# Revisiting Breast Cytology ~ *the WHO IAC perspective*

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# IAC–IARC collaboration in cytopathology

The International Academy of Cytology (IAC) has joined forces with the International Agency for Research on Cancer (IARC) to publish a series of cytopathology reporting systems, which will present an international approach to the cytopathology of various body sites and mirror the WHO Classification of Tumours series (with links between the two series). This standardized approach will include the key diagnostic cytopathological features of each

# IAC-IARC Collaboration

- International approach to the cytopathology of various body sites.
- Mirrors the WHO Classification of Tumours series (with links between the two series).
- Standardized approach includes the key diagnostic cytopathological features of each particular lesion or neoplasm.
- Improves the quality of diagnosis, reporting and subsequent diagnostic procedures.
- Reporting systems include options that recognize variations in the availability of diagnostic modalities and management in low- and middle-income countries, where cytopathology is particularly useful and is increasingly available in the absence of histopathological services.
- These international systems can be used worldwide.

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# IAC-IARC Collaboration

- The new publications series are guided by a Cytopathology Editorial Board, consisting of standing members and experts from around the world.
- The Board liaises closely with relevant groups internationally to ensure that areas of overlap are managed proactively.
- IARC and the IAC share a specific common interest in the development and expansion of internationally standardized diagnostic reporting of cancer and precancerous disorders worldwide.

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**Authors**

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# Invasive lobular carcinoma

## Definition

Invasive lobular carcinoma (ILC) is an invasive breast carcinoma (IBC) composed of dyscohesive cells that are most often individually dispersed or arranged in a single-file linear pattern.

## ICD-O coding

8520/3 Lobular carcinoma NOS

## ICD-11 coding

2C61.1 & XH2XR3 Invasive lobular carcinoma of breast & Lobular carcinoma NOS

## Related terminology

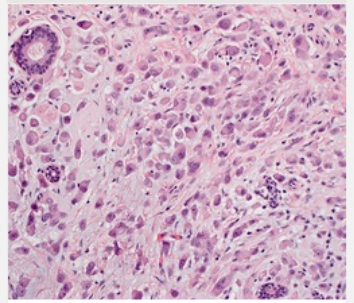
*Not recommended:* infiltrating lobular carcinoma.

## Subtype(s)

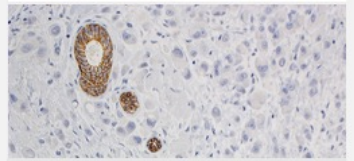
None

## Localization

ILC can affect any part of the breast, although one study found that centrally located tumours were slightly more common in these cases than in IBC of no special type (NST) { 9544955 }. A high rate of multicentric tumours has been reported in some studies { 215300 7"> 215300 7 ; 6277027 }, but this has not been found in other series based on clinical { 8630916 } or radiological { 1438749 } analysis. An incidence of contralateral tumours, particularly synchronous tumours, of 5–19% has been reported, which is higher than for IBC-NST { 15084238 ; 7602346 ; 10548312 ; 215300 ; 4337952 ; 18458044 ; 8156495 }.

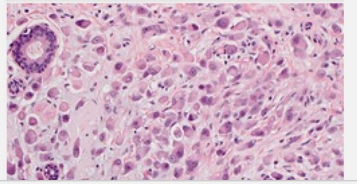


#2290
Invasive lobular carcinoma, pleomorphic type with apocrine features (pleomorphic lobular carcinoma)



### Histopathology

The classic pattern of ILC is characterized by a proliferation of small cells that lack cohesion and appear individually dispersed throughout a fibrous connective tissue or arranged in single-file linear cords that invade the stroma { 21022022 ; 229072 ; 5775975 }. These infiltrating cords frequently present a concentric pattern around normal ducts. There is often little host reaction or disturbance of the background architecture. The neoplastic cells have round or notched ovoid nuclei and a thin rim of cytoplasm, with an occasional intracytoplasmic lumen { 1916690 }, often harbouring a central mucoid inclusion. Mitoses are typically infrequent. These classic cytological features are the same as those seen in atypical lobular hyperplasia and lobular carcinoma in situ, which is associated with ILC in 58–98% of cases { 17325484 ; 2153007 ; 7076138 ; 5915941 }. Lymphovascular invasion is uncommon. In terms of the tissue microenvironment, luminal-type ILC has



A A A
Definition
ICD-O coding
ICD-11 coding
Related terminology
Subtype(s)
Localization
Clinical features
Epidemiology
Etiology
Pathogenesis
Macroscopic appearance
Histopathology
Cytology
Diagnostic molecular pathology
Essential and desirable diagnostic criteria
Staging
Prognosis and prediction

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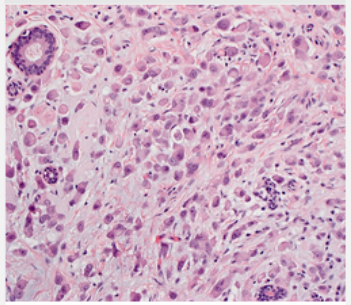
Sandra J. Shin

A mixed group is composed of cases showing an admixture of the classic type with one or more of these patterns { 7076138 }. The classic ILC type and mixed patterns contribute to the majority of lobular tumours, accounting for as many as 75% of all cases { 18704988 ; 17929165 }. In addition, both IBC-NST and lobular features of differentiation are present in about 5% of IBCs (called invasive ductulolobular carcinomas) { 16175185 ; 229072 }, and although these components are morphologically distinct, a recent study has shown that they arise from a common ancestor { 29344954 }.

Although the literature suggests that 80–95% of ILCs are positive for ER, in current practice classic ILCs are almost invariably ER-positive. In comparison, 70–80% of IBC-NSTs are ER-positive. PR positivity is found in 60–70% of both tumour types { 15084238 ; 18035533 ; 8630916 ; 11122436 }. ER was found to be expressed in the classic form and in patterns, with the rate of positivity being highest (100%) in the alveolar pattern { 3940412 } and lowest (10%) in PLC { 10672061 }. *ERBB2* (*HER2*) amplification and overexpression are rare in ILC { 15084238 ; 1676930 ; 18035533 ; 9495354 ; 1672872 }, although evident in some PLCs { 11117786 ; 18473330 }.

One of the most consistent molecular alterations in ILC and its patterns is the loss of expression of the cell–cell adhesion molecule E-cadherin, which contributes to the characteristic dyscohesive nature of lobular cells due to the disruption of the adherens complex { 9496256 ; 7682767 ; 8256859 ; 8453644 ; 7534041 ; 20871222 ; 8383197 ; 18473330 }. Altered adherens complex integrity may also be due to loss of other components, such as α-catenin, β-catenin, and γ-catenin, resulting in mislocalization of p120-catenin from the cell membrane to the cytoplasm { 17325485 ; 20871222 ; 15077190 }. Analysis of the expression of E-cadherin, α-catenin, β-catenin, and p120 may help to differentiate between lobular and low-grade IBC-NSTs that are difficult to classify on the basis of morphological criteria; however, about 15% of ILCs (and most ductulolobular cancers) do express E-cadherin, so positive staining should not be used to reclassify a lobular lesion as IBC-NST { 11190811 ; 18379416 ; 20871222 ; 28779344 }. Inversely, tumours with NST morphology may also show loss of E-cadherin expression. The expression of p53, basal markers (CK14, CK5/6, and EGFR [HER1]), and myoepithelial markers (SMA and p63) is rare in ILC { 8384406 ; 18261623 ; 18035533 }. Proliferation, measured by MIB1/Ki-67 labelling, is generally low in ILC, although higher in other morphological patterns { 9355973 ; 18704988 }.



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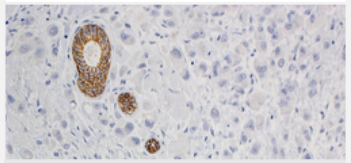

### Cytology

The cytomorphological features of classic ILC on FNA specimens include low cellularity, mild discohesiveness, small nuclear size, indistinct nucleoli, and mild pleomorphism, as well as the absence of apocrine change, signet-ring cell morphology, necrosis, and mitoses. In contrast, PLC is characterized by greater cellularity, nuclear pleomorphism, and hyperchromasia; prominent nucleoli; and high mitotic activity, more resembling cancers of no special type { 1398644 ; 7992580 ; 9100538 ; 27489086 }.

# Role of breast cytology in a histopathologist's world

- Decreasing number of FNAC samples from the breast.
- Gradual erosion of cytologic interpretive expertise.
- Unfamiliarity with challenges and pitfalls.
- Discomfort, dismay and even dislike for cytology specimens.

***Perceived realities***

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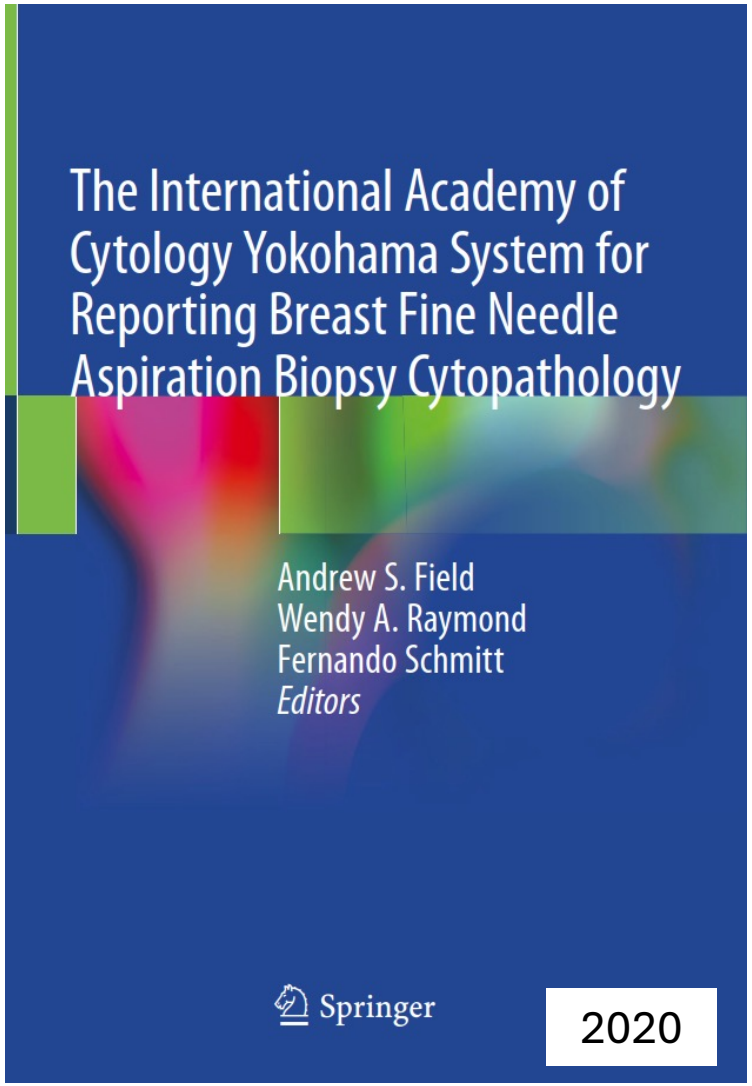
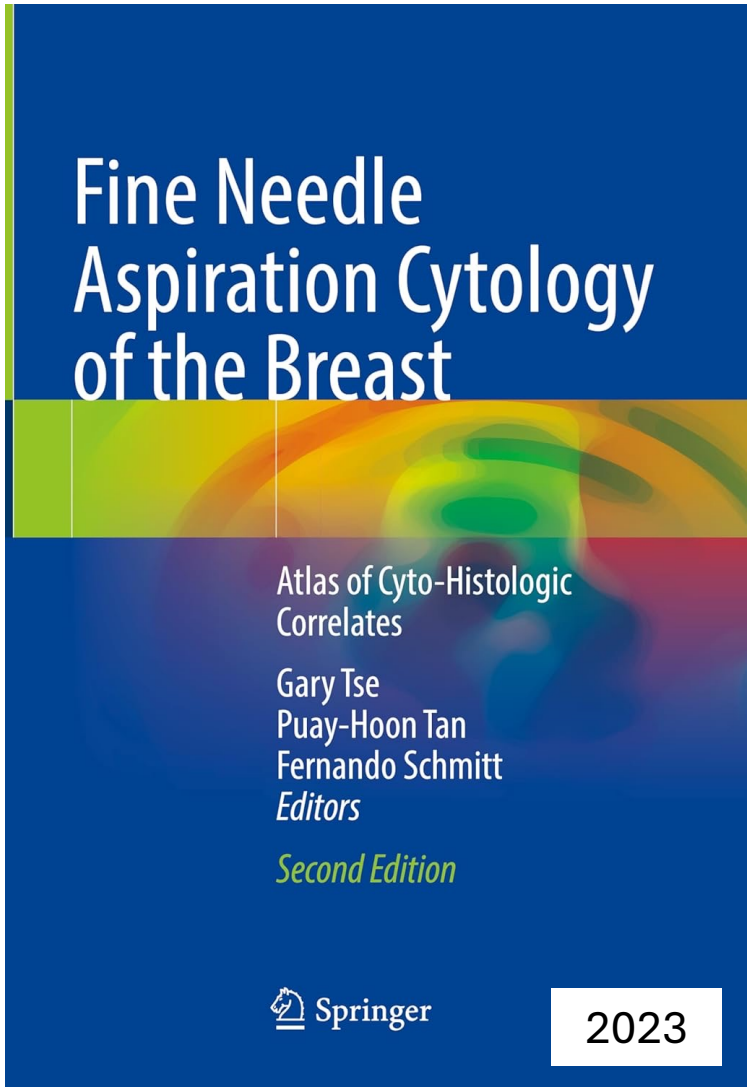

The International Academy of Cytology Yokohama System for Reporting Breast Fine Needle Aspiration Biopsy Cytopathology
Andrew S. Field
Wendy A. Raymond
Fernando Schmitt
Editors
Springer
2020


Fine Needle Aspiration Cytology of the Breast
Atlas of Cyto-Histologic Correlates
Gary Tse
Puay-Hoon Tan
Fernando Schmitt
Editors
Second Edition
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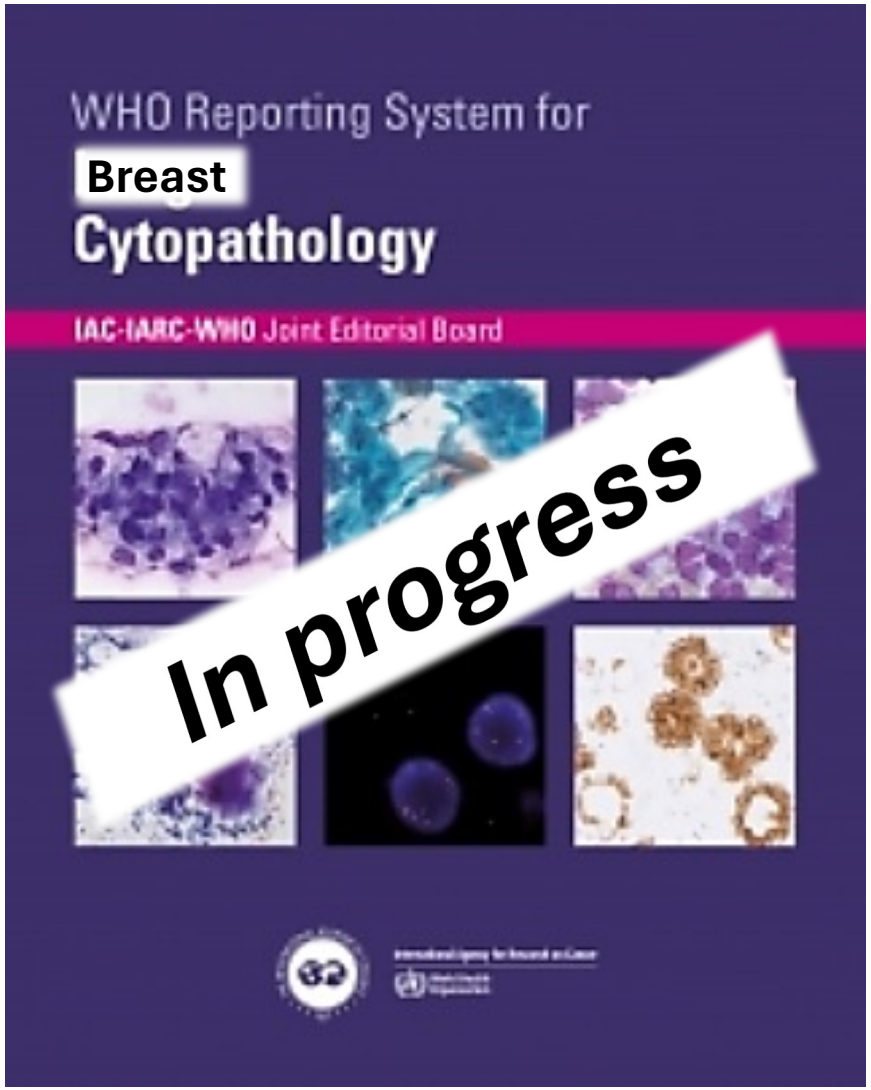
WHO Reporting System for
Breast
Cytopathology
IAC-IARC-WHO Joint Editorial Board
In progress

International Agency for Research on Cancer

World Health Organization

**WHO Reporting System for Breast Cytopathology**

- Role of Cytopathology
- Integration of Clinical, Imaging and Key FNAB Cytopathological Features
- System Categories and Structured Reporting
- Risk of Malignancy and Management Recommendations

# Role of cytology in breast pathology

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# Role of cytology in breast pathology

- Complementary to histopathology.
- Rapid, inexpensive, on-site diagnosis.
- Important part of the triple assessment.
- Requires skilled operators and experienced interpretation.
- Present & future ~
  - IAC-Yokohama System for Reporting Breast FNAB
  - IAC-IARC-WHO Cytopathology Reporting Systems Series (Breast)

# Role of cytology in breast pathology

- The breast is highly accessible to biopsy sampling including FNAB.
- Palpable masses may be sampled under radiologic guidance or blindly.
- ‘Free-hand’ FNAC is an advantage in low to middle income countries where image-guided FNAB may not be available.
- Non-palpable masses are readily sampled under image guidance.
- Longstanding history and widespread acceptance by patients and clinicians of breast FNAB as a diagnostic modality.
- FNAB allows a rapid and accurate diagnosis without the need for anaesthesia or hospitalisation.
- Very low rate of complications such as bleeding, infection, and scarring.

# Role of cytology in breast pathology

- Sensitivity of breast FNAB is 90-99%.
- Positive predictive value approaching 100%.
- False positive rate is very low.
- Indications for breast FNAB ~
  - Diagnosis and drainage of simple cysts.
  - Diagnosis of palpable and impalpable mass lesions.
  - Rendering a final diagnosis in conjunction with the triple test.
  - Diagnosis of inflammatory conditions with the ability to obtain material for microbiologic evaluation, in pregnant or lactating patients to avoid sinus formation and in patients with bleeding disorders.
  - Facilitates the performance of rapid onsite evaluation (ROSE) for immediate diagnosis and appropriate triage of material.

# Role of cytology in breast pathology

- Despite the utility of breast FNAB, core need biopsy (CNB) is the procedure of choice in some countries for women with a breast lesion, either palpable or non-palpable.
- CNB is indicated for the work up of calcifications and more diffuse lesions within the breast.
- CNB offers better diagnostic ability in certain proliferative lesions and low-grade ductal carcinoma in situ.
- Specificity of FNAB and CNB is similar.
- For non-palpable image-guided breast masses, some reports find FNAB is more specific than CNB.
- CNB is more invasive and costly and have more complications.
- Choice between FNAB and CNB depends on the prevailing practice in a particular clinical milieu and characteristics of the breast lesion.

# Role of cytology in breast pathology ~ nipple discharge

- Approximately 5-10% of patients at a breast clinic present with nipple discharge.
- Nipple discharge can be physiologic, such as lactation, or pathologic.
- Nipple discharge may be the only presenting symptom in a patient with breast cancer.
- Nipple cytology is a non-invasive diagnostic modality with easy collection of material for microscopic evaluation.
- Nipple discharge cytology has a sensitivity of 75% and 62% and specificity of 87% and 71% for benign and malignant breast disease respectively.

