

Ovarian Mucinous Tumors: Primary *Versus* Metastases

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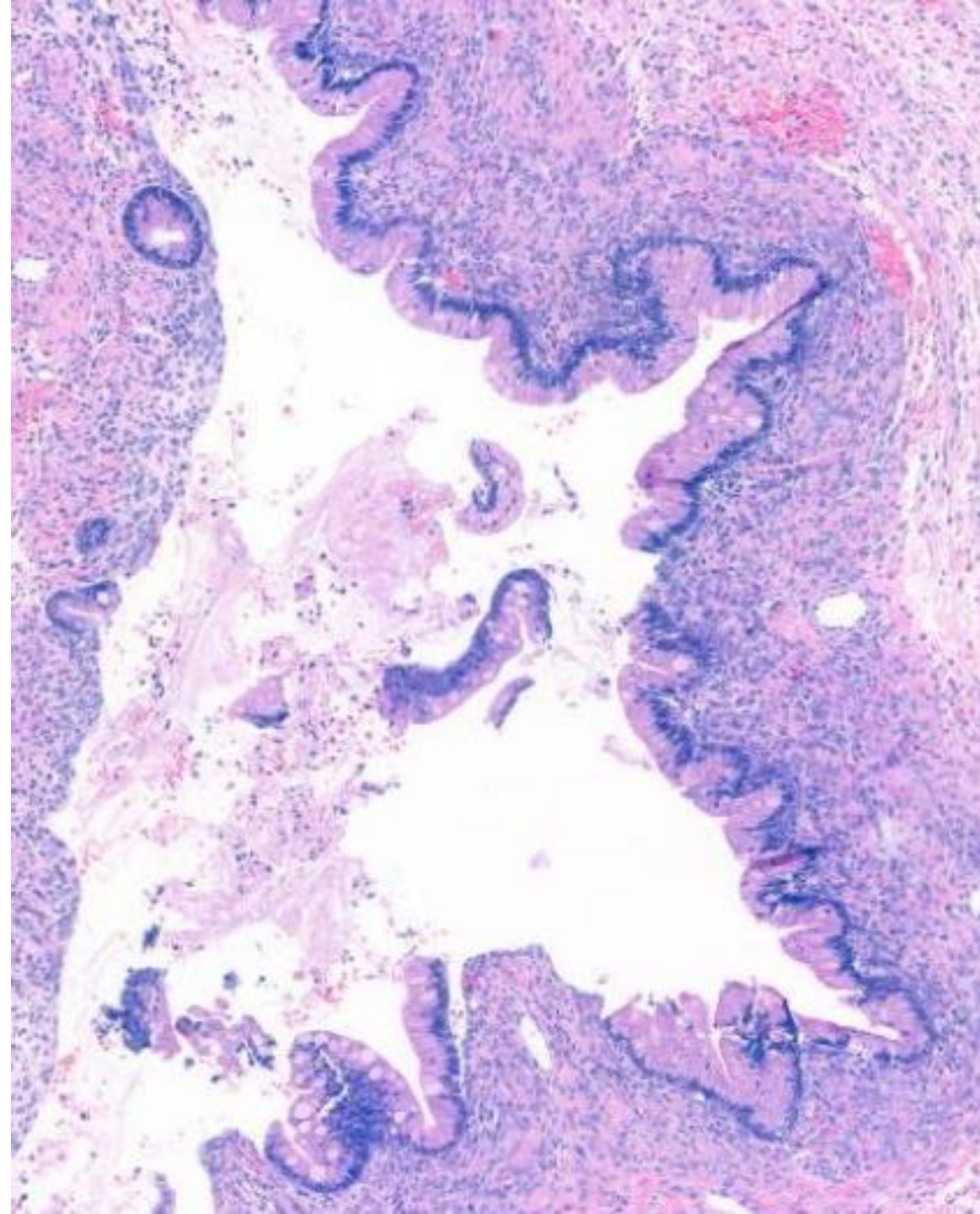
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Classification of Primary Ovarian Mucinous Neoplasms

- Mucinous cystadenoma/cystadenofibroma
- Mucinous borderline tumor
- Mucinous carcinoma:
 - ✓ Expansile growth
 - ✓ Infiltrative growth

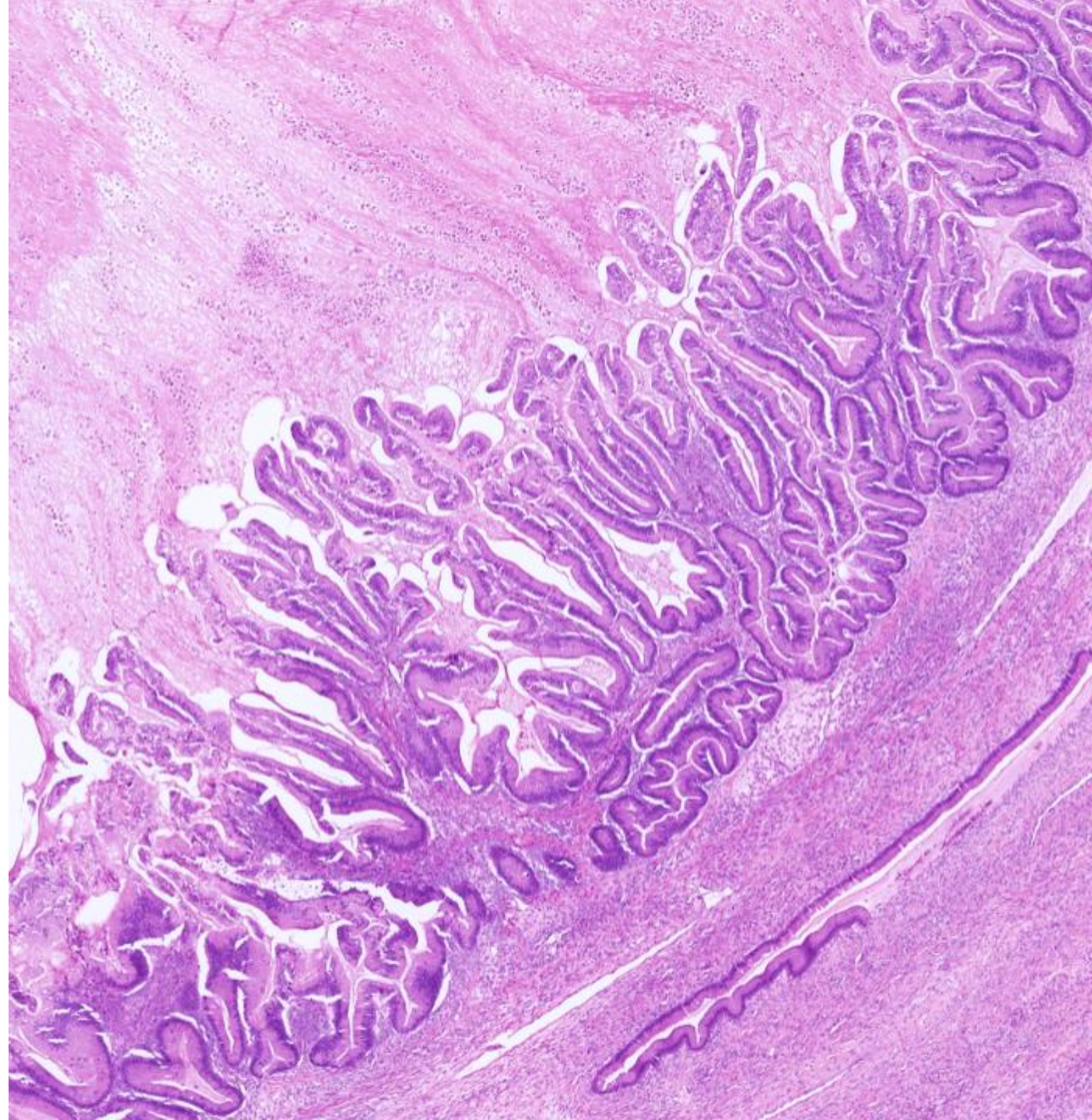
Mucinous Cystadenoma/ Cystadenofibroma

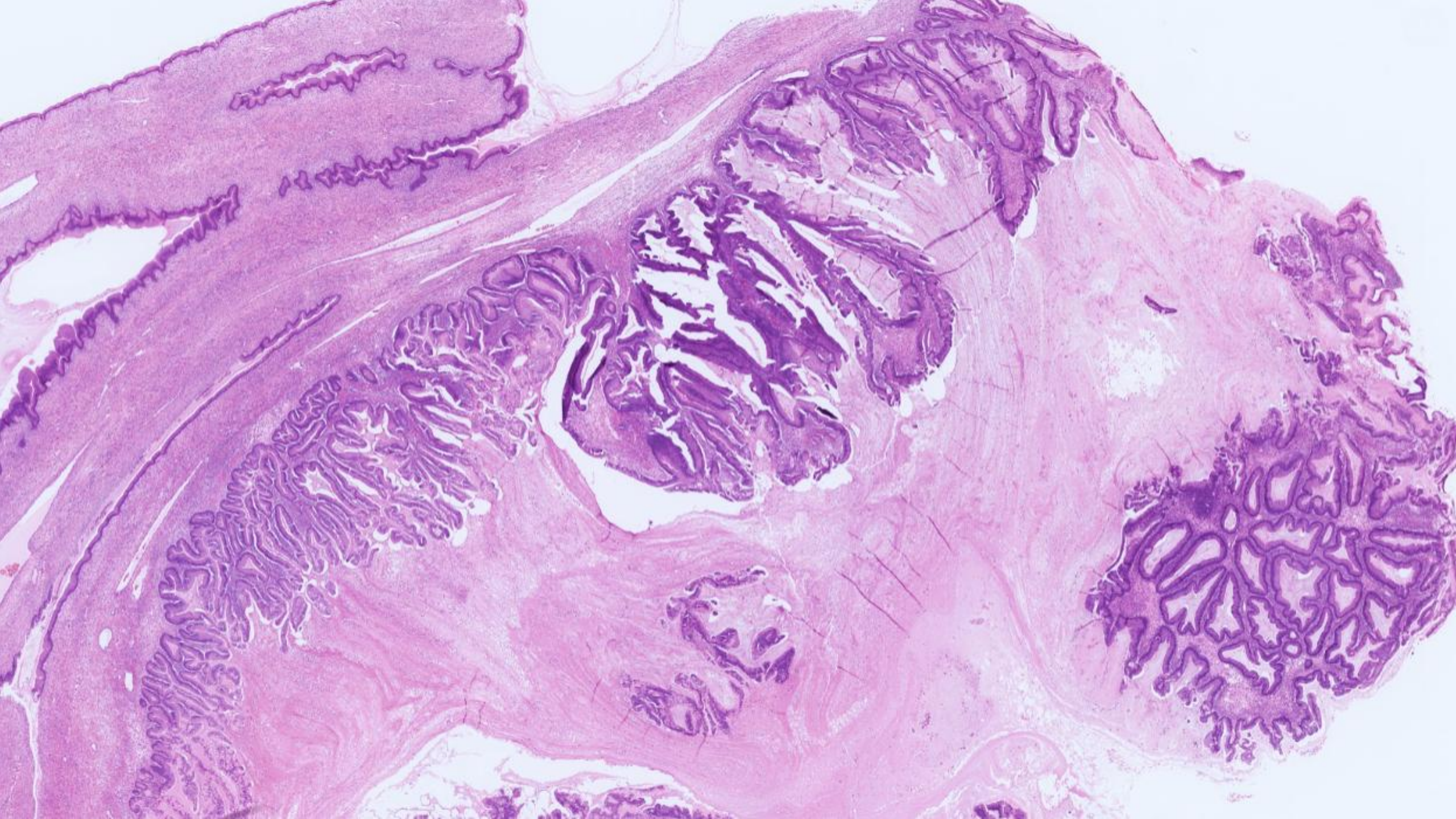
- Maybe associated with mature cystic teratoma or Brenner tumor
- Unilateral
- Mucinous epithelium lacking architectural or cytologic atypia
- **IHC:**
 - ✓ Pos CK7, $\pm$ CK20, CDX2, PAX8
 - ✓ Neg ER, PR
- Excellent prognosis

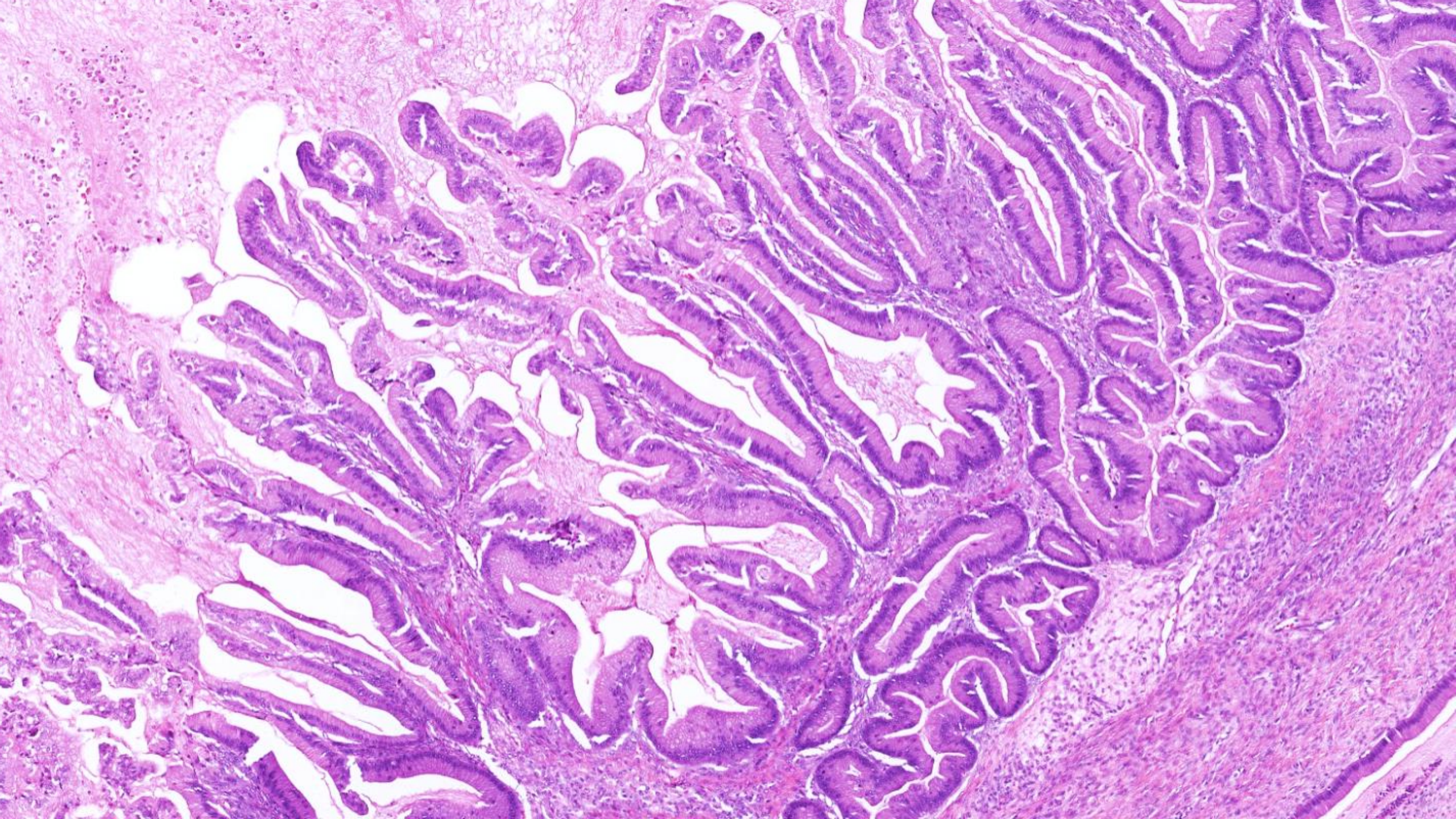


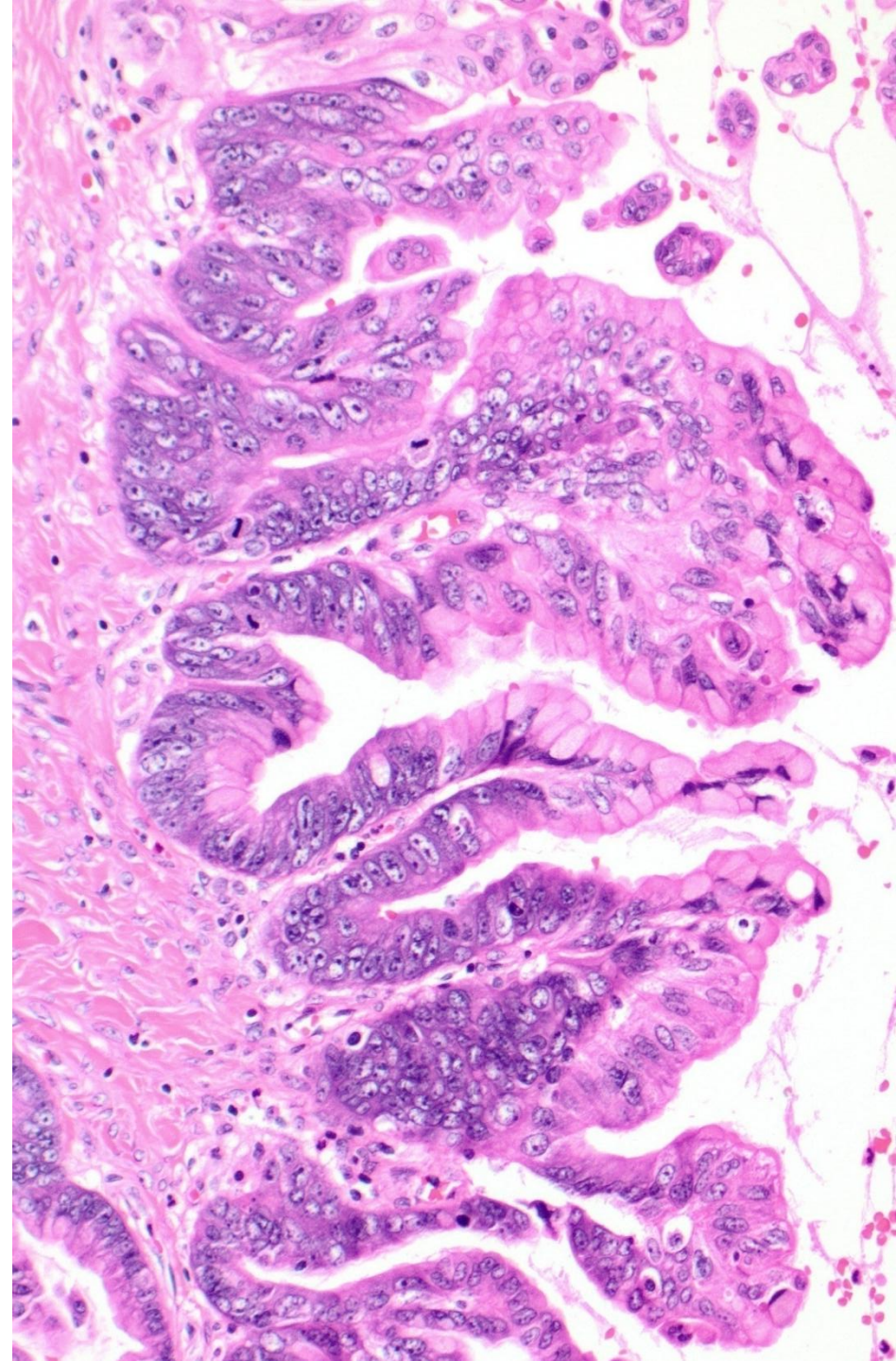
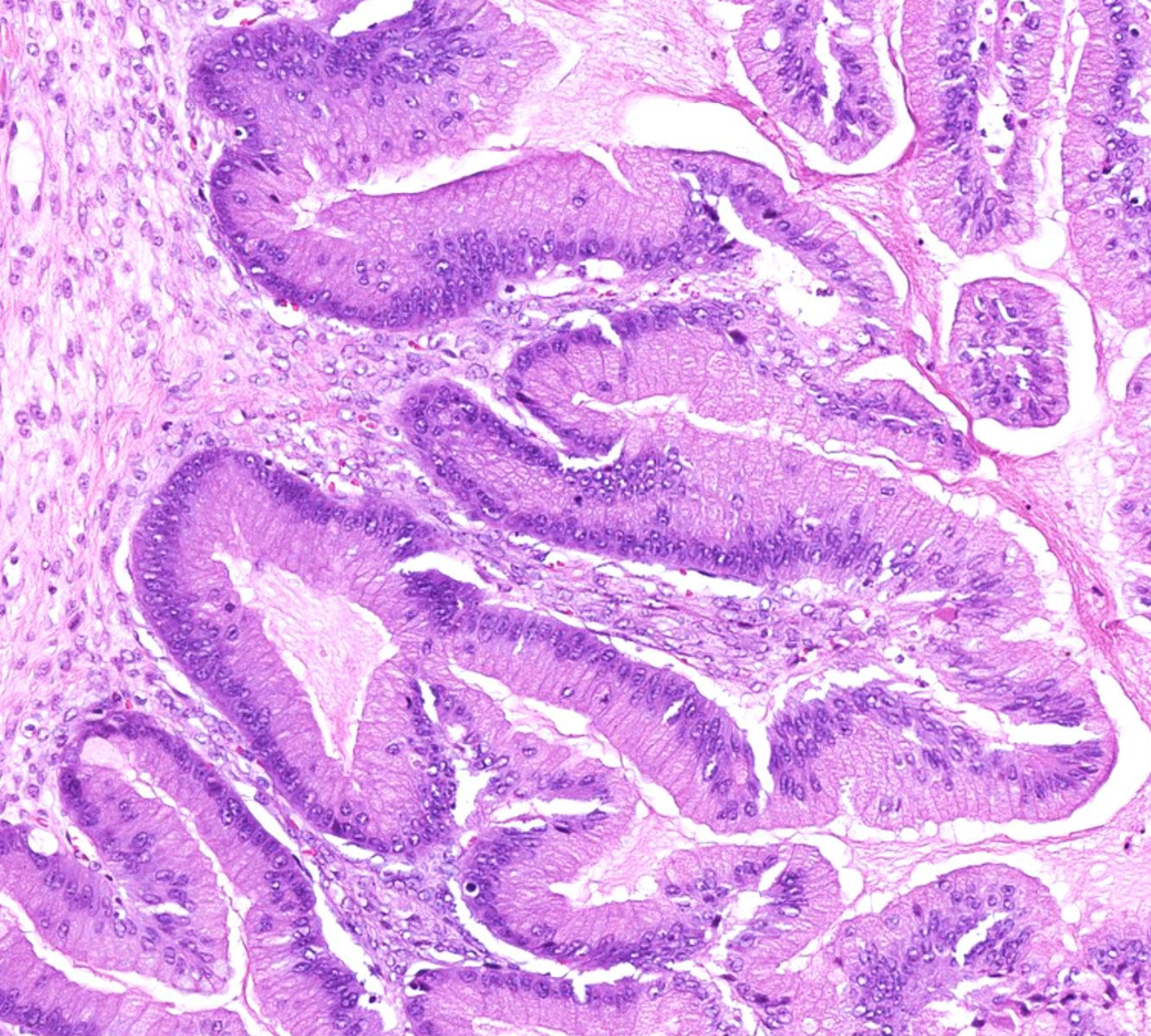
Mucinous Borderline Tumor

- Variable degrees of epithelial stratification, tufting, and villous or slender filiform papillae, in $\geq 10\%$ of tumor
- Low-grade nuclear atypia
- No stromal invasion

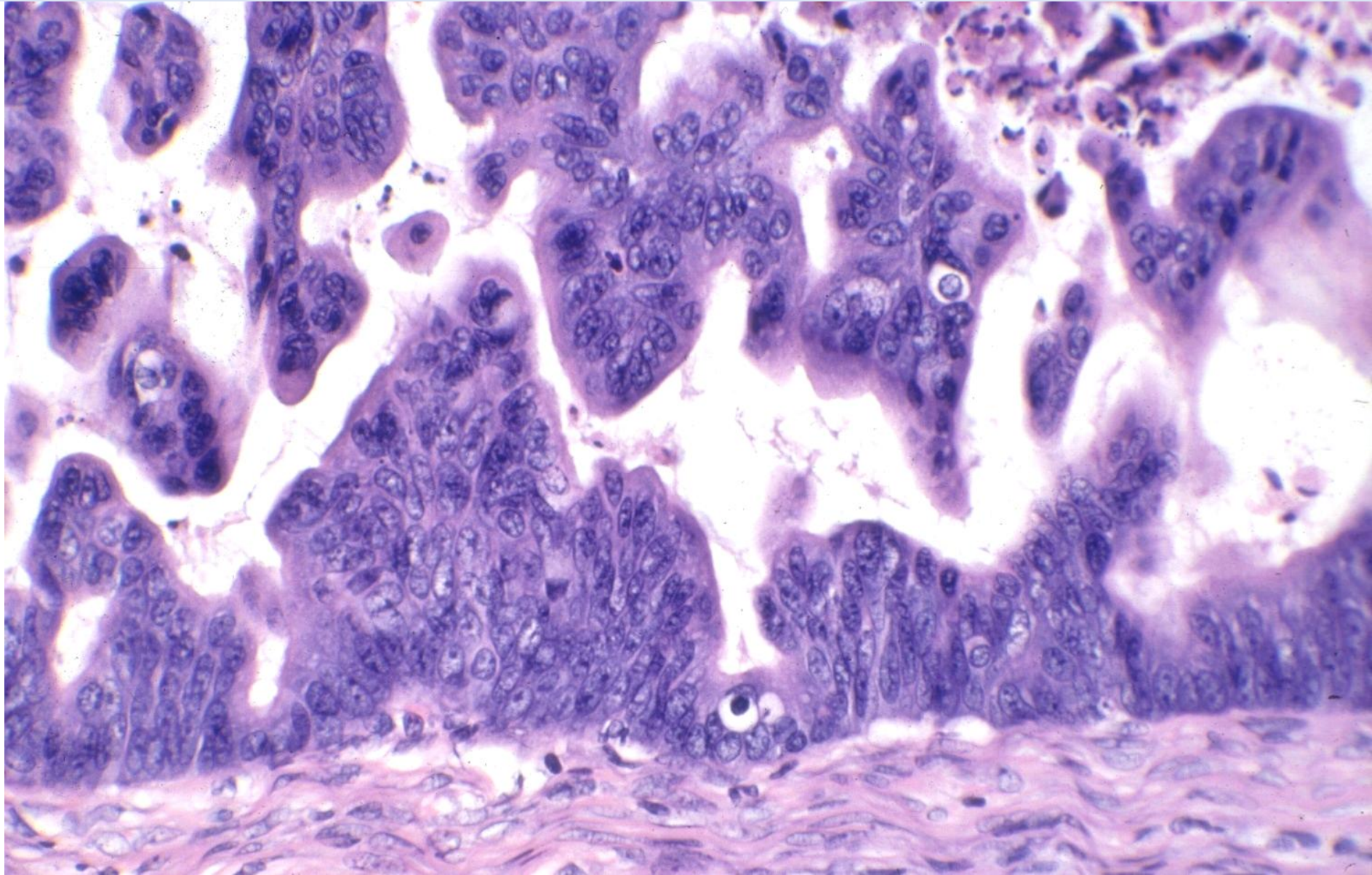
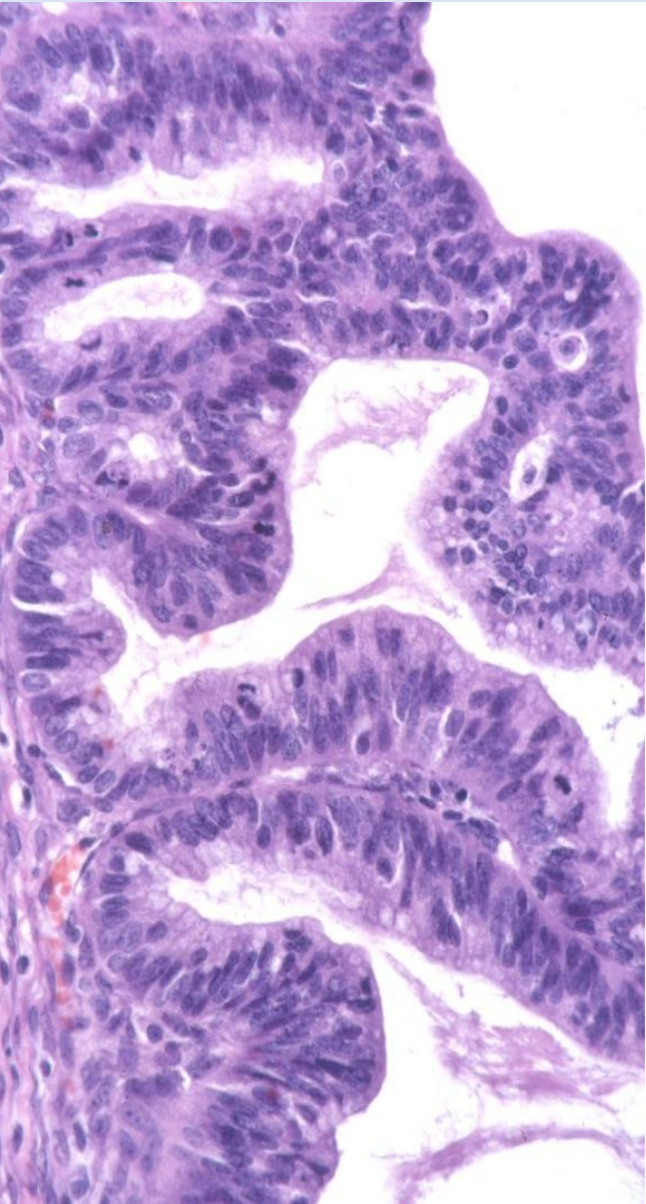






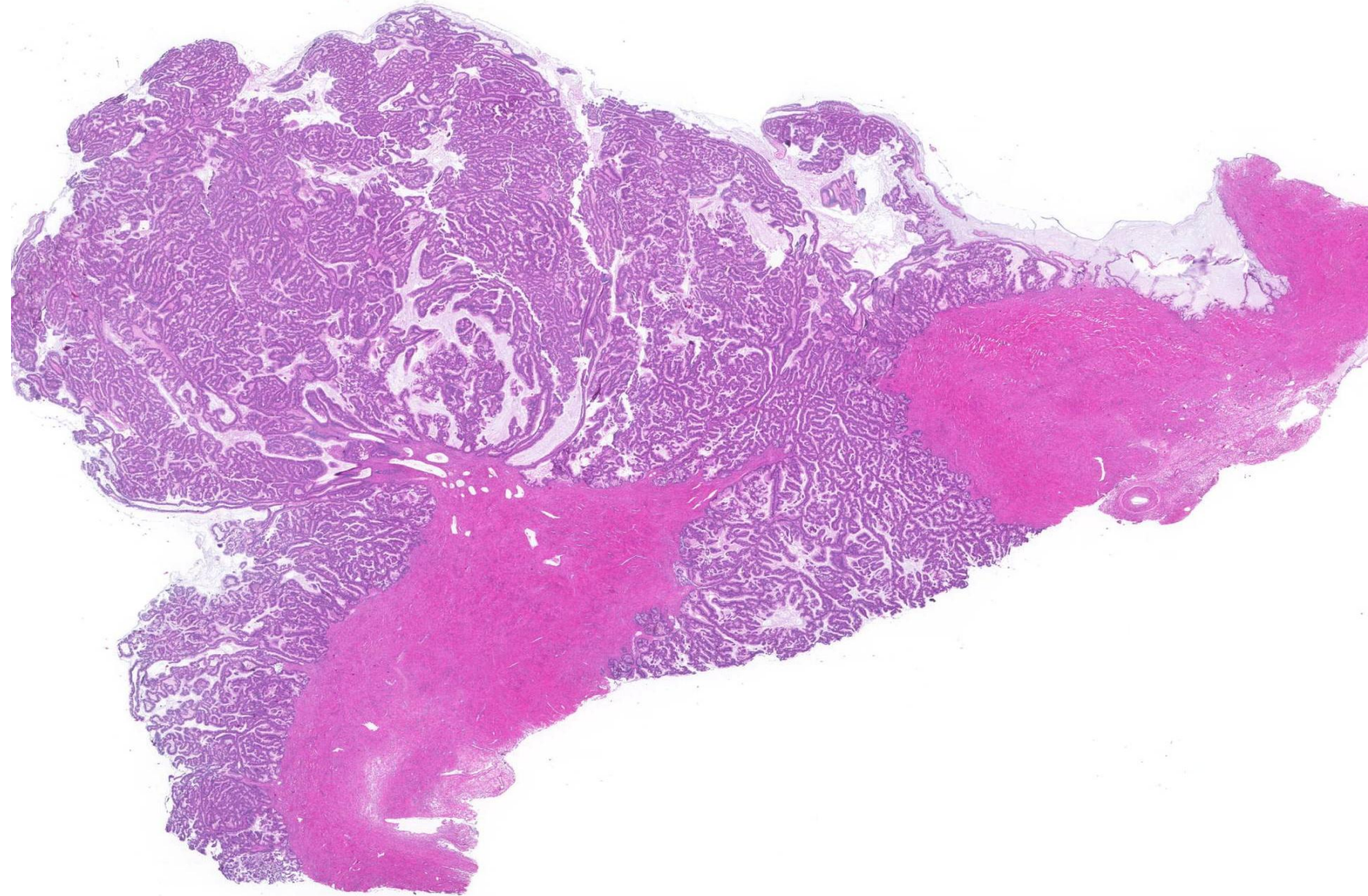


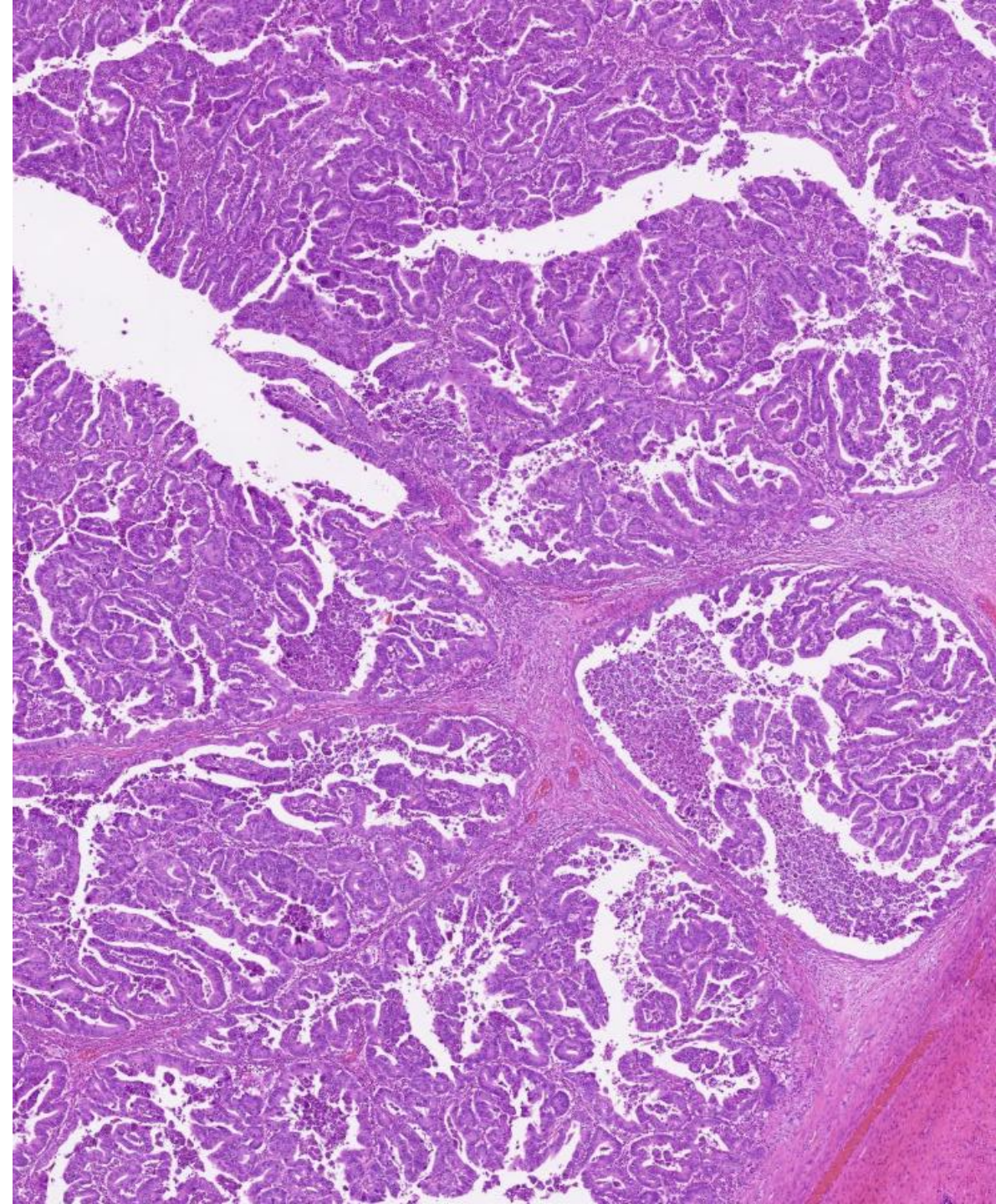
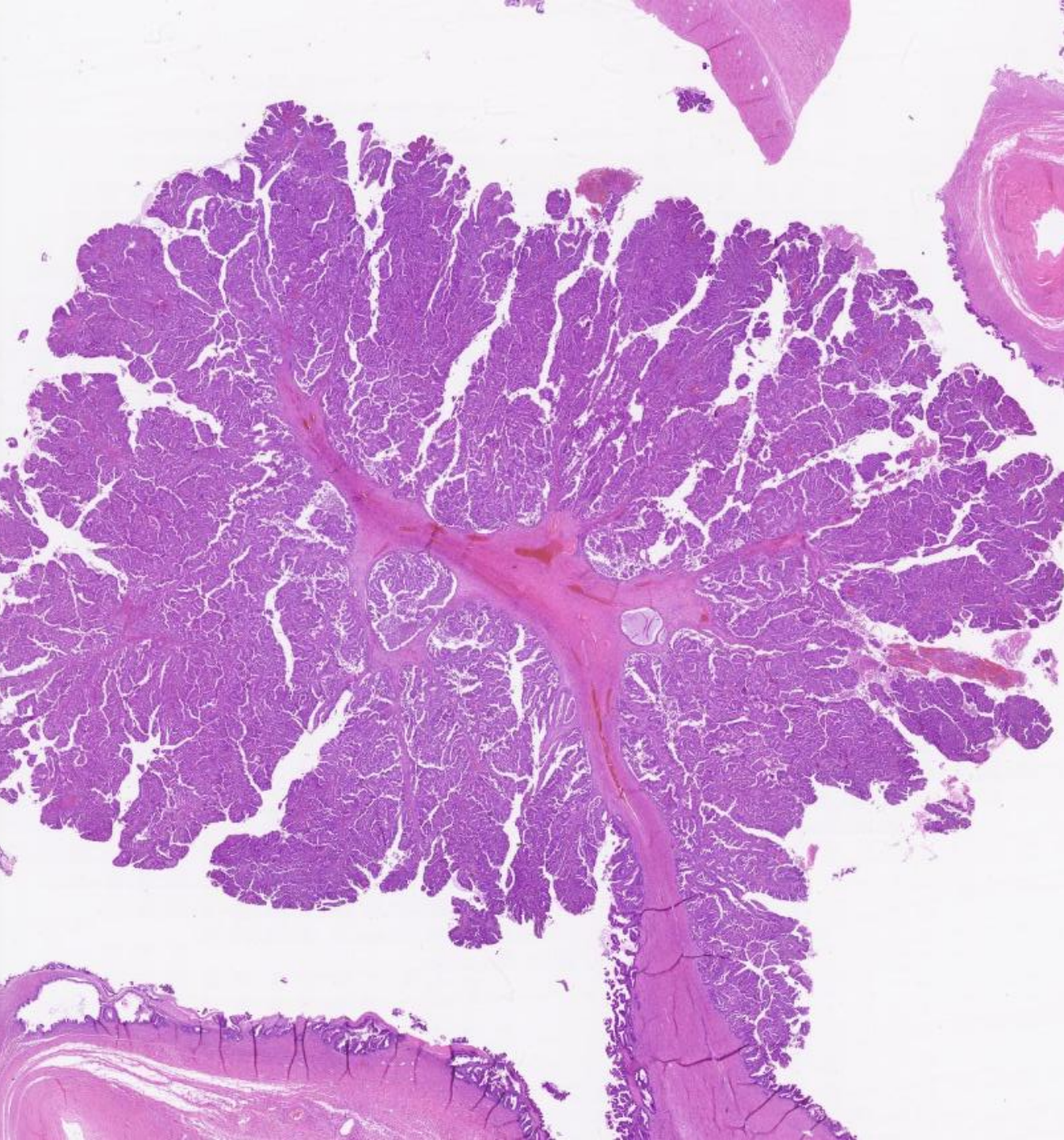
Intraepithelial Carcinoma: Marked Nuclear Atypia

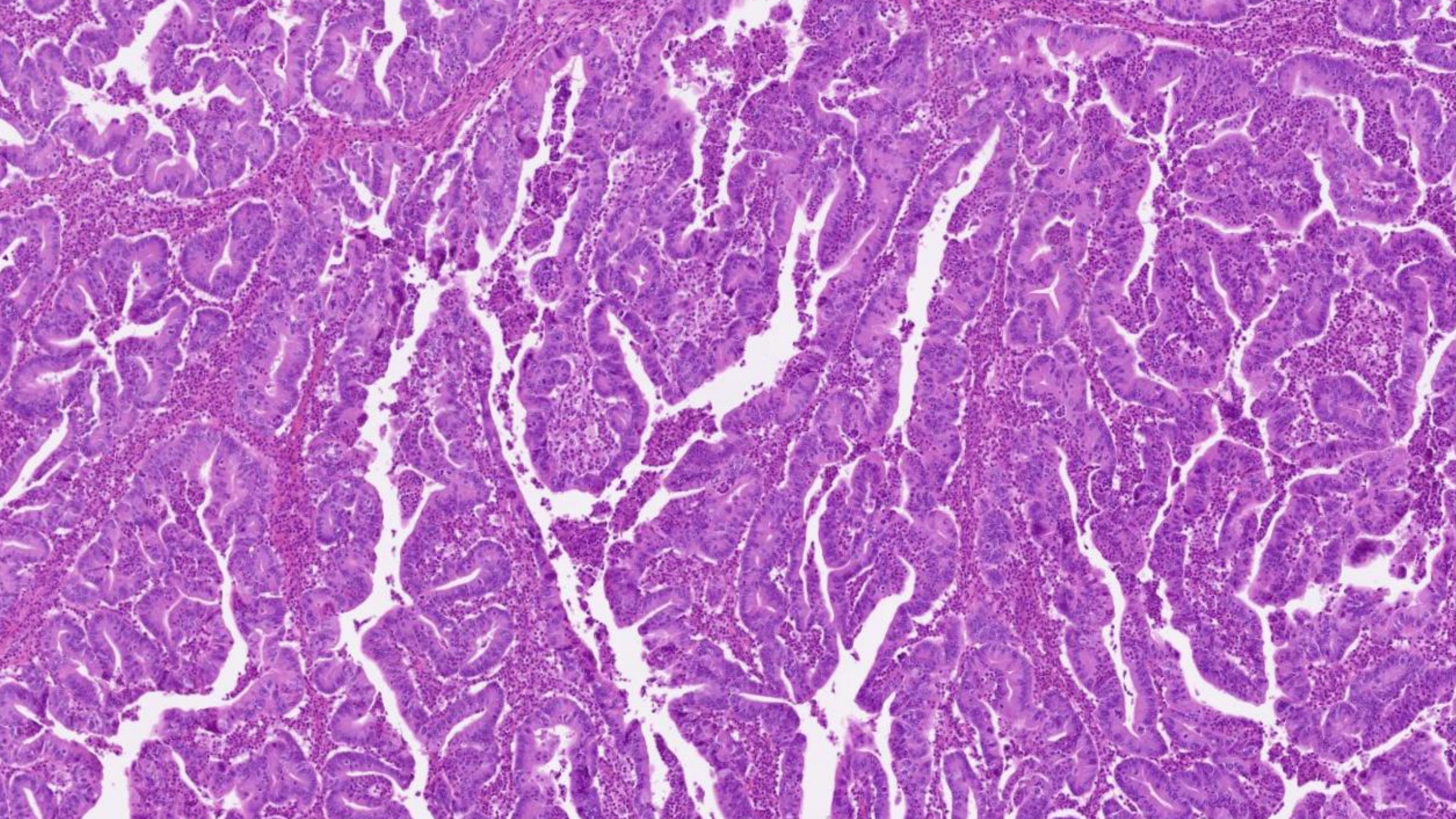


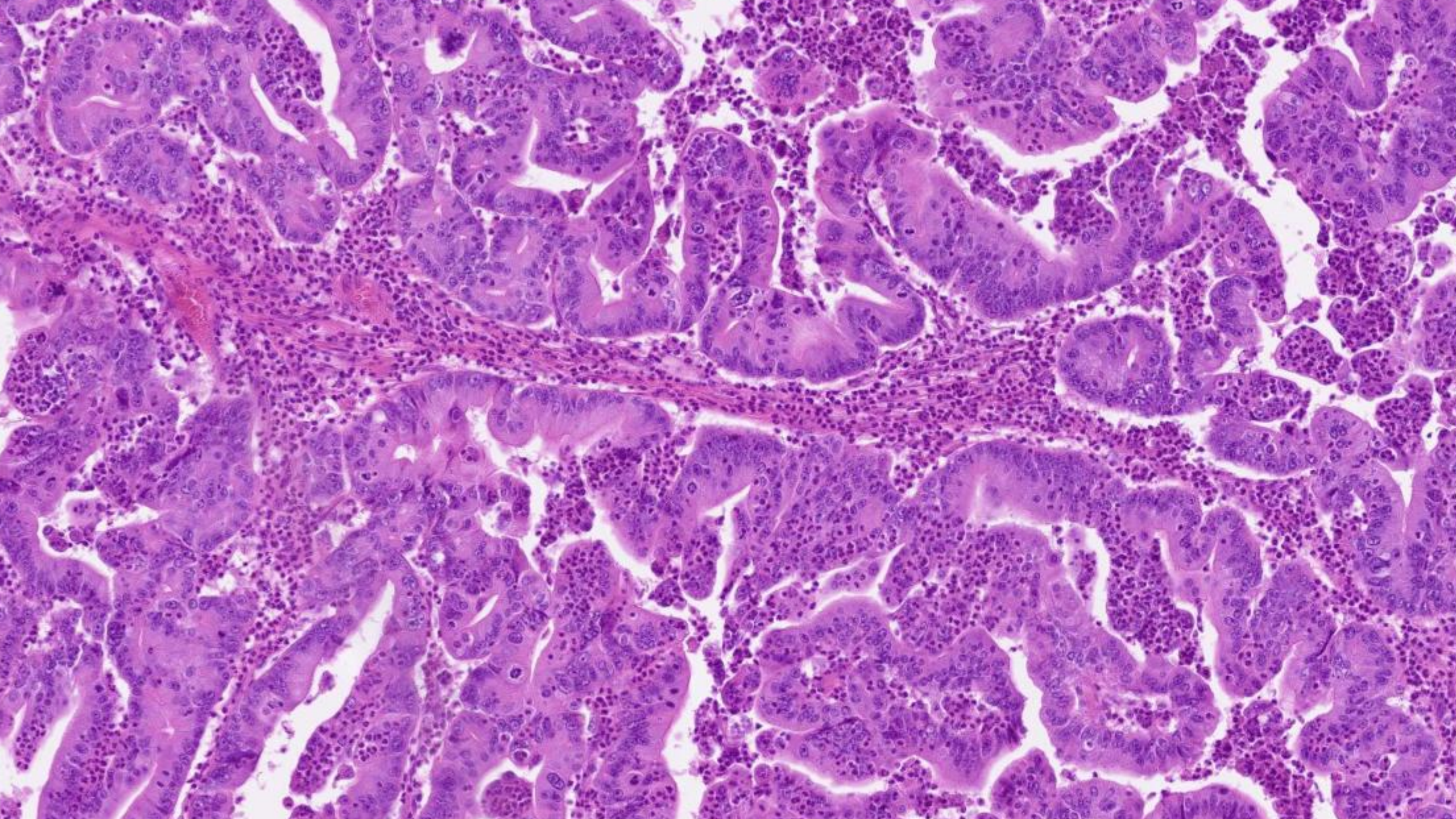
Mucinous Carcinoma: Expansile Growth

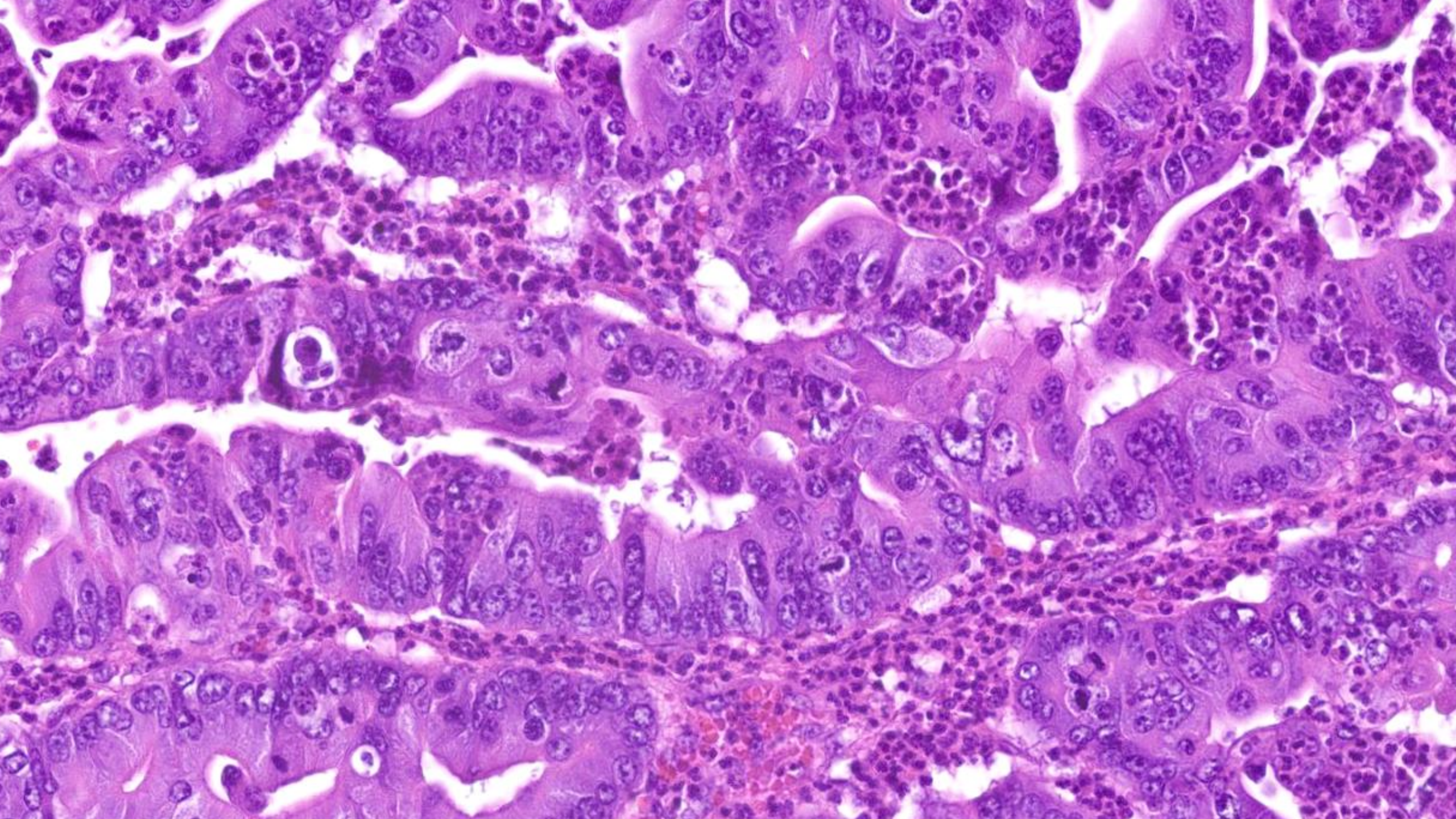
- Marked glandular crowding, with little or absent intervening stroma -> labyrinthine appearance
- ±Papillary and/or cribriform areas
- >5 mm

