Ultrasound staging of breast cancer streamlines patients for neoadjuvant chemotherapy

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Determining nodal involvement in breast cancer is key

Appropriate staging for statistics

Tailor treatment

Decide on neoadjuvant chemotherapy

Clear the axilla of disease

Clinical examination and mammography have a sensitivity of approximately 30%

Current method is intraoperative

- Sentinel node
- Axillary dissection
- Morbidity of the procedure

Other expensive tools

- PETSCAN, MRI

STAGING

Tumours	T0/Tis	T1	T2	T3	T4
Tumour Size	**T0**: No primary tumour. **Tis**: Tumour only in breast ducts or lobules.	0-2 cm	2-5 cm	>5 cm	Tumor of any size with extension to chest wall/skin or ulceration ****inflammatory breast cancer** is staged as T4.
Nodes	**N0**	**N1**	**N1mi**	**N2**	**N3**
	No lymph node metastases.	Cancer cells present in 1-3 axillary lymph nodes.	Lymph node tumor > 2 mm.	Cancer cells present in 4-9 axillary lymph nodes.	Cancer cells in infra or supraclavicular lymph nodes, or in >10 axillary lymph nodes.
Metastasis	**M0**	**M1**			
	No evidence of cancer metastasis.	Cancer found in other areas of body.			

Occult carcinoma	TX	N0	M0
Stage 0	Tis	N0	M0
Stage IA	T1a, b	N0	M0
Stage IB	T2a	N0	M0
Stage IIA	T1a, b	N1	M0
	T2a	N1	M0
	T2b	N0	M0
Stage IIB	T2b	N1	M0
	T3	N0	M0
Stage IIIA	T1, T2	N2	M0
	T3	N1, N2	M0
	T4	N0, N1	M0
Stage IIIB	T4	N2	M0
	Any T	N3	M0
Stage IV	Any T	Any N	M1a,b

