Croatia and the EU:
Together
Against Cancer

IMPROVEMENT OF QUALITY OF THE NATIONAL CANCER SCREENING PROGRAMMES IMPLEMENTATION (CRO SCREENING)

MINISTRY OF HEALTH OF THE REPUBLIC OF LITHUANIA

NCI

LITHUANIAN UNIVERSITY OF HEALTH SCIENCES

CPVA

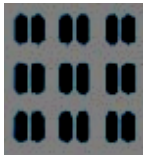
NIJZ
Nacionalni institut za javno zdravlje

Ministry of Health

HZJZ

This project is funded by the European Union

BREAST BIOPSY IN SCREENING



Pathologic diagnosis in minimal invasive biopsy

Non-operative diagnosis represents the norm in breast screening assessment.

Its role in malignancy is to provide a definitive diagnosis allowing rapid referral for treatment and in benign conditions avoiding surgery and allowing return to routine recall.

Significant breast abnormalities should be assessed by needle core biopsy (NCB) or fine needle aspiration cytology (FNAC).

Needle core biopsy (NCB) by automated biopsy guns and vacuum assisted systems (VANCB or ‘mammotome’) are widely accepted tools that have led to the introduction of histology in replacement of traditional fine needle aspiration cytology (FNAC).

Choice of sampling technique

- All sampling techniques share the same purpose to obtain a representative sample of the targeted mammographic or ultrasound abnormality.
- This abnormality often represents a lesion, but is sometimes only the expression of a non-pathological tissue distortion of the mammary glandular structure
- The indication and the preferred method for non-operative biopsy is decided according to the degree of suspicion and the nature of the lesion
- There should be written local protocols clearly defining the indications for FNAC, NCB and VANCB techniques.
- All cases should undergo a thorough work up including imaging and clinical examination prior to FNAC or NCB.

Fine needle aspiration cytology (FNAC)

The accuracy of FNAC depends on:

- a sample which is adequate and representative of the lesion
- suitable processing and staining without artefacts
- accurate interpretation of the cytological material

The procedure can fail at any of the stages of preparation (aspiration, spreading and staining) even before diagnostic interpretation.

The confidence and experience of the aspirator are vital for obtaining a satisfactory sample.

Advantages:

- less expensive than NCB and less time consuming - immediate diagnosis is possible

- may be useful to aspirate clinically or radiologically abnormal axillary nodes as staging of the axilla may be helped by positive cytology obviating the need for a sentinel node procedure

Disadvantages:

- it may show poor cellularity leading to an inadequacy

- it supplies cells isolated from their environment which does not allow analysis of the tissue architecture

- an accurate diagnosis of common benign lesions except cysts, intramammary lymph nodes and the most typical fibroadenomas may be difficult

- it is more difficult to correlate FNAC with the radiological image

Needle core biopsy (NCB)

- well suited to palpable or non-palpable masses but may be insufficient for microcalcification

Advantages:

- allows better characterization of lesions associated with microcalcification than FNAC

- able to characterize lesions more completely than FNAC and can provide a definitive diagnosis in a higher proportion of cases

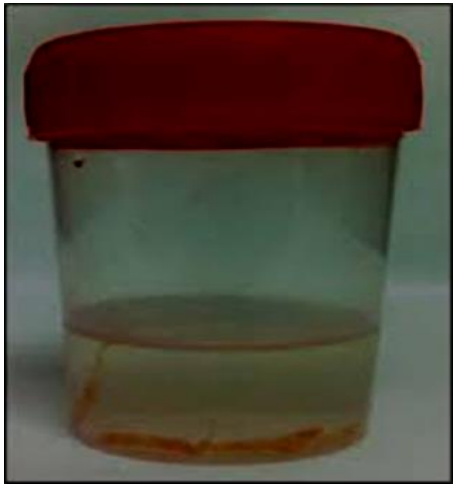
- It may differentiate between invasive and in situ carcinoma

- allows the use of immunohistochemistry – differential diagnosis

- assessment of steroid receptors and Her2 status

Interpretation of core biopsies requires experience and knowledge of complex breast lesions.

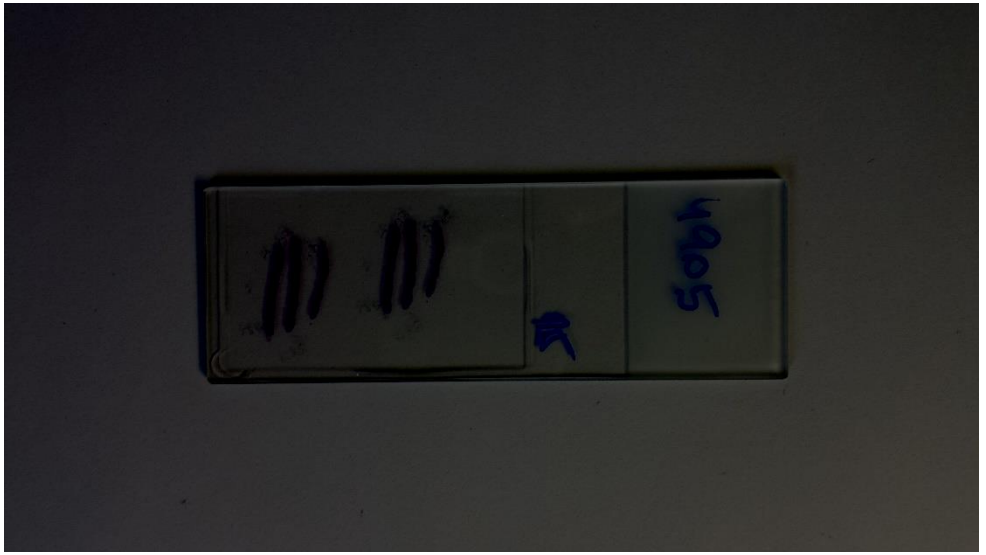
Handling of specimens



- Placed in 10% buffered formaldehyde immediately after harvesting /guarantees routine processing and allows a histologic diagnosis within 24h
- Specimens from different locations – cassettes with different ID numbers
- Maximum of 5 cores in single cassette, arranged in paraller arrays

GROSS PATHOLOGY – of limited value in final diagnosis - helpful for deciding whether the core is representative and sufficient for histology:

- number of cores and maximum lenght
- Short description (to avoid errors in tissue identification in the laboratory)
- a) predominantly fatty tissue
- b) predominantly soft solid tissue
- c) predominantly firm solid tissue



- Histologic sections 4μm thick and of high quality
- At least 3 levels from each block – masses, arhitectural distorsions
- 4 levels at 20μm intervals for microcalcifications

- pathologist should receive the radiologic features of the lesion from th
- imaging classification should be used to indicate the radio

Pathology reporting categories

For standardization of reporting the needle biopsy findings The European Working Group for Breast Screening Pathology (EWGBSP) recommended the use of the B categories, the system initially proposed by the UK National Coordinating Group for Breast Screening Pathology.

B categories do not represent a pathologic diagnosis but a code for the assessment of histological status which without a definitive diagnosis, may decide on further management. Thus, most of the samples can be immediately categorized as normal, benign or malignant.

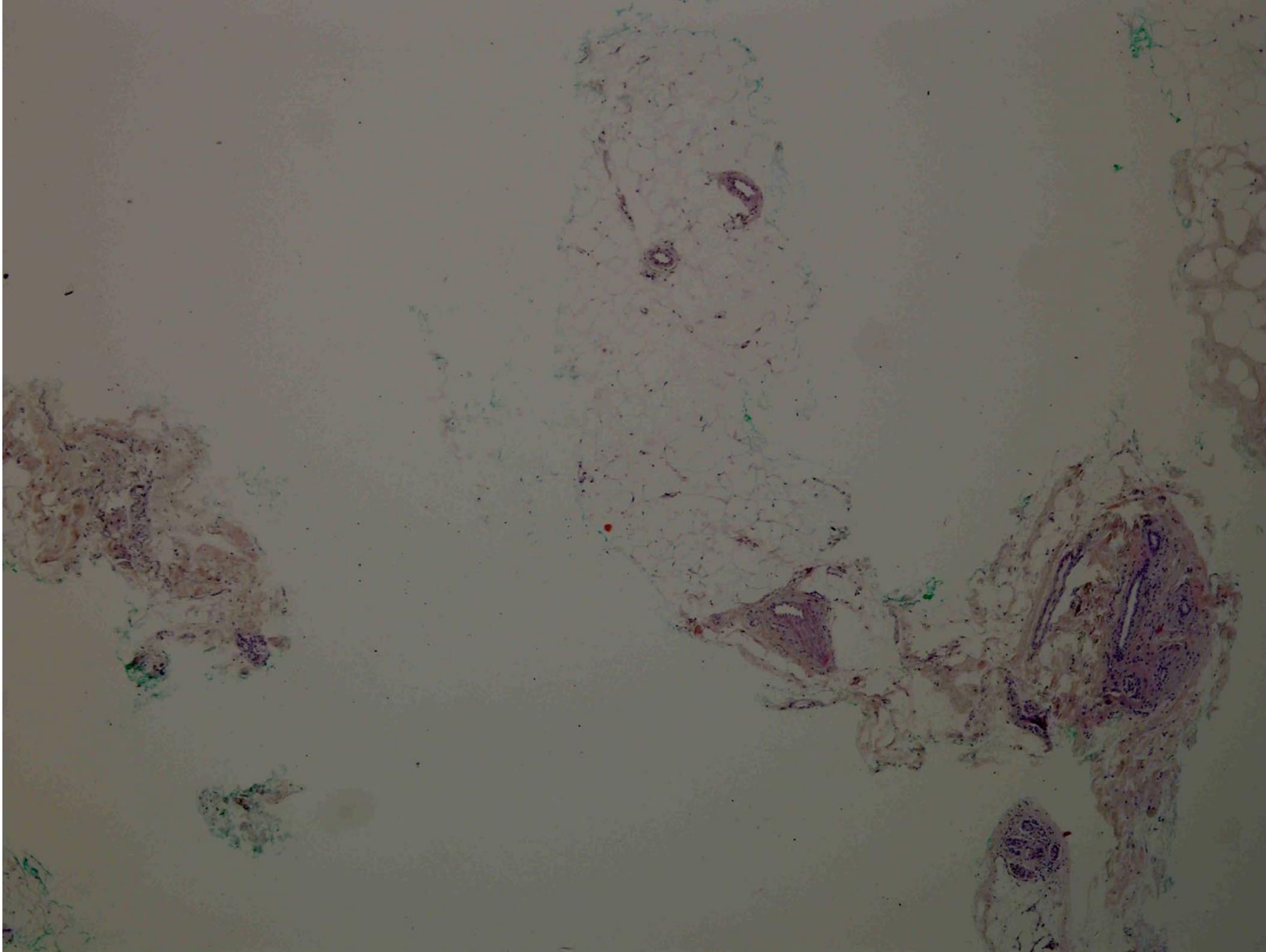
The system consists of 5 groups that are marked as B1, B2, B3, B4 and B5, with B5 further divided into a, b, c and d subgroup.

Should be used outside the screening program.

