Stereotactic Breast Biopsy update and Case studies

Prone Table Stereo Needle Localizations

- 5 FDA approved stereotactic prone tables
- Hologic Lorad Multi-Care Platinum Prone Table
- Hologic Affirm prone Biopsy system
- Fischer Mammotest Plus/S Prone Table
- Siemens Mammotest Prone Table
- Cintron Medical/Echoserve Mammotest Flx
Newest prone table approved by FDA

Hologic Affirm Prone biopsy system
Approved April 2016
Needle Localization with stereotactic

- Performing needle localization on a dedicated prone stereotactic biopsy table, rather than on a conventional mammography unit, has four advantages. First, the prone table makes fainting virtually impossible, and the entire procedure is conducted out of sight of the patient. Second, the digital acquisition and display of images speed the procedure considerably. These two advantages are shared by all procedures performed on a stereotactic table, whether with the technique described by Sanders et al.

- Third, the combination of the stereotactic calculations and the computer-controlled stage permits precise needle placement. Once the appropriate coordinates have been locked in, the front and back needle guides provide a foolproof guidance system for placing the needle, permitting skewering of even tiny targets. Fourth, stereotactic imaging provides nearly instant feedback, permitting verification of placement of the needle tip in three dimensions relative to the target before compression is released.

Instruction's for Hologic Prone Table

- Change stage to state Needle wire localization
- Get out yellow guide wire holder (2)
- Take a scout image in the view with shortage distance
- If you want to put needle on clip you don’t need a safety zone
- If you want needle 10mm past clip, then you must have at least 2 + 3, if 15mm then you must have 2 + 8 to be successful
- So take scout, then take stereo pair and target. Transmit target to stage
- If you want needle on clip dial in 0 (Zero) on differential number
- If you want 10mm beyond, dial to 10 plus on differential number
- If you want 15mm beyond, dial to 15 plus on differential number
- Put needle in while holding the back of it so it doesn’t move
- Take another stereo pair and confirm it is dead on or 10 past or 15 past by hitting your marker cursors.
- Then take to room for post mammogram in CC and LA.
Needle’s for Stereotactic Needle Localizations and other options

**BARD ULTRAWIRE**
One-Handed Breast Localization Device

**BARD GHIATAS**
Beaded Breast Localization Wire

**BARD DUALOK**
Breast Localization Wire

**BARD CHESBROUGH**
Breast Localization Wire

**Needle Localization Case study**
Needle Localizations 2D and 3D on Hologic Selenia Dimensions

- Needle localization should be the last resort to diagnose an abnormality in the breast. Needle guided breast biopsy should be the first choice.
- Purpose of needle localization is to guide surgeon to the correct area of abnormal or cancerous cells to be removed.
- Needle localization is going to be a thing of the past.
- I-125 Seeds are the next generation for breast localizations.

Upright Hologic Selenia Dimensions

- Biggest advantage with the Hologic Selenia Dimensions for needle localizations is you have a choice between 2D and 3D Digital Breast Tomosynthesis.
- For 2D selection you will do needle localizations the same way as any other FFDM.
- For 2D selected also for small calcifications you can do needle localizations with the magnification stand on with a specialized crosshair wire grid aperture.
New Mag

What is I-125

- Unstable radioactive isotope of the element iodine
- Titanium-encapsulated cylindric seed
- 53 protons and 72 neutrons
- Half life of 59.4 days
- When it decays its formation changes to an element called tellurium 125
I-125 Seed-Localization for breast surgery

♦ Iodine 125 seed localization
♦ Patient's can come in 5 days before surgery/day of surgery
♦ Benefit is pt can eat and drink before procedure so less pt's have vasovagal reaction
♦ Day of surgery can go right to surgery suite/no confusion
♦ More accurate for surgeons
♦ Does not migrate like needle localization wires can do
Breast Needle Localization
Tomosynthesis Mode

