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# Comparison of Two Planning Strategies for the Meningioma Stereotactic Hypofractionated Radiosurgery Planning

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## Abstract

Objectives: Aim of the study is to compare and evaluate two radiosurgical planning strategies using two planning systems - Precision and Eclipse with Multileaf Collimator for the meningioma treatment planning.

Methods: 15 meningiomas with maximum dimension 3 cm were used to compare two planning systems - Precision (CyberKnife M6 - Accuray) and Eclipse (Edge - Varian Medical System). In the CyberKnife System, the InCise Multileaf Collimator (MLC) was used with 82 - 2.5 mm leaves (41 pairs), and in the Varian System - HD120 MLC with 120 interleaved leaves including 64 - 2.5 mm leaves for central 8 cm field and 56 - 5 cm leaves for two peripheral 7 cm fields was used. The prescribed dose was 16 Gy in a single fraction. Treatment planning was done using the same parameters (dose constraints, auto-shells) for each system. Meningiomas were distant from organs at risk and therefore the comparative criterion was dose in the whole brain (V12 < 10cc). It will also be compared estimated treatment time, Conformity Index (CI), number of beams and total MU.

Results: Minimum, mean and maximum doses were comparable for both treatment planning systems. For the Precision System treatment time was 23 ± 3 min., there was 38 ± 4 beams, total MU were 4033 ± 819 MU, CI = 1.5 ± 0.2 and V12 = 4.2 ± 2. For the Eclipse System treatment time was 15 ± 0.5 min., there was 4 beams, total MU were 4000 ± 336 MU, CI = 1.5 ± 0.2 and V12 = 5.3 ± 1.9.

Conclusions: Treatment time is shorter for the MLC in the Varian System, but the dose distribution outside the tumor is better for the Precision System. The physician's decision is, which treatment planning strategy is better for an individual patient.

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