B1. Normal tissue/uninterpretable

indicates a core of normal tissue whether or not breast parenchymal structures are present. Appropriate for:

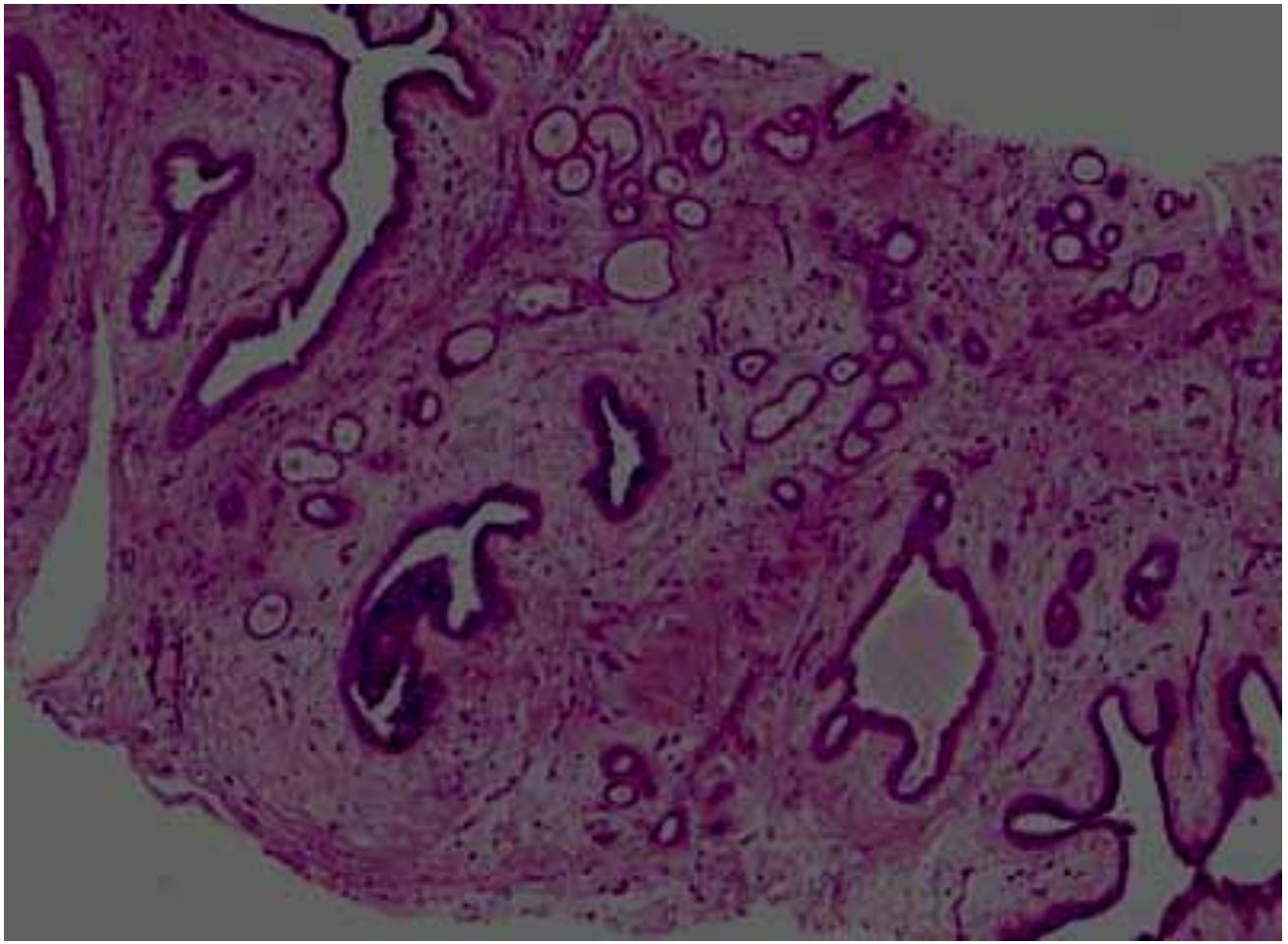
- normal breast ducts and lobules or
- mature adipose/fibrous tissue only
- Involuted lobules and calcifications < 100µm
- Minor degrees of fibrocystic change
- Uninterpretable - excessive crush artefact or composed of blood clot only
- A B1 report should include a description of the components present and comment should be made regarding the presence of breast epithelial structures.



B2. Benign lesion

Indicates a benign abnormality:

- Fibroadenoma
- Cyst
- Fibrocystic change
- Sclerosing adenosis
- Duct ectasia
- Abscess
- Fat necrosis



B3. Lesion of uncertain malignant potential

benign abnormal findings with an incresed risk of synchronously associated malignancy

I) – lessions more often associated with malignancy which may be missed in the biopsy (sampling error)

II) – lesions with heterogeneous composition - atypical or malignant proliferation may not be detected

I) well documented association with DCIS or invasive carcinoma

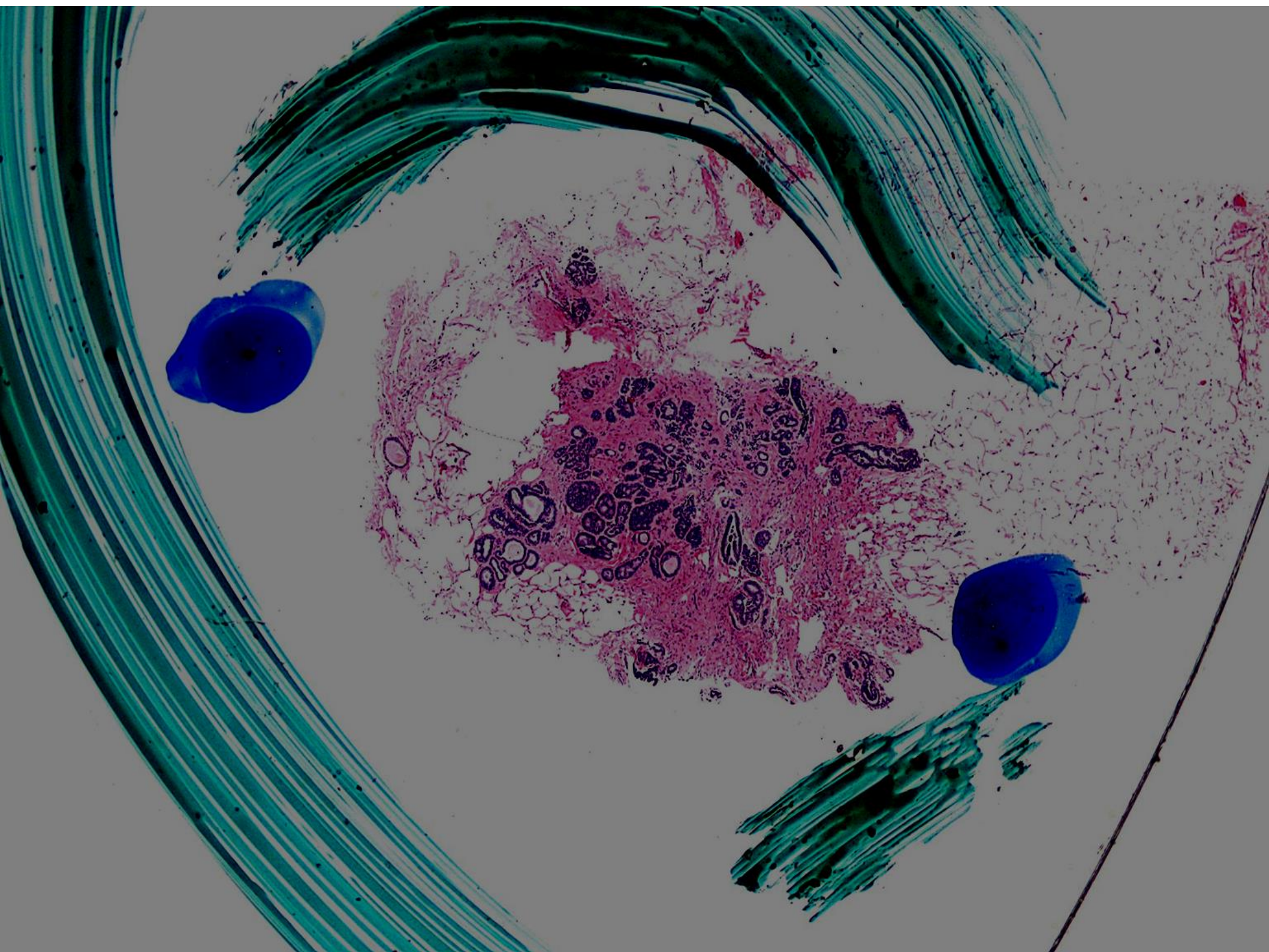
- Lobular neoplasia
- Atypical epithelial proliferations of ductal-type
- Flat epithelial atypia

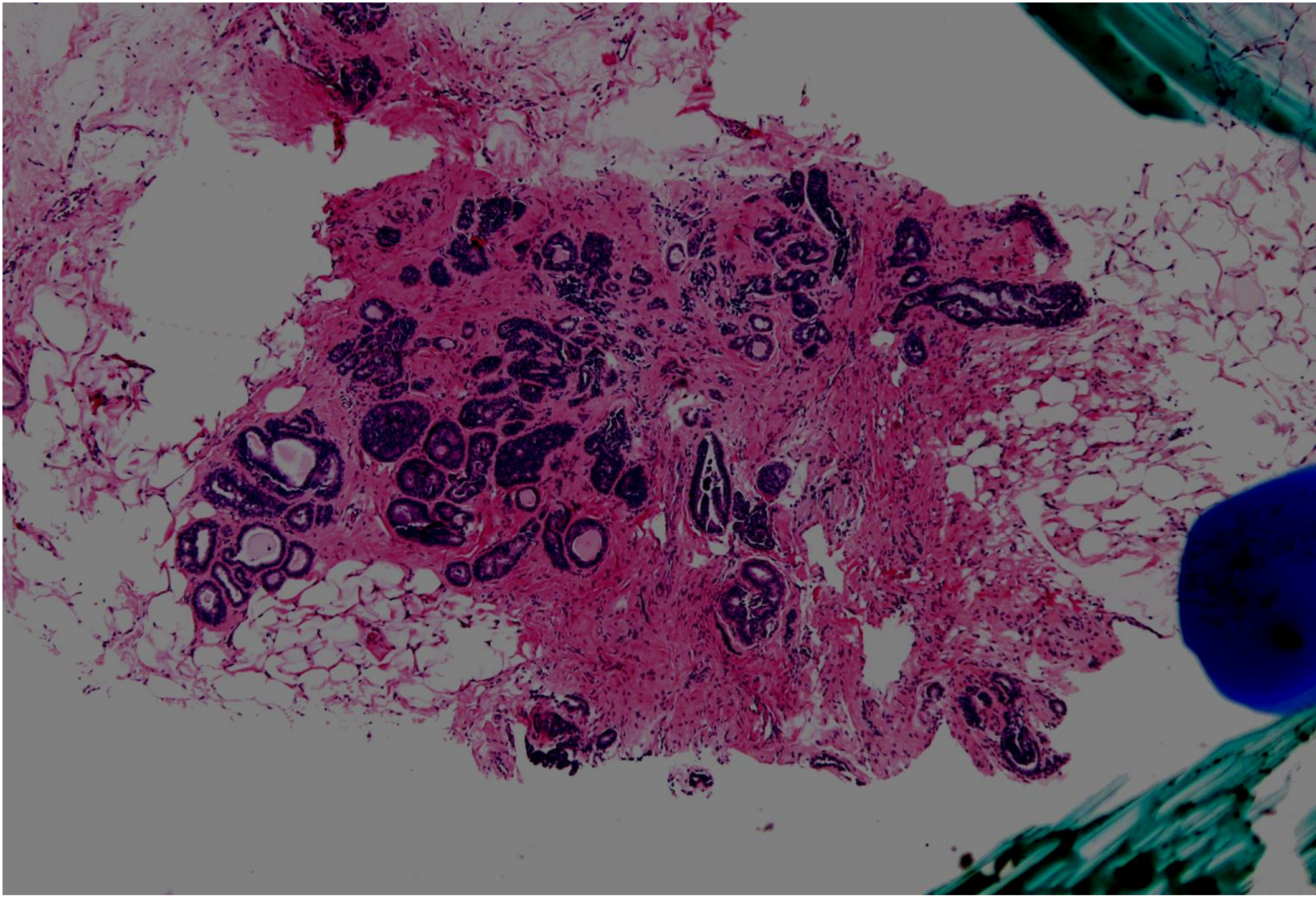
- Produce no characteristic finding on imaging – assume the target was missed / inadequate sampling

II) intralesional heterogeneity

- Papillary lesions
- Complex sclerosing lesions
- Phyllodes tumor
- Mucocele – like lesions

