National Cancer Institute

Preoperative Therapy in Invasive Breast Cancer

Reviewing the State of the Science and Exploring New Research Directions

Evaluating the Axilla and Other Nodal Areas with Non-Invasive Techniques

Nagi Khouri M.D.
Associate Professor of Radiology and Oncology
The Johns Hopkins University

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health

PREOPERATIVE STAGING OF BREAST CANCER

- Local extent of the cancer
- Multifocality
- Multicentricity
- Contralateral breast
- Regional lymph node extension
- Systemic Extension

ULTRASOUND EVALUATION OF REGIONAL NODES IN BREAST CANCER

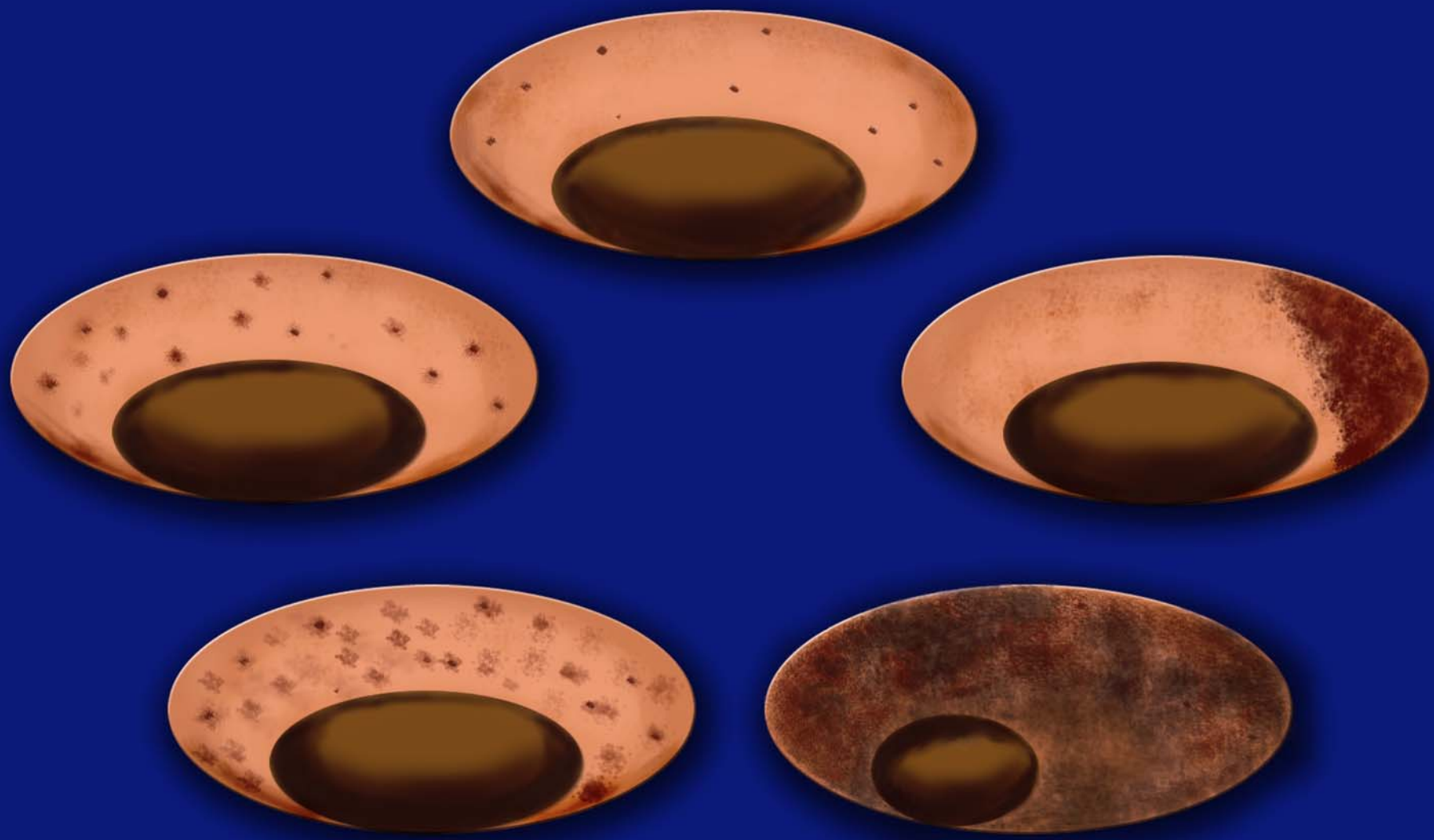
- Axillary nodes
- Internal mammary nodes
- Supra and infraclavicular and low cervical

