

## AbstractID: 1925 Title: Contrast-Enhanced Breast Tomosynthesis: A Feasibility Study

Breast tomosynthesis has shown the potential to improve the detection and diagnosis of breast cancers by reducing structure noise caused by superimposed breast tissues. The diagnostic capability of tomosynthesis may be further improved by the use of contrast agent. This study investigates the feasibility of performing contrast-enhanced breast tomosynthesis using mastectomy specimens. Tomosynthesis acquires 11 projections over a  $50^\circ$  angular range using an a-Si flat-panel detector. From these projections, a breast volume is reconstructed using a Maximum-Likelihood (ML) algorithm. In this study, pre- and post-contrast imaging, as well as contrast subtraction, was performed with an iodine-based contrast agent (Omnipaque 180mgI/ml). A 52mm thick mastectomy was imaged by tomosynthesis. Then, the contrast agent was injected into the specimen, followed by another four tomosynthesis acquisitions (T=0, 7, 12, and 29 minutes). In another experiment, a 12-inch PVC tubing (2mm in diameter, model GIU-30, Ranfac Corp., Avon, MA) was inserted between a 61mm thick specimen and a 15mm thick gelatin phantom to simulate a blood vessel in the breast. Two tomosynthesis acquisitions were acquired before and after the contrast agent was injected into the tubing. Contrast-enhanced interstitial spaces at different depths were shown in the reconstruction. The alternation in contrast enhancement within the injected tissue was observed. Additionally, structure separation within the enhanced tissue was achieved in the tomosynthesis reconstruction, allowing improved visibility and feature detail. The contrast agent in the tubing was also identified. Contrast-enhanced breast tomosynthesis could provide more accurate diagnosis of the enhanced features, as well as their locations.