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

Andrew Smith, PhD, Vice President Breast Health R&D
Hologic, Inc., Marlborough, MA, USA

Introduction

This paper documents several methods by which users of Hologic I-View™ software may biopsy lesions seen in contrast images that cannot be biopsied using an alternative biopsy 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 CEDM-Combo capability of the system to first identify a lesion with the CEDM image, and subsequently locate it in the tomo image. One can then proceed to biopsy using tomo guidance.
2. Directly localize 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 localization. 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 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 tomo image set.
C. The biopsy can be performed using the Affirm system's tomo guidance if the tomo-identified lesion can be reidentified during the Affirm biopsy procedure.
D. If the tomo 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 localization paddle.
B. Correlate and identify the contrast lesion on the tomo image set.
C. A biopsy clip, localizing RF tag, localizing 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 localization device can be performed in the standard ways.

D. If no tomo correlate can be identified, or if the system is not enabled for tomo imaging, then the next method (using CEDM imaging) is another alternative.

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

This approach is described in Covington, Pizzitola, Lorans et al, *The Future of Contrast-Enhanced Mammography*, AJR Am J Roentgenol. 2018 Feb;210(2):292-300.

A. Perform a CEDM study with a fenestrated alphanumeric localization 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, localizing RF tag, or localizing radioactive seed, and proceed with stereotactic or surgical excisional biopsy based on the clip or localization device. Additionally, if the clip is visible on ultrasound, ultrasound may be capable as a localization tool to guide the biopsy.

General Imaging Guidelines

All the imaging described here uses normal protocols[1] 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] See, for example, Contrast-Enhanced Digital Mammography (CEDM). Nori, Kaur (Eds.). Springer, ISBN 978-3-319-94553-8, 2018.

United States / Latin America
50 Campus Drive
Marlborough, MA 01752 USA
Tel: +1.508.263.2900
Sales: +1.781.999.7453
Fax: +1.781.280.0668
www.hologic.com

HOLOGIC®