Breast Pathology Course 2020@21

SingHealth DukeNUS ACADEMIC MEDICAL CENTRE PATHOLOGY

Singapore General Hospital SingHealth Division of Pathology

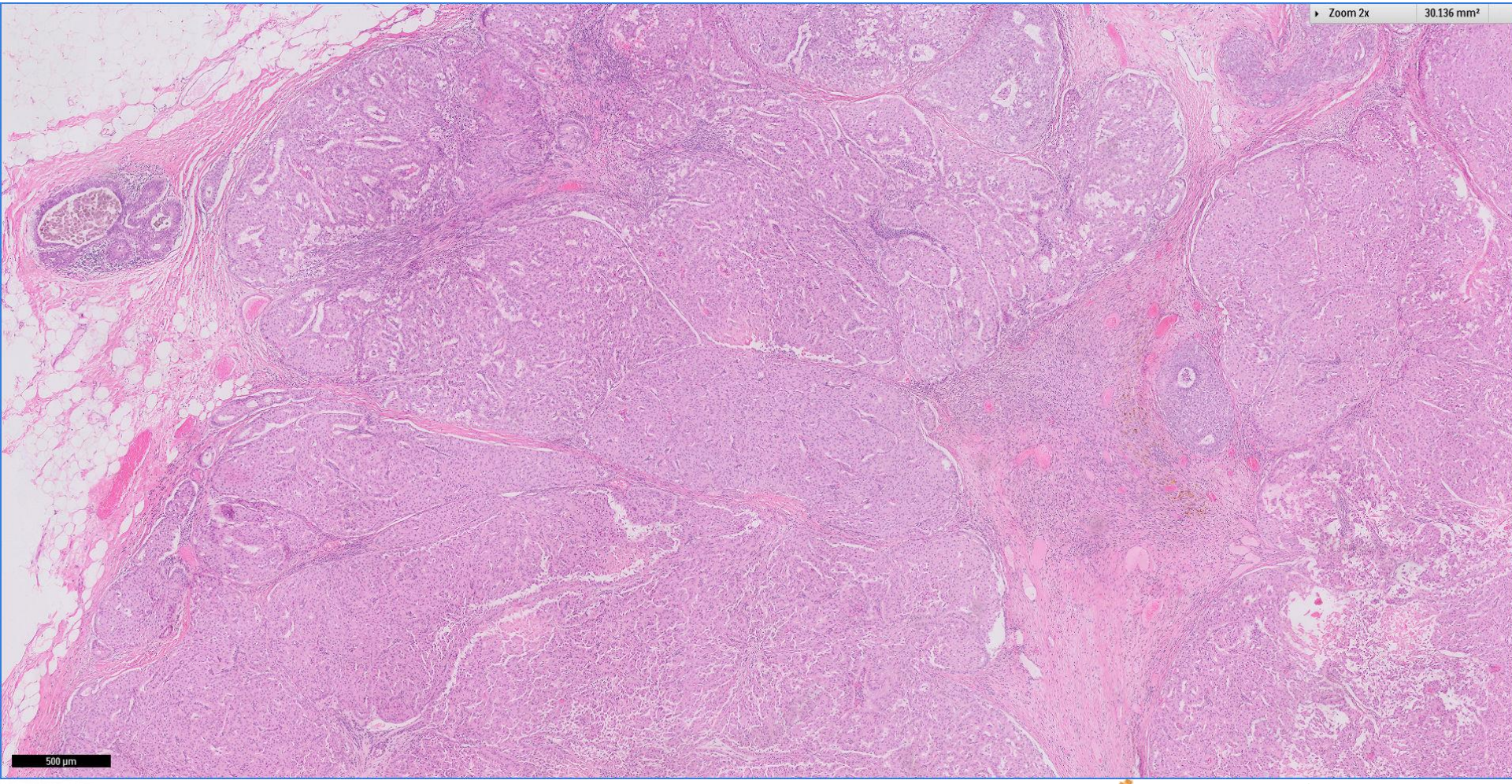
SGH 200

Case 13

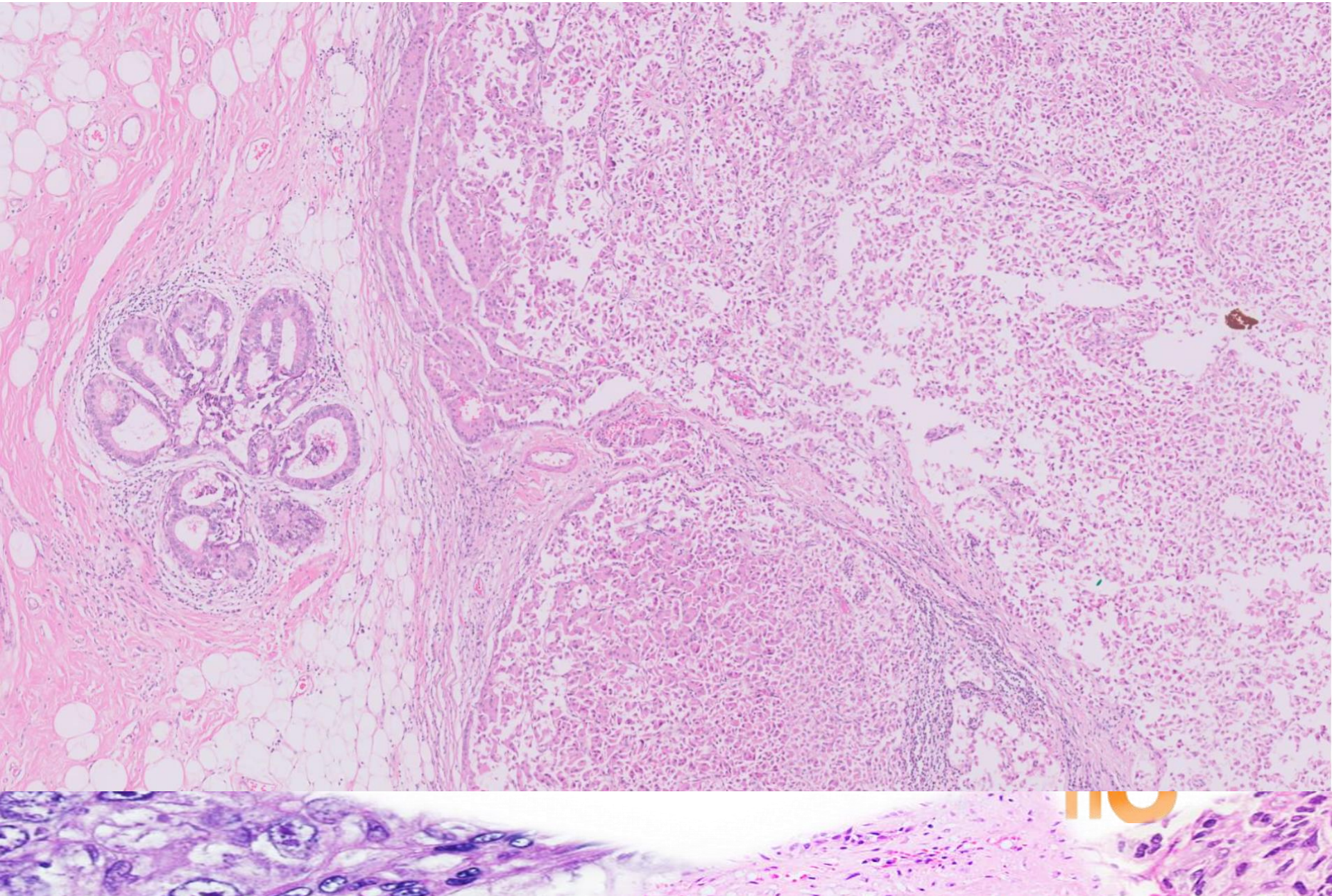
40 year old Chinese female. Right nipple sparing mastectomy.

