The background features a light blue to purple gradient with a faint, repeating hexagonal pattern. Scattered throughout are several realistic water droplets of various sizes, some with highlights and shadows, giving a sense of depth and texture.

AXILLARY STAGING OF BREAST CANCER WHAT THE SONOGRAPHER NEEDS TO KNOW

PRESENTED BY PHILIP EGHAN

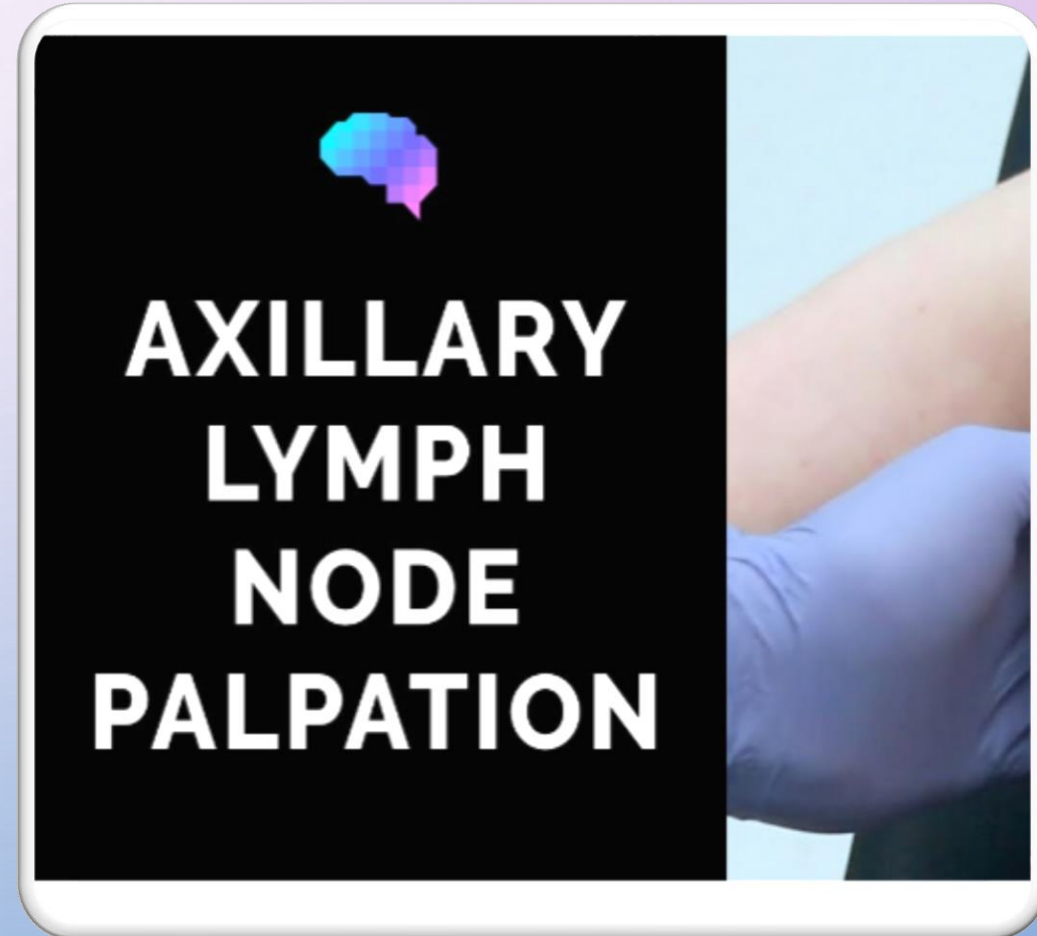
OUTLINE

- **INTRODUCTION OF AXILLARY STAGING OF BREAST CANCER**
- **MODES OF AXILLARY STAGING**
- **TELLTALE SIGNS OF AXILLARY INVOLVEMENT**
- **BRIEF ANATOMY OF THE AXILLA**
- **AXILLARY ULTRASOUND (AUS)**
- **SUMMARY**

INTRODUCTION TO AXILLARY STAGING OF BREAST CANCER

- Detection of metastasis
- Common earliest clinical manifestation
- Clinically spread in the axillary may be detected as a lump in the axillae/parasternum

Chen and Gillanders, 2021



MODES OF AXILLARY STAGING

PHYSICAL EVALUATION

- Involves the use of the fingers to clinically locate lymph nodes
- Notably inaccurate and not sensitive with about 70% false negatives and 20% false positive

CHALLENGE

- Some metastatic lymph nodes may not be palpable
- Reactive lymph nodes or other masses may be considered as metastatic lymph nodes

FERRONI ET AL., 2023

MODES OF AXILLARY STAGING

AXILLARY LYMPH NODE DISSECTION

- One of the most used modes of staging
- It involves the removal of almost all lymph nodes along the axilla plane

CHALLENGES

Complications such as Numbness, seroma, lymphedema, limitation of arm movement and pain have been associated with ALND

