Pediatr Blood Cancer. 2024 Sep 25:e31341. doi: 10.1002/pbc.31341. Online ahead of print.

Long-term outcomes following proton therapy for pediatric spinal low-grade glioma

Ryan J Brisson [1], Daniel J Indelicato [1], Julie A Bradley [1], Philipp R Aldana [2], Darren Klawinski [3], Christopher G Morris [1], Raymond B Mailhot Vega [1]

Affiliations

PMID: 39323035 DOI: 10.1002/pbc.31341

Abstract

Background: Due to its rarity, no standard treatment guidelines exist for pediatric spinal low-grade glioma (LGG-S). Proton therapy (PT) offers an attractive modality to minimize toxicity. Herein, we present the first published series of pediatric patients who received PT for progressive LGG-S.

Procedures: We identified eight consecutive patients with nonmetastatic LGG-S treated with PT. Cumulative incidence method was used to estimate local control (LC), freedom from distant metastases (FFDM), and freedom from progression (FFP). The Kaplan-Meier product limit method assessed overall survival (OS). Toxicity was assessed according to the Common Terminology Criteria for Adverse Events Version 5.0.

Results: Median age at diagnosis was 4 years. All patients underwent attempted resection and developed recurrence/progression prior to referral for PT, with median duration between initial surgery and PT of 4.4 years. Median age at the start of PT was 8 years. Most patients (n = 5) received PT as ≥third line treatment. Seven patients were treated with PT to the primary tumor. Most patients (n = 7) received between 45-50.4 CGE. Median follow up was 7.8 years. The 10-year estimates for LC, FFDM, FFP, and OS were 85, 88, 73, and 55%, respectively. One patient experienced malignant transformation and two developed pseudoprogression following PT. No pulmonary, gastrointestinal, or musculoskeletal toxicities were observed during or after PT.

Conclusions: Despite negative selection bias our experience suggests PT for pediatric LGG-S offers long-term disease control with limited toxicity. The favorable therapeutic ratio of PT suggests it should be considered among first-line therapy in children with nonmetastatic, unresectable LGG-S.

Keywords: CNS; low-grade glioma; outcomes; proton therapy.