CLINICAL SIGNIFICANCE

Early stage I and IIA

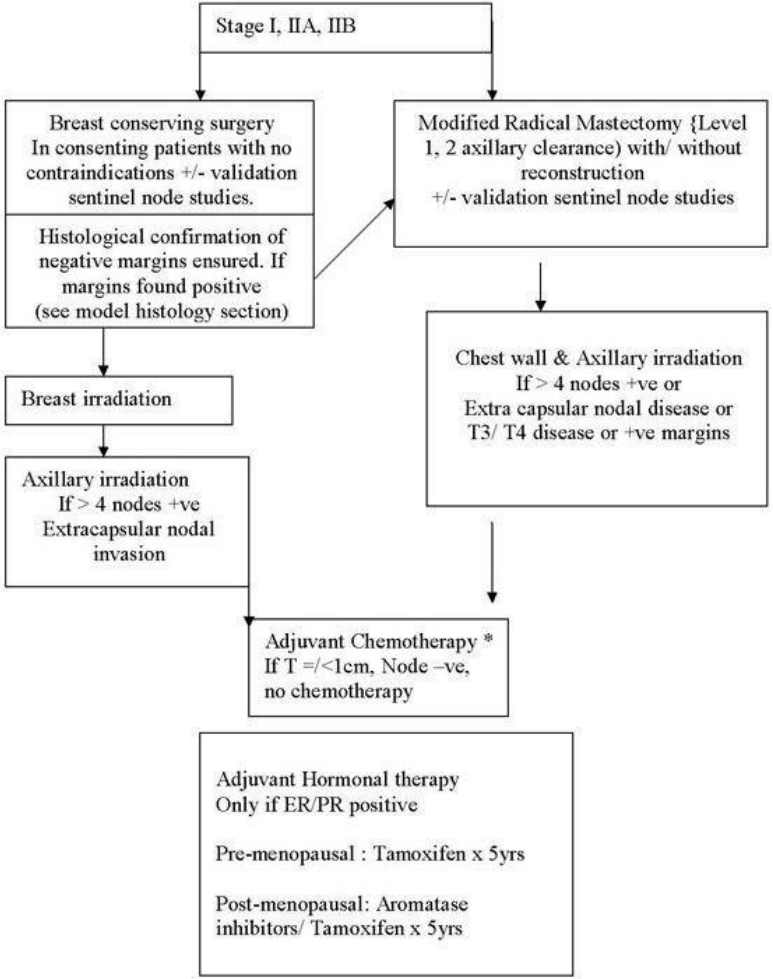
Intermediate stage IIB chemotherapy

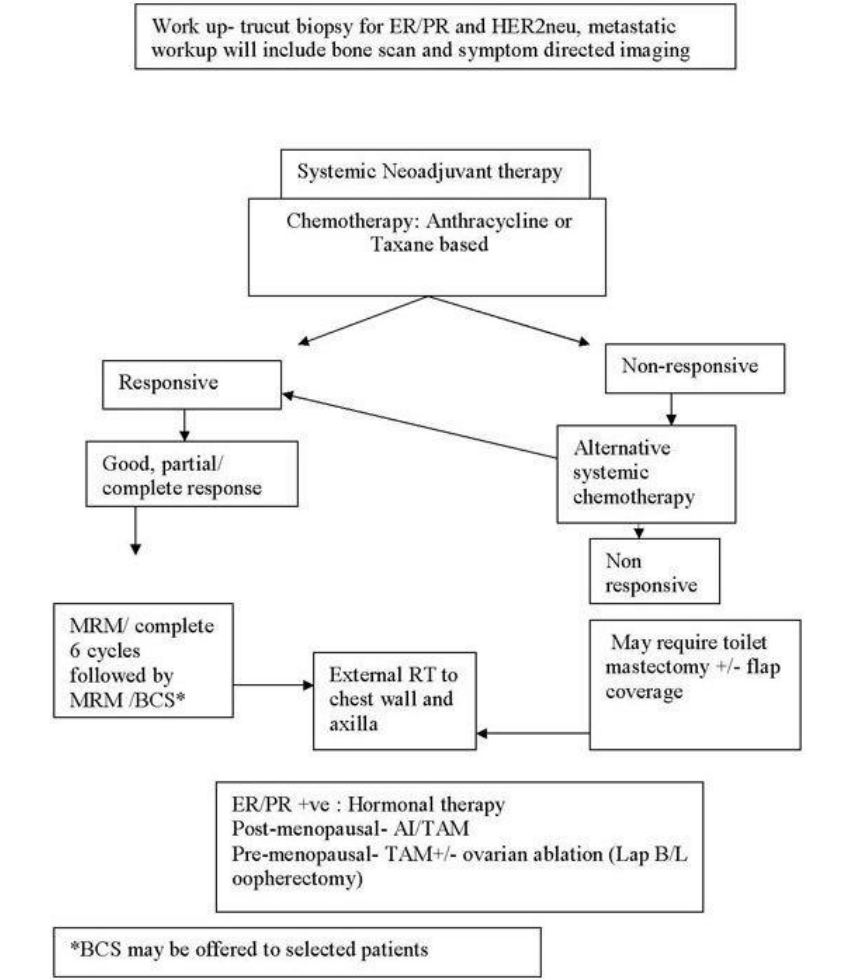
Advanced stage III will need chemotherapy AND radiation to axilla