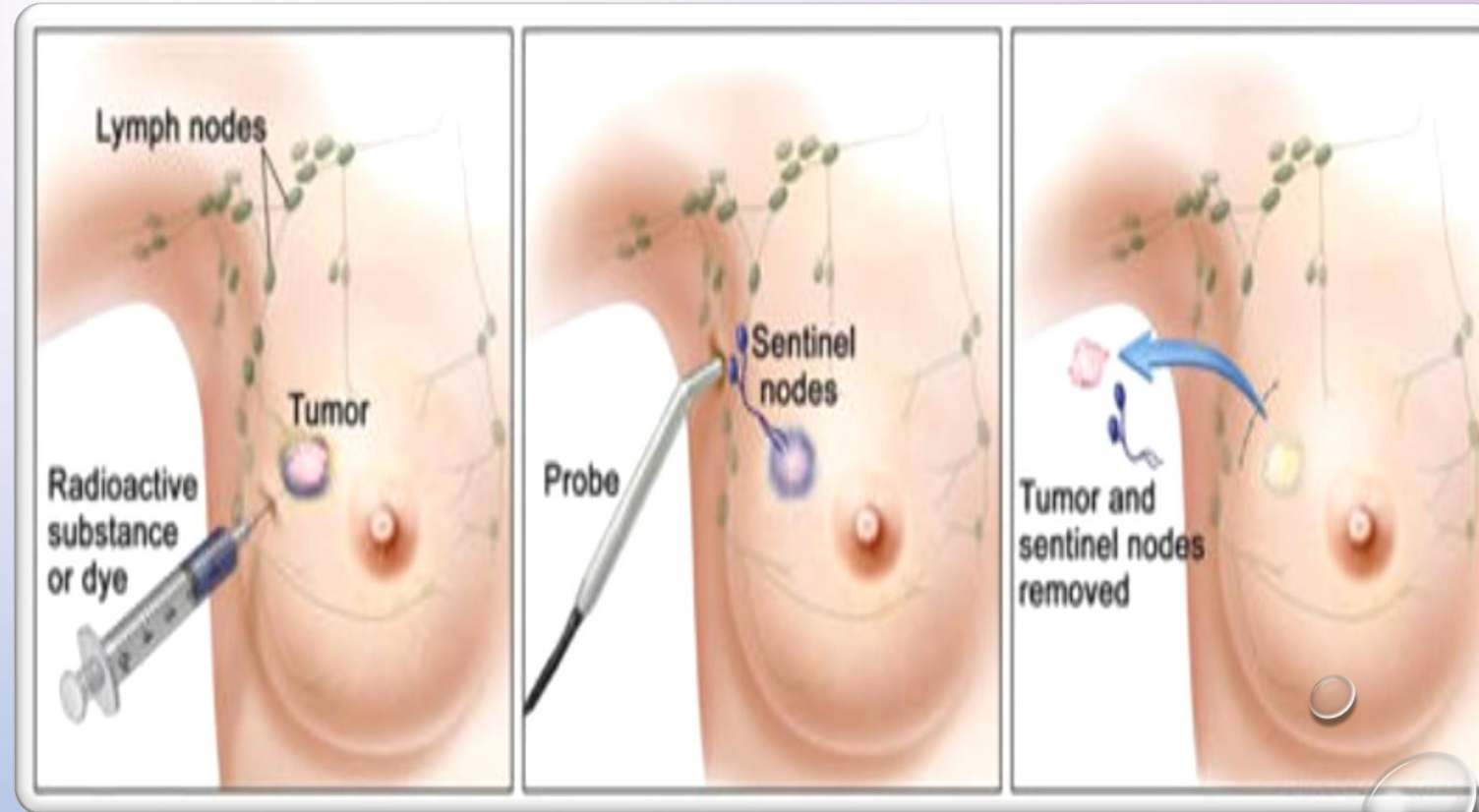
Warmuth et al., 1998

MODES OF AXILLARY STAGING

SENTINEL LYMPH NODE BIOPSY

It is still an invasive procedure with milder forms of pain and lymphedema.

The other challenge is it is an expensive and may not be readily affordable for every one