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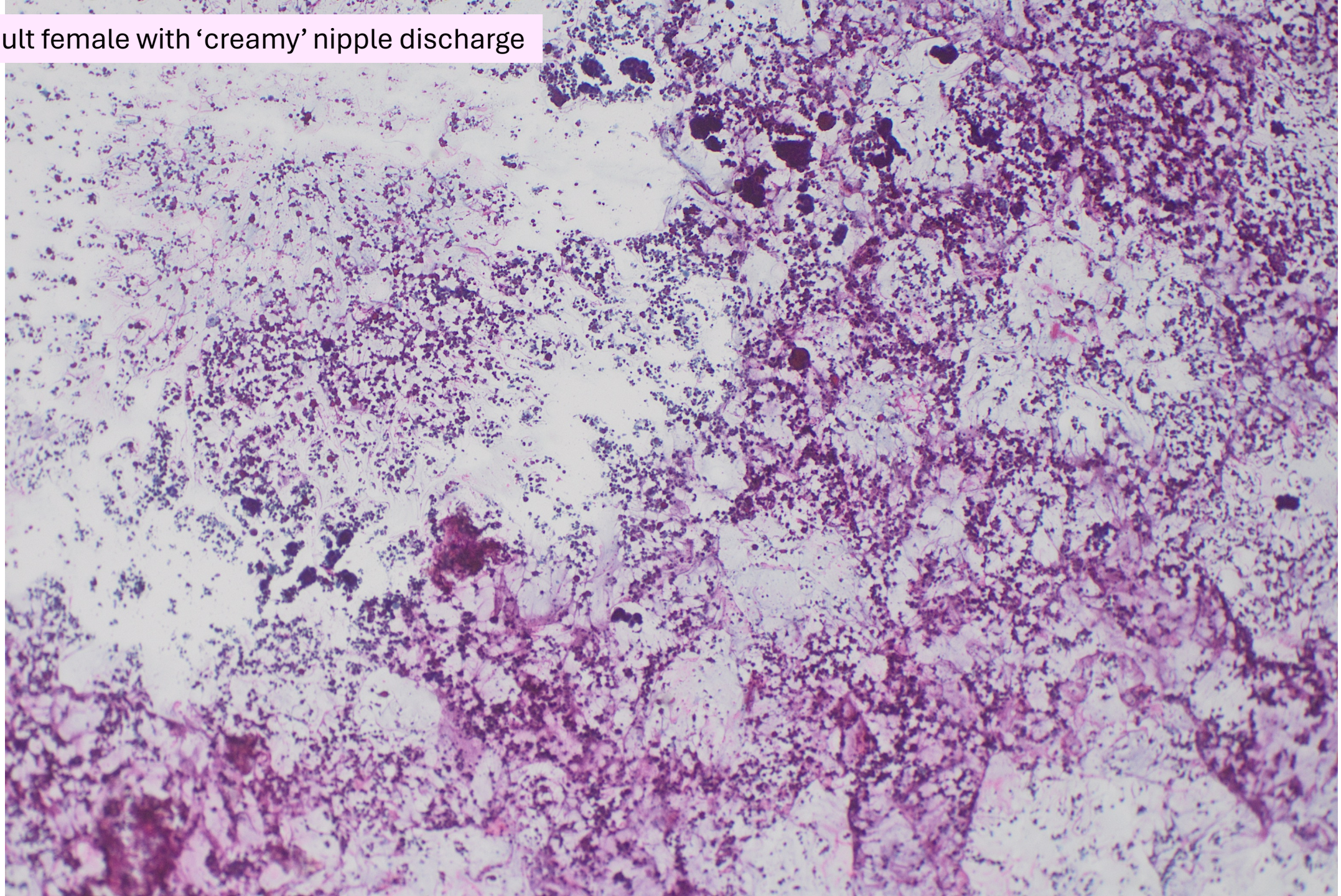
Adult female with ‘creamy’ nipple discharge



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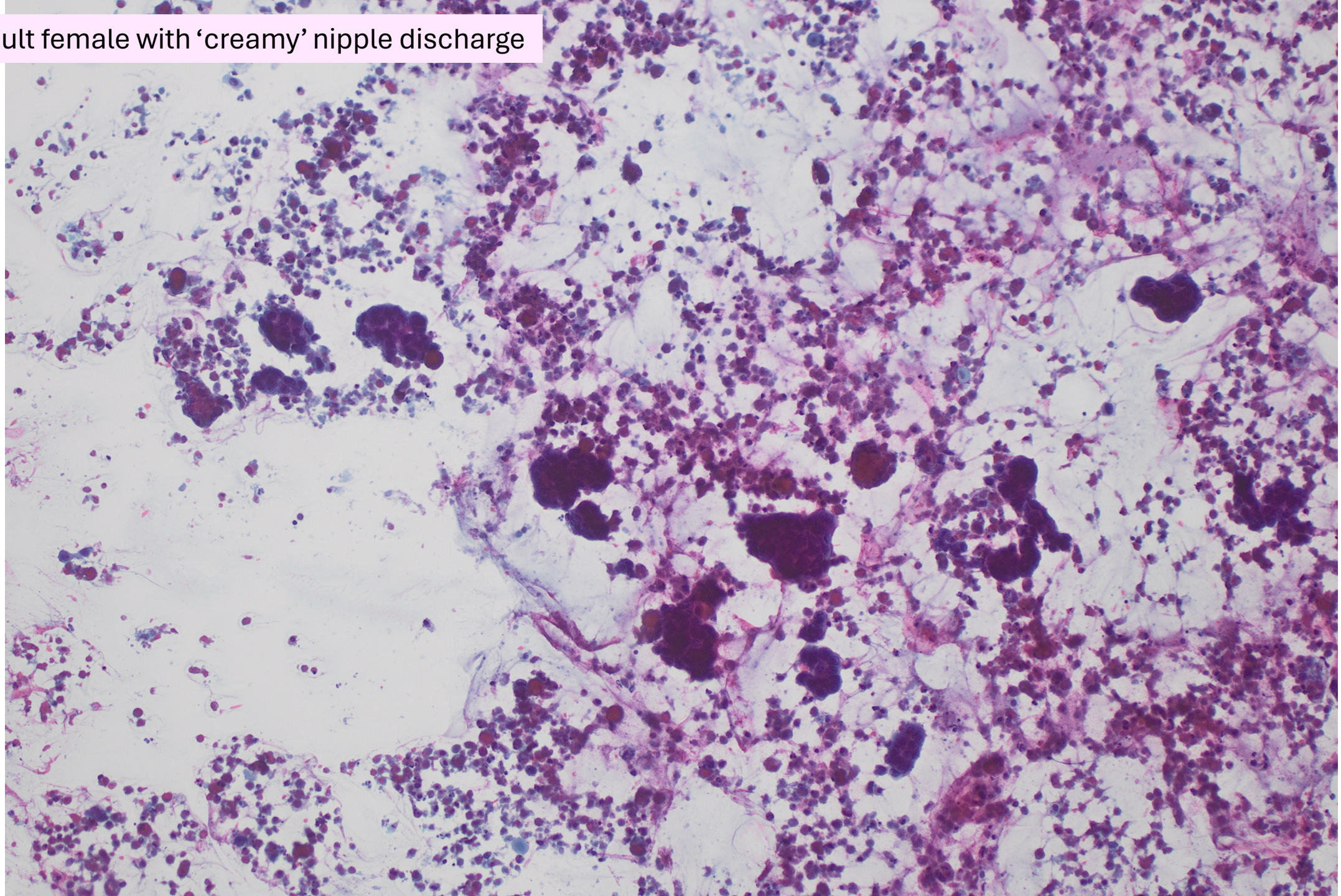

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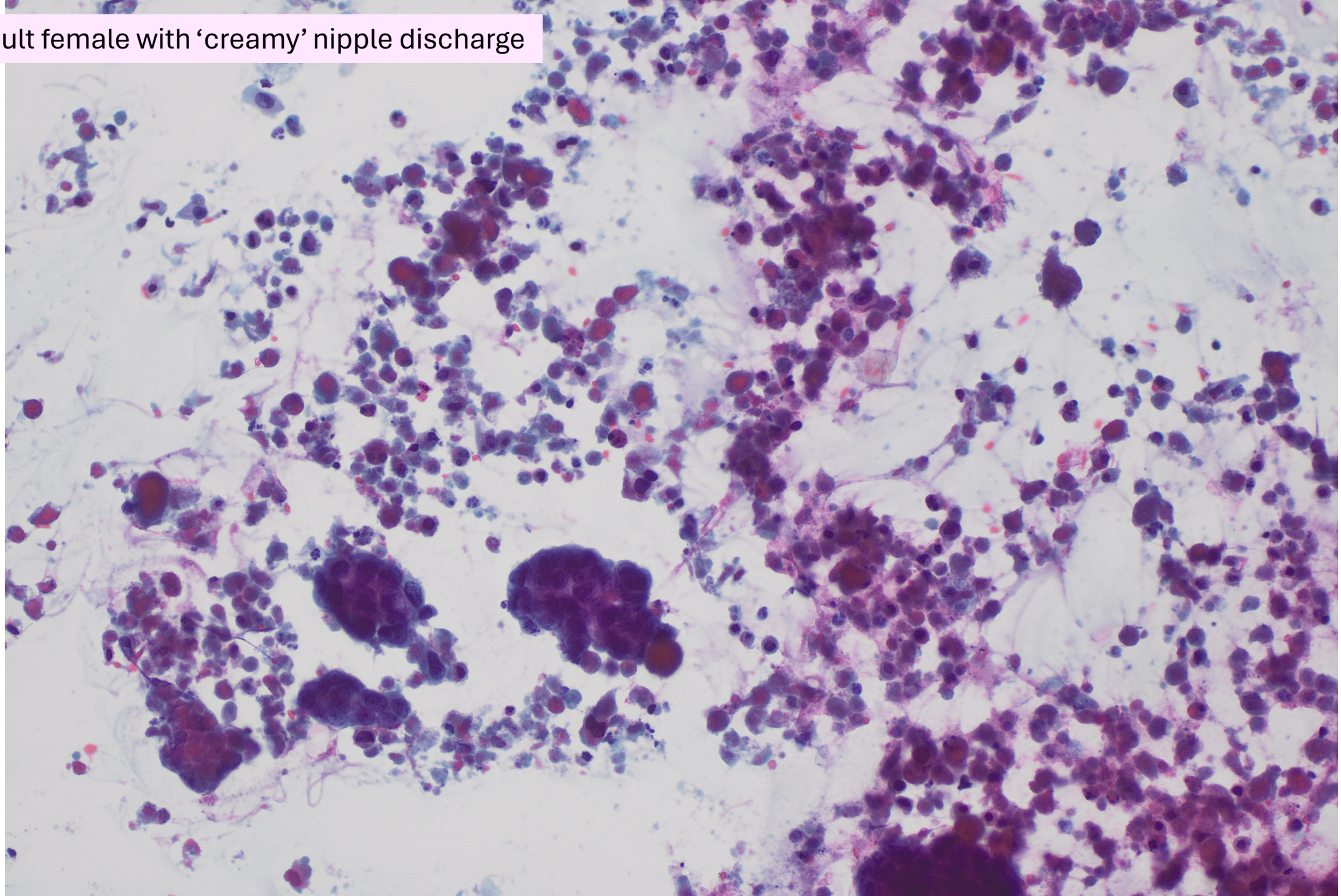

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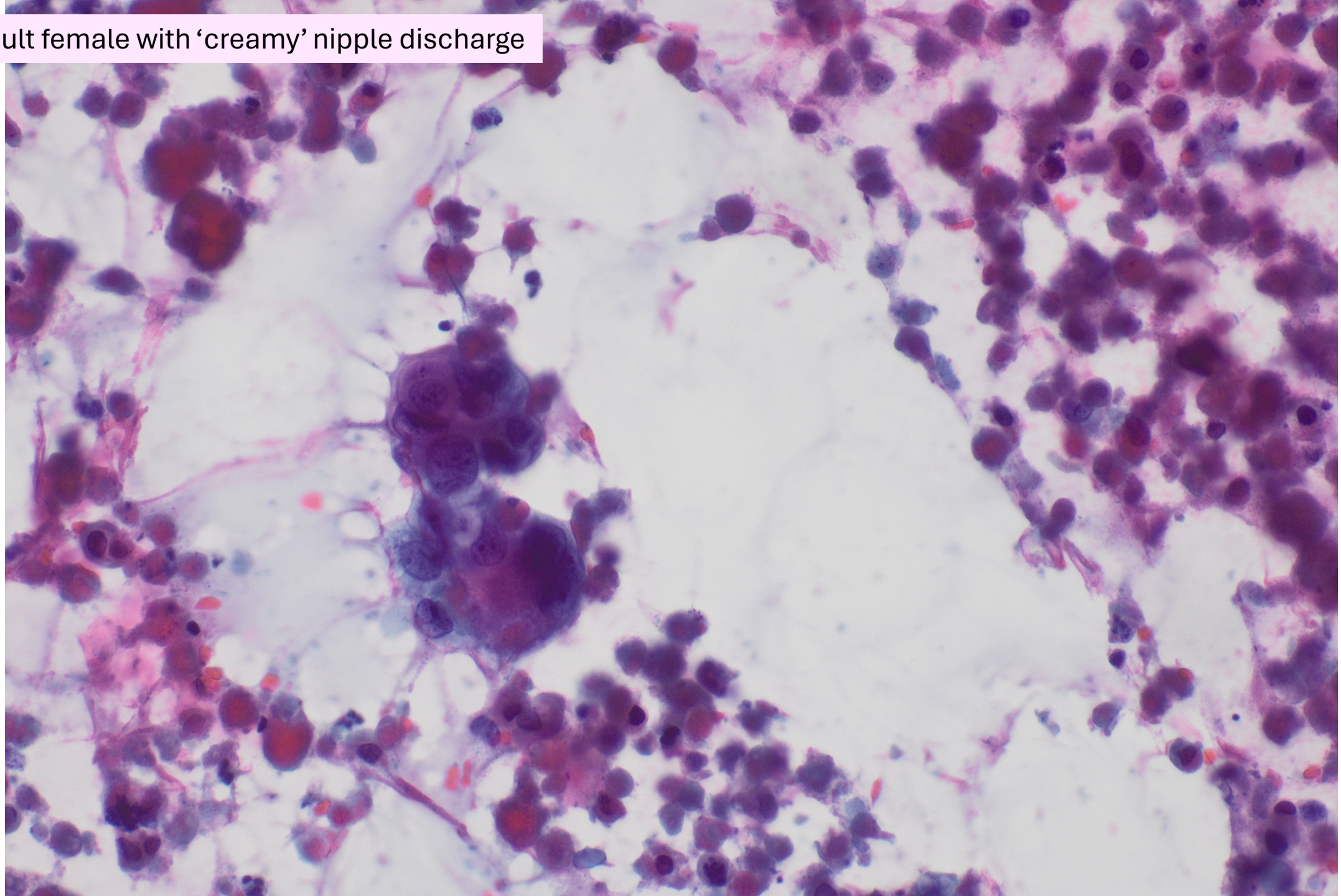

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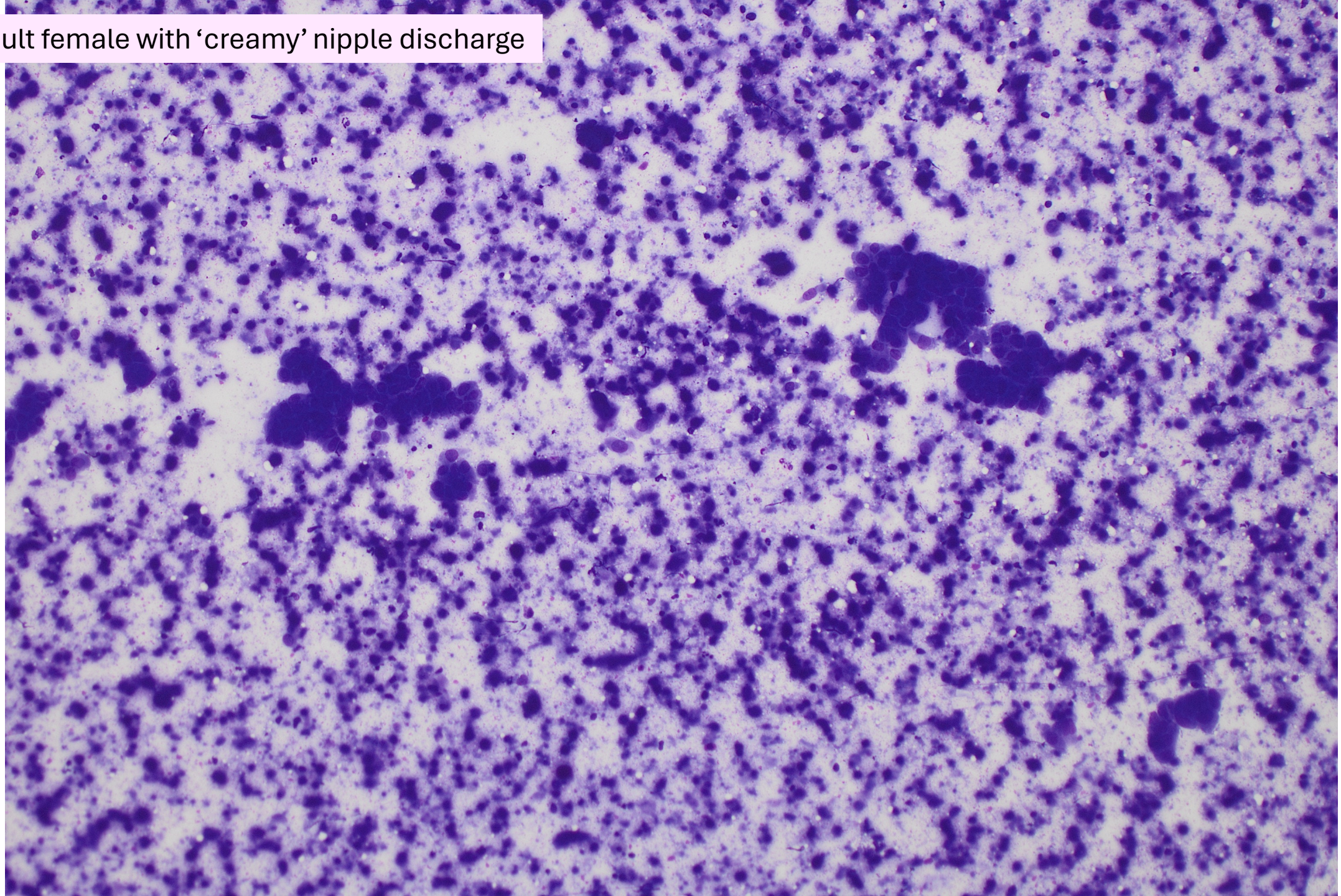