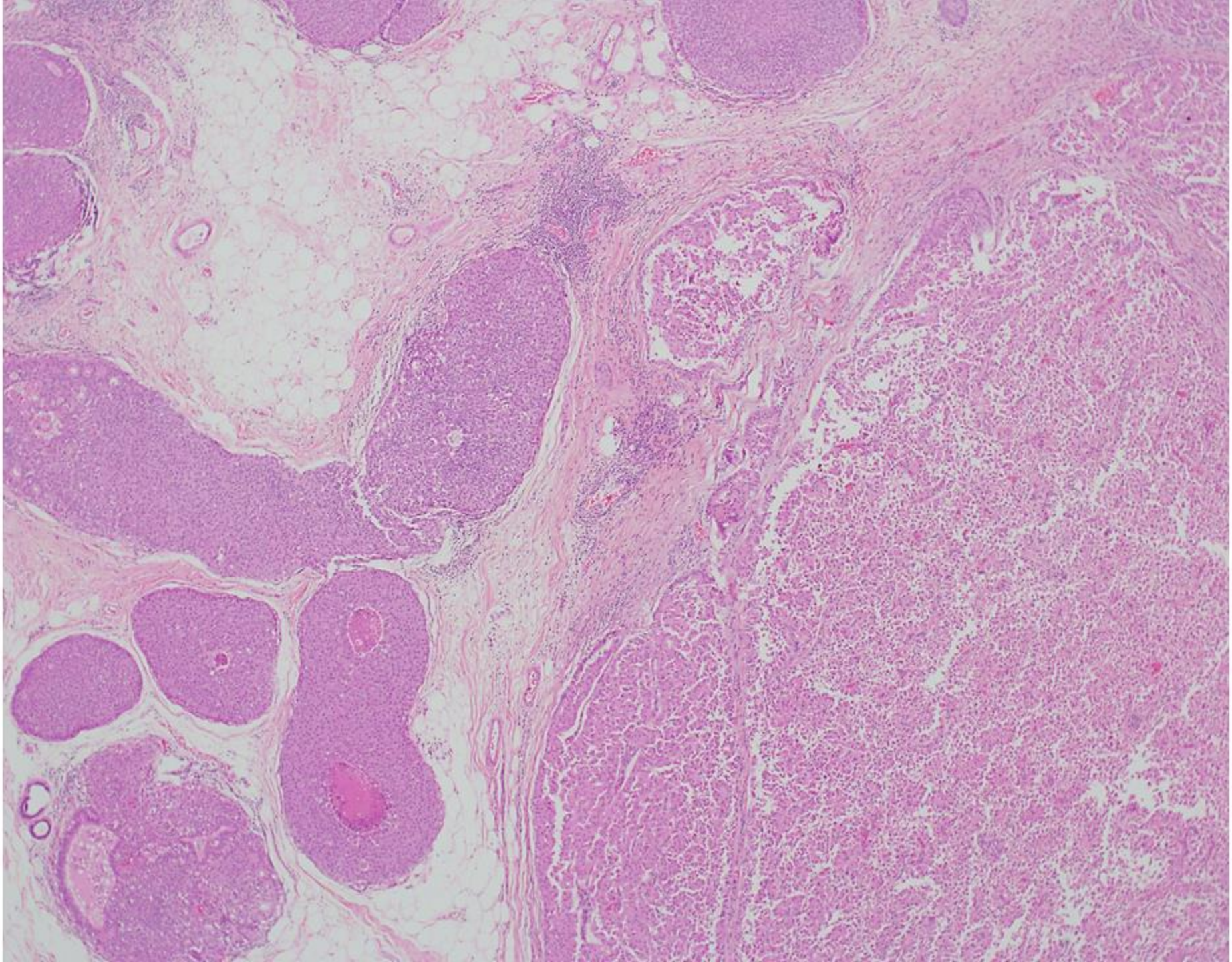
Presented by Puay Hoon Tan

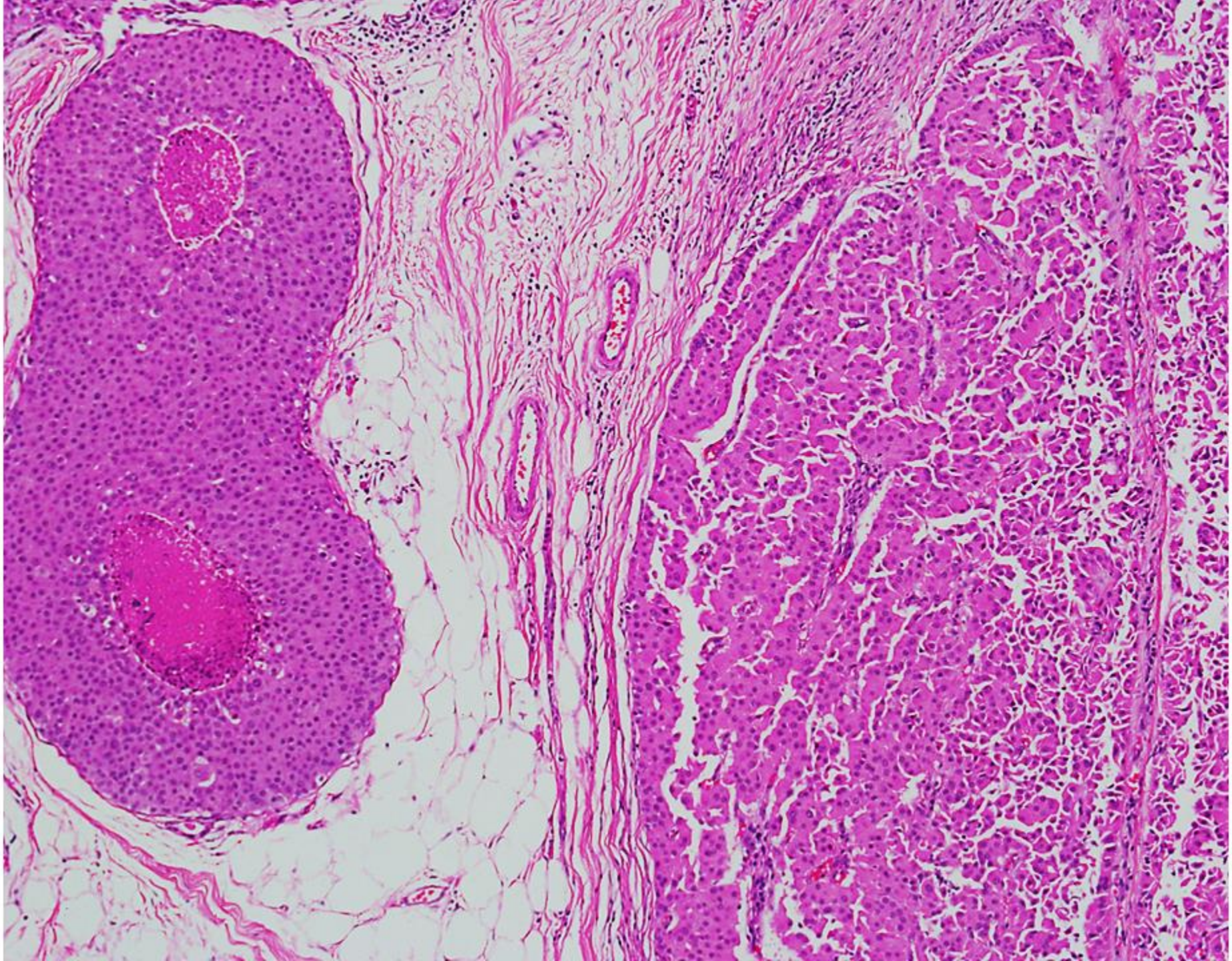