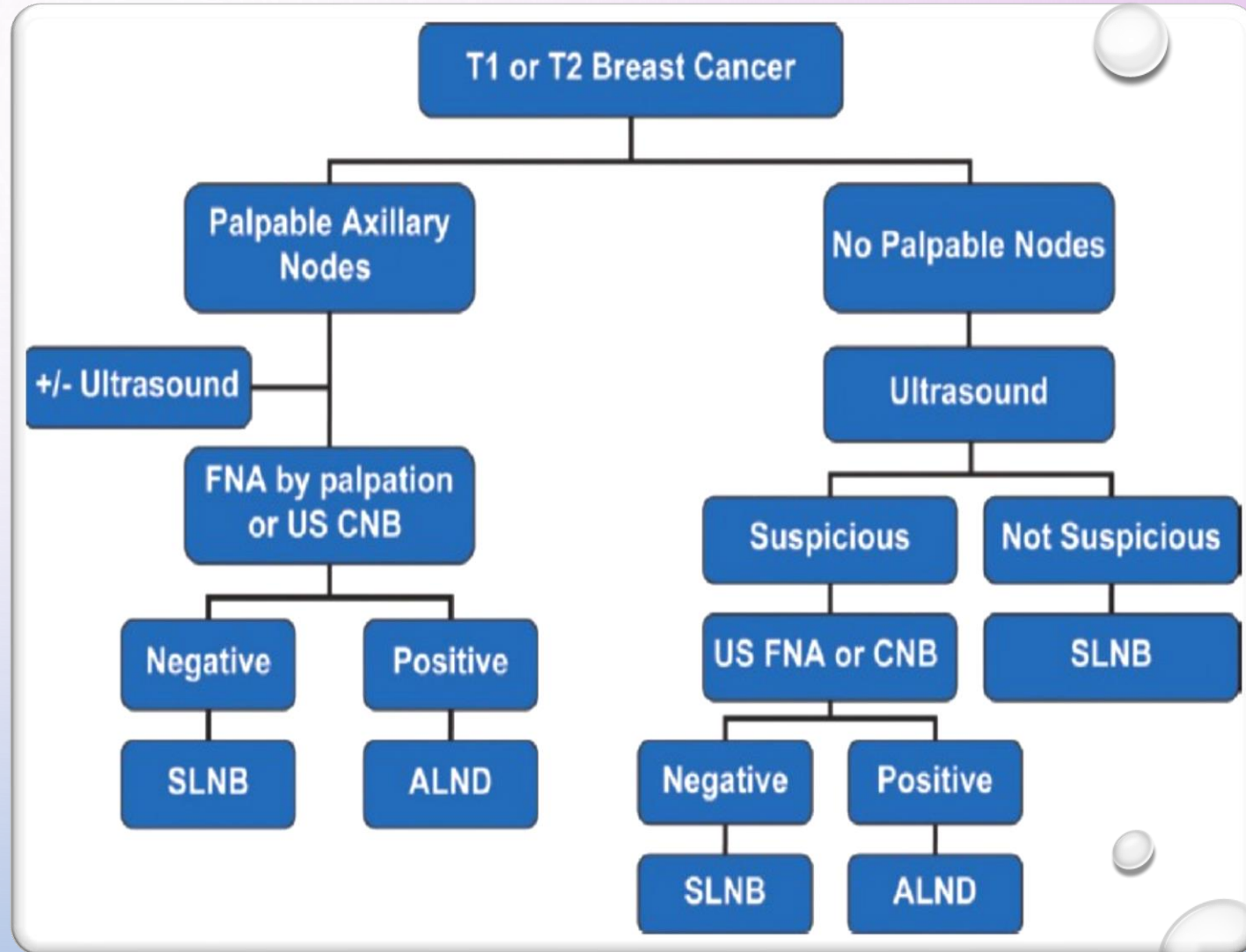


MODES OF AXILLARY STAGING

AXILLARY ULTRASOUND AND BIOPSY

- This is a cheaper non invasive, readily available form of axillary staging
- When combined with biopsy there is a reported sensitivity and specificity of 79.6% and 98.3%

Ecanow et al., 2013



TELLTALE SIGNS OF AXILLARY LYMPH NODE INVOLVEMENT

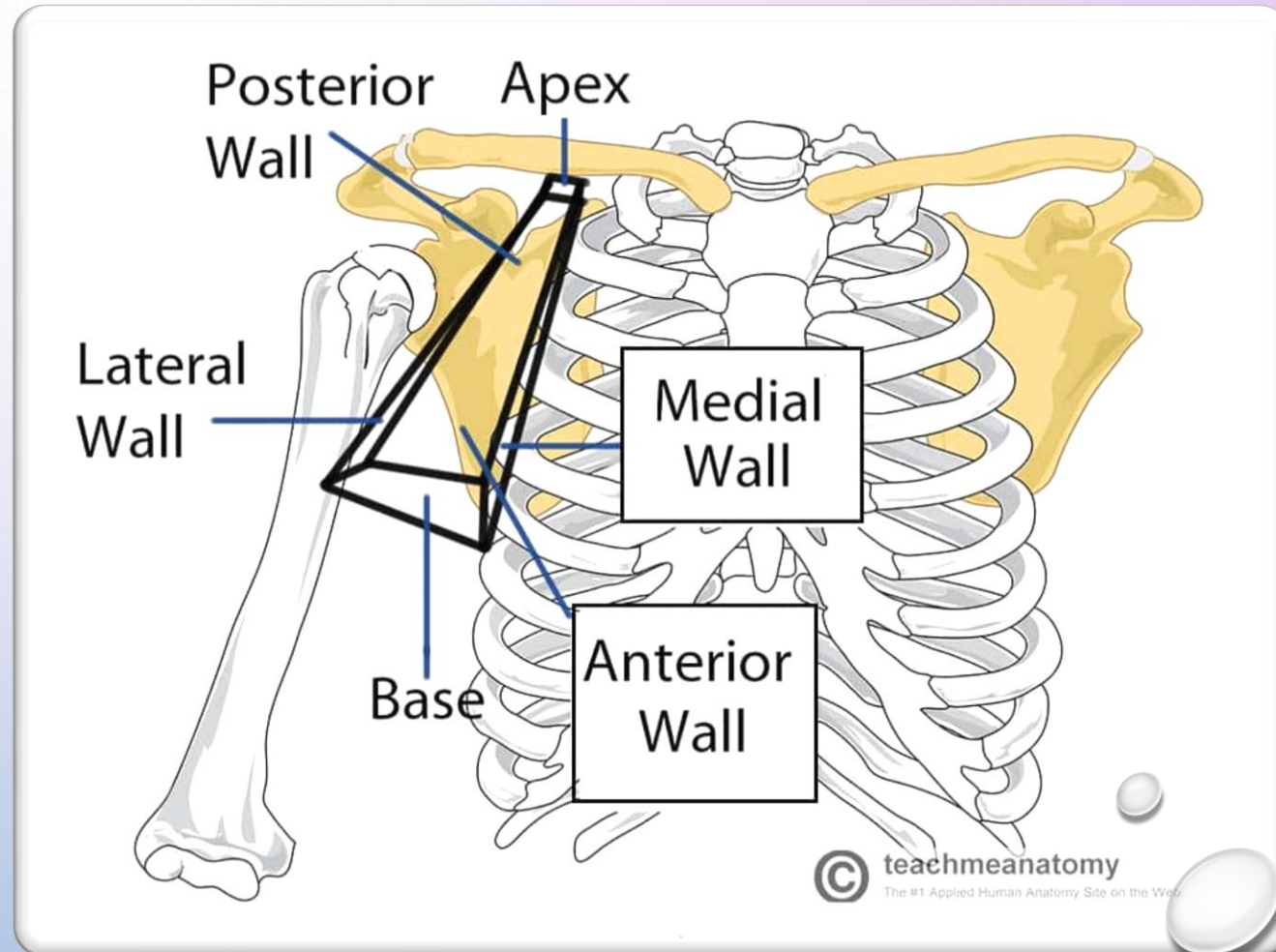
- Tumor/mass size
- Tumor/mass location
- Histological features

