

عنوان مقاله:

Impact of 6 MV & 10 MV Flattened and Flattening Filter Free Beams in Whole Brain Radiotherapy: A Treatment Planning Study

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خلاصه مقاله:

Introduction: To study the impact of 6 MV and 10 MV flattened beam (FB) and flattening filter free (FFF) beam in whole brain radiotherapy (WBRT) by using volumetric modulated arc therapy (VMAT). **Material and Methods:** Twenty WBRT patients were selected randomly. The dose prescription was 30 Gy, which was delivered in ten fractions. The planning target volume (PTV) and organs at risk (OARs) were contoured. Four VMAT plans, including 6 MV FB, 6 MV FFF, 10 MV FB, and 10 MV FFF beam plans, were generated. **Results:** The 6 MV FB and FFF beam plans were statistically significant ($p < 0.05$) in terms of the dose received by 98% of the PTV ($D_{98\%}$) (26.86 Gy vs. 27.31 Gy, $P=0.006$), the dose received by 95% of the PTV ($D_{95\%}$) (28.28 Gy vs. 28.52 Gy, $P=0.038$), 107% isodose ($V_{107\%}$) of the PTV (2.43% vs. 3.74%, $P=0.001$), $D_{100\%}$ of the hippocampus (9.31 Gy vs. 9.16 Gy, $P=0.009$), and the Dmean scalp (16.7 Gy vs. 16.8 Gy, $p=0.035$). The 10 MV FB and FFF beam plans showed significant differences in the conformity index (0.9 vs. 0.85, $P=0.01$), $V_{107\%}$ of the PTV (1.68% vs. 4.54%, $P=0.001$), $D_{100\%}$ (10.08 Gy vs. 9.81 Gy, $P=0.036$), and Dmean of the hippocampus (12.78 Gy vs. 12.57 Gy, $P=0.018$). The 6 MV and 10 MV FFF beams showed homogeneous conformal plans, which required 18-19% more MUs, compared to the FB plans. **Conclusion:** The 6 MV and 10 MV FB and FFFB spared the hippocampus and the scalp with acceptable target coverage in WBRT cases.

کلمات کلیدی:

Whole brain radiotherapy, Hippocampus, scalp sparing, flattened beam, flattening filter free beam

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