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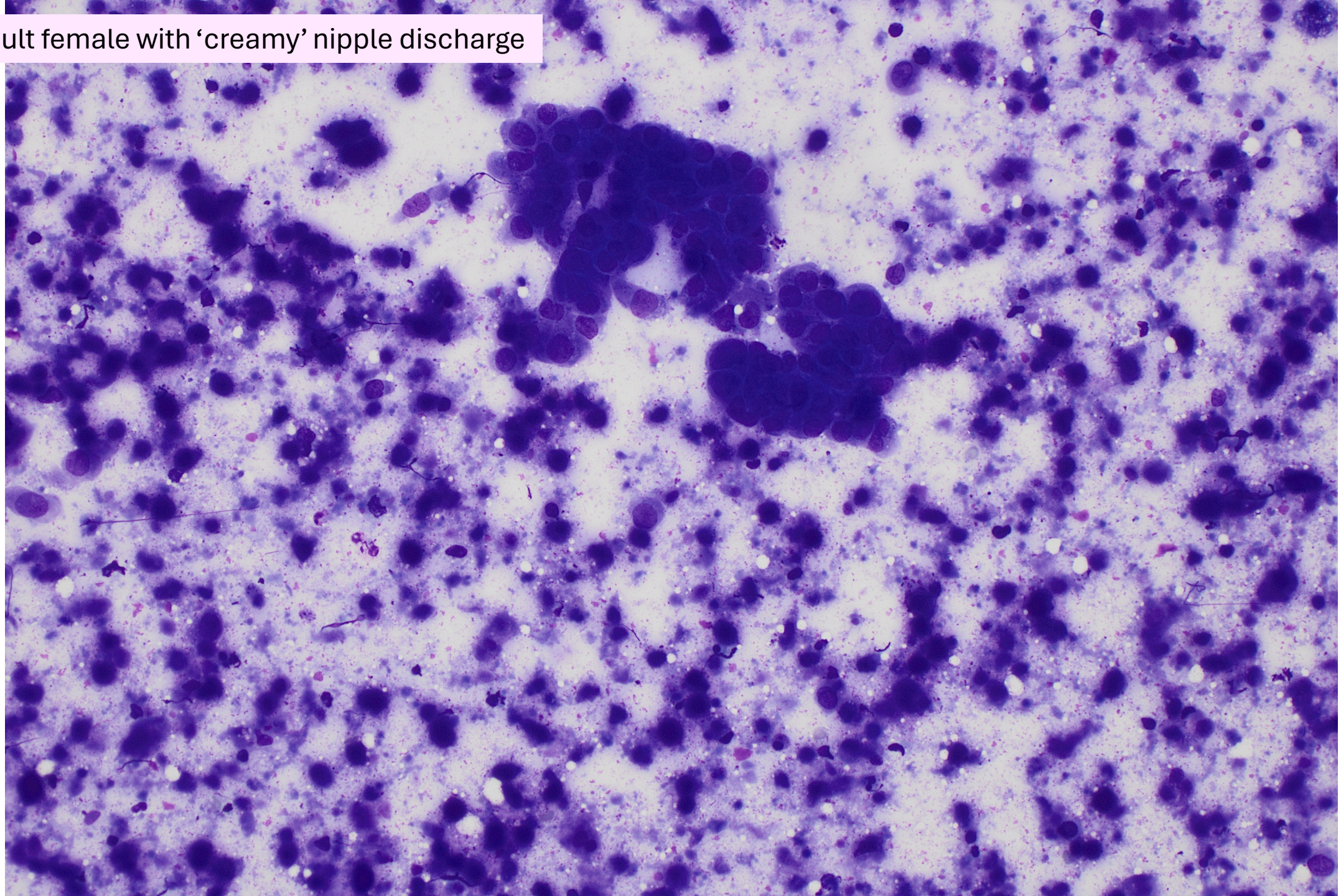

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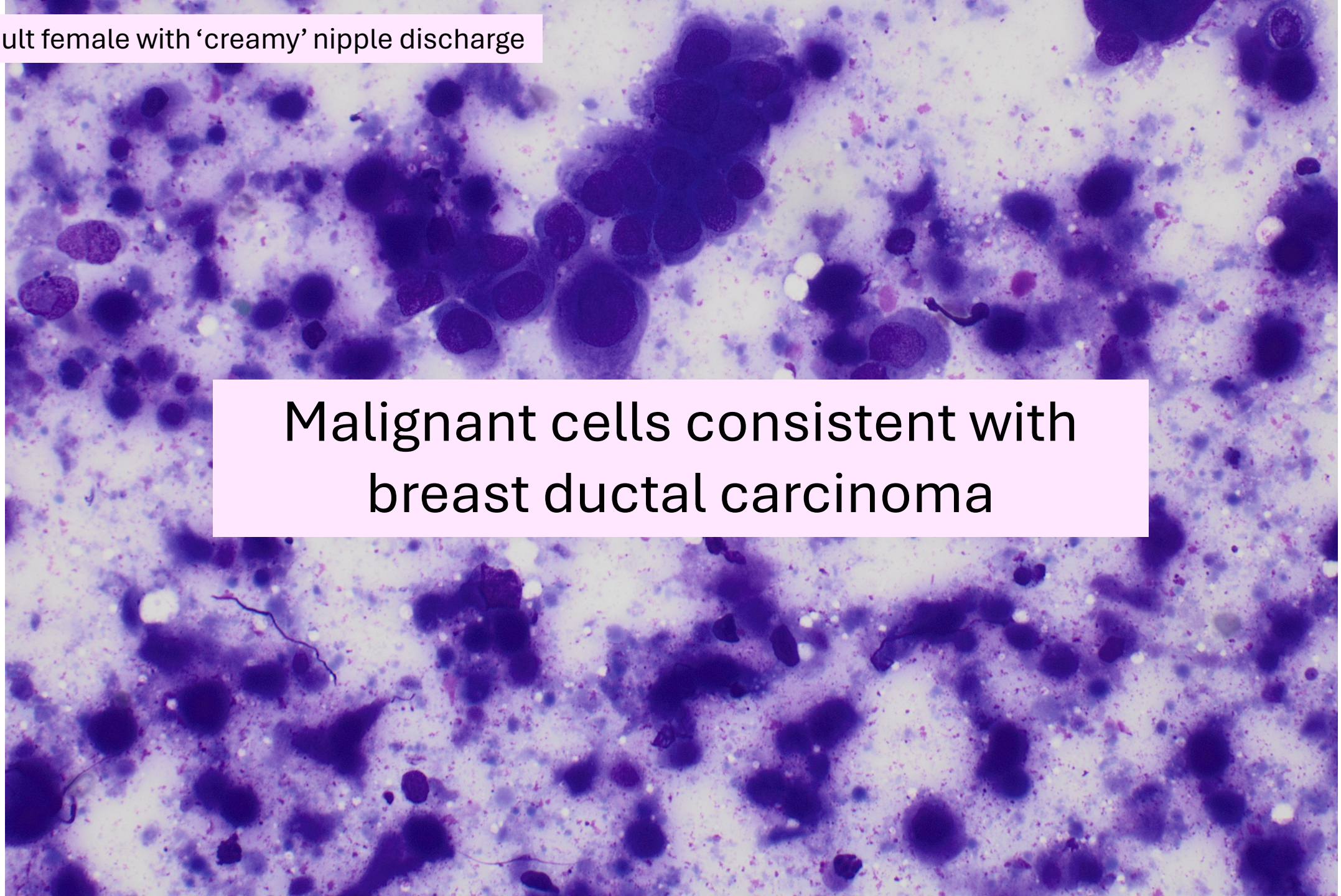

Malignant cells consistent with breast ductal carcinoma

# Role of cytology in breast pathology ~ Axillary lymph nodes

- Axillary FNAB is a useful diagnostic test in patients with breast cancer to exclude or confirm metastases guiding further management decisions.
- Radiologic-guided axillary FNAB  may spare patients sentinel node biopsy allowing surgeons to move directly to axillary clearance.
- Meta-analyses of FNAB in this regard provide a sensitivity of 63% and specificity of 99%}.

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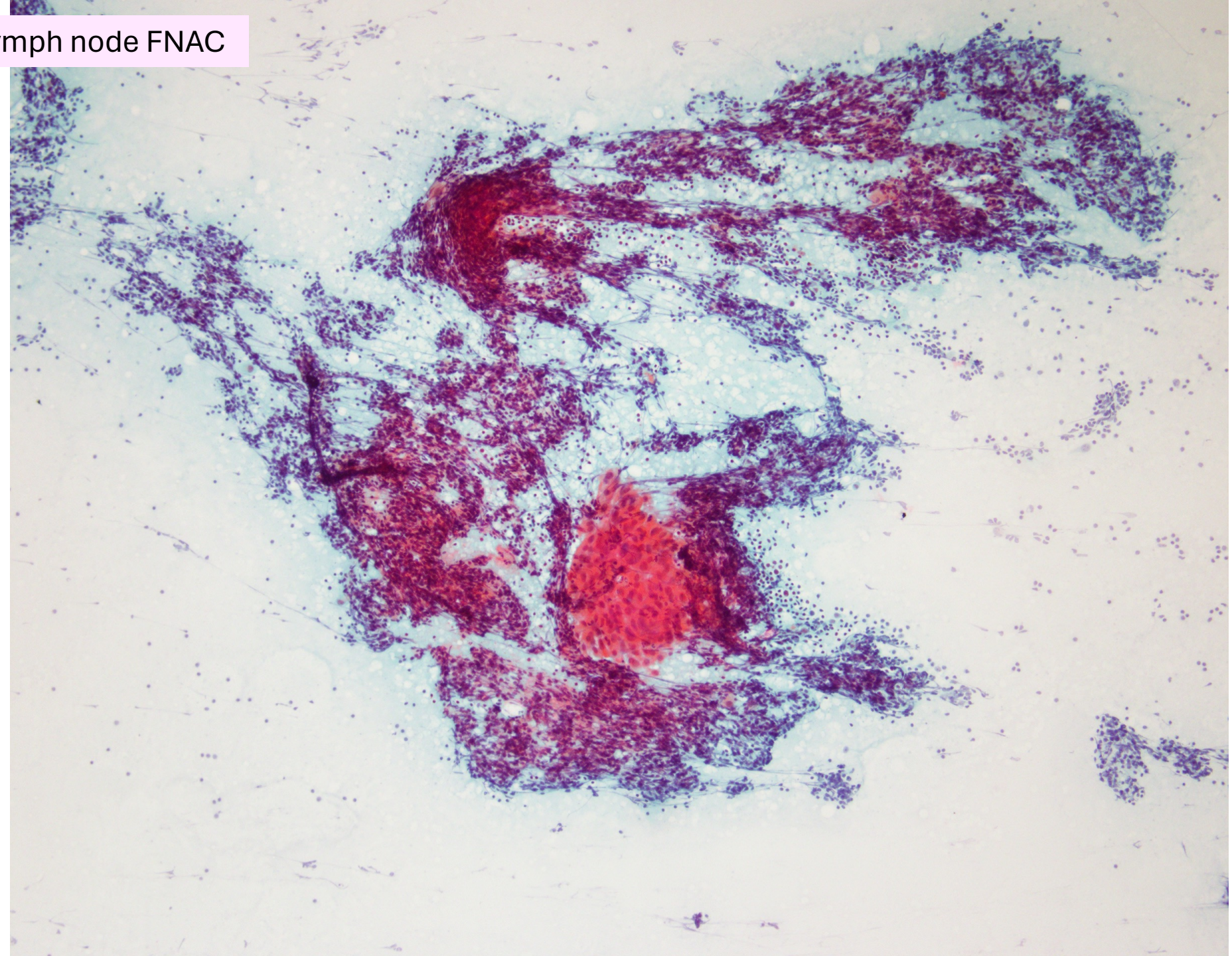
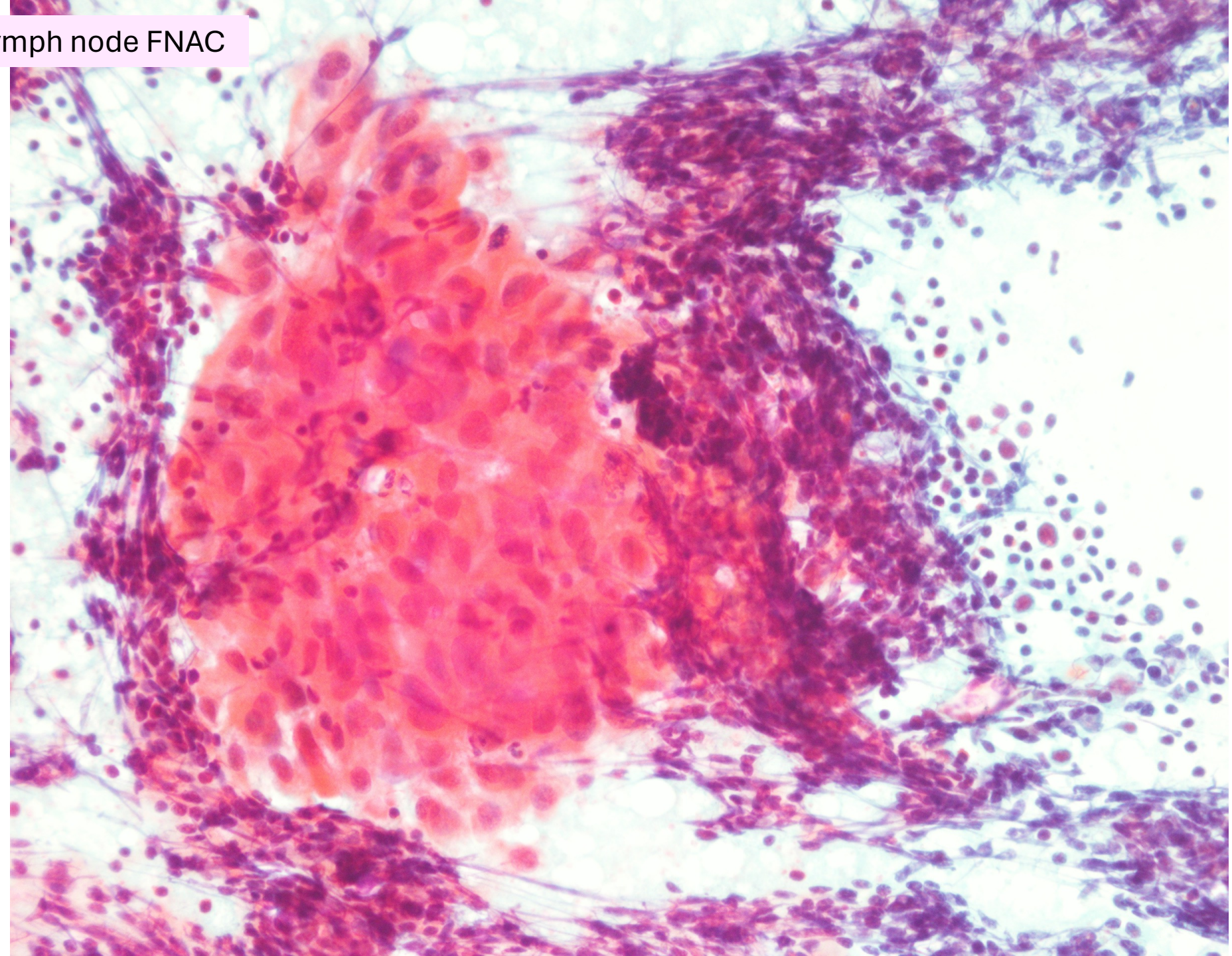
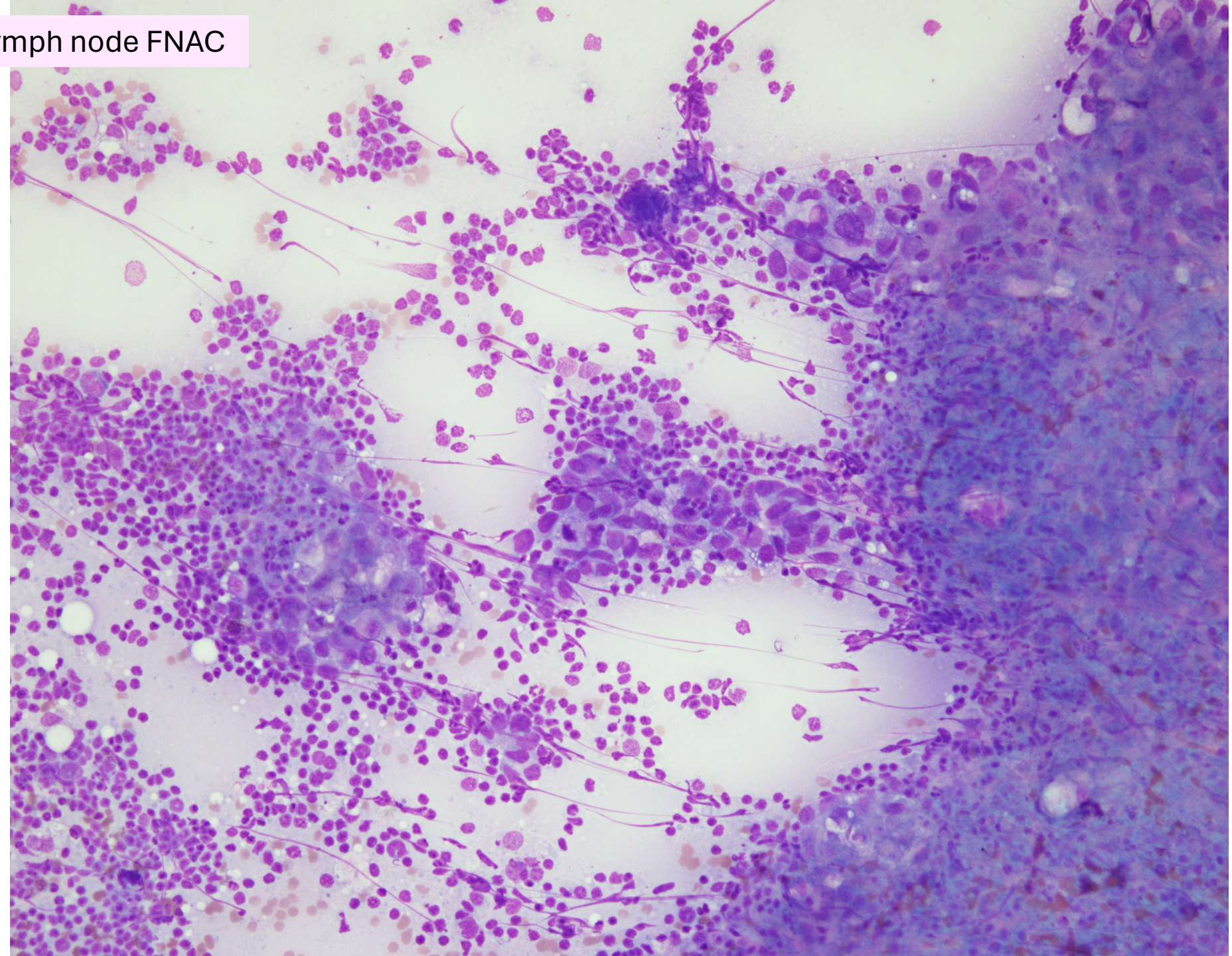
Axillary lymph node FNAC



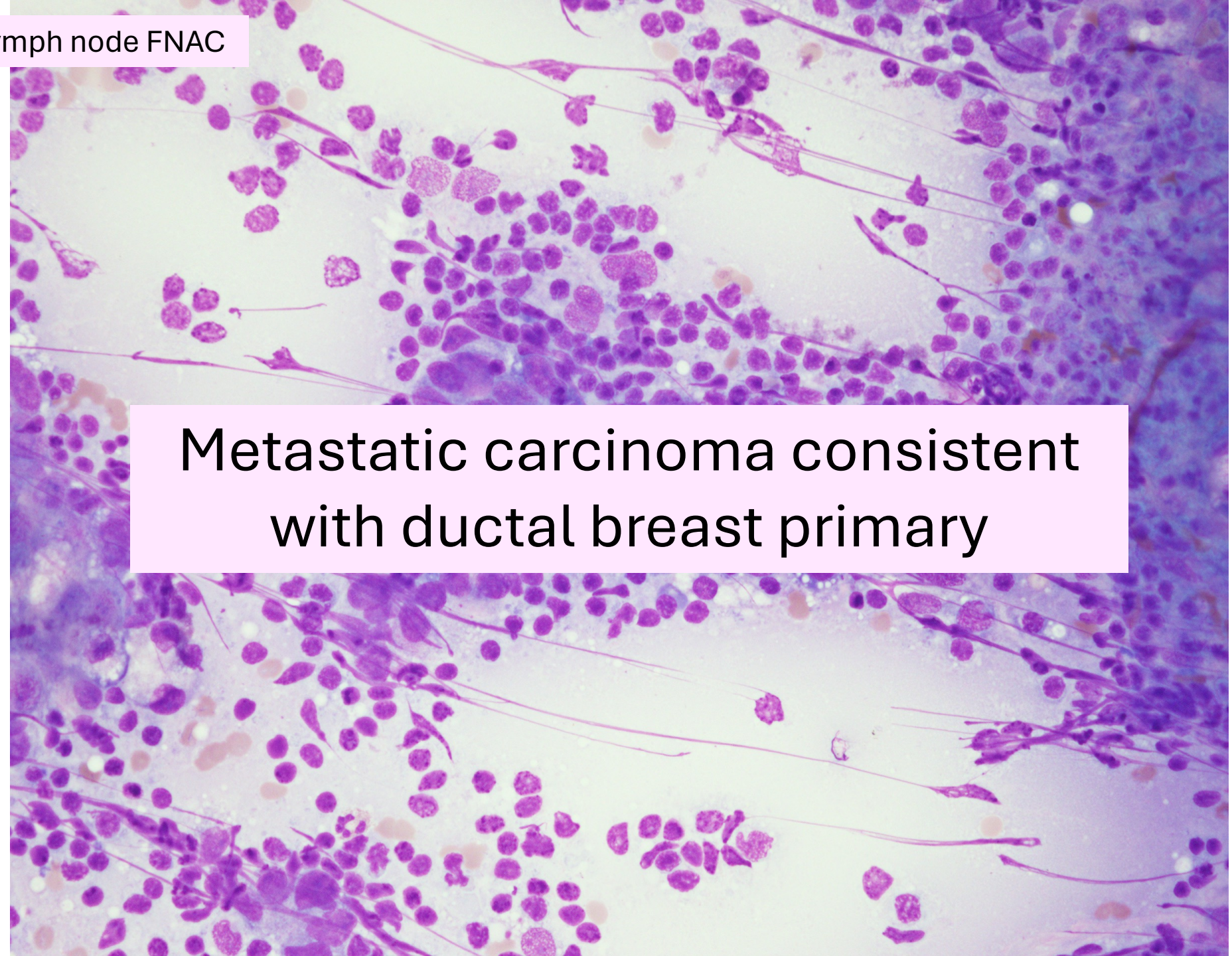
Axillary lymph node FNAC



Axillary lymph node FNAC



Axillary lymph node FNAC



Metastatic carcinoma consistent with ductal breast primary

# Role of cytology in breast pathology ~ TRIPLE TEST

- **Cytologic findings** should always be correlated with the **clinical and radiologic features** wherever possible.
- The **Triple Test** allows a definitive diagnosis in most patients with breast lesions and enables a coordinated management approach.
- **ROSE** performed at the time of FNAB will reduce the rate of inadequate diagnoses and facilitate triage of additional material and selection of ancillary procedures.