The difference is the axilla

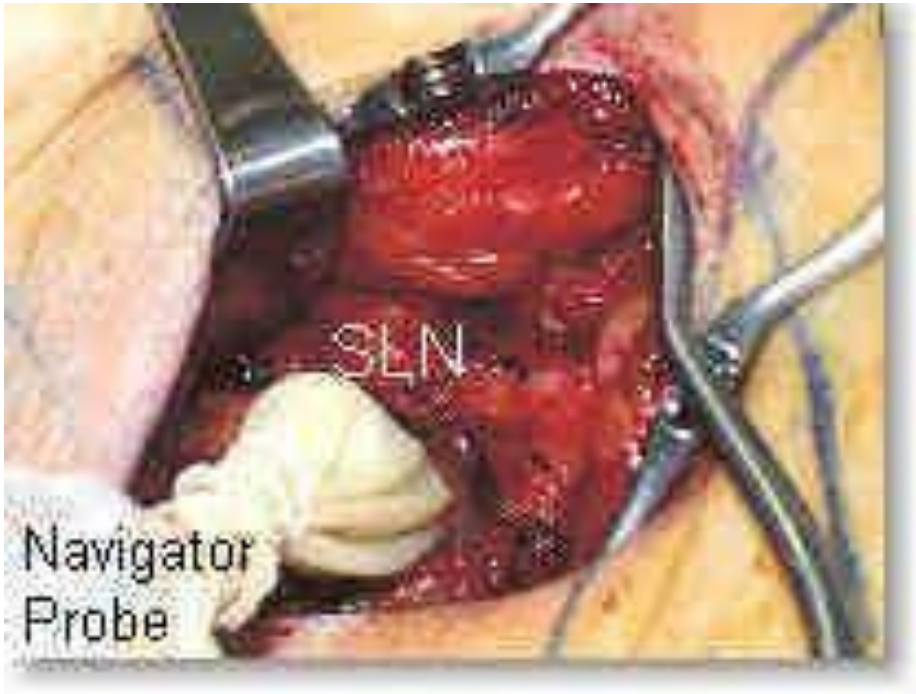
N1 1-3 nodes

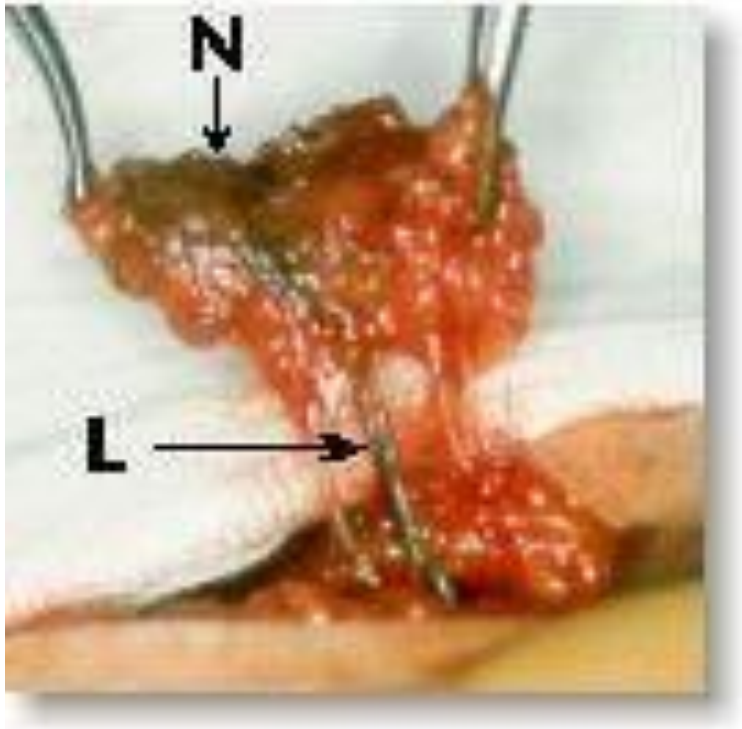
N2 4 and more nodes


Stage I, IIA, IIB
Breast conserving surgery
In consenting patients with no contraindications +/- validation sentinel node studies.
Histological confirmation of negative margins ensured. If margins found positive
(see model histology section)
Modified Radical Mastectomy {Level 1, 2 axillary clearance) with/ without reconstruction
+/- validation sentinel node studies
Breast irradiation
Axillary irradiation
If > 4 nodes +ve
Extracapsular nodal invasion
Chest wall & Axillary irradiation
If > 4 nodes +ve or
Extra capsular nodal disease or
T3/ T4 disease or +ve margins
Adjuvant Chemotherapy *
If T =/<1cm, Node –ve, no chemotherapy
Adjuvant Hormonal therapy
Only if ER/PR positive
Pre-menopausal : Tamoxifen x 5yrs
Post-menopausal: Aromatase inhibitors/ Tamoxifen x 5yrs


Work up- trucut biopsy for ER/PR and HER2neu, metastatic workup will include bone scan and symptom directed imaging
Systemic Neoadjuvant therapy
Chemotherapy: Anthracycline or Taxane based
Responsive
Non-responsive
Good, partial/ complete response
Alternative systemic chemotherapy
Non responsive
MRM/ complete 6 cycles followed by MRM /BCS*
External RT to chest wall and axilla
May require toilet mastectomy +/- flap coverage
ER/PR +ve : Hormonal therapy
Post-menopausal- AI/TAM
Pre-menopausal- TAM+/- ovarian ablation (Lap B/L oopherectomy)
*BCS may be offered to selected patients

SENTINEL NODE TECHNIQUE





PURPOSE

TO VALIDATE THAT PREOPERATIVE ULTRASOUND BREAST CANCER STAGING PERFORMED BY THE SURGEON AT OFFICE IS ADVANTAGEOUS AND EFFICIENT TO TAYLOR TREATMENT FOR BREAST CANCER PATIENTS

SINGLE SURGEON PRACTICE

Using literature based ultrasonographic criteria for malignant lymph nodes

SINGLE SURGEON PRACTICE: 165 PATIENTS

Consecutive breast carcinoma patients

All stages

All ages

Exclusion Criteria:

