

Proton Therapy in Pediatric Oncology: Experiences and Future Perspectives in Serbia

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Proton Therapy in Pediatric Oncology: Experiences and Future Perspectives in Serbia

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Introduction: Pediatric cancer survival rates have significantly improved, from 30% in the late 1960s to 70-80% today. However, long-term side effects of conventional photon radiation therapy remain a major concern. Proton therapy offers a promising alternative due to its reduced toxicity profile, especially in young patients. The Institute for Oncology and Radiology of Serbia, a national referral center for pediatric radiation oncology, aims to explore and provide proton therapy options for its patients to enhance outcomes and quality of life.

Methodology: Our center treats 60-80 pediatric patients annually, utilizing highly conformal radiation techniques supported by anesthesia and a multidisciplinary team of five pediatric radiation oncologists. From 2022 to 2024, we initiated collaborations with U.O. Protonterapia, Ospedale di Trento, Italy, to send pediatric patients for proton therapy based on medical indications and tumor board recommendations. Clinical profiles, indications, and outcomes of the first three patients referred for proton therapy were reviewed.

Results: Three pediatric patients were successfully treated with proton therapy in Trento. The first patient, an 18-year-old girl diagnosed with carcinoma of the lacrimal gland in 2022, is currently in remission with a stable, minimal residual tumor. The second patient, a 17-year-old girl with Neurofibromatosis type 2 and multiple tumors treated in 2023, has achieved stable disease. The third patient, an 18-month-old boy diagnosed with choroid plexus carcinoma in 2024, currently shows no evidence of disease. All treatments were fully funded by the Serbian government.

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Conclusion: Our collaboration with European proton centers demonstrates the feasibility of providing state-of-the-art proton therapy to Serbian pediatric patients. Until regional proton therapy capabilities are established, we will continue to prioritize sending patients abroad based on medical indications. Ongoing international collaborations and education will ensure the long-term advancement of pediatric radiotherapy in Serbia.