PATHOLOGY 108

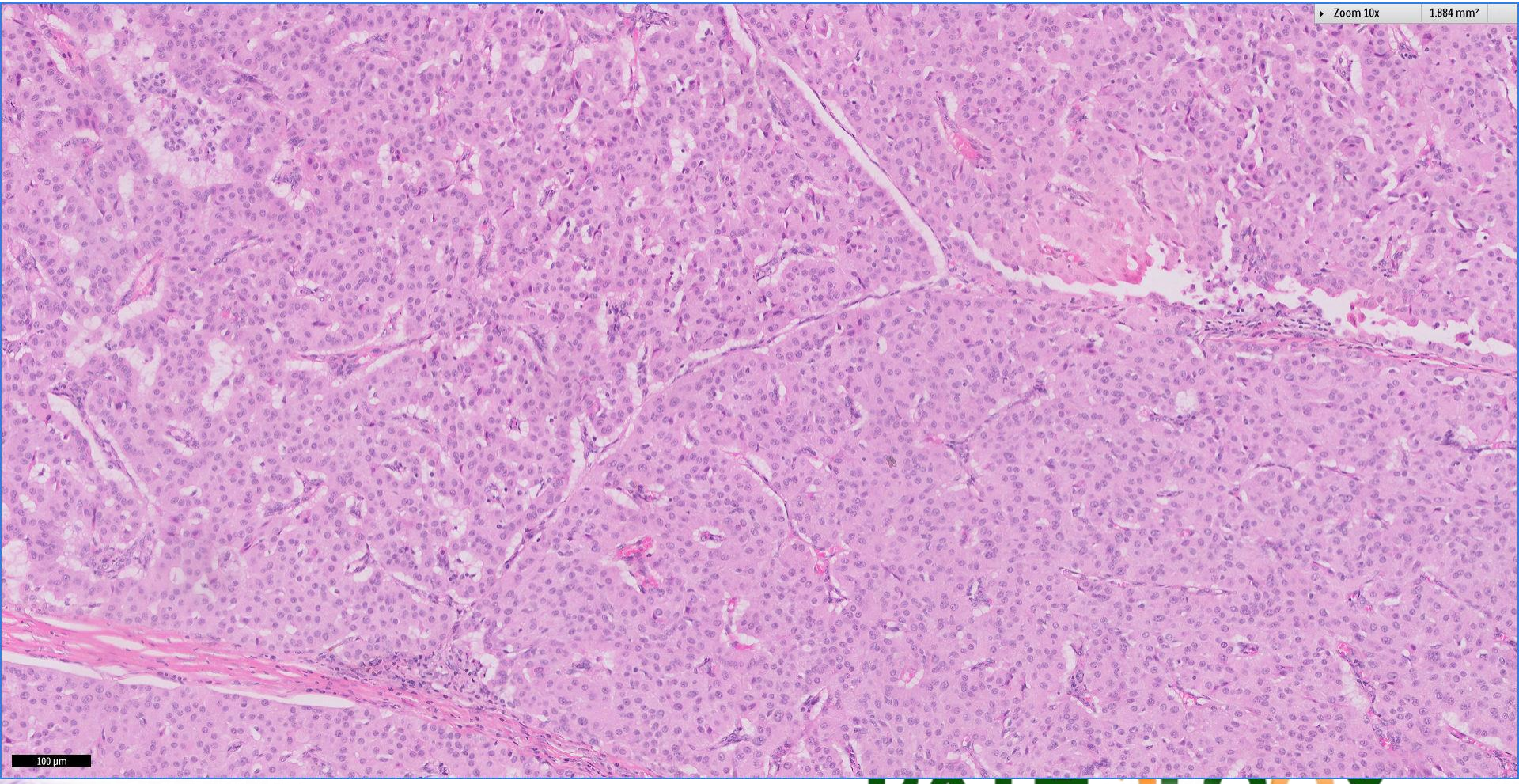


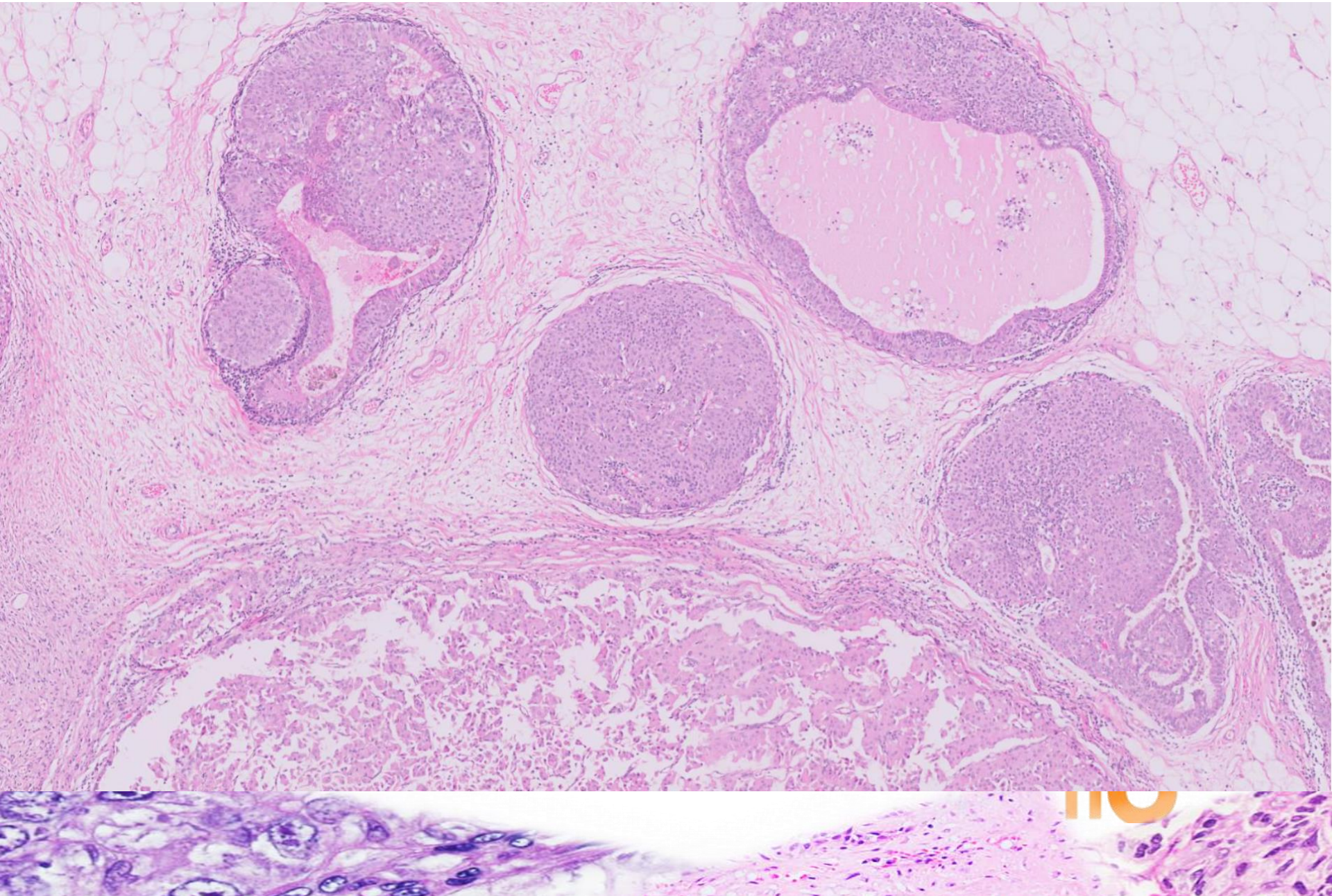