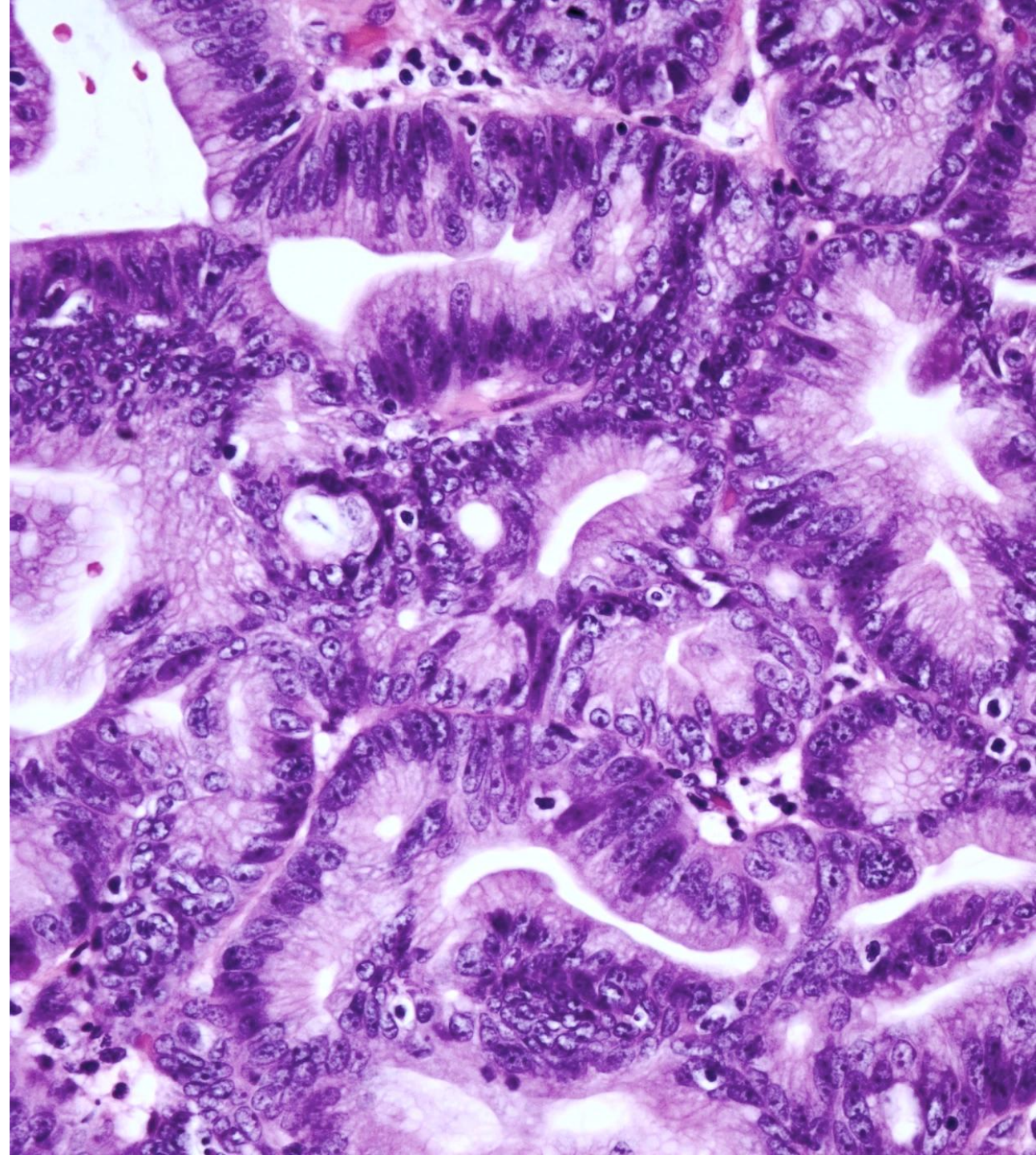
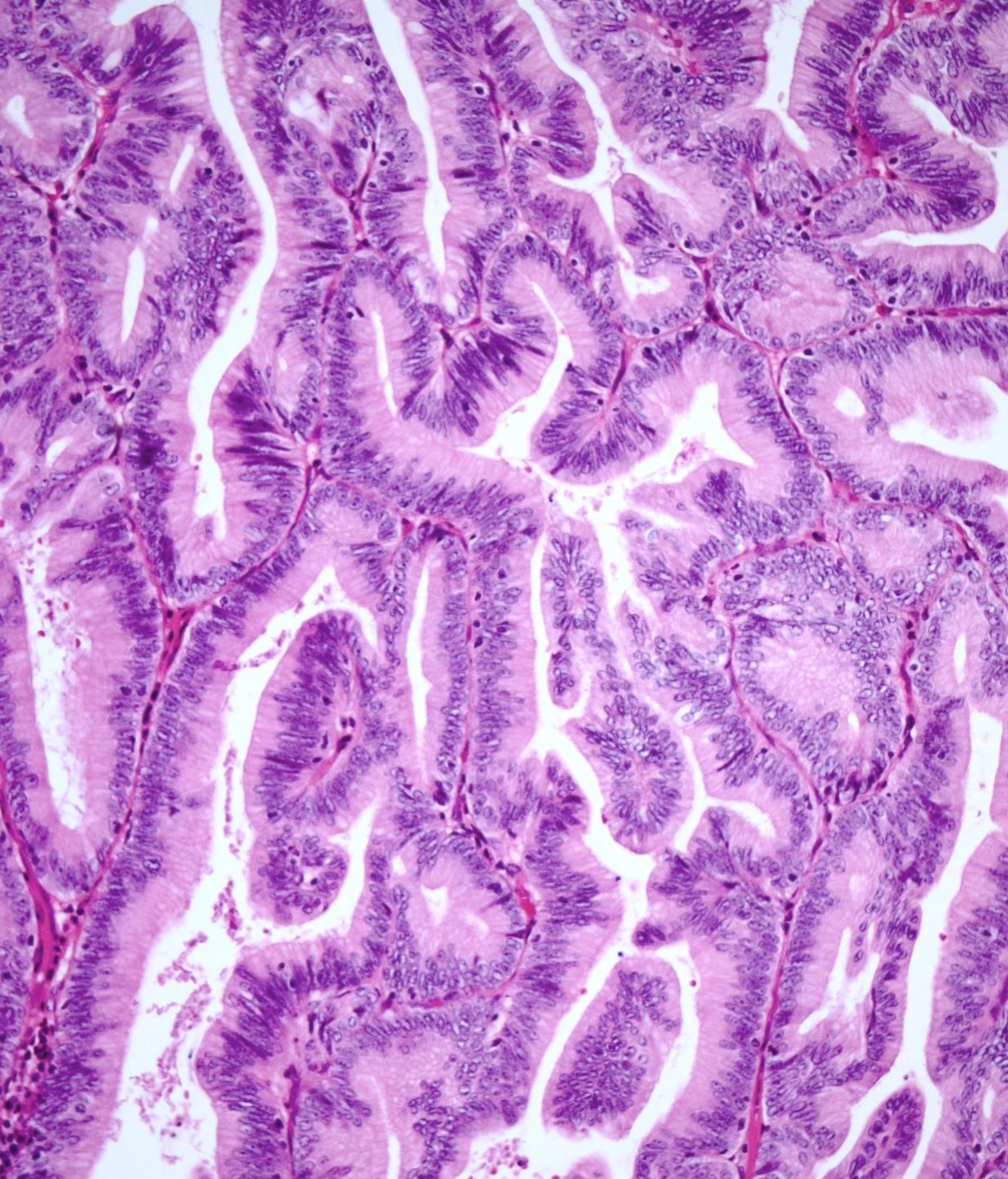




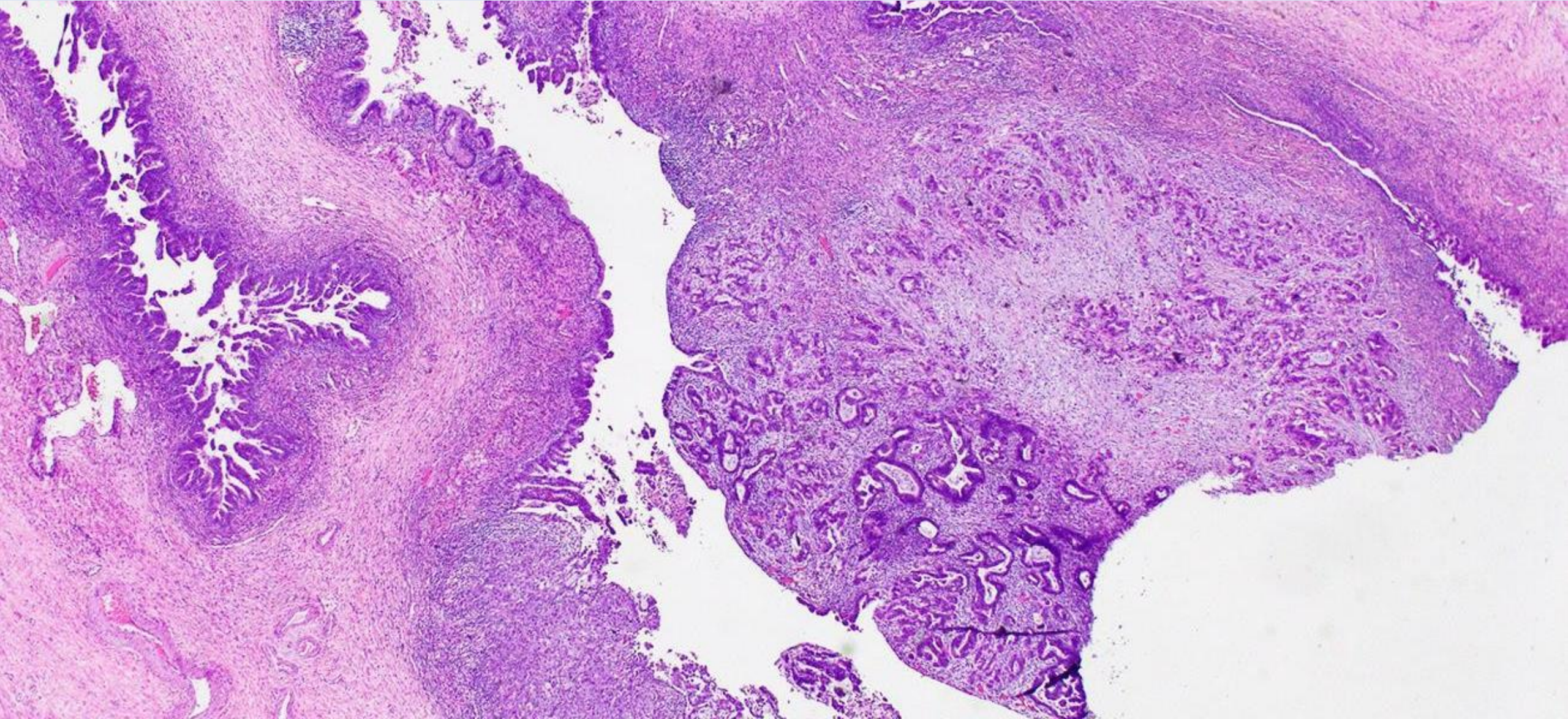


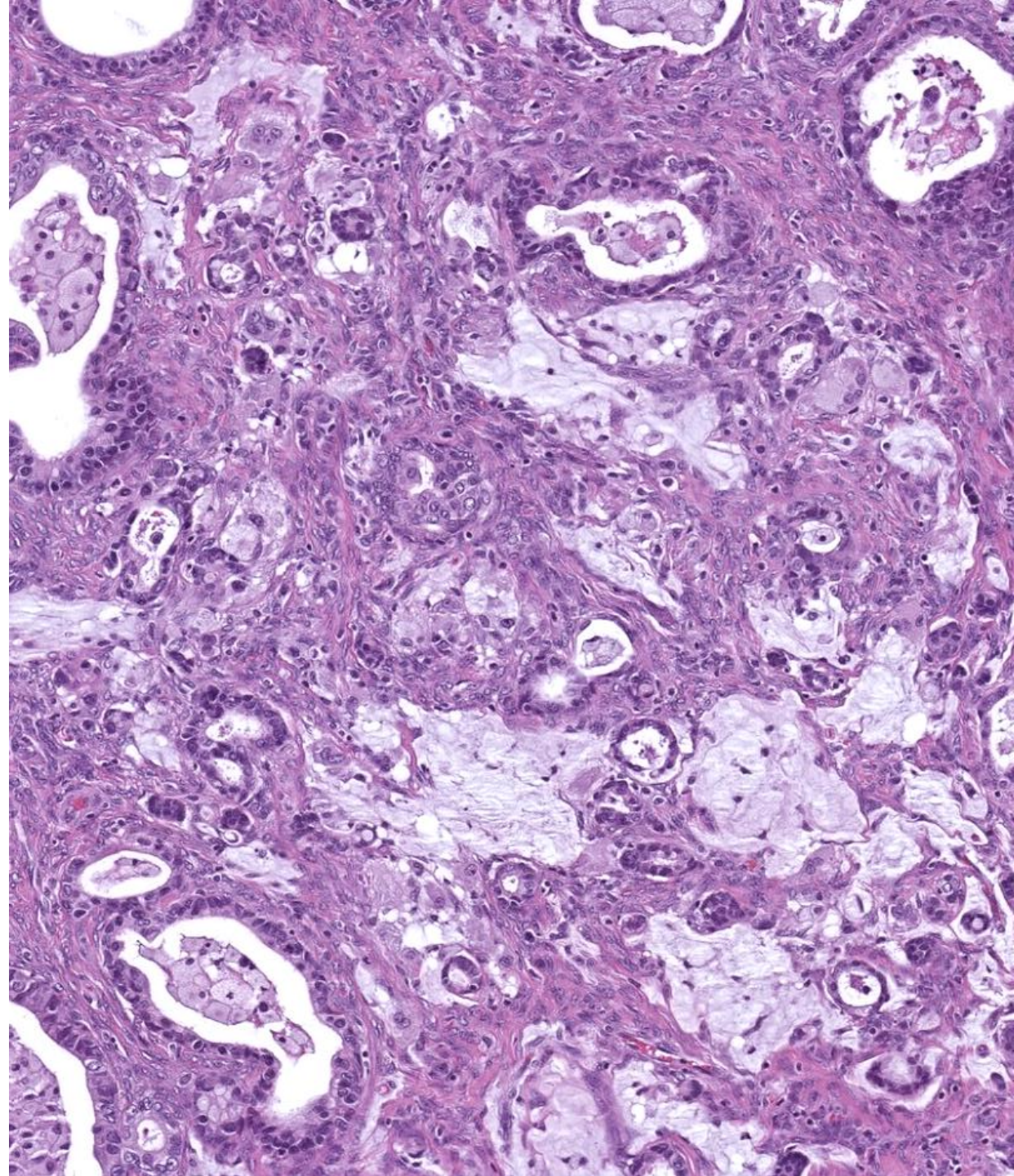
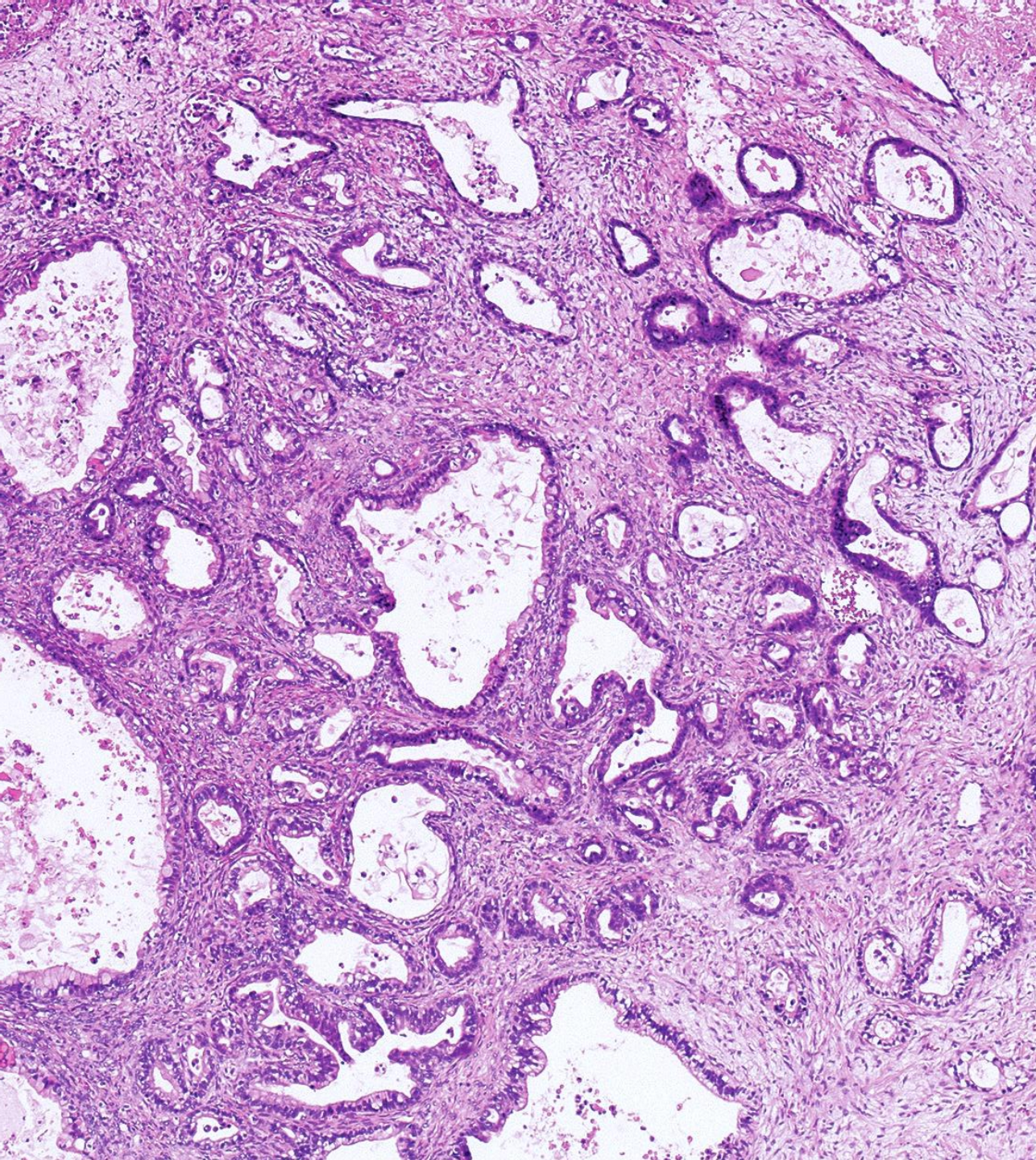




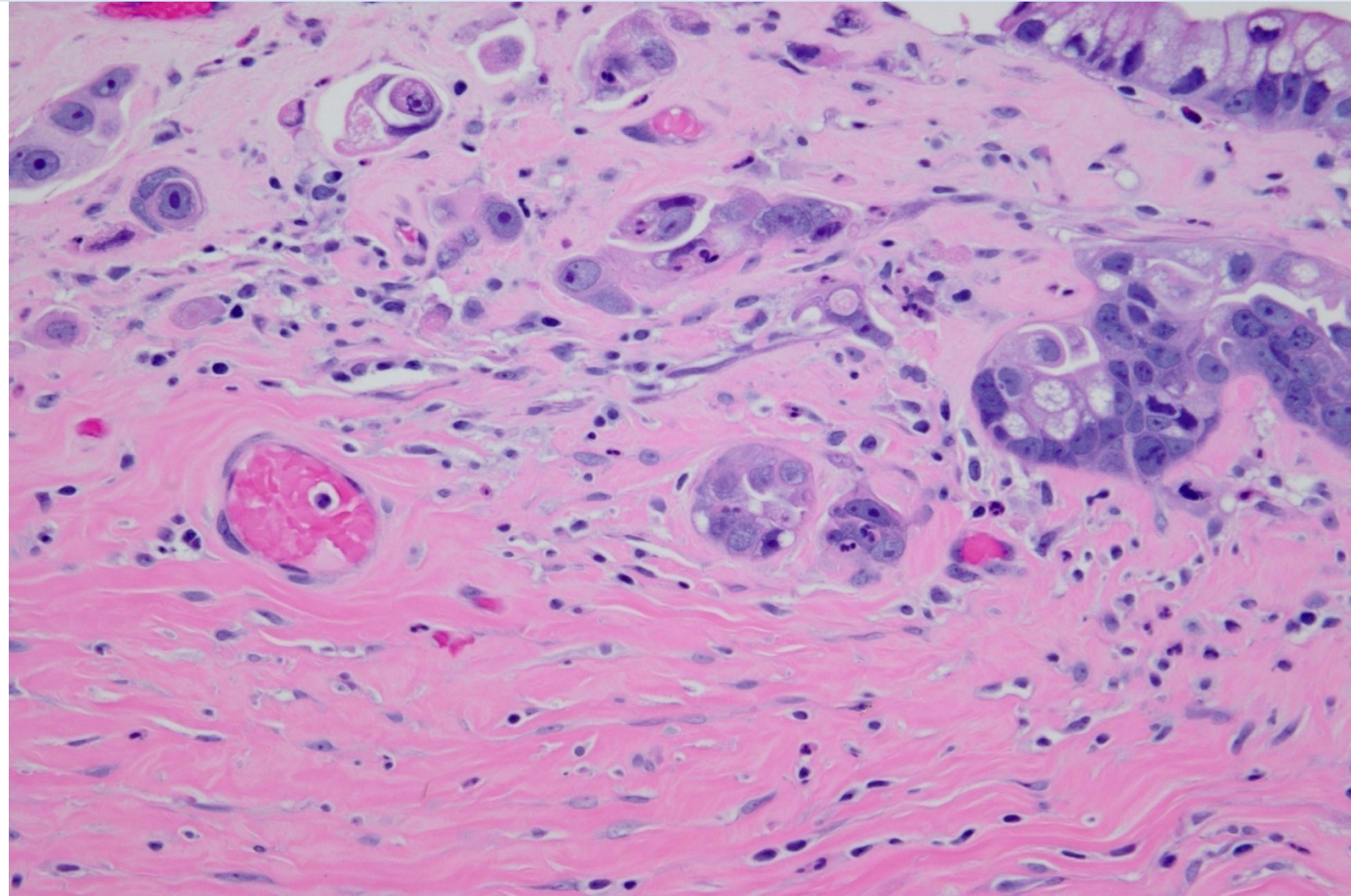
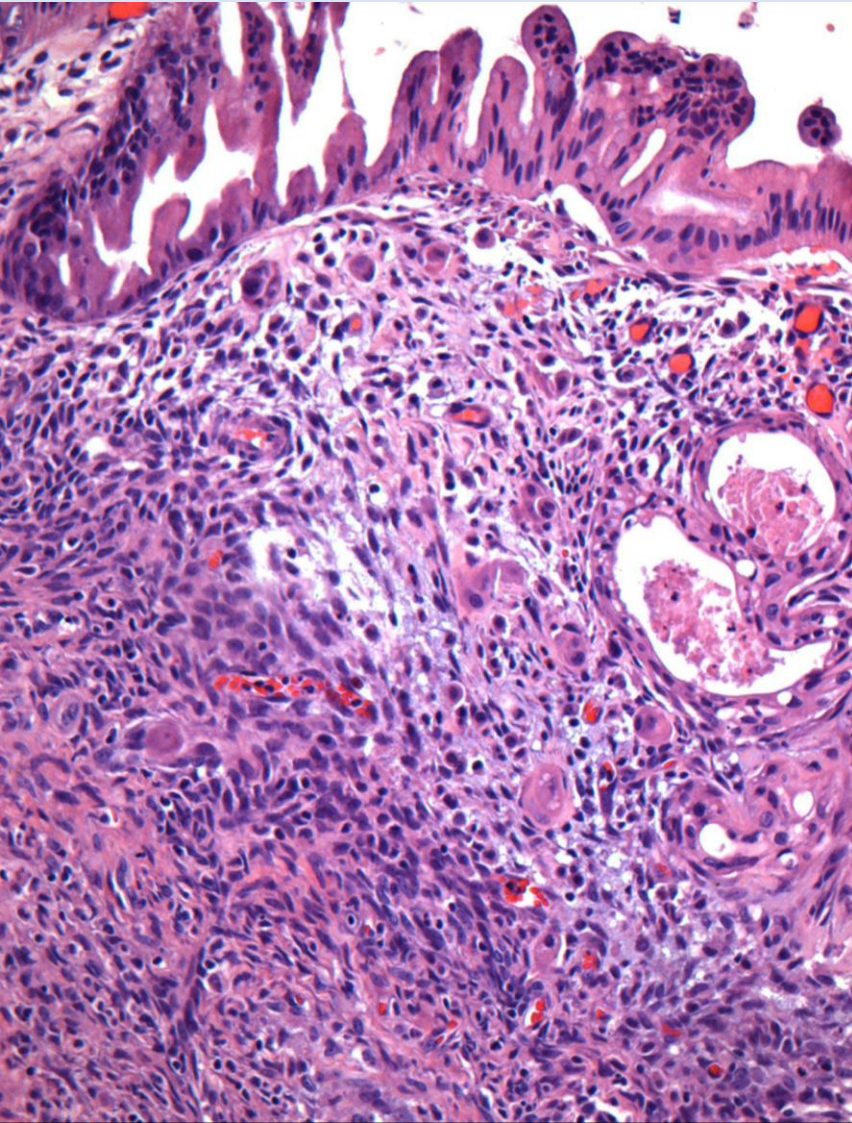


Mucinous Carcinoma: Infiltrative / Destructive Growth (>5 mm)

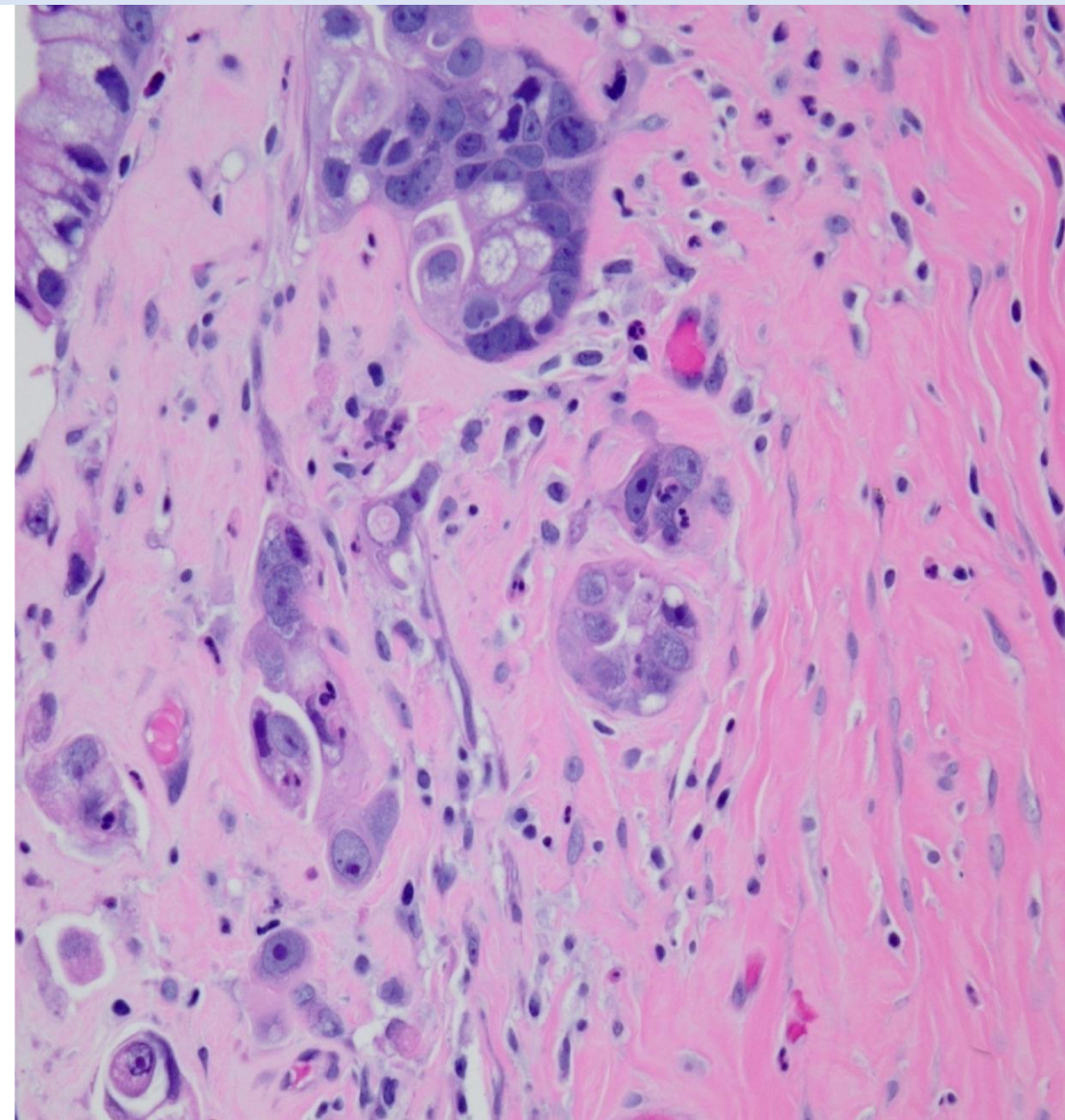
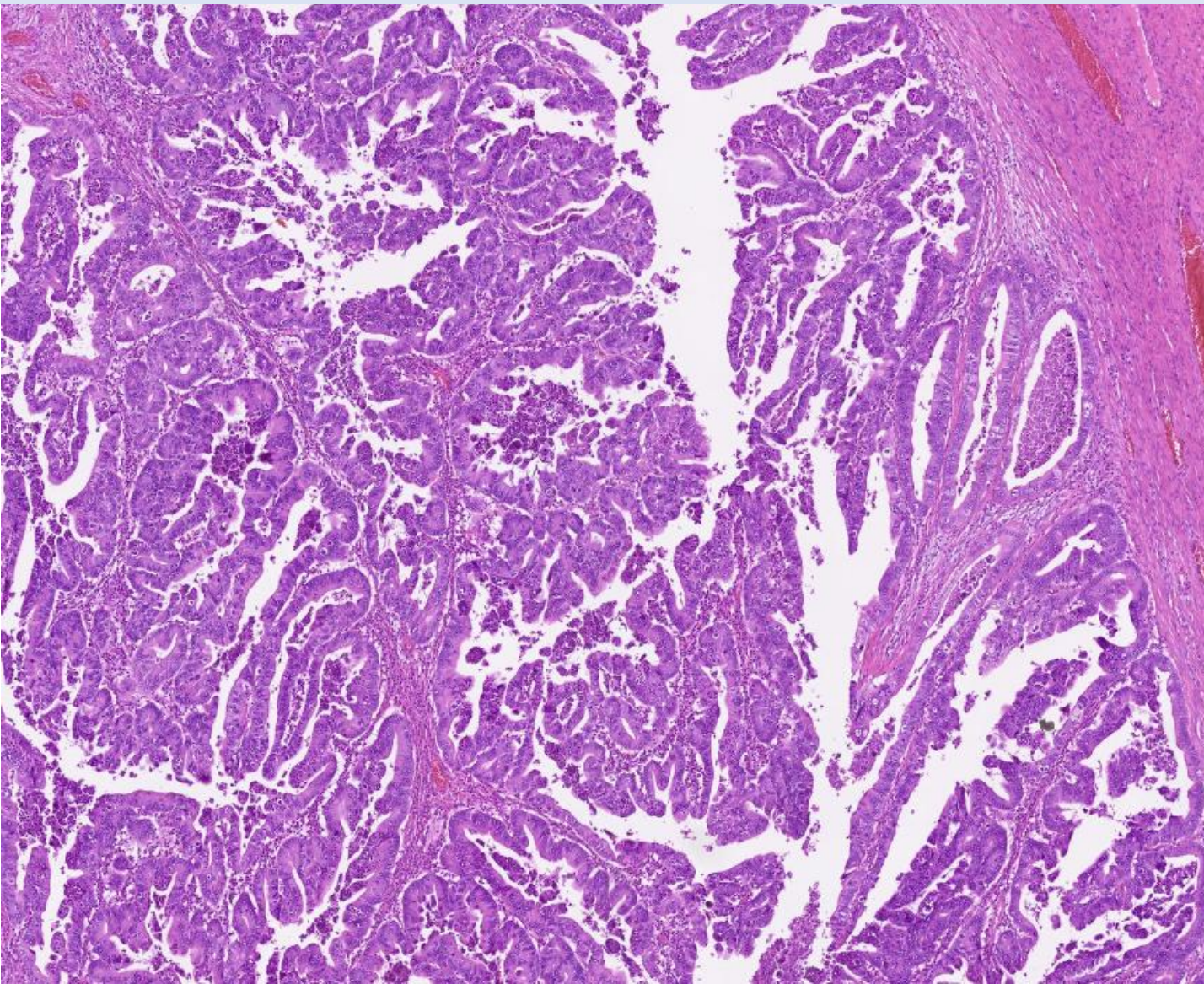




Microinvasive Mucinous Carcinoma: Infiltrative / Destructive Growth (<5 mm)



Specify the Type of Invasion in the Report: Infiltrative Invasion Is Associated with Recurrence



Assessment of Prognostic Significance of Extent of Infiltrative Growth In a Multi-Institutional Series of Ovarian Mucinous Carcinoma

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Background

- Ovarian mucinous carcinomas (OMC) may exhibit expansile or infiltrative/destructive growth patterns.
- Expansile growth (EG) has been associated with better prognosis.
- Although multiple systems (including growth-based grading with a 10% cut-off) are suggested to predict prognosis in OMC with infiltrative growth (IG), no standardized grading is universally accepted.
- We aimed to assess the prognostic significance of

Results

Fig. 1. A-B: OMC with EG. C-F: OMC with IG (C) comprising single cells (D), signet ring cells (E) and poorly formed glands (E-F).

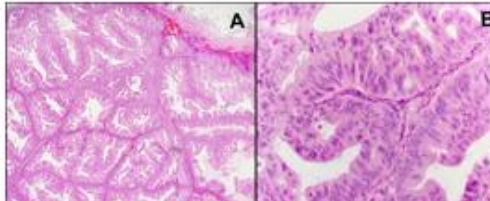


Fig. 2. Clinical outcomes (n=77).



Any proportion of infiltrative growth can be associated with poor clinical outcomes!

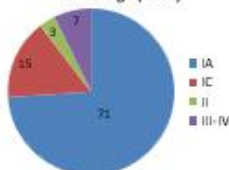
Statistical analysis performed in SPSS statistics (v26).

Results

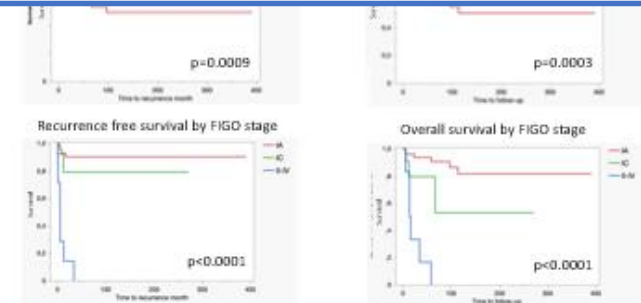
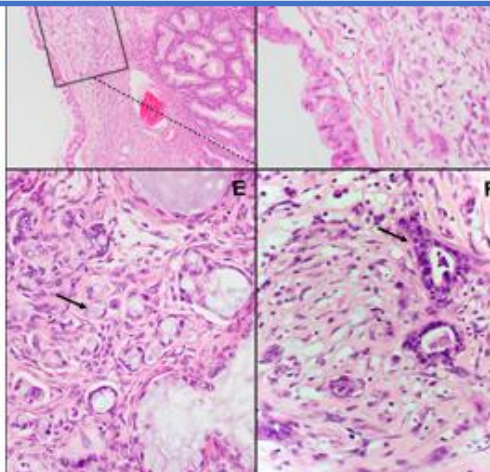
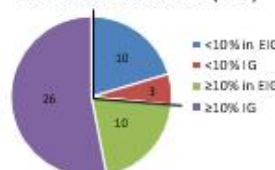
Table 1. Clinical features (n=96).

	EG (n=47)	IG (n=29)	EIG (n=20)	Total (n=96)
Age, median (range); yrs	45 (10-75)	41.5 (22-75)	38.5 (18-83)	43 (10-83)
Tumor size, median (range); cm	17.3 (4-35.5)	17 (5-40)	18 (10-40)	17.3 (4-40)
Chemotherapy (data available in 52)	7	9	5	21

FIGO Stage (n=96)



Extent of Infiltrative Growth (n=49)

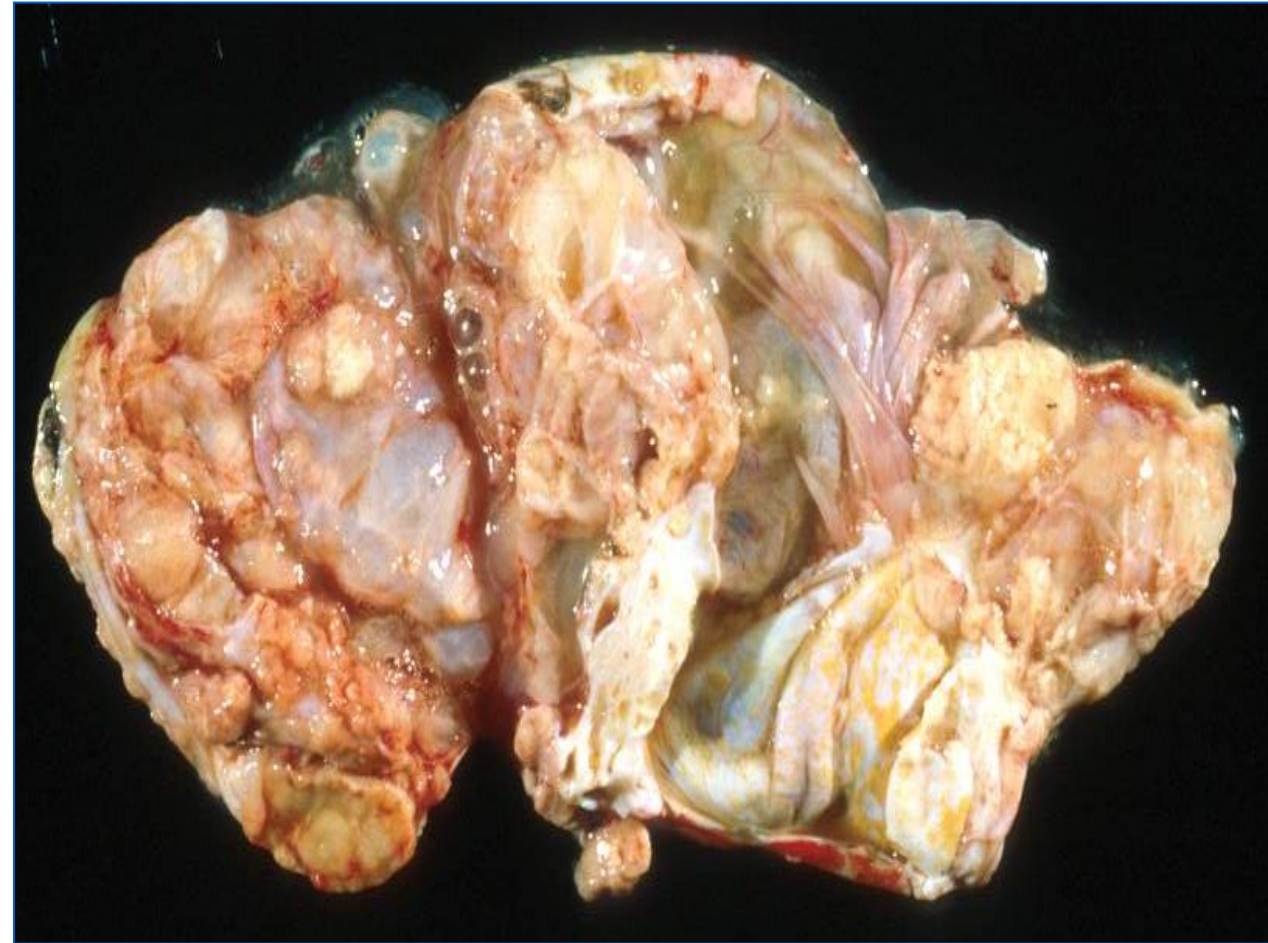
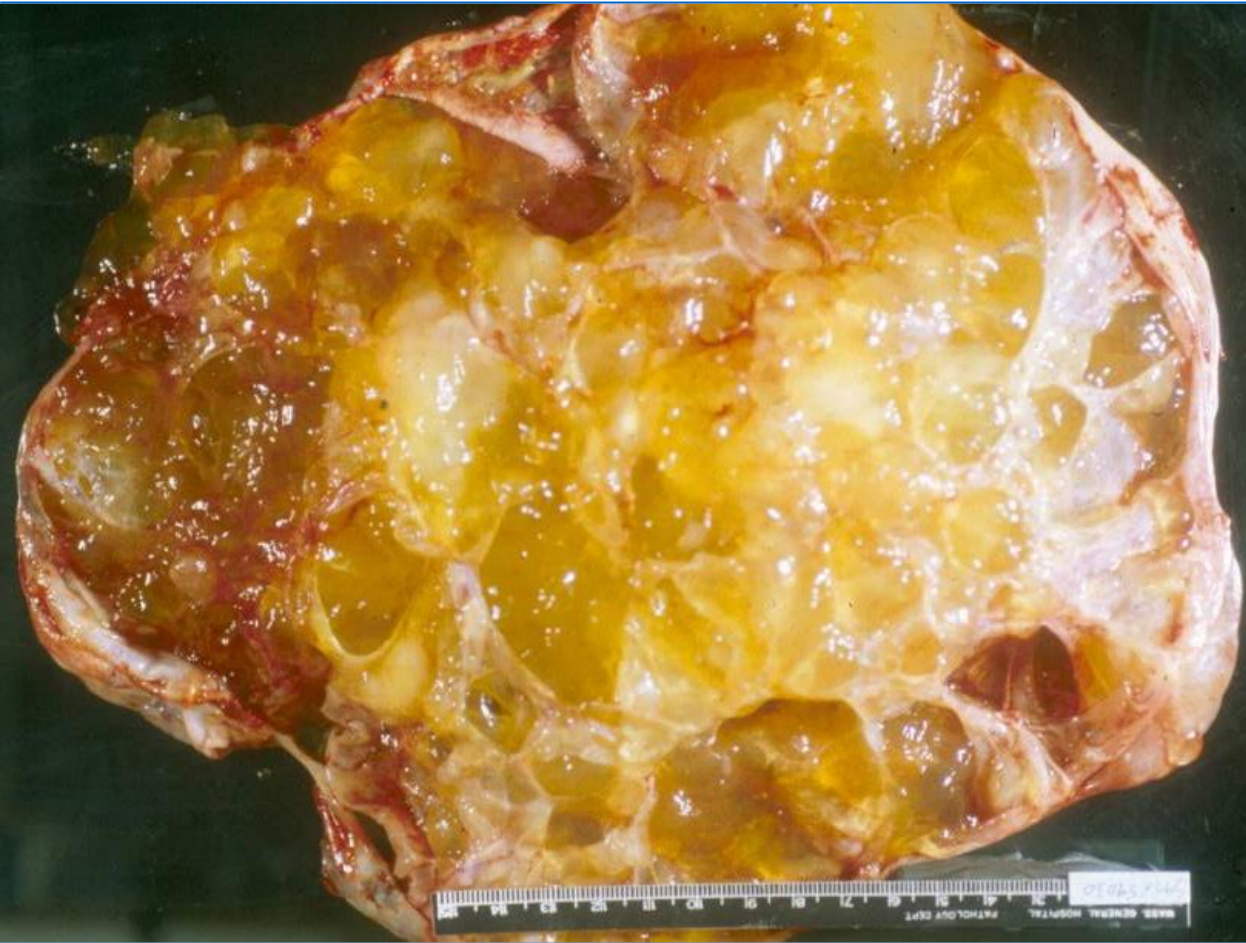


Conclusion

- Our findings suggest that any proportion of IG in OMCs can be associated with unfavorable clinical outcomes and question the utility of the term microinvasion and growth-based grading systems based on the 10% cut-off, warranting further studies.

