Field matching between conventional static radiotherapy and IMRT is often required in sites such as H&N and Para-Aortic Nodes. A standard matching procedure can avoid unnecessary underdose or overdose near the match line. This study compares different methods in matching between conventional RT and SMLC-IMRT.

A clinic H&N case was used for the study. Besides the standard critical organs and targets, the target volume in the vicinity of match line (named junction PTV) was specifically delineated for dose volume histogram comparison. Split beam technique was used for the AP low neck. We compared the field matching using the combination of following strategies: (1) Split beam technique in the IMRT fields; (2) Block margins in the inferior border of IMRT-PTV; (3) Planning AP low neck field before IMRT planning; (4) PTV was extended 10 mm inferiorly to the match line for IMRT inverse planning. Film dosimetry was performed for dose comparison, because for method #4, the dose delivery was different from the treatment plan. The inferior jaw was closed to the matching line in dose delivery, while it was extended 10 mm inferiorly for treatment planning.

We found that (1) using a block margin at the inferior PTV border caused severe underdose near the matching line; (2) adding AP low neck plan after IMRT plan caused significant overdose; (3) using split beam technique in IMRT fields improved matching, however, a reasonable small Y1 jaw setting (< 5 cm) was also acceptable; (4) Method 4 had the best result.