Comparison of MLC (VARIAN) vs. Cerrobend Block In Clinical Setup

Multileaf Collimator (MLC) is often a replacement for custom made cerrobend blocks used in radiation oncology departments. Because the finite width of individual leaves, a step effect (visually distorted to the physician) replaced the smooth cerrobend block curvature. The dosimetry of this step effect has been well documented in literature. Clinically, this step effect is washed out by the day to day variation in the patient setup. In this study, we used a VARIAN 80 leaf MLC system with 1 cm leaf width on a typical 4 field box prostate technique to demonstrate there is no clinically significant step effect after 15 treatments, assuming the daily setup variation of 5 mm standard deviation from baseline. Of equal significance, the dose distribution differences between MLC fields and cerrobend block fields after 15 treatments is minimal (dose line <2 mm spatial difference). In conclusion, the step effect disappears for a multiple fraction treatment with random setup variations on the order of 5 mm standard deviation, and the 1 cm leaf width MLC can effectively replace cerrobend block with no clinical significant step effect.