PATHOLOGY 108

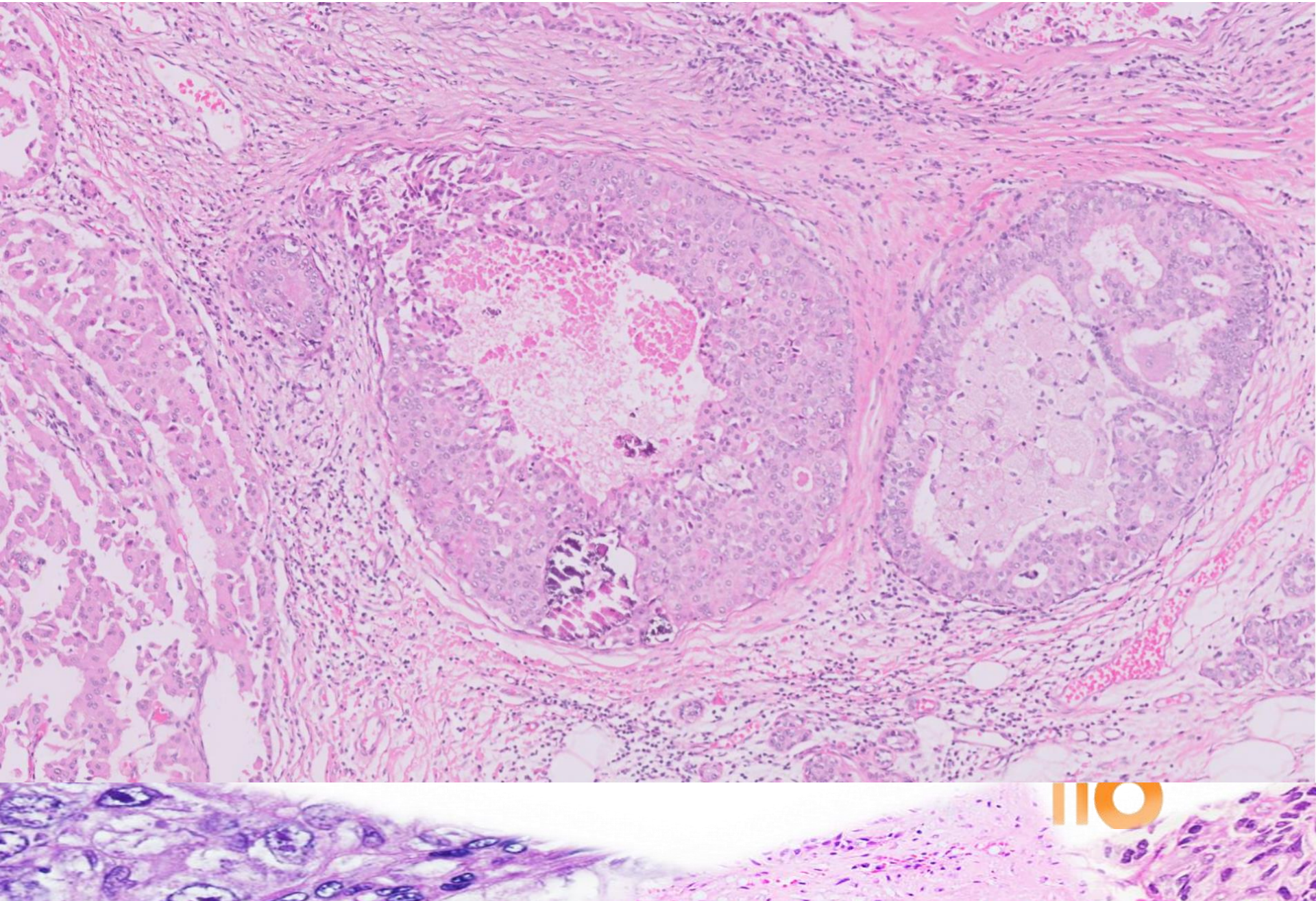


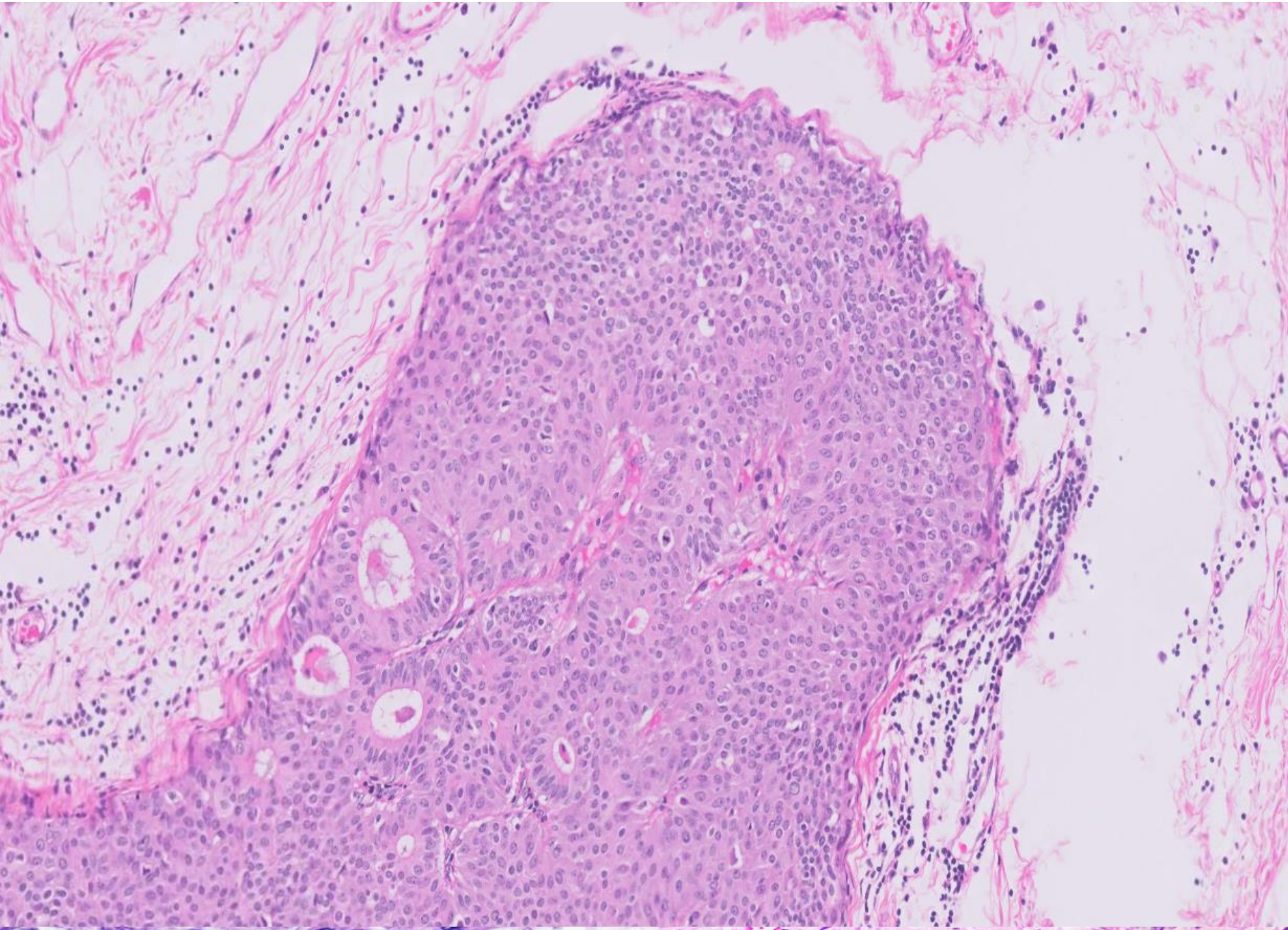





Zoom 10x
1.884 mm²
100 µm







Diagnosis

Right nipple sparing mastectomy:
Encapsulated papillary carcinoma with DCIS intermediate nuclear grade, with necrosis 24mm.