- Limited amount of tissue – malignancy may have been missed





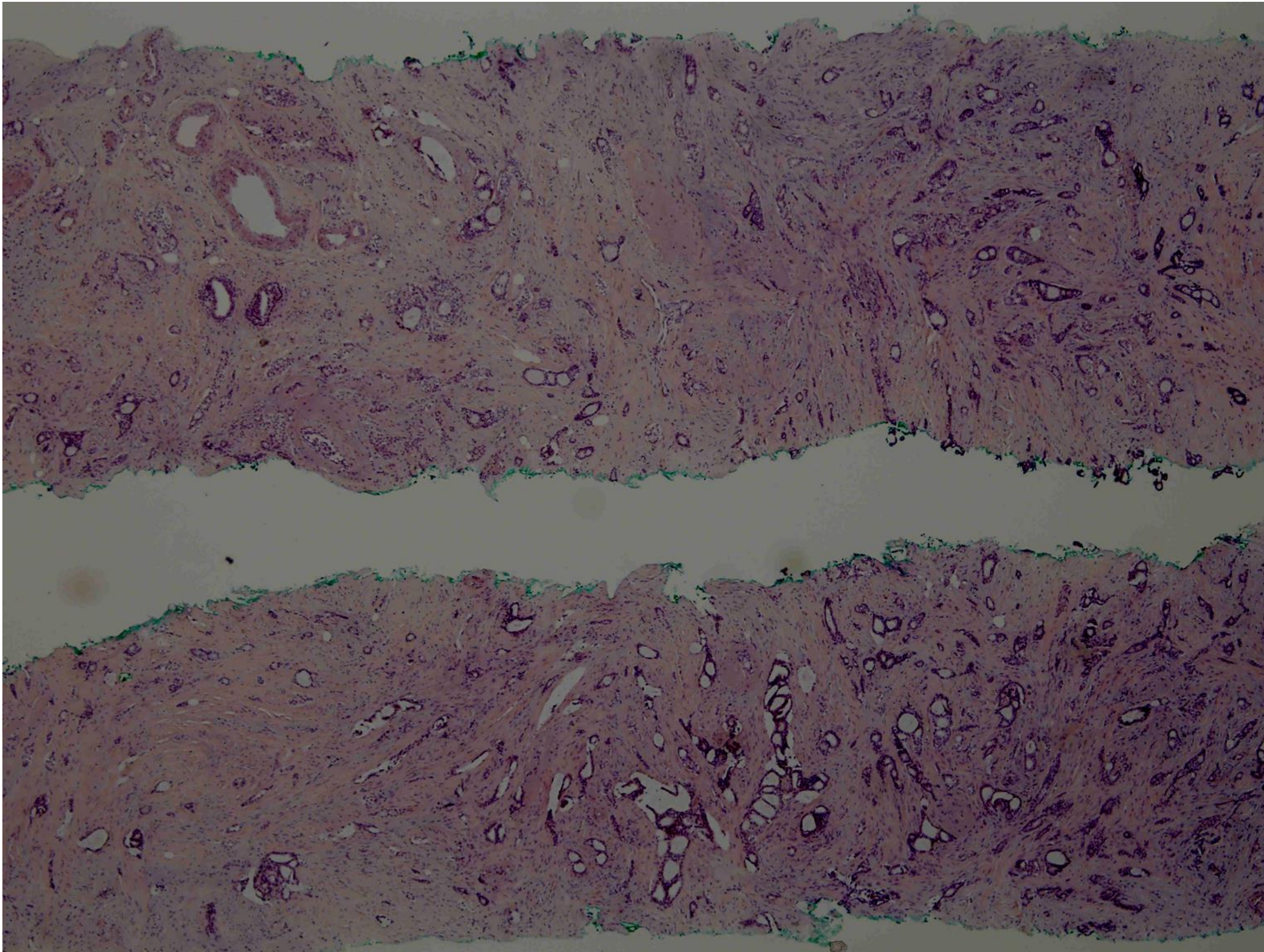
B4. Suspicious

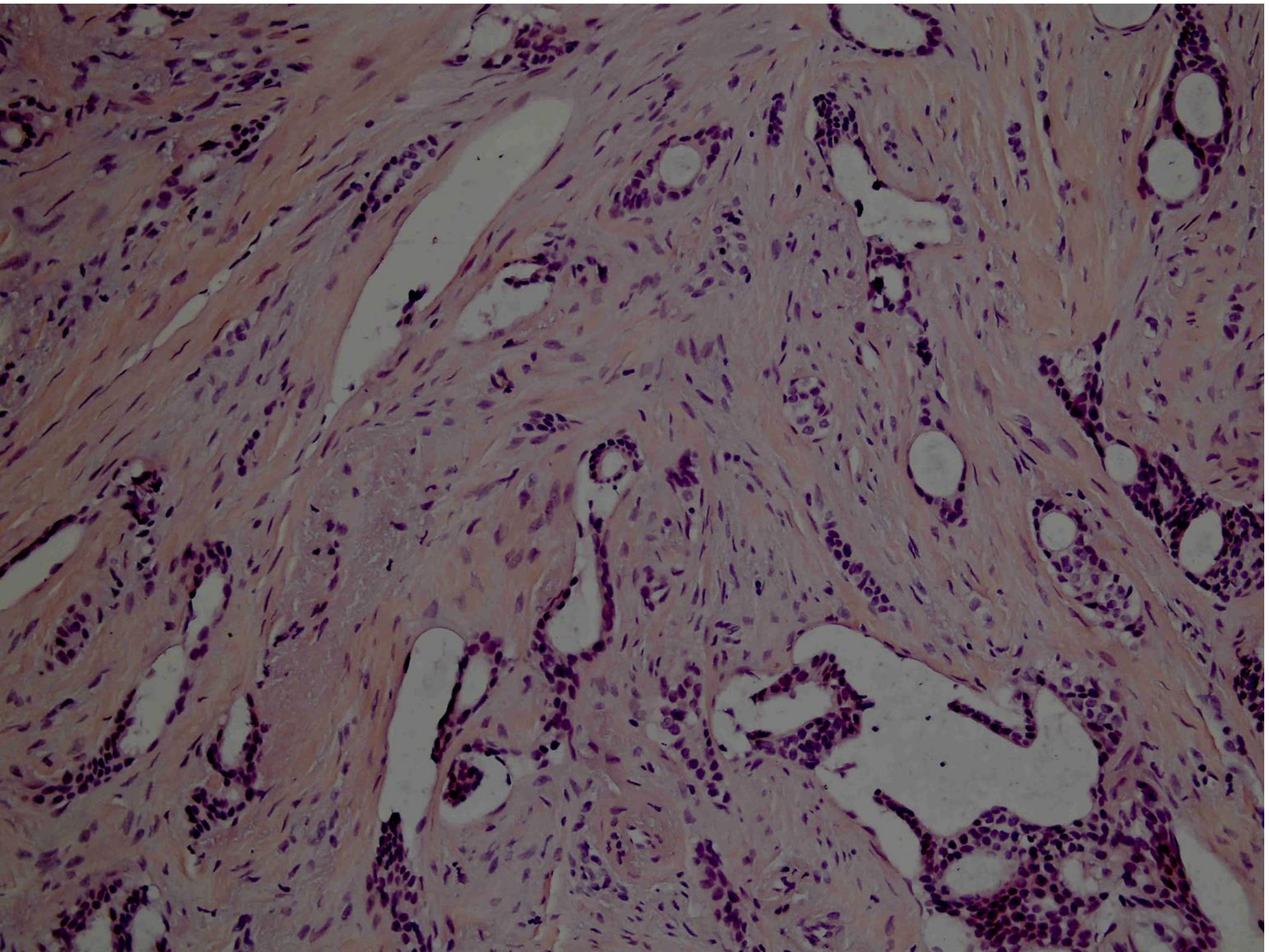
Malignant features present but insufficient for definite diagnosis

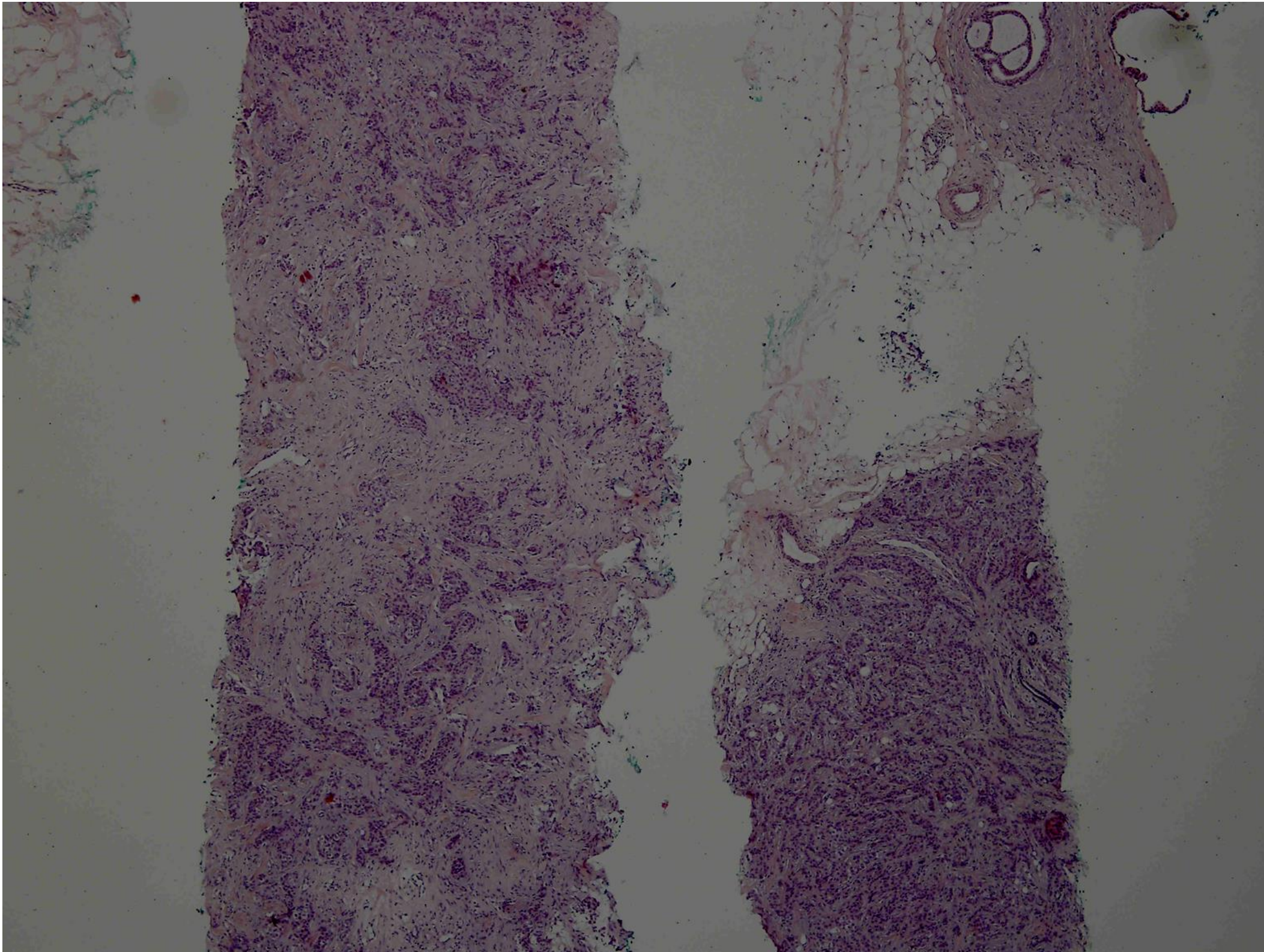
- Crushed or poorly fixed cores
- Abnormalities separated from main specimen eg neoplastic cells contained within blood clot or adherent to the outer aspect of the sample
- Incomplete involvement of duct space by highly atypical epithelial process