Weaver et al., 2006, Colleoni et al., 2005 and Ravdin et al., 1994

ANATOMY OF THE AXILLA

- Pyramid shaped space
- Apex – inlet
- Base – outlet
- It houses nerves, blood and lymph vessels

Cocco et al., 2023

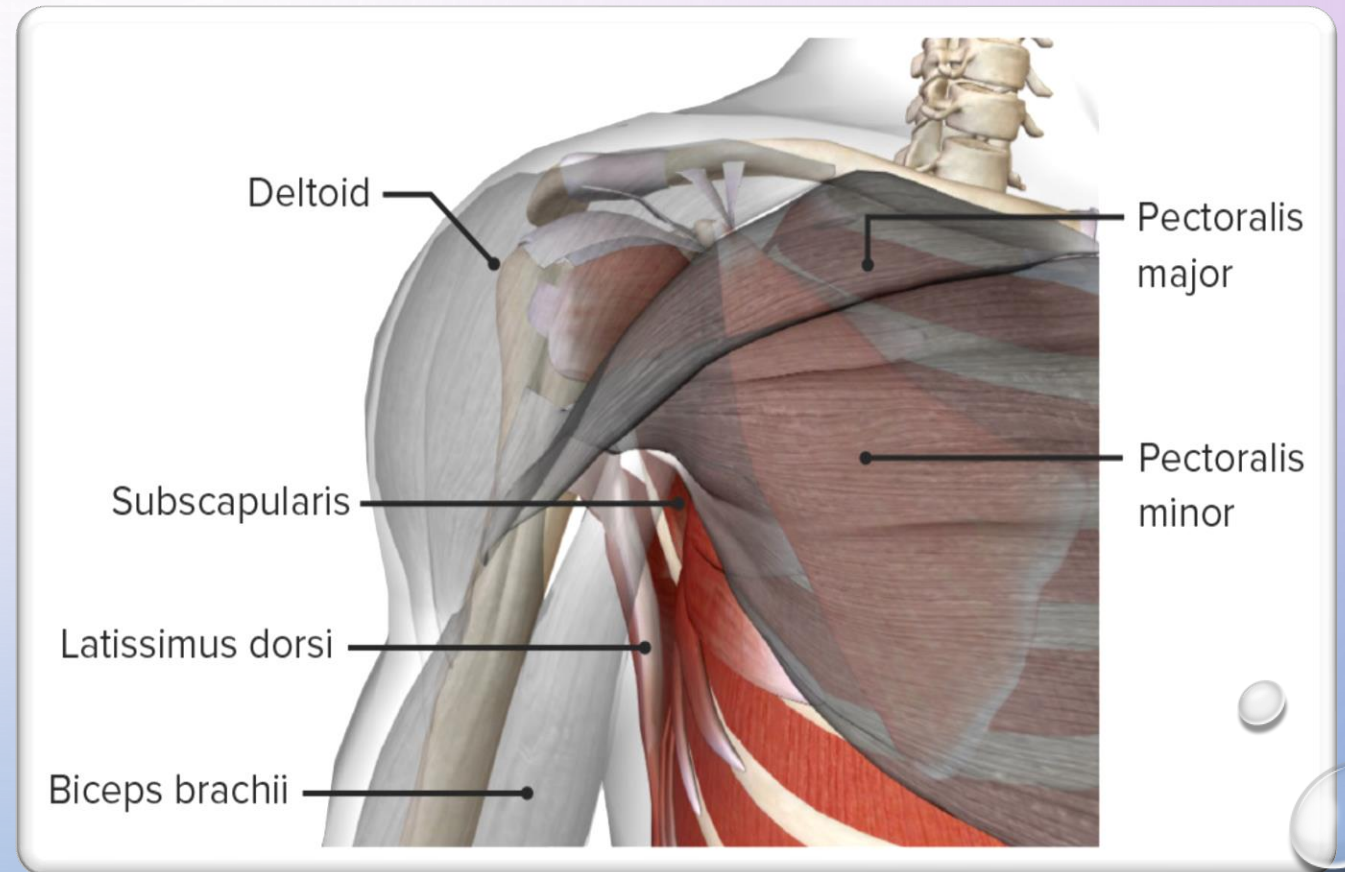


ANATOMY OF THE AXILLA

WALLS

- Anterior wall
- Posterior wall
- Medial wall
