottom of the parietooccipital fissure.

Posterior medial temporal gliomas present identical invasion patterns, resulting in unique radiological features that are strongly affected by the parietooccipital fissure. The parietooccipital fissure is a key anatomical landmark for understanding the complex infiltrating architecture of posterior medial temporal gliomas <sup>1)</sup>

It play an important role as surgical landmarks using posterior interhemispheric parietooccipital approach to lesions located adjacent to the ventricular trigon deep to the cingulate gyrus.

The H-pattern was observed in 50% (n = 28) of all hemispheres, being the most common pattern of the subparietal sulcus. The Straight pattern was observed in the 30.4% (n = 17) of all hemispheres, being the most common pattern of the parietooccipital sulcus. Furthermore, more detailed results among the patterns, connections, side branches and the relationship with the adjacent sulci are given.

Better knowledge of these variations will further help neurosurgeons to navigate easily during approaches involving the medial surface of the parietal lobe <sup>2)</sup>.

## 1)

Shibahara I, Saito R, Kanamori M, Sonoda Y, Sato S, Hide T, Tominaga T, Kumabe T. Role of the parietooccipital fissure and its implications in the pathophysiology of posterior medial temporal gliomas. J Neurosurg. 2021 Dec 14:1-10. doi: 10.3171/2021.7.JNS21990. Epub ahead of print. PMID: 34905728.

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