1. Male
2. Pregnancy
3. Pathologicalspecimen negative cases
4. Lactating

Compared with intraoperative sentinel node and or axillary dissection

Analysis of Sensitivity specificity of subgroups:

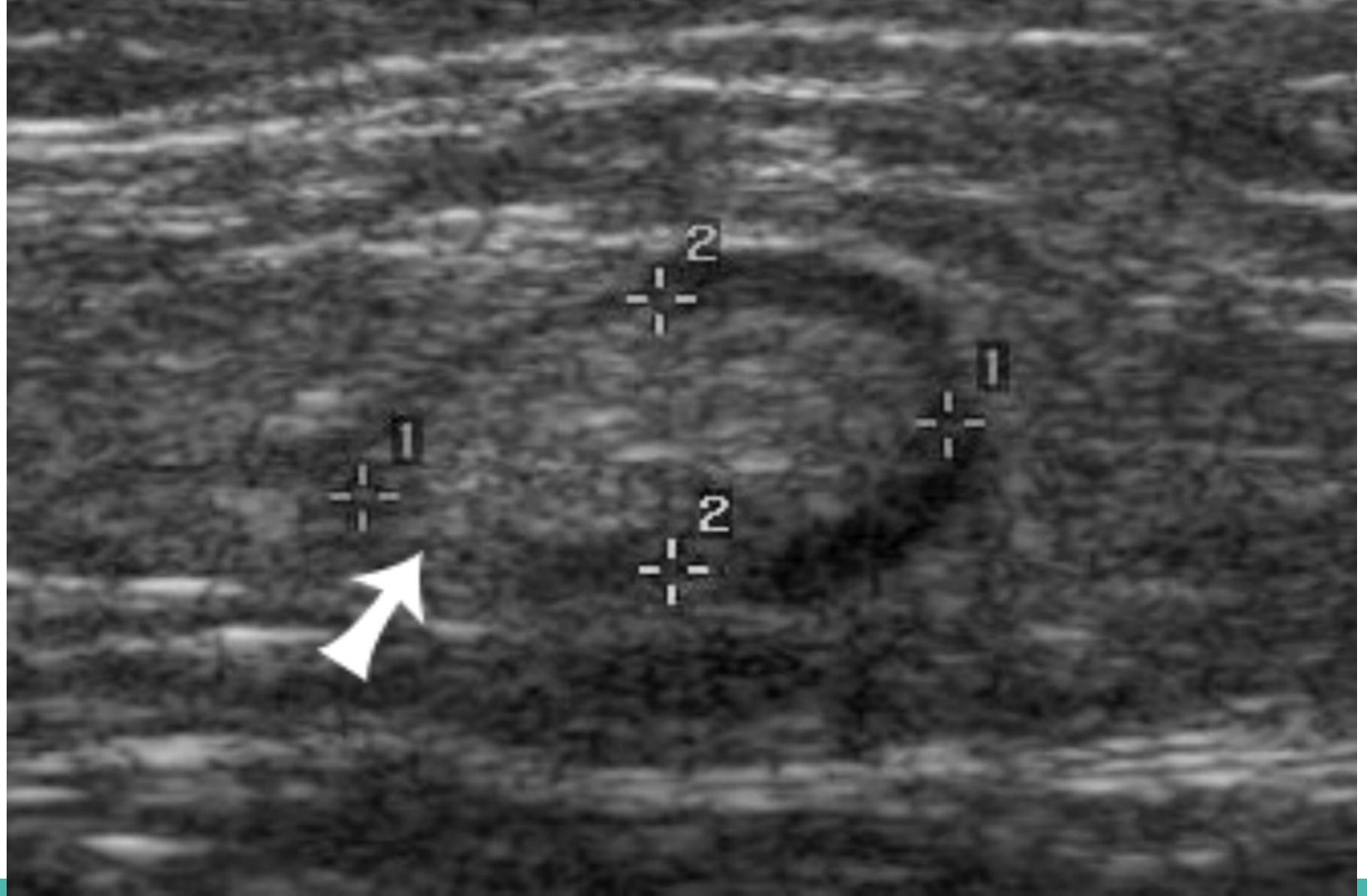
Hystological type