Borderline Tumor vs Carcinoma?

Extensive Sampling (2 Sections Per CM) Required

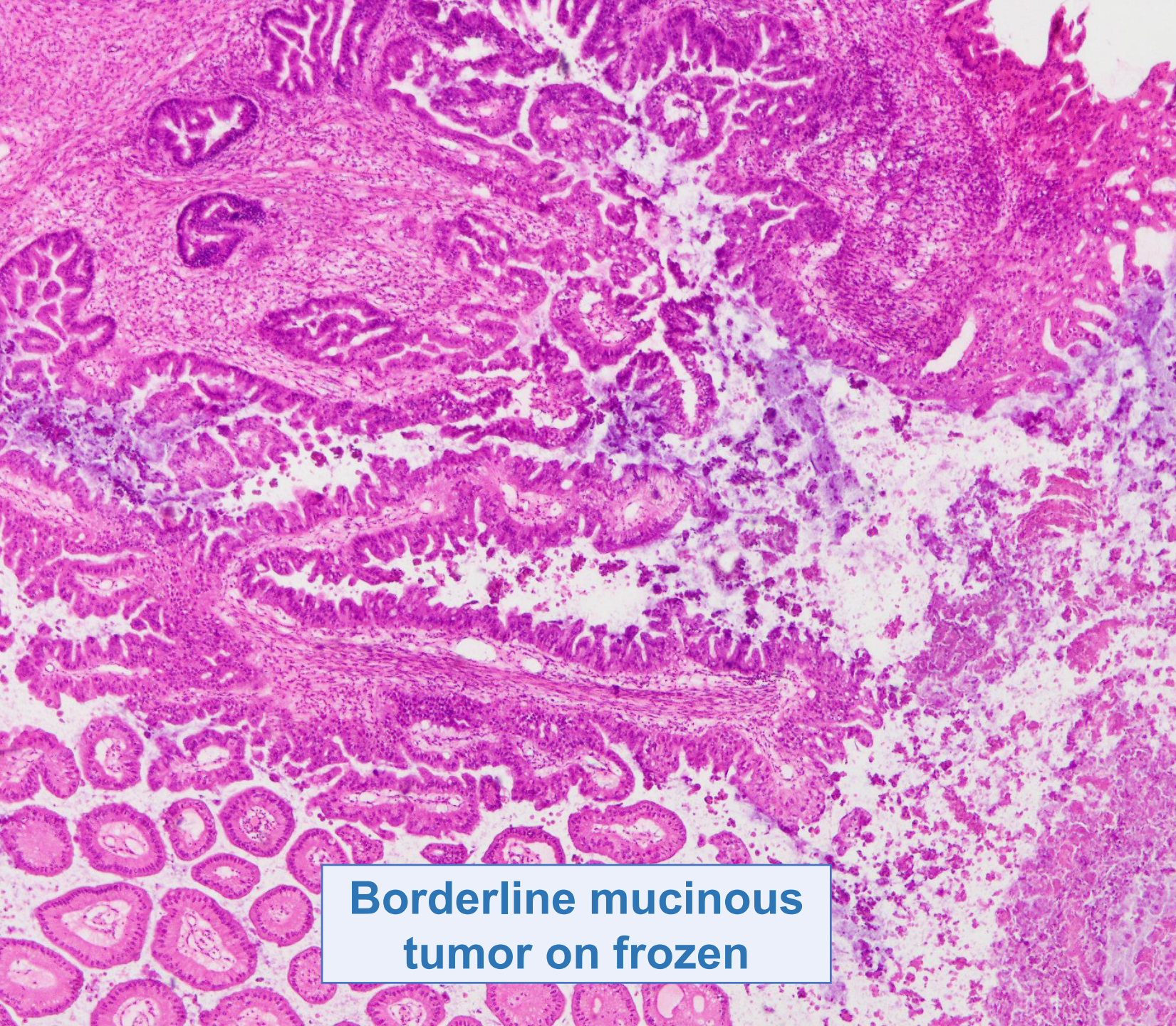




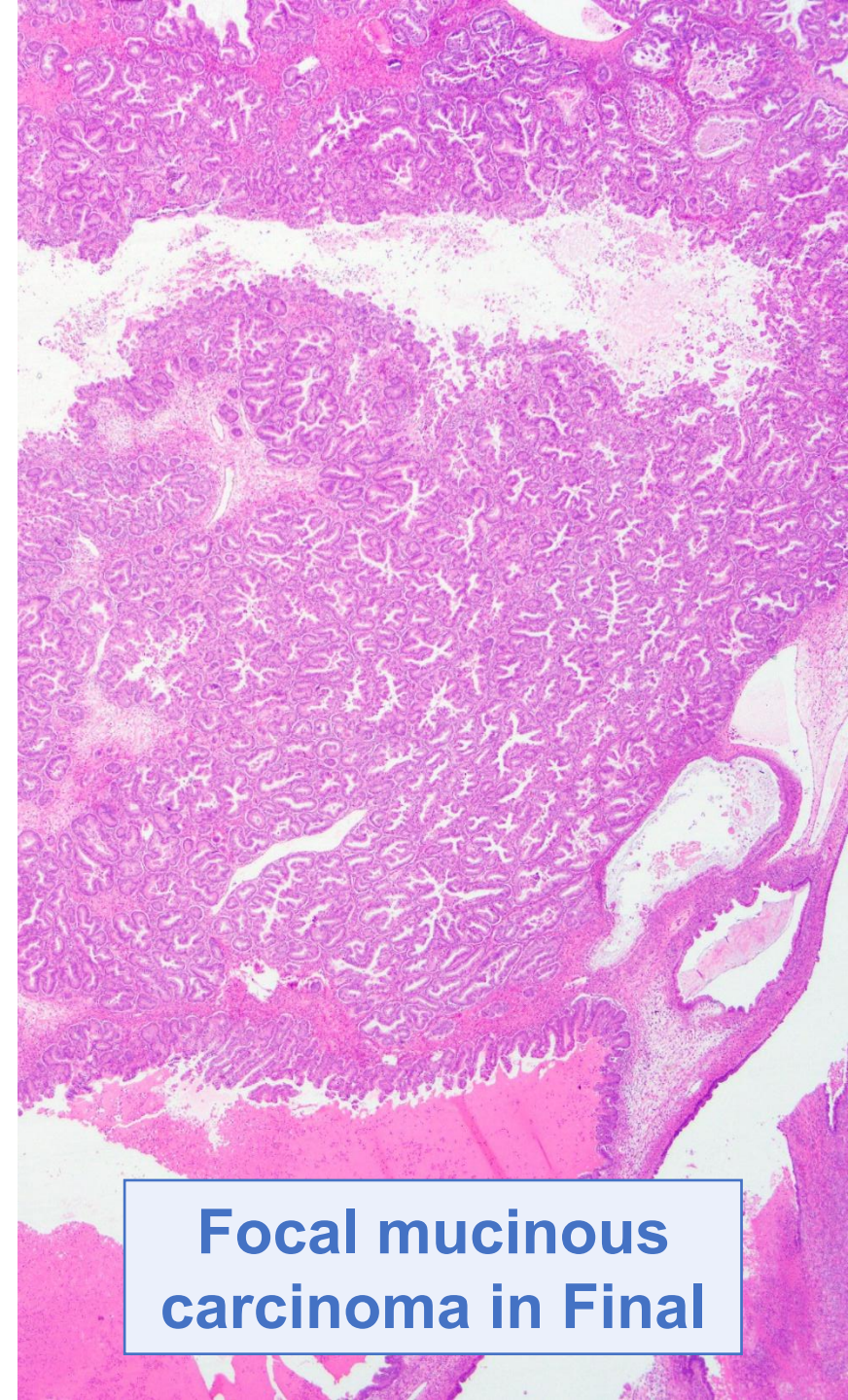
Important!

Communication with surgeon, especially in intraoperative setting, given limited sampling

Careful examination of ovarian surface and fallopian tube



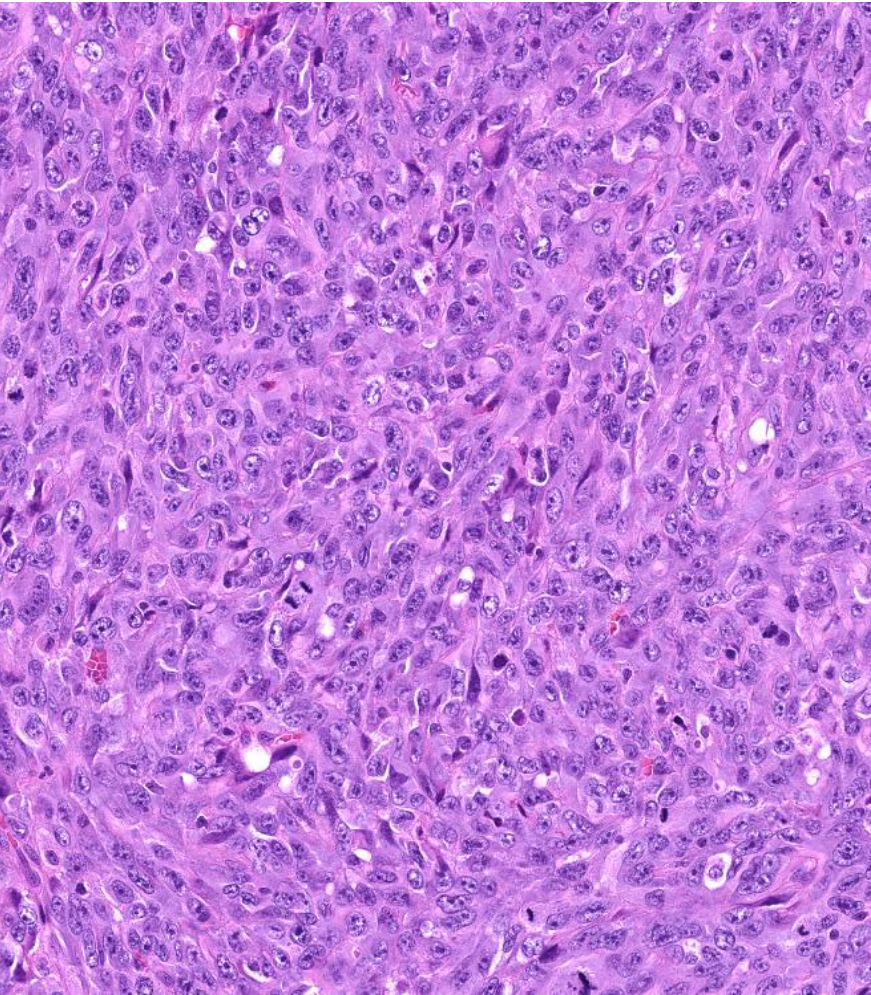
**Borderline mucinous
tumor on frozen**



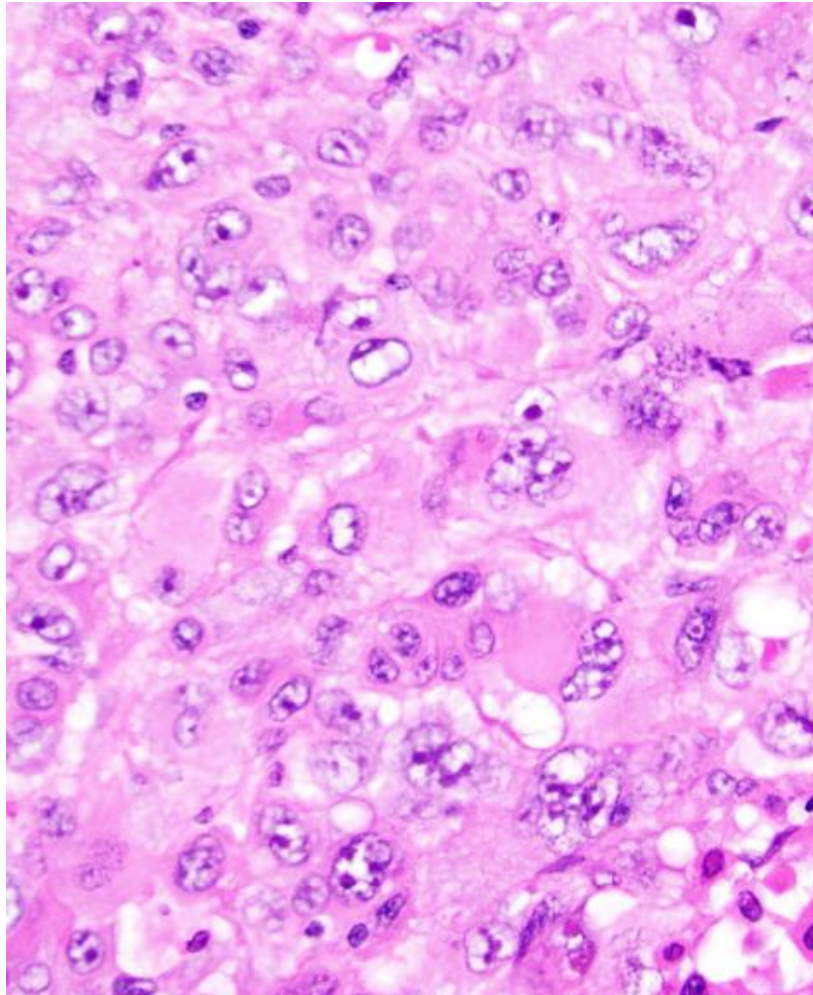
**Focal mucinous
carcinoma in Final**

Anaplastic Carcinoma (Keratin+) Is Associated with 33% Mortality

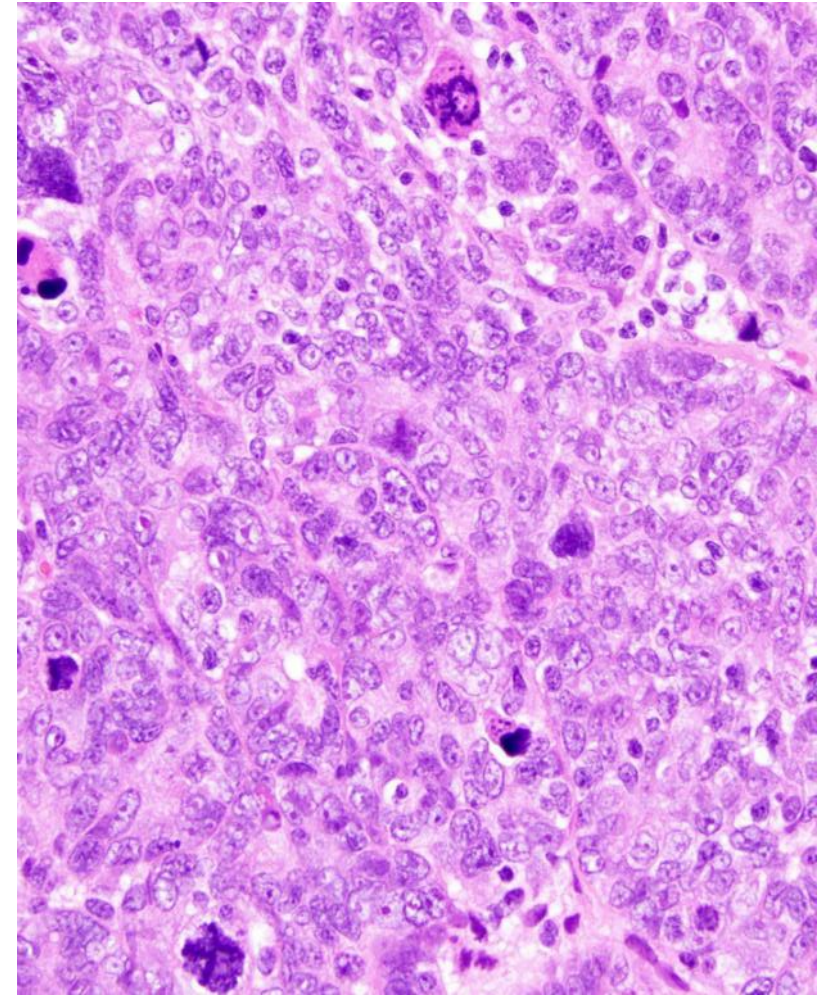
Spindled



Rhabdoid

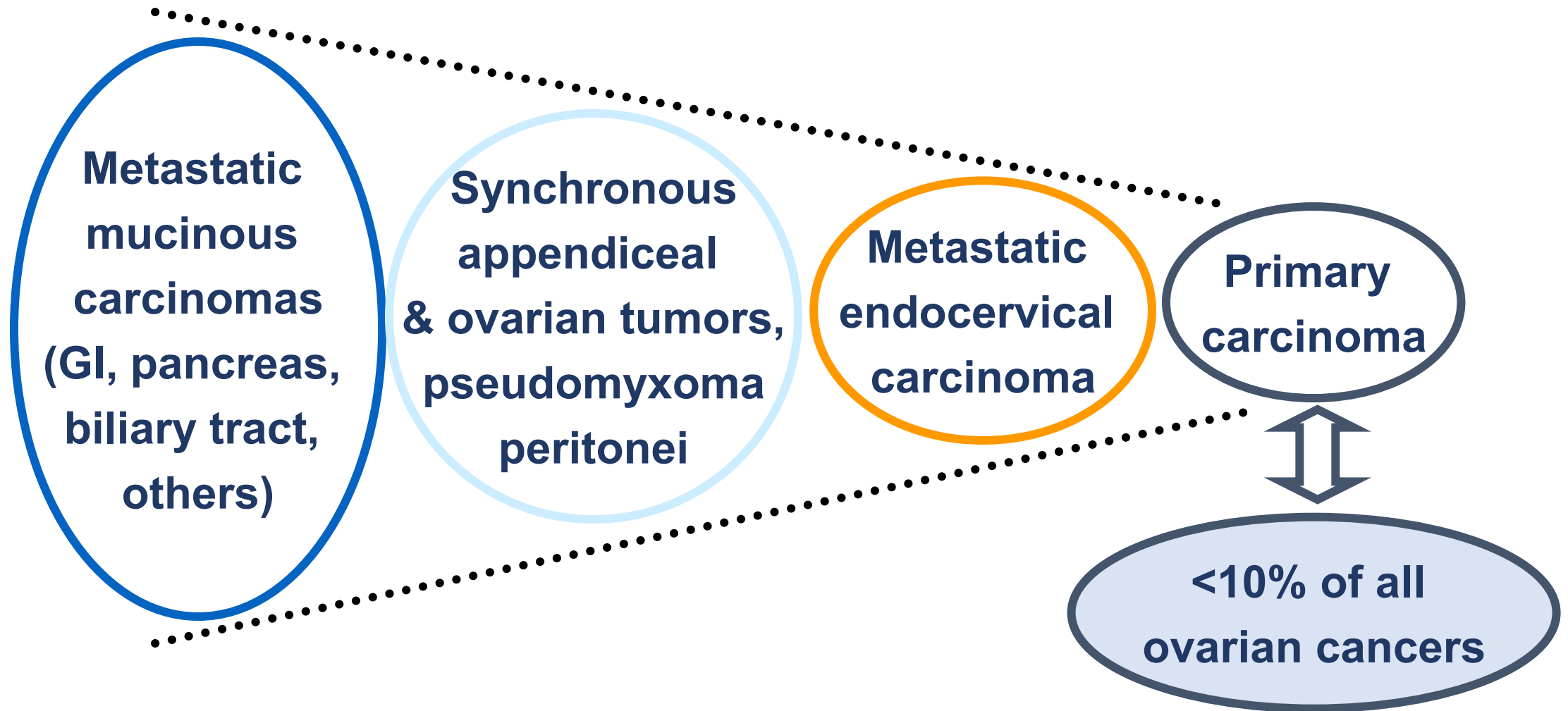


Pleomorphic



PRIMARY MUCINOUS CARCINOMA

Frequency:



METASTATIC CARCINOMAS TO THE OVARY (Mass Forming)

Colorectum

Stomach

Appendix

Pancreas/biliary tract

Cervix

Breast

Distinction of Primary and Metastatic Tumors: Size ≥ 10 vs < 10 cm

- Bilateral tumors of any size or unilateral tumor < 10 cm = **Metastatic**
- Unilateral tumor ≥ 10 cm = **Primary**
- **Overall, 84% classified correctly:**
 - ✓ 100% primary ovarian tumors
 - ✓ 77% metastases (colon: 74%; appendix: 79% low-grade tumors, 100% carcinomas; pancreaticobiliary: 95%; small intestinal: 33%; stomach: 80%; endocervix: 55%)

Distinction of Primary and Metastatic Tumors: Size ≥ 13 vs < 13 cm

- **Overall, 87% classified correctly:**
 - ✓ 98% primary ovarian tumors
 - ✓ 82% metastases (colon: 80%; appendix: 79% low-grade tumors, 100% carcinomas; pancreaticobiliary: 100%; small intestinal: 33%; stomach: 100%; endocervix: 70%)

Pathologic Features of Primary Tumors vs Metastases

Beware of Exceptions!
(e.g. colorectal,
endocervical)

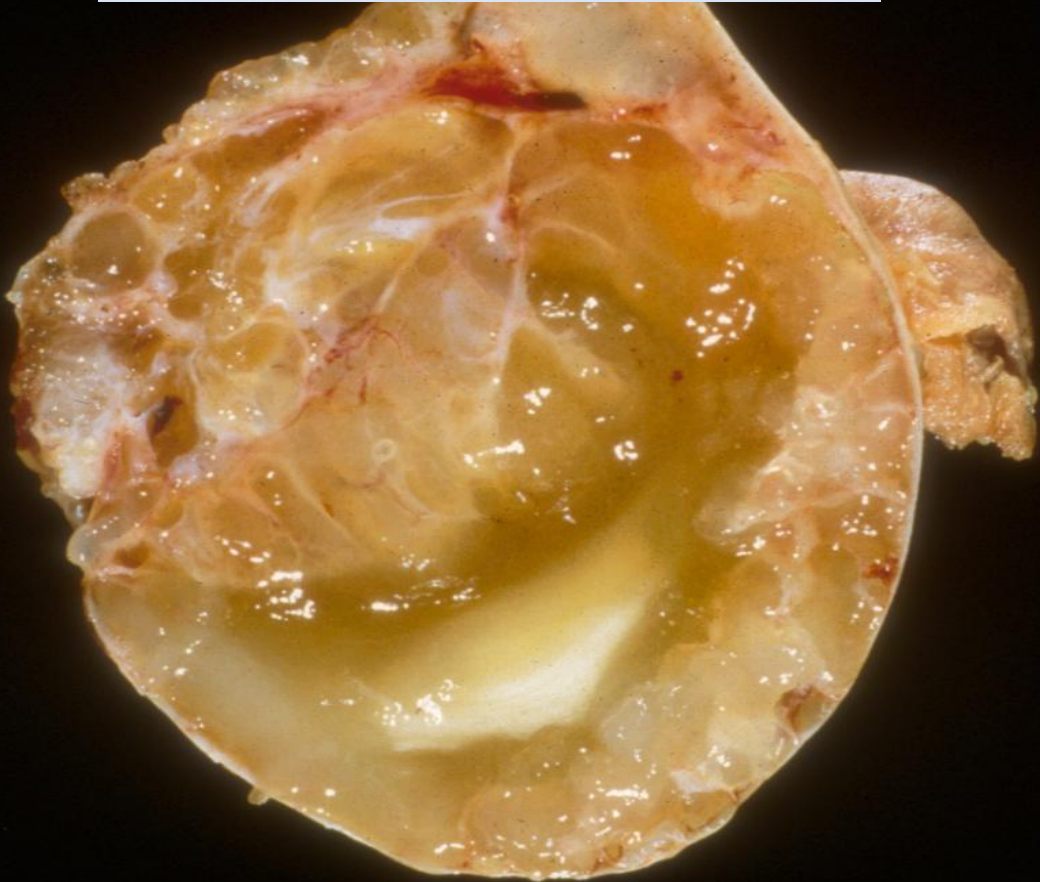
*Mucinous tumors arising in
teratomas

**Krukenberg tumor
(stomach > colon > breast
> biliary tract)

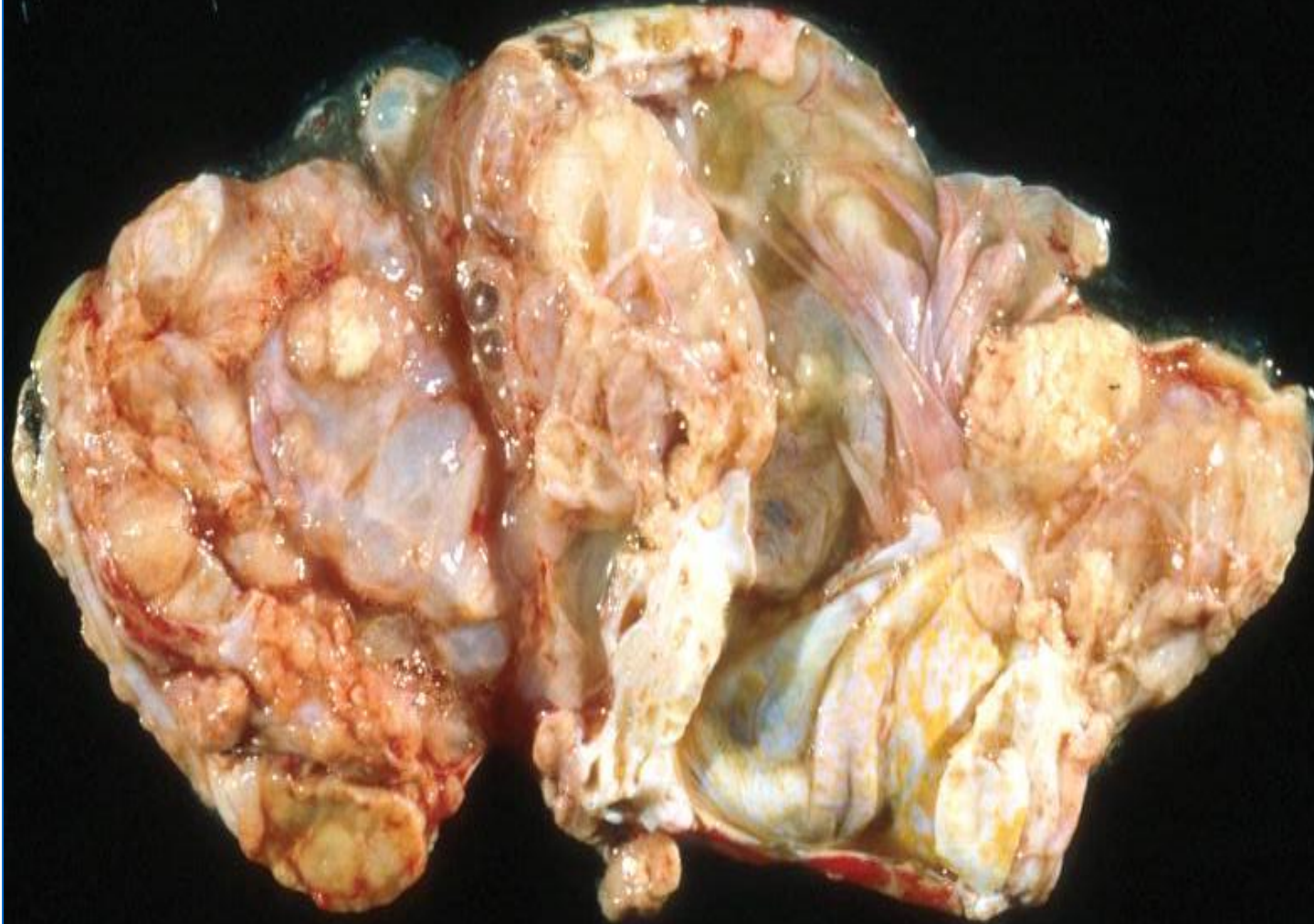
Features	Primary	Metastasis
Bilateral & <10 cm	- / +	+ / -
Heterogeneous, solid-cystic	+	- / +
Necrosis	+	- / +
Pattern of growth	Expansile	Nodular
Destructive stromal invasion	- / +	+
Hilar & surface involvement	- / +	+
Lymphovascular invasion	- / +	+
Extraovarian spread	- / +	+
Signet ring cells**	- / +	+ / -
Abundant necrosis	- / +	+ (colon)
Pseudomyxoma ovarii	- *	+
Pseudomyxoma peritonei	- *	+

Metastatic Carcinomas May Mimic Primary Ovarian Mucinous Neoplasms

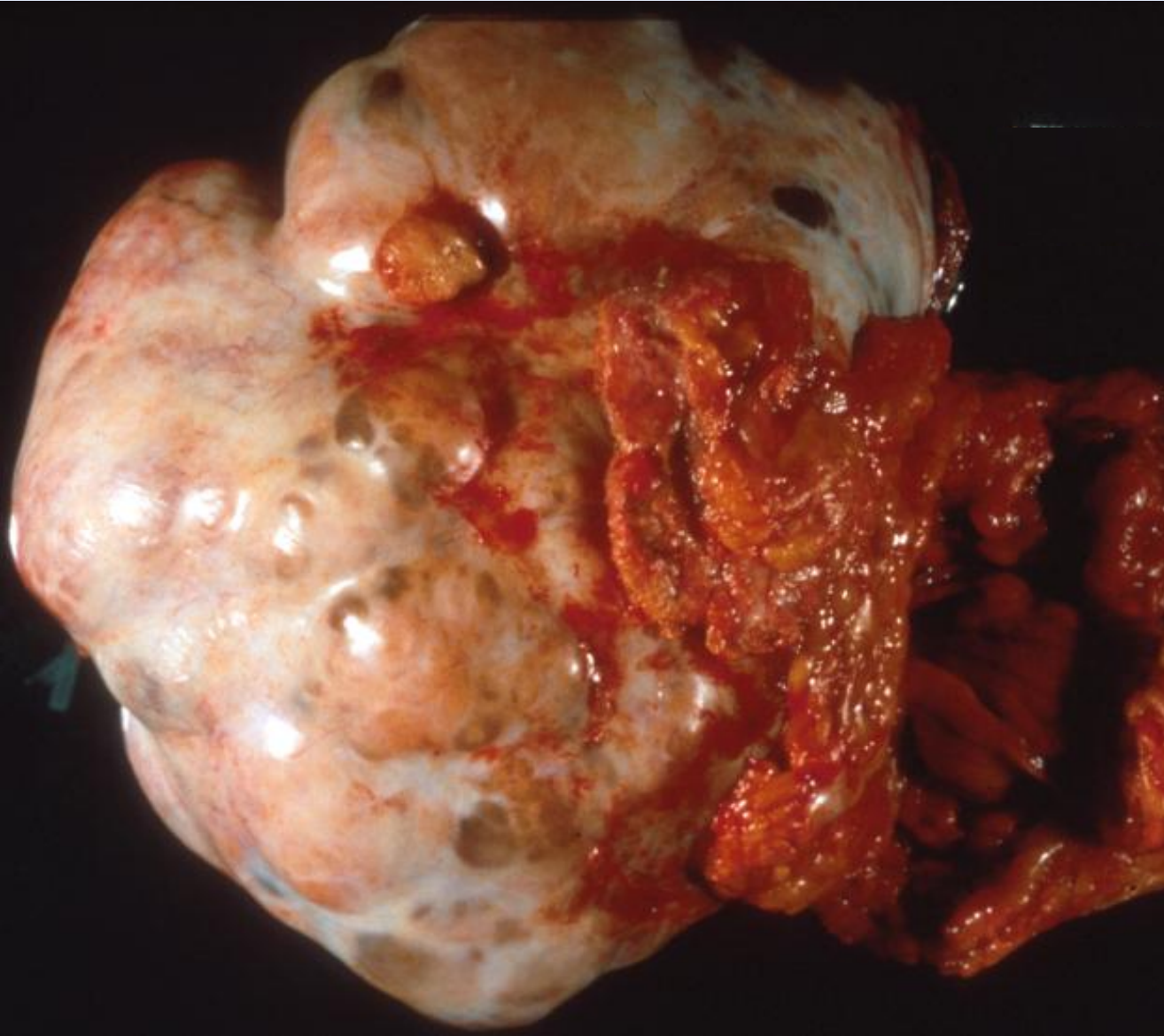
Metastatic cecal carcinoma

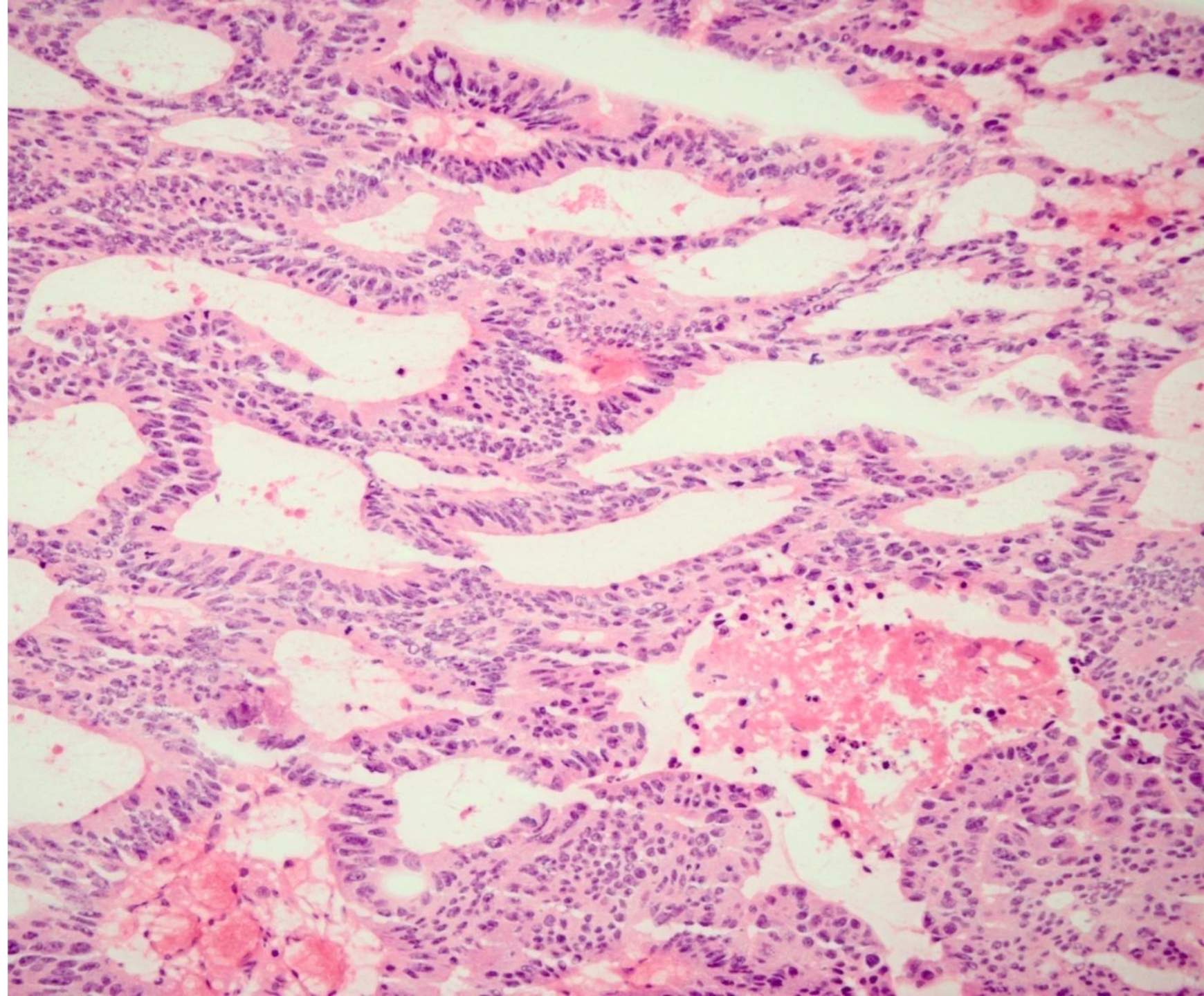
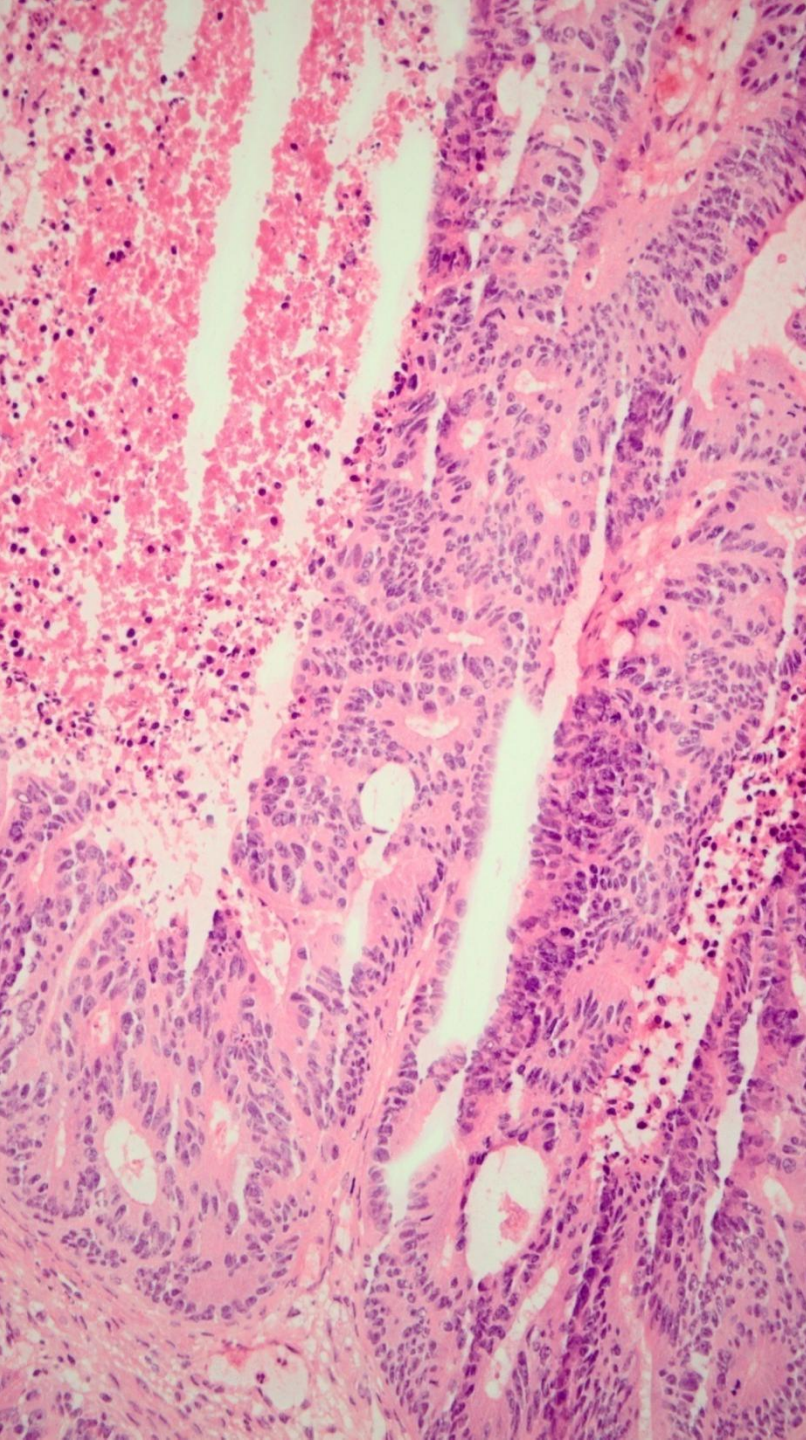


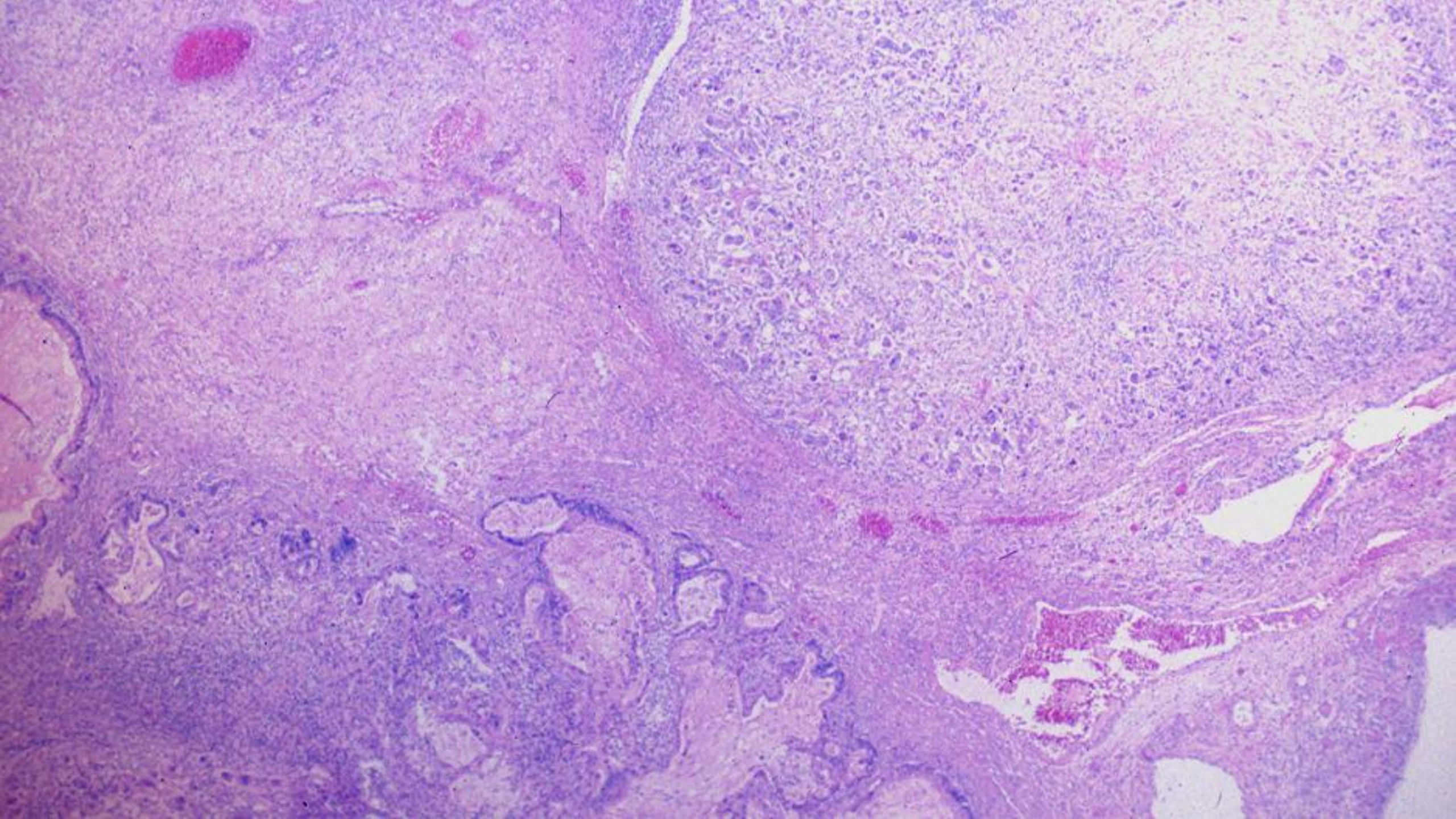
Primary mucinous carcinoma

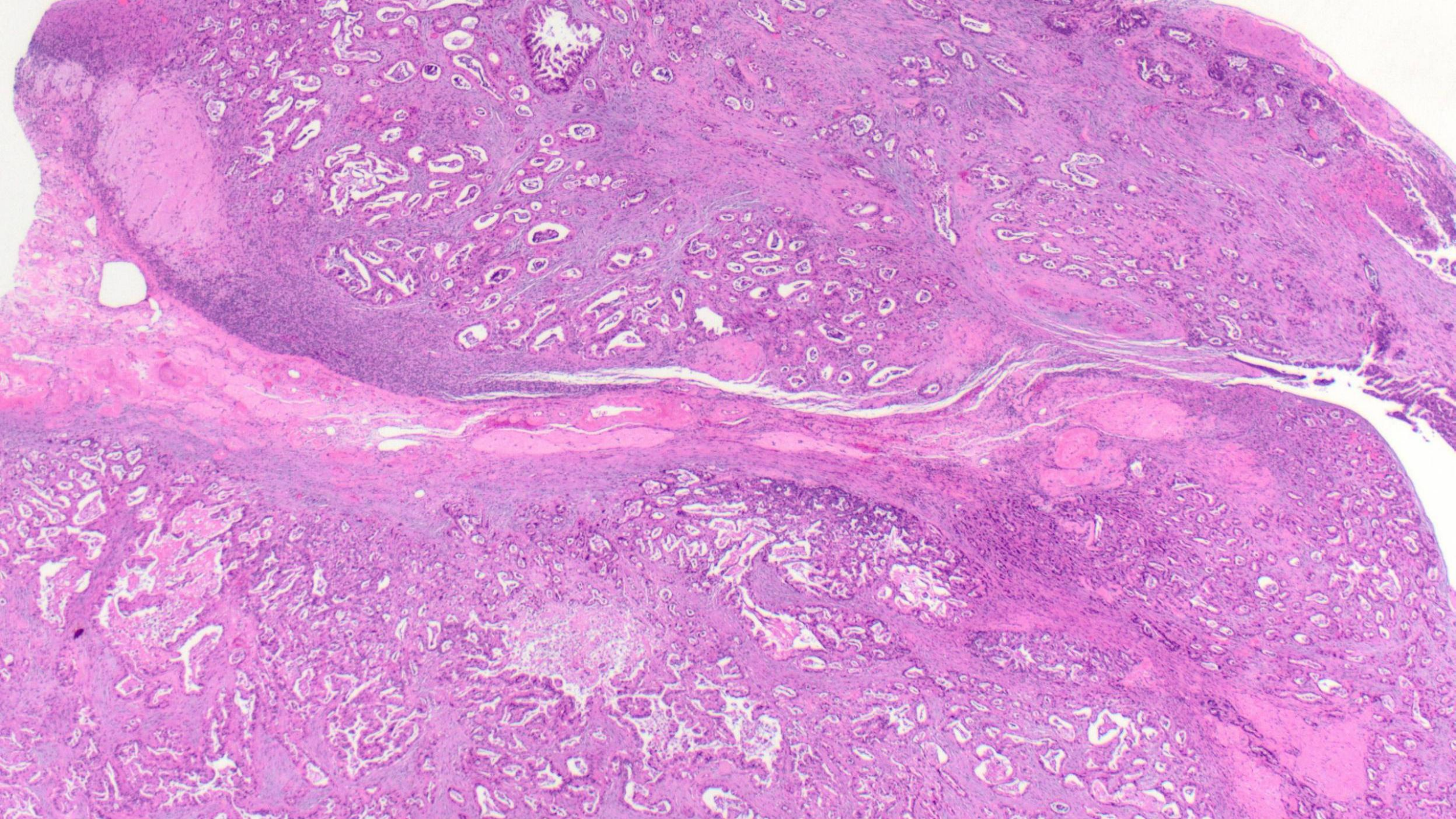


Metastatic Colorectal Cancer to Ovary: 33% Present with Ovarian Involvement, Younger (48 vs 63 Years Old)

