

**Purpose:**

It is reported to have an impact on dose due to uncertainty of MLC drive control in IMRT using MLC. It is reported to have displacement of about 0.5mm in a month as changes over time of MLC drive control accuracy installed in LINAC made by SIEMENS. There is fear that these changes over time contribute to dose distribution when SMLC-IMRT is practiced.

**Methods:**

For LINAC, We used PRIMUS High-Energy KD2 7467 (Siemens Medical Systems) that generates 10MV-X rays. MLC installed in this therapy machine is MLC-20A (Toshiba Medical Systems) with lower collimator replaced by MLC of 29 pairs and adopts double focus that does focusing with two aspects in a structure of MLC's leaf tip and side contacting always parallel to dose angle. We used Kodak Extended Dose Range2 (Carestream health Inc.) for film, D.D.system (R-TECH Inc.) for film analyzer, flat bed scanner ES-10000G (EPSON Corp.) for film reader and Xio-version4.50.00 (ELEKTA) for RTP. We studied the impact of MLC drive control accuracy on dose evaluation (gamma analysis) measuring IMRT dose distribution as well as evaluating MLC drive control accuracy (resting positional accuracy and position reproducibility) once a week for 60 days.

**Results:**

MLC positional accuracy tended to expand by 0.1-0.15mm in one week accompanied by changes over time and tended to expand by about 1mm in 60 days. The reproducibility was within 0.2mm for roughly over 95%. For prostate gland IMRT, I did not see a significant difference in pass rate of  $\gamma$  analysis if the resting positional accuracy of MLC is about 1mm.

**Conclusions:**

It was suggested that it would be an effective index to continue IMRT safely in the future by practicing regular management upon setting an acceptable value by MLC positional accuracy test.

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