Contrast Enhanced Mammography Guided Biopsy - Single Institute Initial Clinical Performance

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Contrast Enhanced Mammography (CEM) is a relatively new technology which relies on dual-energy exposure after contrast Iodine is injected intravenously. Suspicious enhancing lesions detected by CEM, and not by ultrasound or mammography, are typically biopsied under breast Magnetic Resonance Imaging (MRI) guidance. A new biopsy technique which was recently developed enables dual-energy exposure to be combined with stereotactic guided biopsy (namely, CEM-guided biopsy) with either a vertical or horizontal approach. The purpose of this abstract is to describe our initial experience and performance with 50 patients. This prospective study was approved by Health Canada and the Western University Research Ethics Board and is funded by GE Healthcare.

Material and method: The trial was conducted between June 2020-September 2021. Out of the total of 1246 CEM exams, 772 lesions required biopsy (BI-RADS 4/5); 713 were biopsied under ultrasound/ mammogram (497 malignant), 8 under MRI (1 malignant). Fifty women with 51 lesions were enrolled in this trial. Three lesions were initially detected by MRI and then by CEM. Five patients had breast implants.

Results: Patients ages ranged between 38-82. Average breast density was heterogeneous (BI-RADS category C), lesion size ranged 3-25mm (mean 14mm; 10 foci, 12 masses, 29 non-mass enhancement). CEM-guided biopsy was completed in 46/51 lesions (90.2%; 32 27 benign, 10 malignant, 9 high risk- 1 was upgraded to high grade DCIS on surgery). Horizontal approach was used in 26/46 lesions. 26 lesions (51%) were reported to be subjectively less enhancing compared to the reference CEM exam. Six non-mass enhancing lesions were not visualized at the time of the biopsy: in 1, biopsy was completed based on tissue landmarks (benign) and in 5, biopsy was canceled (9.8%) (4 benign, 1 lost

for follow-up). Mean biopsy time (from injection to release from compression) was 15 minutes and average biopsy time was 18.45 minutes (range 12-59 min). For 27 lesions, standard ipsilateral CEM exam was used instead of standard mammography to confirm the placement of tissue markers, at 21-53 minutes after the injection; in 20 lesions (74%) lesion enhancement was still noted.

Conclusion: Satisfactory performance of CEM-guided biopsy; over 90% can be biopsied despite showing less enhancement. Average biopsy time of 18.45 minutes is significantly shorter than 57.9 minutes reported with MRI for single lesion. Lesions that did not enhance usually presented as non mass enhancement and proved to be benign, yielding cancelation rate of 9.8%, similar to 6.3-13% previously reported with MRI-guided biopsy.

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