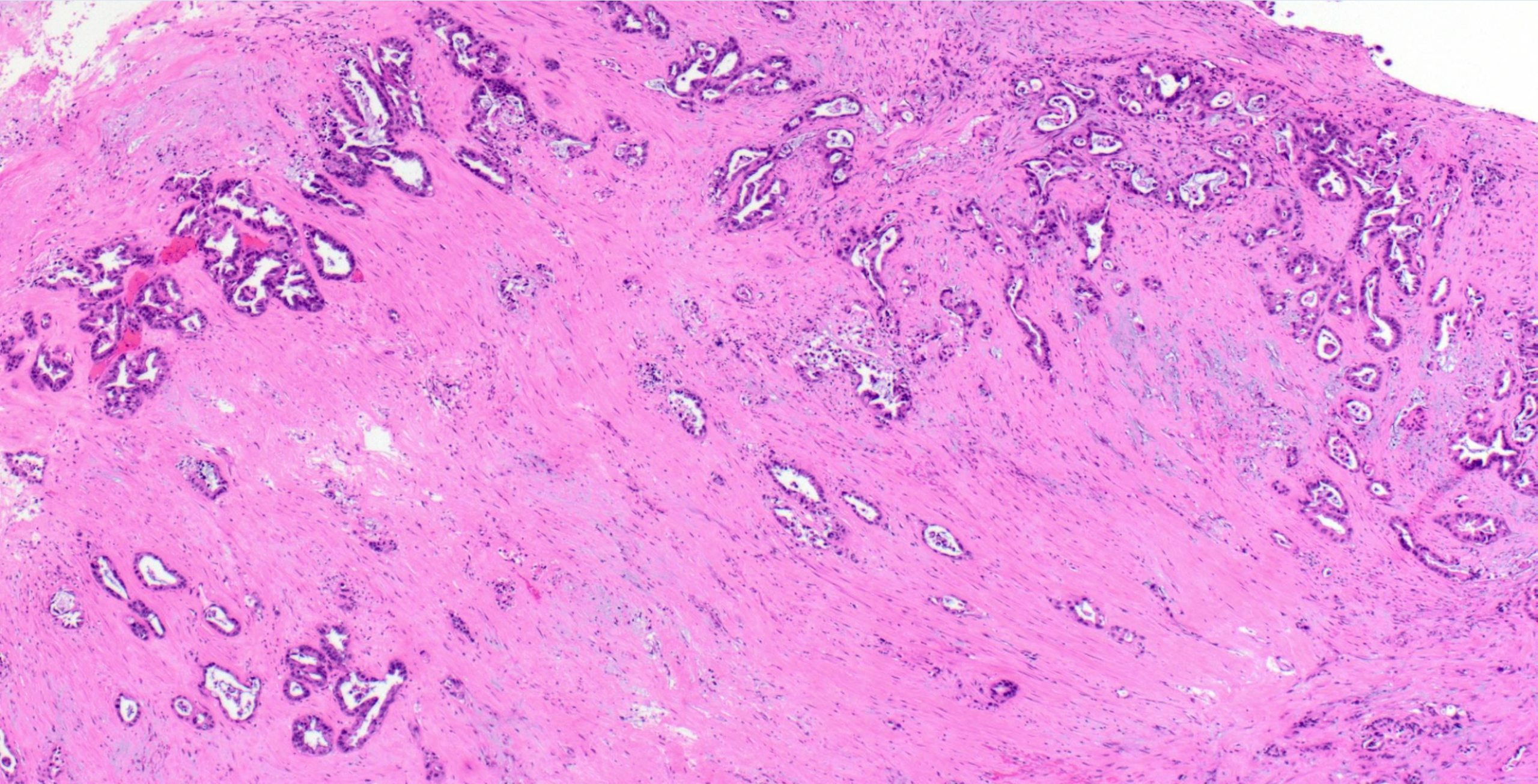




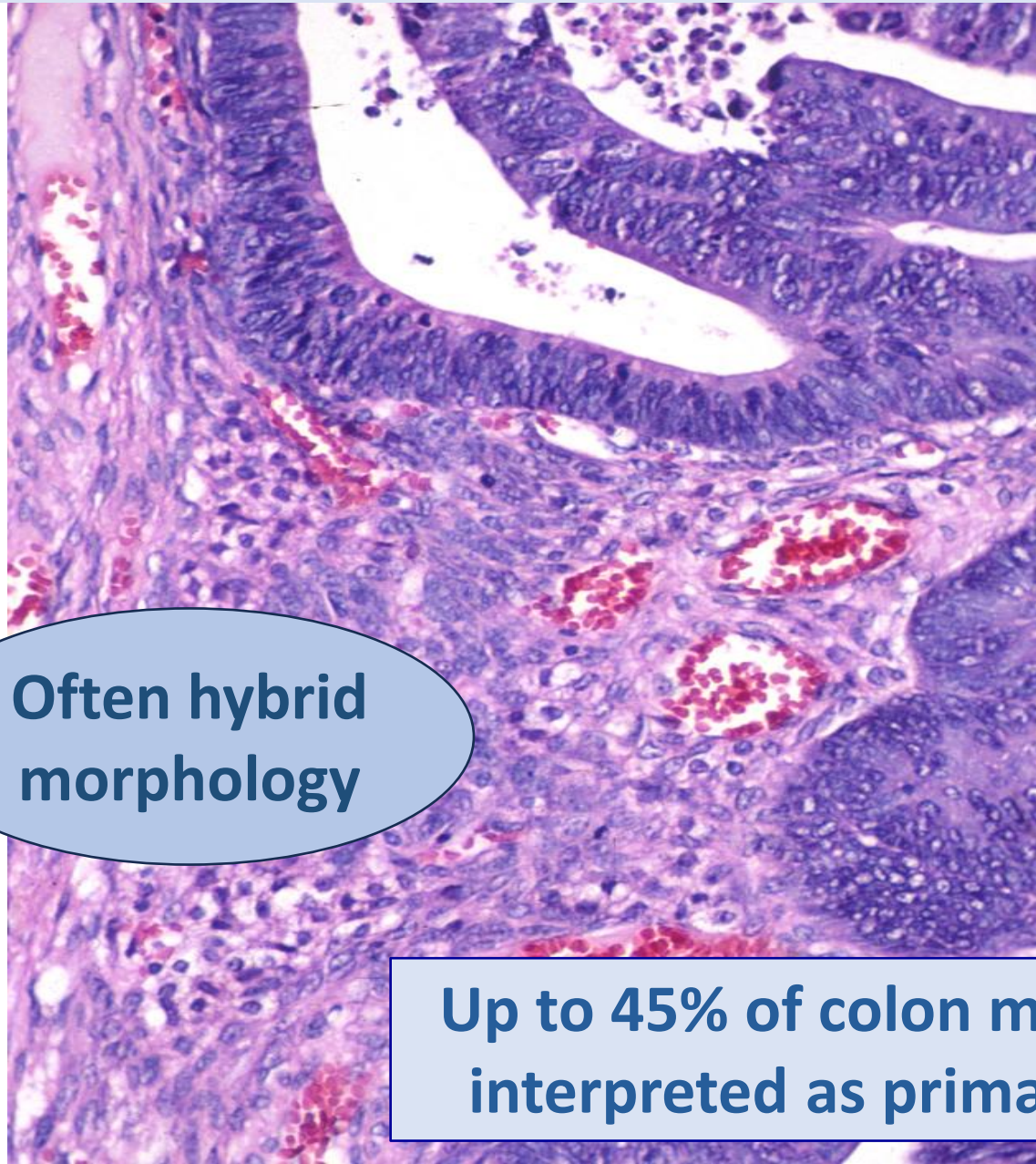




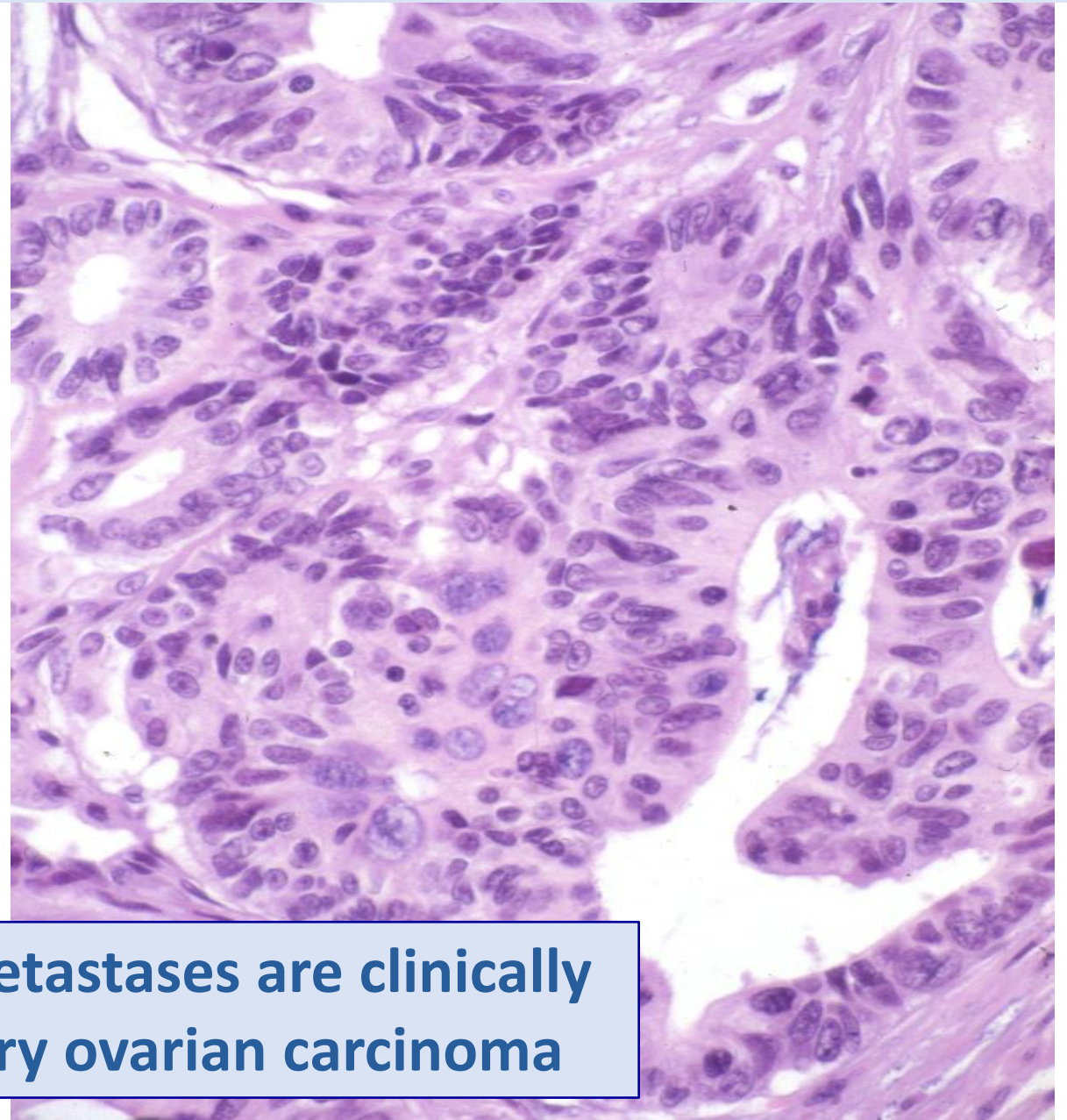
Dense Hyalinized Stroma Can Be Seen in Metastatic Carcinomas



Metastatic Colon Carcinoma Simulating Endometrioid Carcinoma

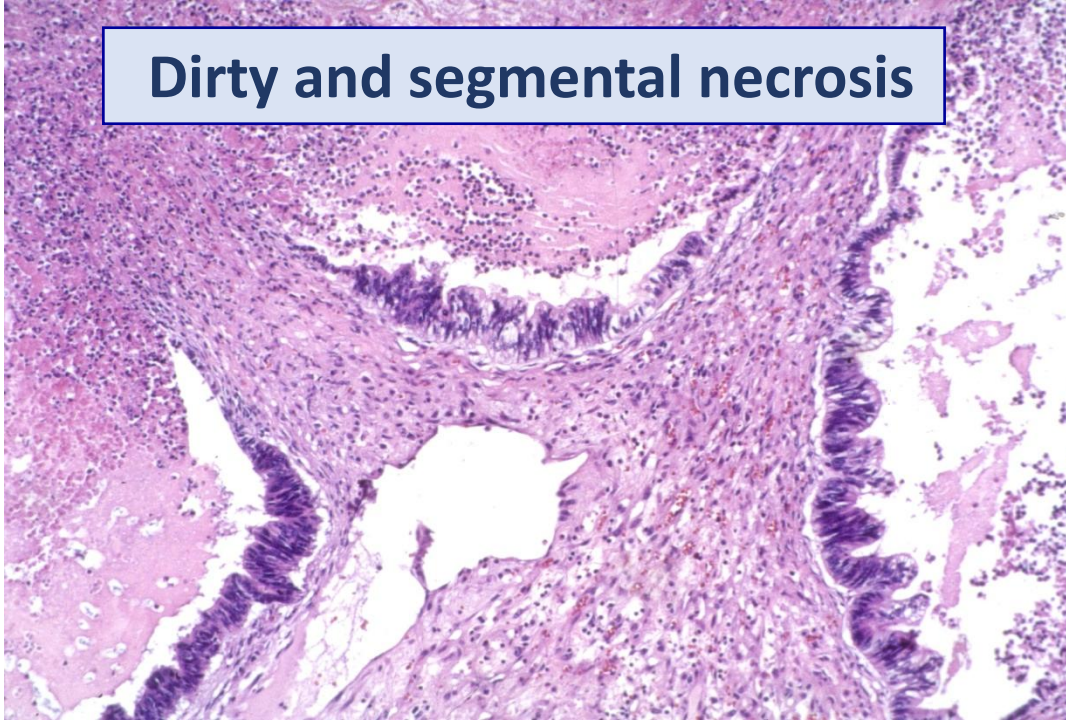


Often hybrid morphology

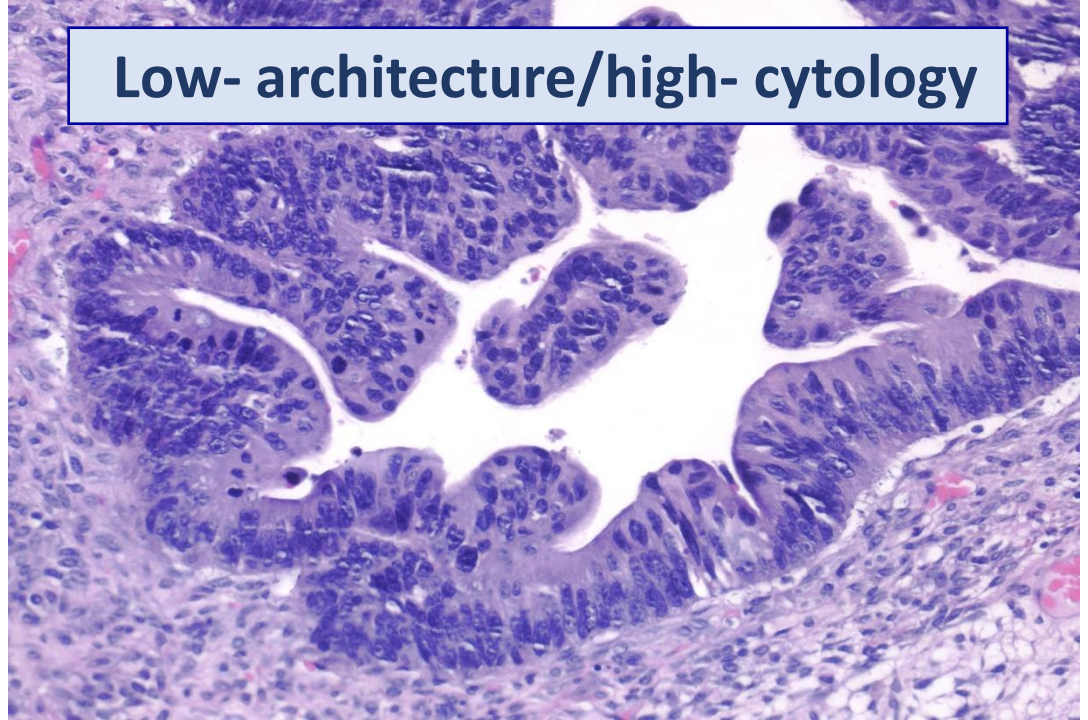


Up to 45% of colon metastases are clinically interpreted as primary ovarian carcinoma

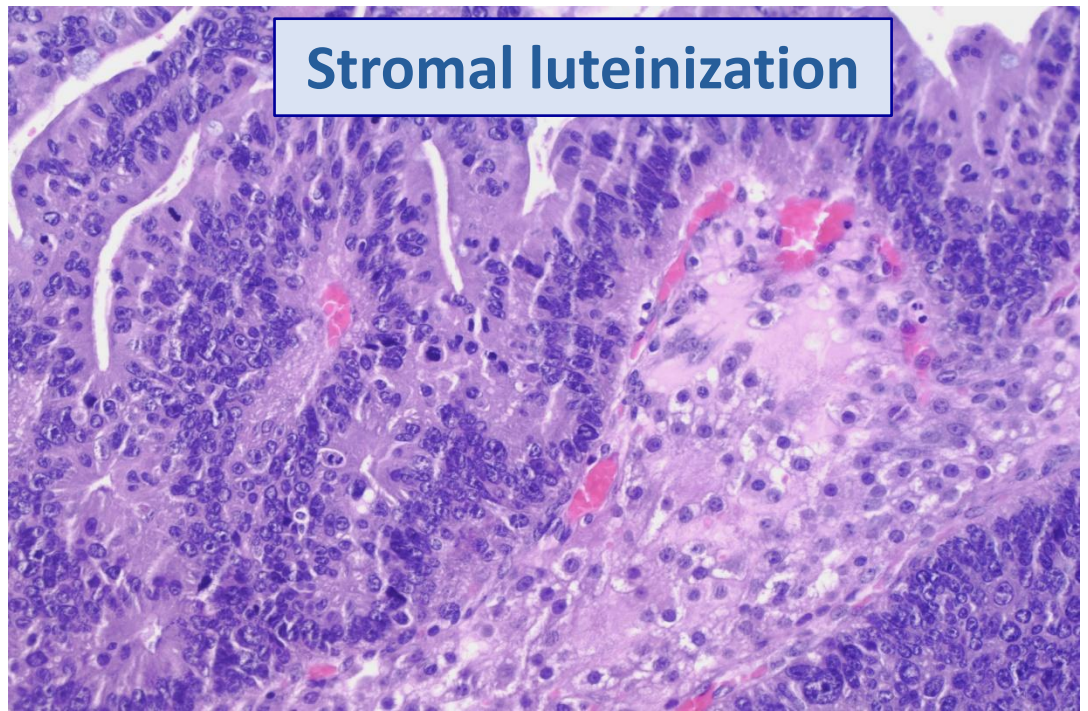
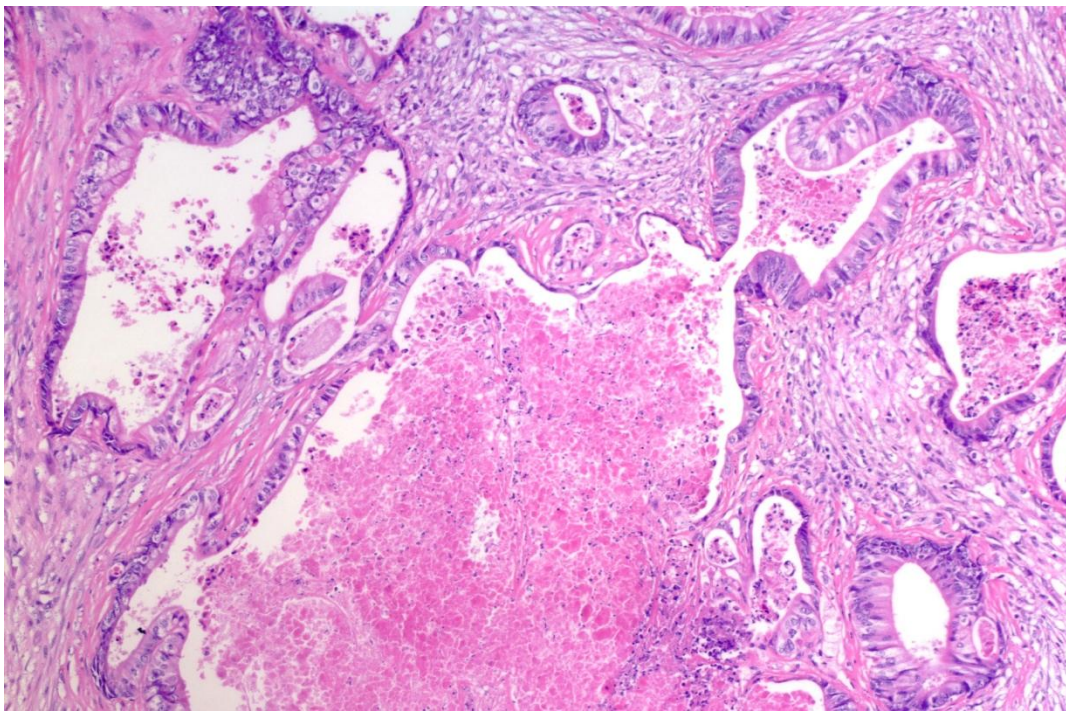
Dirty and segmental necrosis



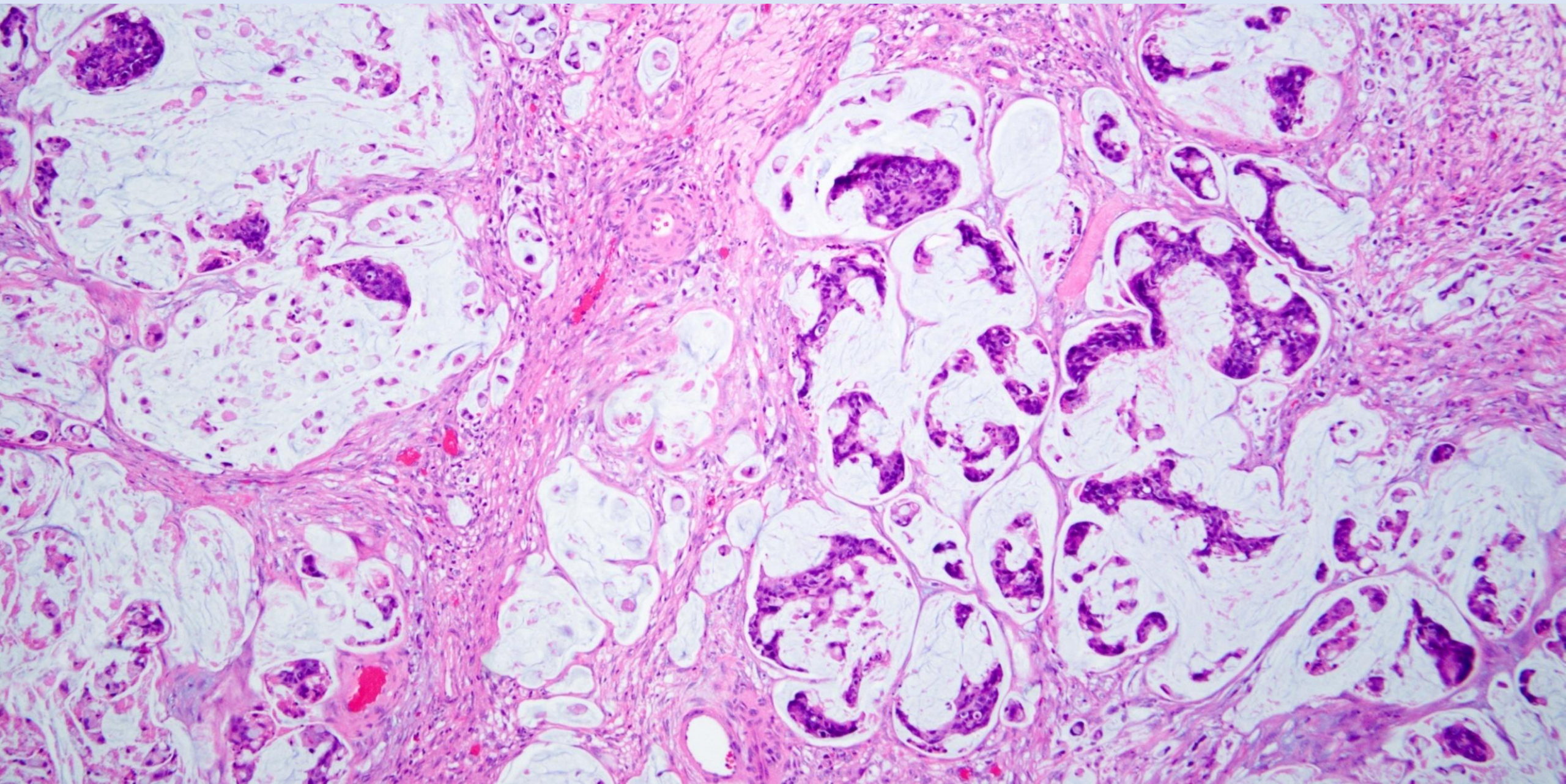
Low- architecture/high- cytology



Stromal luteinization



Metastatic Colloid Colonic Carcinoma



Caveats

- Primary mucinous carcinomas show variable patchy CK20 expression (40-70%)
- Mucinous tumors arising in mature cystic teratomas are CK7-/CK20+
- Right-sided and high-grade large bowel carcinomas are more frequently CK7+/CK20- and small bowel carcinomas are typically CK7+
- Some appendiceal mucinous carcinomas are variably CK7+ (signet-ring and mixed cell types)

Colonic vs Ovarian Mucinous Carcinoma

- CDX2 is a highly sensitive but relatively non-specific marker of colorectal carcinoma
- PAX8 and SOX17 positivity favors Müllerian origin:
 - ✓ In contrast to other ovarian carcinomas, PAX8 expression seen in ~40% and SOX17 in ~25% of mucinous carcinomas!
- CK7, SATB2, and PAX8 separated primary from secondary GI neoplasms with 77% sensitivity and 99% specificity, outperforming tumor laterality and size
- Second-line markers (CDX2, MUC2, ER, MUC1, β -catenin) increased sensitivity of immunohistochemistry in excluding lower GI origin

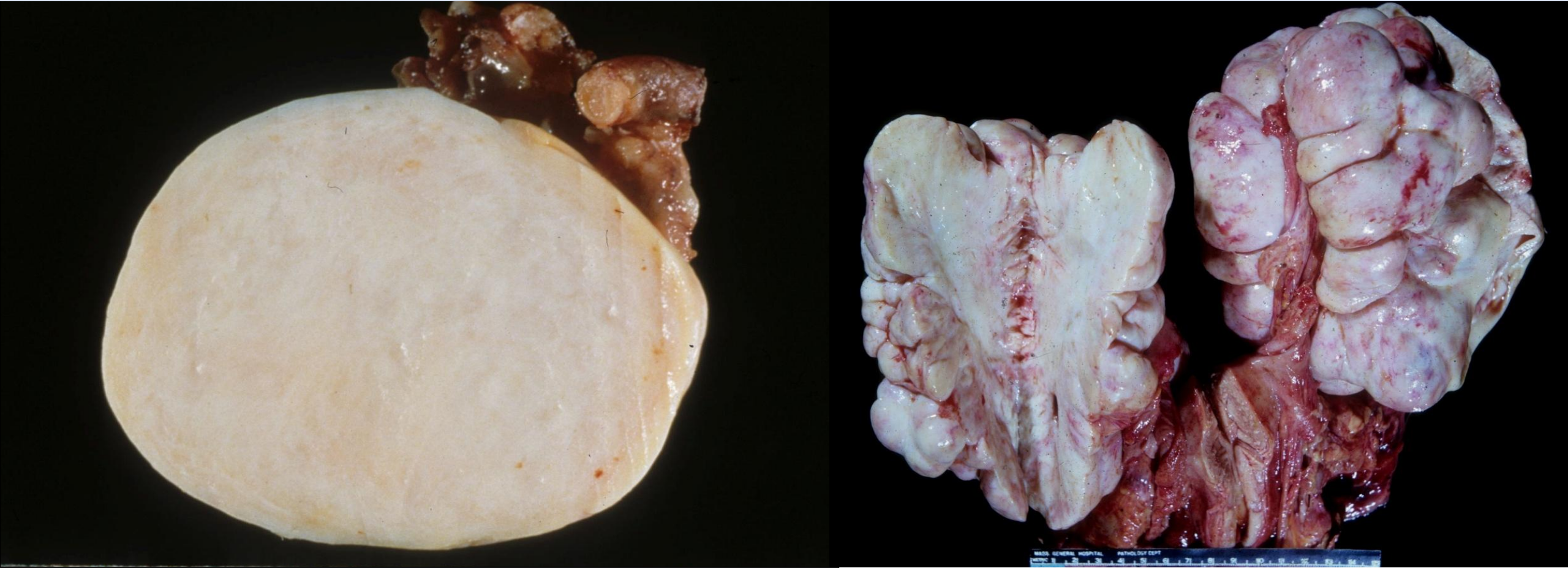
Krukenberg Tumor: Variable Origin

- Stomach: 76%
 - Colon & rectum: 11%
 - Breast: 4%
 - Gallbladder/biliary tract: 3%
 - Others (appendix..): 6%
-
- Primary carcinoma may be small and difficult to identify!



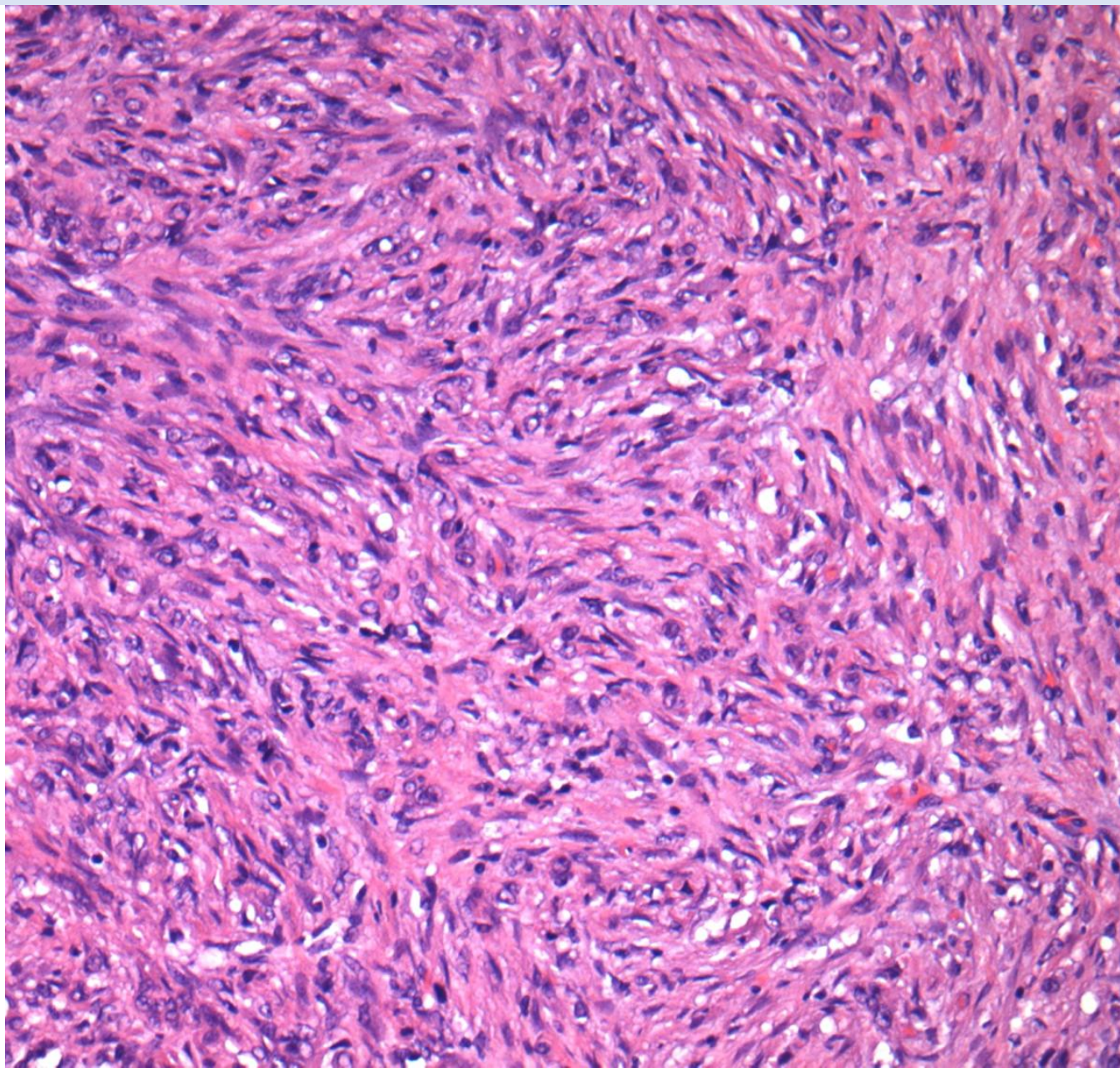
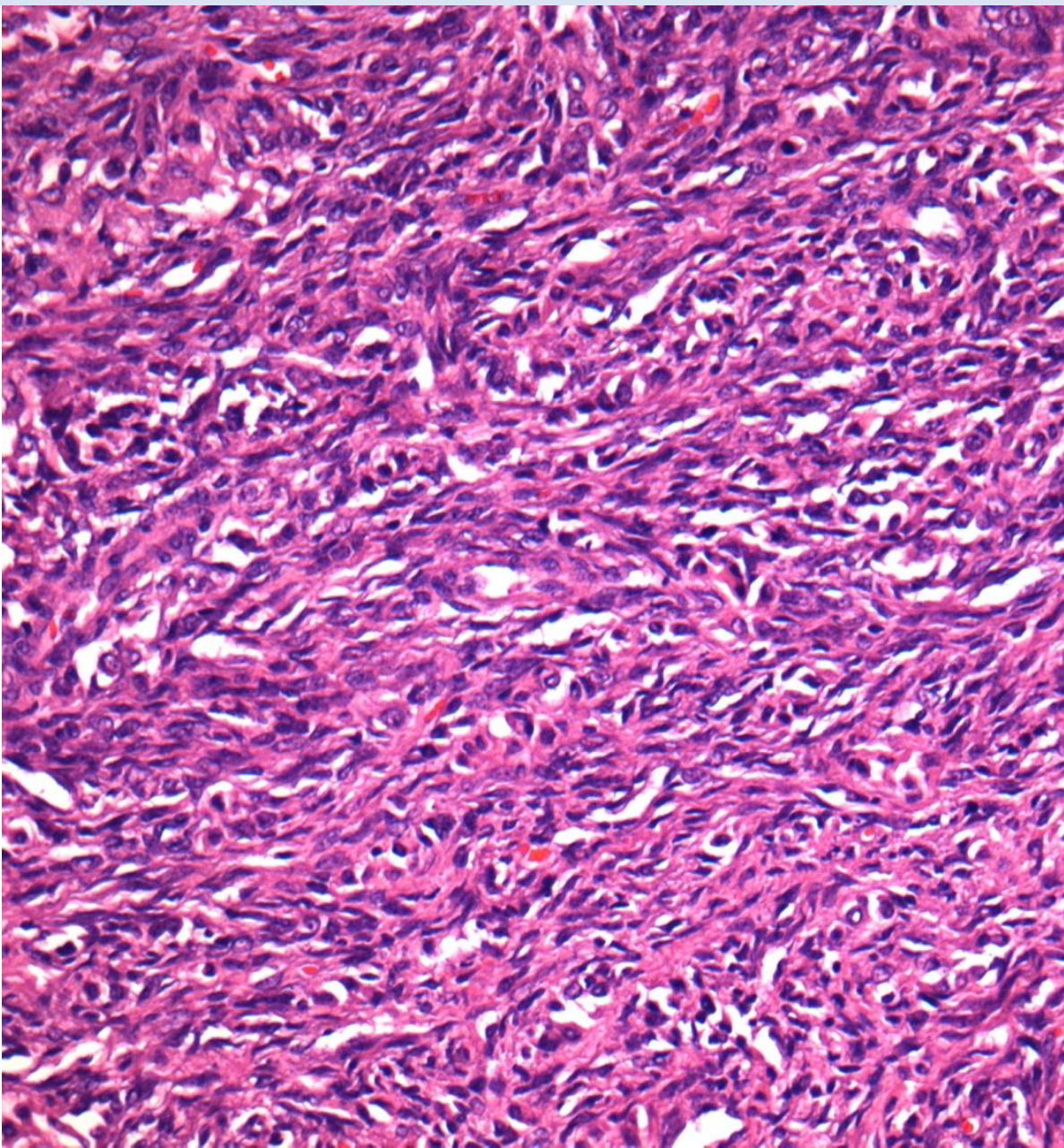
Nodular, edematous and/or gelatinous cut surface

Fibroma?

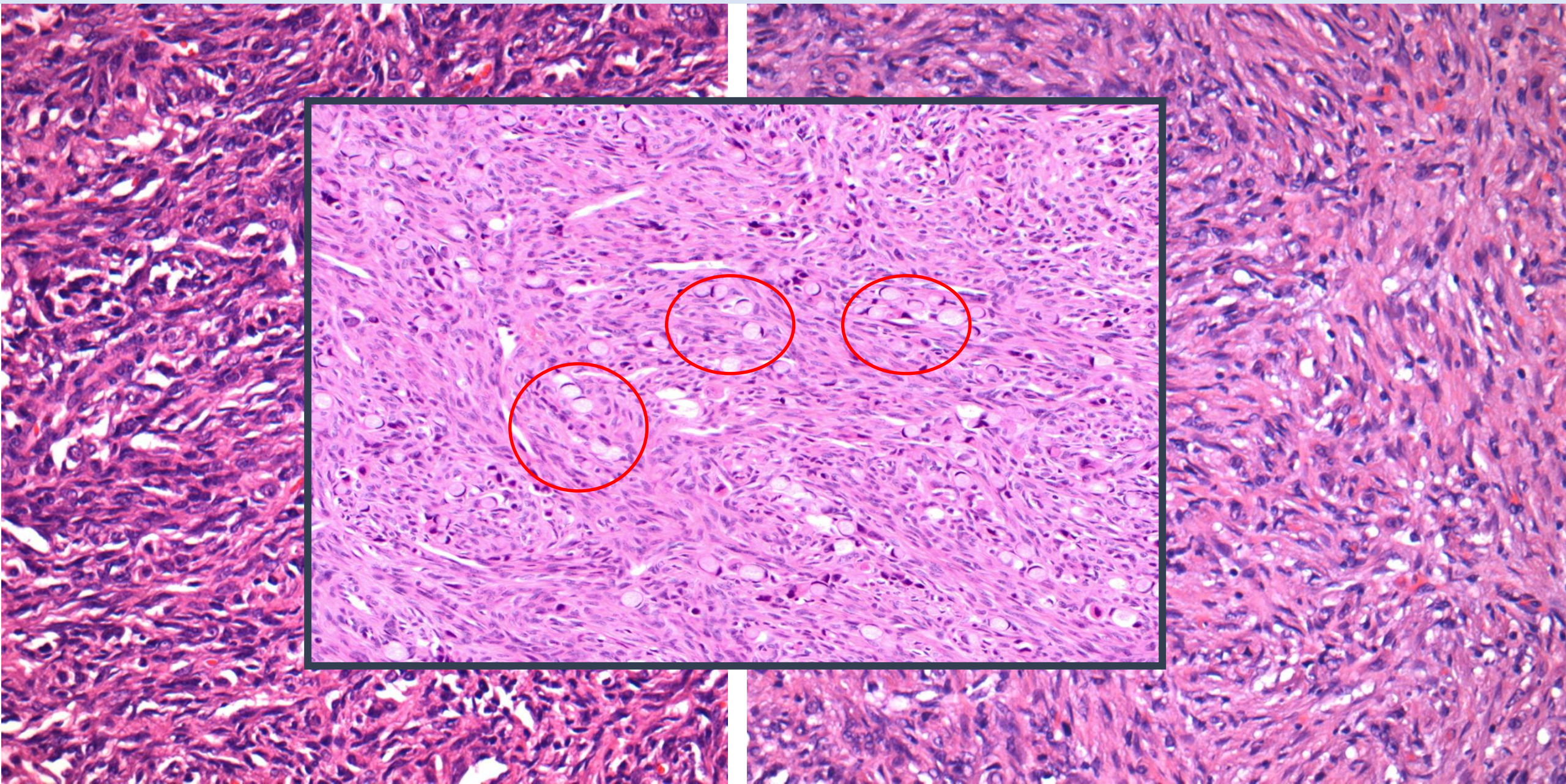


- Krukenberg tumor, fibroma and other benign tumors (Brenner) may look similar grossly!
- Ask for status of the contralateral ovary if not known
- At least look for signet ring cells!!!

