Reirradiation of relapsed brain tumors in children
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A B S T R A C T

Aim: The aim of this study was to evaluate toxicity and response to fractionated reirradiation (FR) of relapsed primary brain tumors in children. Background: The treatment options for recurrent brain tumors in children previously irradiated are limited. Reirradiation is performed with fear due to the cumulative late CNS toxicity and the lack of a significant chance of cure.

Materials and methods: Between 2008 and 2009, eight children with a median age of 14.5 years with a diagnosis of a recurrent brain tumor underwent reirradiation. Initially, all patients were treated with surgery, chemotherapy and radiotherapy. The median time to the first recurrence after the initial treatment was 19.5 months. Intervals between radiotherapy courses were in the range of 5–51 mos. All retreatments were carried out with 3D image-based conformal methods. The total prescription dose was 40 Gy in a fraction of 5 × 2 Gy/week. The total cumulative dose ranged from 65 to 95 Gy (median: 75 Gy). The median cumulative biologically effective dose was 144 Gy (range: 126–181 Gy).

Results: The median overall survival and progression free survival measured from the beginning of reirradiation was 17.5 and 6.5 months, respectively. During the first evaluation, four patients showed a complete or partial response, two did not respond radiologically. Two children were progressive at the time of reirradiation. Among children with progression that occurred during the first year after reirradiation, only two progressed in the treatment area. The repeated irradiation was well tolerated by all patients. No late complications have been observed.

Conclusion: In the absence of other treatment possibilities, the fractionated reirradiation with highly conformal three-dimensional planning could be a therapeutic choice in case of recurrent brain tumors in children. The control of craniospinal dissemination remains to be the main problem.

Keywords: Reirradiation, Late side effects, Conformal radiotherapy, Recurrent brain tumors