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# WHO Reporting System

- The WHO Reporting System in Cytopathology.
- Based on cytomorphology for initial categorization and reporting of the lesion.
- Can be applied in any department whether well-resourced or in a low to middle income country setting.
- Incorporates application of appropriate ancillary testing as current best practice, which may impact the final diagnostic category of a particular case.

# Integration of Clinical, Imaging and Key FNAB Cytopathological Features with Ancillary Testing in a Diagnostic Approach

# Breast cytology ~ integration with clinical and imaging findings

- Critical for a successful breast FNAB service.
- Two key occasions:
  - Rapid on-site evaluation (ROSE)
  - Final cytopathologic diagnosis when ancillary studies are also incorporated into the interpretation.

- Interventional cytology ~ term used to refer to the integration of clinical findings with cytomorphology for diagnosis.
- Ideally, FNAB of the breast is performed by an interventional cytopathologist, or with an interventional cytologist present during the procedure, who can correlate the rapid on-site evaluation (ROSE) of the FNAB with the physical examination findings and available breast imaging studies.
- Interventional cytologist can adjust the approach for the FNAB, and triage the FNAB sample to specific solutions needed for ancillary testing.

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# Breast cytology ~ integration with clinical and imaging findings
# Goals of ROSE

- To ensure adequate sampling of the targeted lesion.
- To reduce the incidence of false negative diagnosis that result from missing the target lesion by FNAB.
- To correlate with clinical and radiological findings.

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# Breast cytology ~ integration with clinical and imaging findings
# Goals of ROSE

- Once the clinical impression of a benign, malignant or indeterminate lesion has been established, the FNAB is performed, smears prepared and examined microscopically.
- If the **clinical impression is benign**, and **ROSE is also benign** with sufficient quantity and quality of well-preserved benign ductal cells and stroma or cyst fluid, then the **FNAB is adequate**.
- If the **clinical impression is benign** but **insufficient quantity or quality** of ductal cells is present, then an **additional FNAB pass** should be considered, possibly targeting a different area of the lesion.
- In the case where the **clinical impression is malignant**, and **FNAB-ROSE** also demonstrates **malignant or atypical** ductal cells, then the **FNAB is adequate**.
- Additional FNAB passes could be considered to obtain adequate material for cell block for immunohistochemical (IHC) staining or for other **ancillary testing** as indicated.
- In **clinical-cytologic discordances**, consider additional FNAB passes for a cell block, IHC or other ancillary tests that may help confirm the diagnosis at final review.

# Breast cytology ~ integration with clinical and imaging findings

- The triple test, combing physical exam, breast imaging and cytopathologic diagnosis for final diagnosis results in a negative predictive value of nearly 100% for benign breast lesions.
- Without the triple test, *eg imaging is not performed or clinical findings are not communicated to the cytopathologist*, the negative predictive value decreases to 93%.
- At the time of final cytopathologic diagnosis, the pathologist should correlate the cytomorphologic findings with all available clinical data to reduce false negative and false positive diagnoses.
    - Physical exam findings
    - Mammogram, US and MRI findings
- In cases where cytomorphology is benign but clinical impression is suspicious or malignant, the cytopathology diagnosis should reflect the discordance, with recommendation for additional evaluation by core biopsy or excision as clinically indicated.

# Breast cytology ~ integration with clinical and imaging findings ANCILLARY TESTS

- Important role for the final breast FNAB diagnosis.
- Most common ancillary study is the cell block which is often incorporated in the final cytopathology report.
- Cell blocks can provide suitable material for breast biomarker studies including hormome receptors (ER, PR) and HER2.
- Need for strict fixation requirements for receptor studies, hence cell blocks should follow core biopsy handling procedures with immediate formalin fixation.
- Cell blocks ~
  - IHC to confirm cell type such as ductal, lobular, mesenchymal, or lymphoid.
  - Provide material for next generation sequencing (NGS) or other molecular diagnostics.

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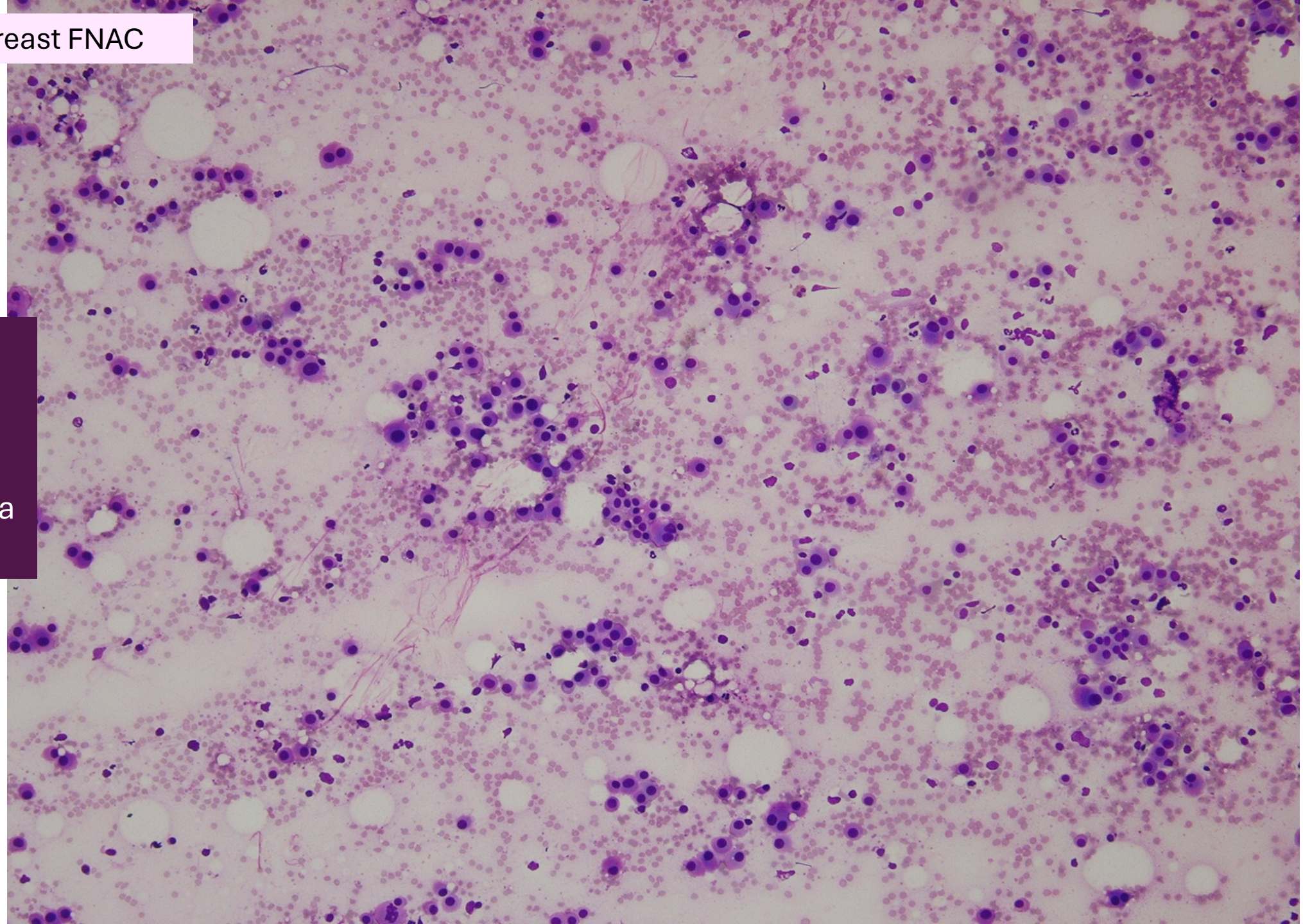
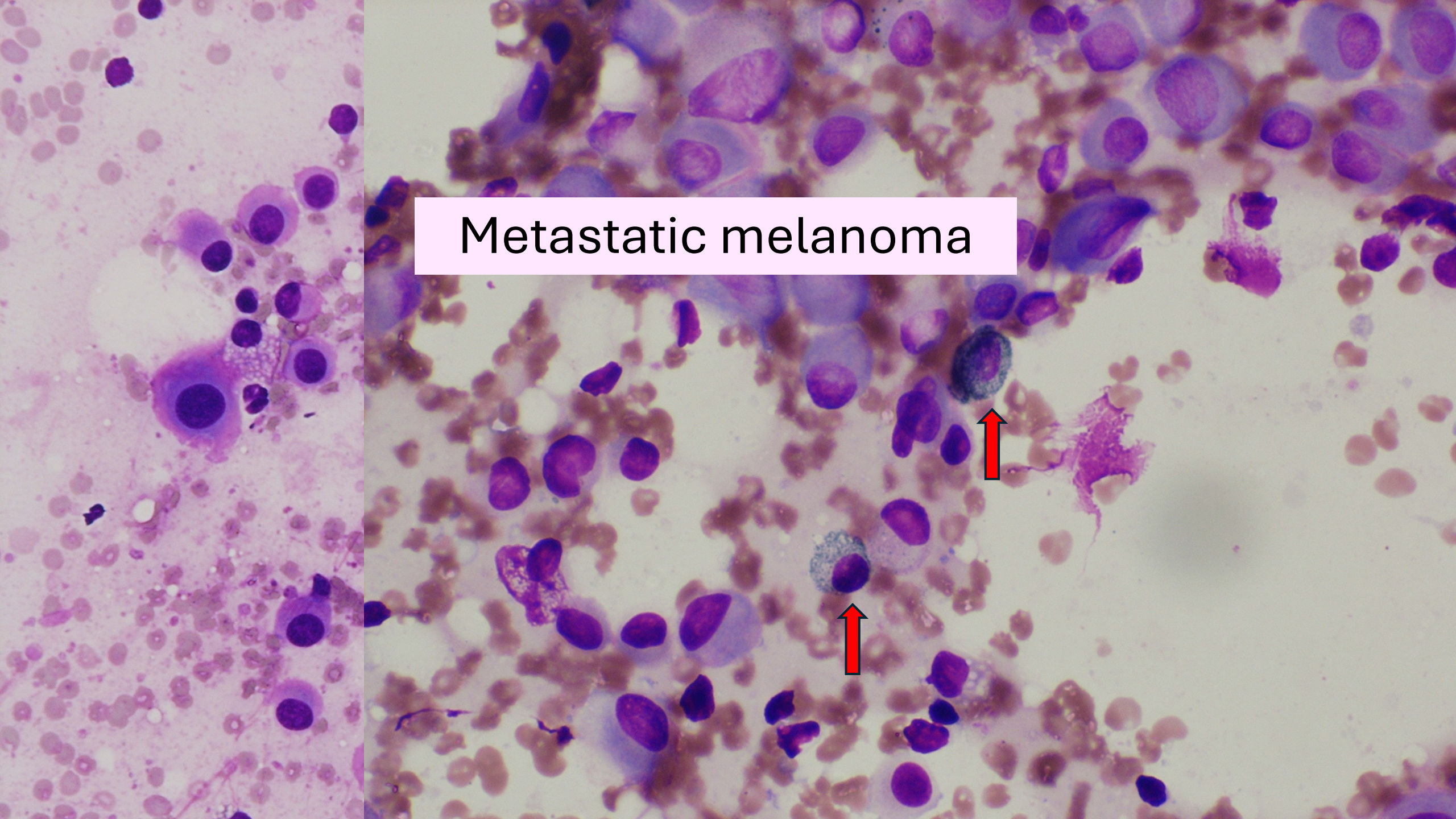
# Breast cytology ~ integration with clinical and imaging findings ANCILLARY TESTS

- In metastasis to the breast, IHC with the cell block should be used to identify the primary site.
- Most common metastatic tumours to the breast ~ melanoma, lymphoma, lung and ovarian carcinoma.
- Primary sites can be confirmed with IHC or NGS on cell block.
- Other ancillary tests at the time of ROSE ~ flow cytometry for possible lymphoma and microbiology culture studies for acute suppurative or granulomatous inflammation.
- Role of the interventional cytologist ~ perform ROSE and identify these often unexpected diagnoses at the time of FNAB and ensure adequate material is collected in appropriate media for ancillary studies.

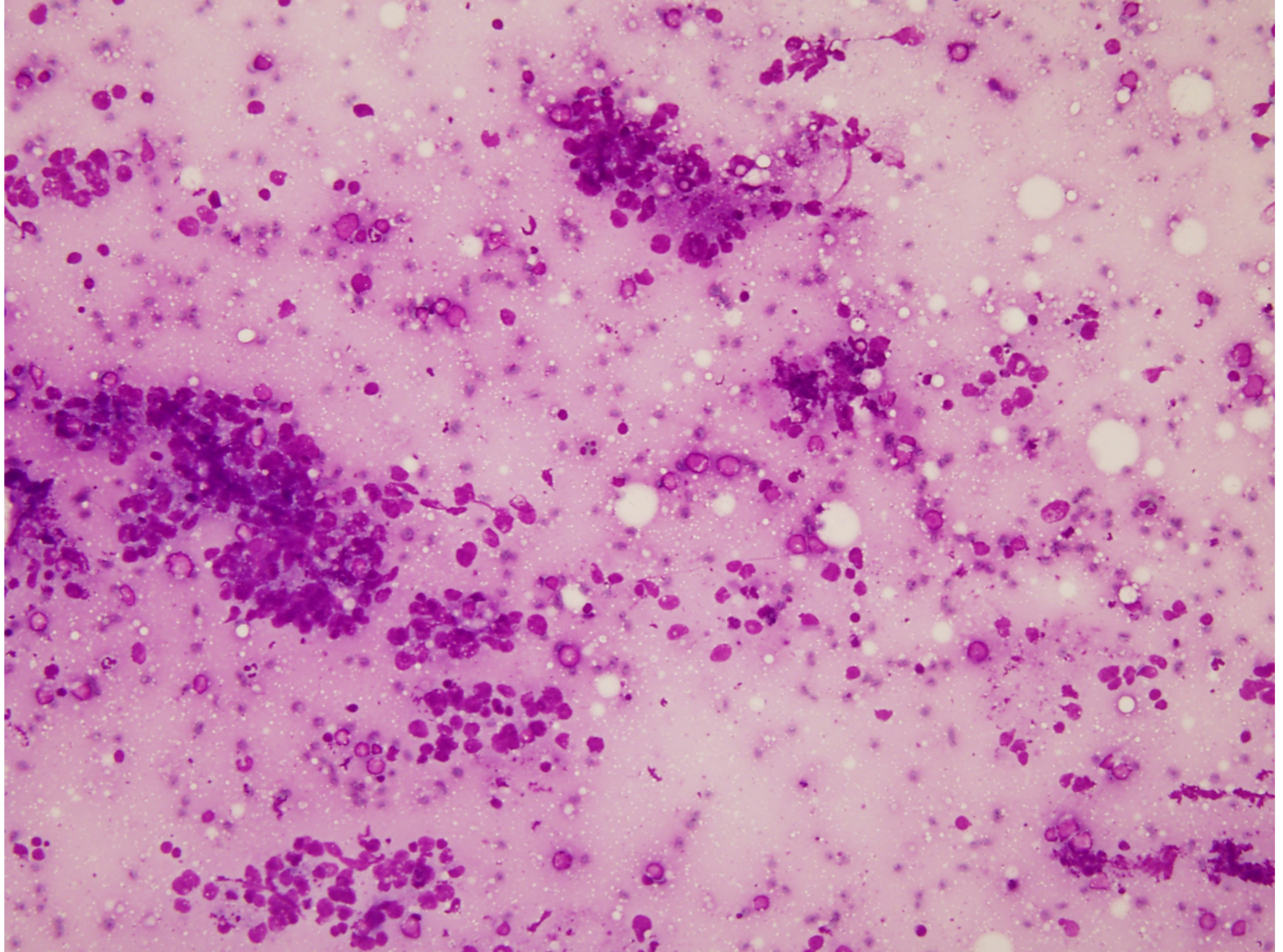
Left breast FNAC

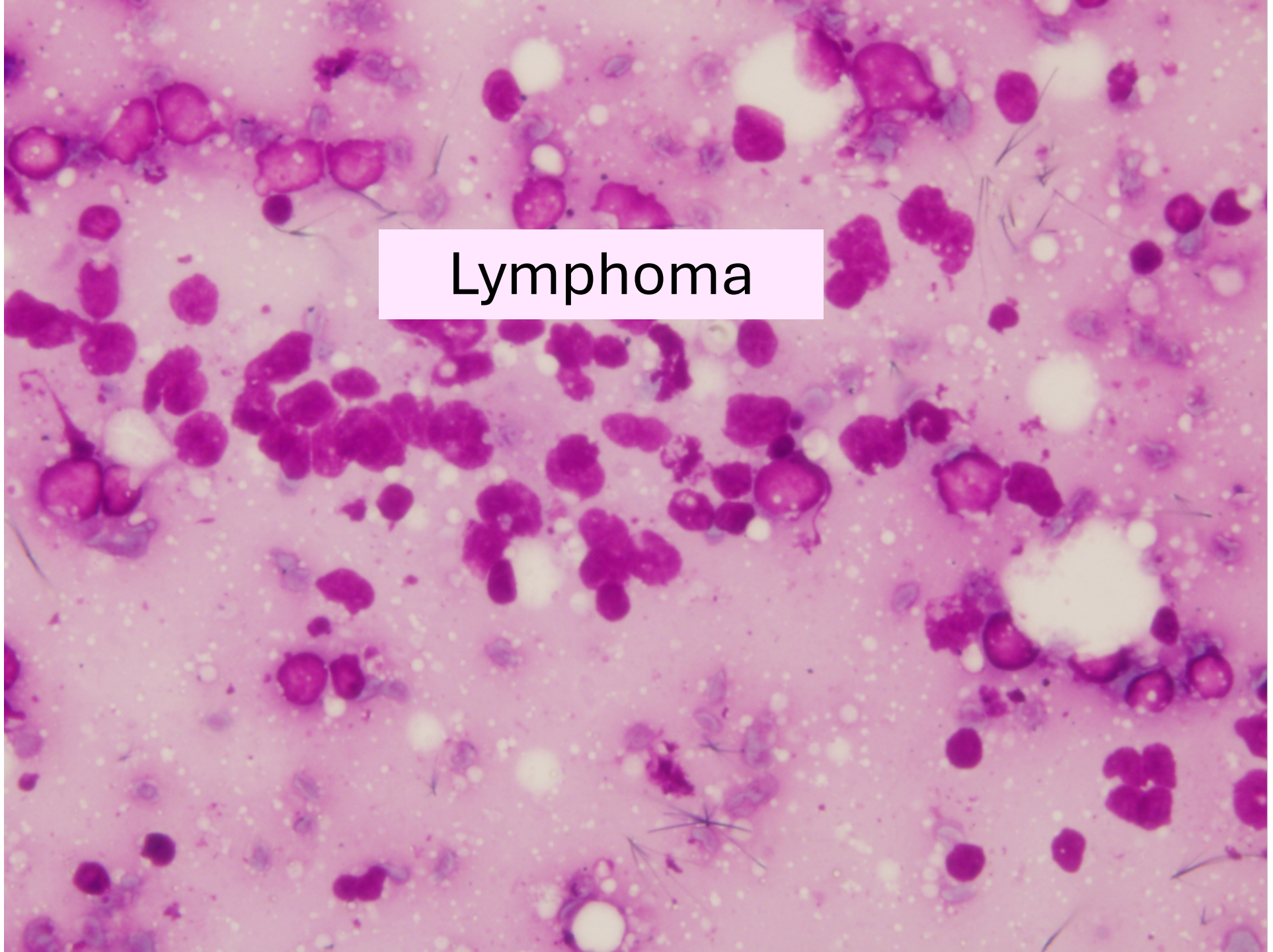
53 year old female
Lumps in left knee, left breast and left axilla
History of melanoma skin of right foot




Metastatic melanoma

Adult female with breast lump and enlarged axillary lymph nodes FNAC performed on the breast lump




Lymphoma

# System categories

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# System categories

- Each diagnostic category generates a ***risk of malignancy (ROM)***.
- ROM can be linked to:

~ recommendation for further diagnostic testing to achieve a specific diagnosis.