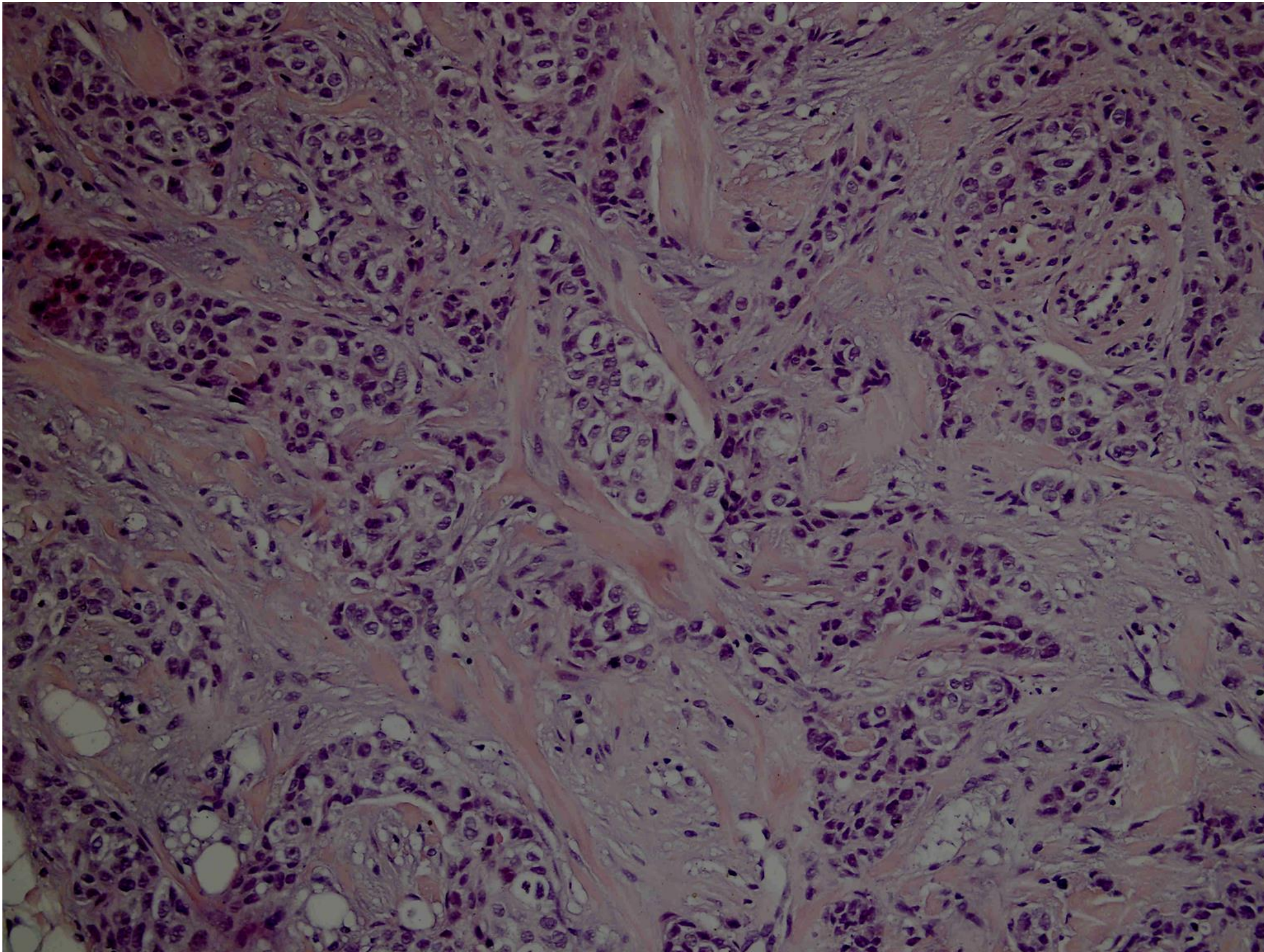
B5. Malignant

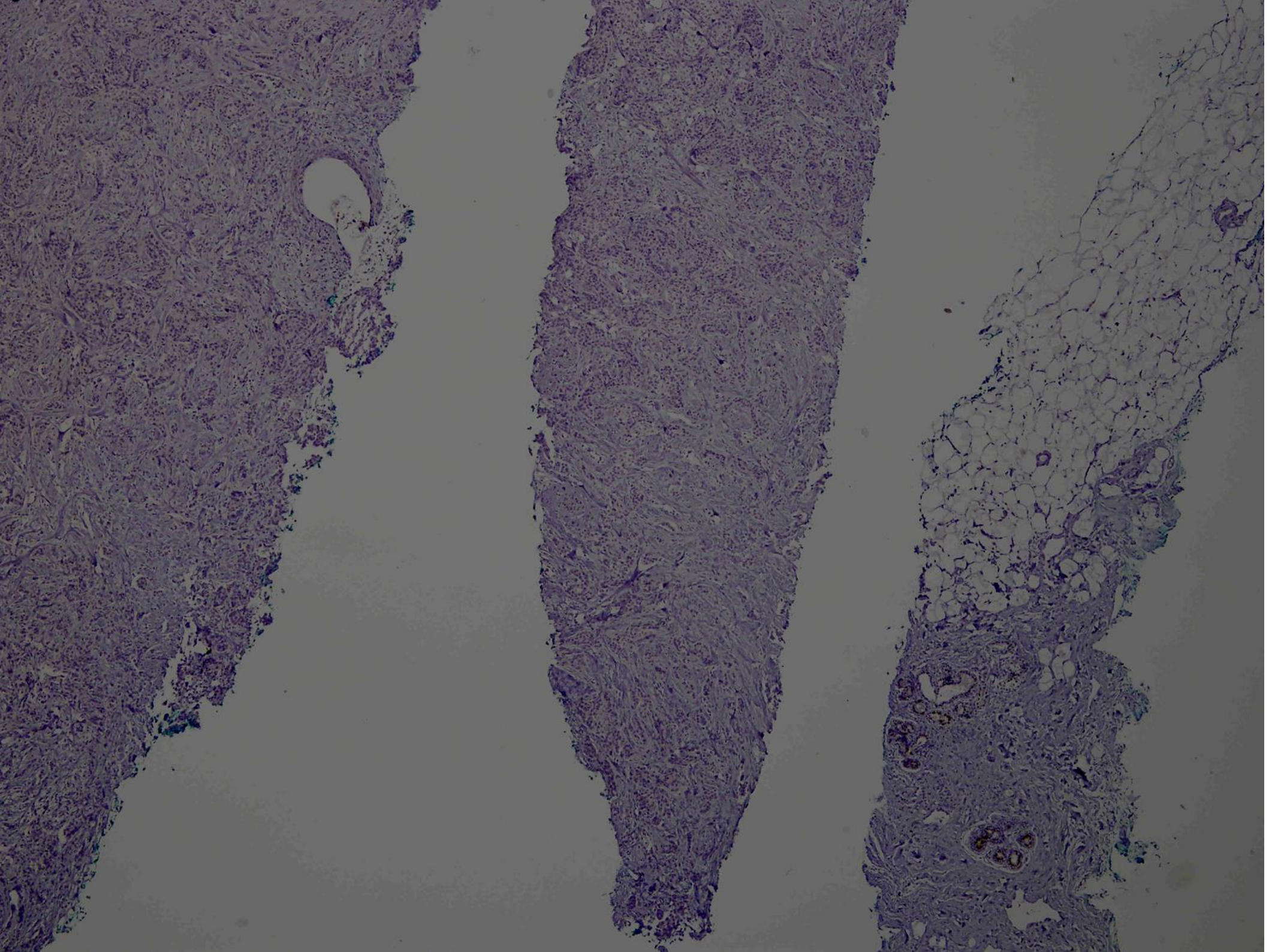
- B5a- Ductal carcinoma in situ
- B5a- Lobular neoplasia – indistinguishable from low grade DCIS / pleomorphic type / central necrosis
- B5b- Invasive carcinoma
- B5c- Invasive status not assessable
- B5d- Other malignancies

