

40- Re-irradiation of recurrent pediatric ependymoma: CCHE experience

**Soha Ahmed MD1,2**, Rana Hegazy MSC1, Moatasem Alayadi MD1.3.4, Ahmed El Hemaly MD 1.3.4, Amal Refaat MD 1.6.7, Mohamed El Beltagy MD 1.8.9, Mohamed Reda MD1.8.9, Hala Taha MD 1.10.11, Hany Ammar MD, 1.2, Eslam Maher12, Mohamed Zaghoul MD1.13

1. Department of Radiation Oncology, Children's Cancer Hospital Egypt (CCHE-57357), Cairo, Egypt, 2. Department of Clinical Oncology, Aswan University, Aswan, Egypt., Cairo, Egypt, 3. Department of Pediatric Oncology, Children's Cancer Hospital Egypt (CCHE-57357), Cairo, Egypt, 4. Department of Pediatric Oncology, National Cancer Institute, Cairo University, Cairo, Egypt, 5. Department of Clinical Research, Children's Cancer Hospital Egypt (CCHE-57357), Cairo, Egypt, Cairo, Egypt, 6. Department of Radiology, Children's Cancer Hospital Egypt (CCHE-57357), Cairo, Egypt, 7. Department of Radiology, National Cancer Institute, Cairo University, Cairo, Egypt, 8. Department of Neurosurgery, Children's Cancer Hospital Egypt (CCHE-57357), Cairo, Egypt, Cairo, Egypt, 9. Department of Neurosurgery, Kasr El-Ainy School of medicine, Cairo University, Cairo, Egypt., Cairo, Egypt, 10. Department of Pathology, Children's Cancer Hospital Egypt (CCHE-57357), Cairo, Egypt, Cairo, Egypt, 11. Department of Pathology, National Cancer Institute, Cairo University, Cairo, Egypt, 12. Neuro-Oncology Study Team Clinical Research Department Children's Cancer Hospital, Egypt 13. Department of Radiation Oncology, National Cancer Institute, Cairo University, Cairo, Egypt,

### **Background**

Ependymoma (EP) is the third most common central nervous tumors in pediatric. Despite the aggressive standard of treatment for localized disease (surgery followed by radiotherapy) one third of the cases relapsed.

### **Objectives**

To identify the optimum dose and volume for the re-irradiated relapsed pediatric EP and long term survival outcomes.

### **METHODS:**

A total of 14 patients with recurrent EP were diagnosed and treated at Children Cancer Hospital Egypt between 2007 and 2017, with initially localized EP at the time of definitive initial radiotherapy (RT1) with median dose 5400 cGy. They underwent a second course of Radiotherapy (RT2) after local ( $n=7$ ), metastatic ( $n=5$ ), or combined ( $n=2$ ) failure. Re-irradiation included focal fractionated conformal volumetric radiotherapy (VMAT) ( $n=12$ ) with median dose 5020 cGy, or craniospinal VMAT (CSI;  $n=2$ ) with median dose 5310 cGy. Overall survival (OS) from the first day of diagnosis and progression free survival (PFS) after RT2 were measured.

### **RESULTS:**

The median age was 4.4 years (range: 2.1 - 15.9 years; male/female ratio: 1.73.) Initial time to failure was 10.5 months. The median interval between RT1 and RT2 was 14 months. Median age at RT2 was 6.1 years. Six patients out of 14 (42%) had re-surgery before RT2. Four patients (28.5%) achieved GTR and 2 (14.2%) had STR. OS showed improvement for patients had re-surgery compared to those who had RT2 without surgery, 8.8, 4.5 months respectively, yet not statistically significant ( $p=0.62$ ), 95% CI: 0.853-8.226). The cumulative incidence of grade  $\geq 3$  radiation necrosis after RT2 was not detected. The OS at 5 years 45.7%, mean OS 41.54 months (95% CI 27.82 - 55.26) and PFS at 6-months was 25.9%, median PFS 5.95 months (95% CI: 3.86 - 8.04)

### **CONCLUSION:**

Re-irradiation for relapsed pediatric EP was well tolerated by most patients and resulted in long-term survival in a subset of patients. The option of re-irradiation could be considered valid option of treatment for recurrent ependymoma.

**Keywords:** Ependymoma, Recurrent, Radiotherapy, Radiosurgery, Children