Cingulate gyrus glioma

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Epidemiology

Gliomas arising from the cingulate gyrus are rare.

In 7 cases (18%) the tumor was located in the posterior (parietal) part of the cingulate gyrus, and in 31 (82%) the tumor was in the anterior (frontal) part. In 10 cases (26%) the glioma was solely located in the cingulate gyrus, and in 28 cases (74%) the tumor extended to the supracingular frontal/parietal cortex.

Classification

Tumors were classified as low grade gliomas in 11 cases (29%). A glioblastoma multiforme (WHO Grade IV, 10 cases [26%]) and oligoastrocytoma (WHO Grade III, 9 cases [24%]) were the most frequent histopathological results.

Clinical features

Most cases (23 [61%]) had seizures as the presenting symptom, 8 patients (24%) suffered from a hemiparesis/hemihypesthesia, and 4 patients (12%) had aphasic symptoms.

Diagnosis
Surgery

see Cingulate gyrus surgery.

Case series

see Cingulate gyrus glioma case series.

Video

This case is a left sided cingulate gyrus glioma in a 15 year old patient with seizures as the presenting symptom.

Interhemispheric approach.

Dura opening (Second 26)

The dura is opened in a U-shaped fashion and flapped toward the sagittal sinus. This allows for careful inspection for arachnoid granulations and cortical veins draining into the sinus as midline is approached.

At this stage the venous anatomy along the midline can be carefully assessed.

Interhemispheric fissure (Second 36)

Arachnoid bands tethering these veins are sharply dissected. There are usually multiple corridors between for interhemispheric dissection. If at all possible, no draining veins are sacrificed. A self retaining retractor was not placed along the medial edge of the exposed hemisphere.

For a discussion about retractorless surgery we recommend

The quiet revolution: retractorless surgery for complex vascular and skull base lesions.
The cortex is buffered by a Telfa patty prior to retractor placement. A retractor along the falx to widen the operative field is not indicated to avoid cerebral venous sinus thrombosis.

**Pericallosal cistern dissection (Minute 1:20)**

**Tumor debulking (Minute:2:00)**

**Case reports**

A 34-year female underwent surgery for drug resistant epilepsy attributable to the lesion. A near-total resection was attained through a single-stage, trans-cortical route through the medial prefrontal cortex. Despite seizure-freedom and lack of tumor growth (42 months follow-up), she developed symptoms of major depressive disorder (MDD) soon after surgery that have persisted. To identify functional networks potentially engaged by the surgical corridor and tumor resection cavity, both were segmented separately and used as seeds for normative resting-state fMRI connectivity mapping. Then, to study depression specifically, networks associated with the tumor and surgical approach were compared to those associated with subgenual cingulate deep brain stimulation (DBS). The LNM results suggested that the surgical corridor, rather than the tumor, had greater overlap with DBS-based depression networks (32% vs 8%).

The early postoperative development of MDD following resection of a cingulate region tumor, though likely multi-factorial, should be considered and patients appropriately counselled preoperatively. Further validation of LNM as a viable methodology for correlating symptoms to lesion(s) could make it a valuable tool in selection of surgical approach and patient counseling.

2014

Plaza et al. report the longitudinal case study of a right-handed patient harboring two frontal tumors that benefited from bilateral simultaneous surgery. The tumors were WHO Grade II gliomas located in the left inferior frontal area (including the cingulate gyrus) and the right anterior superior frontal gyrus. The double tumor resection was guided by direct electrical stimulation of brain areas while the patient was awake. Neuropsychological assessments were administered before and after the surgery to analyse how the brain functions in the presence of two frontal gliomas that affect both hemispheres and reacts to a bilateral resection, which can brutally compromise the neuronal connectivity, progressively established during the infiltrating process. We showed that both the tumor infiltration and their bilateral resection did not lead to a “frontal syndrome” or a “dysexecutive syndrome” predicted by the localization models. However, a subtle fragility was observed in fine-grain language, memory and emotional skills. This case study reveals the significance of brain plasticity in the reorganization of cognitive networks, even in cases of bilateral tumors. It also confirms the clinical relevance of hodotopical brain models, which considers the brain to be organized in parallel-distributed networks around cortical centers and epicenters.

2010

A 27 year-old male, right handed, was admitted for a 2 years history of very frequent gelastic seizures accompanied sometimes by simple motor partial seizures in both arms, more often being involved his left arm, without impairment of his consciousness state. His neurological examination was normal. Diagnosis was made on native CT scan: minimal hypodense frontal right paramedian lesion, cerebral MRI showed a small well delimited right, parenchymal, homogeneous lesion (16/22/15 mm), involving gyrus cinguli, without perilesional edema and mass effect, hyperintense both on T1 and T2 MR sequences, non-enhancing after Gadolinium. The cerebral lesion was also documented on EEG and video-EEG recordings. Using an interhemispheric microsurgical approach, above the corpus callosum
and the right pericallosal artery, at the level of gyrus cinguli, a yellow-gray, infiltrative tumor, having a moderate vascularisation, has been identified and totally removed. The anatomopathological analysis revealed a grade II astrocytoma. The patient recovered very well, without deficits, no gelastic seizures or epileptic manifestations; three months after operation he is still free of seizures.

A case of gelastic seizures accompanied by simple motor partial seizures in both arms, without the impairment of his consciousness state induced by a grade II right gyrus cinguli astrocytoma is described and documented by radiological and electrophysiological studies. Using microsurgical resection, the tumor was totally removed, the patient clinical condition improved. Without an affective connotation as in temporal or hypothalamus topography, gelastic seizures are not patognomonic for hypothalamic hamartomas and in the case of frontal localization of the lesion; they can be associated with motor involvement of the limbs as in this case 6).

References

1) , 2) , 3) 

4) 

5) 

6) 