Age

Tumor size

BMI

Graphpad software two and one tailed tests


2
1
1
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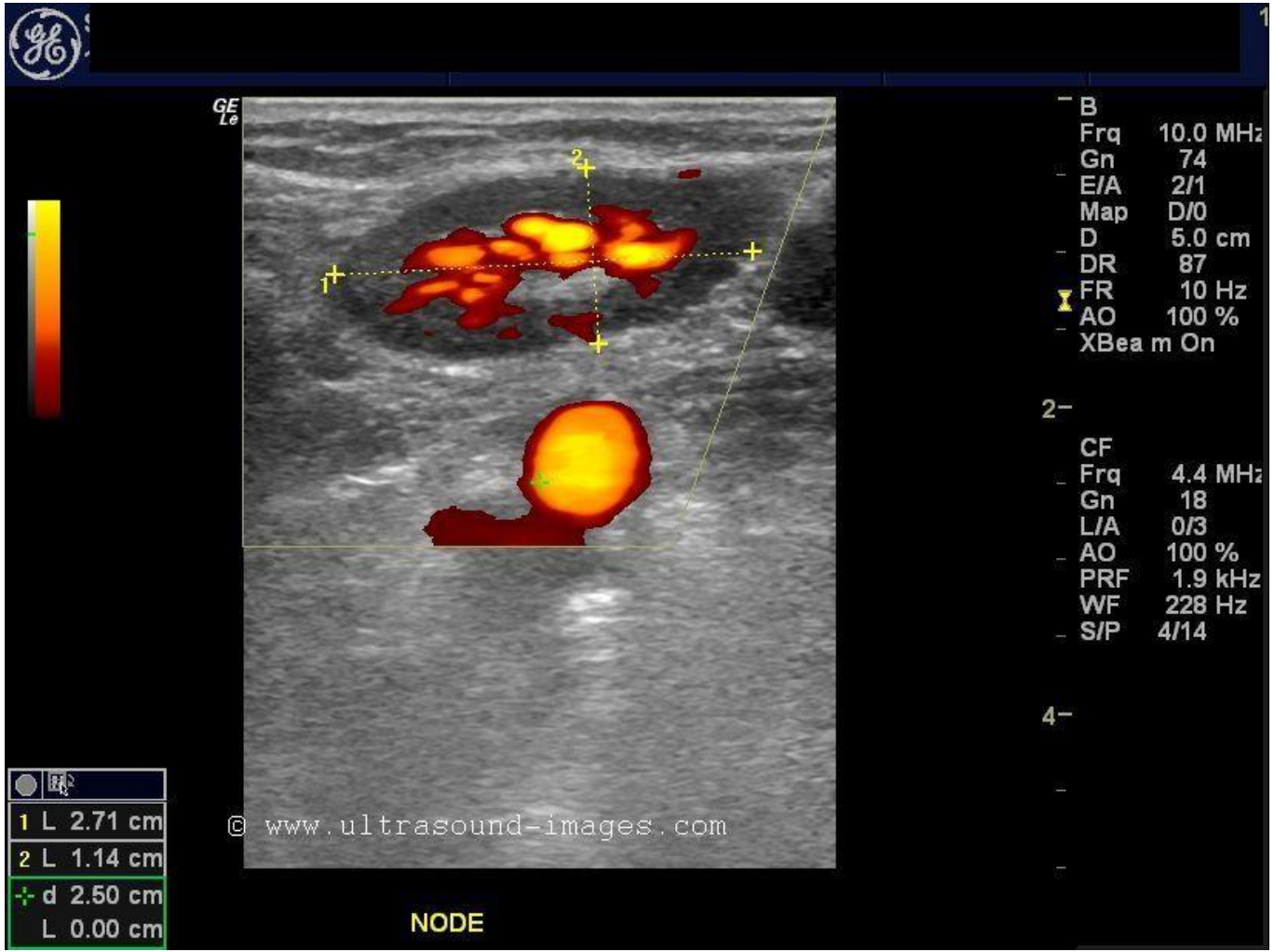
B
Frq 10.0 MHz
Gn 74
E/A 2/1
Map D/0
D 5.0 cm
DR 87
FR 10 Hz
AO 100 %
XBeam On
CF
