

AbstractID: 6404 Title: Comparison of Tangential Fields with Non-coplanar Irradiation for Partial Breast Treatment

Purpose : To Compare DVH for 4-5 non-coplanar beam arrangement with tangential beams using forward FNF (field-in-field) planning technique for partial breast treatment and investigate the effect of setup uncertainty and patient motion on DVH.

Method and material: Five breast patients with right and left lesion are chosen randomly for the planning comparison with partial breast treatment protocol RTOG #0413. Four or five non coplanar beams arrangement is compared with the tangential two beam arrangement using field in field technique with Varian eclipse treatment planning system. CTV is defined as surgical cavity +1.5 cm to chest wall, excluding 5 mm from skin; PTV is defined as 1.0 cm margin around CTV. PTV_eval (PTV, exclude chest wall and 5mm away from skin) is used for the DVH evaluation. Organ motion effects are investigated with adjusting beams isocenter 5mm up and down, with the same fields' apertures.

Results: Non-coplanar planning spares more ipsilateral normal breast than FNF, however non-coplanar treatment requires longer treatment time and prone to have higher setup error and patient motion. For smaller breast (e.g. separation <20cm), FNF is preferred. For large breast (e.g., separation > 20cm), non-coplanar planning improves PTV coverage by >2-3% compared with FNF. Magnitude of DVH differences between organ motion and ideal position are similar for normal tissues in both planning technique. PTV-EVAL is more influenced by organ motion in non-coplanar plan compared with FNF for both small and large breast treatments.

Conclusion: Both non coplanar and forward FNF methods meet the RTOG #0413 dose volume requirement. Forward FNF planning can provide comparable local control rate as well as with reduced treatment and verification time. Forward FNF planning is preferred for smaller breast, e.g., separation smaller than 20 cm.