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KEY WORD : BREAST IRRADIATION / TANGENTIAL / HALF-BEAM
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PACHUEN POTUP : COMPARISON OF DOSE DISTRIBUTION FOR
DIFFERENT TECHNIQUES OF BREAST IRRADIATION TREATMENT. THESIS
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The study of dose distribution for different techniques of breast and chest wall irradiation treatment was under taken to determine the best method for improving homogeneity of dose in the treated breast and reducing the dose delivered to tissue outside the treatment volume. The dose in lung tissue and surface dose to target and to contralateral breast were considered. This study used a Clinac 1800 linear accelerator set to produce 6 MV x-rays, a rando phantom tissue-equivalent model and two patients who were undergoing conservative breast treatment. Dose measurements were made by using thermoluminescence dosimeters (TLD-100 chips). The irradiation treatment was conducted using opposing tangential field technique with source to skin distance (SSD) of 100 cm. Asymmetric half beam created using asymmetric collimators and symmetric beam created using symmetric collimators were both used in this study. All techniques were tested without the wedge beam accessory, and with both 15° and 30° wedges used as compensators.

For all techniques, the absorbed dose at reference points in the rando phantom breast model are very close to the prescribed dose of 200 cGy. The upper transverse plane shows higher dose and the lower transverse plane shows lower dose than the central plane. The absorbed dose in the lower plane of asymmetric beams is lower than that of symmetric beams. The use of asymmetric beams results in somewhat poorer homogeneity of radiation dose to the target breast than the use of symmetric beams. Wedge filters are not ideal compensators use in the irradiation treatment of breasts. The average doses to chest wall and lung in all techniques are increased when larger degree of wedge angle is used and doses are decreased significantly when asymmetric beams are used. Finally, the surface doses on target breast phantom and patients are decreased significantly when larger degree of wedge is used, but the surface doses at the contralateral breast are higher when larger degree of wedge angle is used, but the surface doses to the contralateral breast are higher when larger degree of wedge angle is used. The behavior of surface doses in both the target and contralateral breasts of the patients irradiated by symmetric and asymmetric beams are different from the behavior of the doses to the phantom due to variations of individual patients size and shape. Due to the variations in patients breast shape and size, as well as the small number of patients, it is difficult to compose the patient's results to the rando phantom results in this study.