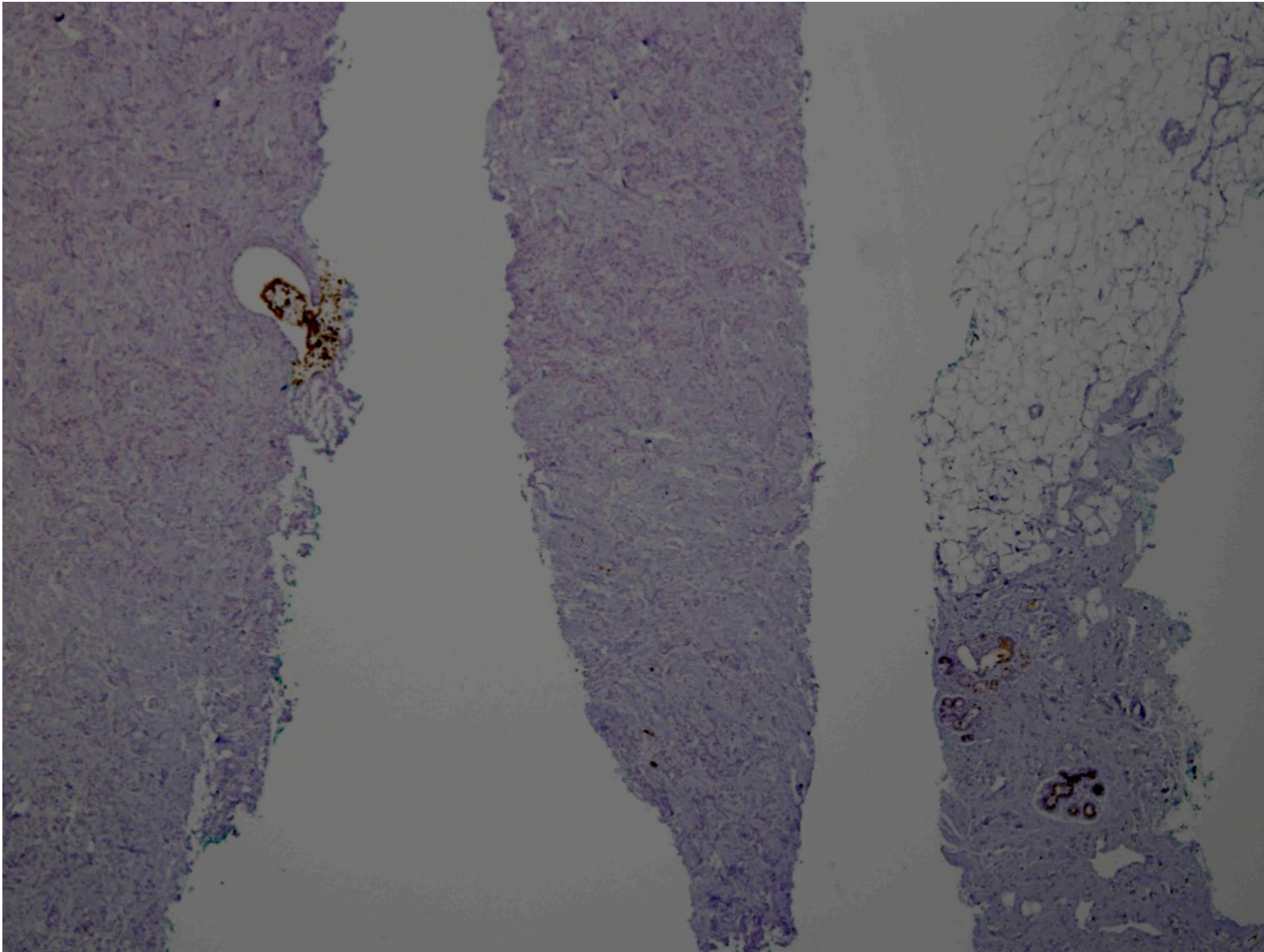


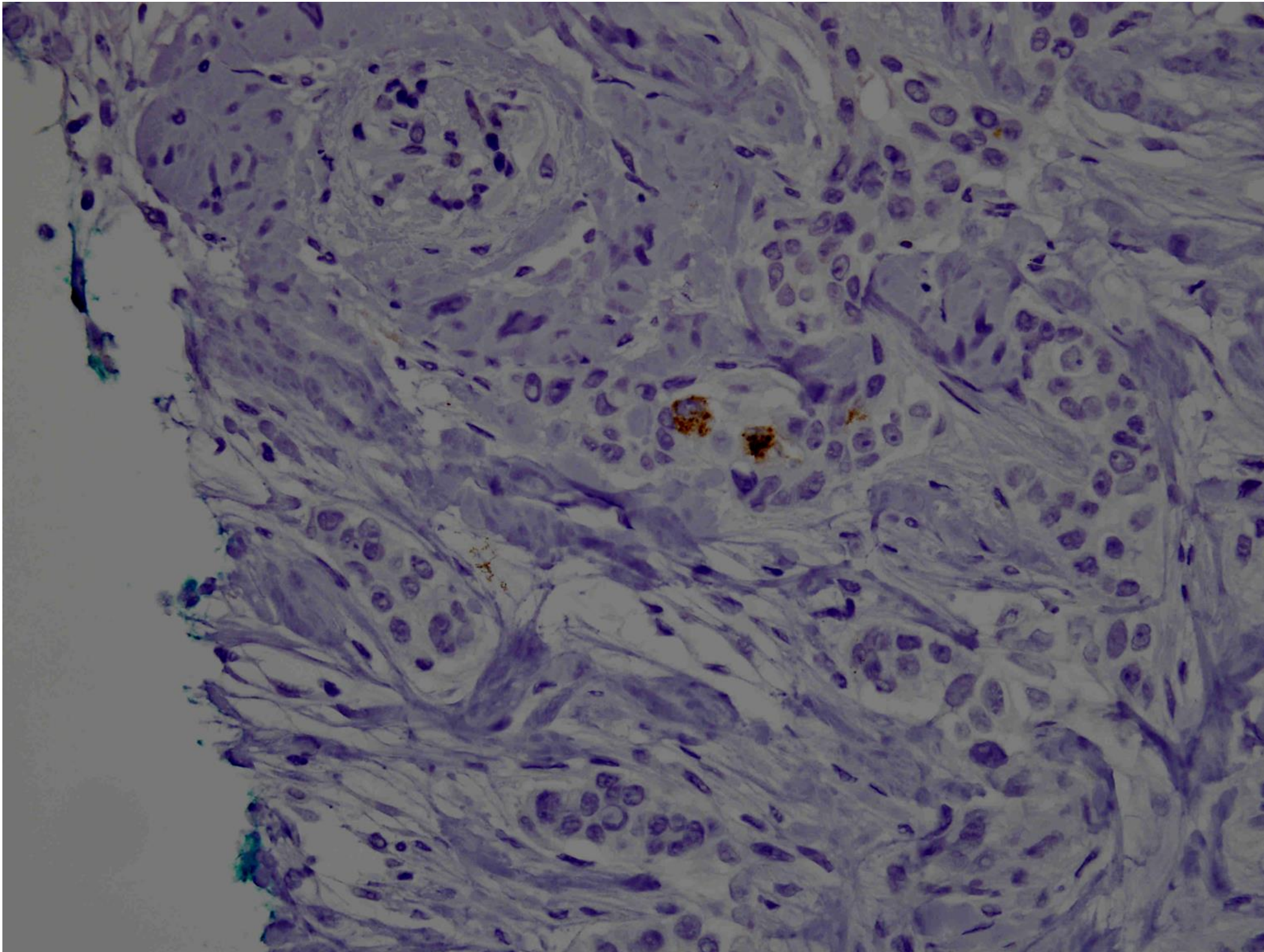


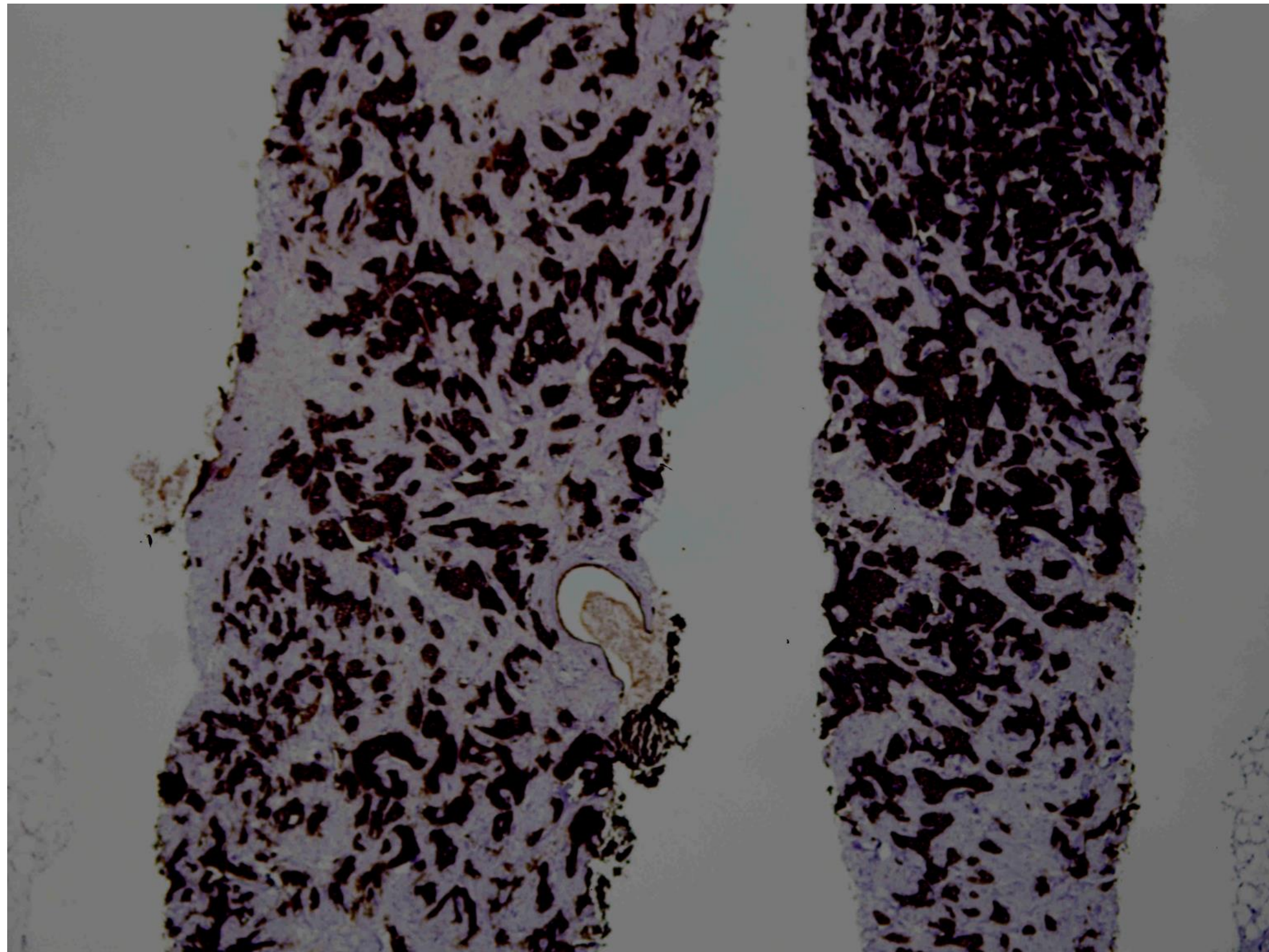


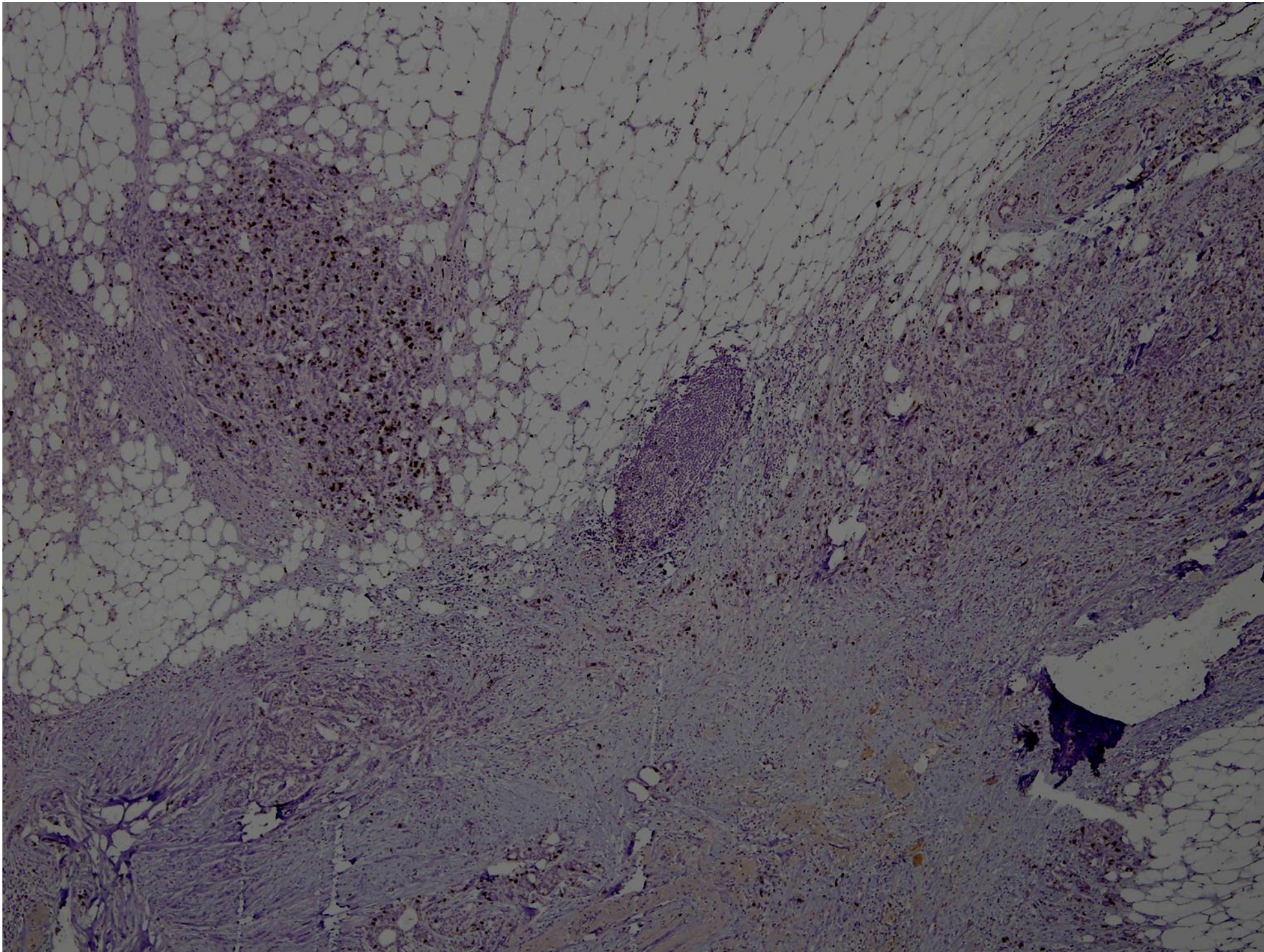












Histology report

<u>HISTOLOGICAL CATEGORY:</u> B1, B2, B3, B4, B5a , B5b B5c, B5d

SPECIMEN TYPE: NCB

LOCATION: right breast, upper out quadrant

IMAGING APPEARANCE: eg. spiculated mass, microcalcifications, arhitectural distorsion, stellate lesion

IMAGING CATEGORY: eg. BI-RADS 4

SIZE OF LESION: 12cm

NUMBER / LENTH: 6 cores, max. length 5,6 cm

MICROCALCIFICATIONS: yes/no (significant / unsignificant)

HISTOLOGICAL DESCRIPTION: eg.columnar changes without atypia

B5b CARCINOMA MAMMAE INVASIVUM

SPECIMEN INFORMATION: 2 cores with poorly diferentiated invasive carcinoma

HISTOLOGICAL TYPE: NST, lobular

NUCLEAR GRADE: I-III

IN SITU CARCINOMA: no/yes (type of DCIS, nuclear grade, necrosis)

VASCULAR INVASION: no/yes

ER: %

PR: %

HER2: negative (0,1+), equivocal (2+), pozitive (3+)

Ki67: %

IMMUNOPHENOTYPE: luminal A, luminal B, luminal B HER2 +, triple negative, HER2 pozitive

Problems and pitfalls

Border line lesions

- Lobular vs DCIS (IHC:E-cadherin, β catenin) management implications different from DCIS
- Ductal hyperplasia vs neoplastic proliferation (IHC: CK 5/14, ER)
- DCIS vs microinvasive carcinoma
- Atypical epithelial proliferation of ductal type
- Focal lactational change vs cancerisation of lobules
- Apocrine atypia (+ sclerosing adenosis) vs DCIS

Problems and pitfalls

Border line lesions

- Lobular vs DCIS (IHC:E-cadherin, β catenin) management implications different from DCIS
- Ductal hyperplasia vs neoplastic proliferation (IHC: CK 5/14, ER)
- DCIS vs microinvasive carcinoma
- Atypical epithelial proliferation of ductal type vs DCIS
- Focal lactational change vs cancerization of lobules
- Apocrine atypia (+ sclerosing adenosis) vs DCIS

- Atypical ductal hyperplasia or atypical epithelial proliferations of ductal type
-
- ADH main criterion: confined to single TDL – cannot be verified on NCB.
- ADH vs secondray lobular cancerization by DCIS of LG/IG
- descriptive term - atypical epithelial proliferations of ductal type
- atypical duct proliferation in interlobular ducts – suspicious of DCIS - B4

- reported risk of malignancy 18 – 83% - excision mandatory

- Apocrine atypia vs apocrine DCIS
- Cautious approach – nuclear size does not indicate malignancy
- Arhitectural pattern assessment:
- Flat and micropapillary – benign
- Solid, cribriform – apocrine DCIS
- Apocrine DCIS:
- multiple duct involvement
- Necrosis
- Mitosis
- High grade cytonuclear atypia

Sclerosing lesions vs invasive carcinoma, tubular carcinoma

- Sclerosing adenosis
- Radial scar / complex sclerosing lesions
- Sclerosing papillary lesions
- Adenomyoepithelial tumors

