

Experience Using CyberKnife Radiosurgery for Ocular Tumors

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Objective: Frameless stereotactic radiosurgery is a potentially effective treatment method for tumors near or around critical structures of the optic apparatus. We report on a retrospective analysis of CyberKnife radiosurgery treatment outcomes for ocular tumors.

Methods: Since 2006, 32 tumor patients were treated at the Philadelphia CyberKnife Center for ocular tumors. A retrospective analysis of treated with at least 12 months follow-up was performed. Treatment areas included the eyelid, orbital, or periorbital regions. All patients were positioned supine with a CT scanner using IV contrast in a thermoplastic mask prior to their treatment. MRI of the orbital area was also done in many cases and fused for any possible additional information. A bolus was used when surface doses were required. The average number of treatment beams was 165. The median treatment dose was 18.5 Gy (range, 13.5-30 Gy). Most patients received 5 fractions delivered in 5 consecutive days, although two patients only received 3 fractions and one patient only received 4 fractions. Lens doses to the treated eye were not considered critical. Cataract surgery was deemed an acceptable later consequence of the therapy and patients consented. Doses to the contralateral eye were 0 Gy, while the optic chiasma was kept below 10 Gy.

Results: Twenty patients with a minimum of 12 months follow-up were analyzed. Patient ages ranged from 16 to 91 years old with a median age of 65. Patients presented for initial treatment with lymphoma, squamous cell carcinoma, adenocystic carcinoma, basal cell carcinoma, or metastatic melanoma. A few patients had previous radiation therapy to the treatment area or surgery. All patients were without major complications. All patients who presented with pain were pain free between 2 days and 2 weeks after therapy. Those with neurologic deficit either improved or remained stable without progression. At a median follow-up of 34 months (range, 13-42 months), 16 patients (80%) exhibited local control and 15 patients (75%) had systemic control. A detailed analysis of patient outcomes will be presented.

Conclusions: In our experience, frameless stereotactic radiosurgery using the CyberKnife has been an effective treatment modality for periorbital tumors.

Outline:

A: Introduction of SRS and Ocular Tumor

B: Method

1. Pt and tumor characteristics
2. Simulation, planning and Delivery
3. Treatment Tolerance and Dosage

C: Result

1. Low Toxicity
2. Encourage response