ABSTRACT SUBMISSION FORM

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PRESENTATION TITLE

Can conventional MRI predict survival in pediatric ependymoma patients?

AUTHOR(S)
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ABSTRACT

Please type in your abstract up to a MAXIMUM of 500 words. Figures may be included.

Purpose:
Ependymoma is the third most common brain tumor in children. Radiation therapy (RT) is systematically administered after maximum surgical resection, utilizing recent advances in radiation delivery. Imaging can make a significant contribution to improving treatment outcome. This prompted us to look for significant preoperative and postoperative imaging markers for survival.

Materials & Methods:
A retrospective review of 121 patients who underwent primary resection of ependymoma followed by radiation therapy was undertaken utilizing quantitative volumetric analysis of pre- and postoperative MR images. Preoperative tumor volume (PRTV) on Post contrast (PC) T1 imaging, preoperative tumor volume ((PRTVF) on T2/FLAIR imaging, postoperative tumor volume on T2/FLAIR (POTVF) and Contrast Enhancement volume (CEPTVF) on PC-T1 imaging were delineated by an experienced radiation oncologist and double-checked by a neuroradiologist, after coregistration of T2/FLAIR imaging to the PC-T1WI. A survival analysis was done including clinical data (Gender, tumor location, tumor grade, the extent of resection, radiation dose) and extracted imaging volumes. All survival times were calculated from the date of beginning of RT. Overall survival (OS) and disease free survival (DFS) were estimated by the Kaplan-Meier method and using the following first-event definitions: local and distant relapse or death for disease free survival (DFS) and death for overall survival (OS). Univariate analyzes were performed using Cox proportional hazards model for quantitative variables and the log-rank test for qualitative variables. The hazard ratio (HR) (respectively, the survival rate at 3 years) is presented for each quantitative covariate (qualitative respectively) with 95% confidence interval. PRTV variable was dichotomized with the median value (<= 43.8 cc, vs> 43.8 cc) and POTVF variable with (0 (no) vs> 0 (presence))

Results:
After a median follow-up of 38.5 months, 80.2% of patients were alive, but 39.7% had experienced at least one event. Statistically significant differences between patients with and without postoperative FLAIR abnormalities were found for both DFS (71.9% vs. 40.3%; p = 0.006) and OS (93.7% vs. 72.4%; p = 0.023) in the univariate analyses, and for OS (p = 0.049) in the multivariate analyses.

Conclusions:
Postoperative FLAIR hyperintensities are a negative prognostic factor for intracranial ependymoma and may be a surrogate for residual disease. They could therefore prove helpful in patients’ surgical and radiotherapeutic management.