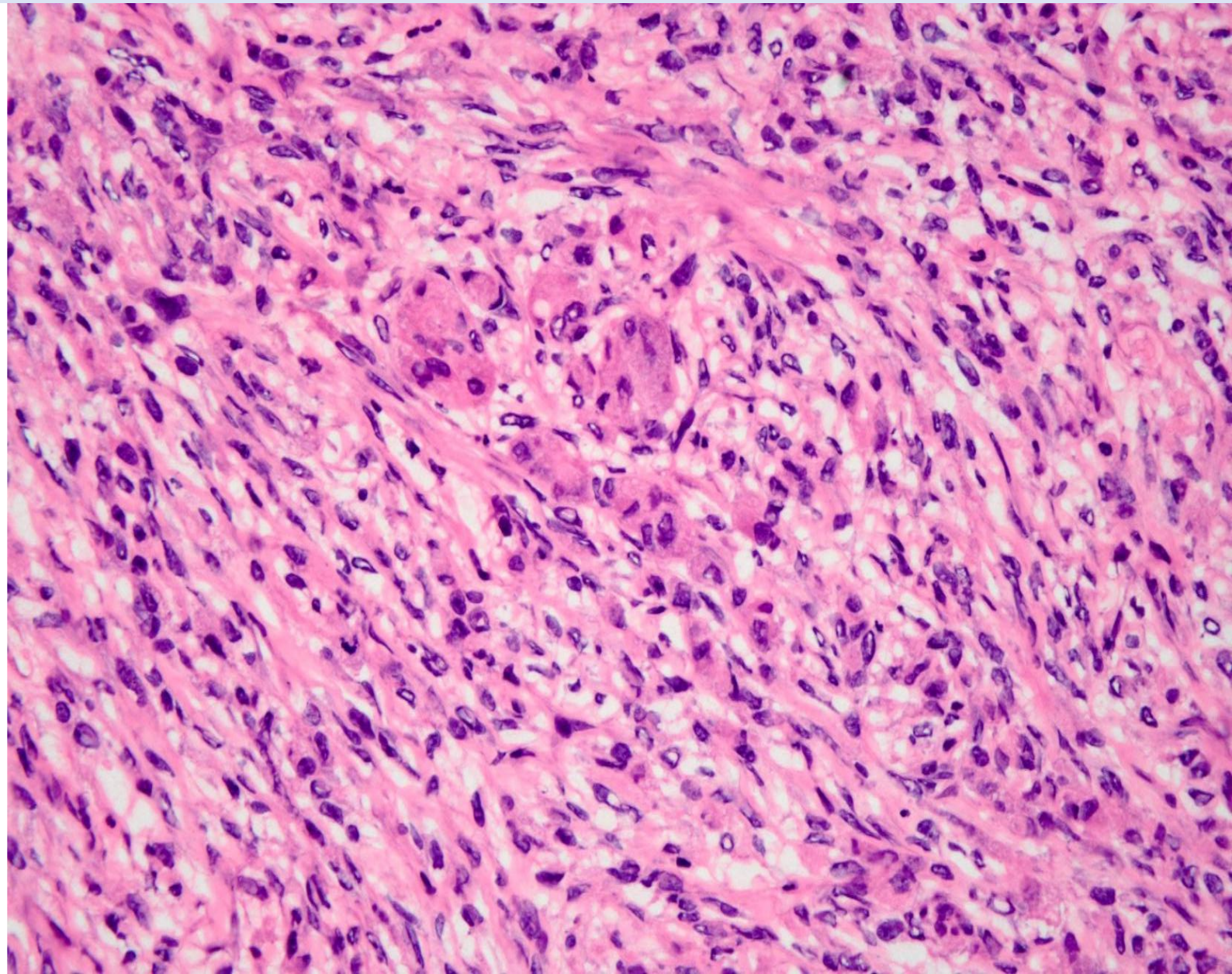
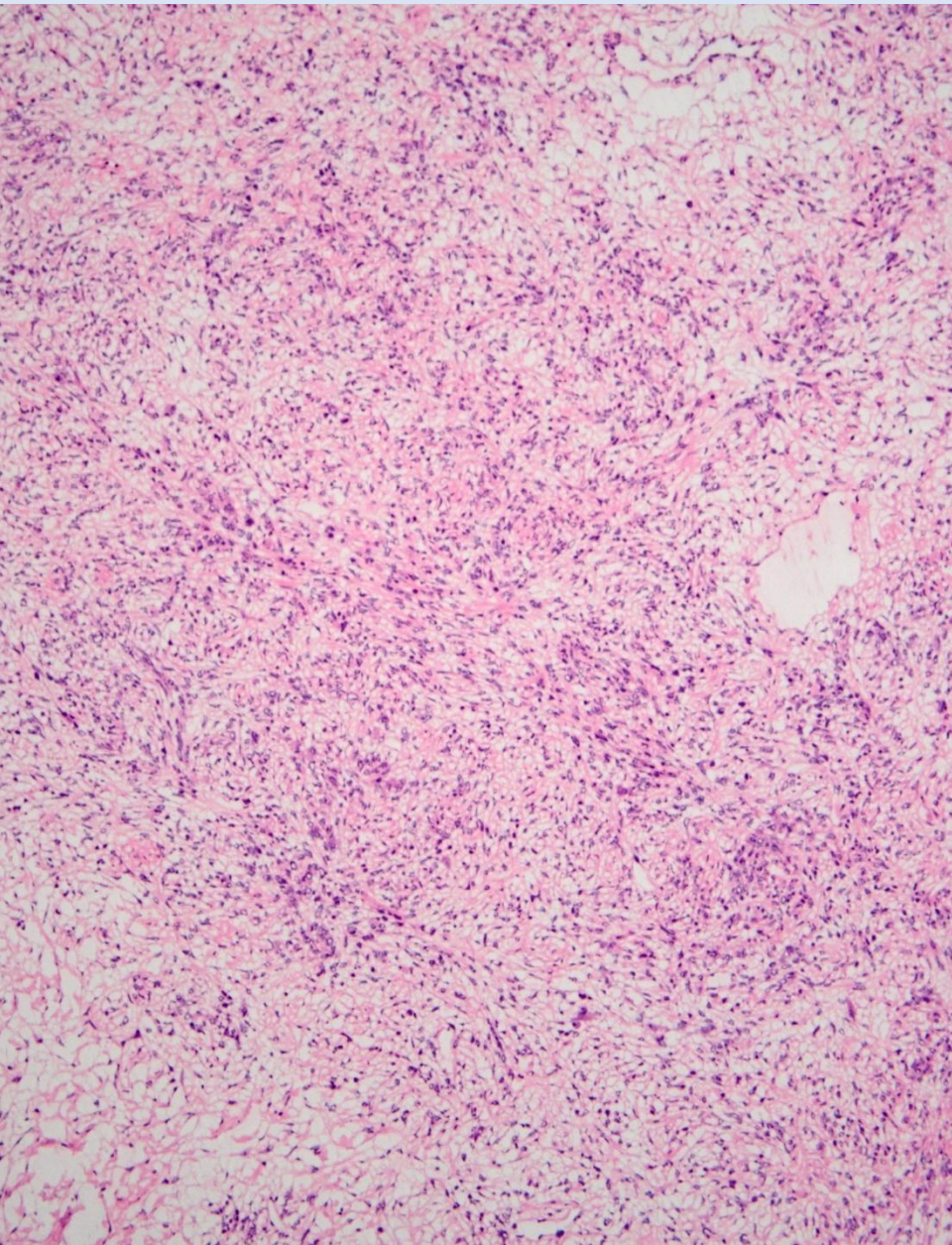
Krukenberg Tumor: Fibroma-Like



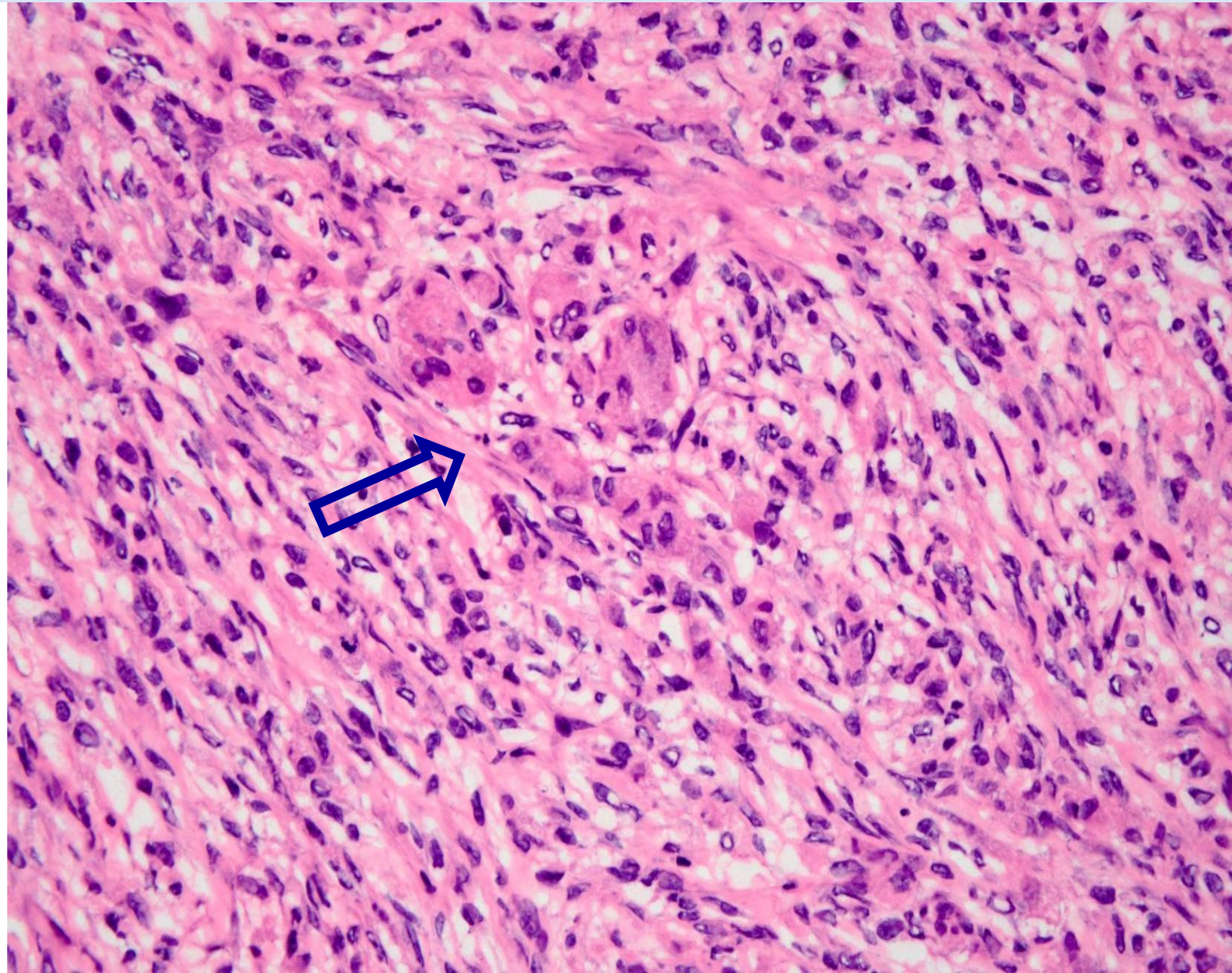
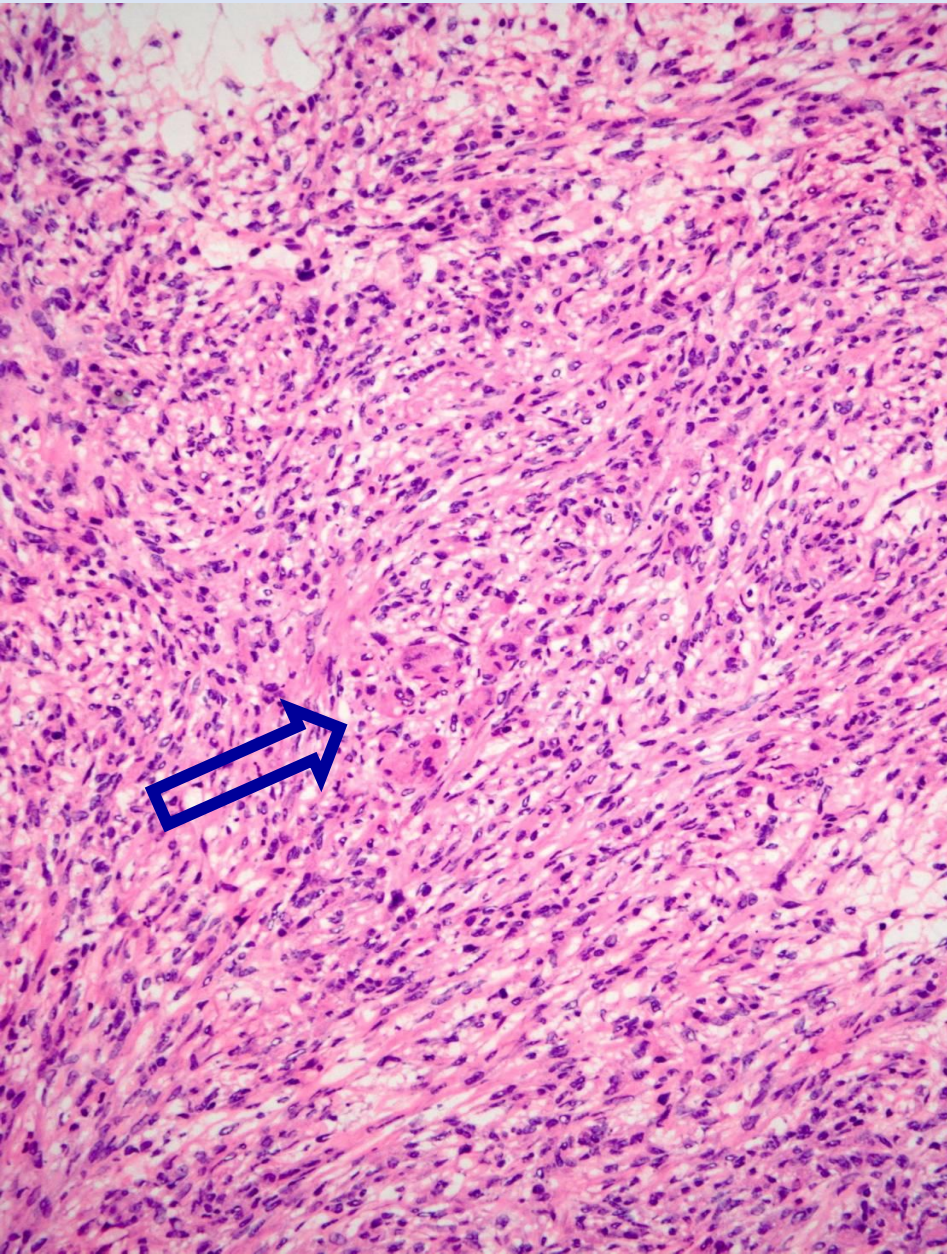
Krukenberg Tumor: Fibroma-Like

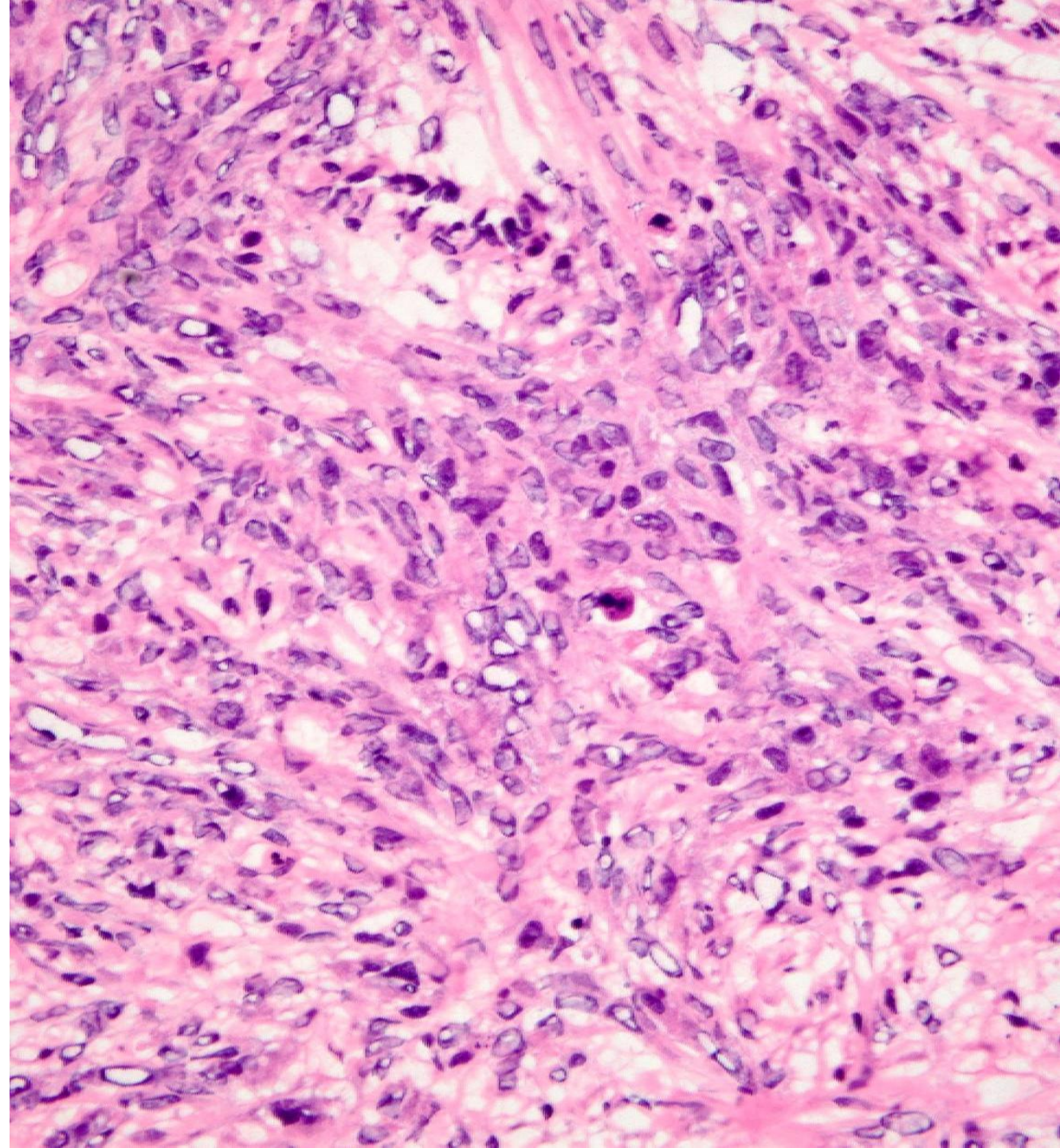
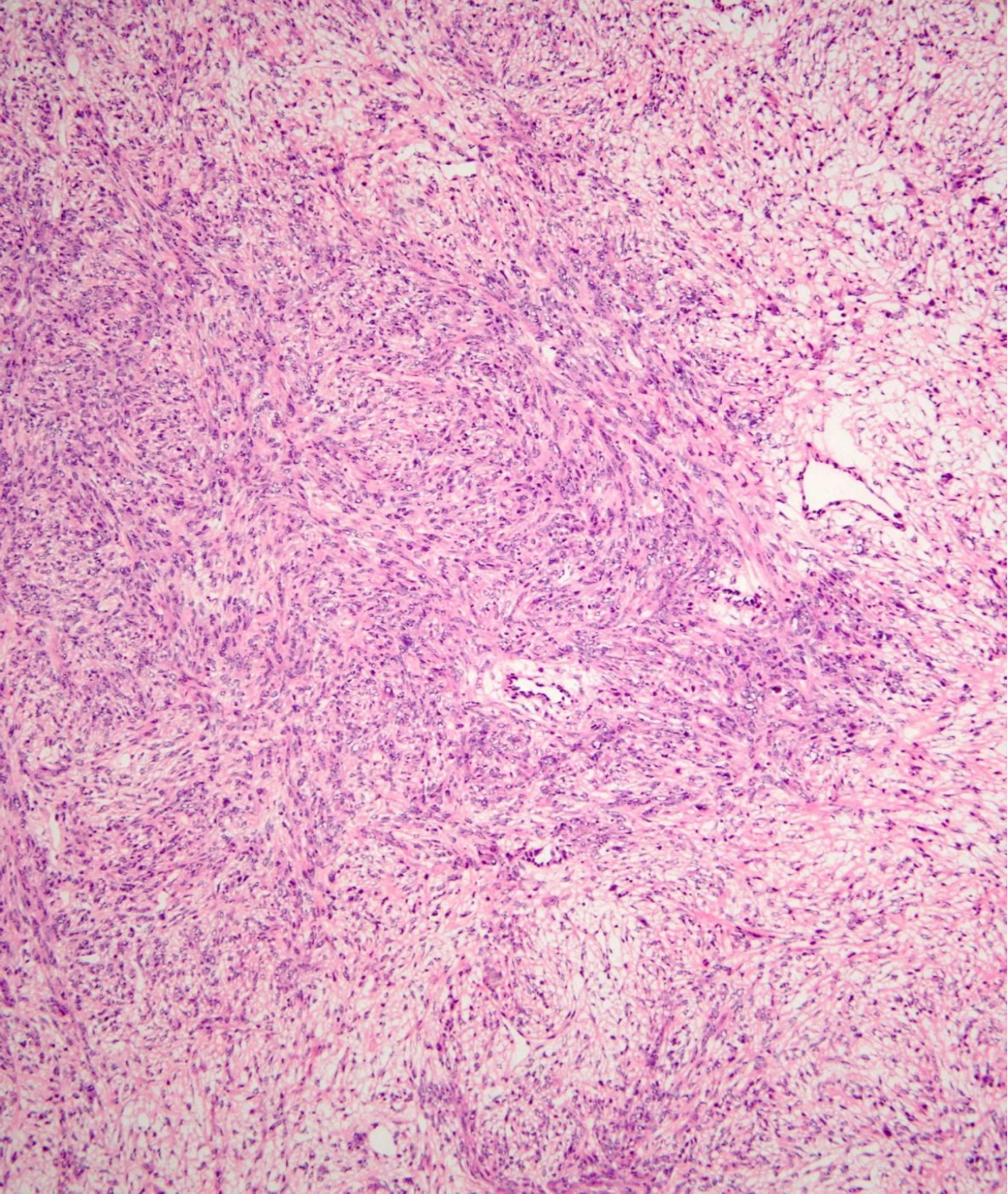


Ovarian Mass: Sarcoma?

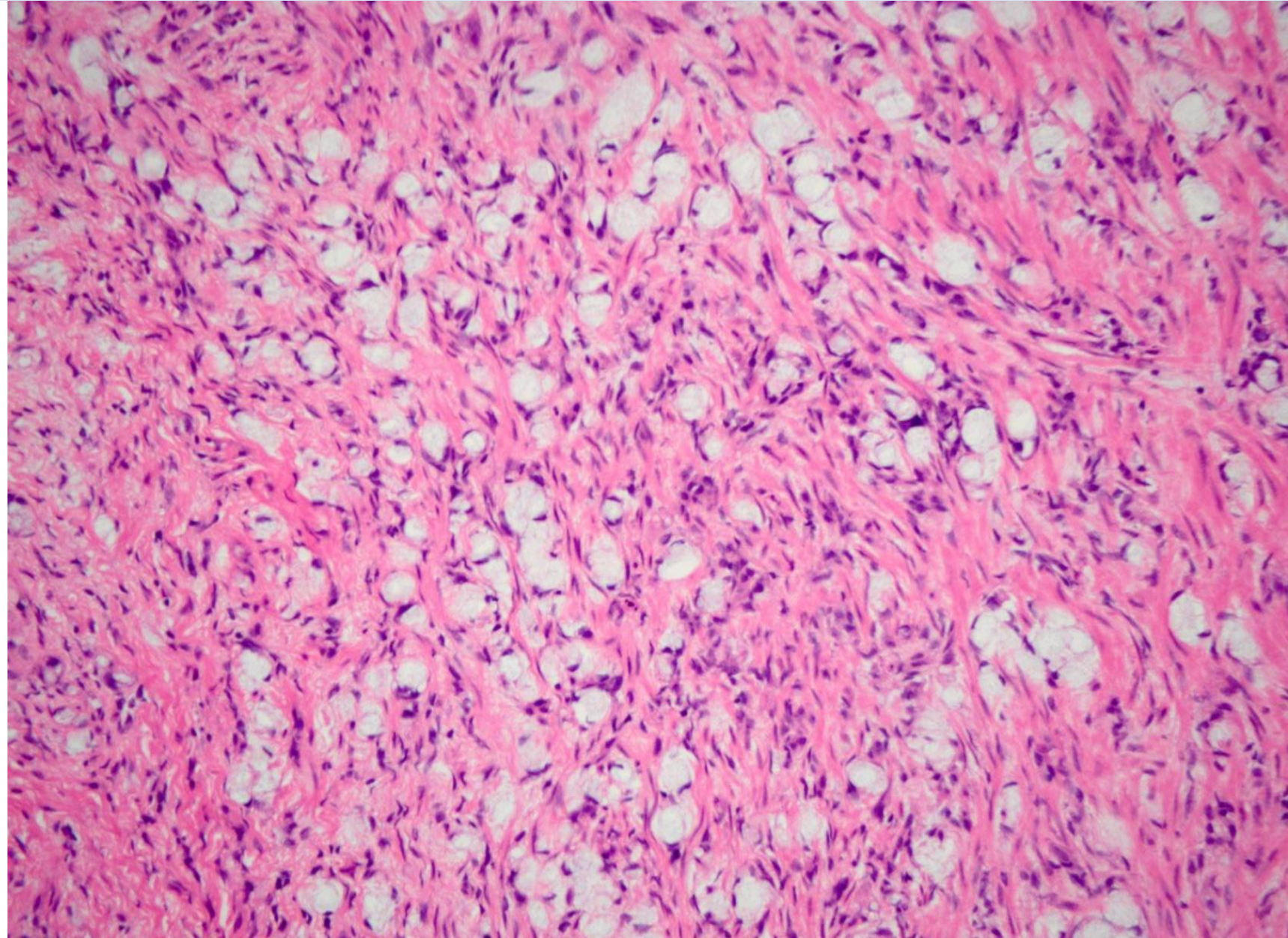
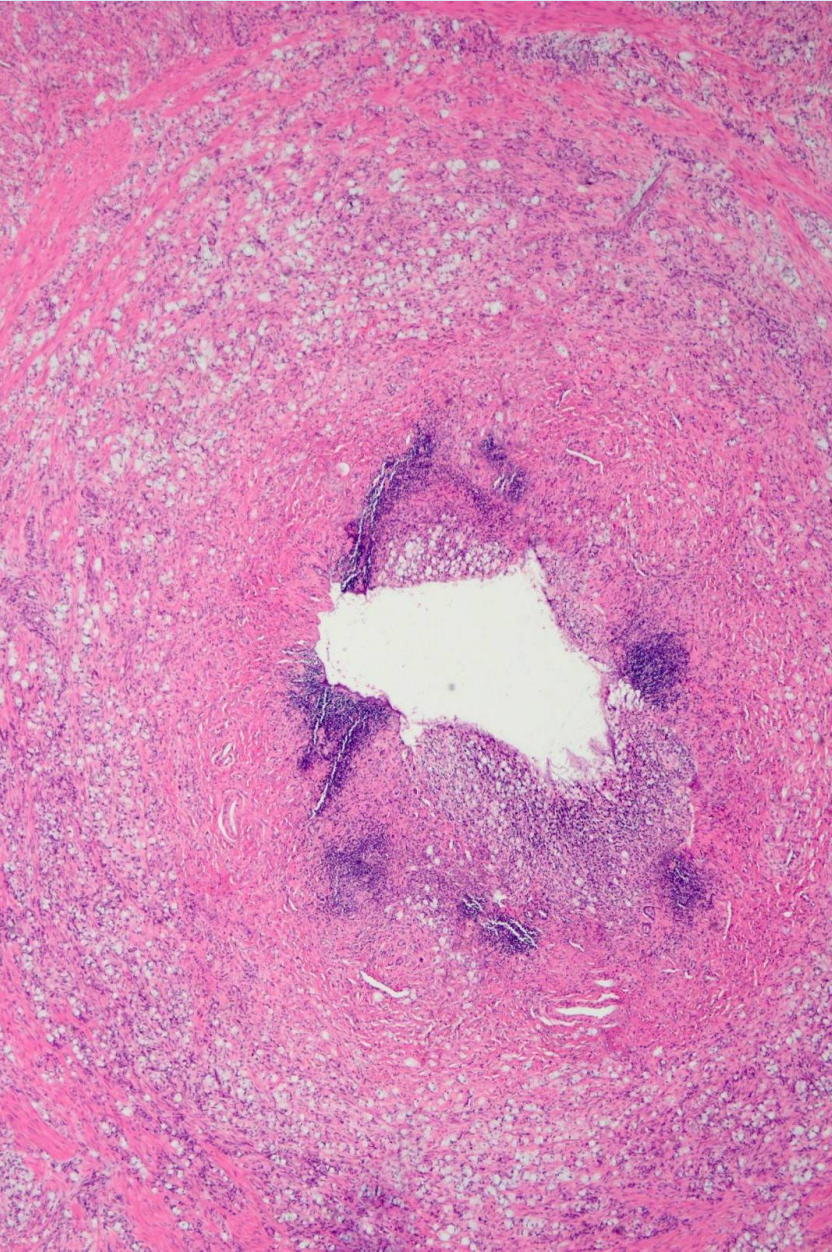


Ovarian Mass: Sarcoma?



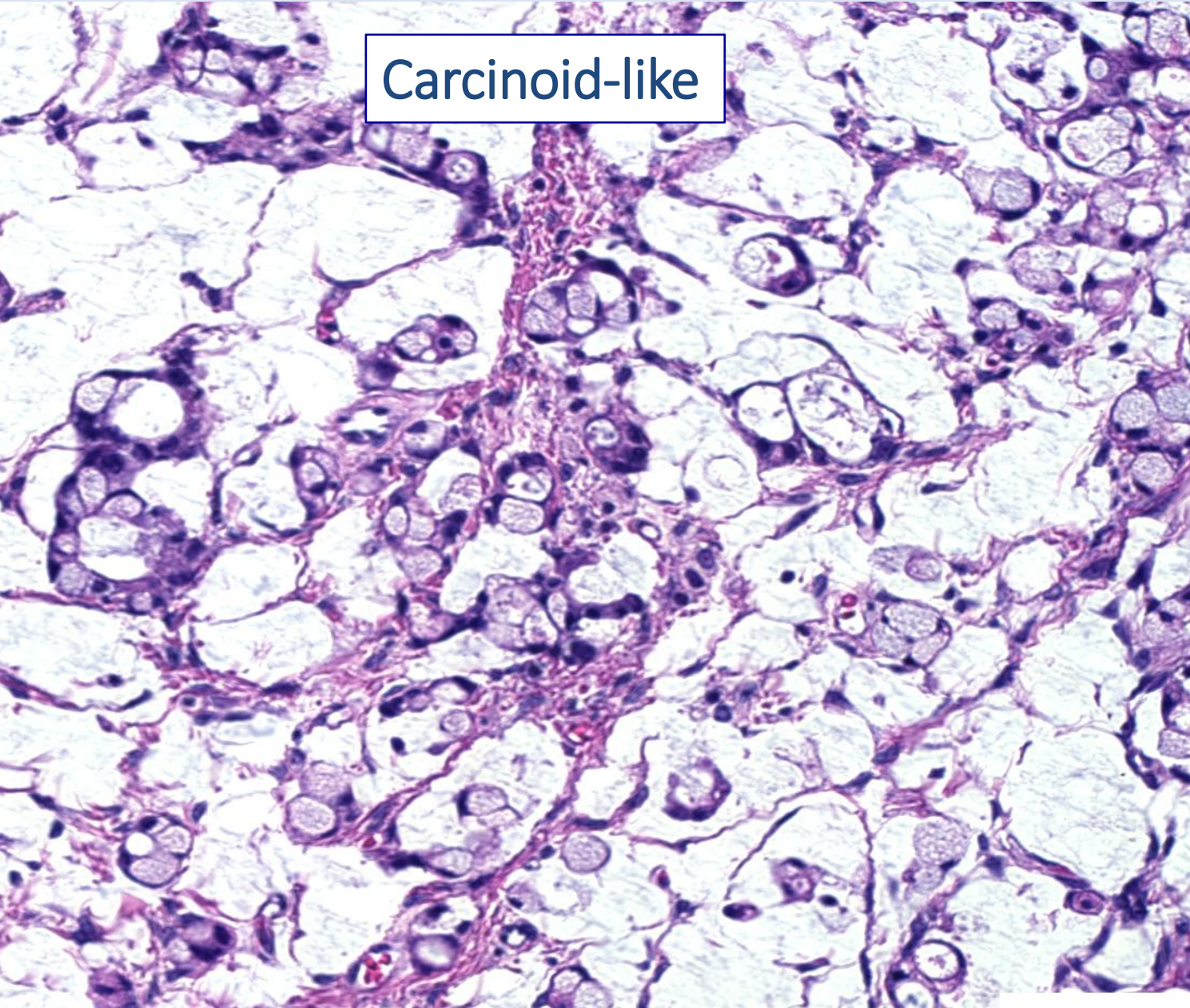


Krukenberg Tumor: Appendiceal Primary

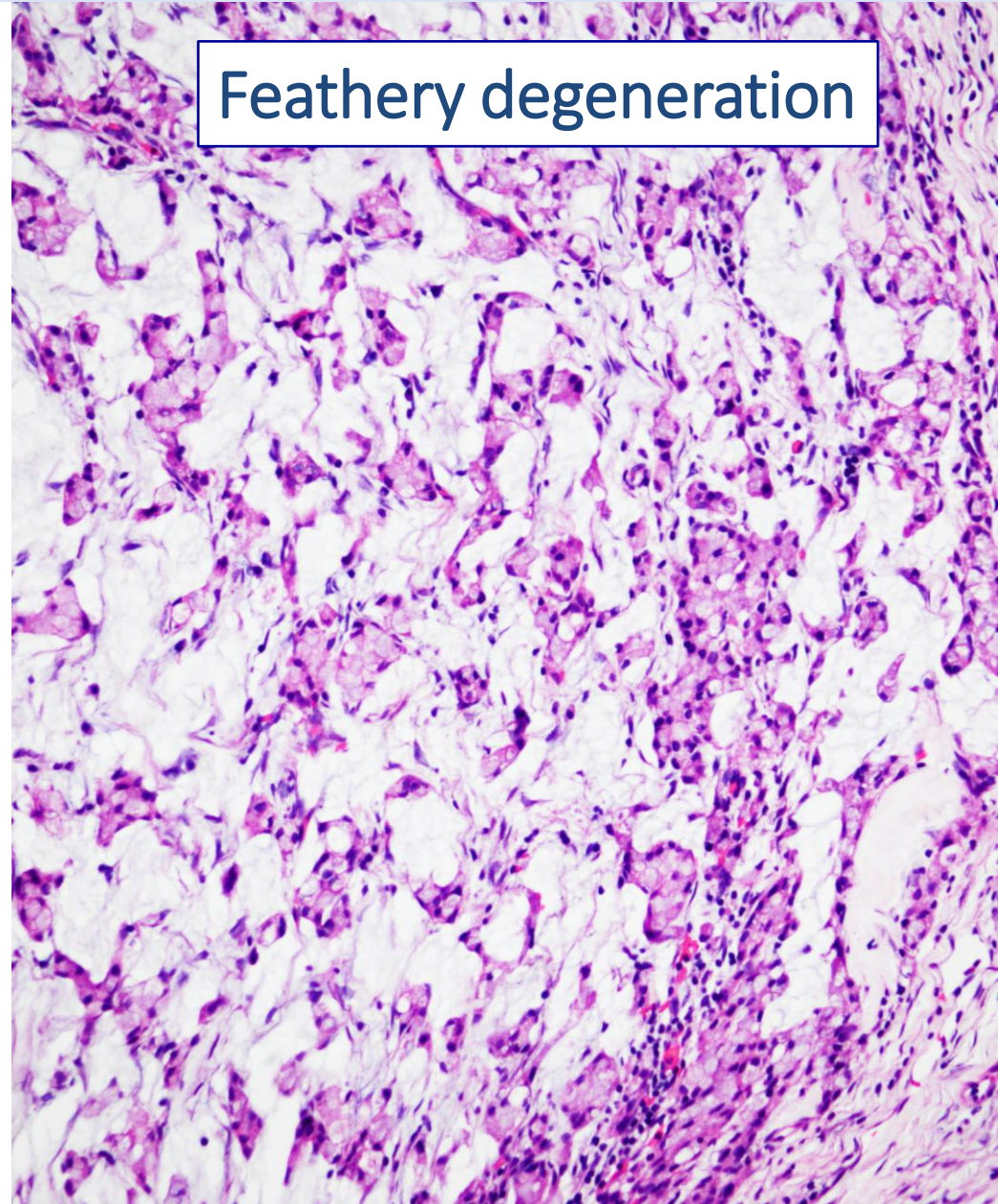


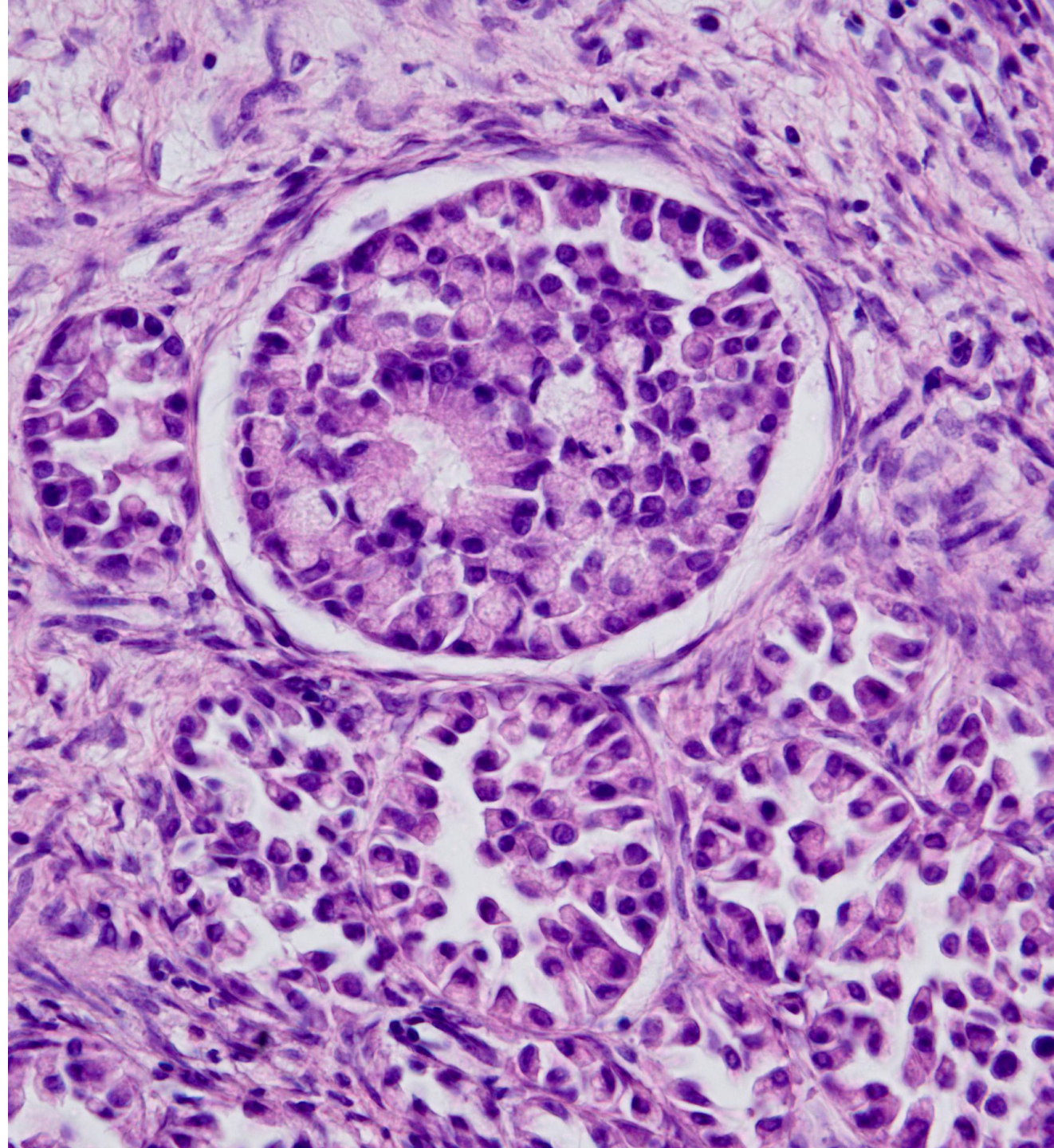
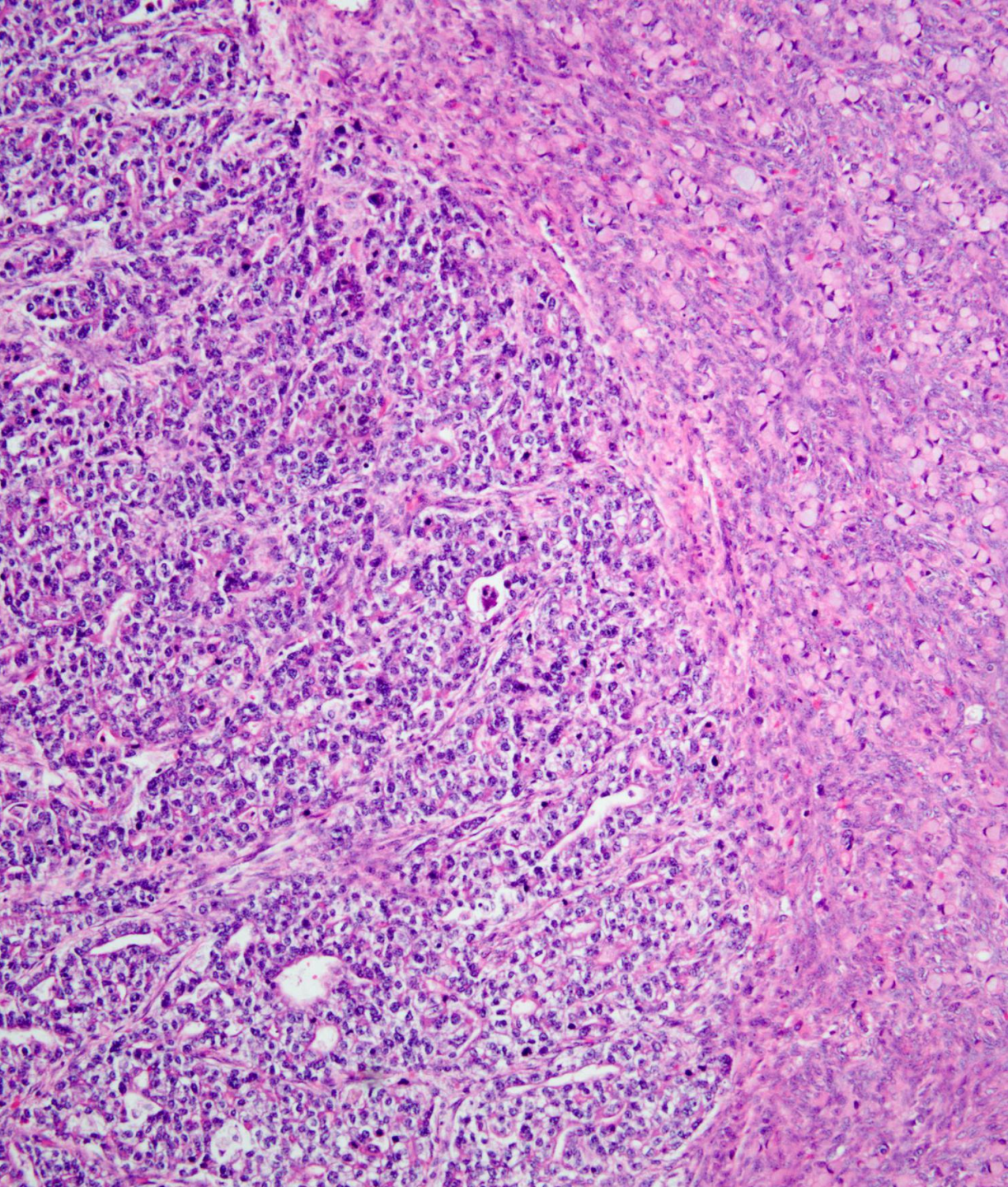
Krukenberg Tumor: Range of Morphologies

