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Disease Control and Ototoxicity Using Intensity-Modulated Radiation Therapy Tumor-Bed Boost for Medulloblastoma.

[Polkinghorn WR](#), [Dunkel IJ](#), [Souweidane MM](#), [Khakoo Y](#), [Lyden DC](#), [Gilheaney SW](#), [Becher OJ](#), [Budnick AS](#), [Wolden SL](#).

Department of Radiation Oncology, Memorial Sloan-Kettering Cancer Center, New York, New York 10065.

Abstract

PURPOSE: We previously reported excellent local control for treating medulloblastoma with a limited boost to the tumor bed. In order to decrease ototoxicity, we subsequently implemented a tumor-bed boost using intensity-modulated radiation therapy (IMRT), the clinical results of which we report here.

PATIENTS AND METHODS: A total of 33 patients with newly diagnosed medulloblastoma, 25 with standard risk, and 8 with high risk, were treated on an IMRT tumor-bed boost following craniospinal irradiation (CSI). Six standard-risk patients were treated with an institutional protocol with 18 Gy CSI in conjunction with intrathecal iodine-131-labeled monoclonal antibody. The majority of patients received concurrent vincristine and standard adjuvant chemotherapy. Pure-tone audiograms were graded according to National Cancer Institute Common Terminology Criteria for Adverse Events version 3.0.

RESULTS: Median age was 9 years old (range, 4-46 years old). Median follow-up was 63 months. Kaplan-Meier estimates of progression-free survival (PFS) and overall survival (OS) rates for standard-risk patients who received 23.4 or 36 Gy CSI (not including those who received 18 Gy CSI with radioimmunotherapy) were 81.4% and 88.4%, respectively, at 5 years; 5-year PFS and OS rates for high-risk patients were both 87.5%. There were no isolated posterior fossa failures outside of the boost volume. Posttreatment audiograms were available for 31 patients, of whom 6%, at a median follow-up of 19 months, had developed Grade 3 hearing loss.

CONCLUSION: An IMRT tumor-bed boost results in excellent local control while delivering a low mean dose to the cochlea, resulting in a low rate of ototoxicity.

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