Frq 4.4 MHz
Gn 18
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AO 100 %
PRF 1.9 kHz
WF 228 Hz
S/P 4/14
1 L 2.71 cm
2 L 1.14 cm
d 2.50 cm
L 0.00 cm
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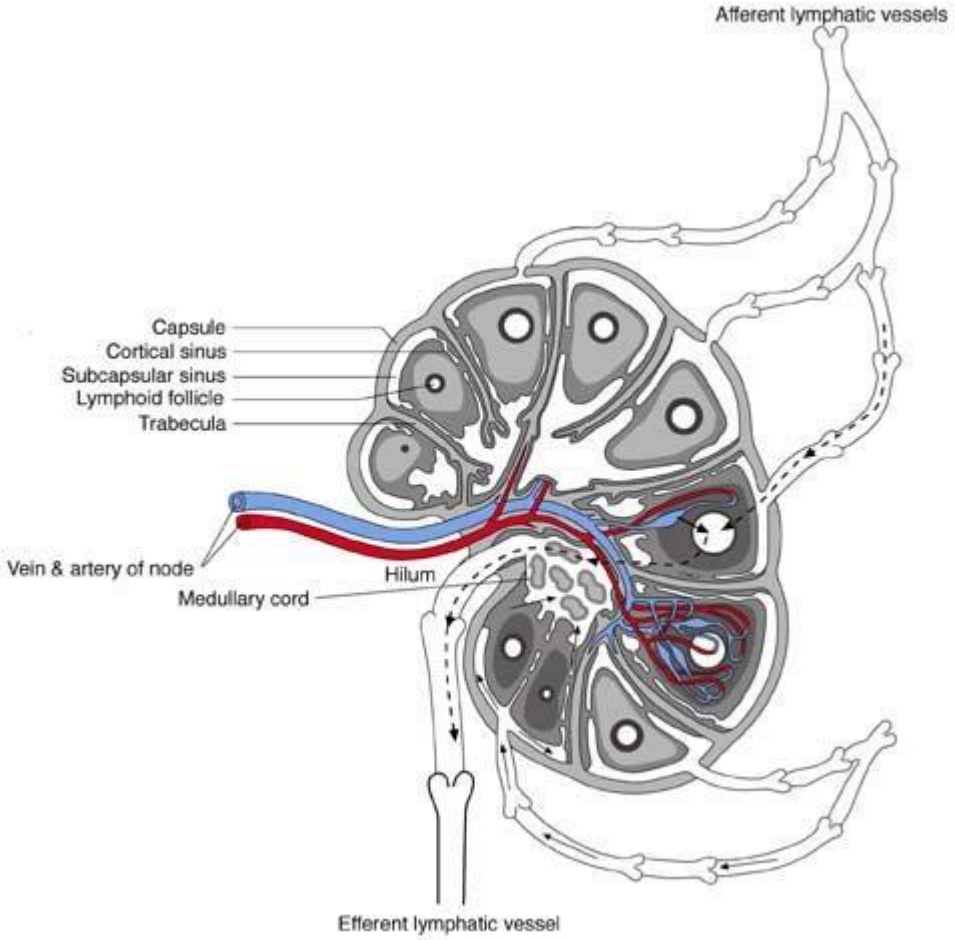
NODE


