

AbstractID: 8844 Title: Dose in-homogeneity at the vicinity of the match line between an anterior of-cord photon field (APF) and a posterior electron field (PEF) for head and neck (H/N) cancer

Purpose: It is common practice to split the initial H/N photon field to an APF and PEF to avoid overdosing the cervical spinal cord. A close study at the vicinity of the junction of APF and PEF using conventional field matching techniques with either MLC or regular Cerobend blocks reveals a significant dose variation in this vicinity. This study researched for the causes of this dose in-homogeneity under varieties of fields matching method, as well as solutions for this undesirable phenomenon.

Materials and Methods:

- I. Film dosimetry and 3-D treatment planning system were used to study the dose distribution for the three ways of shaping APF and PEF.
 - 1) APF and PEF were both shaped with Cerobend blocks without using MLC (Cerobend-Cerobend, or CC),
 - 2) APF shaped with 0.5 and 1.0 cm MLC, but PEF shaped by a Cerobend block with smooth matching line (MLC-Cerobend, or MC), hence, there were small areas of over/under exposure, and
 - 3) APF with MLC and PEF was outlined with a matching zigzag shape Cerobend block (MZC).

- II. Using a match line adjusted for the SSD of the virtual electron source (VES), with 10-15 cm shorter than the nominal SSD, Step I was repeated.

Result: The dose in-homogeneity has a wide range of variation of up to 40% at the vicinity of the match line for all three ways of shaping the fields. The effect of off-center matching is also observed. The study shows that with careful adjustment, the dose in-homogeneity can be reduced significantly.