~ refine a differential diagnosis.

~ follow-up clinical management.

- Specific processes or tumours which have a similar ROM are placed in the same category.
- The WHO Reporting System for Breast Cytopathology (WHO System) uses diagnostic categories to communicate the ROM to the clinician.
- Final aim is for a specific diagnosis or differential diagnosis to be achieved, with ancillary testing as required.

# WHO system categories

**Five diagnostic categories** for breast fine needle aspiration (FNAB) cytopathology, applicable to ~

- ❑ Touch preparations of core needle biopsies
- ❑ Liquid based cytopathology (LBC)
- ❑ Nipple discharge cases

Five diagnostic categories are:

- ❖ Insufficient/Inadequate/Non-diagnostic
- ❖ Benign
- ❖ Atypical
- ❖ Suspicious for malignancy
- ❖ Malignant

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# System categories ~ ‘Insufficient’ ‘Inadequate’ or ‘Non-diagnostic’

- No material for assessment
- Technical problems which prevent assessment of material on the slides.
- *If any atypical features are seen in a case showing otherwise insufficient material, the case is regarded as ‘Atypical’ and not "Insufficient/Inadequate/Non-diagnostic".*

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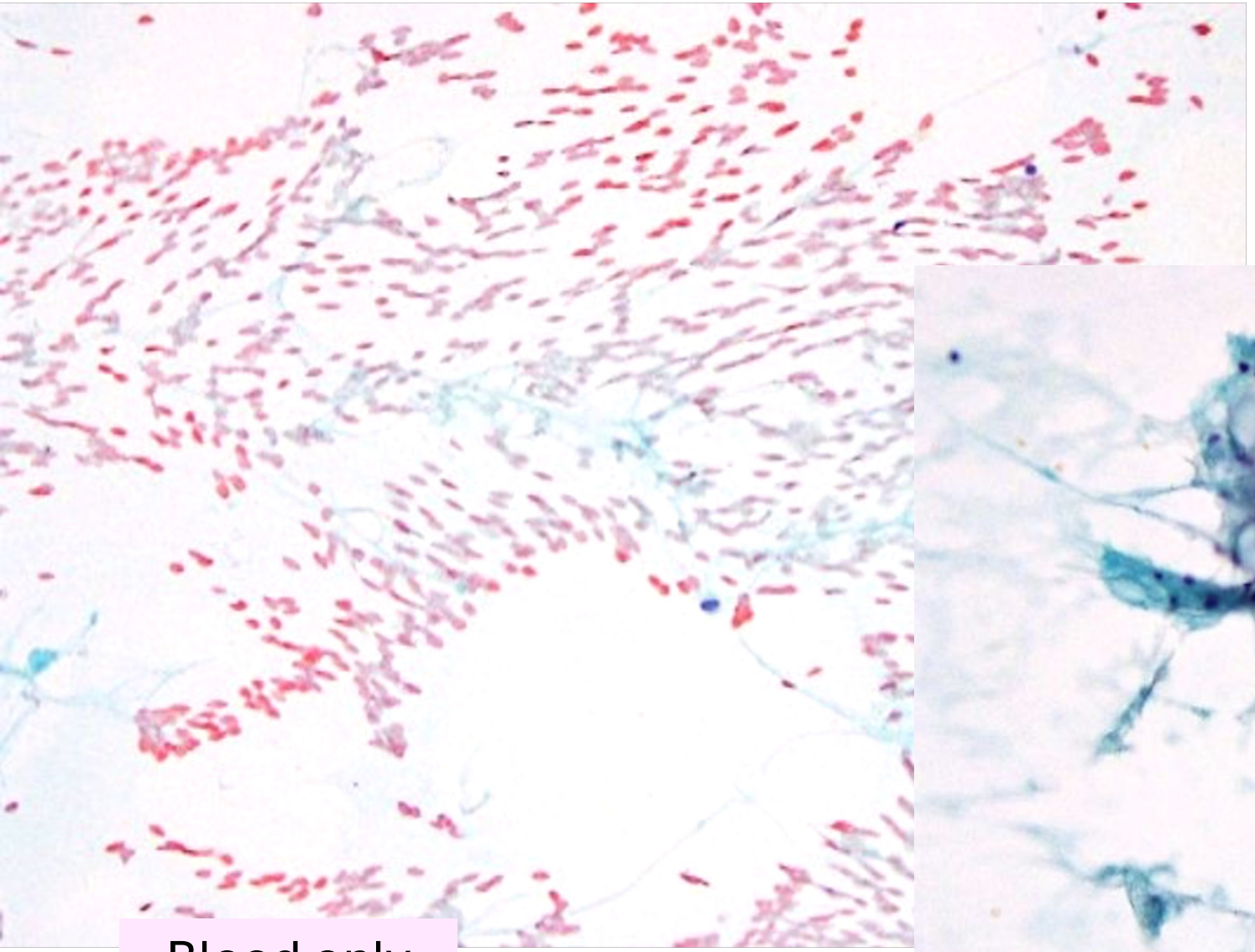
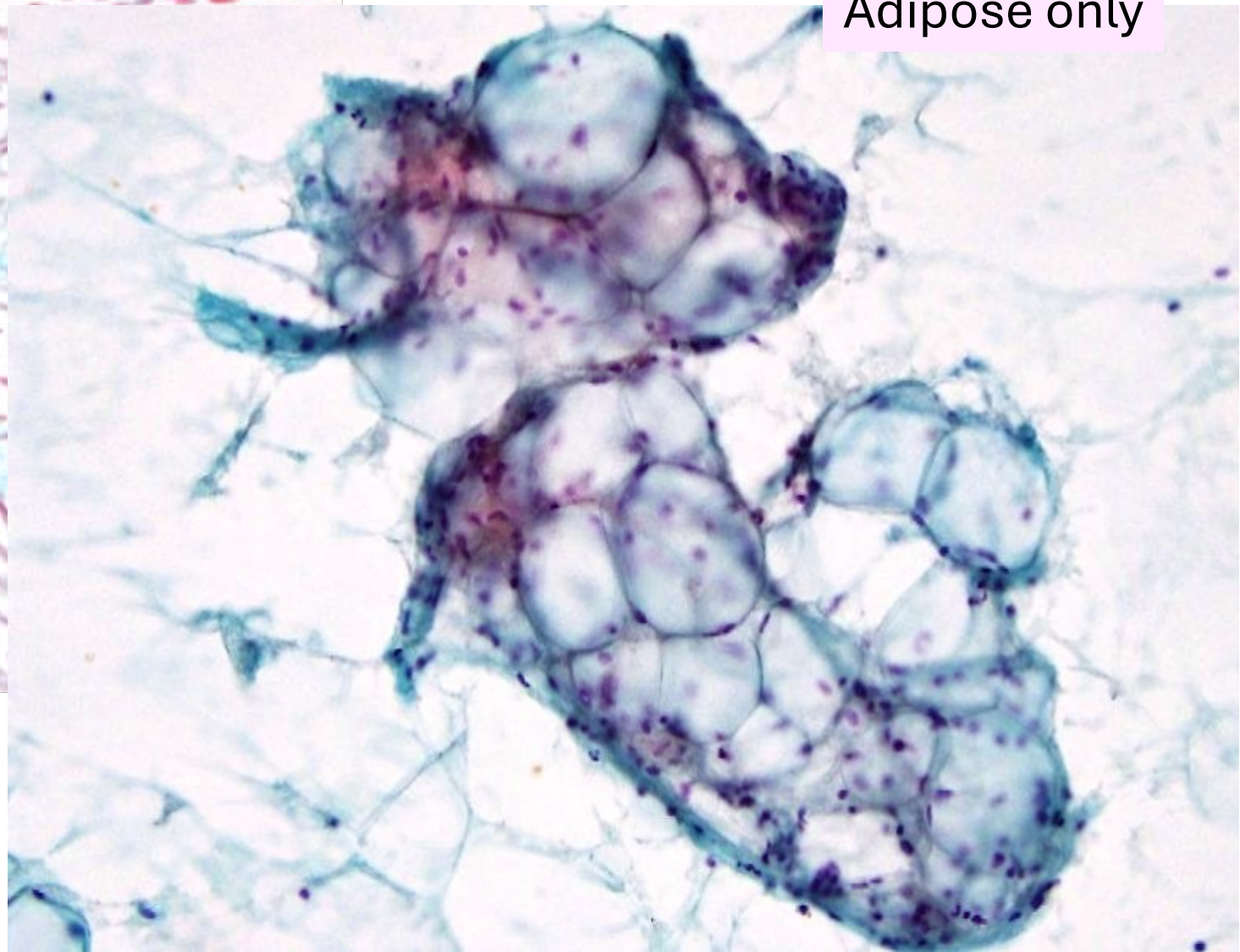


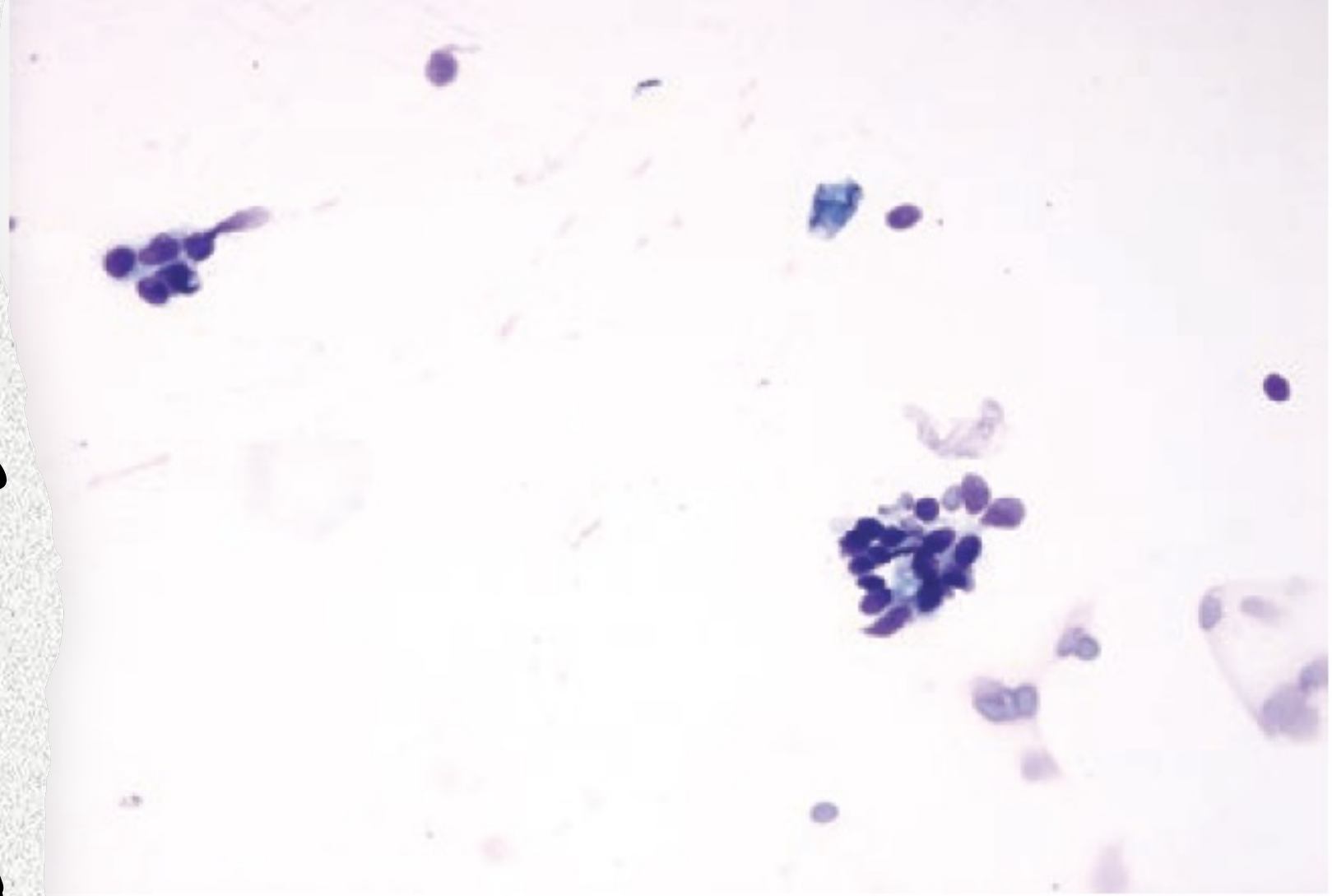
Blood only



Adipose only

Guide for adequacy ~

- At least six cell clusters
- At least 5-10 well preserved cells per cluster



**g. 5.1** insufficient sample: Giemsa stained air-dried
near with a few small groups of ductal-type epithelial
lls and possible bipolar nuclei. Too few cells

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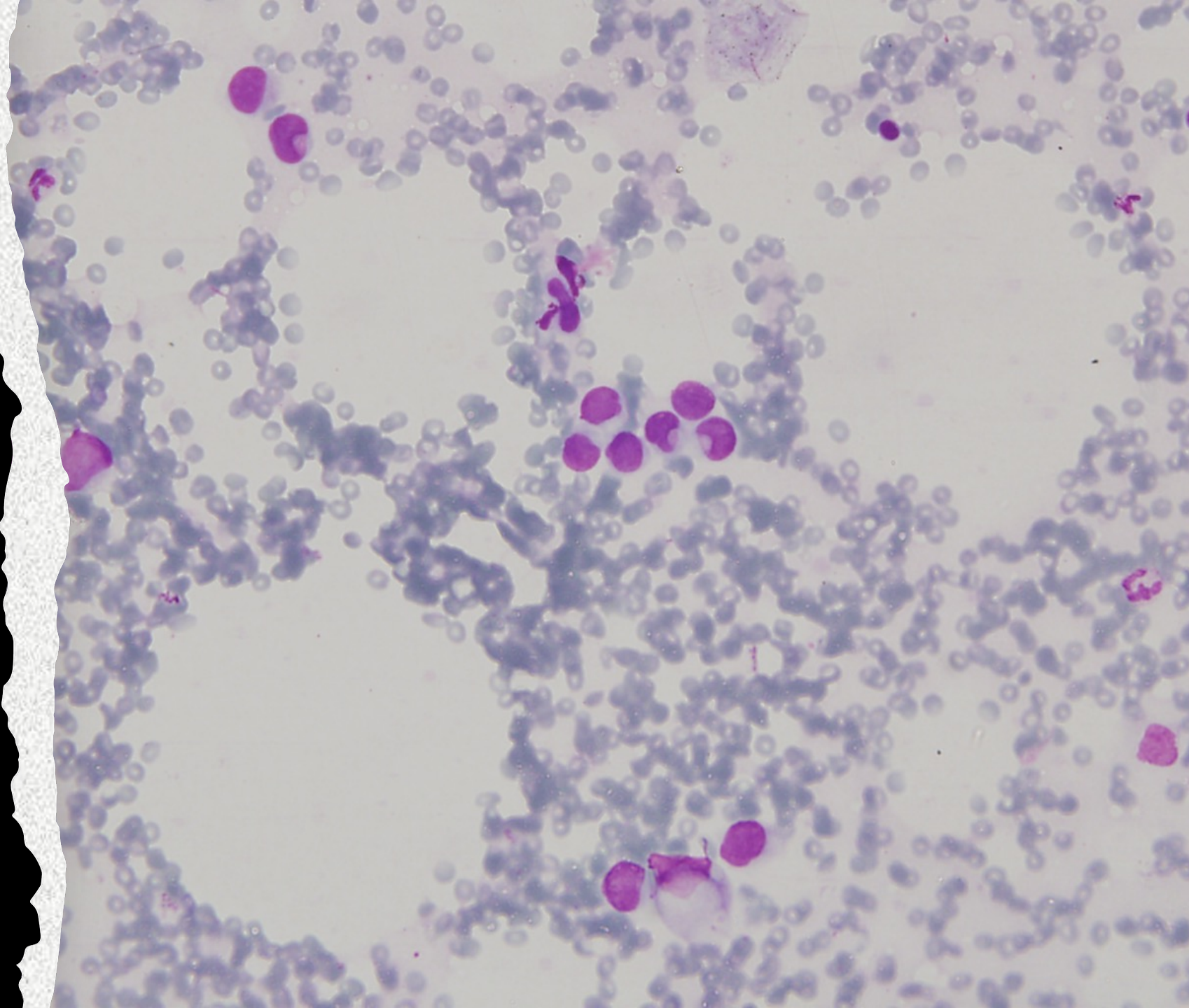
Low cellularity but atypical cells ~ Categorise as ‘Atypical’ and not *Insufficient/Inadequate /Non-diagnostic*



# System categories ~ Benign

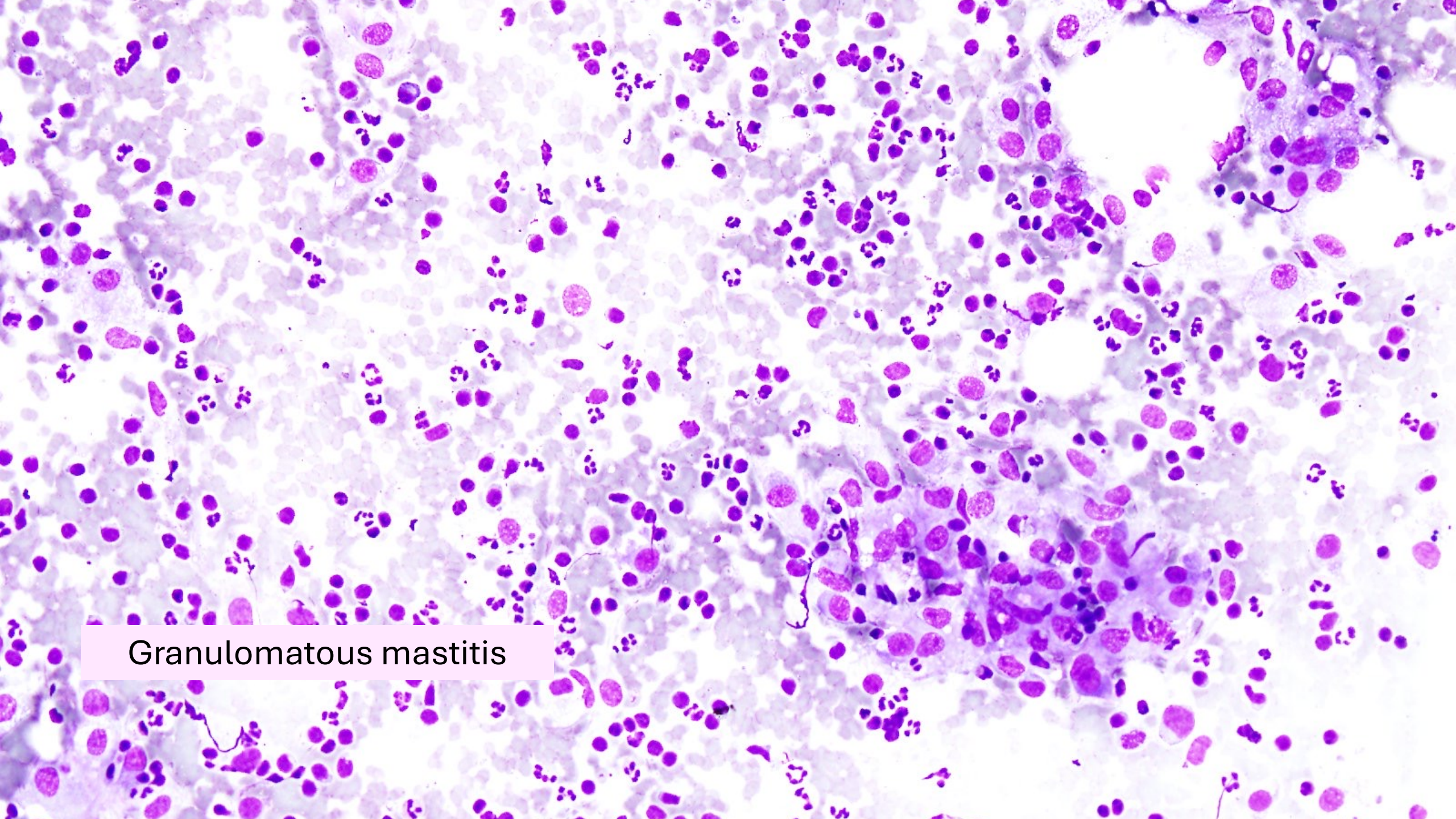
- Cases with unequivocally benign cytological features, which may or may not be diagnostic of a specific benign lesion.

