Cerebellar tumor

- Unilateral Hearing Loss as the Sole Presentation of Extensive Intracranial Epidermoid Cyst: A Case Report
- Robust molecular subgrouping and reference-free aneuploidy detection in medulloblastoma using low-depth whole genome bisulfite sequencing
- Delivery of LOXL1-AS1-siRNAs using targeting peptide-engineered extracellular vesicles with focused ultrasound to suppress medulloblastoma metastasis
- Association of Cerebellar Peduncle Morphometry with Hypertrophic Olivary Degeneration: A Pilot Case-Control Study
- Lymphoid enhancer-binding factor 1 (LEF1): a reliable immunohistochemical predictive marker for WNT-activated medulloblastoma
- Mechanistic role of metal-responsive transcription factor-1 (MTF1) in cadmium-induced prostate carcinogenesis
- Leptomeningeal hemangioblastoma: illustrative case
- When an aneurysm pretends to be a tumor: thrombosed posterior inferior cerebellar artery aneurysm mimicking a neoplasm in a pediatric patient. Illustrative case

Classification

Cerebellar metastases.

Cerebellar hemangioblastoma.

Cerebellar pilocytic astrocytoma.

Cerebellar liponeurocytoma.

Cerebellar pilocytic astrocytoma.

Cerebellar medulloblastoma

Pediatric age

PNET including medulloblastoma.

Infratentorial ependymoma.

Cerebellar pilocytic astrocytoma.

Atypical teratoid rhabdoid tumor.

Differential diagnosis

Cerebellar lesion differential diagnosis.

Posterior fossa tumor surgery

Case series

Presurgical differentiation based on neuroimaging is crucial since management differs substantially. A comprehensive full assessment of MR dynamic-susceptibility-contrast perfusion-weighted imaging (DSC-PWI) may reveal critical differences between entities. A study aims to provide new insights into these tumors' perfusion patterns and explore the potential of DSC-PWI in their presurgical discrimination.

Adult patients with a solitary cerebellar tumor on presurgical MR and confirmed histological diagnosis of metastasis, medulloblastoma, hemangioblastoma, or pilocytic astrocytoma were retrospectively retrieved (2008-2023). Volumetric segmentation of tumors and normal-appearing white matter (for normalization) were semi-automatically performed on CE-T1WI and coregistered with DSC-PWI. Mean normalized values per patient tumor mask of relative cerebral blood volume (rCBV), percentage of signal recovery (PSR), peak height (PH), and normalized time-intensity curves (nTIC) were extracted. Statistical comparisons were done. Then, the dataset was split into training (75%) and test (25%) cohorts and a classifier was created considering nTIC, rCBV, PSR, and PH in the model.

Sixty-eight patients (31 metastases, 13 medulloblastomas, 13 hemangioblastomas, and 11 pilocytic astrocytomas) were included. Relevant differences between tumor types' nTICs were demonstrated. Hemangioblastoma showed the highest rCBV and PH, pilocytic astrocytoma had the highest PSR. All parameters showed significant differences on the Kruskal-Wallis tests ($p < 0.001$). The classifier yielded an accuracy of 98% (47/48) in the training and 85% (17/20) in the test sets.

Intra-axial cerebellar tumors in adults have singular and significantly different DSC-PWI signatures. The combination of perfusion metrics through data analysis rendered excellent accuracies in discriminating these entities.

The authors constructed a classifier for the non-invasive imaging presurgical diagnosis of adult intra-axial cerebellar tumors. The resultant tool can support decision-making in clinical practice and enable optimal personalized patient management [1)]

1)
Pons-Escoda A, Garcia-Ruiz A, Garcia-Hidalgo C, Gil-Solsona R, Naval-Baudin P, Martin-Noguerol T, Fernandez-Coello A, Flores-Casaperalta S, Fernandez-Viñas M, Gago-Ferrero P, Oleaga L, Perez-Lopez R, Majos C. MR dynamic-susceptibility-contrast perfusion metrics in the presurgical discrimination of adult solitary intra-axial cerebellar tumors. Eur Radiol. 2023 Jul 13. doi: 10.1007/s00330-023-09892-7. Epub ahead of print. PMID: 37439938.