Variability of breast imager's approach to the axilla in breast cancer

- Will not look
- Ultrasound evaluation
- Information from MRI
- +/- Needle biopsy

Pathologic distribution of cancer cells in metastatic lymph nodes

- Isolated tumor cells
- Islands of metastatic cancer
- Focal mass
- Total replacement



Sonographic Criteria of Indeterminate/Suspicious/Metastatic Nodes

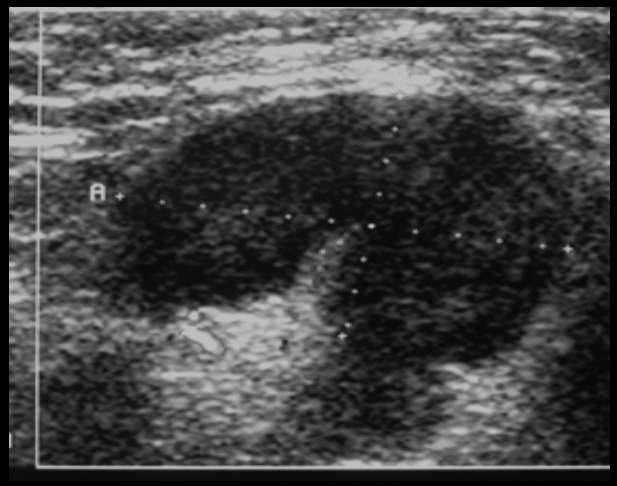
- Size
- Thickening of cortex (diffuse or eccentric)
- Lobulation of cortex
- Rounded or vertically oriented lymph node
- Complete disappearance of the hilum

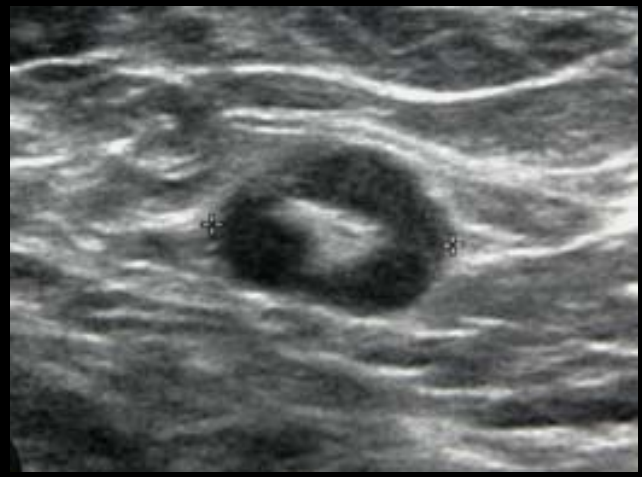
Don’t forget that you can compare to the other side!