Procedure for Needle Localization with Tomosynthesis
1. Install a Localization Paddle, and install the Croscheck Device at the tubehold. Be sure that the croscheck guides are out of the x-ray field.
2. Open a new procedure with a Tomo or TomoHD view for your approach.
3. Position the patient and apply compression.
4. Acquire a Tomo Scan. Make sure that the IOD is visible inside the Localization Paddle opening. If not, reposition the patient and repeat.
5. Note the Compression Thickness, and note the thickness of the masses tissue through the opening of the Localization Paddle.
6. Scroll through the reconstruction slices to identify where the lesion is best seen. Note the slice number (each slice is 1 mm in thickness).
7. Place the Acquisition Workstation mouse on the lesion.
8. To find the coordinates for the Gantry Croscheck Device, scroll through the reconstructions until you can identify the alpha numeric coordinates.
9. Calculate the needle depth.
Have to calculate the depth from skin line rather than from paddle
50 thickness plus 7 bulge = 57 - 30 = 27

Example

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thickness of the tissue through the opening of the localization paddle</td>
<td>7 mm</td>
</tr>
<tr>
<td>2</td>
<td>Thickness measured from the localization paddle to the lesion</td>
<td>30 mm</td>
</tr>
<tr>
<td>3</td>
<td>Lesion slice number (the slice number where lesion is best seen (height))</td>
<td>30 mm</td>
</tr>
<tr>
<td>4</td>
<td>Thickness measured from the detector to the lesion</td>
<td>6 mm</td>
</tr>
<tr>
<td>5</td>
<td>Skin number 1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Needle</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Lesion</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Enhancing the needle 1–15 mm more than the lesion (optional)</td>
<td>1–15 mm</td>
</tr>
<tr>
<td>9</td>
<td>Localization paddle</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Sum of the breast compression from the detector (0 mm) to the localization paddle (5 mm in this example)</td>
<td>10 mm</td>
</tr>
</tbody>
</table>

Tomo needle localization case
The Affirm

- Hologic's latest addition to its breast health portfolio, the Affirm™ breast biopsy guidance system, represents the next step in the evolution of upright breast biopsy procedures. Designed to work seamlessly with any Selenia® Dimensions® digital mammography system, the Affirm system delivers exceptional images, accurate targeting, and streamlined workflow.

This revolutionary system is designed to provide biopsy solutions for today and the future. Innovations including a novel, 10° angled biopsy approach provides an unobstructed view of lesions, and opens the pathway for tomorrow's advances in breast biopsy.

Stereotactic Breast Biopsy in Tomo mode
Upright Stereotactic Breast Biopsy 3D Breast Tomosynthesis

- Advantage is less images needed therefore less time for patient movement and patient discomfort
- Can be very accurate for depth
- More accurate for masses and density's
- Schematic map makes sure procedure is able to be performed

No stero pair is needed because the tomo sweep gives the depth of lesion or calcifications

Do a Tomo Sweep in the position that is shortest distance to area of concern. Scroll through images to find the clearest image of the area, then send coordinates.
Stereotactic tomo mode case study

Outside report

Eight stained slides (S8-05-15-4017, 04/14/2015), designated as:

LEFT BREAST, 2 O’CLOCK, ULTRASOUND-GUIDED NEEDLE CORE BIOPSY:
Stromal fibrosis with benign breast parenchyma.

RIGHT BREAST, 8 O’CLOCK, ULTRASOUND-GUIDED NEEDLE CORE BIOPSY:
INVASIVE LOBULAR CARCINOMA, NOTTINGHAM HISTOLOGIC GRADE 1, CLASSIC TYPE.
No lymphovascular invasion identified.
Biomarker analysis (outside slides received for review):
Estrogen receptor: Positive (100%, strong intensity).
Progesterone receptor: Negative (0%).
LEFT BREAST, 2 O’CLOCK, 9 CM FROM NIPPLE, STEREOTACTIC GUIDED CORE BIOPSY:
INVASIVE DUCTAL CARCINOMA, LOW NUCLEAR GRADE, NOTTINGHAM HISTOLOGIC
GRADE 1 (WELL DIFFERENTIATED). (SEE COMMENT)
Fibrocystic changes including cysts and sclerosing adenosis.
Microcalcifications associated with benign breast tissue.