

عنوان مقاله:

Dosimetric Comparison of Two Linear Accelerator-Based Radiosurgery Systems for Intracranial Tumours with Rapidarc and Dynamic Conformal Arc Therapy

محل انتشار:

مجله فیزیکی پزشکی ایران، دوره 18، شماره 5 (سال: 1400)

تعداد صفحات اصل مقاله: 10

نویسندگان:

Vaibhav Mhatre - *Department of Radiation Oncology and Neurosurgery, Kokilaben Dhirubhai Ambani Hospital and Medical Research Institute, Andheri, Mumbai, India*

Pranav Chadha - *Department of Radiation Oncology and Neurosurgery, Kokilaben Dhirubhai Ambani Hospital and Medical Research Institute, Andheri, Mumbai, India*

Rajkumar Chauhan - *Department of Radiation Oncology and Neurosurgery, Kokilaben Dhirubhai Ambani Hospital and Medical Research Institute, Andheri, Mumbai, India*

Kaustav Talapatra - *Department of Radiation Oncology and Neurosurgery, Kokilaben Dhirubhai Ambani Hospital and Medical Research Institute, Andheri, Mumbai, India*

Abhaya Kumar - *Department of Radiation Oncology and Neurosurgery, Kokilaben Dhirubhai Ambani Hospital and Medical Research Institute, Andheri, Mumbai, India*

خلاصه مقاله:

Introduction: The present study focused on the dosimetric evaluation of Edge and Novalis Tx (NTx) linear accelerator (LA)-based radiosurgery system by using RapidArc (RA) and dynamic conformal arc (DCA) planning techniques. **Material and Methods:** Forty patients with brain lesions of variable sizes (1.1-15.98 cc) were planned for Edge and NTx system by using the RA and DCA planning techniques on eclipse treatment planning system, version 13.6 (Varian Medical Systems, Palo Alto, CA, USA). All the plans were evaluated on the basis of paddick conformity index (PCI), homogeneity index (HI), and gradient index (GI). The maximum doses to organs at risk (OAR), V12Gy, V10Gy, and V5Gy for healthy brain tissue were also evaluated for all the plans. The treatment delivery efficiency for both systems was also evaluated. **Results:** The mean PCI and GI for both RA and DCA plans were found to be better in Edge as compared to NTx system (PCI Edge, RA=0.77±0.1, PCI NTx, RA=0.66±0.11, PCI Edge, DCA=0.69±0.12, PCI NTx, DCA=0.67±0.12). Significant differences in HI, doses to OAR, and V12Gy, V10Gy, and V5Gy brain volume were observed for both systems with p-value less than 0.05. Reduced treatment time was observed in Edge LA as compared to NTx LA. **Conclusion:** Edge LA produced clinically better target volume conformity, rapid dose fall-off, and reduced reduction in normal brain volume irradiation and treatment time compared to NTx. Thus, in the set of patient plans evaluated, it was noted that Edge stereotactic suite is more efficacious and diametrically suitable for intracranial radiosurgery

کلمات کلیدی:

dynamic conformal arc, Linac, Stereotactic radiosurgery, Treatment Planning

