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Contemporary Management of Pediatric Brainstem Tumors

Sheng-Che Chou [1] [2], Yu-Ning Chen [3], Hsin-Yi Huang [4], Meng-Fai Kuo [1], Tai-Tong Wong [5], Sung-Hsin Kuo [6], Shih-Hung Yang [1]

Affiliations

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Abstract

Brain tumors are the second most common malignancy in childhood. Around 15-20% of pediatric brain tumors occur in the brainstem. The most common type of brainstem tumor are diffuse tumors in the ventral pons, whereas focal tumors tend to arise from the midbrain, medulla, and dorsal pons. Glioma is the most common pathological entity. Contemporary management consists of surgery, radiotherapy, chemotherapy, and other adjuvant treatment. Surgical options range from biopsy to radical excision. Biopsy can be performed for diagnostic and prognostic purposes, or in the setting of clinical trials, mainly for diffuse intrinsic pontine gliomas. For focal tumors, surgeons need to carefully balance clinical outcomes against possible neurological sequelae in order to achieve maximal safe resection. Radiotherapy is essential for control of high-grade tumors and may be applied to residual or recurrent low-grade tumors. Proton therapy may provide similar efficacy and less neurotoxicity in comparison to conventional photon therapy. Oncological treatment continues to evolve from conventional chemotherapy to targeted therapy, immunotherapy, and other novel treatment methods and holds great potential as adjuvant therapy for pediatric brainstem tumors.

Keywords: Brainstem tumor; Chemotherapy; Child; Immunotherapy; Molecularly targeted therapy; Radiotherapy; Surgery.