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Self-Shielding Gyroscopic Stereotactic Radiosurgery: Initial Experience of 150 Patients

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Abstract

Objectives:

The Zap-X Gyroscopic Radiosurgery platform is novel regarding its self-shielding system and offers a variety of improvements over traditional linear accelerator systems. We report our initial experience with the first 150 patients treated with gyroscopic radiosurgery with the intention to expand the existing literature on this novel treatment option.

Methods:

All patients were treated using the Zap-X Gyroscopic Radiosurgery Platform at Jersey Shore University Medical Center. Patient demographics as well as treatment parameters and characteristics were collected and analyzed. Patient comfort and satisfaction was gauged with a post-operative questionnaire which utilized a 5-point Likert scale.

Results:

150 patients were treated using the Zap-X Gyroscopic Radiosurgery System from October 2023 to September 2024. There were 68 cases of brain metastases, 32 meningiomas, 13 of trigeminal neuralgia, 9 schwannomas, 8 recurrent glioblastoma multiforme, 7 pituitary adenomas, 3 spinal tumors, 1 hemangioma, and 1 arteriovenous malformation. Linear regression revealed a decrease in treatment times over the course of several months, with an average treatment time of 51 minutes. The median treatment dose was 24 Gy, and the median prescription isodose line was 60%. The average percent coverage was 98%, with a median conformity index of 1.18 and a median gradient index of 2.95. The most common side effect was fatigue (71%) and the least common were tinnitus and visual disturbance with a single occurrence each (1.6%). Patient experience metrics were extremely favorable; the average overall rating of care was 4.96 and the mean patient level of comfort during Zap-X treatment was 4.38.

Conclusion(s):

Our initial experience with the use of Zap-X showed its utility in the treatment of various neurosurgical conditions along with strong patient satisfaction with the treatment. Further treatment data and long term follow-up is needed to determine its effectiveness as a treatment option for patients.