Pediatric Medulloblastoma

- How long should survivors of pediatric medulloblastoma and ependymoma be screened for recurrence? A retrospective cohort study
- Direct SERS profiling of small extracellular vesicles in cerebrospinal fluid for pediatric medulloblastoma detection and treatment monitoring
- Measles oncolytic virus as an immunotherapy for recurrent/refractory pediatric medulloblastoma and atypical teratoid rhabdoid tumor: results from PNOC005
- Human Chorionic Gonadotropin Injection to Retrieve Mature Oocytes During Laparoscopic Surgery for Ovarian Tissue Cryopreservation: A Case Report
- Long-term neurocognitive sequelae in pediatric medulloblastoma survivors treated according to the HIT protocol
- Acute Toxicities of Proton Craniospinal Irradiation in Pediatric Medulloblastoma: A Pediatric Proton/Photon Consortium Registry (PPCR) Study
- lncRNAs and circRNAs: Emerging Players in Pediatric Medulloblastoma Pathology
- Impact of radiation response on survival in pediatric medulloblastoma with residual or disseminated disease

Despite the optimal treatment given to children with medulloblastoma, many relapses are seen after combining treatments. Re-irradiation is part of salvage therapy for children who relapse and might provide long-term disease control. Nevertheless, it is challenging because there is a concern about exceeding radiation tolerances and late treatment toxicities. Re-irradiation is an option for many brain tumors, including medulloblastoma in children. This study presents a case of recurrent medulloblastoma treated with re-irradiation. A systematic review of the literature provided up-to-date data on the re-irradiation of medulloblastoma in children [1)].

Case series

identified pediatric patients with MB treated with protons between 2002 and 2016 and who had recurrent disease. To estimate the risk of peri-hippocampal recurrence, three hippocampal zones (HZs) were delineated corresponding to ≤5 mm (HZ-1), 6 to 10 mm (HZ-2), and >10 mm (HZ-3) distance of the recurrence from the contoured hippocampi. To determine the feasibility of HA, three standard-risk patients with MB were planned using either volumetric-modulated arc therapy (VMAT) or intensity-modulated proton therapy (IMPT) plans.

Results: Thirty-eight patients developed a recurrence at a median of 1.6 years. Of the 25 patients who had magnetic resonance imaging of the recurrence, no patients failed within the hippocampus and only two patients failed within HZ-1. The crude incidence of peri-hippocampal failure was 8%. Both HA-VMAT and HA-IMPT plans were associated with significantly reduced mean dose to the hippocampi ($p < .05$). HA-VMAT and HA-IMPT plans were associated with decreased percentage of the third and lateral ventricles receiving the prescription craniospinal dose of 23.4 Gy.

Conclusions: Peri-hippocampal failures are uncommon in pediatric patients with MB. Hippocampal avoidance should be evaluated in a prospective cohort of pediatric patients with MB.

Plain language summary: In this study, the patterns of disease recurrence in patients with a pediatric brain tumor known as medulloblastoma treated with proton radiotherapy were examined. The majority of failures occur outside of an important structure related to memory formation called the

hippocampus. Hippocampal sparing radiation plans using proton radiotherapy were generated and showed that dose to the hippocampus was able to be significantly reduced. The study provides the rationale to explore hippocampal sparing in pediatric medulloblastoma in a prospective clinical trial [2)]

1)
Giakoumettis G, Mantzavinou A, Moschos G, Giakoumettis D, Capizzello A. Re-irradiation of Pediatric Medulloblastoma: A Case Report and Systematic Review. Cureus. 2022 Nov 16;14(11):e31585. doi: 10.7759/cureus.31585. PMID: 36540431; PMCID: PMC9757891.
2)
Baliga S, Adams JA, Bajaj BVM, Van Benthuysen L, Daartz J, Gallotto SL, Lewy JR, DeNunzio N, Weyman EA, Lawell MP, Palmer JD, Yeap BY, Ebb DH, Huang MS, Perry AF, MacDonald SM, Jones RM, Tarbell NJ, Yock TI. Patterns of failure in pediatric medulloblastoma and implications for hippocampal sparing. Cancer. 2022 Dec 11. doi: 10.1002/cncr.34574. Epub ahead of print. PMID: 36504293.