Purpose: Intraocular metastases are present in up to 10% of patients with systemic malignancies. With tumor cells spreading hematogenously, the posterior choroid is frequently involved because of its rich vasculature. We treated a woman who developed bilateral choroidal metastases from breast cancer. For the patient, we designed three radiotherapy techniques. The study was to find the dosimetric differences between them.

Methods: For the patient with bilateral choroidal metastases, three-dimensional conformal radiotherapy (3D-CRT), inverse intensity-modulated radiotherapy (IMRT) and volumetric modulated arc radiotherapy (V-MAT) plans were designed. The prescription dose was 60 Gy in 30 fractions. The dose distribution in the target, the dose to the organs at risk, total MU and delivery time were compared.

Results: In 3D-CRT, IMRT and V-MAT plans, the volume of target in 100% prescription dose were 92.5%, 93.3% and 92.0% respectively. V-MAT plan showed the best conformity and homogeneity in target. IMRT plan showed a better homogeneity than 3D-CRT plan. In 3D-CRT, IMRT and V-MAT plans, the max doses on left lens were 975.3 cGy, 739.9 cGy, 870.2 cGy respectively. The max doses on right lens were 929.9 cGy, 802.9 cGy and 889.0 cGy respectively. V-MAT plan showed the lowest value for the max dose on left optic nerve and the lower value for the right one compared to 3D-CRT plan. The MUs were 386, 973, 709 and the delivery times were 10 min, 14 min and 1.6 min respectively in 3D-CRT, IMRT and V-MAT. V-MAT could significantly reduce the delivery time.

Conclusions: V-MAT plan showed the best conformity and homogeneity in target. IMRT showed the lowest value in the max doses to lenses though the delivery time was longest. Overall, V-MAT showed a similar or better dose distribution, and most importantly, improved treatment delivery efficiency. With the results, V-MAT technology could be expected to choroidal metastases.