

Purpose: to study the effects of multi-leaf collimator (MLC) leakage-ray and scattered-ray to eyes and lens in radiotherapy of patients with brain metastasis tumor. **Methods and Materials:** 10 patients treated by whole brain radiotherapy were selected, for each of which two model treatment plans were designed. Plan_1: Two fields in 90° (field_1) and 270° (field_2) were arranged to the brain, while the angle of collimators were fixed in 0° . Plan_2: The same angle of fields were arranged, but the angle of collimators were modified with rotation of 45° in field_1 and -45° in field_2, respectively. In this case, the lens and most of eyes were out of irradiated volume, so that most of leakage-ray and scattered-ray effecting to them were reduced. The whole brain was irradiated to the prescription dose. The dose of lens and eyes received were evaluated by dose-volume histogram (DVH). **Results:** two plans both met the clinical demands with almost same dose distribution to whole brain. Compared to Plan_1, the maximum dose on left lens decreased on average 100.5cGy ($t = 8.299$, $P < 0.01$), and the maximum dose on right lens decreased on average 109.5cGy ($t = 7.567$, $P < 0.01$); the mean dose on left eyes decreased on average 151.6cGy ($t = 3.252$, $P < 0.01$), and the mean dose of right eyes decreased on average 124.2cGy ($t = 3.256$, $P < 0.01$). **Conclusions:** in the whole brain radiotherapy, the effects of leakage-ray and scattered-ray to lens and eyes were significant. Therefore, it is necessary and salutary to modify the angle of collimators in order to reduce the dose on lens and eyes remarkably.