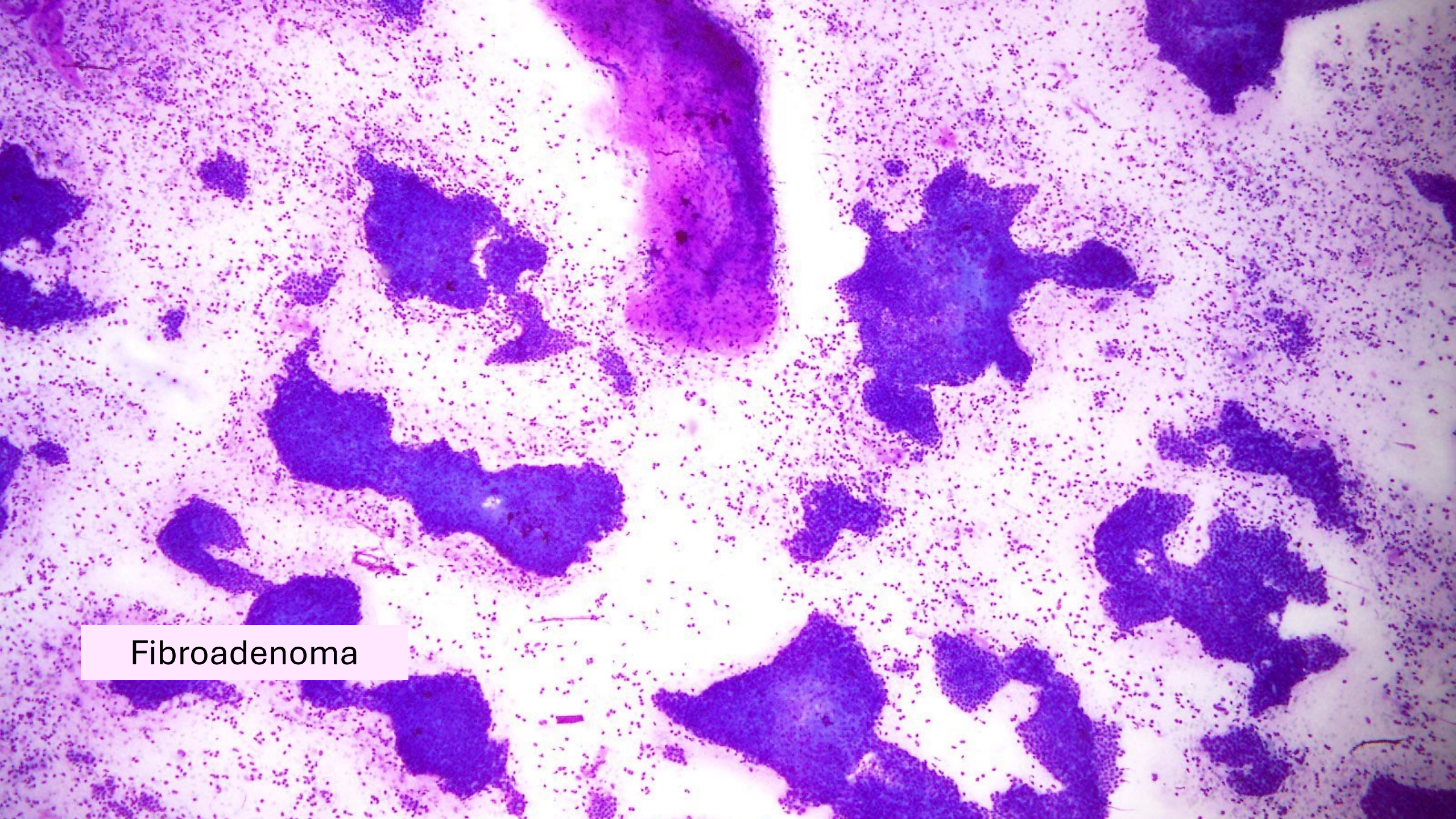
Luma

# System categories ~ Benign

- Normal breast components
- Inflammatory processes
- Benign tumours, eg fibroadenomas
- If the features are benign, but a precise diagnosis cannot be made, the features should be described and a differential diagnosis provided if possible
- As with all categories, correlation with physical examination and imaging is required if possible
- ROM ~ 1.4–2.3%, reported as generally under 5%

Luma

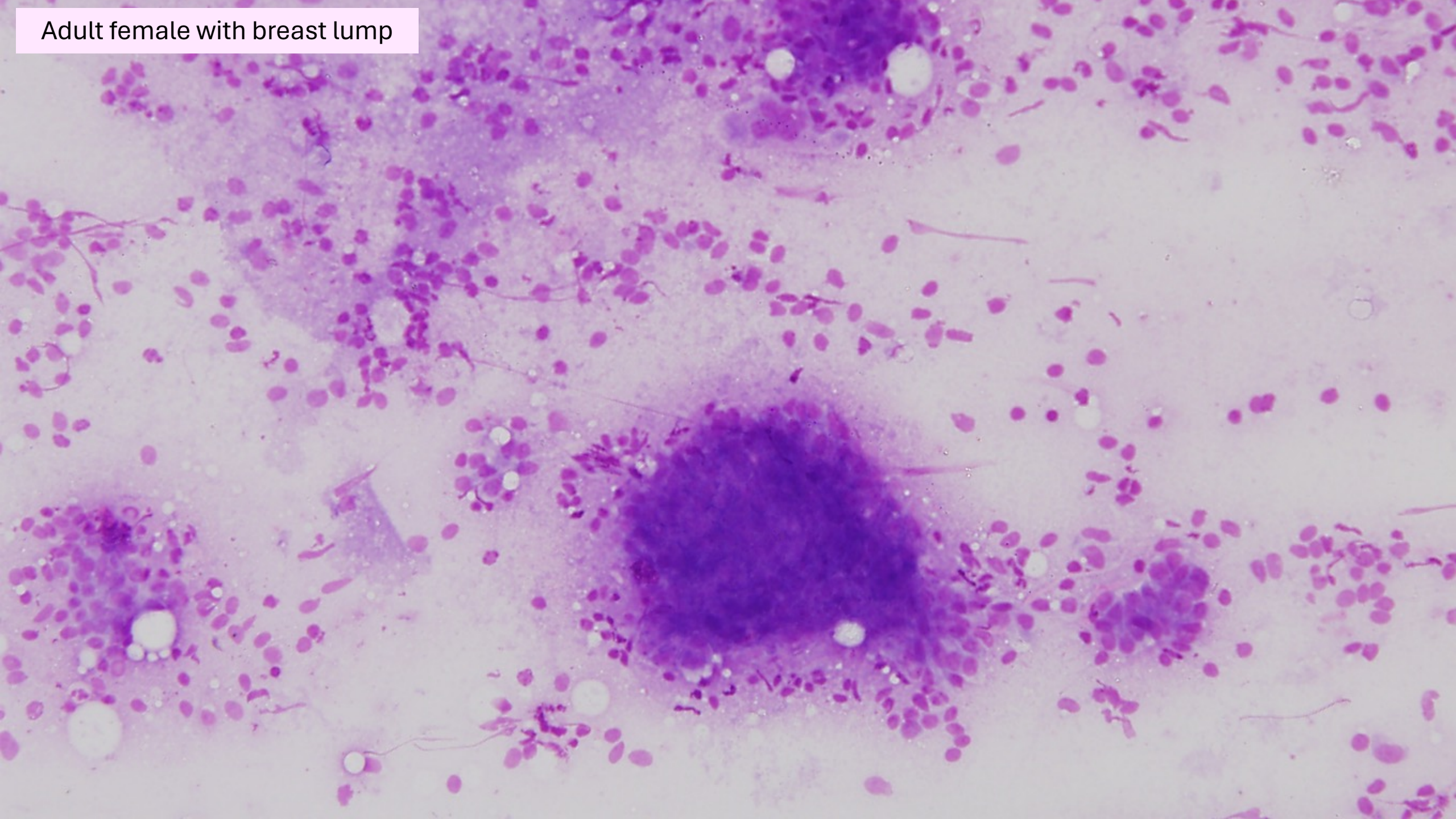

Granulomatous mastitis

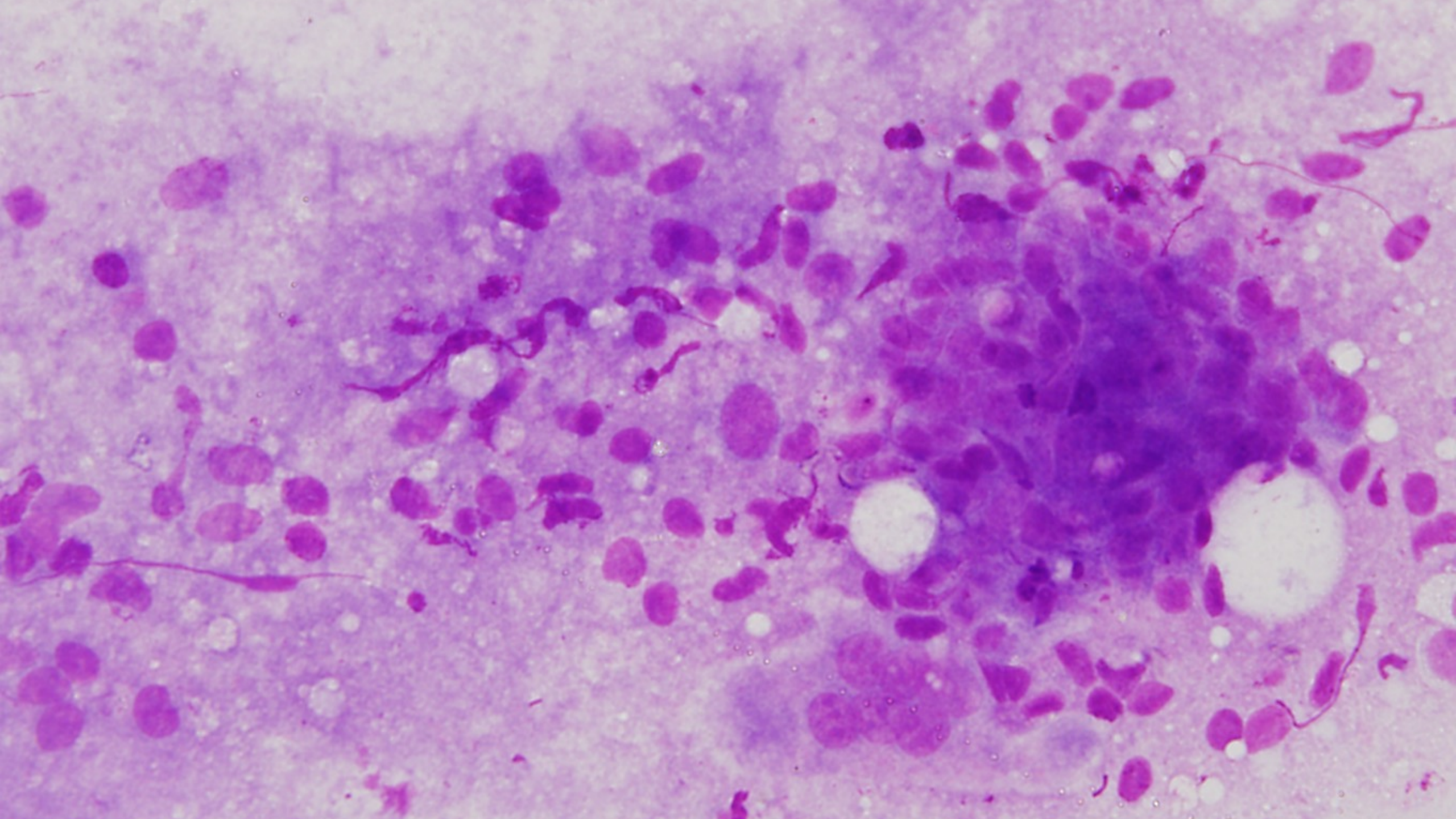

Fibroadenoma

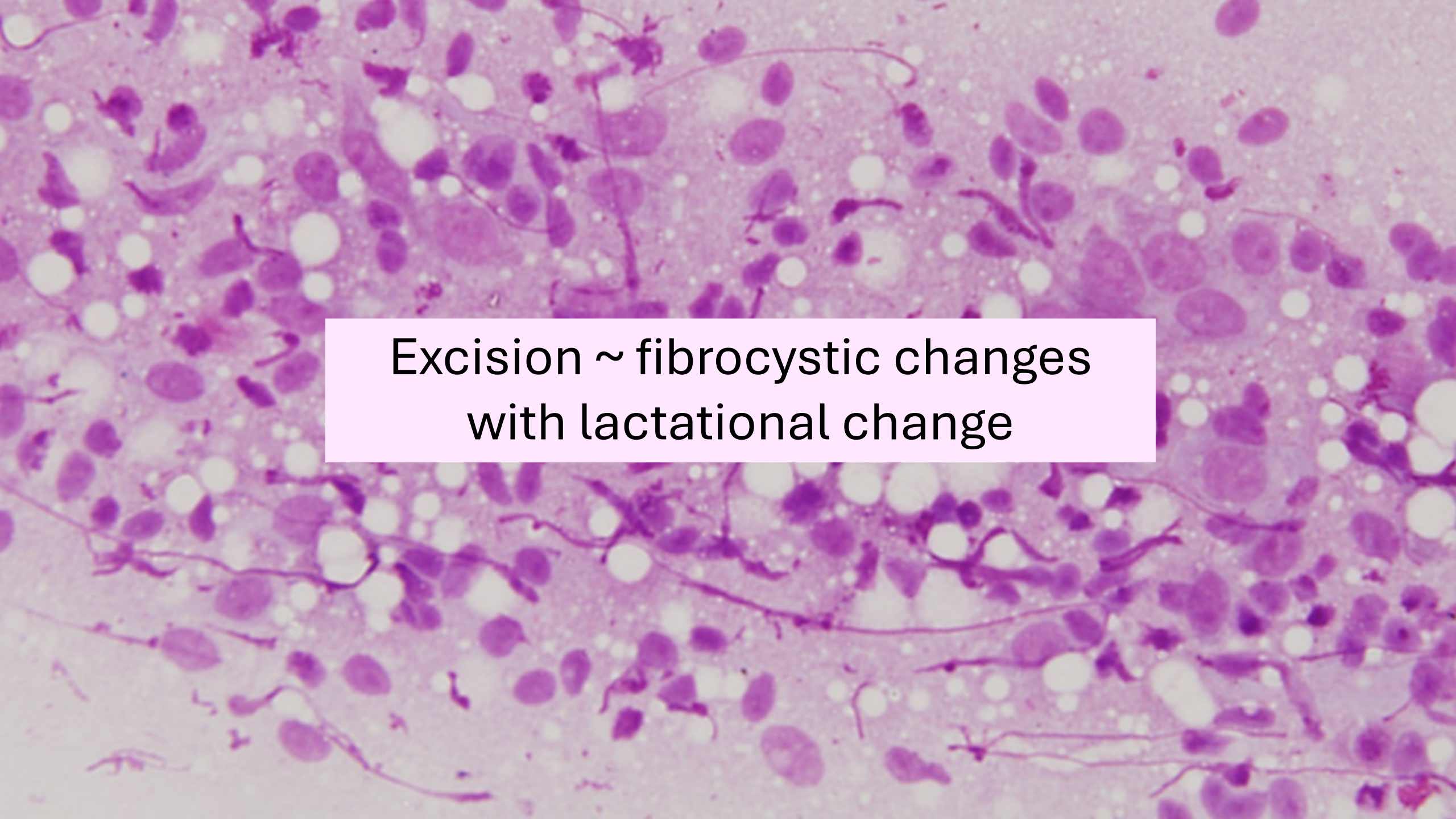
# System categories ~ Atypical

- Scant or poorly prepared but atypical cells.
- Mainly benign cytopathological features are present, but there are some features which may raise the possibility of malignancy:
  - marked dispersal of intact cells
  - nuclear atypia
  - necrosis