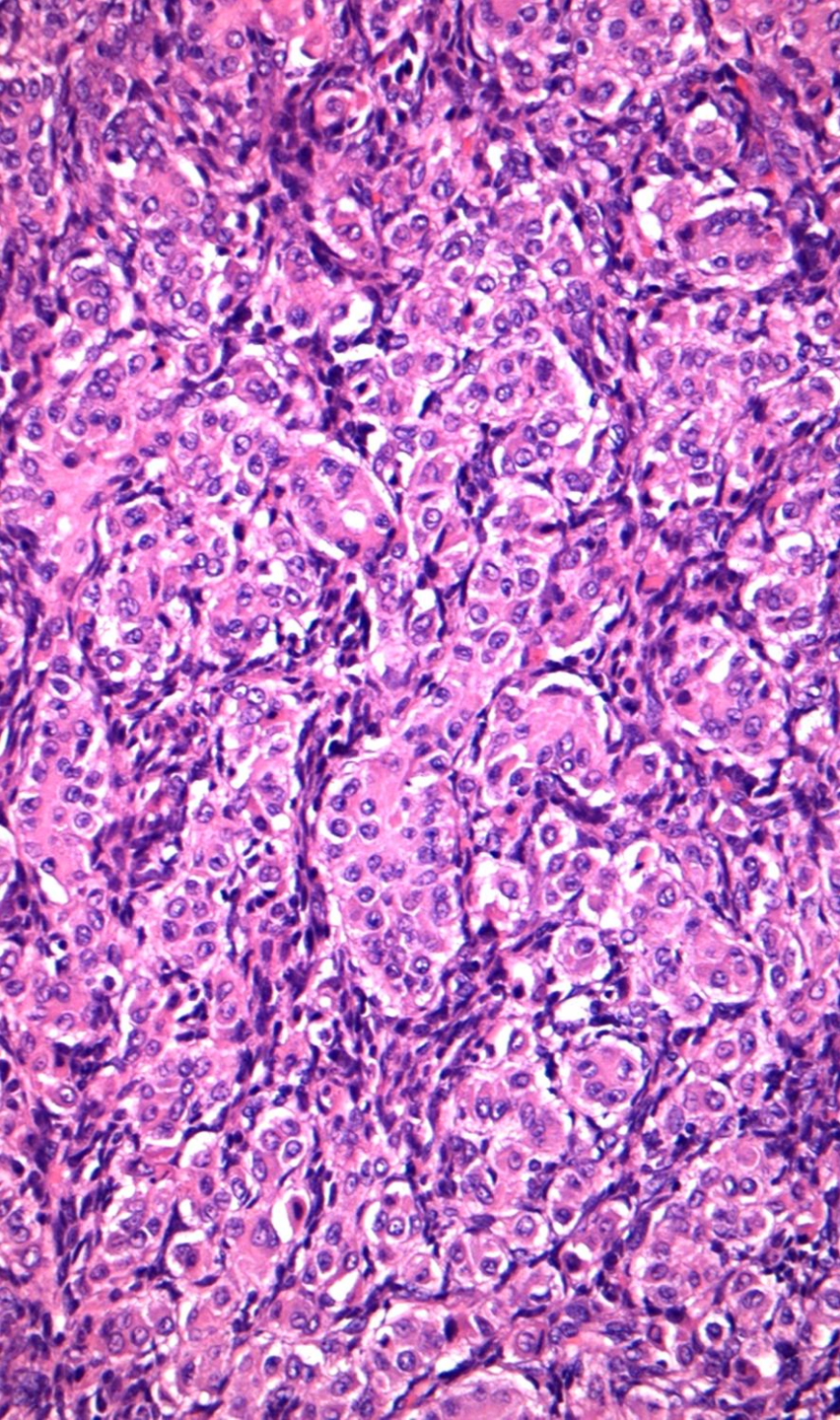
Carcinoid-like



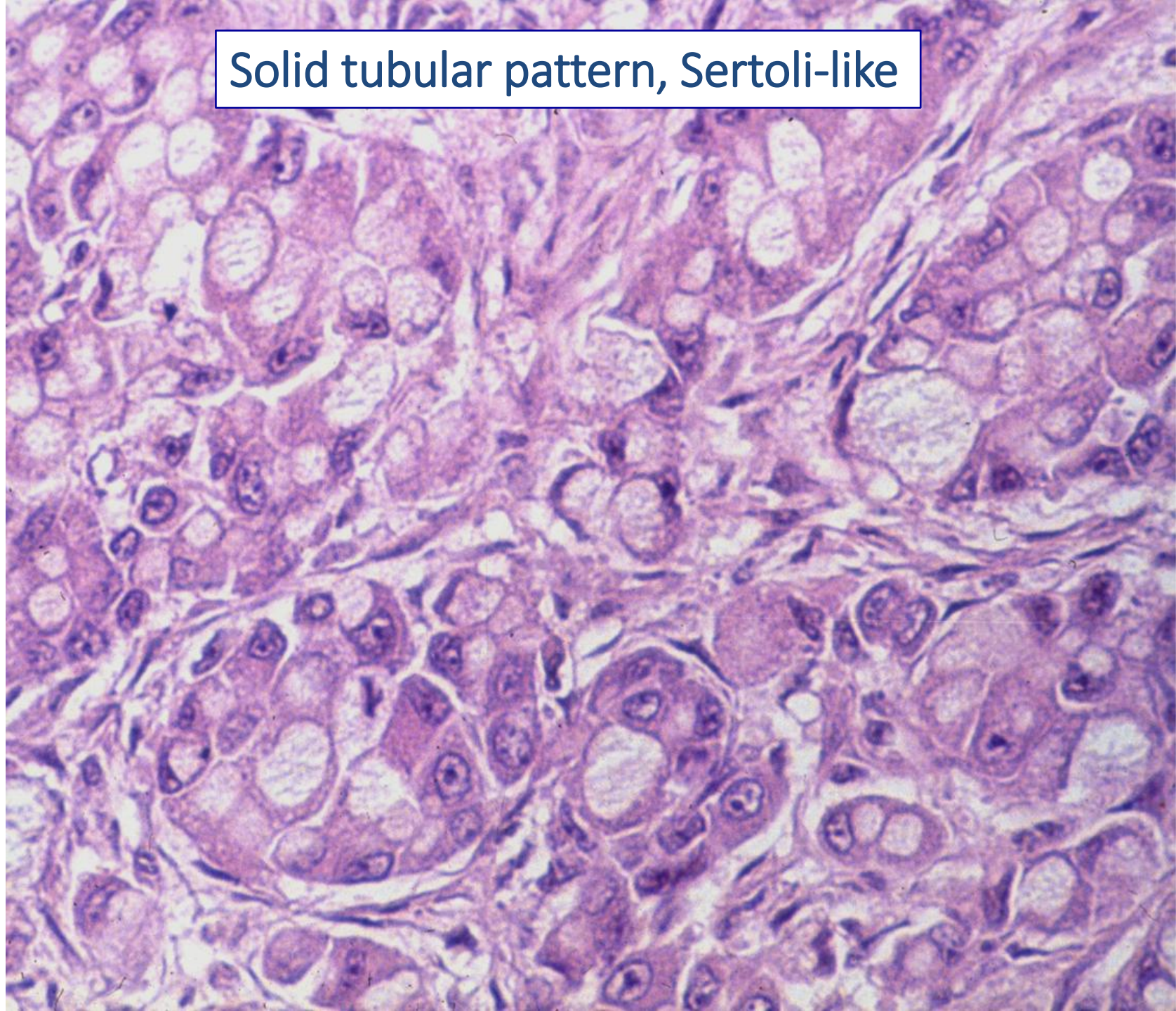
Feathery degeneration

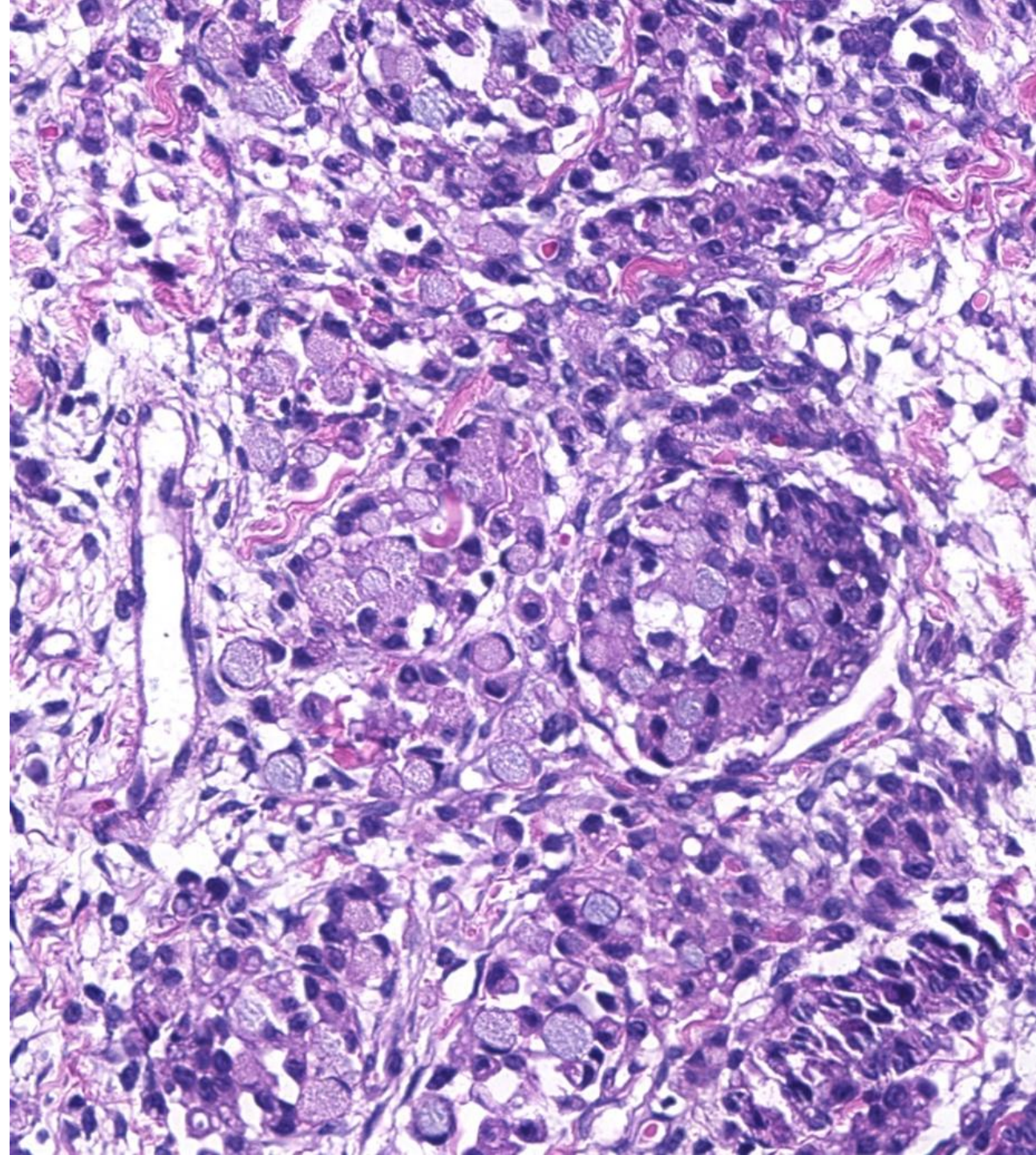
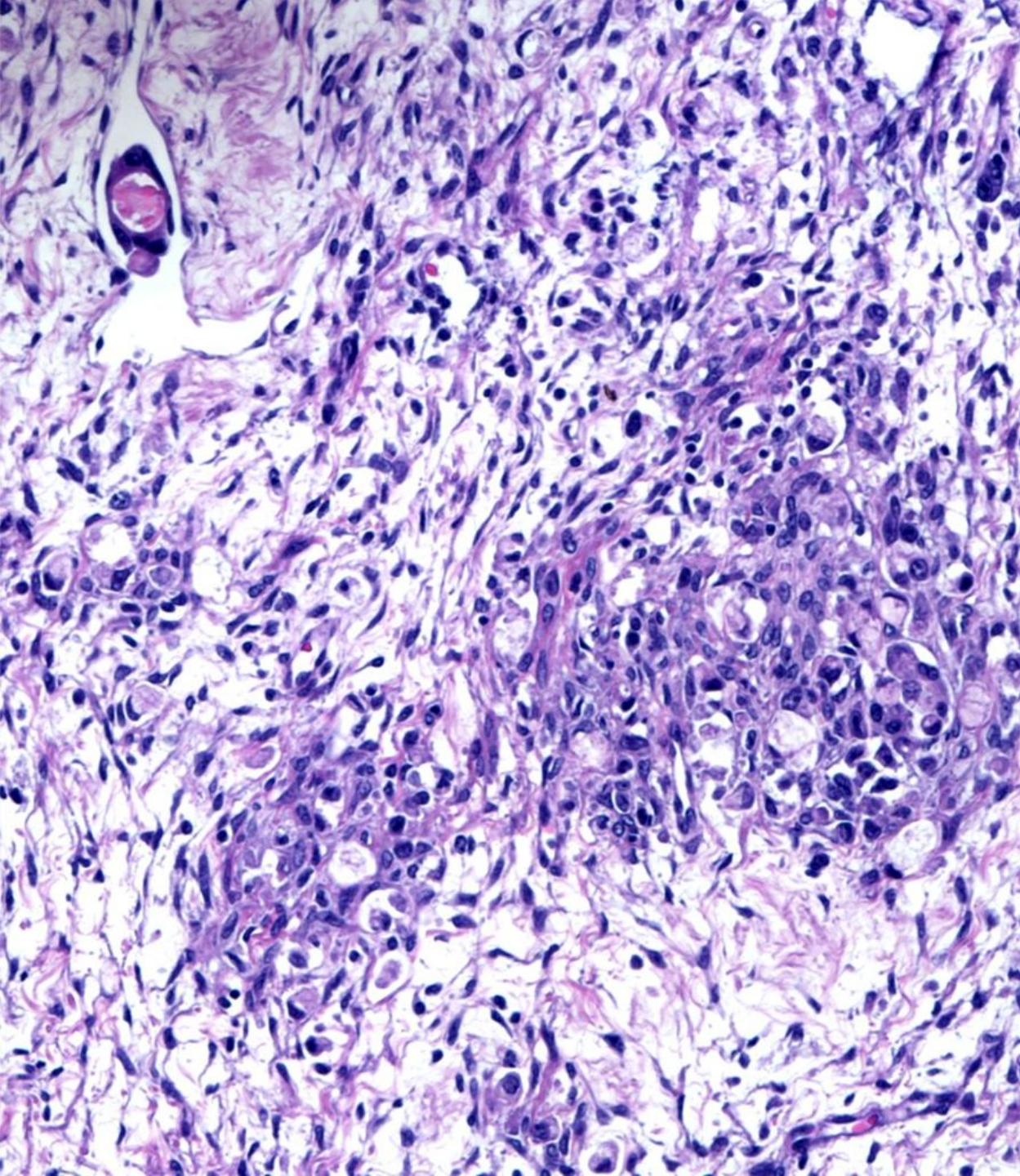






Solid tubular pattern, Sertoli-like



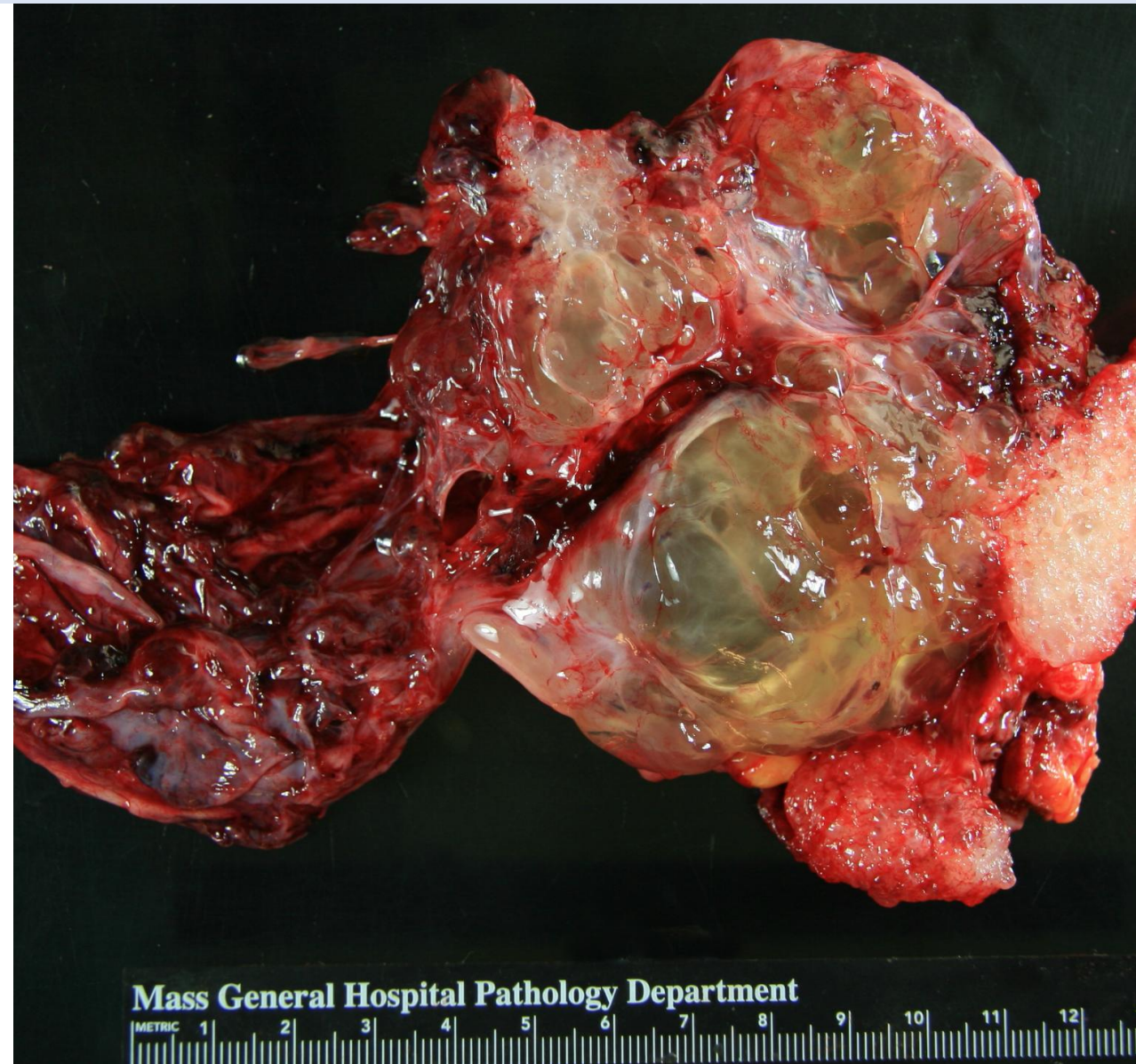


Mucinous Tumors of Appendix and Ovary

Appendiceal origin based on:

- High frequency of bilateral ovarian tumors
- Right ovarian involvement > left if unilateral
- Ruptured stage I primary mucinous neoplasm not associated with pseudomyxoma peritonei except if arising in teratoma
- Different microscopic appearance from primary mucinous ovarian tumors
- Immunohistochemical and molecular studies consistent with appendiceal origin

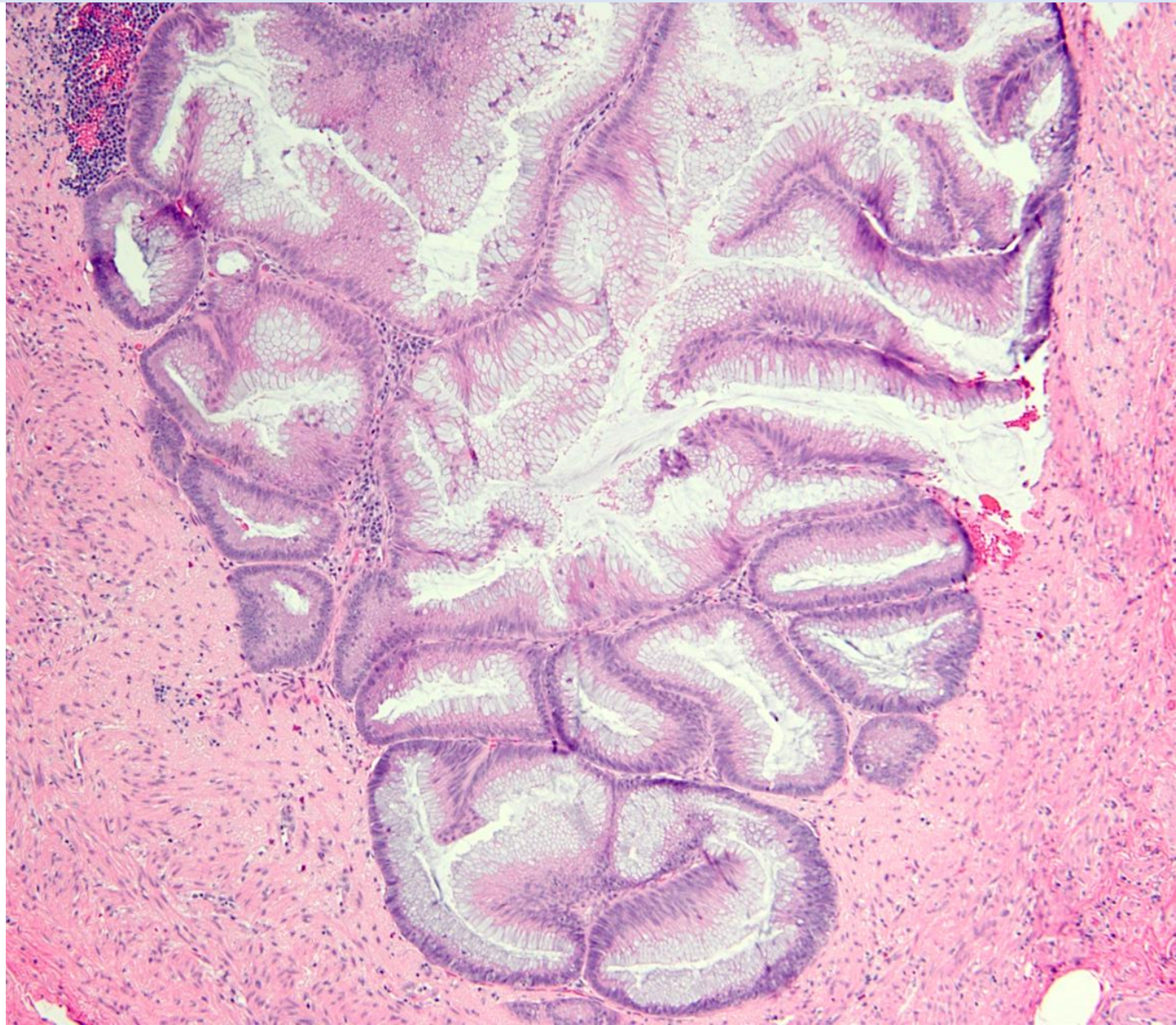
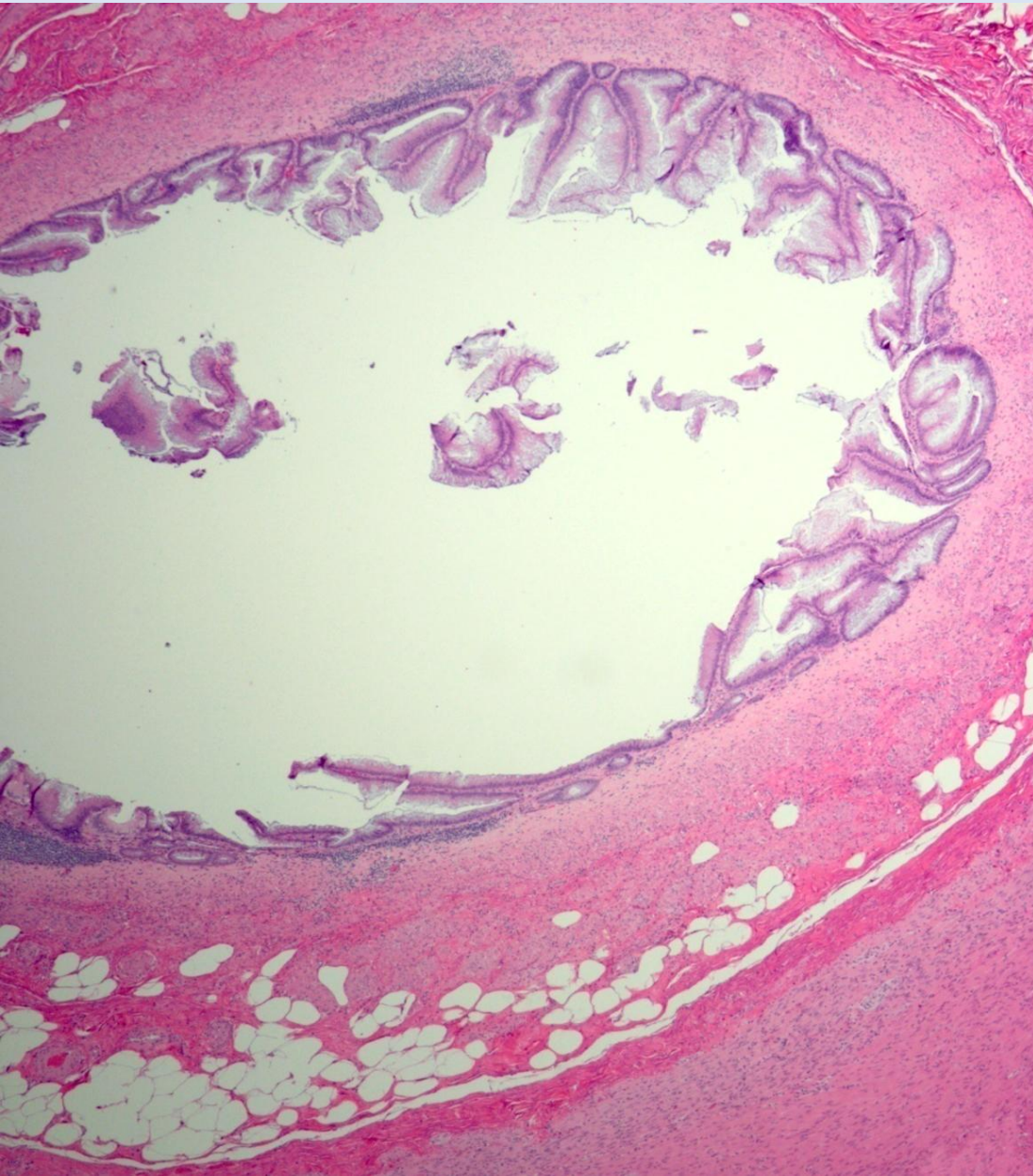
Metastatic Low-Grade Appendiceal Neoplasm to Ovary: Multilocular with Jelly-Like Mucin



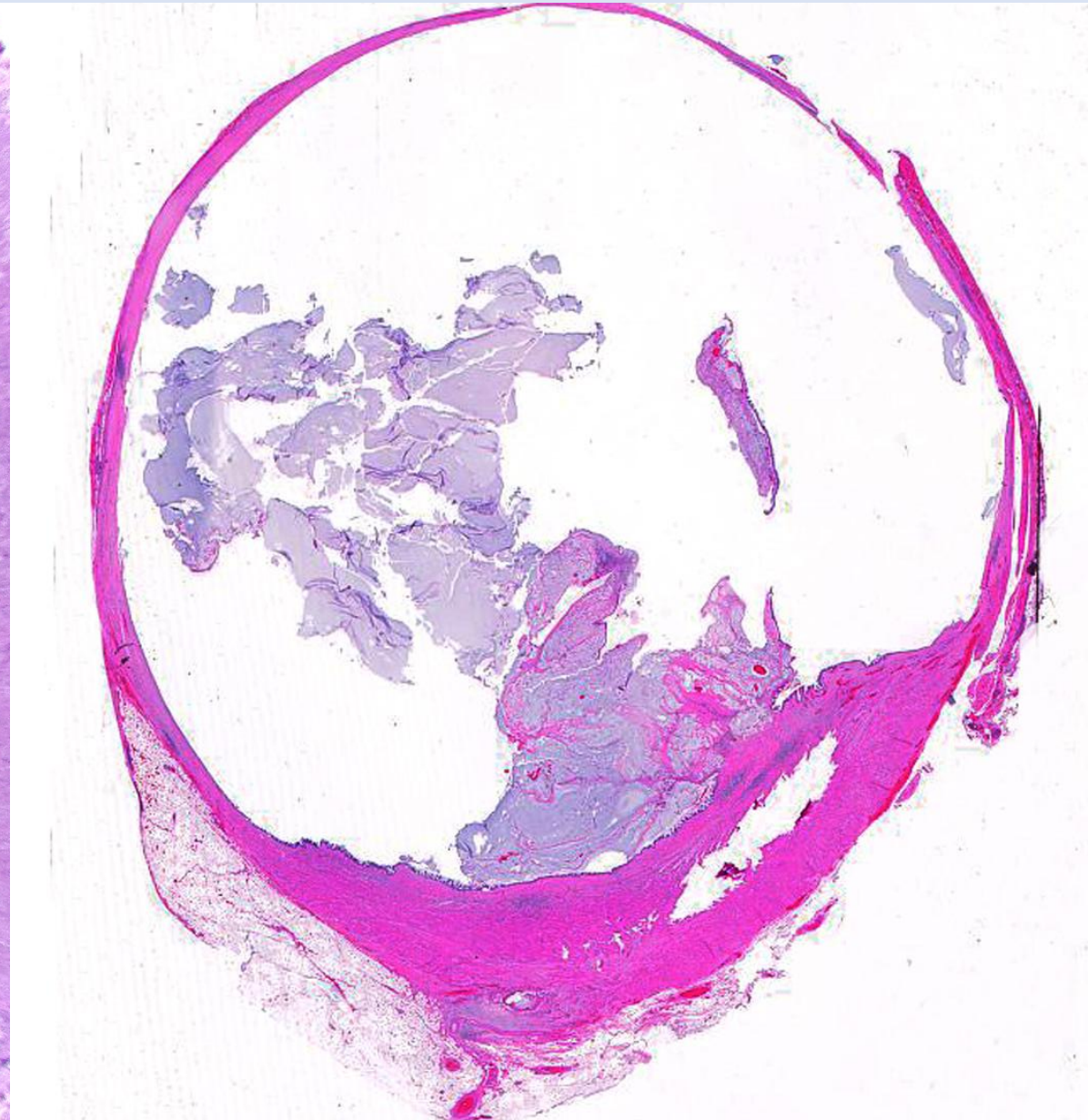
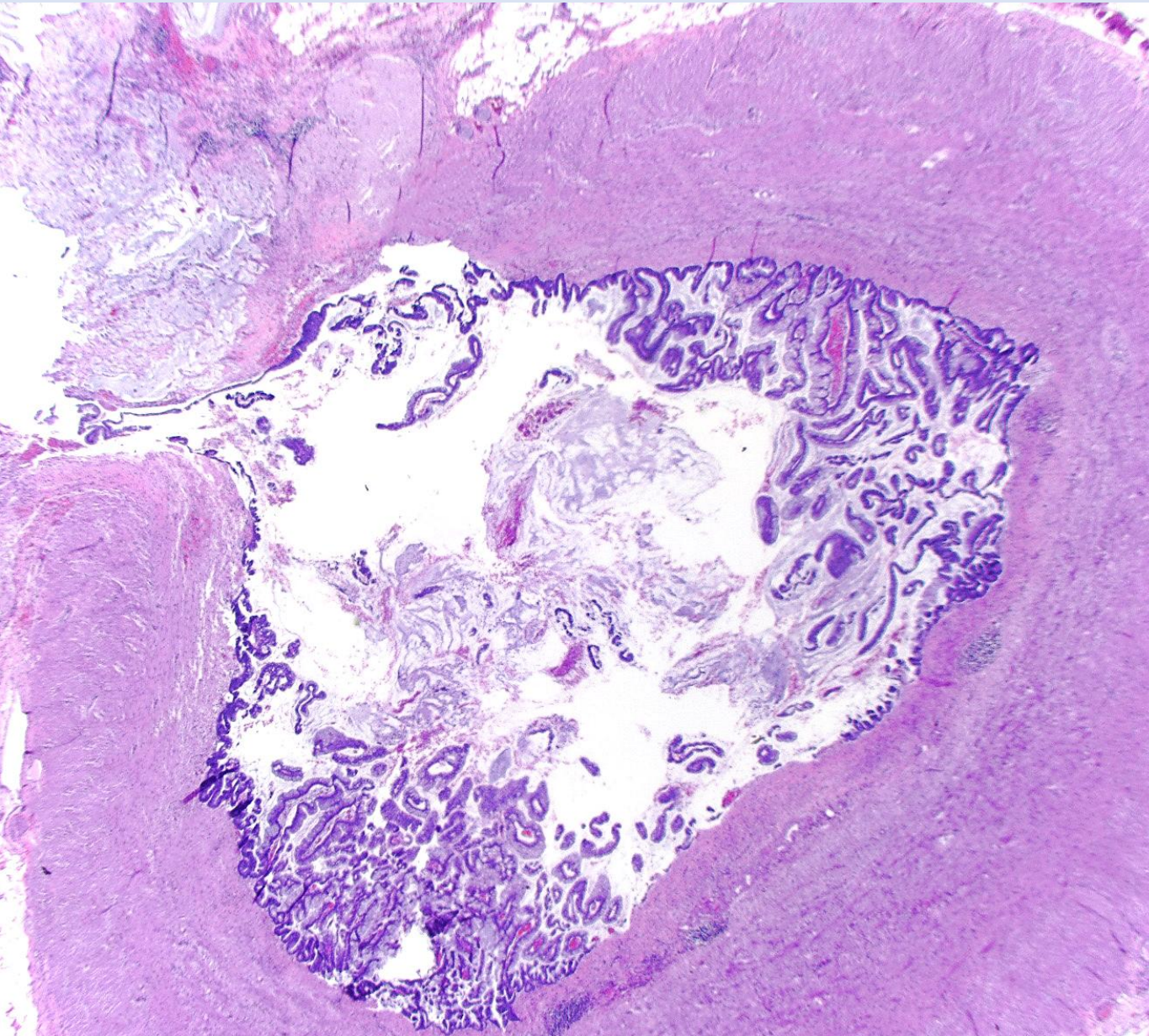
Low-Grade Appendiceal Neoplasm



Low-Grade Appendiceal Neoplasm



Low-Grade Appendiceal Neoplasm: Rupture Not Always Seen

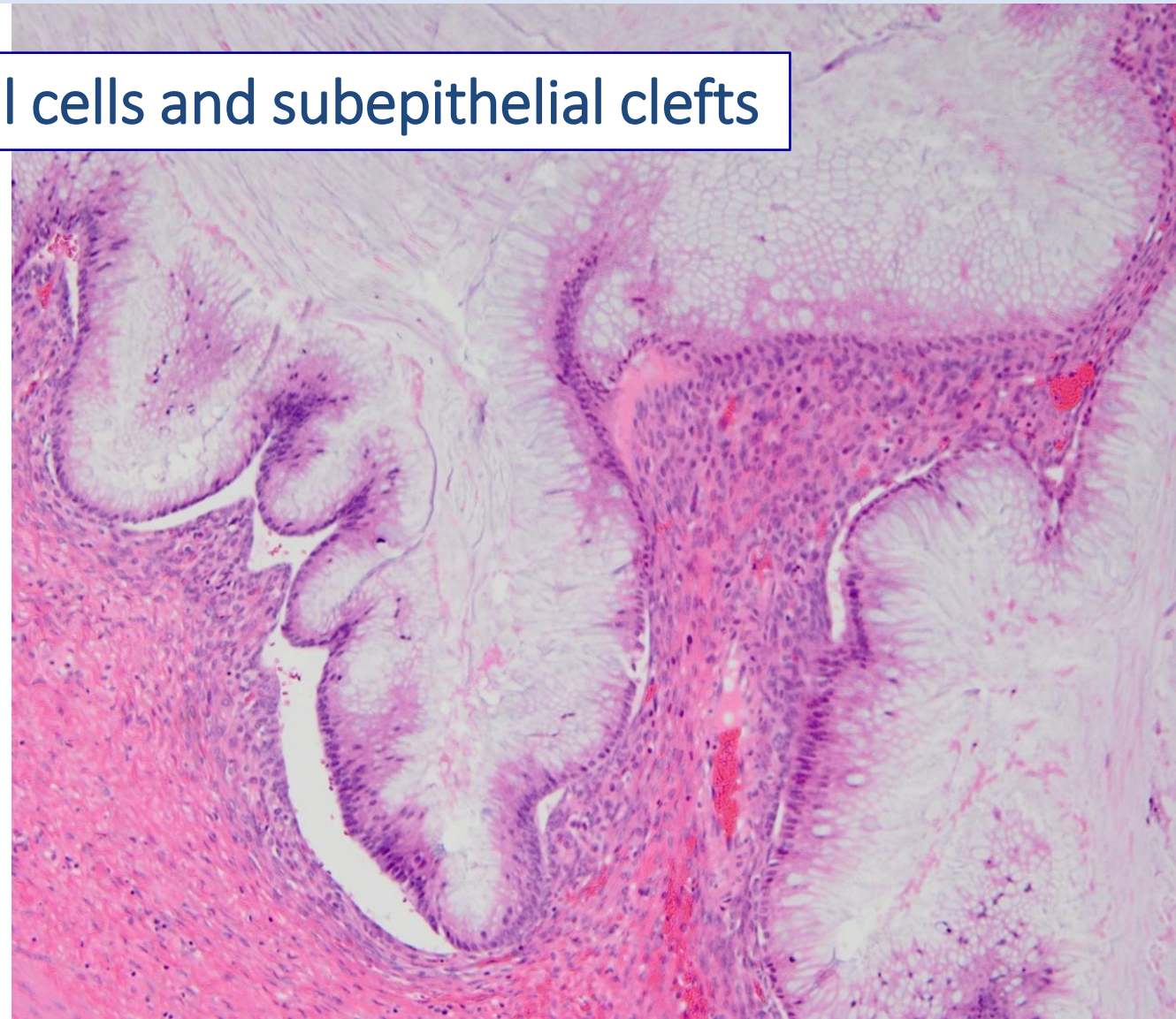


Problems in Interpretation of Appendiceal Mucinous Neoplasm Involving the Ovary

- Initial presentation as ovarian mass
- Large tumor size (>10 cm) with cyst formation
- Deceptive patterns of invasion simulating borderline tumor
- Greater degree of differentiation in ovarian compared to appendiceal tumor
- Hormonal symptoms suggesting sex cord-stromal tumor

Metastatic Low-grade Appendiceal Mucinous Neoplasm: Tips

Scalloped glands with tall cells and subepithelial clefts

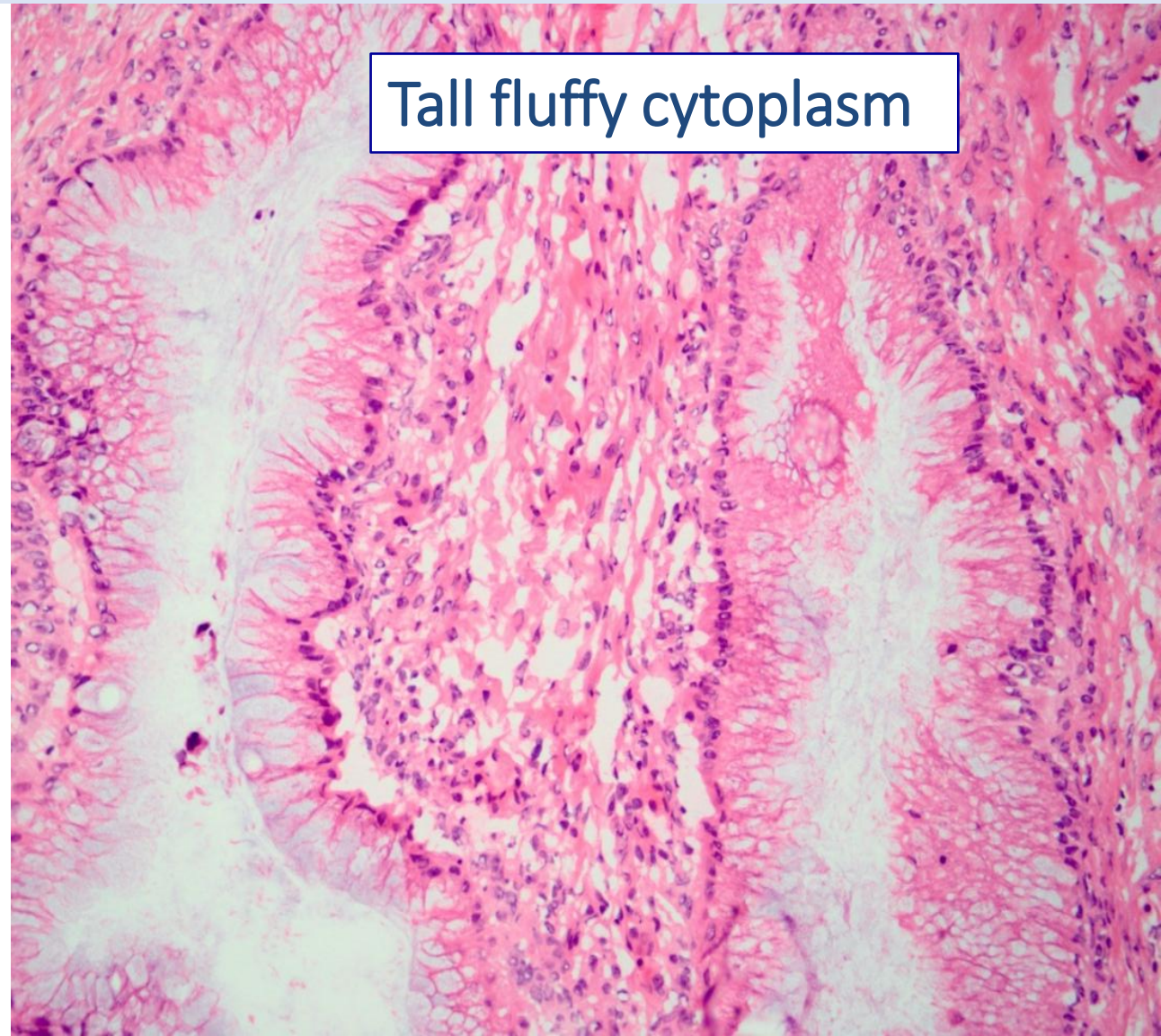


Metastatic Low-grade Appendiceal Mucinous Neoplasm: Tips

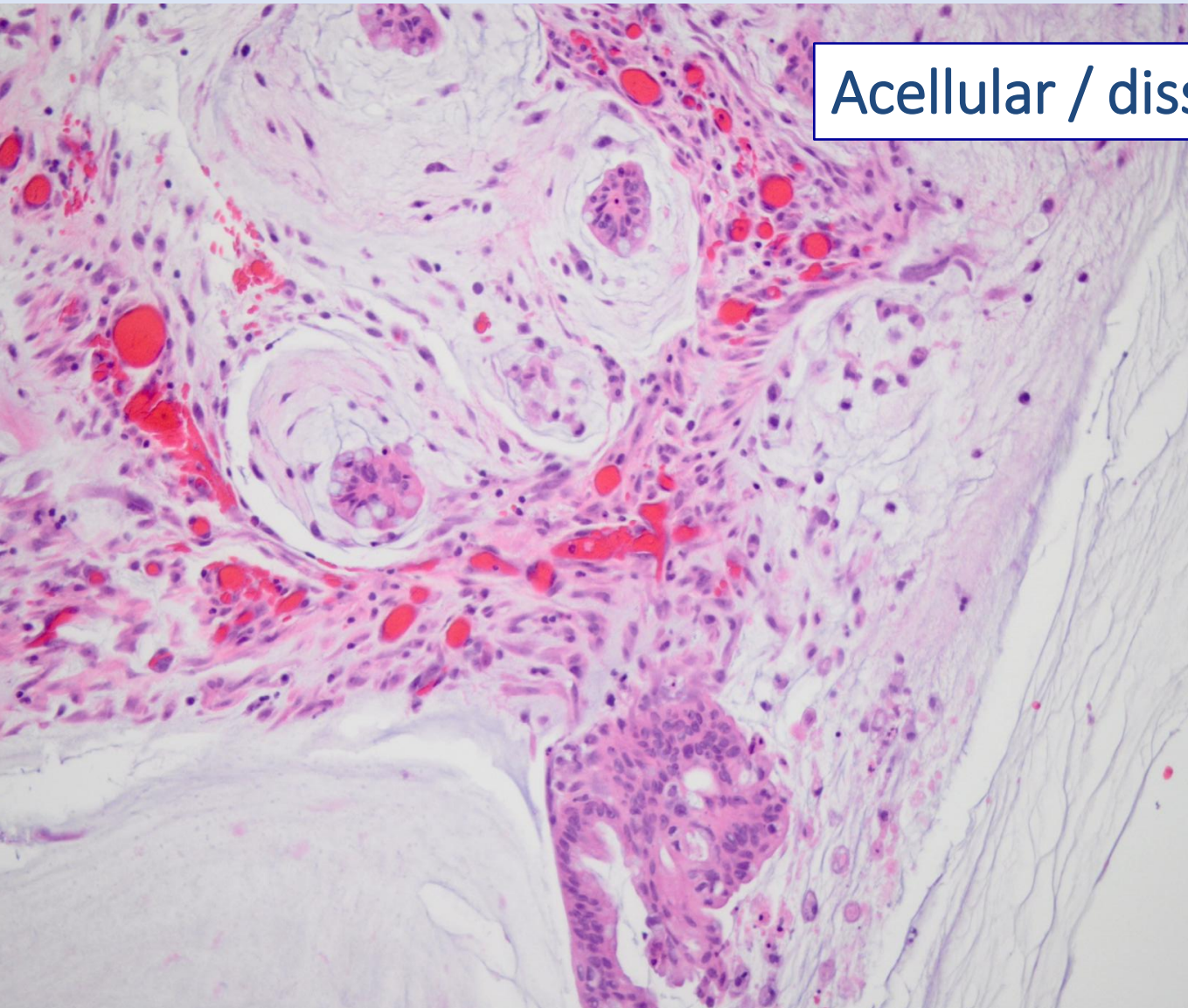
Subepithelial clefts



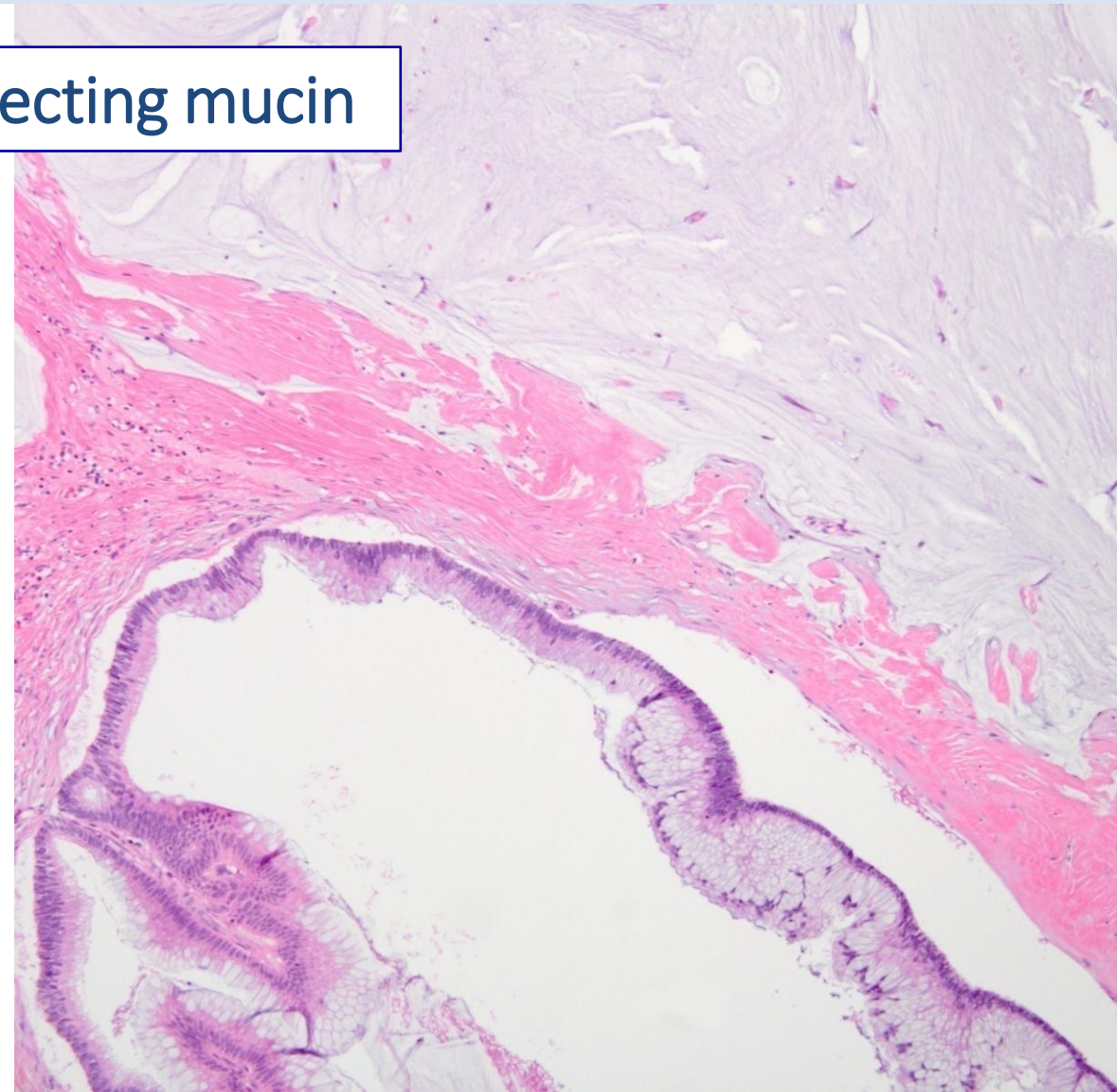
Tall fluffy cytoplasm



Metastatic Low-grade Appendiceal Mucinous Neoplasm: Tips



Acellular / dissecting mucin



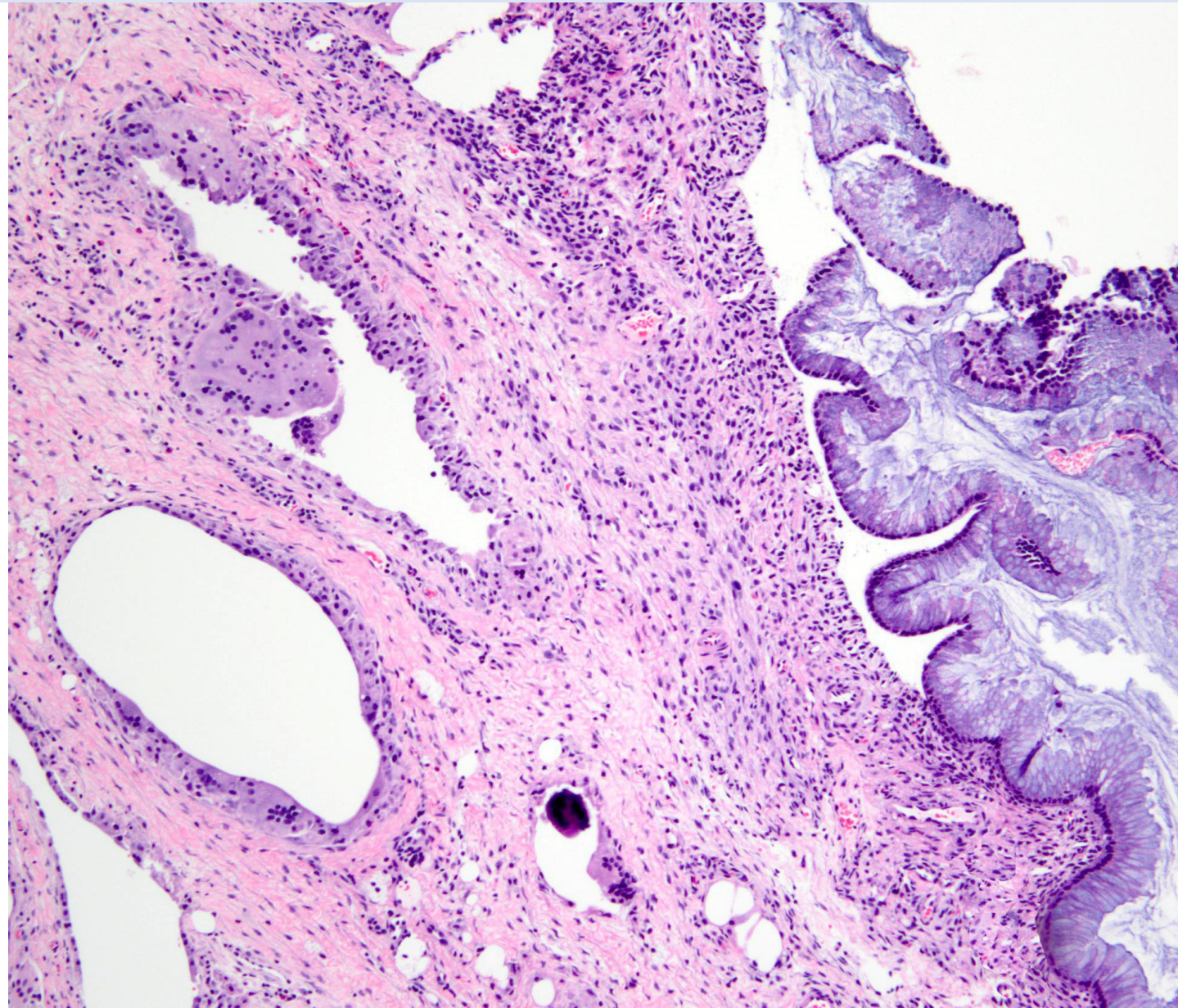
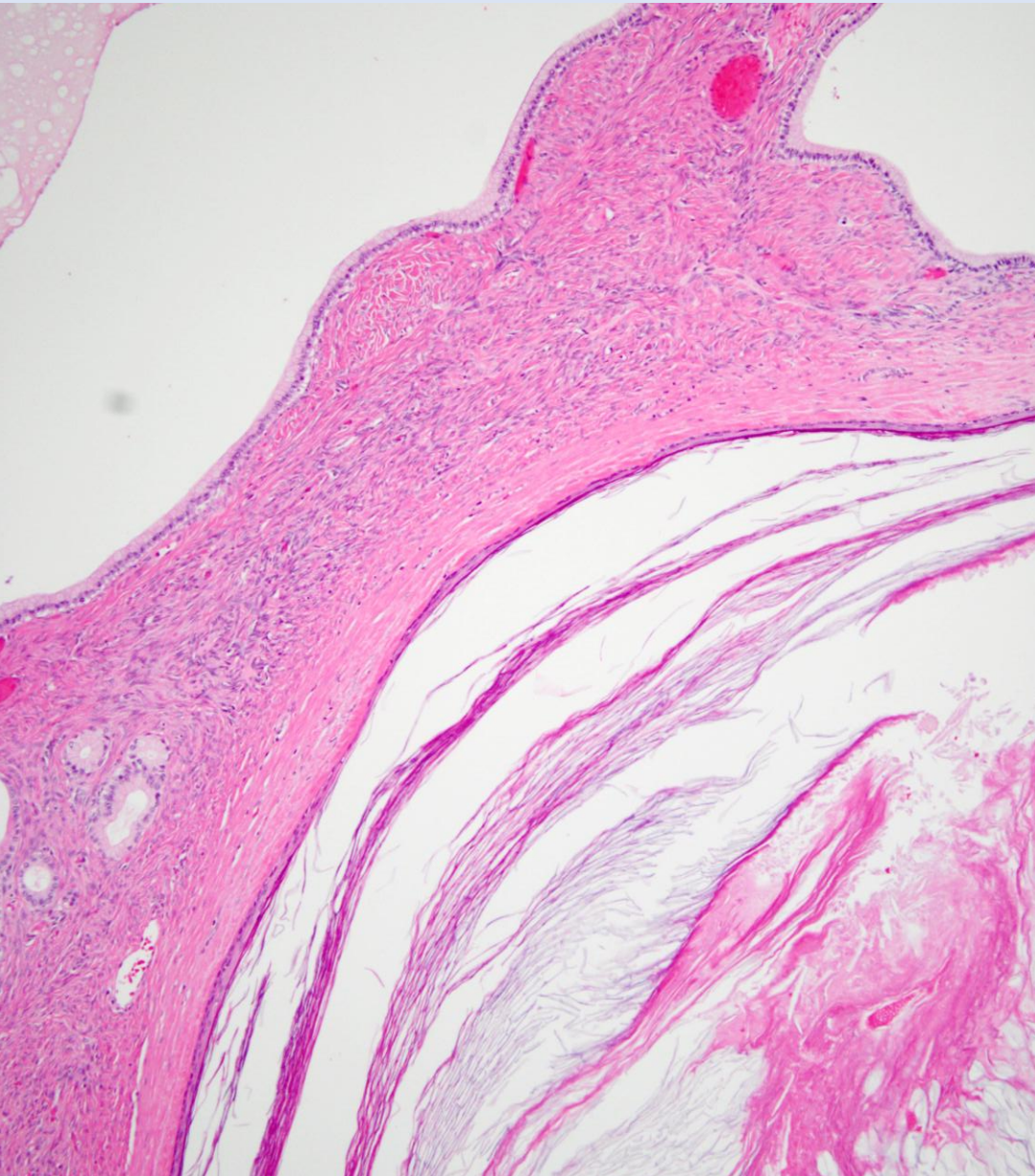
Comparison of Morphologic Features of Metastatic Low-Grade Mucinous Neoplasm of the Appendix with Primary Ovarian Mucinous Tumors

TABLE 1. *Summary of clinicopathologic features in ovarian involvement by low-grade appendiceal mucinous neoplasm, primary ovarian gastrointestinal-type borderline mucinous tumors, and primary teratoma-associated mucinous tumor*

	LAMN n = 18 (%)	IBMT n = 18 (%)	Teratoma-associated mucinous tumor n = 6 (%)	<i>P</i>
Median age (range)	57 (39–79)	48 (18–81)	49 (37–61)	0.121
*Median tumor diameter cm (range)	14.3 (3.0–30.0)	20.0 (15.0–36.0)	20.8 (14.0–42.0)	0.071
Psuedomyxoma peritonei (%)	16 (88.9)	0	6 (100)	<0.001
Bilateral ovarian involvement (%)	12 (66.7)	0	0	<0.001
Subepithelial clefts (%)	16 (88.9)	7 (38.9)	6 (100)	<0.001
Scalloped glands (%)	17 (94.4)	3 (16.7)	6 (100)	<0.001
Psuedomyxoma ovarii (%)	15 (83.3)	4 (22.2)	6 (100)	<0.001
Tall cells (%)	16 (88.9)	2 (11.1)	6 (100)	<0.001
Cellular stroma (%)	2 (11.1)	11 (61.1)	0	0.005
Histiocyte aggregates (%)	0	10 (55.6)	0	0.001

*Larger tumor dimension used in bilateral cases, size not documented in 1 LAMN case.
 IBMT indicates ovarian gastrointestinal-type borderline mucinous tumor; LAMN, low-grade appendiceal mucinous neoplasm

Mucinous Tumors Arising in Mature Cystic Teratoma



Low-Grade Mucinous Epithelial Neoplasm Arising In Mature Cystic Teratoma

- Adenocarcinomas most commonly arise from gastrointestinal and respiratory epithelium in dermoid cysts
- Benign and low-grade mucinous epithelial neoplasms with mucin extravasation are rare, and a primary appendiceal tumor should be excluded
- CK20, CDX2 and MUC2 are typically strongly and diffusely positive in appendiceal tumors:
 - ✓ Ovarian tumors are also positive, but usually less extent
 - ✓ CK7 may be expressed in ~30% of appendiceal tumors
- SATB2 not helpful in distinction of metastatic appendiceal tumor vs primary mucinous tumor arising in a mature cystic teratoma
- **Sampling is important to identify a teratomatous component!**

Immunohistochemical Profile

Ovarian tumor	CK7 focal	CK7 diffuse	CK20 focal	CK20 diffuse	SATB2 focal	SATB2 diffuse	CDX2 focal	CDX2 diffuse
Primary	13%	85%	56%	17%	0%	0%	13%	0.1%
Metastasis ^a	10%	0.5%	5%	95%	10%	85%	15%	80%
Others metastasis ^b	25%	75%	25%	25%	0%	0%	0%	0%
Primary associated to teratoma	0	25%	25%	75%	25%	75%	25%	50%

^a Metastasis from appendix and colon.