Papillary lesions

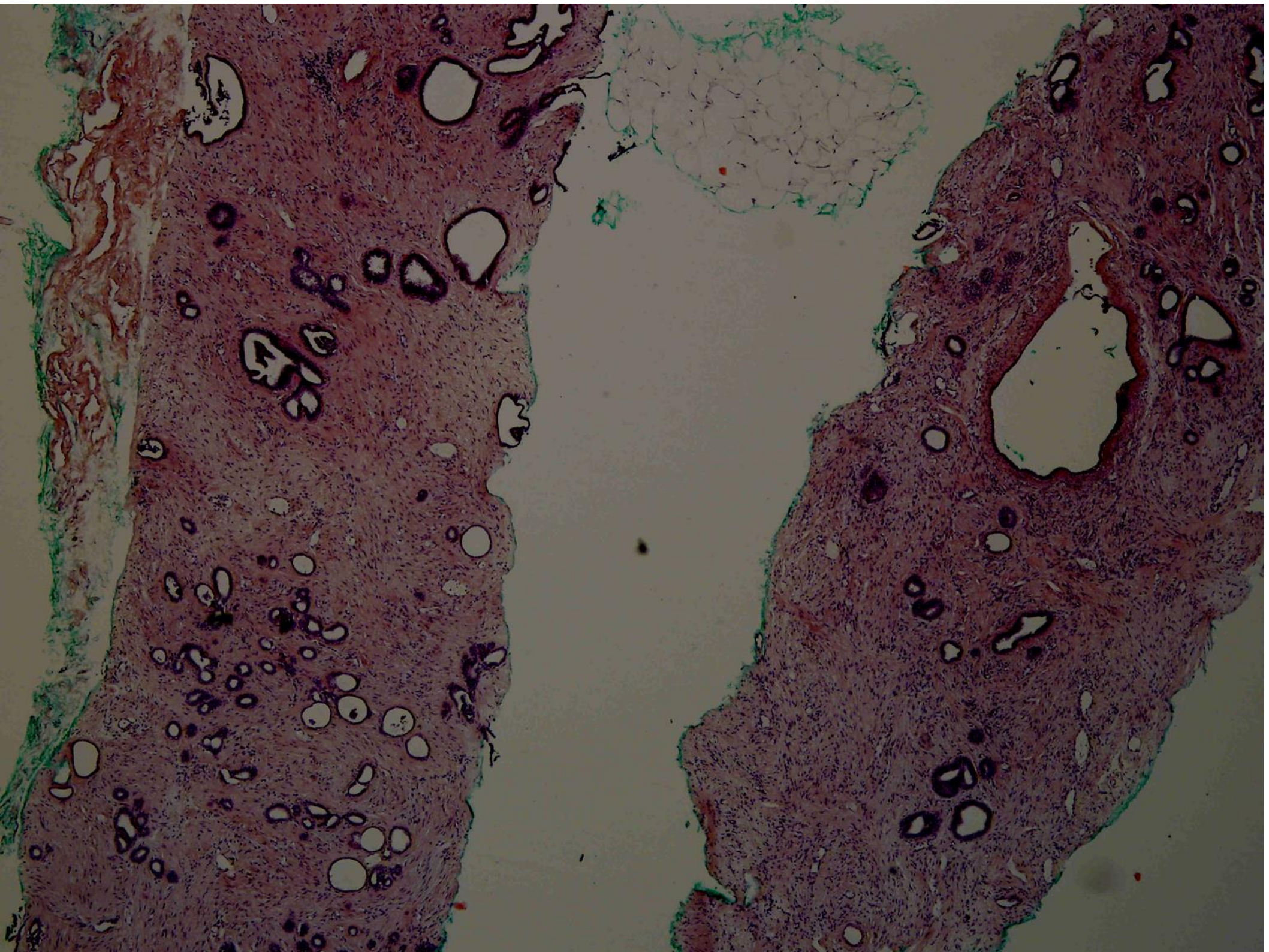
- Widely sampled by NCB or no longer detectible by imaging after NCB – B2
- Atypical proliferations of ductal type within the lesion – B4

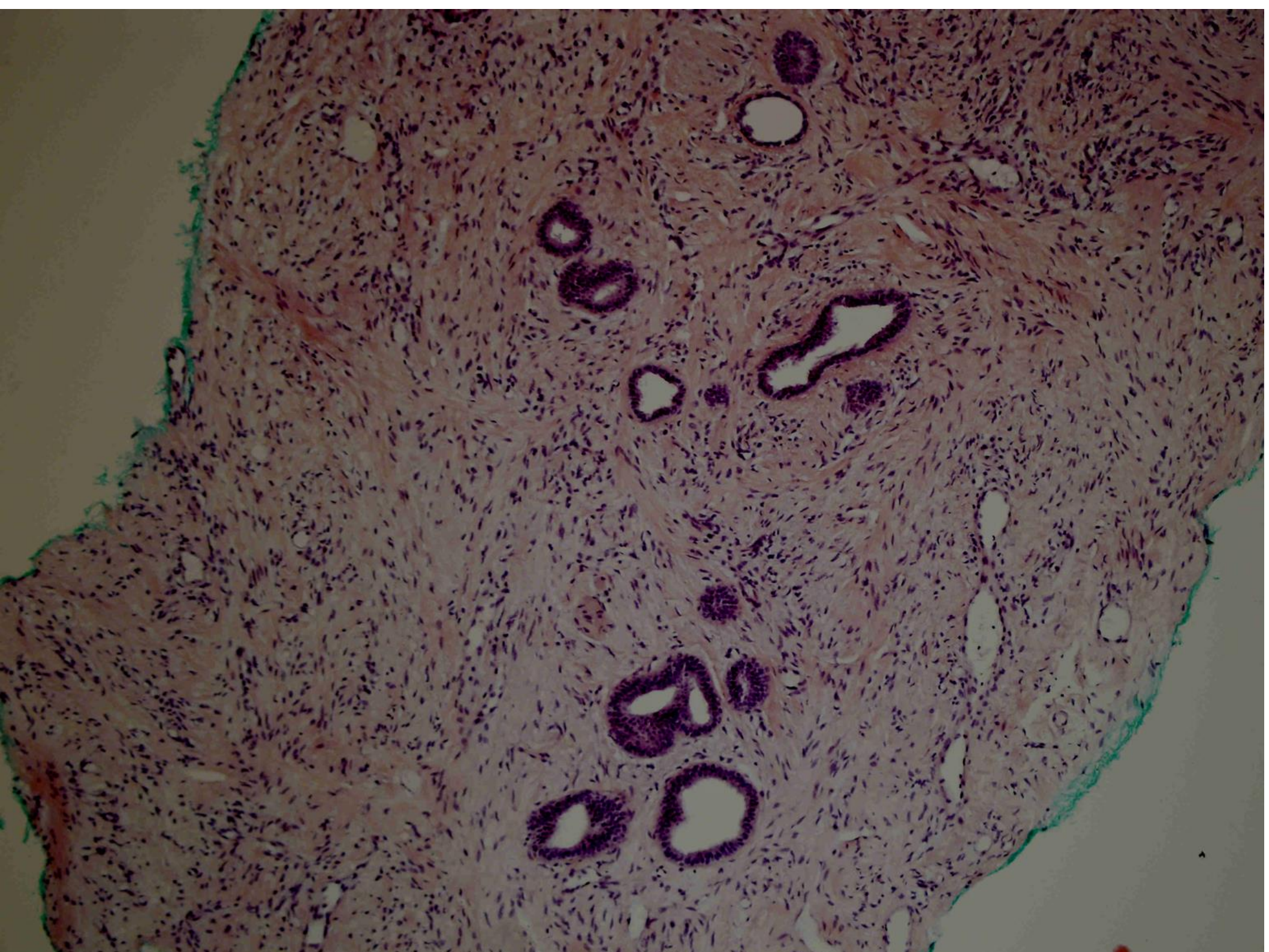
Mucocele-like lesions

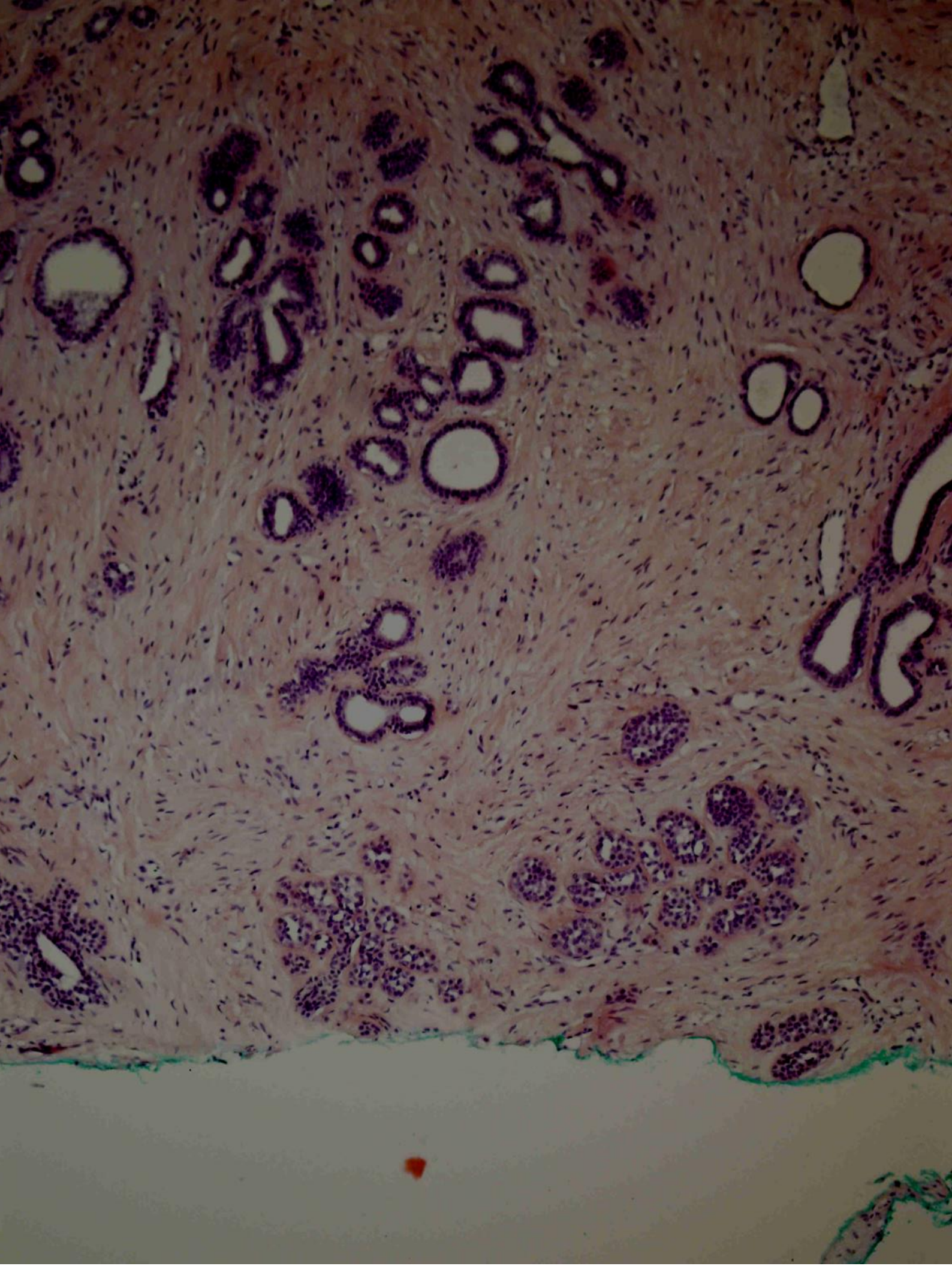
- No safely distinquishing between benign and malignant mucinous lesions