Afferent lymphatic vessels
Capsule
Cortical sinus
Subcapsular sinus
Lymphoid follicle
Trabecula
Vein & artery of node
Hilum
Medullary cord
Efferent lymphatic vessel


PATHPEDIA.COM


BARAJAS, MARIA
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Res
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SONOGRAPHIC CRITERIA OF LYMPH NODES IN AXILLA

MORPHOLOGICAL CRITERIA

Disappearance or the eccentric character of the hilum

Concentric thickening of the cortex > 3 mm

Focal thickening of the cortex > 2 mm

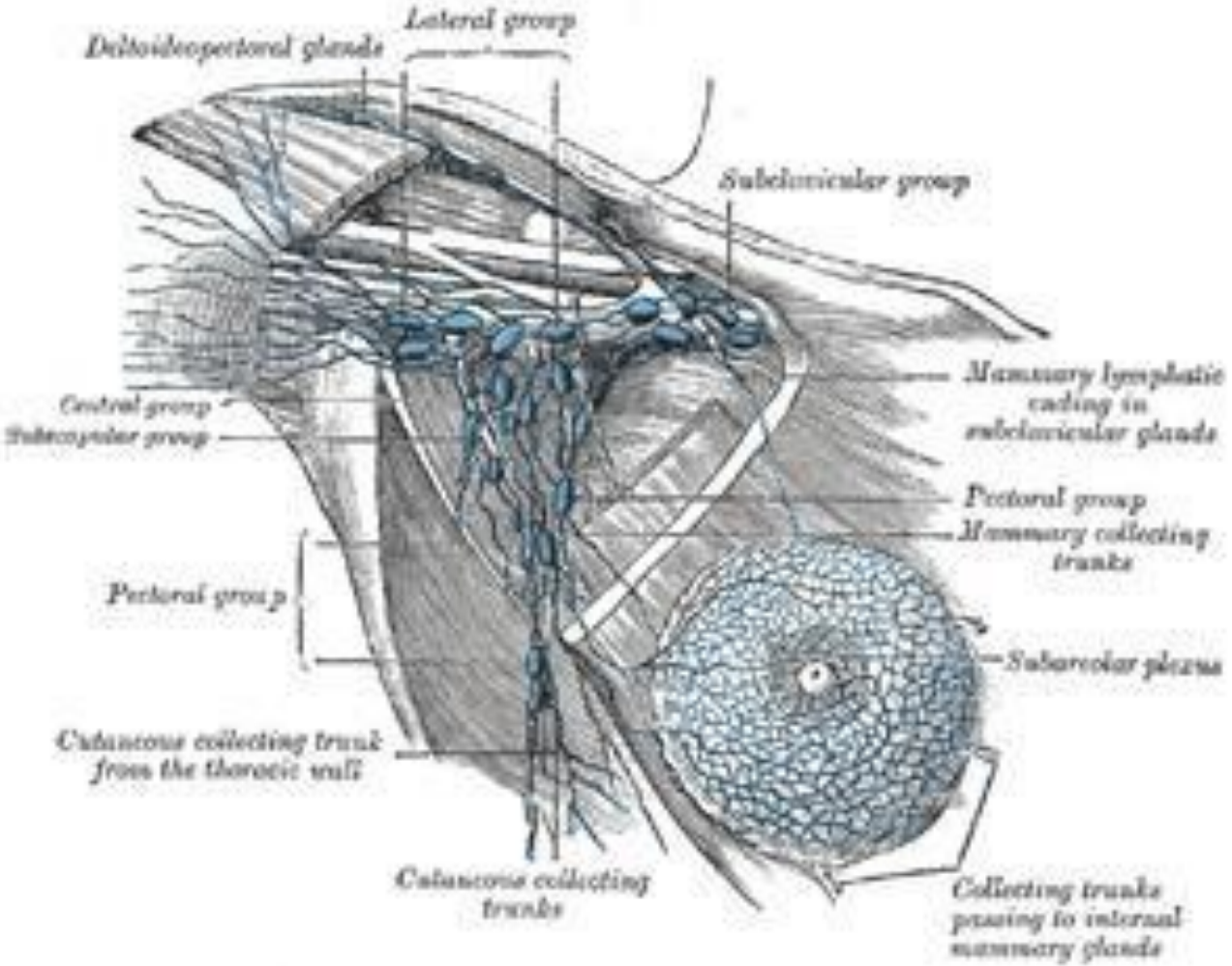
Cortex vascularity by doppler

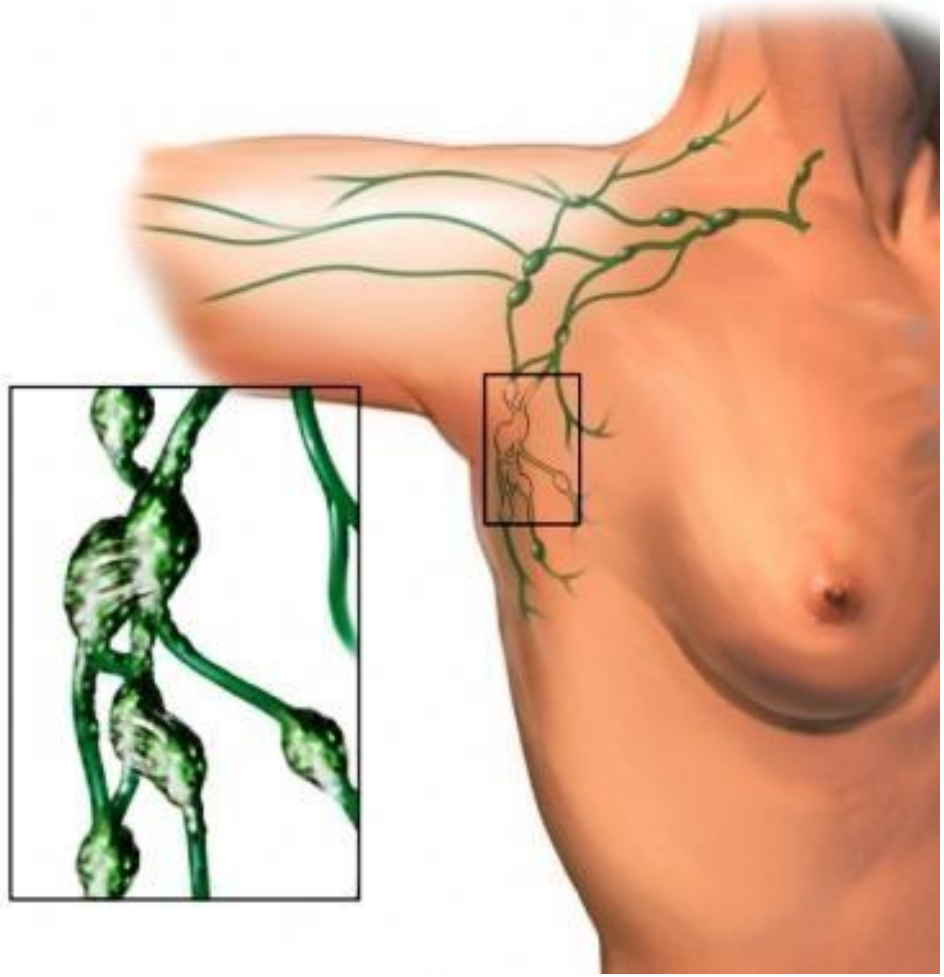
SIZE and SHAPE

Size > 5 mm

Transverse axis > 10 mm

Long/transverse axis ratio 1.5


Deltoideopectoral glands
Lateral group
Subclavicular group
Mammary lymphatic
ending in
subclavicular glands
Central group
Subscapular group
Pectoral group
Mammary collecting
trunks
Pectoral group
Subareolar plexus
Cutaneous collecting trunk
from the thoracic wall
Cutaneous collecting
trunks
Collecting trunks
passing to internal
mammary glands



RATIONALE

Upstaging

Reduce cost and scheduling time by knowing node positive disease going straight to axillary dissection

Referral to plastic surgery for immediate reconstruction

Clip placement prior to neoadjuvant therapy facilitates sentinel node after therapy.

Negative US of axilla supports sentinel node alone during lumpectomies

Identify N2 disease

CONCLUSION:

In our contemporary series, preoperative AUS±USNB streamlined surgical care for 29% of node-positive patients. Two-thirds of T1/T2 USNB-LN+ patients with multiple AUS-suspicious LNs had >2LN+, suggesting they should undergo ALND without SLNB. AUS±USNB helps identify node-positive breast cancer patients who fall outside **Z11 guidelines.**