- lateral wall

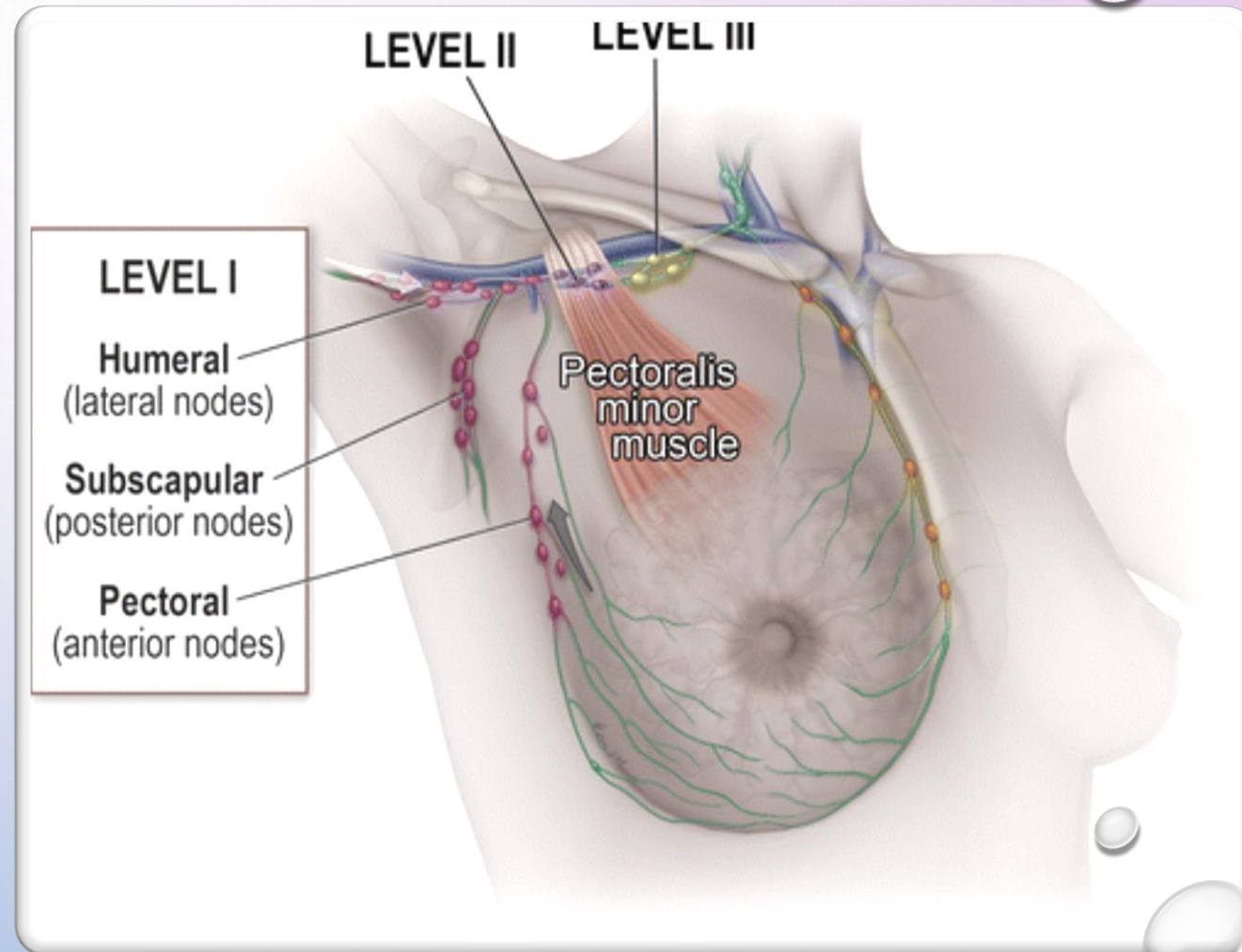
Cocco et al., 2023



ANATOMY OF THE AXILLA

- 20 – 30 lymph nodes in the axilla
- These lymph nodes are grouped into 5 namely lateral, apical, posterior, central and pectoral
- The axillary lymph nodes receive about 85% of lymphatic drainage from all quadrant of the breast.