^b Metastasis from cervix, pancreas, and bile tract.

Common Practice Is to Take Out Appendix When Dealing With Mucinous (Excluding Benign) Ovarian Tumors

- ~10% of patients with ovarian mucinous borderline tumor/carcinoma have co-existing appendiceal tumors:
 - ✓ ~5% have grossly normal appendices
- Factors that may increase suspicion for appendiceal primary include:
 - ✓ Age >50 years
 - ✓ Prior rupture of ovarian tumor
 - ✓ Involvement of intra-abdominal organs
 - ✓ Grossly abnormal appendix

Metastases from Carcinomas of the Pancreas Simulating Primary Mucinous Tumors of the Ovary

A Report of Seven Cases

Robert H. Young, M.D., and William R. Hart, M.D.

- 7 patients
- Age: 29-87 (mean 63) years
- Discovered synchronously (n=5)
- Clinical presentation simulated a primary ovarian neoplasm (n=4)
- Various degrees of differentiation resembling mucinous cystadenoma, borderline tumor and low-grade mucinous carcinoma

Ovarian Metastases of Pancreaticobiliary Tract Adenocarcinomas: Analysis of 35 Cases, With Emphasis on the Ability of Metastases to Simulate Primary Ovarian Mucinous Tumors

Zina Meriden, MD, Anna V. Yemelyanova, MD,*
Russell Vang, MD,*† and Brigitte M. Ronnett, MD*†*

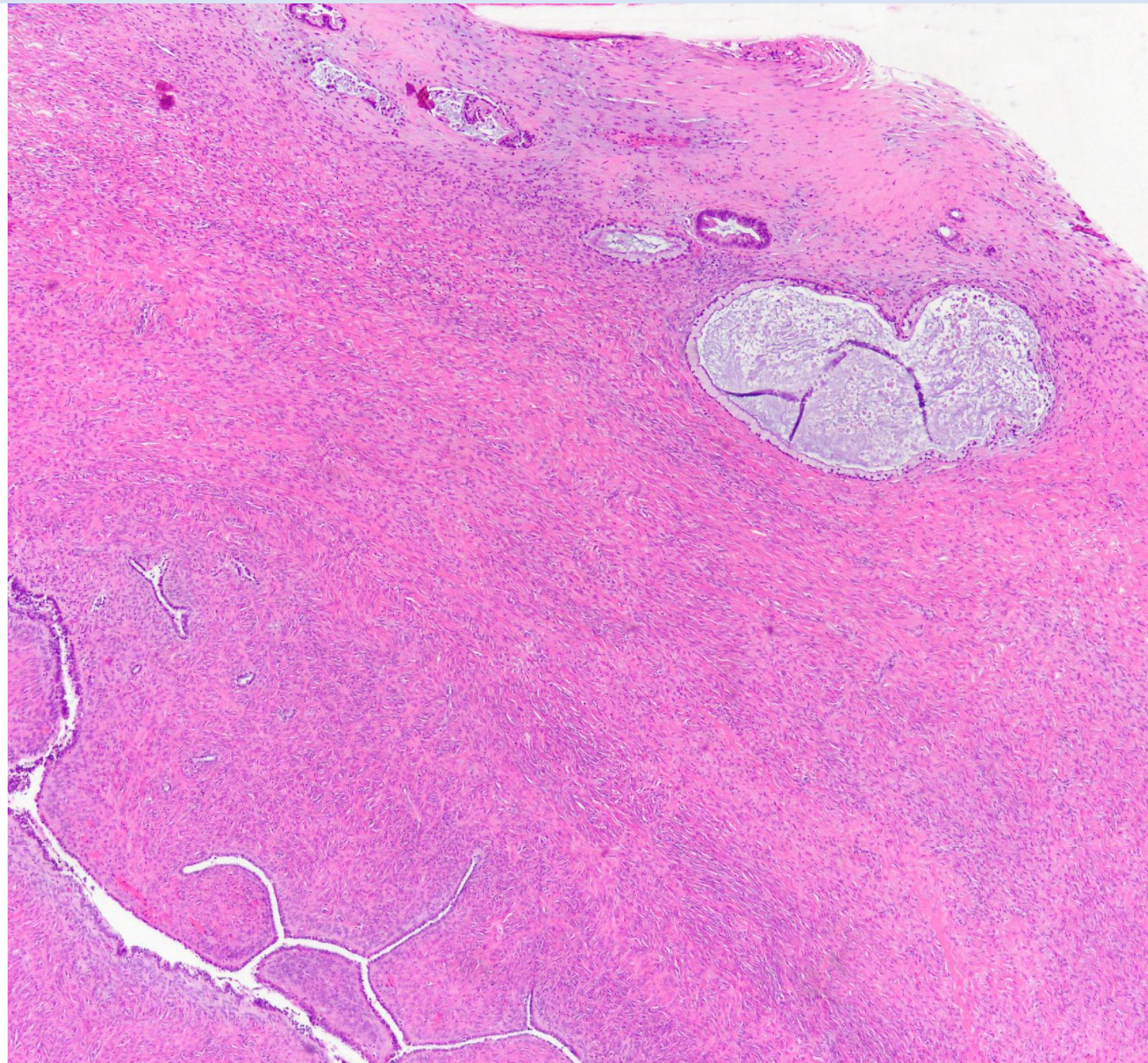
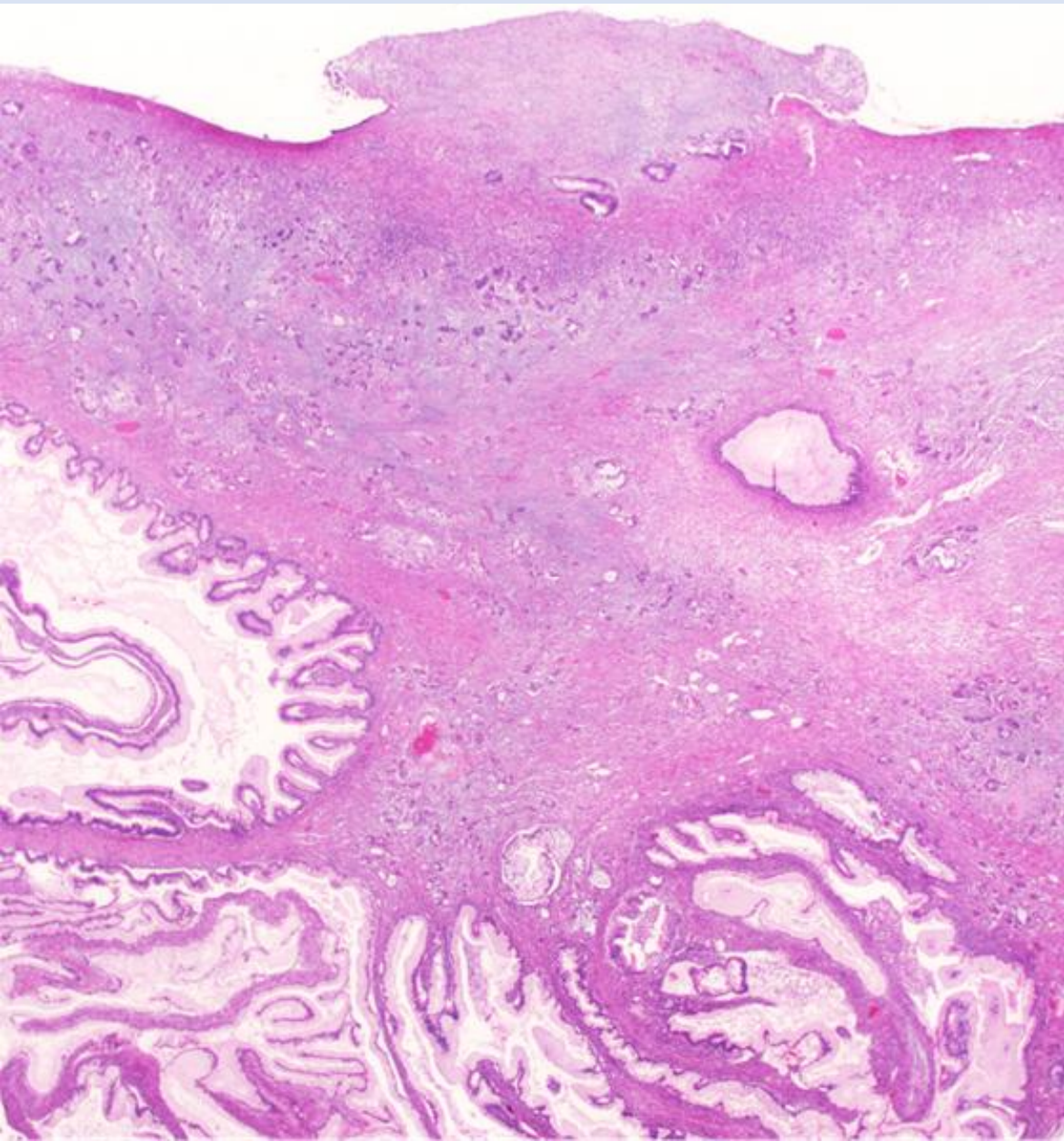
Am J Surg Pathol 2011;35:276-88

- 35 patients
- Age: 33-78 (median 59) years
- Synchronous presentation (n=15; 43%)
- First manifestation (n=2; 6%)
- Bilateral ovarian tumors (n=31; 89%)
- Tumor size: median 9.5 cm, mean 10.6 cm
- Nodularity (n=22; 63%)
- Surface involvement (n=14; 40%)
- Borderline-like and/or cystadenoma-like morphology (n=24; 69%); only these patterns (n=7; 20%)

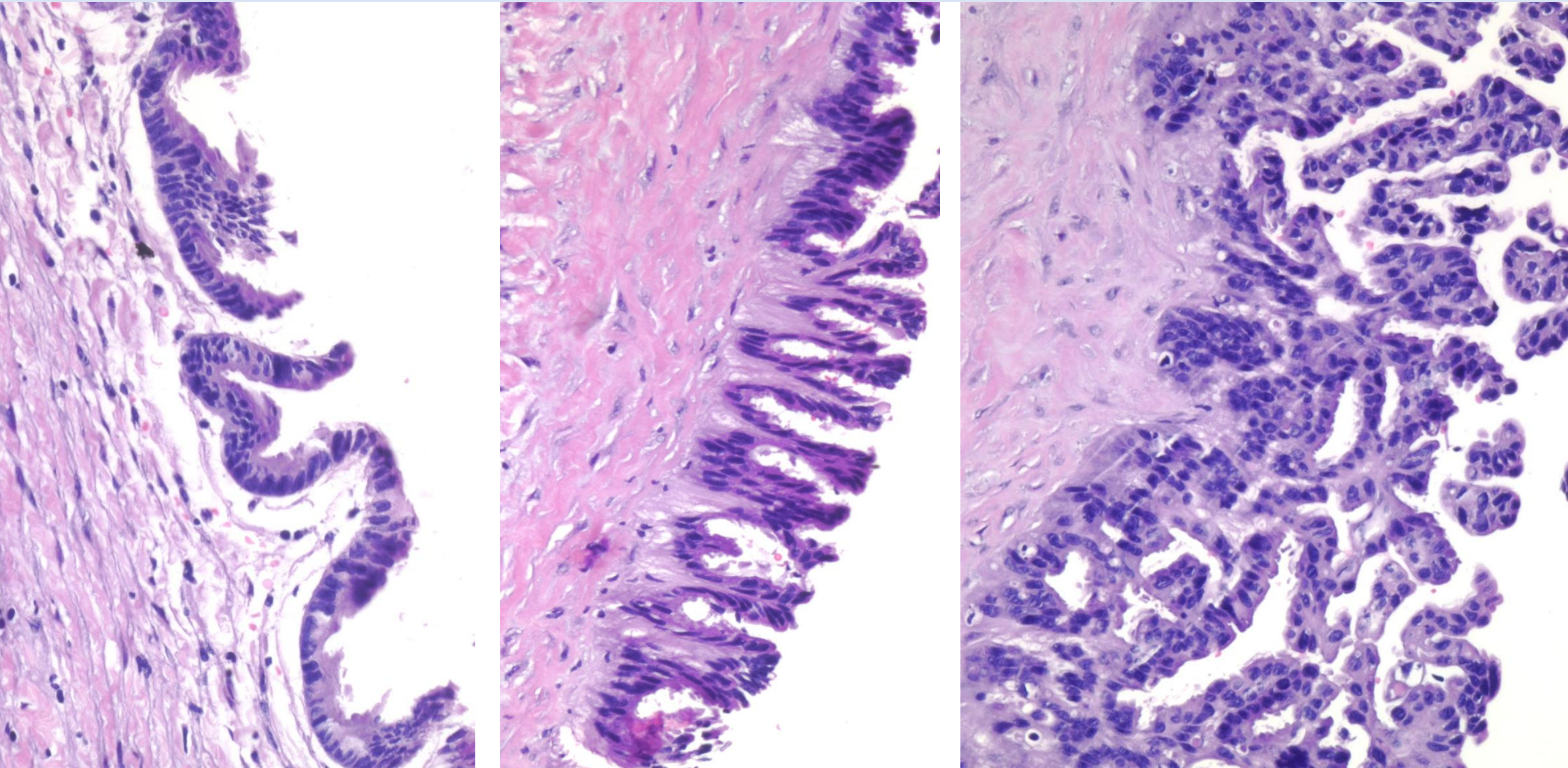
Pancreatic Carcinoma Metastatic to Ovary

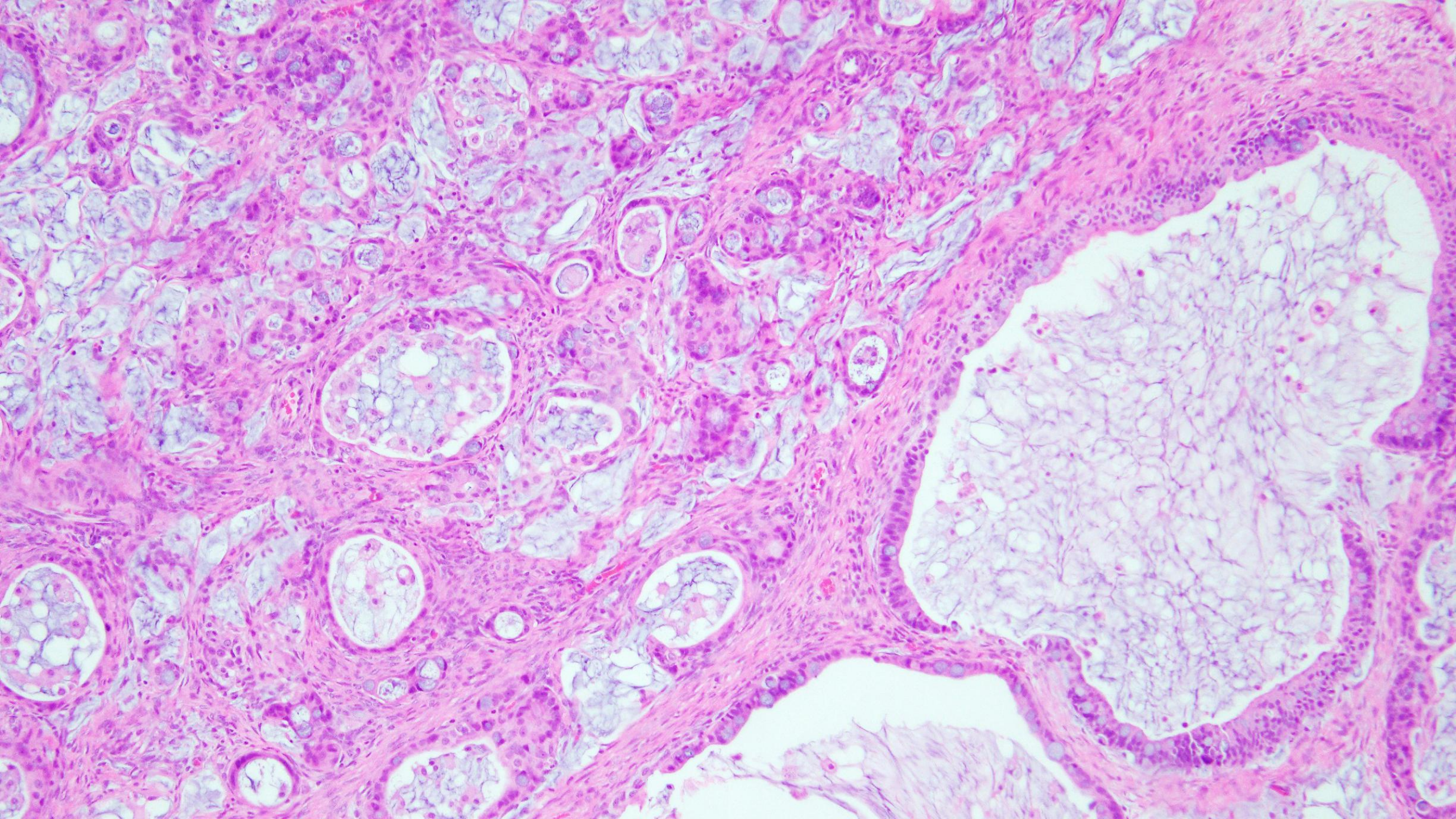


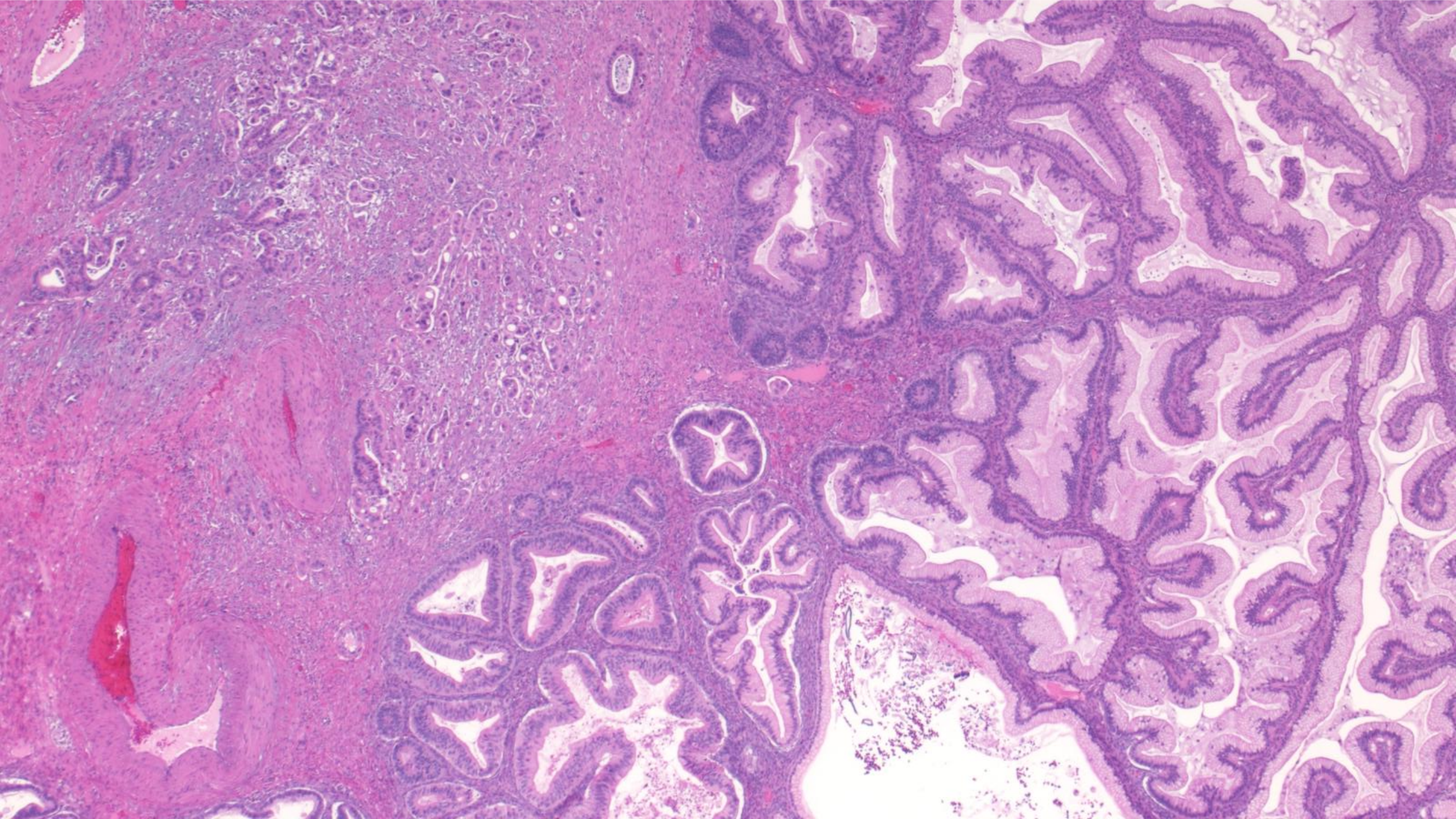
Ovarian Surface Involvement



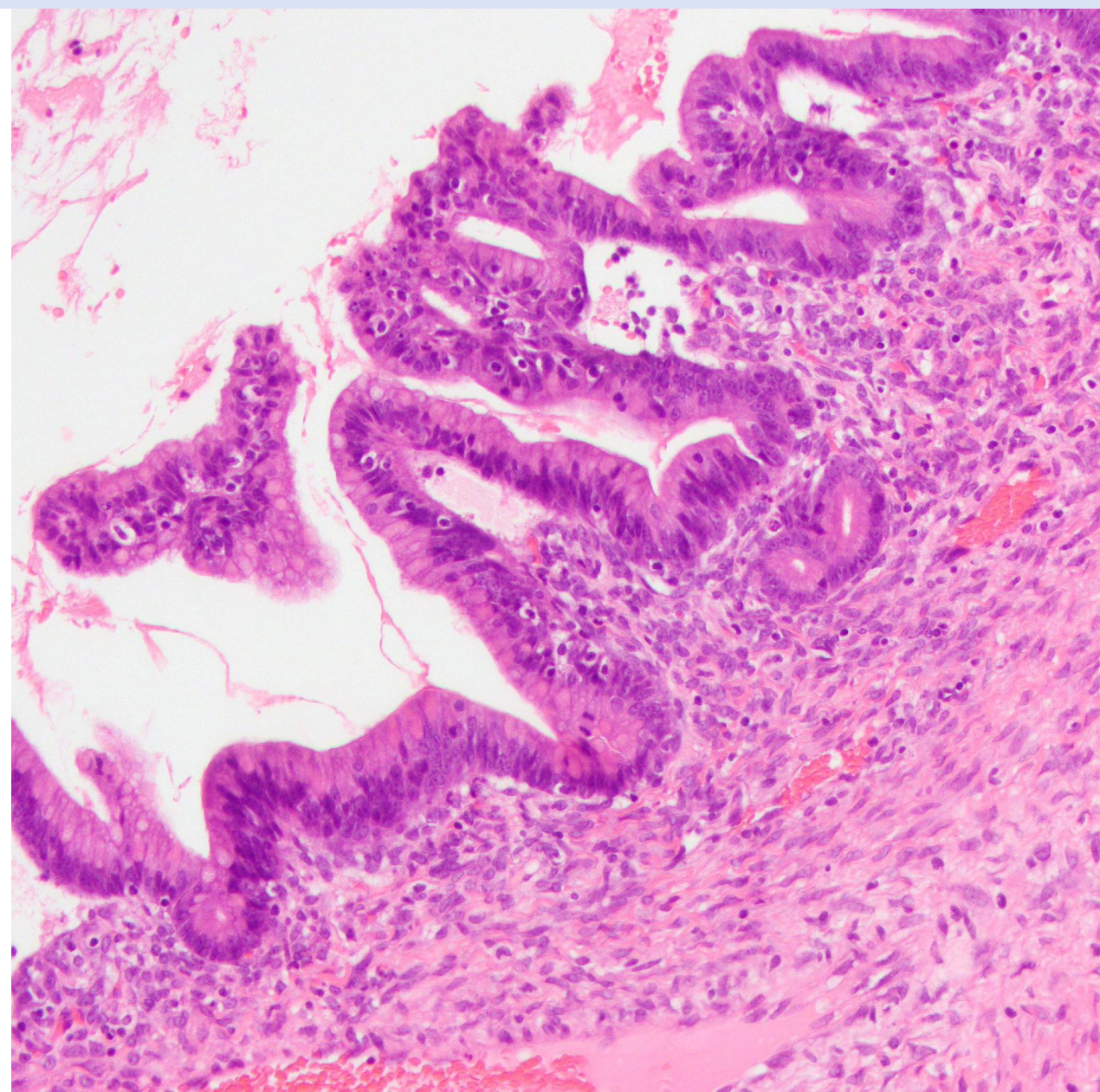
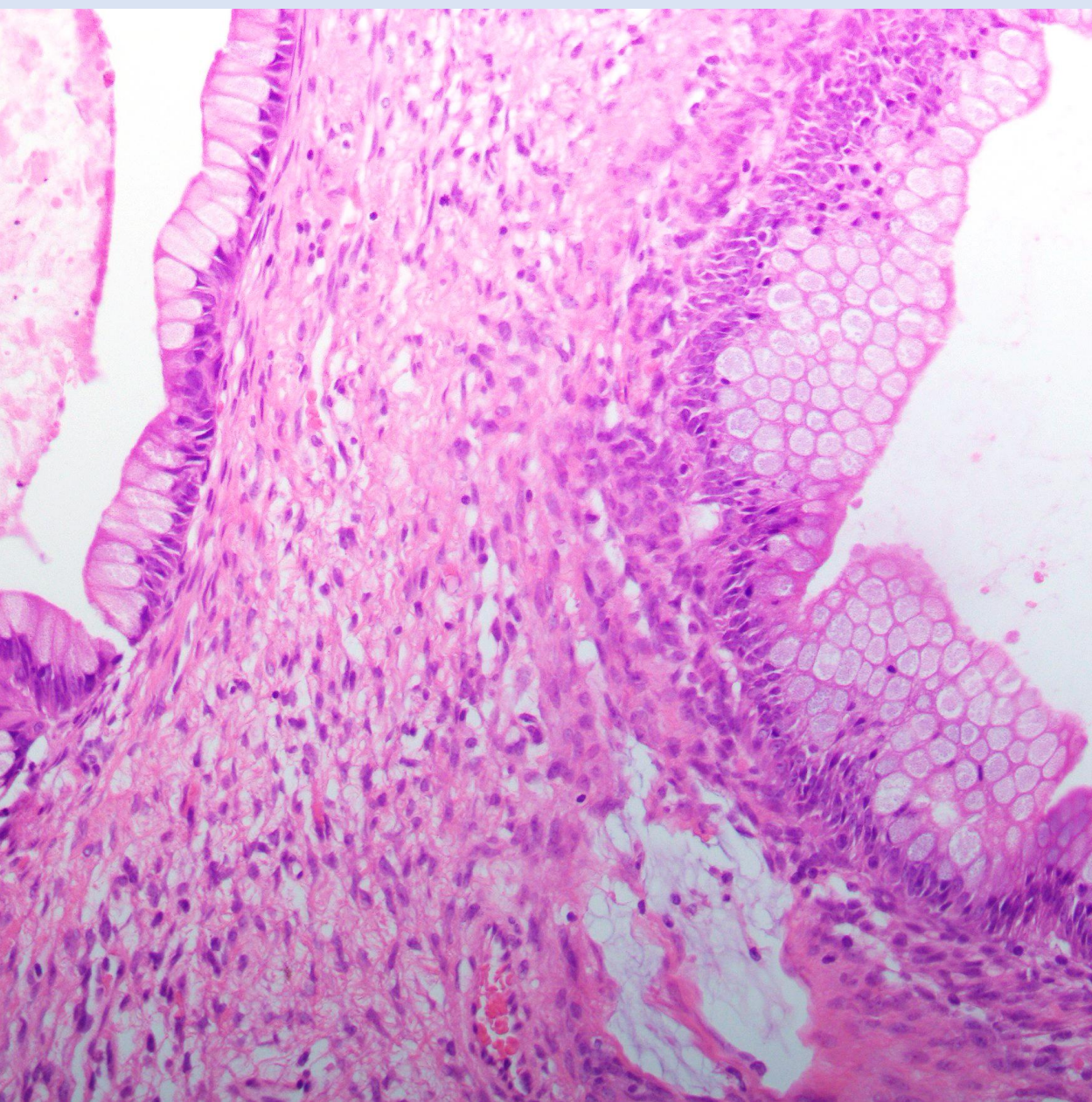
Wide Morphologic Spectrum Closely Mimicking Ovarian Primary

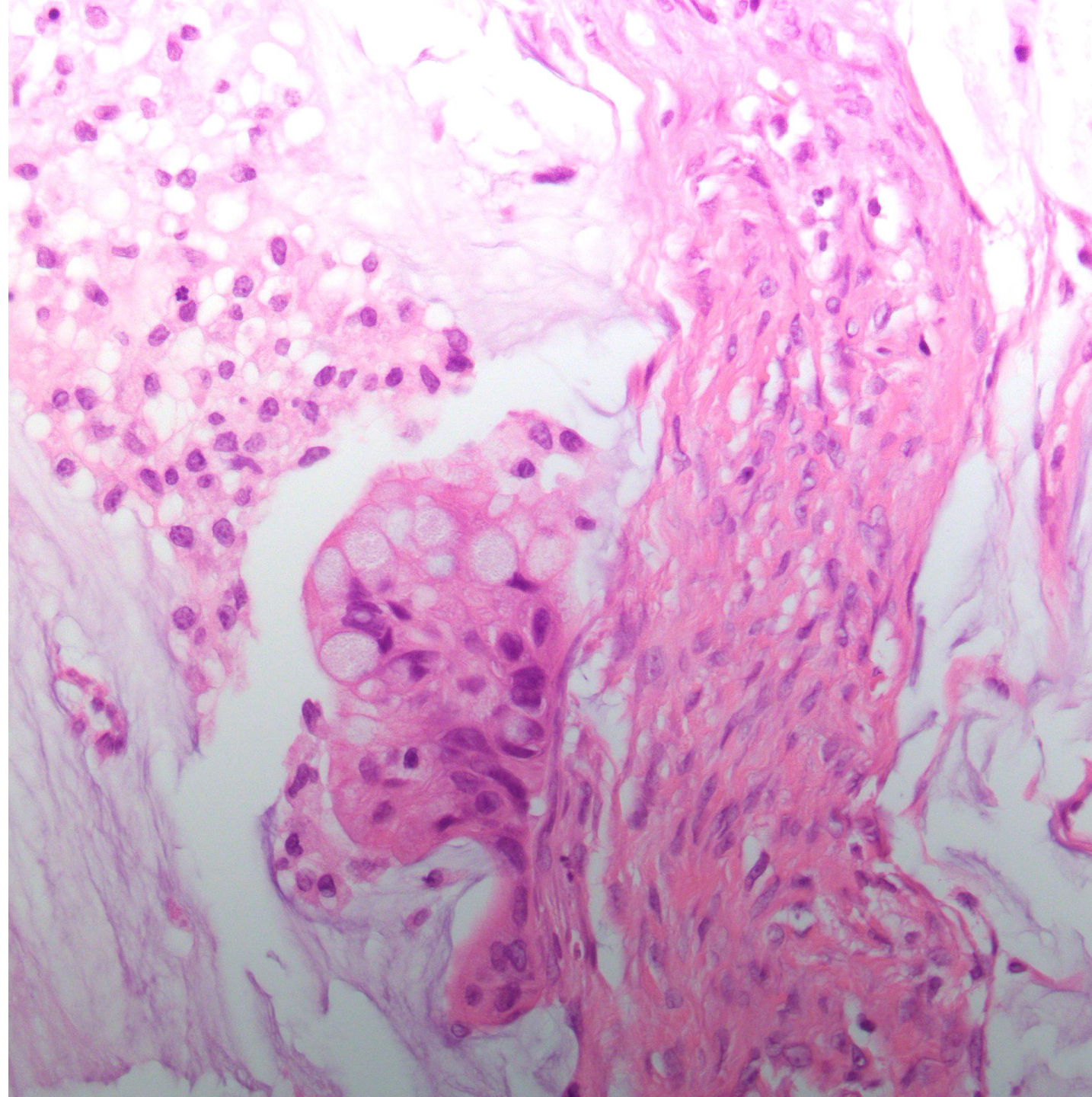
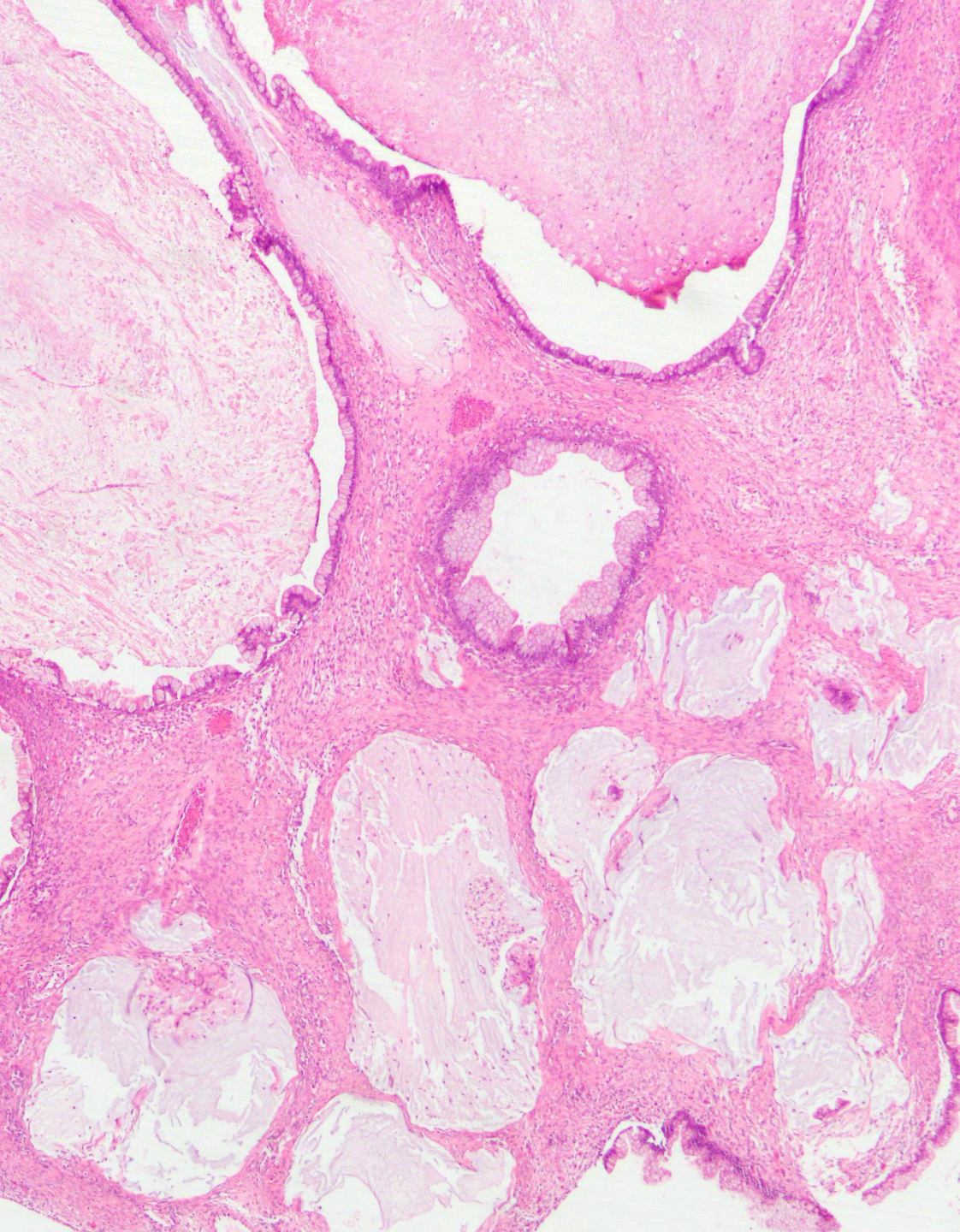






Deceptive Morphologic Appearance



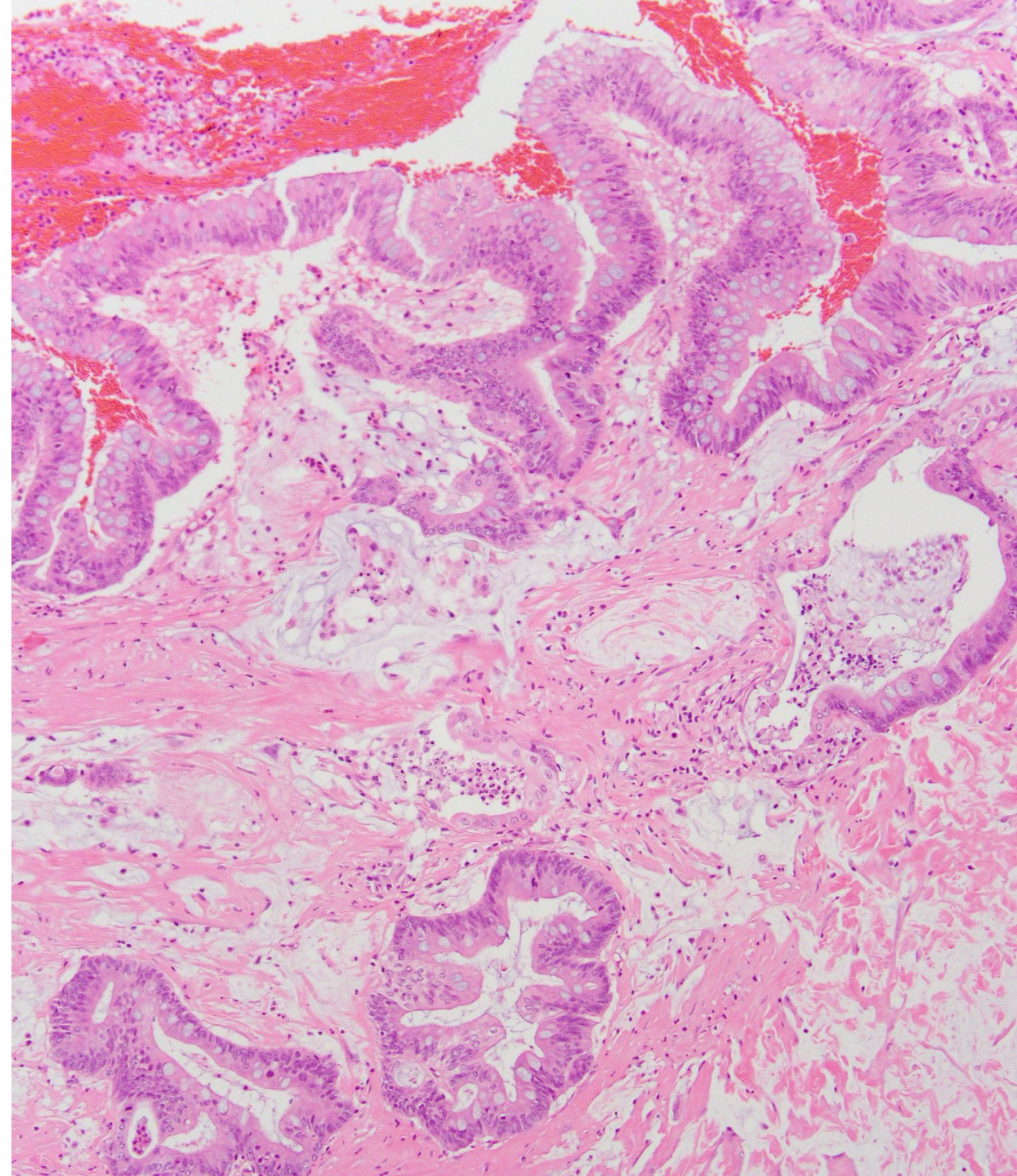
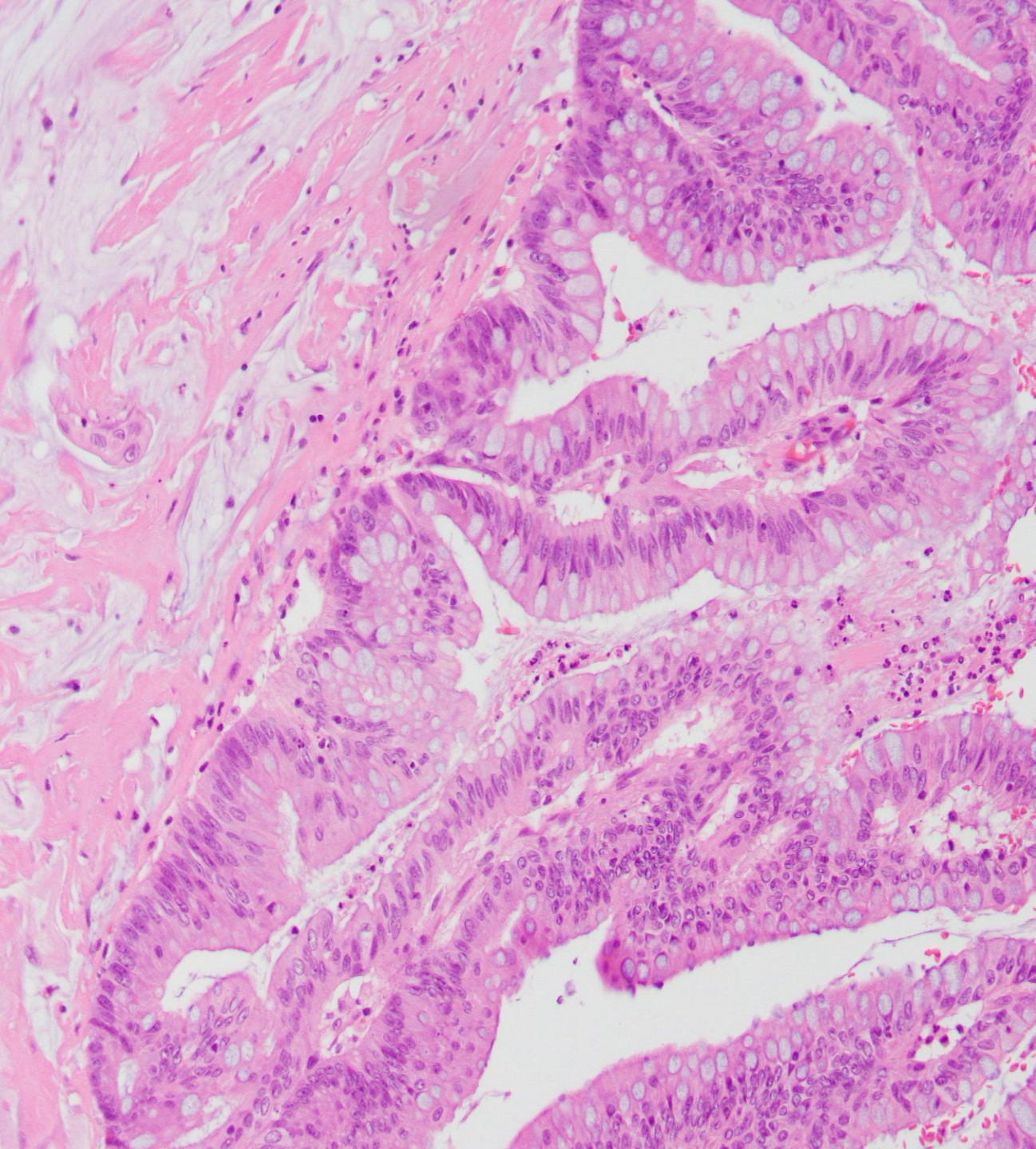


