AbstractID: 12959 Title: Quantification of breast density using MRI and CT in postmortem breasts

**Purpose:** To compare breast density measurements from cone-beam CT and breast MRI using a fuzzy C-means clustering technique.

**Methods and Materials:** Twenty pairs of post-mortem breasts were scanned with MRI and cone-beam CT. The cone-beam CT system was constructed using a standard x-ray tube, a rotation stage, and a flat panel detector. The imaging technique for CT was 80 kVp, 0.16 mAs and 921 frames spanning 360 degrees. Each scan used a total of 147 mAs. MR images were acquired with an Aurora 1.5T dedicated breast MRI system. The MRI and CT data were processed with a fuzzy C-means clustering technique. Six clusters were used to categorize the image gray levels into 6 different categories. The operator specified which clusters corresponding glandular and adipose by comparing the "clustered" images and the raw images. The images were then segmented into glandular and adipose regions.

**Results:** Breast weight calculated using MRI ($W_{MRI}$) and CT ($W_{CT}$) image data were related to the measured weight ($W_S$) as $W_{MRI} = 0.89W_S + 50$ (R$^2$=0.99) and $W_{CT} = 0.99W_S - 14$ (R$^2$=0.997), respectively. Breast density computed from CT ($D_{CT}$) was related to densities computed from MRI ($D_{MRI}$) as $D_{MRI} = 0.96D_{CT} + 0.0009$ (R$^2$ = 0.98).

**Conclusion:** Breast density measurements using cone-beam CT and breast MRI were highly correlated.