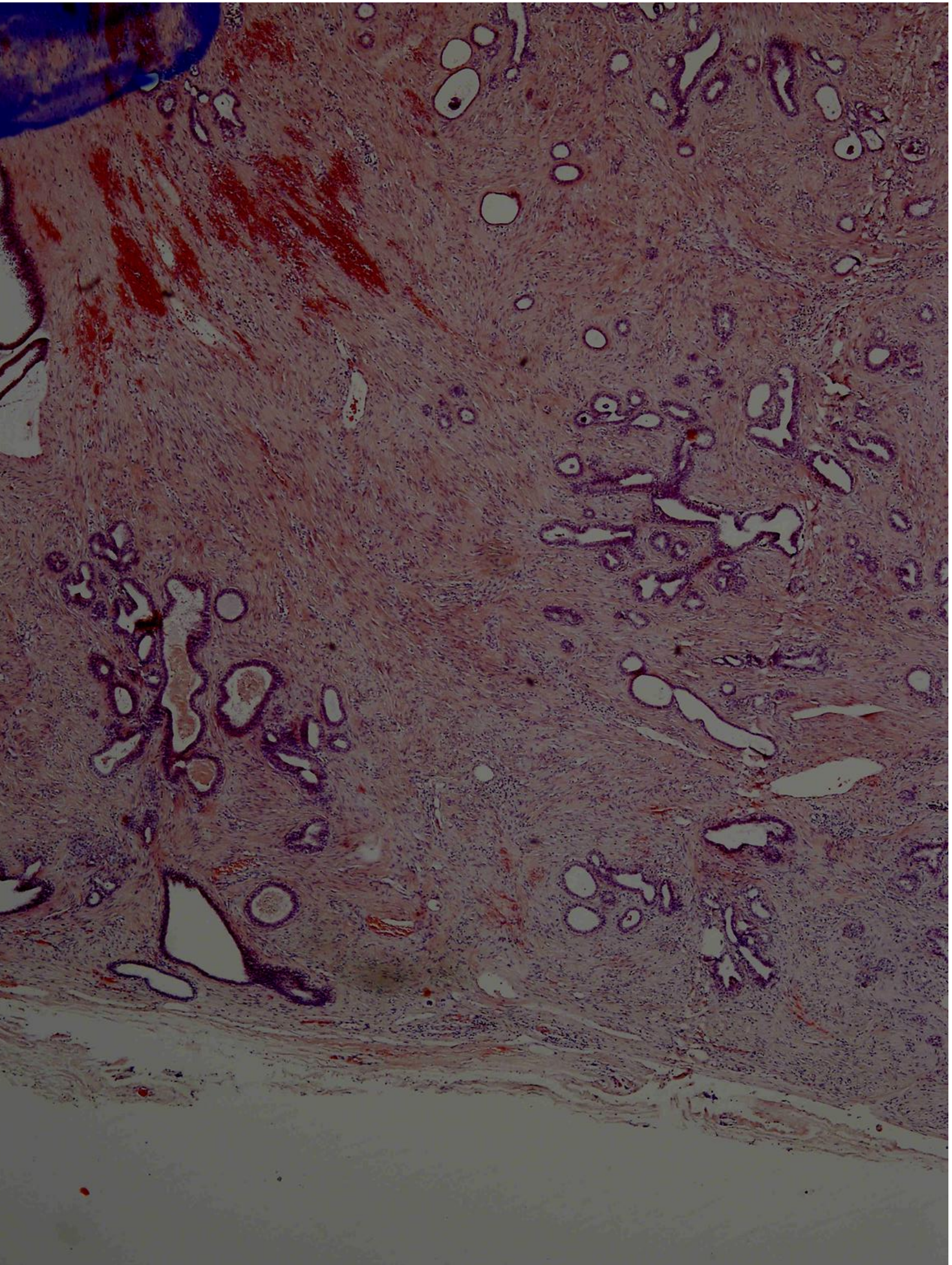
Spindle cell proliferations

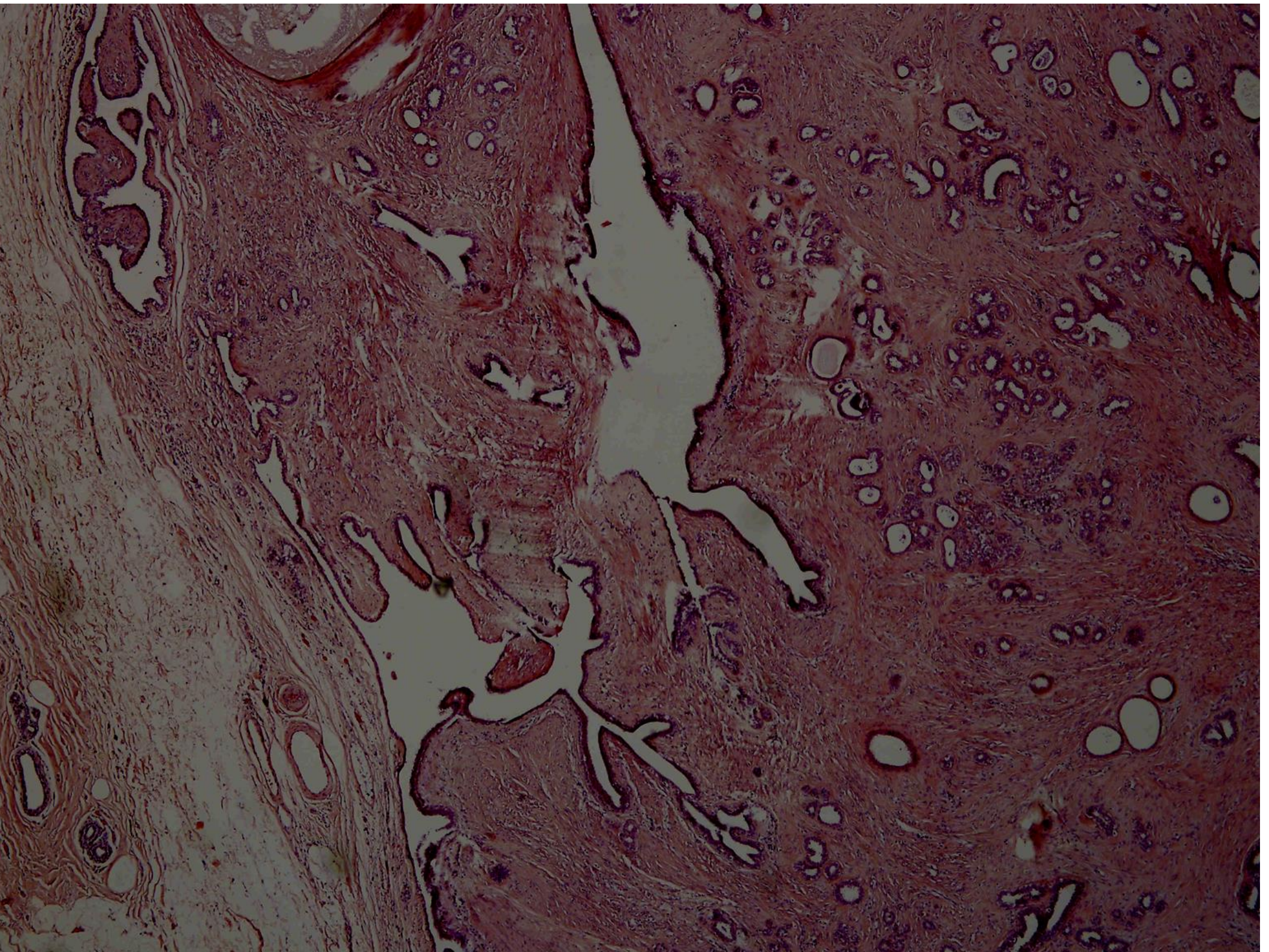
- Spindle cell tumors or carcinoma with spindle cells (IHC)
- Reactive process indistinguishable from tumors even by IHC – spindle cell lesions of uncertain origin – B3
- Fibroepithelial tumors
- Cellular stroma, stromal overgrowth, mitotic activity – suspicious of phyllodes tm – B3
- Clearly malignant phyllodes tm – B5d