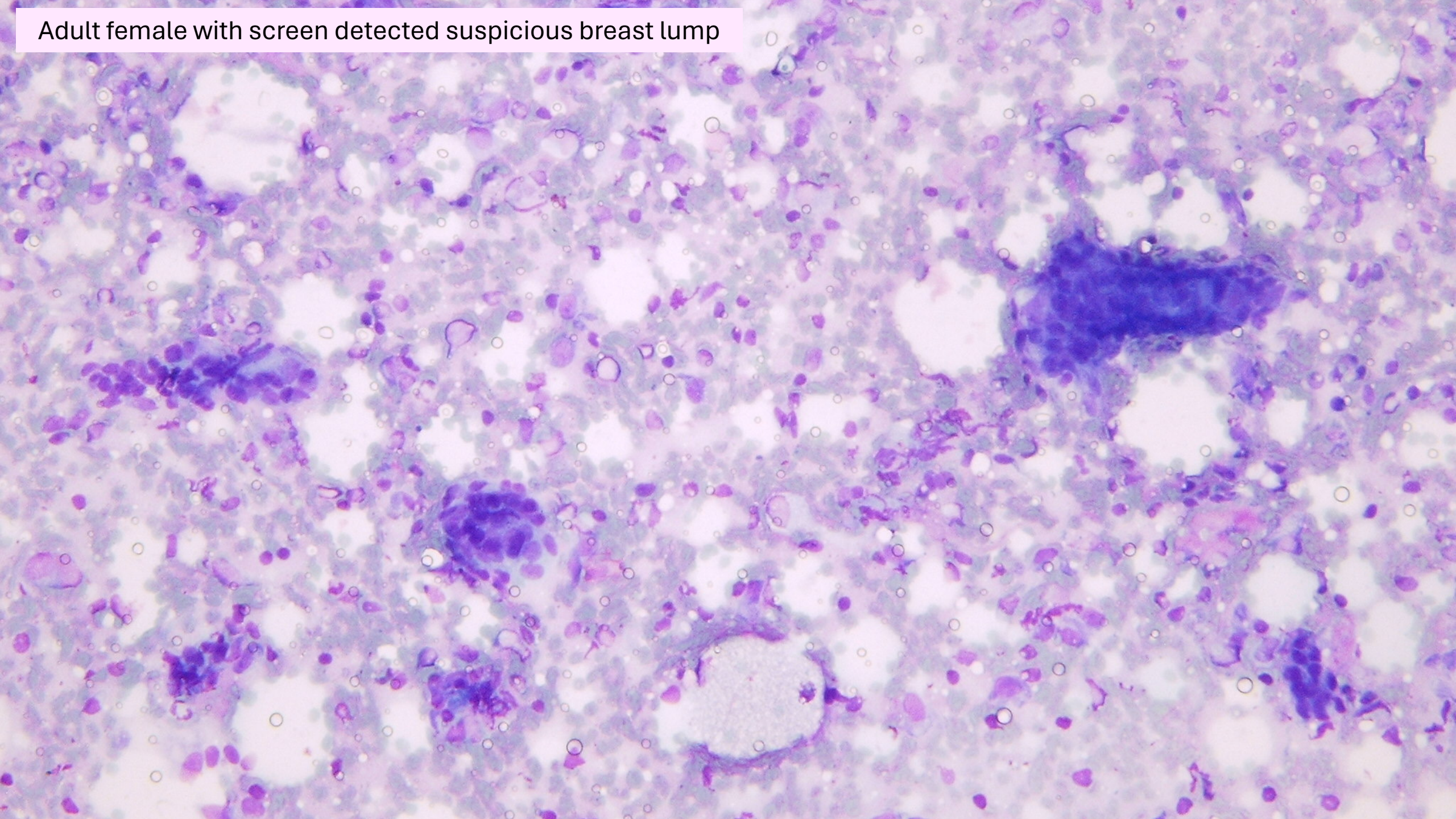
Luma

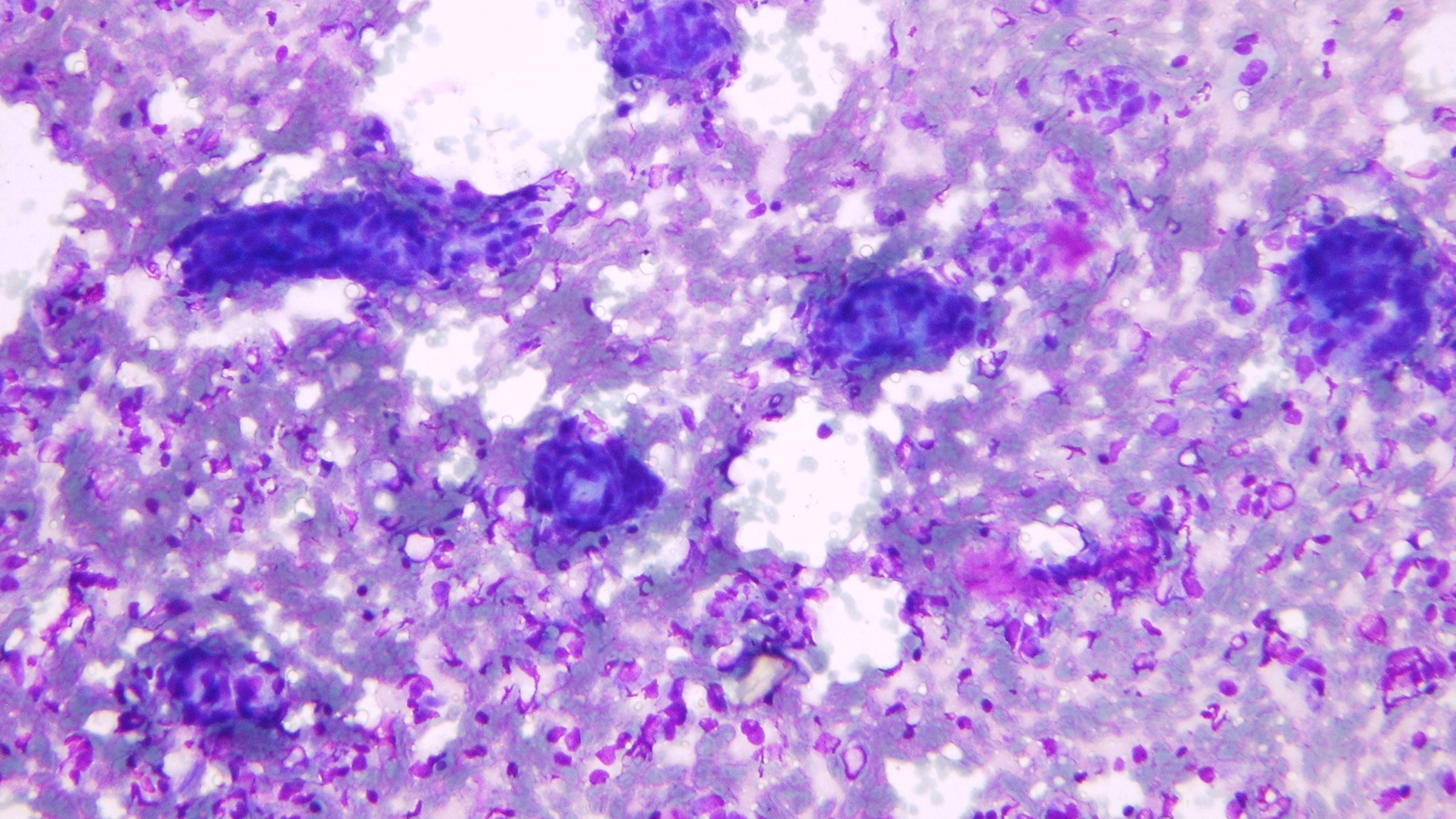

Adult female with breast lump

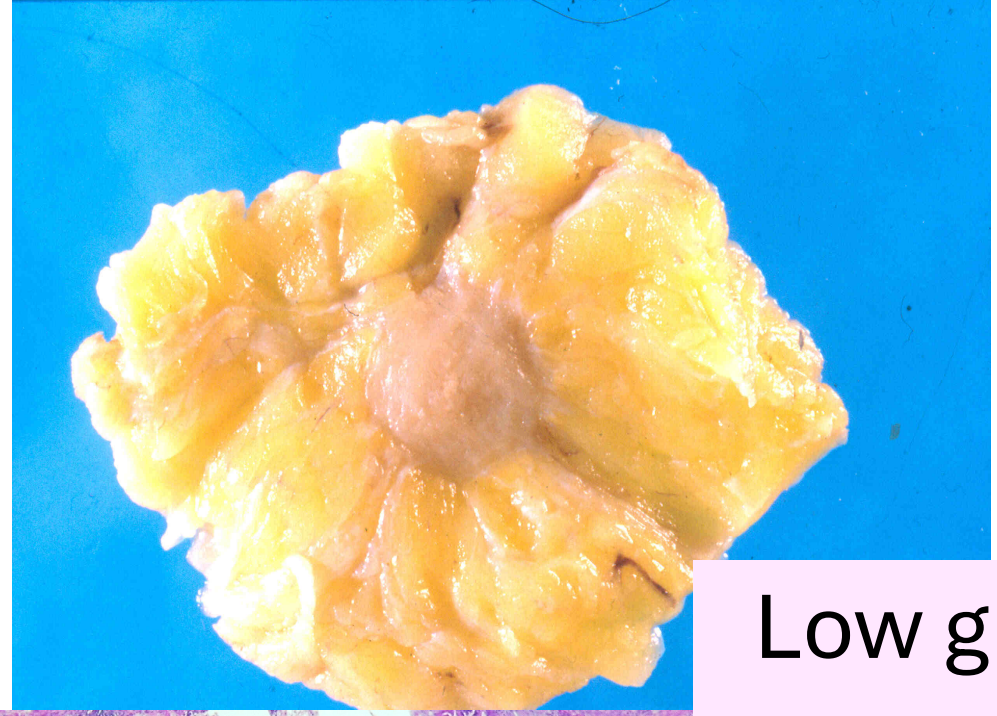


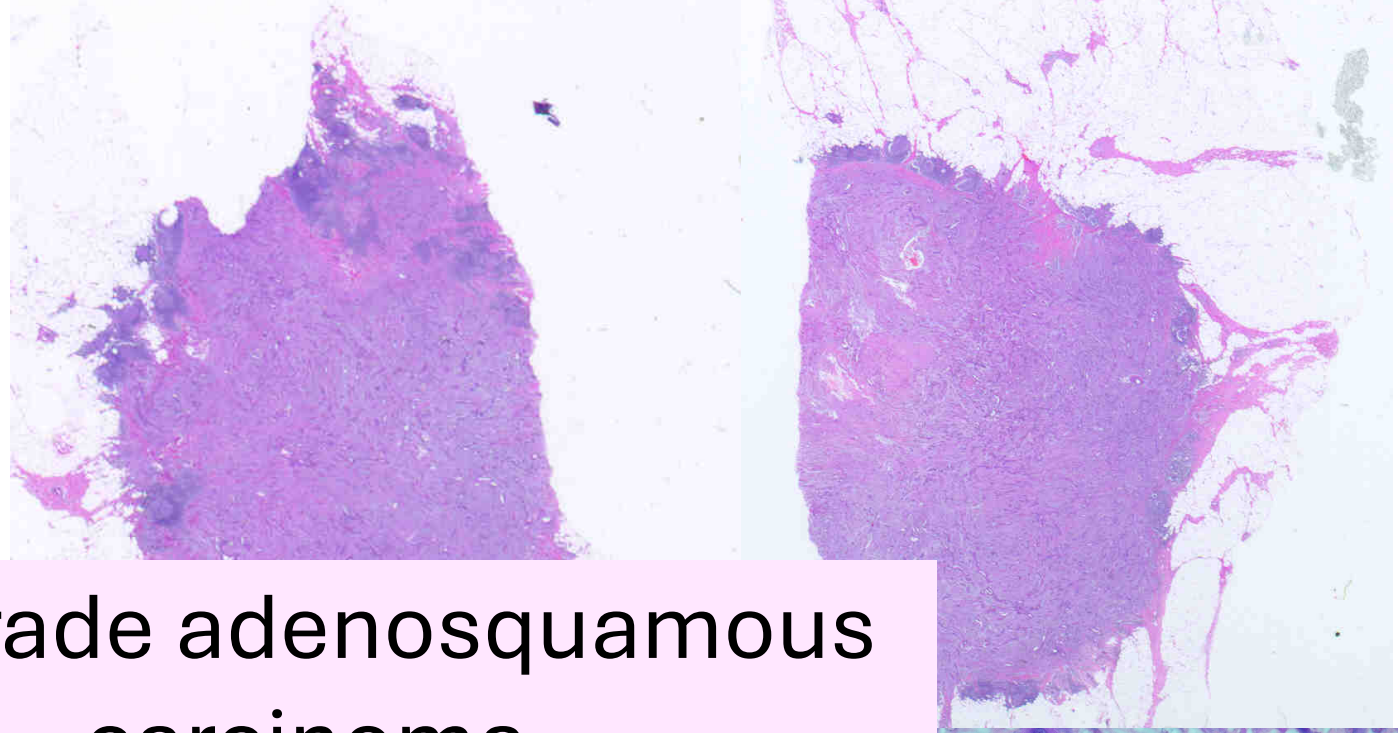

Excision ~ fibrocystic changes
with lactational change

Adult female with screen detected suspicious breast lump

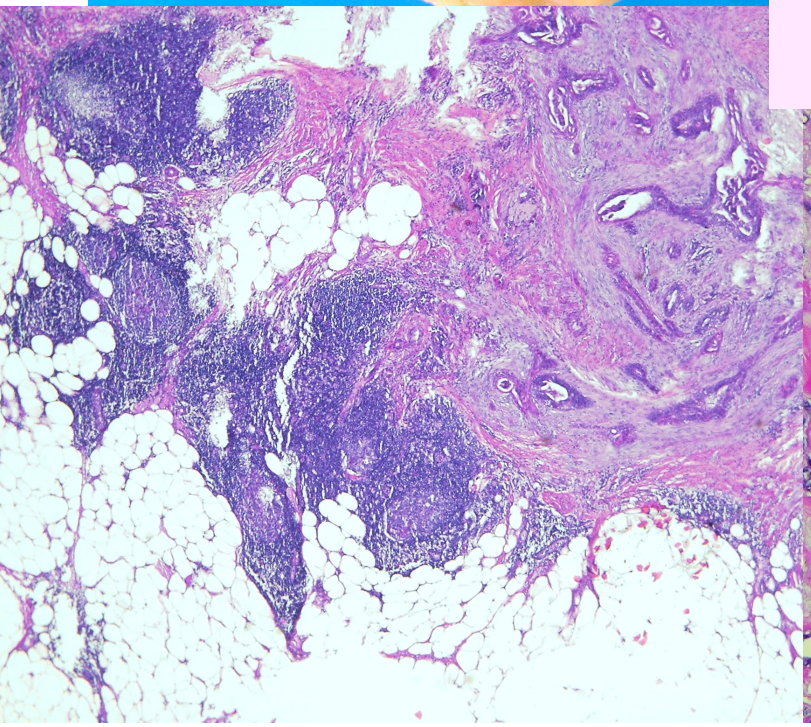


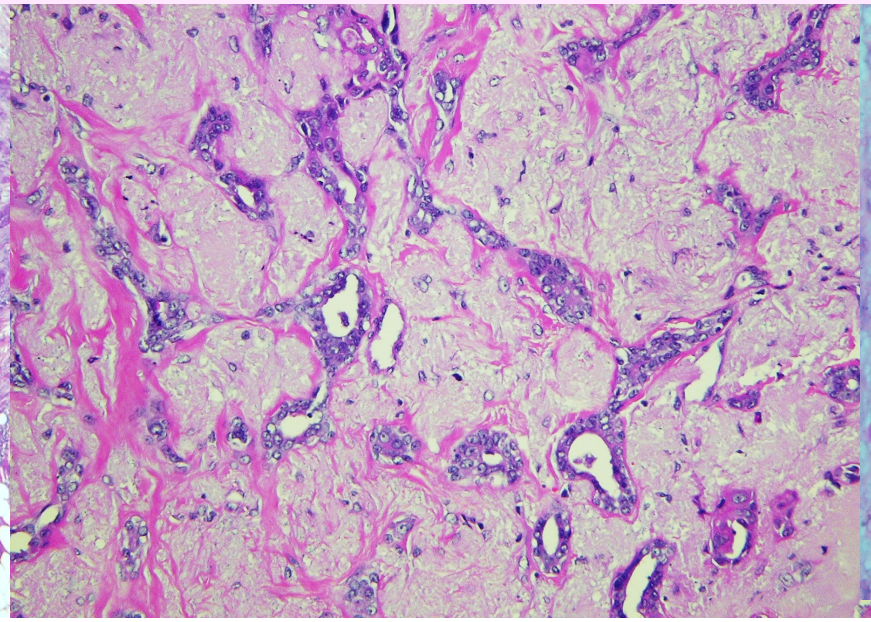


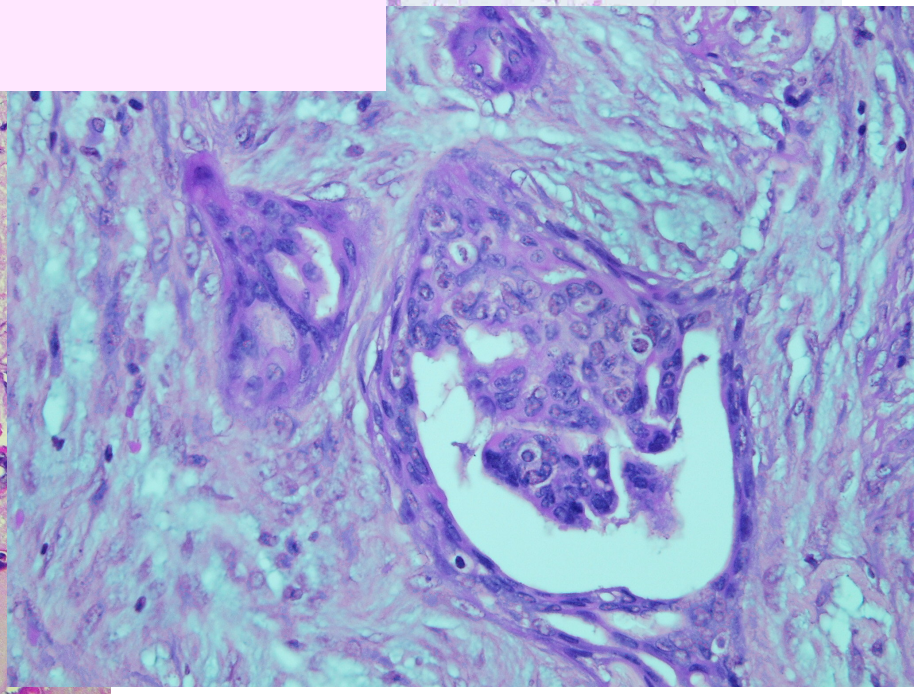




# Low grade adenosquamous carcinoma







# System categories ~ Atypical

- ‘Atypical’ category is expected to have a relatively low ROM.
- Allows for a high negative predictive value (NPV) for a ‘Benign’ diagnosis.
- Allows for a high ROM for ‘Suspicious for Malignancy’.
- ROM ~ 22 to 39% in literature.
- ROM ~ 13 to 15.7% in recent studies applying the Yokohama system.
- Allows for a high positive predictive value (PPV) approaching 100% for a malignant diagnosis.

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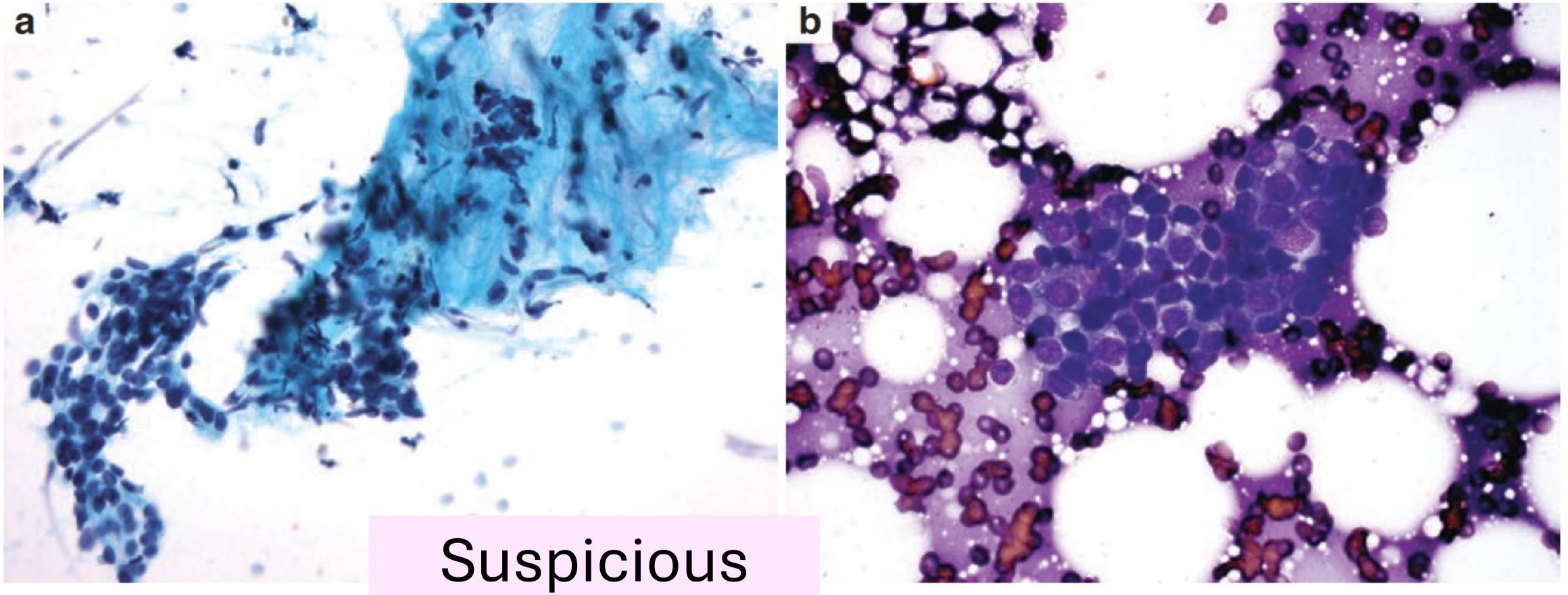
# System categories ~ Suspicious for malignancy

- Cases where there is scant, poorly smeared or poorly prepared and stained material suggestive of malignancy.
- Cases where there is considerable tissue, suggestive of malignancy but not all features of a particular malignancy are present or there may be discrepant features.

