

Biopsy of Contrast-Identified Breast Lesions Using Conventional and Hologic I-View™ Technology

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Introduction

This paper discusses several methods that Hologic I-View™ software users may consider when performing biopsy procedures on lesions seen in contrast images that otherwise cannot be biopsied using an alternative method, based on second-look ultrasound. When the ultrasound shows the lesion, ultrasound guidance is a rapid, safe tool for biopsy. Post biopsy clip placement and mammographic images then confirm the correct lesion was biopsied.

These methods fall into two general categories:

1. Use the combined Contrast Enhanced Digital Mammography (CEDM)-Combo capability of the system to first identify a lesion with the CEDM image and subsequently locate it in the tomosynthesis image. One can then proceed to biopsy using tomosynthesis guidance.
2. Directly localise a lesion with the CEDM image(s) and place a wire or marker in the breast at the lesion's location. One can then perform a biopsy using the marker as guidance, or else perform a surgical excision biopsy.

This paper is structured as potential guidance for Radiologists to biopsy suspicious lesions found under contrast screening. The documented steps illustrate how a general combination of CEDM imaging and biopsies can be used for lesion localisation. Hologic's I-View™ software and the Affirm® Breast Biopsy Guidance and Affirm® Prone Biopsy Systems are used independently in these steps.

Biopsy Procedures

Here are several methods to biopsy suspicious lesions.

- I. Using 3-in-1 imaging to biopsy with the Affirm® Upright System (or Affirm® prone system)
 - A. Perform a 3-in-1 CEDM-Combo study with a standard flat compression paddle.
 - B. Correlate and identify the contrast lesion on the tomosynthesis image set.
 - C. The biopsy can be performed using the Affirm® 3D systems' tomosynthesis guidance if the tomosynthesis-identified lesion can be reidentified during the Affirm® biopsy procedure.
 - D. If the tomosynthesis correlate can be identified during the original diagnostic examination, this may obviate the need to re-inject iodine for the biopsy procedure.
 - E. Clip placement post biopsy will confirm that the correct area was biopsied.
- II. Using 3-in-1 imaging to place a biopsy clip or wire
 - A. Perform a 3-in-1 CEDM-Combo study with a fenestrated alphanumeric localisation paddle.
 - B. Correlate and identify the contrast lesion on the tomosynthesis image set.
 - C. A biopsy clip, localising radiofrequency tag, localising radioactive seed or wire can be inserted during the 3-in-1 examination, and a stereotactic biopsy guided by the clip or surgical biopsy guided by the localisation device can be performed in the standard ways.
 - D. If no tomosynthesis correlate can be identified, or if the system is not enabled for tomosynthesis imaging, then the next method (using CEDM imaging) is another alternative.

III. Using CEDM imaging to place a biopsy clip or wire²

- A. Perform a CEDM study with a fenestrated alphanumeric localisation paddle in a lateral view.
- B. Insert a needle and reimage with a craniocaudal view to adjust and confirm that the needle is at the correct depth.
- C. Deploy a biopsy clip, localising radiofrequency tag, or localising radioactive seed, and proceed with stereotactic or surgical excisional biopsy based on the clip or localisation device. Additionally, if the clip is visible on ultrasound, ultrasound may be capable as a localisation tool to guide the biopsy.

General Imaging Guidelines

All the imaging described here uses normal protocols¹ followed for standard CEDM imaging, an example of which is given here:

- A. Test the patient for renal function and for iodine sensitivity.
- B. Perform iodine injection (1.5 cc/kg body weight, injected at nominal 3 cc/second) with the breast uncompressed and the patient seated or lying down.
- C. Wait 2 minutes before compressing the breast.
- D. Complete required iodine imaging within about 6-8 minutes.

Glossary

- CEDM imaging. A 2D dual-energy imaging technique to image iodine tracers in the breast.
- 3-in-1 imaging. Another name for CEDM-Combo imaging.
- CEDM-Combo imaging. A method of breast imaging whereby in a single breast compression the system acquires a standard 2D image, a CEDM dual-energy iodine image, and a standard 3D tomosynthesis image.

References

1. Nori J, Kaur M, et al. Contrast Enhanced Digital Mammography (CEDM). Springer ISBN. (2018); 978-3-319-94553-8.
2. Covington MF, Pizzitola VJ, Lorans R et al, The Future of Contrast-Enhanced Mammography, AJR Am J Roentgenol. 2018 Feb;210(2):292-300.

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