Halsted Mastectomy
- Radical Mastectomy
- Introduced in 1882 by William Halsted.
- Was the removal of the breast, fascia, chest muscle and axillary nodes.
- At this time it was felt necessary to remove all cancerous cells to prevent a local recurrence.

Conservative Breast Surgery
- Total (Simple) Mastectomy
- Segmental (Partial) Mastectomy
- Lumpectomy (excisional/incisional) Mastectomy
- Quadrantectomy (1/4 of breast removed)

Geoffrey Keynes, a World War I Surgeon, was one of the first advocates of conservative surgery of the breast. His studies of combining lesser surgeries with radiation therapy were equally comparable to that of Halsted’s. It would take many years for him to convince the medical community that less is more per se.’
History of Breast Surgery

- 2 Step Procedure
- George Crile Jr
- Advocate separating diagnostic breast biopsy from operative treatment of cancer of the breast.
- As in needle biopsy/FNA/VACNB

First Specimen Radiograph

- 1913, a surgeon named Albert Salmon reported his investigations of using radiography for mastectomy and segmental breast specimens.
- Salmon was able to demonstrate carcinomas in the tissue as well as distinguish between highly invasive carcinoma's and circumscribed lesions.

First Specimen Imaged

First Segmental Mastectomy

- 4 FDA approved stereotactic prone tables
- Hologic Lorad Multi-Care Platinum Prone Table
- Fischer Mammatest Plus/S Prone Table
- Siemens Mammatest Prone Table
- Cintron Medical/Echoserve Mammatest Flx

Prone Table Stereo Needle Localizations
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 LM.

**Needle's for Stereotactic Needle Localizations and other options**

**BARD® ULTRAWIRE®**
ONE-HANDED BREAST LOCALIZATION WIRE

**BARD® GHIATAS®**
BEADED 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 the 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 selection also for small calcifications you can do needle localizations with the magnification stand on with a specialized crosshair wire grid aperture.
Needle Localizations

Mag Stand

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 it’s 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
Have to calculate the depth from skin line rather than from paddle.

50 thickness + 7 bulge = 57 - 30 = 27

Example

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

Example

<table>
<thead>
<tr>
<th>Value</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast compression thickness</td>
<td>50 mm</td>
</tr>
<tr>
<td>Thickness of the tissue through the opening of the paddle</td>
<td>7 mm</td>
</tr>
<tr>
<td>Slice number where the lesion is found</td>
<td>50 mm</td>
</tr>
<tr>
<td>Optional distance past the ROI for the wire</td>
<td>5-15 mm</td>
</tr>
<tr>
<td>Needle depth of the localization wire</td>
<td>12-25 mm</td>
</tr>
</tbody>
</table>
10. Turn on the collimator light and align the Crosshair Device at the Tablehead to match the Acquisition Workstation collimator.
11. Position and insert the needle.
12. Move the Crosshair Device guides out of the x-ray field.
13. Acquire another Tomo image to be sure that the needle is in the correct location. To calculate if a correction is necessary, compare the slice number of the point of the needle and the slice number of the lesion.
14. Insert the guide wire through the needle, and then remove the needle, if desired, leaving the wire in position.
15. If desired, complete the following steps:
   a. Acquire a Conventional or Tomo view to be sure of correct wire placement.
   b. Take the orthogonal view to document wire or needle placement (either in Tomo or conventional).
16. Only add one view icon at a time for orthogonal views to remove the possibility of paddle shift due to possible minimal compression.

Tomo needle localization case
Hologic 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

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

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

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 (358-05-15-4517, 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.