Learning points

- Encapsulated papillary carcinoma can have an apocrine cytomorphology.
- Presence of accompanying DCIS confers a higher risk of local recurrence (WHO 2019).
- Co-existing solid papillary carcinoma can occur.

Pathol Int. 2015 Mar;65(3):133-7. doi: 10.1111/pin.12239. Epub 2014 Dec 24.

Composite encapsulated papillary carcinoma and solid papillary carcinoma.

Cui X(1), Wei S.

Encapsulated papillary carcinoma (EPC) and solid papillary carcinoma (SPC) are distinctive variants of intraductal papillary carcinomas, each accounting for <1% of breast carcinomas. Here we report a composite carcinoma consisting of EPC and SPC.
A 73-year-old woman was found to have a high density mass in the left breast on mammogram. A biopsy showed intermediate to high grade ductal carcinoma in situ (DCIS). Gross examination of the lumpectomy specimen revealed a solid, multinodular mass. Microscopic examination demonstrated two morphologically distinct intraductal carcinomas intermingled with each other. One had delicate papillae in multi-cystic spaces surrounded by thick fibrous capsule, consistent with EPC. The other had solid tumor nests with delicate fibrovascular cores. The cells were monotonous with round nuclei and salt and pepper-like chromatin, characteristic of SPC. The lack of myoepithelial cells within the papillae and at the periphery of the lesion was confirmed by immunostaining for p63 and CK5/6. Neuroendocrine differentiation of SPC was demonstrated by neuron specific enolase staining. To our knowledge, this is the first reported case of composite EPC and SPC. It raises an interesting question as to a possible common pathway of carcinogenesis of these two rare variants.

Table 2 Key immunohistochemical and molecular findings of breast neoplasms with papillary features.

	ER/HER2 staining	Other relevant IHC	Molecular findings
Intraductal papilloma	Heterogeneous positive staining/N.A.	Nil	LOH at 16p13, 16q21 but copy number alterations usually few. Recurrent *PIK3CA* or *AKT1* mutations in up to two-third of cases, present in both epithelial and myoepithelial cells
Papilloma with ADH/DCIS	Uniformly positive in areas of ADH/DCIS/N.A.	Nil	Copy number alterations such as 16q loss, 11q loss and 1q gains enriched in papillomas with co-existing DCIS/IDC compared to benign papillomas. *PIK3CA*/*AKT1* mutation is uncommon in papillomas with DCIS/IDC compared to benign papillomas. Atypical papilloma more likely clonally related to co-existing DCIS or IDC compared to benign papilloma with synchronous carcinoma
Papillary DCIS	Usually positive/N.A.	Nil	Similar to conventional type DCIS
Encapsulated papillary carcinoma	Usually positive but may be negative in high grade and apocrine types/negative	Nil	EPC and SPC have a similar prevalence of *PIK3CA* mutations, but lower number of copy number alterations compared to low grade, ER-positive IDC. Transcriptomically, they have a lower expression of genes related to cellular growth, cell assembly and organization, cell movement and migration, which may explain their indolent behavior. SPC has a higher level of expression of genes related to neuroendocrine differentiation compared to EPC and is transcriptomically similar to hypercellular mucinous carcinoma
Solid-papillary carcinoma	Positive/negative	Synaptophysin and chromogranin often positive	
Invasive papillary carcinoma	Usually positive/negative	Nil	Limited data
AME	Positive or negative/N.A.	RAS Q61R IHC positive in mutated cases	Recurrent *PIK3CA* or *AKT1* mutations in ER-positive cases. Recurrent *HRAS* Q61R mutations with *PIK3CA* or *PIK3R1* mutations in ER-negative cases
Tall cell carcinoma with reversed polarity	Usually negative to low positive/negative	CK5/6, CK7, calretinin positive. IDH2 R172S IHC positive in mutated cases	Recurrent *IDH2* R172 mutation with concurrent *PIK3CA* or *PIK3R1* mutations

ADH atypical ductal hyperplasia, *AME* adenomyoepithelioma, *DCIS* ductal carcinoma in situ, *EPC* encapsulated papillary carcinoma, *IDC* invasive ductal carcinoma, *IHC* immunohistochemistry, *N.A.* not applicable, *SPC* solid-papillary carcinoma.

Tay et al. Mod Pathol epub

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Thank you!