Zhang et al., 2022



AXILLARY ULTRASOUND

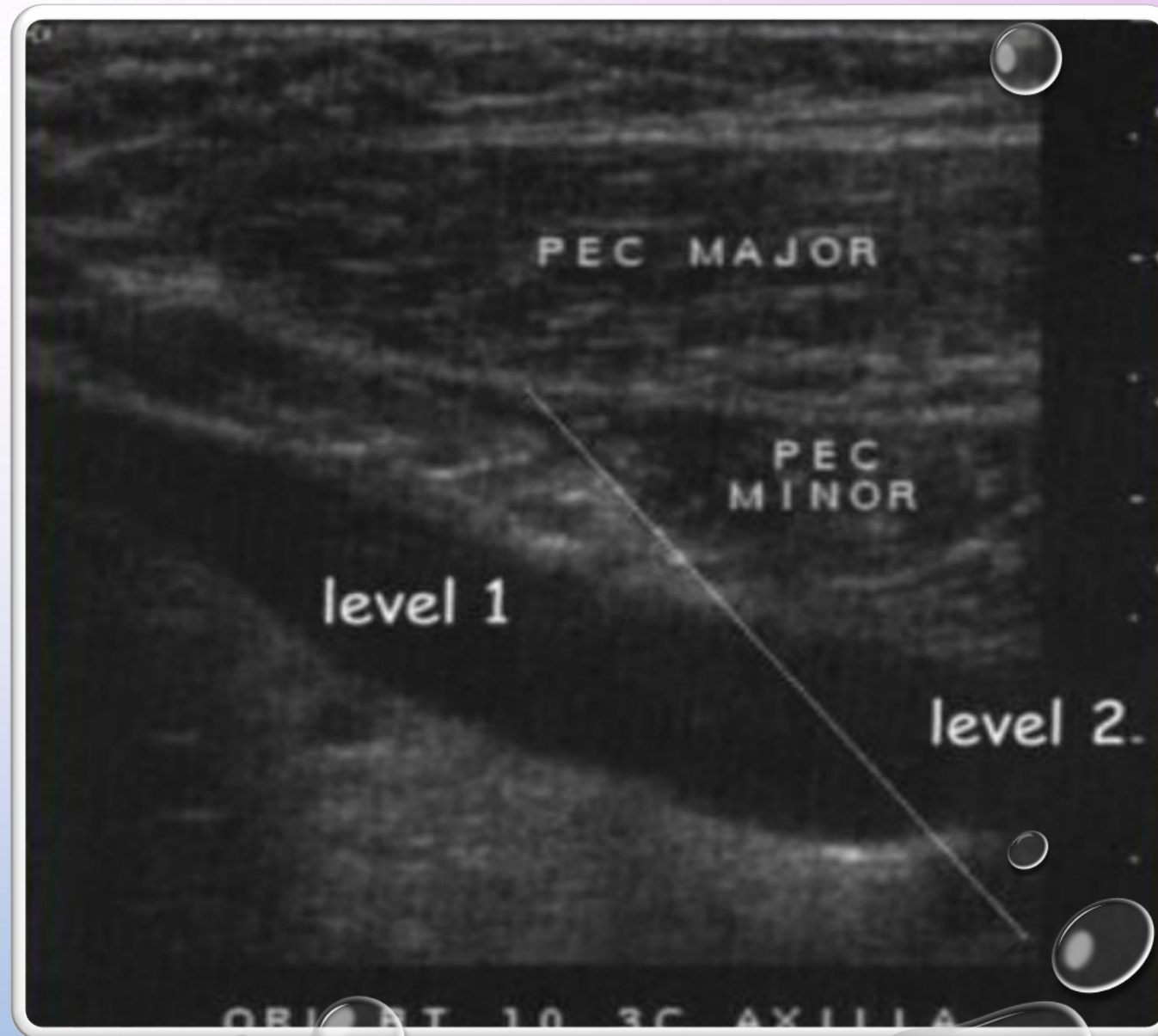
PATIENT POSITIONING

- Bathing beauty position (Aber)



AXILLARY ULTRASOUND

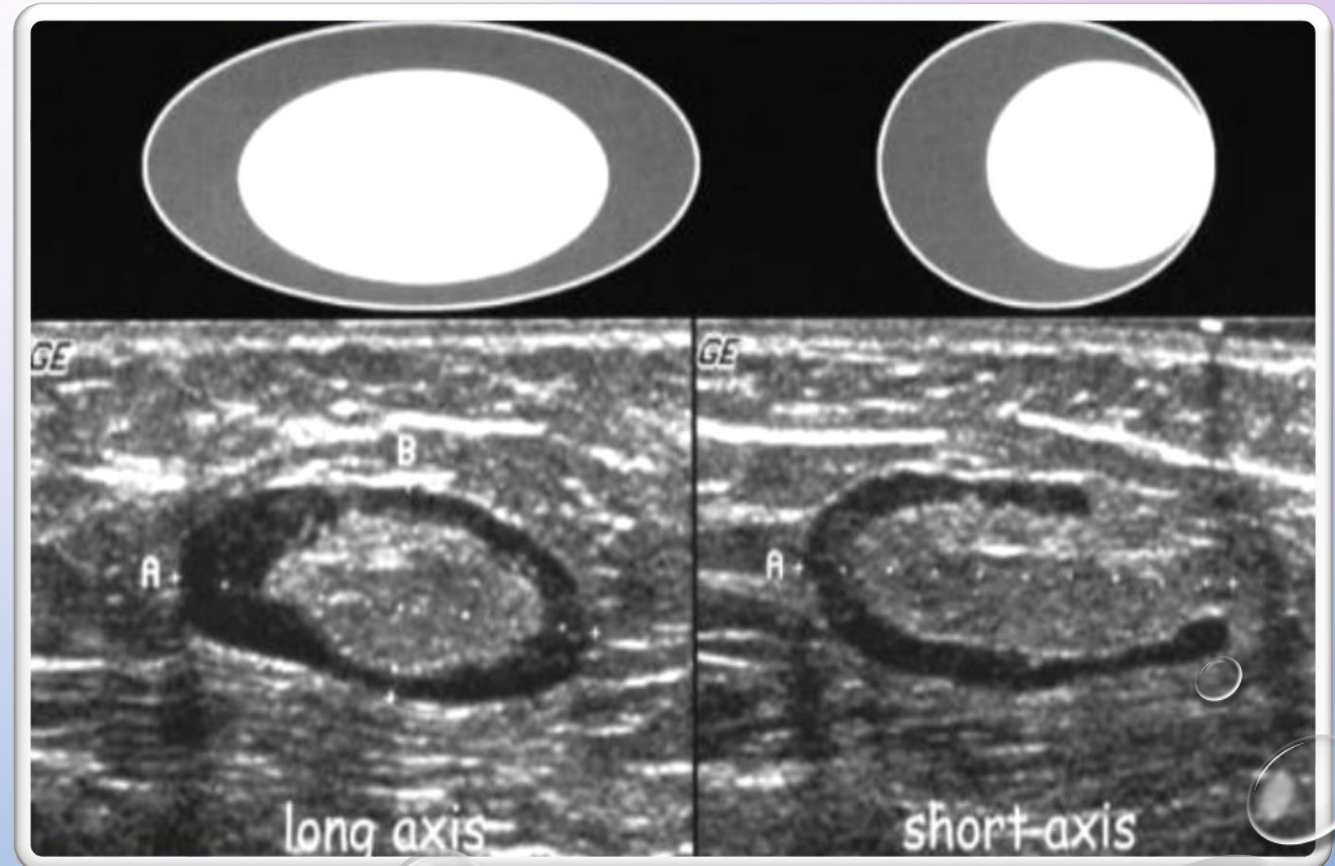
- Should include axillary vein and artery, fat or breast tissue, lymph nodes and possible pathologies
- It should be noted that benign and primary masses could be in the axillae.
- Lymph nodes are mostly visualized at level 1 and 2. Sometimes nodes may be noted at level 3 on ultrasound
- Malignant cells travel from breast to the lymph nodes through level 1 -2 and 3. About 5% of cancers may skip this