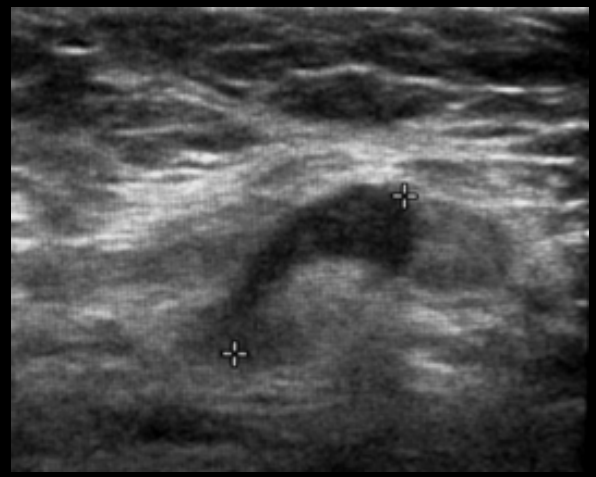
BENIGN CAUSES AXILLARY ADENOPATHY

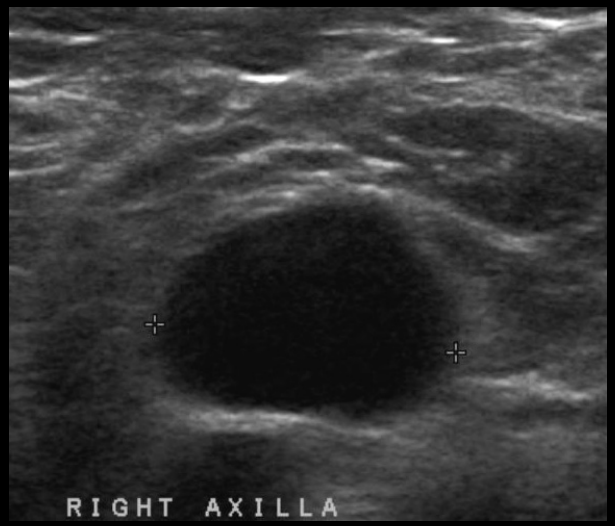
- Normal
- Hyperplasia
- Recent Biopsy (>3 weeks)
- HIV
- Collagen Vascular Diseases
- Dermatopathic
- Silicone adenopathy
- Toxoplasmosis

