

**LIST ALL AUTHORS and AFFILIATIONS – underline presenting author**

Logie N, Bradley JA, Rotondo RL, Nanda RH, Morris C, Sandler ES, Aldana PA, Indelicato DJ  
Department of Radiation Oncology, University of Florida College of Medicine, Jacksonville, FL

**TITLE**

Health-Related Quality of Life Following Proton Radiotherapy for Pediatric Tumors of the Brain and Skull Base: Results of a Prospective Study

**HYPOTHESIS:**

The hypothesis is that pediatric patients receiving proton therapy for skull base and brain tumors will maintain overall HRQOL over 1-year post-treatment.

**BACKGROUND/AIMS:**

Pediatric patients receiving radiotherapy to the brain and skull base are at risk of both acute and late toxicity secondary to treatment. Proton radiotherapy (PT) may allow for sparing of normal structures and reduced integral radiation dose compared to standard photon techniques. This prospective study evaluates changes in health-related quality of life (HRQOL) in children and adolescents one year after PT.

**METHODS:**

Ninety-eight patients  $\leq 21$  years of age receiving PT between 2010 and 2015 with  $>5$ cc of brain tissue receiving  $>5$  Gy(RBE) were enrolled on this study and completed the PedsQL 4.0 instrument with their parent proxy (PP). Domains assessed included physical, emotional, social, school, psychosocial, and total score. The PedsQL core score was completed at baseline and at the 1-year follow-up by PPs and children  $\geq 5$  years old. The Wilcoxon signed rank test was used to assess baseline and follow-up results as well as patient-related factors affecting HRQOL score changes.

**RESULTS & CONCLUSIONS**

The median follow-up was 1.1 years. The median patient age was 8 years; 60% were male, 20% had ependymoma, 20% had skull base tumors, and the median RT dose was 54 Gy(RBE). Patient and PP survey results were significantly correlated at baseline and follow-up (all  $r \geq 0.15$ ;  $p \leq 0.001$ ); however, mean patient scores were higher than PP scores. At 1 year of follow-up, PP scores for all domains were not significantly different from baseline ( $n = 98$ ;  $p \geq 0.052$ ). The mean scores at baseline compared to follow-up were as follows: physical, 68.7 vs 68.9; emotional, 68.6 vs 71.2; social, 79.5 vs 74.3; school, 60.5 vs 62.9; psychosocial, 70.5 vs 69.9; and total score, 70.0 vs 69.6. Mean patient scores were not significantly different for baseline compared to follow-up scores for physical (77.5 vs 78.5), emotional (78.1 vs 77.2), school (61.5 vs 68.0), psychosocial (75.5 vs 75.2), and total score (76.3 vs 76.4) ( $n = 65$ ;  $p \geq 0.17$ ). There was a statistically significant decrease in patient-rated social scores at 1 year compared to baseline (78.8 vs 86.1;  $p = 0.003$ ). Mean change in social score was not correlated with chemotherapy, dose  $\geq 54$  Gy(RBE), craniospinal or whole-ventricular PT, or gender. Patients  $< 8$  years old were significantly more likely to have a decrease in the social score compared to older children as ranked by the PP (-9.9 vs -0.5;  $p = 0.018$ ).

Pediatric patients receiving PT for skull base and brain tumors maintain overall HRQOL at least 1 year after treatment. In our study, only the social sub-domain was impacted at the 1-year follow-up as perceived by patients and parents of children  $< 8$  years of age. Integrated social support resources in a pediatric radiotherapy program may be beneficial. Further long-term follow-up of this prospective cohort will yield valuable understanding of HRQOL in this vulnerable population.