AXILLARY ULTRASOUND

NORMAL AXILLARY LYMPH NODE FEATURES

- Reniform or oval in shape with well defined margins
- Cortex is thin and hypoechoic measuring less than 3mm
- Hilum is fatty and echogenic



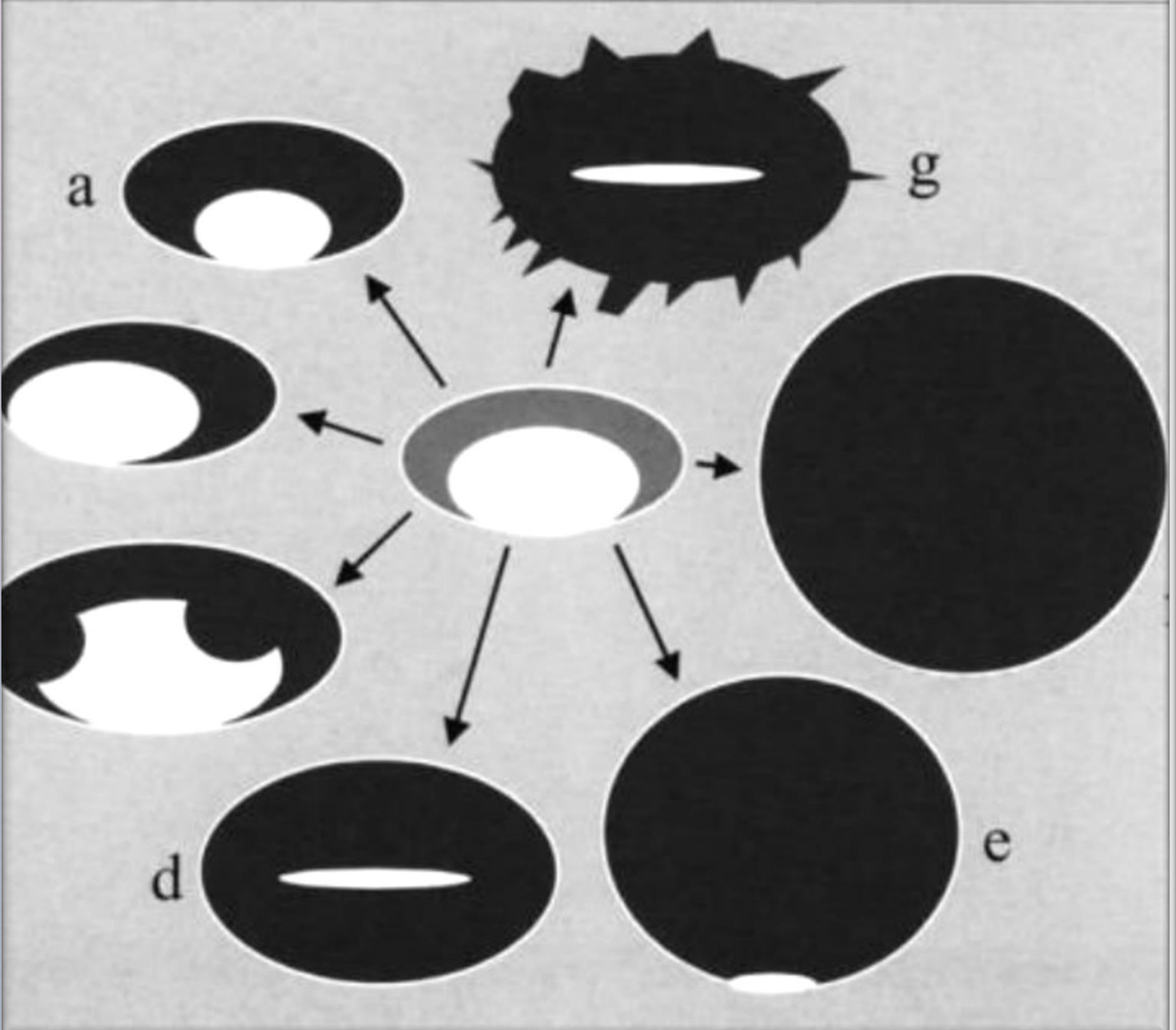
AXILLARY ULTRASOUND

AXILLARY ADENOPATHY

- Sensitivity for metastases 56 - 72% with specificity of 70 – 90%
- 50% of axillary lymph nodes with peripheral colour flow are likely to be positive for metastasis

