

AbstractID: 8511 Title: Dose verification of Mammosite treatments with MOSFET dosimeters

Purpose: In recent years, accelerated partial breast irradiation using the MammoSite balloon has proven an effective and popular treatment. The selection criteria for patients, based on medical and physical (minimum skin distance) considerations have been well established. Our checklist addresses these criteria, confirms that the selected dwell position is at the center of the balloon and is used to assess its integrity prior to treatment. Recently, we have implemented in-vivo dosimetry using MOSFET dosimeters to validate our brachytherapy calculations.

Method and Materials: Five MOSFETs were calibrated for the ^{192}Ir HDR source by taping them on the surface of a 4 cm diameter cylinder. Our calibration geometry assured minimum dose gradient, less than 1.5%, within +/- 2 cm from their location. To calculate the dose at selected skin points, five radio-opaque marks are placed on each patient's skin prior to CT. Before treatment, the five MOSFETs are taped on these skin points of the ipsilateral, contralateral breast and neck. For one patient, the 5th MOSFET was placed at the pacemaker situated 9 cm from the balloon center. At the completion of the treatment the readings are compared to the calculations.

Results: There is generally good agreement between calculated versus measured dose for all five dosimeters. The average of the absolute discrepancy between calculation and measurement for the skin dose at the lateral aspect of the treated breast is 5.7 ± 4.2 cGy for the 9 patients. Both measurement and calculation yield an average dose of 4 cGy to the contralateral breast.

Conclusion: The use of MOSFETs is a convenient and accurate way to obtain skin dose measurements for mammosite cases. In addition to validating the calculations, the readings can provide dosimetry information for clinically significant areas like the thyroid or the pacemaker.

Conflict of Interest (only if applicable):