Luma




Suspicious

**Fig. 5.4** (**a**, **b**) suspicious: (**a**) Papanicolaou stained smear with an irregular crowded group composed of atypical ductal cells with hyperchromatic chromatin and possible infiltrating into a crushed stromal fragment, histology showed well-differentiated invasive carcinoma. (**b**) Giemsa stained smear shows ductal group with enlarged, slightly irregular nuclei; histology invasive carcinoma

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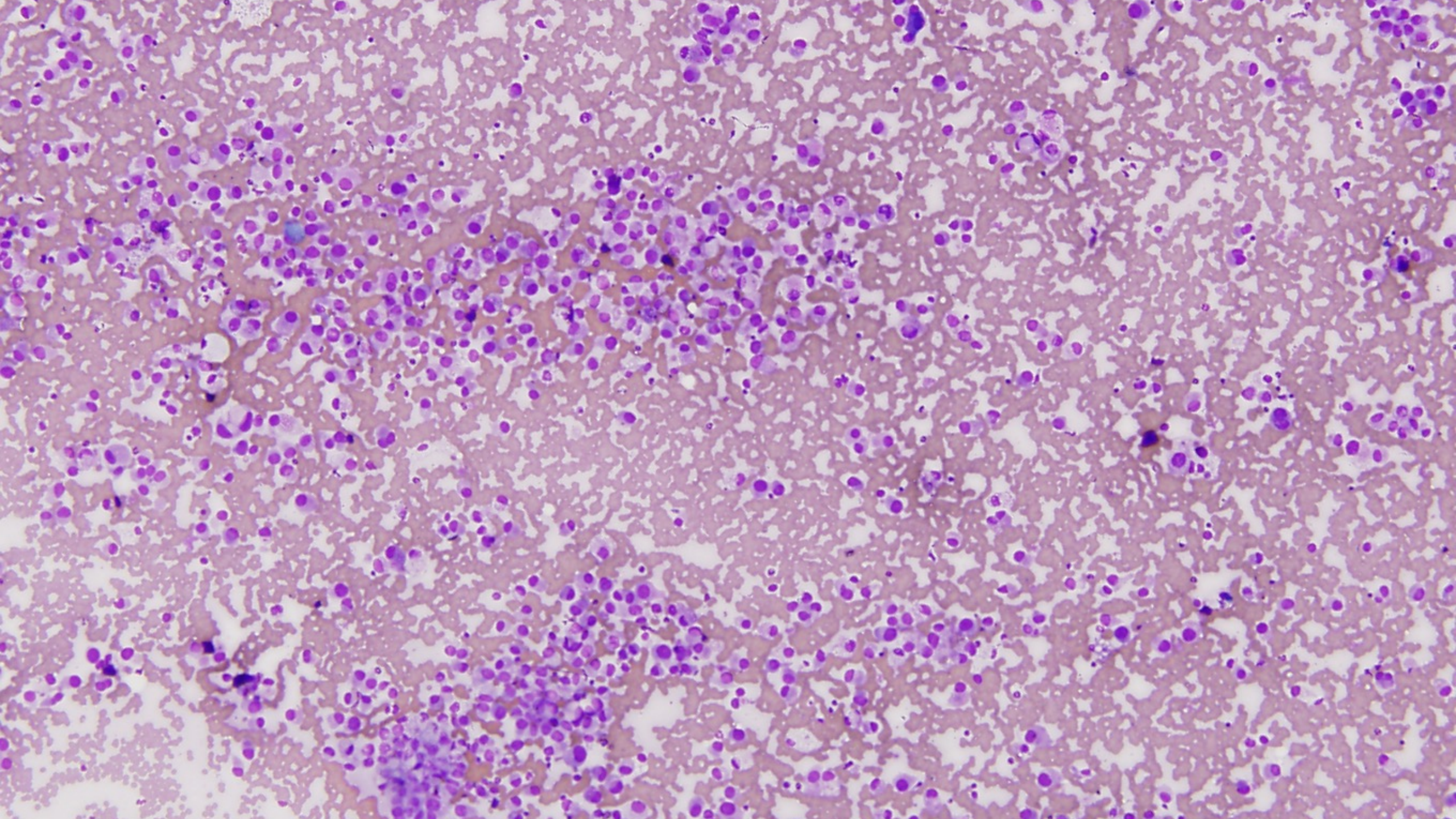
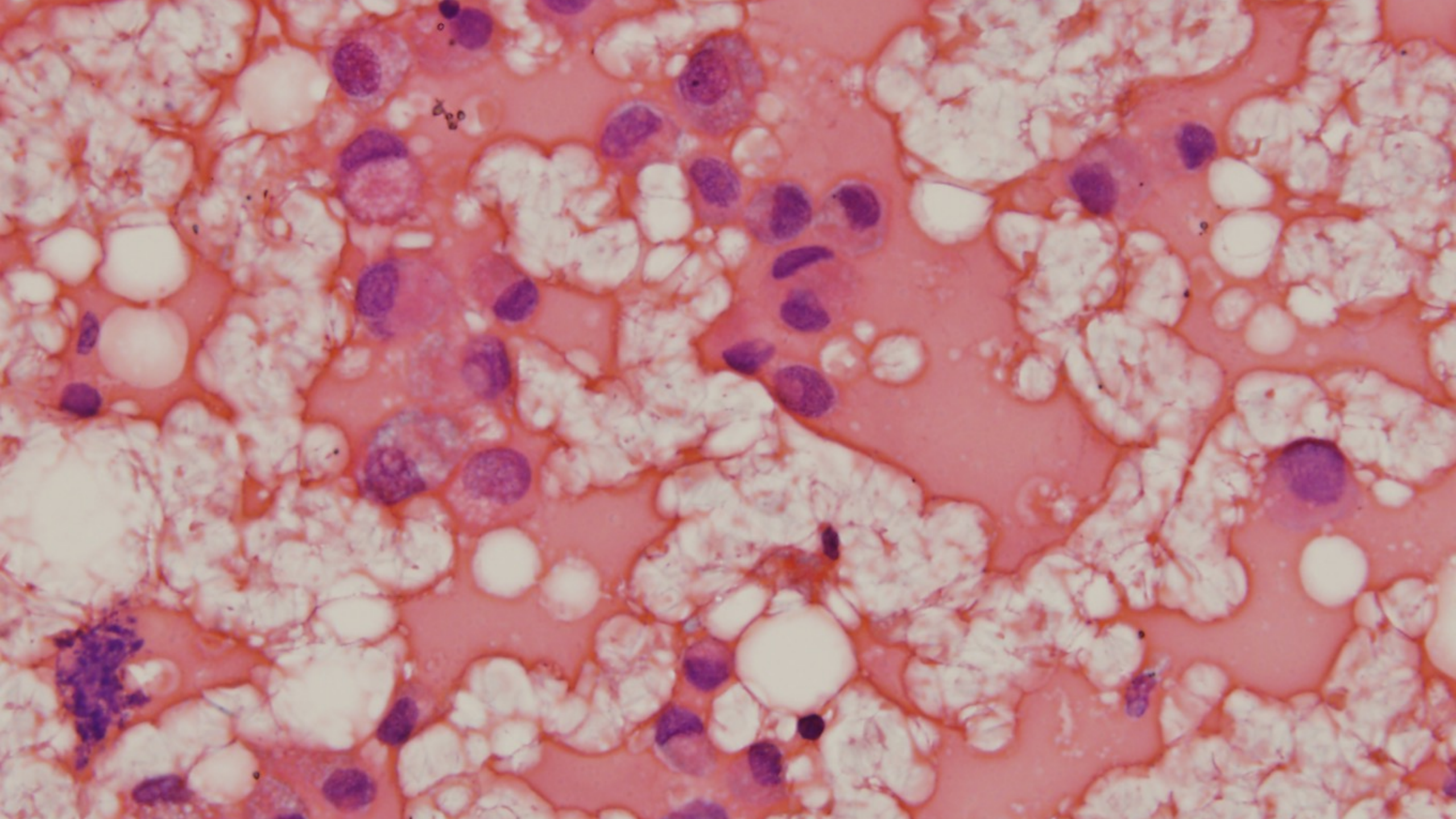
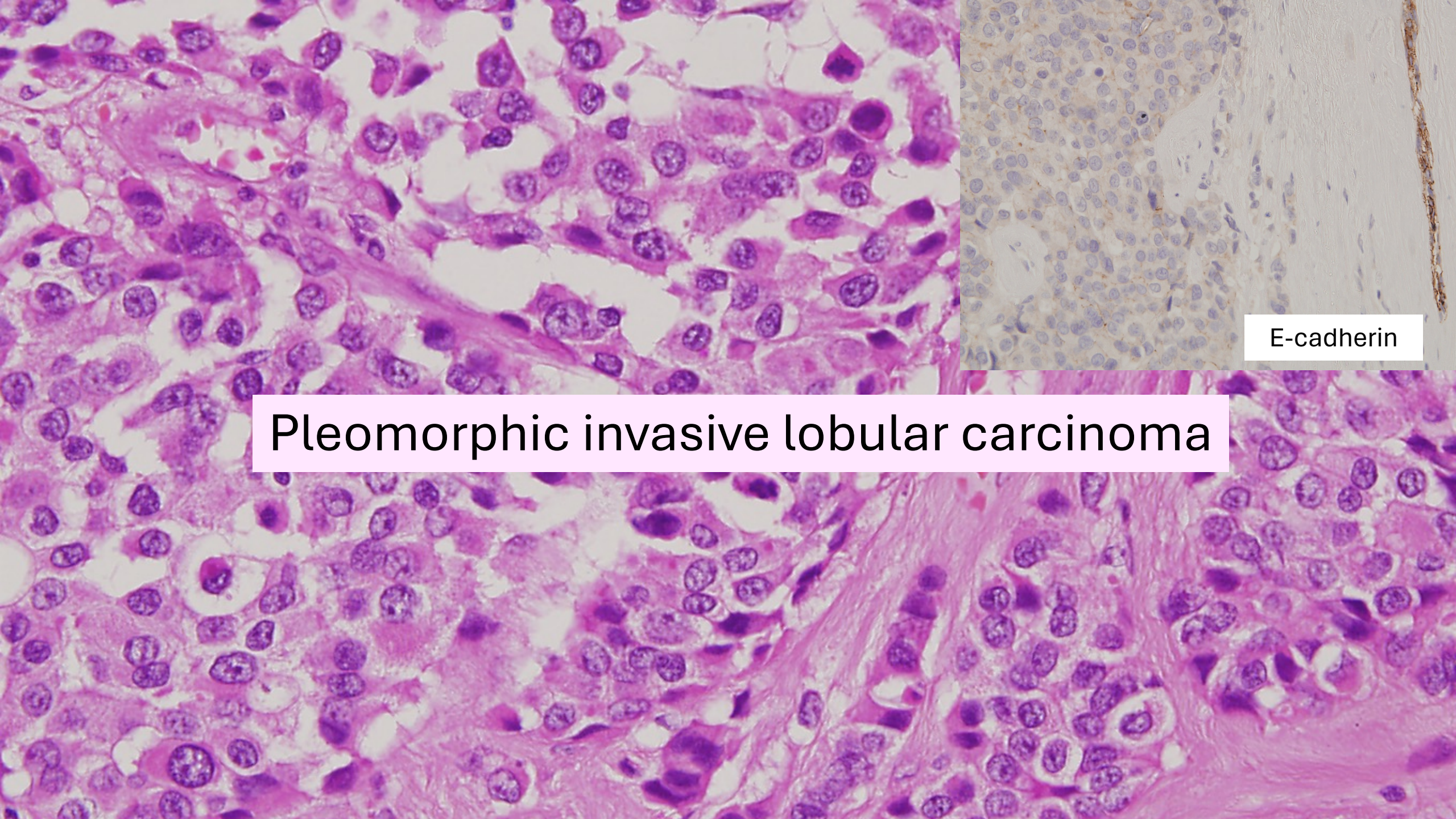
# System categories ~ Malignant

- The ‘Malignant’ category is reserved for cases in which there are ***unequivocal features of malignancy without any discrepant findings***.
- ROM is 99–100%, based on recent studies using the Yokohama System diagnostic categories and literature review.
- Not always possible to make a precise diagnosis of a specific carcinoma or other malignancy, even with ancillary testing on cell blocks and direct smear and LBC preparations and CNB.
- For example, the distinction between fibroadenoma and low grade phyllodes tumour usually requires assessment of the entire resected tumour.

Luma








# Pleomorphic invasive lobular carcinoma

Source:

**Table 1.** The WHO Reporting System for Breast Cytopathology on breast FNAB: implied risk of malignancy (ROM) and clinical management options by diagnostic category.

| Diagnostic category | Estimated ROM[a] | Clinical management options[b] |
|---|---|---|
| Insufficient/Inadequate/Non-diagnostic | 0-60.9% | Repeat FNAB or consider CNB. If low clinical suspicion, consider repeat clinical and radiologic examination in 3-6 months. |
| Benign | 0-11.7% | Correlate clinically. |
| Atypical | 13.0-40.0% | Repeat FNAB or consider CNB. If low clinical suspicion, consider repeat clinical and radiologic examination in 3-6 months. |
| Suspicious | 45.8-100% | CNB or surgical management. |
| Malignant | 91.1-100% | If clinical or imaging discordant, CNB; if clinical and imaging concordant, treat per clinical stage. |

Abbreviations: CNB, core needle biopsy; FNAB, fine needle aspiration biopsy; ROM, risk of malignancy.

[a] Estimated ROMs are based on retrospective and prospective studies on International Academy of Cytology Yokohama System for reporting breast fine needle aspiration biopsy cytology {30783035; 31524134; 33017520; 30929288; 32749785; 31108486; 33755356; 34133084; 34029453; 33629823; 34321772; 34866246; 34876918; 34515039; 34535580; 34703093; 36516743; 36988122}.

# System categories

- Benign and Malignant Chapters follow the order of the 5th edition WHO Classification of Breast Tumours.
- Not all tumours in the ‘blue book’ have been described in the cytopathology publications ~ not presented in the cytopathology reporting system.
- Spindle cell lesions which usually behave in a benign fashion but have a low risk of recurrence or rarely metastasize are described in the ‘Benign’ chapter with a clear discussion of the cytopathological features and ancillary studies that often allow a specific diagnosis.

# Structured reporting

Luma

# Structured reporting

- Each cytopathology report has a structured format with a specific diagnostic category.
- Improves the quality, clarity and reproducibility of reports within individual pathology departments and between countries.
- Enhances patient management, facilitates research and quality assurance measures.
- Based on key diagnostic cytopathological findings.
- Acts as a checklist for the reporting cytopathologist.

Luma

# Structured reporting ~ core components

- Precise site of lesion.
- Descriptors of side, o'clock in the breast based on the nipple and distance from the nipple papilla.
- Diagnostic category using the defined terminology of the reporting system and not a number.
- Diagnosis, which may be specific or as part of a differential diagnosis.
- (If needed), a microscopic description of the key diagnostic features followed by ancillary testing results.
- Optional component ~ quality indicator stating whether there is adequate, limited or inadequate material for evaluation, followed by the diagnostic category and diagnosis.
- No particular format is mandatory.

Luma

# Structured reporting

- Not recommended to use a number in defining a diagnostic category at any stage.
- A category number can be included in the body of the report for audit and research purposes but not in the diagnosis.
- Reducing a cytopathology report to a number reduces the information that can be given to the clinician and management team.
- Microscopic description is optional ~
  - Highly recommended when a specific diagnosis is not provided.
  - Should provide a clear, concise cytopathological description.
  - Includes the degree of cellularity.
  - Focuses on key cytopathological diagnostic features.

Luma

# Structured reporting ~ ancillary tests

Discussion and description of ancillary tests should always be part of the final cytopathology report.

If ICC, ISH, molecular pathology reports are issued by a different laboratory, it is recommended to refer to these tests as pending.

If possible, issue a supplementary report to the original cytopathology report, with the test results.

# Standardised Breast Cytopathology Report

## ❑ Demographic information:

- -Patient's name, date of birth, address, patient identifiers/patient episode, date of request and laboratory accession number
- -Referring doctor and contact details

## ❑ Nature of the Specimen:

- - FNAB, CNB touch preparation, nipple discharge

## ❑ Clinical & Imaging information (if available):

- - Side/laterality, site by o'clock from nipple and distance to the papilla, size (mm), fixation to skin or chest wall, imaging (ultrasound, CXR, tomogram, CT, MRI) features
- -Previous cytopathology, CNB and excision biopsy procedures and results

Luma

# Standardised Breast Cytopathology Report

## •Diagnostic Summary

- Totally in bold, on the first page (if the laboratory information system supports this)

- Each institution should select a term for this main heading, such as ‘Diagnostic summary’ (as used throughout this volume), ‘Diagnosis’ or ‘Final diagnosis’ and use it consistently

- ***Diagnostic summary to include:***

**•*Specimen Type***

-the specimen type and exact site in the breast eg ‘FNAB of right breast at 9 o’clock 30mm from nipple’.

- should correlate with the labelling of the specimen jar and the request form, and if it does not, the clinician should be contacted

**•*Quality Indicator* (optional)**

- satisfactory, limited, unsatisfactory for evaluation

**•*Diagnostic Category***

-Reporting System diagnostic category using the terminology and not a number

**•*Diagnosis***

-Specific diagnosis or descriptive diagnosis including a differential diagnosis

Luma

# Standardised Breast Cytopathology Report

- **Microscopic description:**

- Optional to include the key diagnostic cytopathological features where present or absent.

- Recommended when a diagnosis is not specific and is based on a differential diagnosis.

- If a specific diagnosis is not possible ~

- Provide a descriptive diagnosis

- Discuss the differential diagnosis

- Emphasize the most likely or favoured diagnosis

- If the lesion is “Insufficient/Inadequate/Non-diagnostic” or “Atypical’ or “Suspicious for malignancy”, then the report should include a clear description of what material is present on the slides, and the reason why the material is insufficient, atypical or suspicious of malignancy should be stated; for the “Atypical” and “Suspicious for malignancy” categories this may include a discussion of the differential diagnosis

# Standardised Breast Cytopathology Report

“Insufficient/Inadequate/Non-diagnostic” or “Atypical’ or “Suspicious for malignancy” lesions

Microscopy report should include a clear description of what material is present on the slides.

Reason why the material is insufficient, atypical or suspicious of malignancy should be stated

For the “Atypical” and “Suspicious for malignancy” categories, this may include a discussion of the differential diagnosis

Luma

# Standardised Breast Cytopathology Report

## Ancillary testing

- Cytopathology report (including its conclusion) can be issued as a final or provisional report.
- Supplementary or addenda on ancillary studies can be added to a final integrated report.
- In rare cases the cytopathology report can be withheld until ancillary reports are available.
- Report should state which type of specimen eg cell block, smear scraping, was used for each ancillary test to facilitate continuous quality assurance.
- If a core needle or other surgical biopsy was performed at the same time as the FNAC, the supplementary report should recommend correlation with the surgical report and its accession number should be stated.

Luma

# Standardised Breast Cytopathology Report

- **Macroscopic description:**

- Number of airdried slides, number of alcohol fixed slides

- Type (saline, RPMI, formalin, only specimen without dilutant, liquid based cytology)

- Volume of fluid received, with description of fluid (colour, presence of blood, viscosity, presence of particulate matter), including any other specimens received and specifically designated for flow cytometry, microbiology and cell block

- **Details of rapid on site evaluation (ROSE) (if conducted):**

- Number of passes, gauge of needle used, imaging modality used

- Name of staff performing the clinical and diagnostic procedures

- Number of slides processed and stained at ROSE, airdried and alcohol fixed, other specimen types prepared

- Specific ROSE report provided verbatim and documented, name of the cytopathologist or cytopathologist biomedical scientist issuing ROSE, with further noting of any subsequent ROSE procedures

# Summary

- IAC-IARC-WHO approach to cytopathology classification of breast lesions.
  - System categories ~ inadequate, benign, atypical, suspicious, malignant.
  - Risk of malignancy with management recommendations.
  - Structured reporting
  - Triple test
- Complementary companion to the WHO breast blue books.
- Acknowledges the role and importance of cytology in diagnosis.


Like Koi swimming upstream against powerful currents, life's obstacles can serve to make us stronger. Persist and grow through adversity.

# THANK YOU