US Findings	Comments	Figure
Diffuse cortical thickening	Cortical thickness > 3 mm, relatively nonspecific, can be ... seen in reactive nodes	
Focal cortical bulge	Should be distinct, otherwise less specific; more specific if associated with another finding such as NHBF	Fig 17
Eccentric cortical thickening	Should be distinctly eccentric, otherwise less specific	Fig 18
Rounded hypoechoic node	High specificity in the setting of invasive cancer	Fig 19
Complete or partial effacement of the fatty hilum	High specificity in the setting of invasive cancer	Fig 19
NHBF on color Doppler images	Nonspecific unless combined with another finding, such as effacement of the fatty hilum	Figs 17–19, 22
Complete or partial replacement of the node with an ill-defined or irregular mass	High specificity	Fig 20
Microcalcifications in the node	Should correlate with microcalcifications in the primary tumor	Fig 21

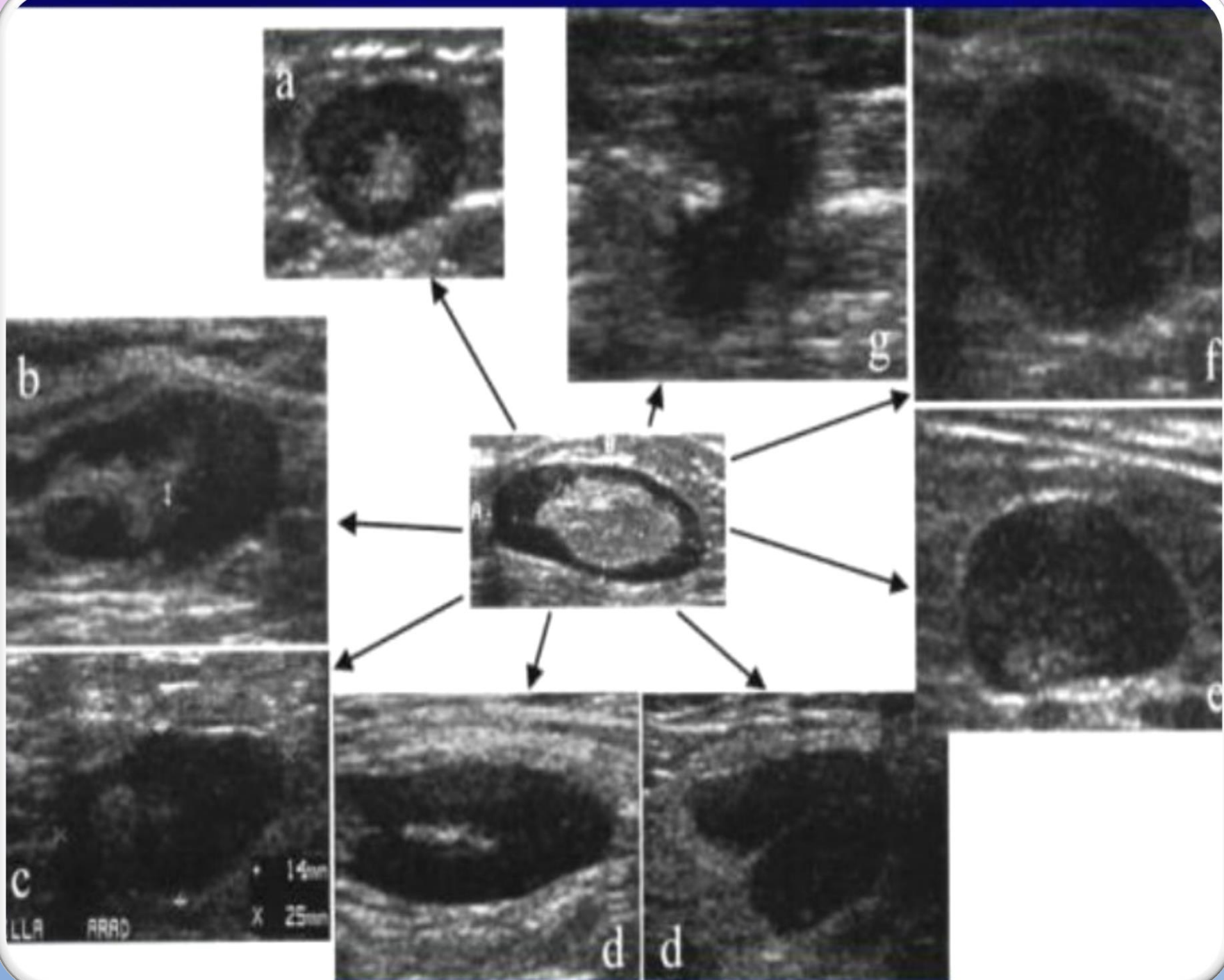
e of abnormal sonographic LN appearance



AXILLARY ADENOPATHY RANGE OF APPEARANCE



AXILLARY ADENOPATHY RANGE OF APPEARANCE



AXILLARY ADENOPATHY

Other sonographic features of indistinct margins, node matting, and perinodal edema predict extranodal extension, which is a marker of poor prognosis having higher risk of both mortality and recurrence of disease

MA ET AL., 2021



SUMMARY

- Imaging of the axilla is an important work up for the staging of metastasis
- It is also a method of choice for biopsy of lymph nodes which may help avoid unnecessary invasive procedure
- It can help avoid delays and treatment and cut cost of treatment

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