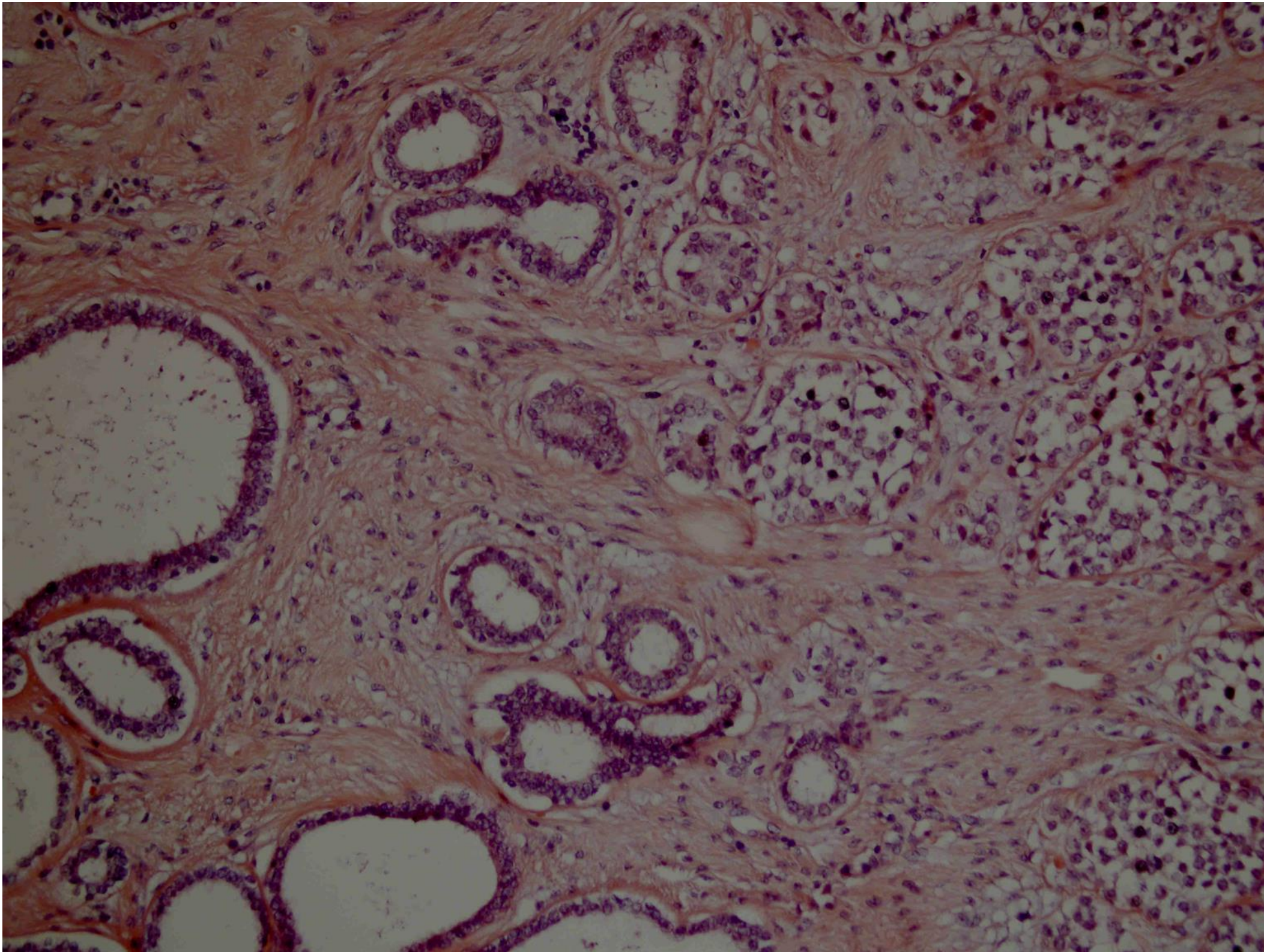


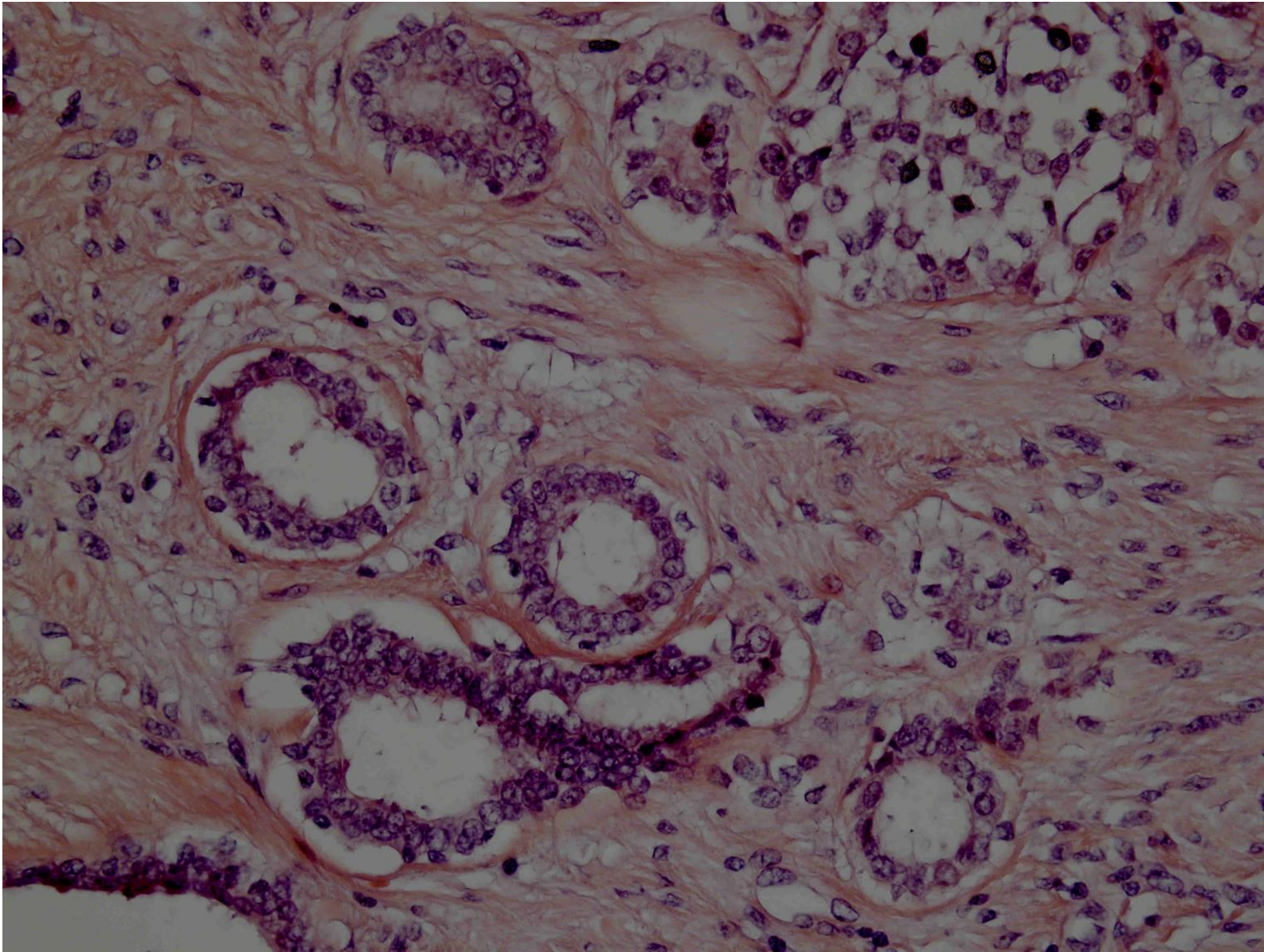


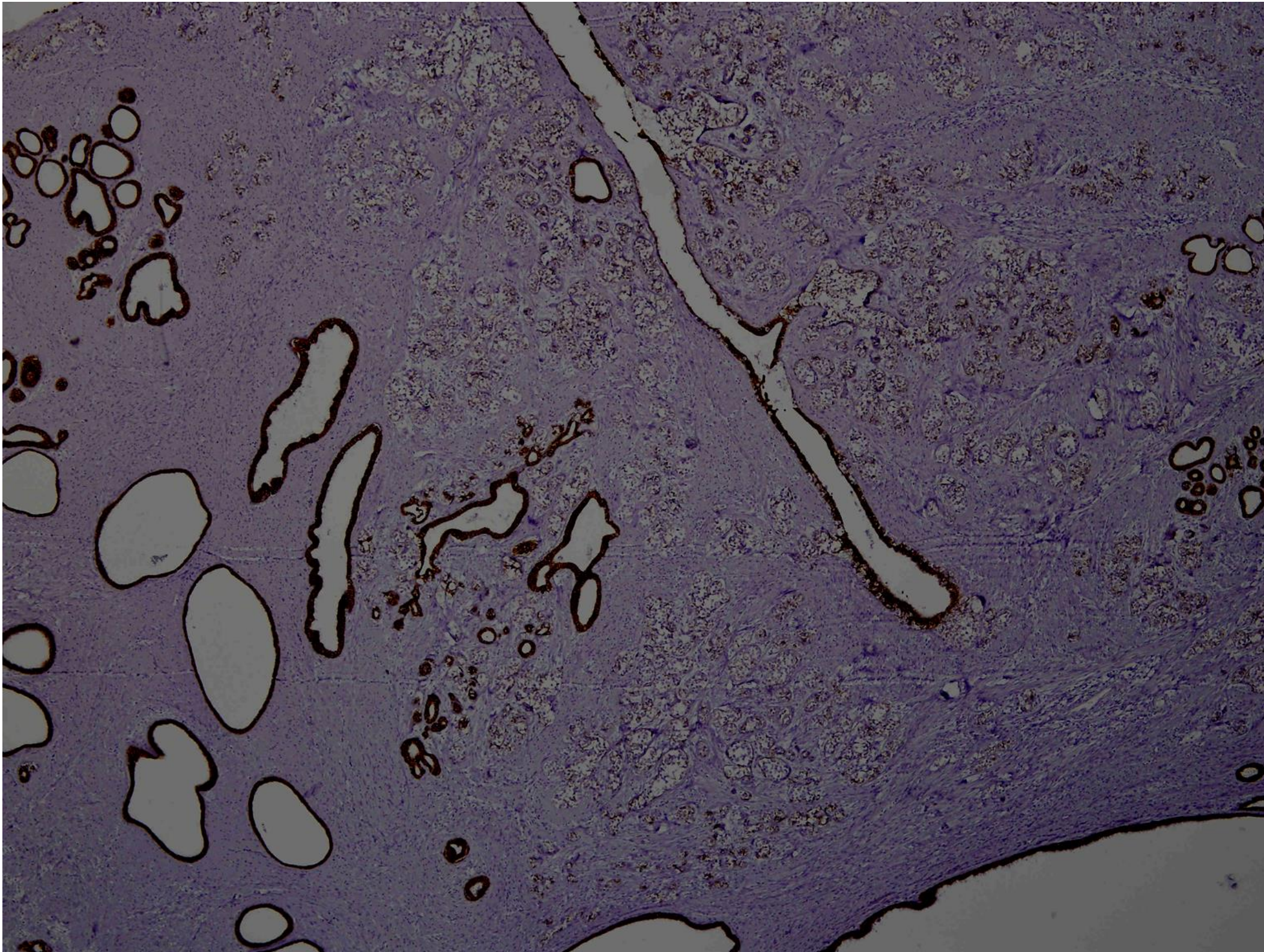


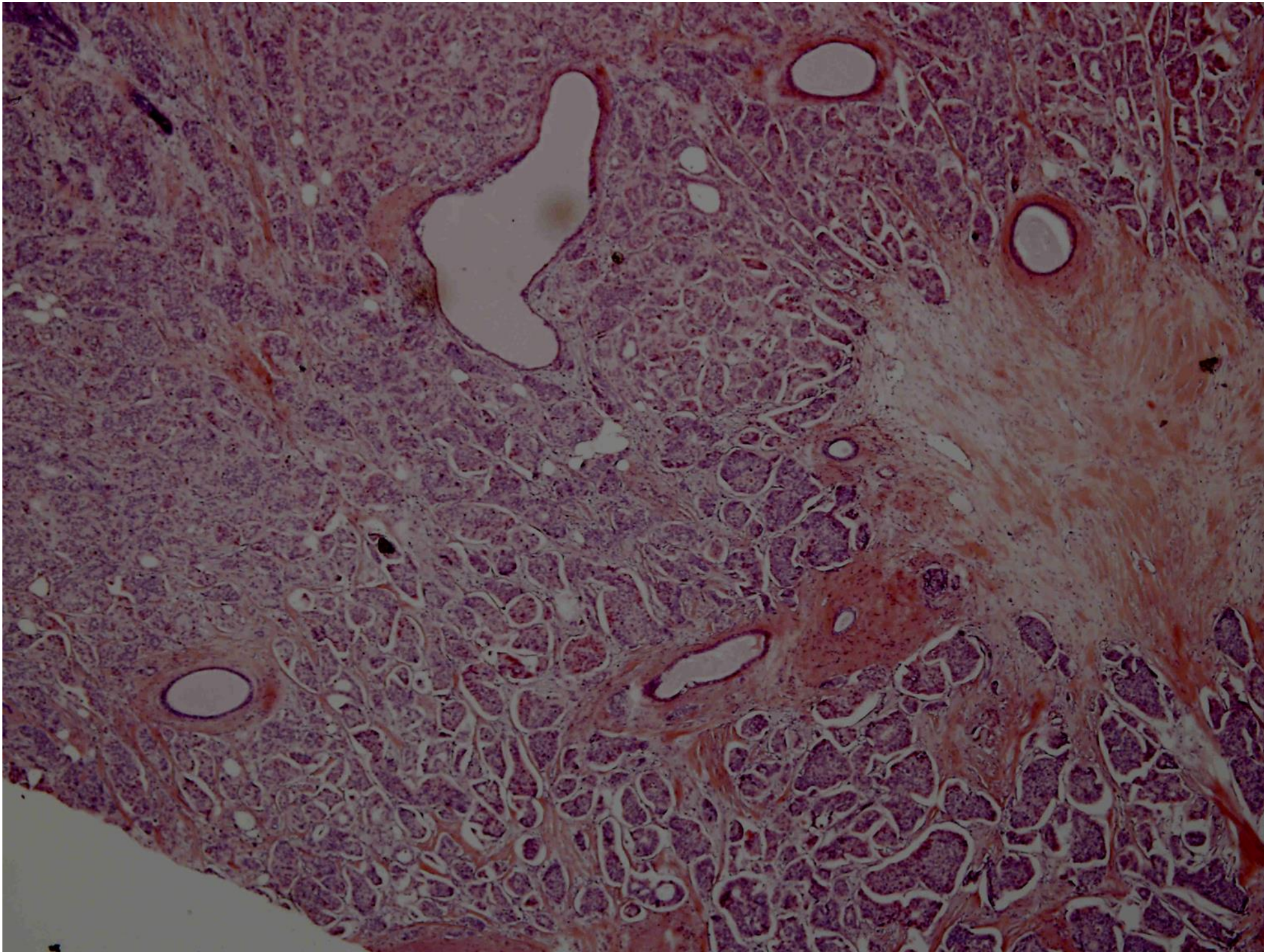


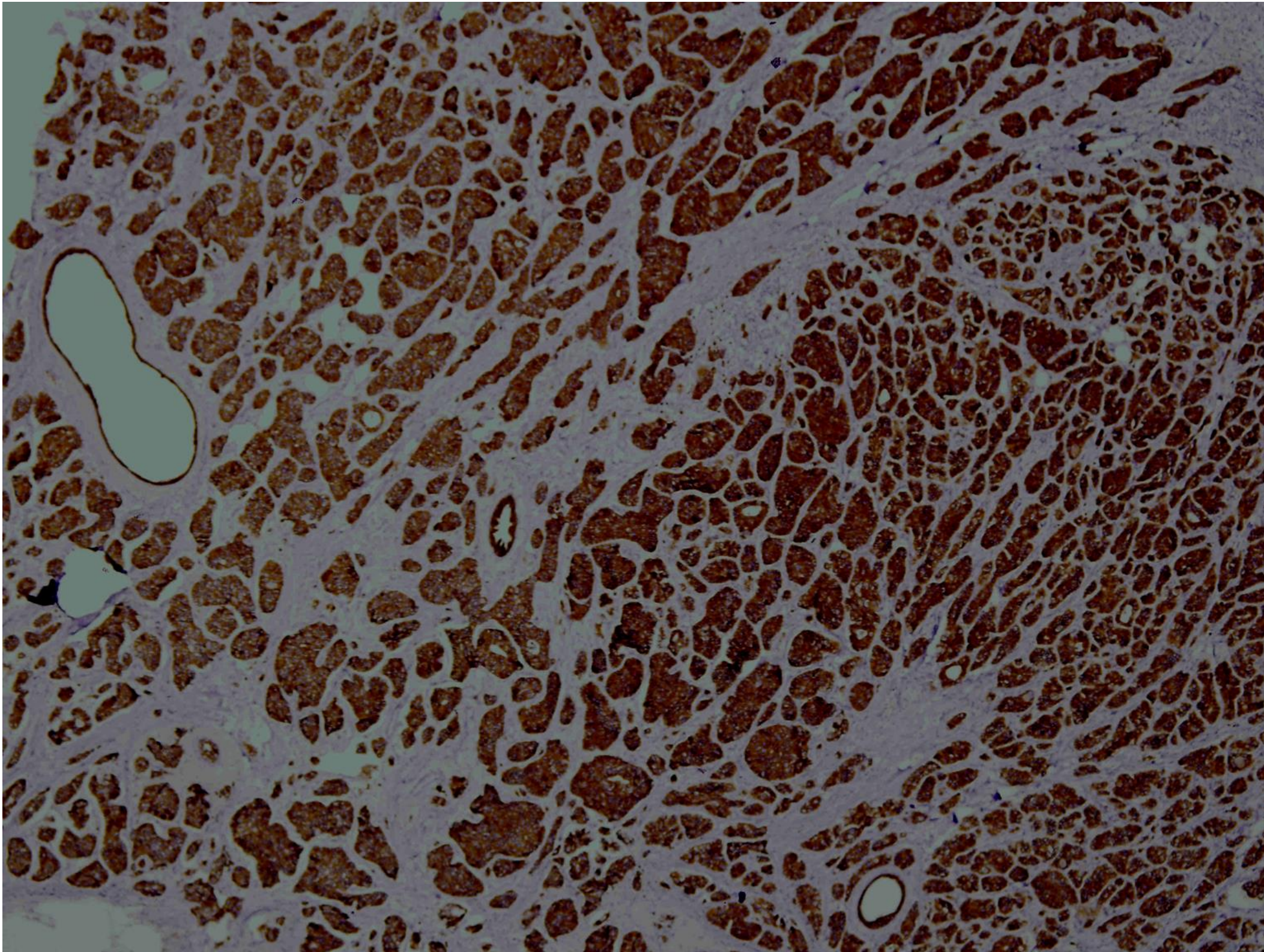












Preoperative multidisciplinary management

B1 not acceptable in indeterminated lesions

no corelation

indeterminated, suspicious, malignant → re-CNB/open biopsy

uncertain corelation

B2 corelation → discharge

indeterminated lesions

no corelation, uncertain corelation → re-CNB/open biopsy

indeterminated lesions, suspicious, malignant

B3

- LIN,
- Atypical proliferation of ductal type,
- Collumnar cell lesion with atypia,
- as incidental findings in association with a mass or calcification identified as histologically benign by CNB → discharge

- papillary lesions and
- radial scars
- without residual imaging findings after CNB → discharge

B4 irrespective of the correlation with imaging → open biopsy/re-CNB

B5 irrespective of the correlation with imaging → therapy

NCB and FNAC diagnosis should be part of triple assessment in a multidisciplinary meeting to decide on therapy, as overdiagnosis and underdiagnosis may occur.