

Accelerated partial breast irradiation in the prone position with helical tomotherapy

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A new method for treating early stage breast cancer, called accelerated partial breast irradiation (APBI), is described. This method is mostly being accomplished through the use of brachytherapy, whether it be interstitial or using the Mammosite[®] device. APBI has proven to be effective but costly in a fiscal and physical sense. APBI is more time intensive for the staff and requires an extra operation. Brachytherapy is used instead of external beam partially because of a lack of image guidance and the inability to easily set up the patient in the prone position. In order to perform high precision IMRT on the breast image guidance and delivery verification is necessary. With the advent of helical tomotherapy, another external beam approach is now possible. Tomotherapy allows for an easier method of setting up the patient and verifying her location in the prone position, and it has the ability to track the position of the target on a daily basis. These and other aspects of external beam APBI such as breathing motion, dosimetry differences, and setup differences have been explored. Results show that treating APBI with external beam is not only possible but may be beneficial. Also an entire new modality based on the helical tomotherapy machine is explored. This would specialize the tomotherapy machine for use on the prone breast taking advantage of its unique geometry.