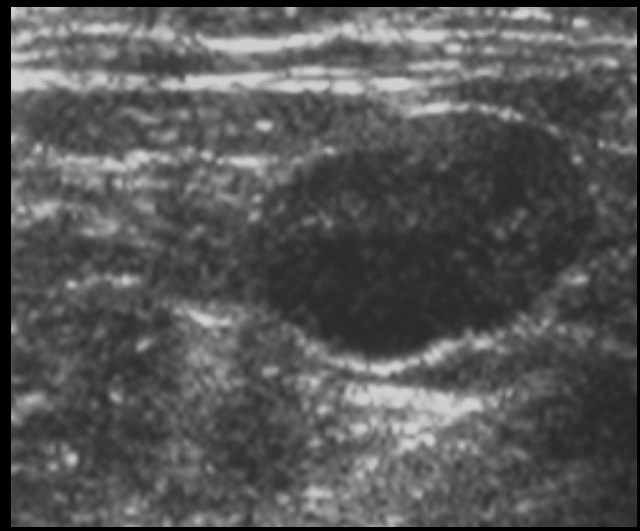
Metastatic / Reactive Nodes

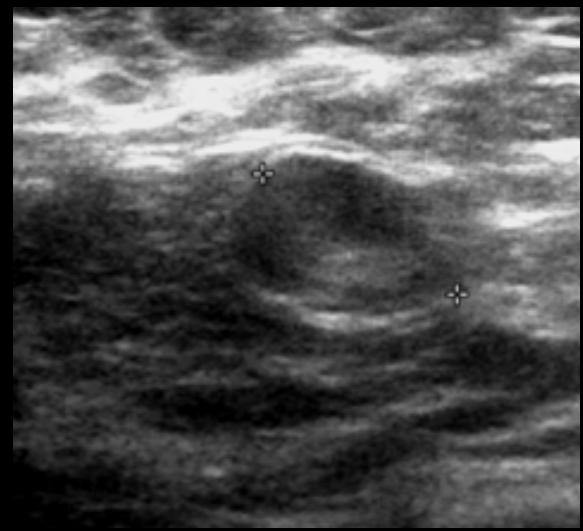












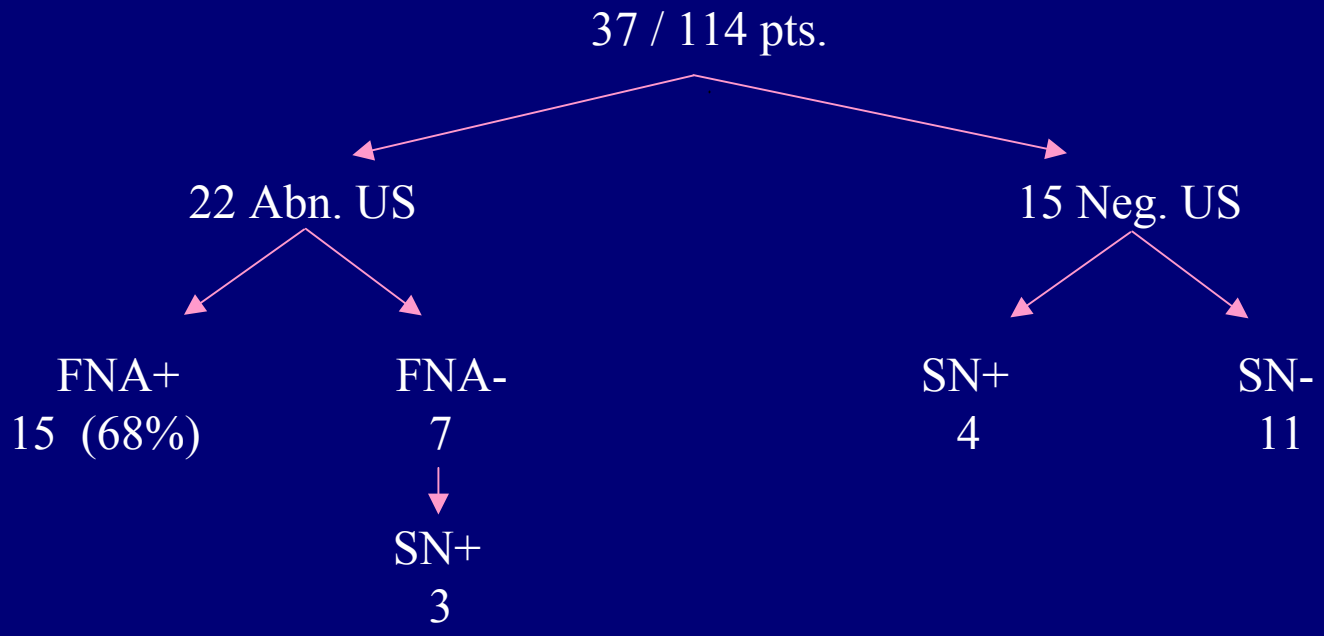
1
2
3

Accuracy of Sonography of Axillary Lymph Nodes in Breast Cancer

SENSITIVITY	**SPECIFICITY**
Palpable and Non-palpable	Palpable and Non-palpable
Size 66-77%	Size 44-98%
Morphology 55-92%	Morphology 80-97%
Non-palpable Only	Non-palpable Only
Size 49-87%	Size 55-97%
Morphology 26-76%	Morphology 88-98%
Ultrasound Guided Biopsy	Ultrasound Guided Biopsy
43-95%	97-100%

