In the next 15 minutes…

- Historical background
- Mammographic localization
  - Freehand, Grid techniques
- US and MRI localization
- Recent Developments
  - Radioactive Seed, US-visible clips

Before Wire Localization

- 1960s & 1970s Surgical excision based on palpation
- Management of nonpalpable suspicious mammographic lesions was problematic
- Surgeon would often resect a large portion of breast quadrant based on mammographic report
- Multiple benign lesions excised for every cancer diagnosed

Message

- Image-guided wire localization is designed to assist the surgeon in successful resection of the target lesion and promote conservation of normal breast tissue.
Freehand Localization

• Developed in late 1970s, early 1980s to maximize likelihood of including the questionable mammographic lesion in the resected tissue
• Freehand insertion of a needle into the region of the suspicious lesion preoperatively


Early Grid Localization

• Developed in 1980s
• Needle insertion parallel to chest wall
  – Reduce risk of pneumothorax
• Difficult to judge depth of needle placement in orthogonal view
  – Two needles placed a different depths

Modern Mammographic Grid Localization

- Grid technique allows accurate targeting of lesion
- Orthogonal imaging allows adjustment of needle to proper depth of target
- Wire deployed after optimizing needle position

Mammographic Wire Localization

Pt imaged in open grid

Clip marking site of cancer

“E-12” localization

Needle inserted perpendicular to skin at site of clip
**Mammographic Wire Localization**

Orthogonal view to determine needle placement relative to clip

Wire deployed with clip located at distal stiffener (circle)

BB markers placed on nipple and at skin entry site for reference

**Specimen Radiograph**

Confirms removal of intact hook wire and clip

**US Localization**

- For mammographically occult lesions
  - No marker clip; significantly migrated clip
- Real-time visualization of needle placement through target
- Post-procedure *noncompressed* mammogram
  - Minimize wire migration
Breast MR Localization

- For lesions not amenable to mammographic or sonographic localization
- Prone position
- Obligate lateral or medial approach
- Uses grid compression device and open coil
- MR-safe needles and wires

Breast MR Wire Localization

Planning
Verification
Post Mammogram

seen on a different slice
roci of susceptibility corresponding to 3 needle locations

Sagittal T1 Post-gad
Sagittal T1 Verification
Post Procedure Mammogram

Breast MR Localization
3D visualization

Radioactive Seed Localization

- Placement of I125 Seed prior to surgery
- Intra-operative localization with Gamma probe
- Reports of equivalency to wire localized excision
- May be performed days in advance

Radioactive Seed Localization

- Process of handling radioactivity nontrivial (strict CA regulations)
- Seed must be tracked from birth to grave
  - Multiple departments (rad onc, mammography, OR, pathology)
  - Patient ID bracelet and tracking outside of facility
  - Protocol for lost or transected seeds

US Visible Clips

- Can be visualized intraoperatively by US to assist localization
- No radiation
- Requires additional surgeon/OR time to localize clip under US
- Reports of “lost” clips in specimen
- US visibility can vary
Message

- Image-guided wire localization is designed to assist the surgeon in successful resection of the target lesion and promote conservation of normal breast tissue.

Thank you for your attention

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