CONCLUSION:

Patients with invasive breast cancer with a positive node on USNB have a significantly greater burden of axillary disease compared with patients with a positive SLNB. USNB(+) patients represent a distinct patient population and further research is required to determine if these patients can be safely exempted from axillary dissection.

Surgery. 2013 Oct;154(4):831-8; discussion 838-40. doi: 10.1016/j.surg.2013.07.017

Clin Breast Cancer. 2015 Oct;15(5):e243-8. doi: 10.1016/j.clbc.2015.03.011.

Z011

Z011

Nodal positivity on AUS/FNAC is associated with higher axillary disease burden. Few patients would satisfy ACOSOG/Z011 criteria and avoid ALND making an upfront SLNB unnecessary.

T1-2

1-2 Positive nodes without extracapsular ext

Agree to whole breast radiation

Eur J Surg Oncol. 2015 Apr;41(4):559-65. doi: 10.1016/j.ejso.2015.01.011. Epub 2015 Jan 24.

Ann Surg. 2010 Sep;252(3):426-32; discussion 432-3. doi: 10.1097/SLA.0b013e3181f08f32

RESULTS

N=165

P= 26

N=139

Sensitivity= 56.81%

Specificity= 98.35%

PPV= 92.6%

NPV= 86.2%

24% patients got upstaged

RESULTS BY SUBGROUP

Sensitivity reached statistical significance:

AGE < 50 vs AGE> 65

T2 vs T1

SENSITIVITY COMPARISON

Sensitivity	ILC	IDC	T1	T2
ILC	NA	0.6355	0.0769	1.00
IDC	0.6355	NA	0.0374	0.2065
T1	0.0769	0.0374	NA	0.0029
T2	1.00	0.2065	0.0029	NA

LIMITATIONS

Underpowered

Small number of patients

Doppler suboptimal

CONCLUSIONS

Inexpensive easily reproducible procedure in office:

- Sensitivity and specificity within the range of the literature
- Upstaged 24% of patients selecting them for better treatment
  - Found an additional 12 % of patients for neoadjuvant chemotherapy
  - Saved 12-24% sentinel node biopsies

More sensitive in young patients with bigger tumors