AbstractID: 7118 Title: IMRT to Breast Tisse and Associated Lymph Nodes with Consideration of Breathing Motion

We investigated IMRT delivery to breast tissue, biopsy cavity, and associated nodes. Although IMRT may offer better dose uniformity, minimize doses to critical organs and, eliminate the field junction issue, breathing may affect ideal dose distribution. Therefore, electronic portal images were taken for multiple patients to study the impact of breathing on the IMRT delivery. For each patient, an average of 8 images per field were acquired during a treatment. Each patient had approximately 240 images for tangential fields. The liquid-filled ionization detector (PortalVision-LC250) was set to run in a fast frame-averaging mode with an image acquisition rate of 1.4 frames/second. We developed an algorithm to analyze 2931 images. The Canny method was used to detect the edge of the breast and the diaphragm. The anterior-to-posterior breast motion on the breast mid-plane was tracked at three different places: top 1/3, middle (apex of the breast), and bottom 1/3 of each image. The vertical motion was also measured at the diaphragm. Breast tissue and associated nodes (axillary, Rotter's, internal mammary, and supraclavicular) were contoured as treatment targets. PTVs (planning-target volume) were generated with 1cm margin to these contours, which was based on the breathing motion study. The maximum displacement in an inhale-exhale cycle was 1cm with the exception of the diaphragm motion. Two intensity-modulated tangential beams covering breast and associated nodes were used to deliver differentiated doses to these targets. IMRT plans were performed with 6MV and 18MV using a FOCUS (CMS) treatment planning system as to be delivered by DMLC.