AJR 2006, 186:1342-1348

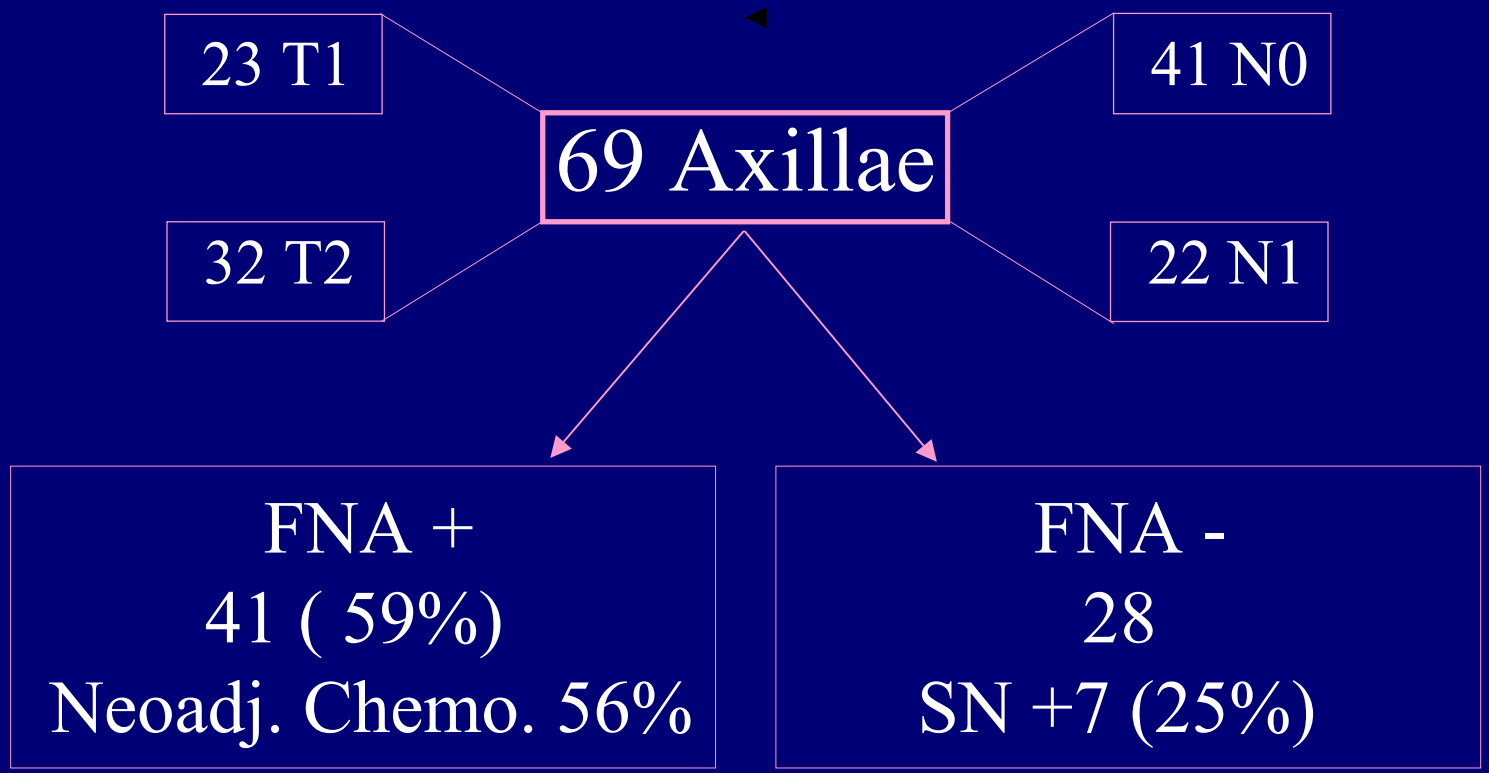
FNA in High Risk Pts. Clinically Neg. Nodes



In total 22/37 had metastatic disease on final histology
64% had grade 3 mean size 5cm with lymphatic invasion in 50% , positive FNA 68%
In total 15/37 had no lymph node metastases
87% had grade 2 mean size 3.2cm with lymphatic invasion in 8%

Annals of Surg. Onc .2006, 13(12):1545-1552

FNA Axillary Nodes
The Johns Hopkins Experience



- Sensitivity 82% PPV 100%
- Specificity 100% NPV 70%

Technical aspects of FNA of lymph nodes

- Needle 23-20g
- Ventral, caudal, cephalad and dorsal sampling
- Avoid the hilum
- Three passes of same node or one pass of three separate nodes
- 30 to 40 excursions-stop when blood in hub of needle

  Learn to smear slides- Avoid dryness

Challenges to successful FNA of lymph nodes in breast cancer

- Skills of axillary ultrasound performance and interpretation
- Skills of performance of FNA
- Skills of cytopathologic interpretation

Impact of Axillary US and FNA

- Reasonable sensitivity, high specificity
- If FNA is positive for cancer cells:

  Patient candidate for surgery and LN dissection
  or
  Preoperative Chemotherapy followed by surgery

- If FNA is negative for cancer cells:

  Patient needs sentinel node biopsy