2156 Photon-based Fractionated Stereotactic Radiotherapy For Post-operative Treatment Of Skull Base Chordomas

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Purpose/Objective(s): Skull base chordoma is a slow but progressive tumor that ultimately leads to the death of the patient. Standard treatment involves surgical resection and post operative radiation therapy, often with proton beam. We report our series of skull base chordoma patients who underwent surgical resection followed by photon-based Fractionated Stereotactic Radiotherapy (FSRT), using both dynamic conformal arcs and intensity modulation with image guidance.

Materials/Methods: Between December 2002 and February 2009, 12 patients with skull base chordomas and no history of prior radiation therapy were treated with adjuvant or salvage radiation therapy at Kaiser Permanente Los Angeles Medical Center. The patients initially were treated with FSRT on the BrainLAB Novalis^{TM} Linear Accelerator using dynamic conformal arcs with static beam IMRT boost. Since 2006, patients have been treated with image guided intensity modulated FSRT using BrainLAB ExacTrac^{TM} for patient positioning. The median age was 55 years (range, 10-79). There were 6 males and 6 females. The median isocenter dose of 74 Gy (range, 54-76) was delivered in 200 cGy fractions and prescribed to the 90% isodose line that covered the PTV (target volume with a median 2 mm margin).

Results: Median follow up period was 34 months (range, 1-74). Median time from surgery to the start of radiation therapy was 3.6 months. The overall survival was 92%, and the median progression free survival after radiation was 24 months. The local control rate was 92% at 1 year and 65% at 3 years. There was no correlation between disease progression and age, tumor volume, or time to start radiation ($p = 0.17$, $p = 0.63$, and $p = 0.97$ respectively). At last follow up, 9 patients had stable or reduced disease. Five patients had progression of disease after radiation with a median time to progression of 18.6 months (range 2.3-27.7). One patient died of disease less than 1 month after completing 54 Gy. One patient was salvaged with radiosurgery and surgical resection, with stable disease at 73 months. Two patients have received small molecule tyrosine kinase inhibitors for salvage therapy, with stable disease at 6.4 months and 7.9 months.

Conclusions: For our small cohort of patients, FSRT as post-operative treatment resulted in local control comparable to other treatment modalities. These early results reveal the safety of delivering a high dose to these tumors and gives credence to the possibility of dose escalation for future patients with image guided, intensity modulated FSRT.

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