

Purpose:

For irregular-surface-compensator based breast irradiation (ISCBBI), the skin flash tool application (SFTA) is useful to expand the intensity map with considering the respiratory motion. However, the default recommended setting of SFTA is assumed for large breast case. The purpose of this study is to verify the influence of SFTA and to establish the suitable setting on the treatment planning for ISCBBI in our hospital.

Methods and Materials:

Twenty patients with breast cancer were selected for this study. All patients were fixed by an arm support with a combination of Vaclok vacuum cushion. A 6 MV photon beam from Varian 21EX linear accelerator that equipped with 5 mm width multi-leaf collimator was used. The plans were created by Eclipse treatment planning system. The spatial resolution of SFTA was 2.5 mm. The intensity maps of ISCBBI were compared. These intensity maps and the transmission factors on some region-of-interest (ROI) area were evaluated. ROIs were defined at superior side, center area and inferior side. After the planning, the rehearsals of leaf motion were performed.

Results:

The image-guided setup error with considering respiratory motion was within 3 mm. The satisfactory intensity map was created for ISCBBI when the suitable setting was defined at ROIs. The conformable intensity maps on ISCBBI were obtained when the transmission factors with ranging from 0.45 to 0.60 and the penetration depths of 45% were selected for ISCBBI planning, respectively. The suitable setting reduced the dynamic leaf motion error during delivery of ISCBBI.

Conclusion:

The unsuitable setting of ISCBBI planning leads to make inconformity of intensity map. The optimal number of transmission factor to obtain the satisfactory intensity map for ISCBBI in our hospital are approximately 0.5. To classify the setting for ISCBBI planning in patient's condition, the further evaluations and measurements are required.