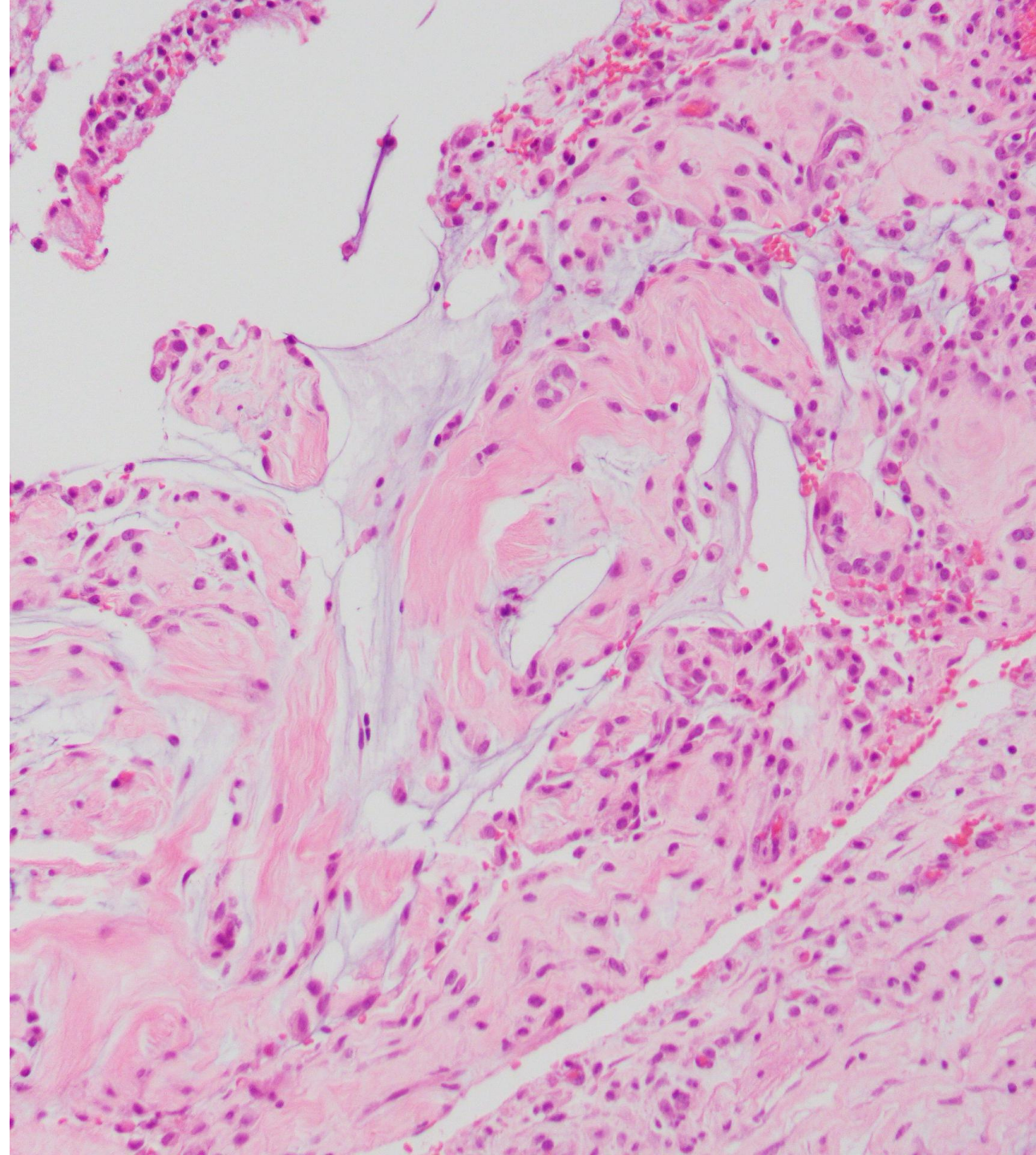
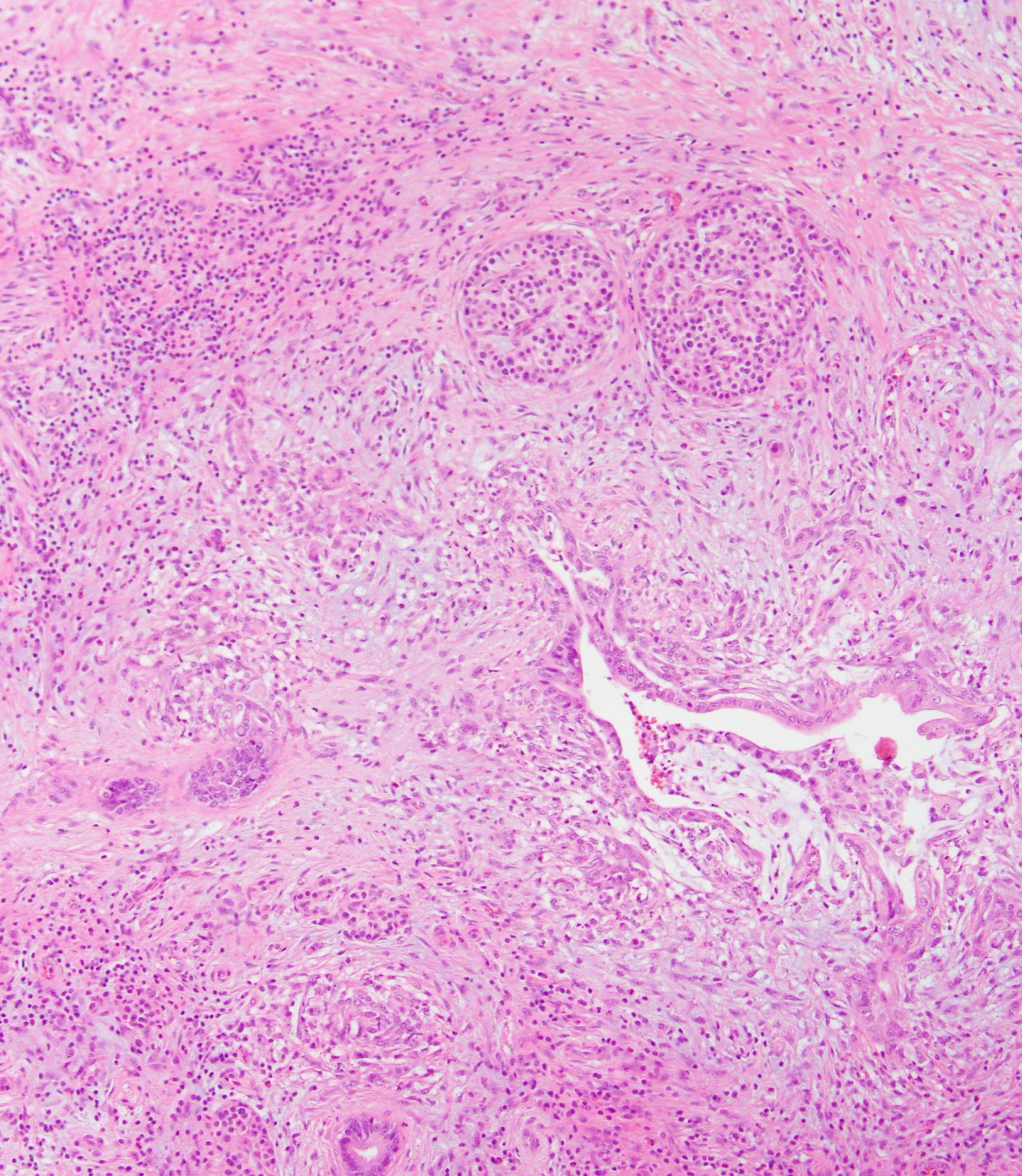
Pancreatoduodenectomy: 5 cm Mass in Pancreatic Head



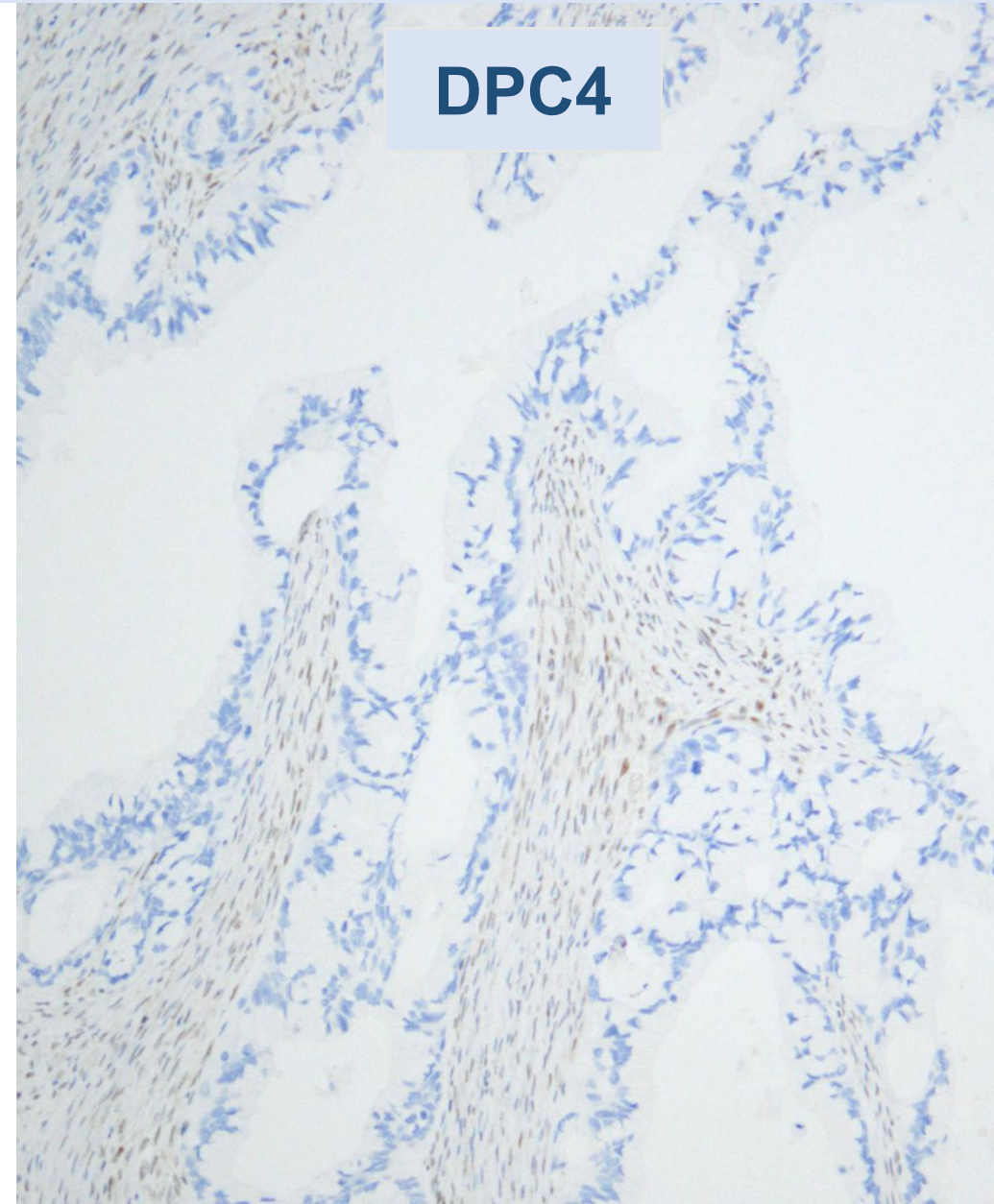
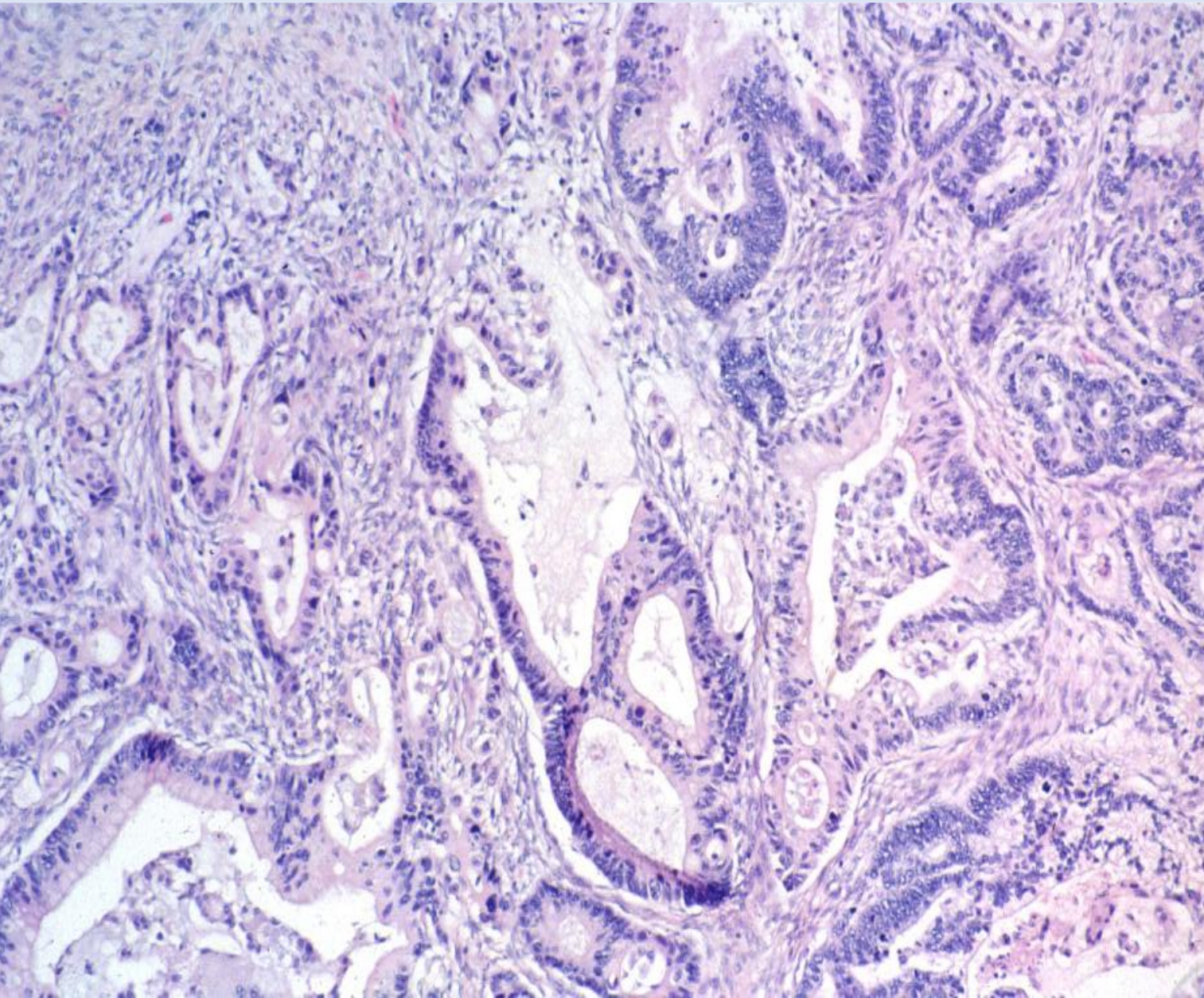
Invasive adenocarcinoma, ductal with mucinous features, grade 2, arising in association with IPMN and high-grade dysplasia, invading into duodenal wall and peripancreatic soft tissue (pT3)

3 positive lymph nodes (pN1)





Pancreatic Carcinoma Metastatic to Ovary



Loss of DPC4/SMAD4 Expression in Gastrointestinal and Extra-Gastrointestinal Tumors

- **Pancreatic carcinomas: 58%**
- **Appendiceal carcinomas: 27%**
- **Colorectal carcinomas: 19%**
- **Cholangiocarcinomas: 16%**
- **Lung adenocarcinomas: 10%**
- **Esophageal, breast, gastric & ovarian carcinomas: <5%**

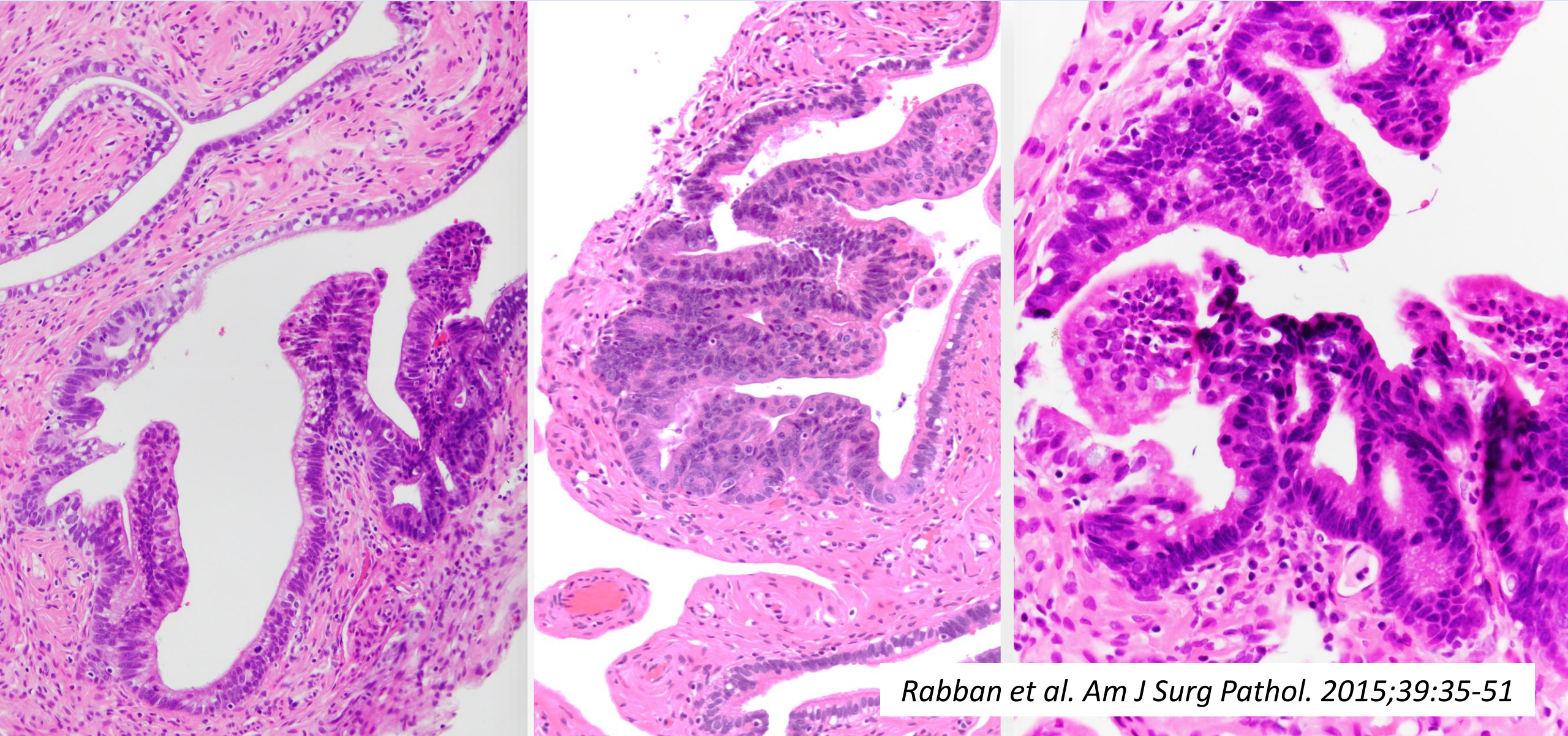
SMAD4 Expression Is Retained in Most Gynecologic Tumors with Mucinous Differentiation

- Ovarian mucinous tumors (13 adenocarcinomas, 9 borderline, 19 cystadenomas, 3 arising from teratomas)
- Endometrial carcinomas (23 endometrioid with mucinous differentiation, 13 mucinous carcinomas)
- Cervical carcinomas (16 usual-type, 1 gastric-type)
- Metastatic adenocarcinomas to ovary (6)
- **SMAD4 LOST** in:
 - ✓ 3 endocervical adenocarcinomas (2 usual-type, 1 gastric-type)
 - ✓ 1 mucinous carcinoma arising in an ovarian teratoma

Immunohistochemical Loss of DPC4 in Tumors with Mucinous Differentiation Arising in or Involving the Gynecologic Tract

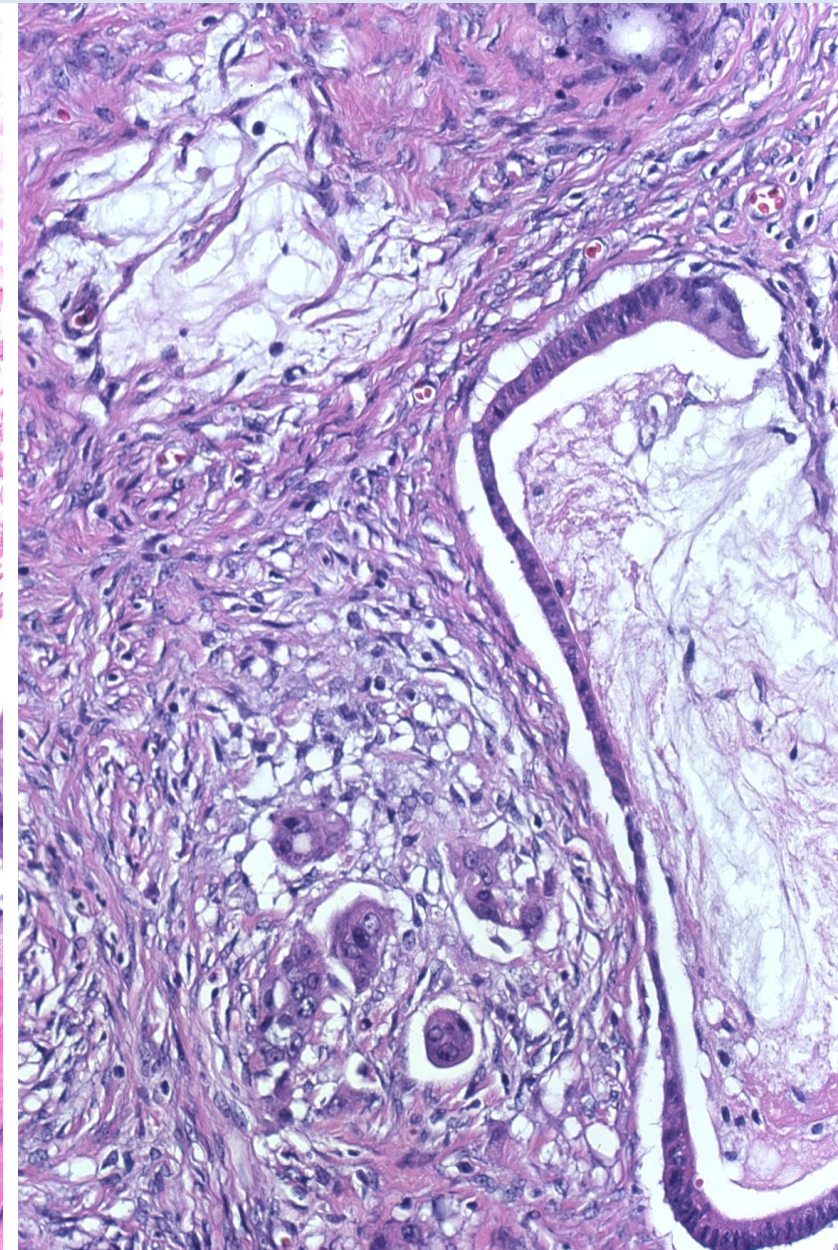
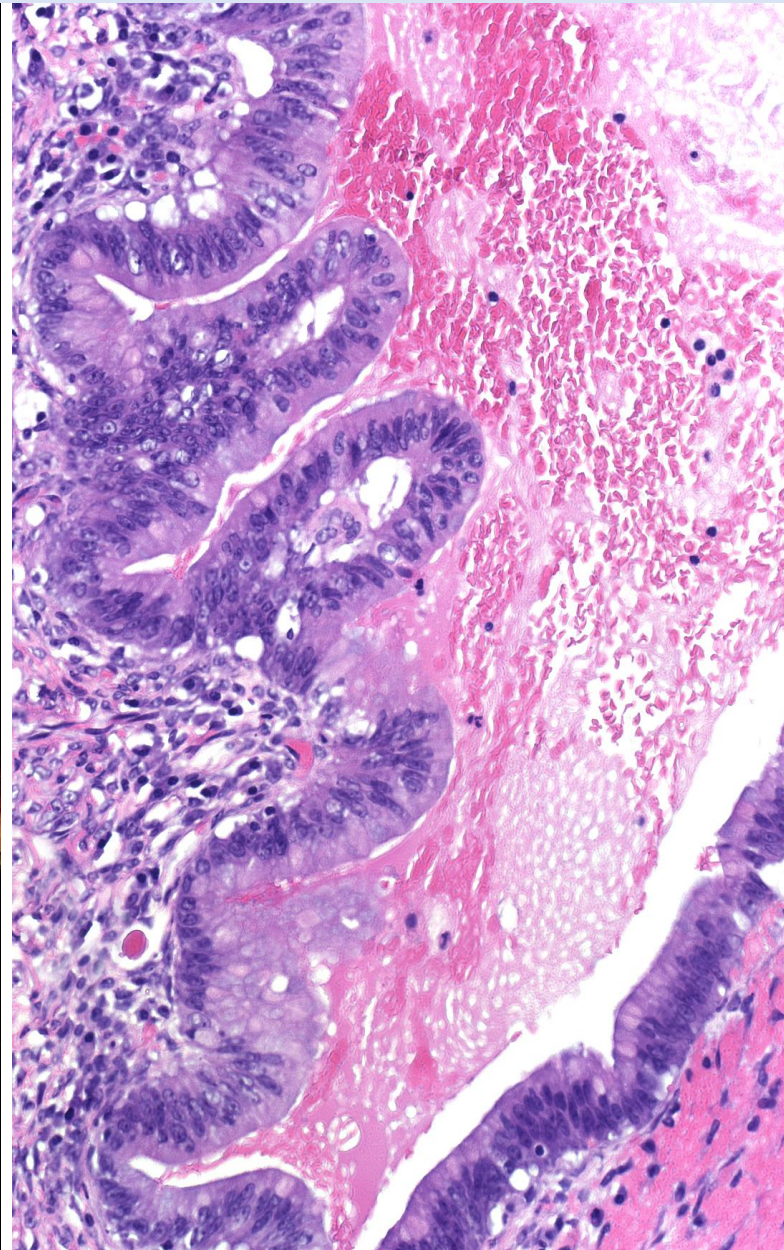
- Primary ovarian carcinomas: 119
- Primary cervicovaginal carcinomas: 18
- Metastatic tumors: 31 gynecologic, 83 non-gynecologic
- **DPC4 LOST** in:
 - ✓ Ovarian carcinomas (1 mucinous, 1 mixed mucinous & endometrioid)
 - ✓ Cervicovaginal gastric-type adenocarcinomas (5/18)
 - ✓ Metastatic gynecologic carcinomas:
 - Endocervical adenocarcinomas (2/5 gastric-type, 2/6 usual-type)
 - ✓ Metastatic non-gynecologic carcinomas to the GYN tract:
 - Pancreatic carcinomas (5/16)
 - Appendiceal carcinoma (1/8)
 - Cholangiocarcinoma (1/2)
 - Unknown primary mucinous adenocarcinoma (9/49)

Metastatic Pancreatic Carcinoma May Mimic Serous Tubal Intraepithelial Carcinoma

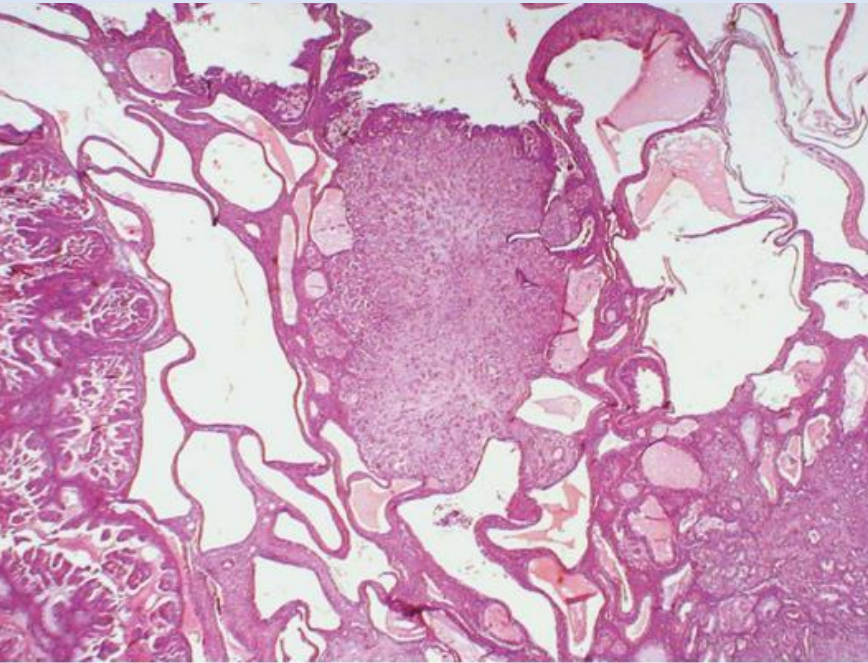


Rabban et al. Am J Surg Pathol. 2015;39:35-51

Metastatic Cholangiocarcinoma



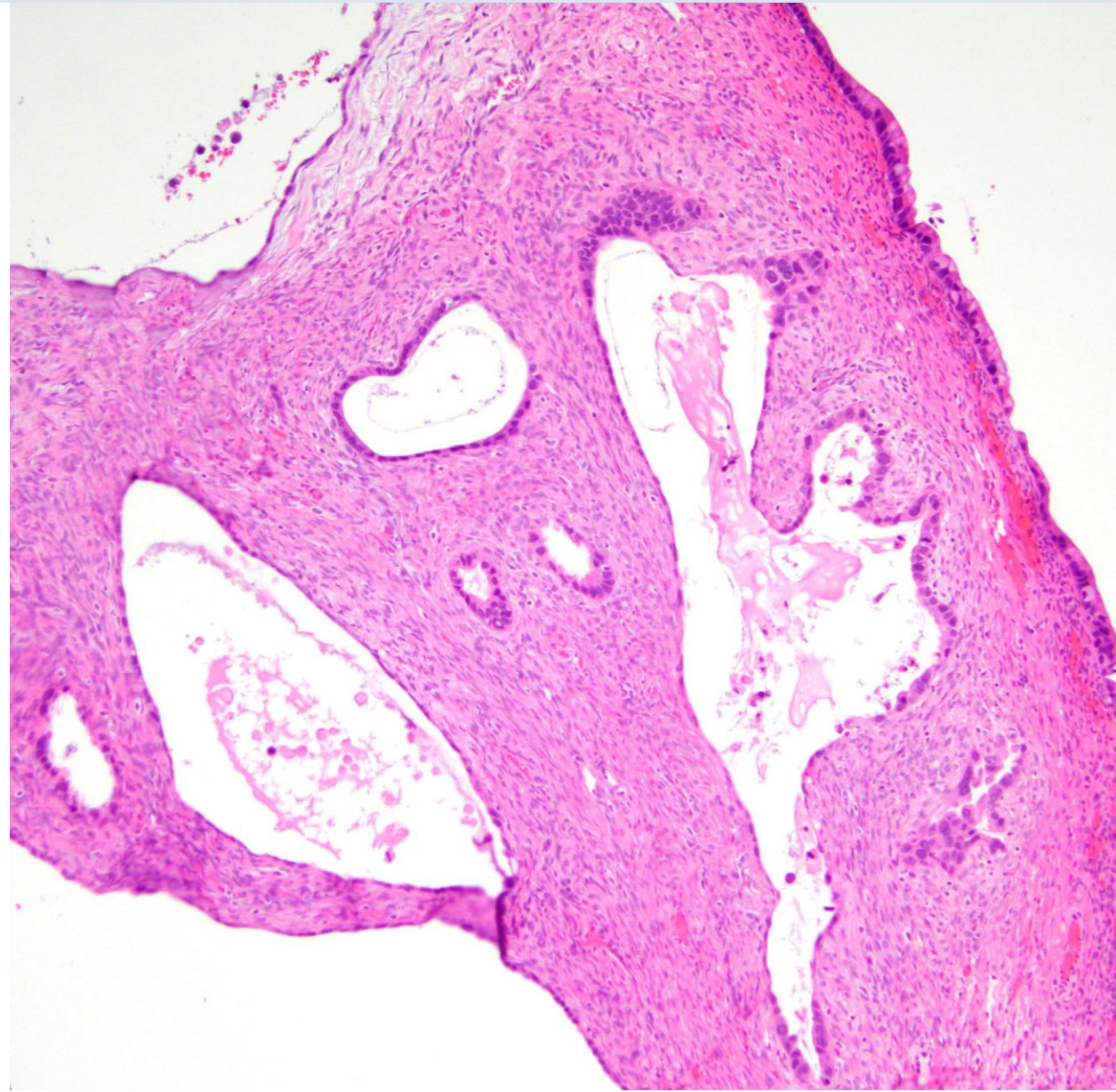
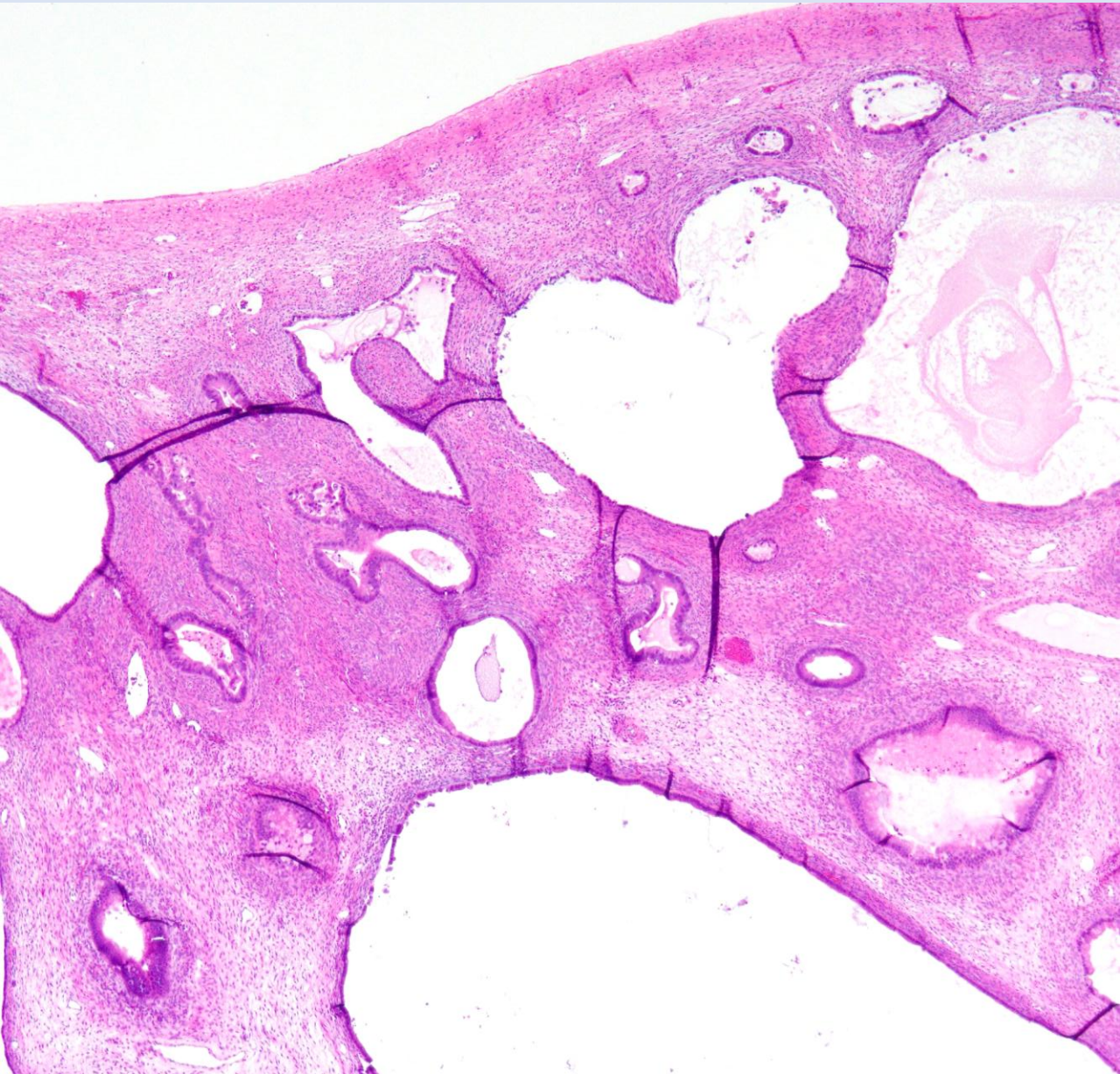
Metastatic Intrahepatic Cholangiocarcinoma: Heterogeneous Growth Patterns



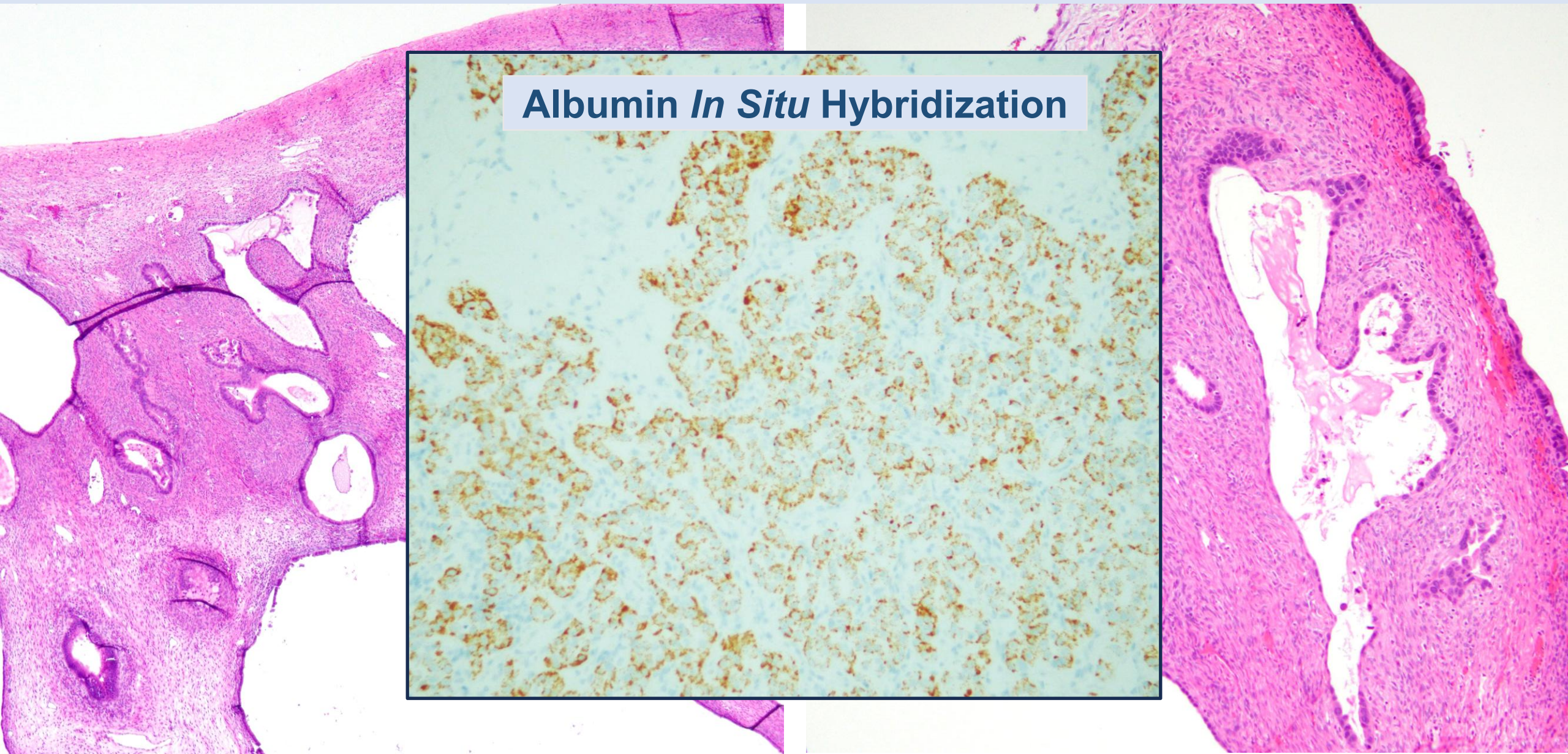
Microscopic Feature (N = 21)	No. Tumors	%
Multinodular pattern	10	48
Ovarian surface implants (N* = 20)	16	80*
Hilar involvement (N* = 19)	6	32*
Lymphovascular invasion	2	10
Infiltrative pattern	18	86
Small glands or single invasive cells	12	57
Signet ring cells	4	19
Intraluminal necrotic debris or segmental necrosis	4	19
Residual follicle structures between tumor cells	9	43
Expansile (confluent) invasive pattern†	2	10
Cribriform glands	11	52
Papillae	13	62
Intraepithelial carcinomalike component	19	90
Typical borderlinelike component	18	86
Benign-appearing component	13	62
Goblet cells	17	81
Focal fibromatous stroma	17	81
Luteinized stromal cells	4	19
Intrastromal mucin dissection	3	14



Metastatic Cholangiocarcinoma, FROZEN SECTION: Ductal and Cystic Patterns Are Most Common



Metastatic Cholangiocarcinoma, FROZEN SECTION: Ductal and Cystic Patterns Are Most Common

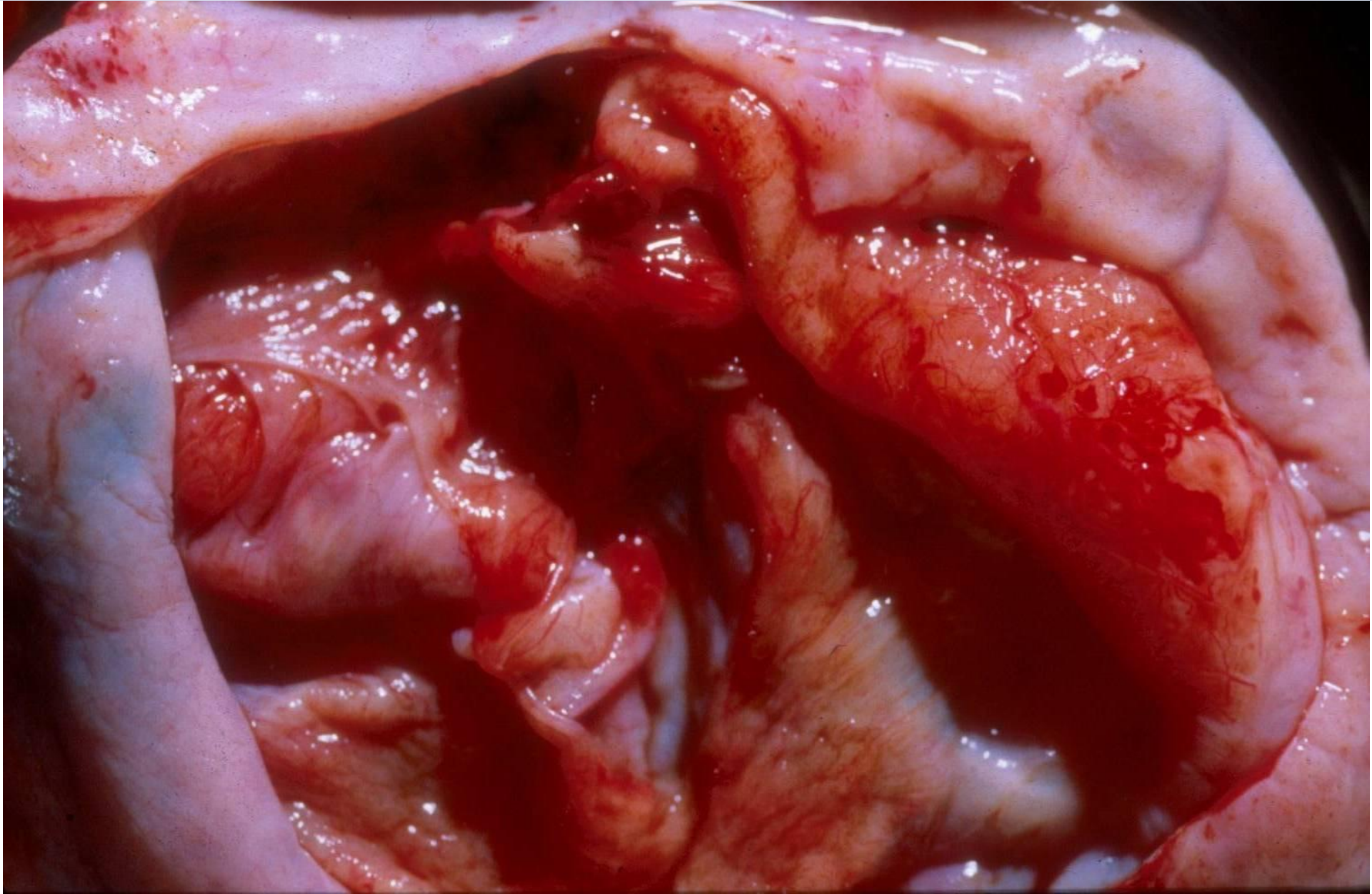


ENDOCERVICAL ADENOCARCINOMA WITH OVARIAN METASTASES: Emphasis on Minimally Invasive Tumors and the Ability of Metastases to Simulate Primary Ovarian Neoplasms

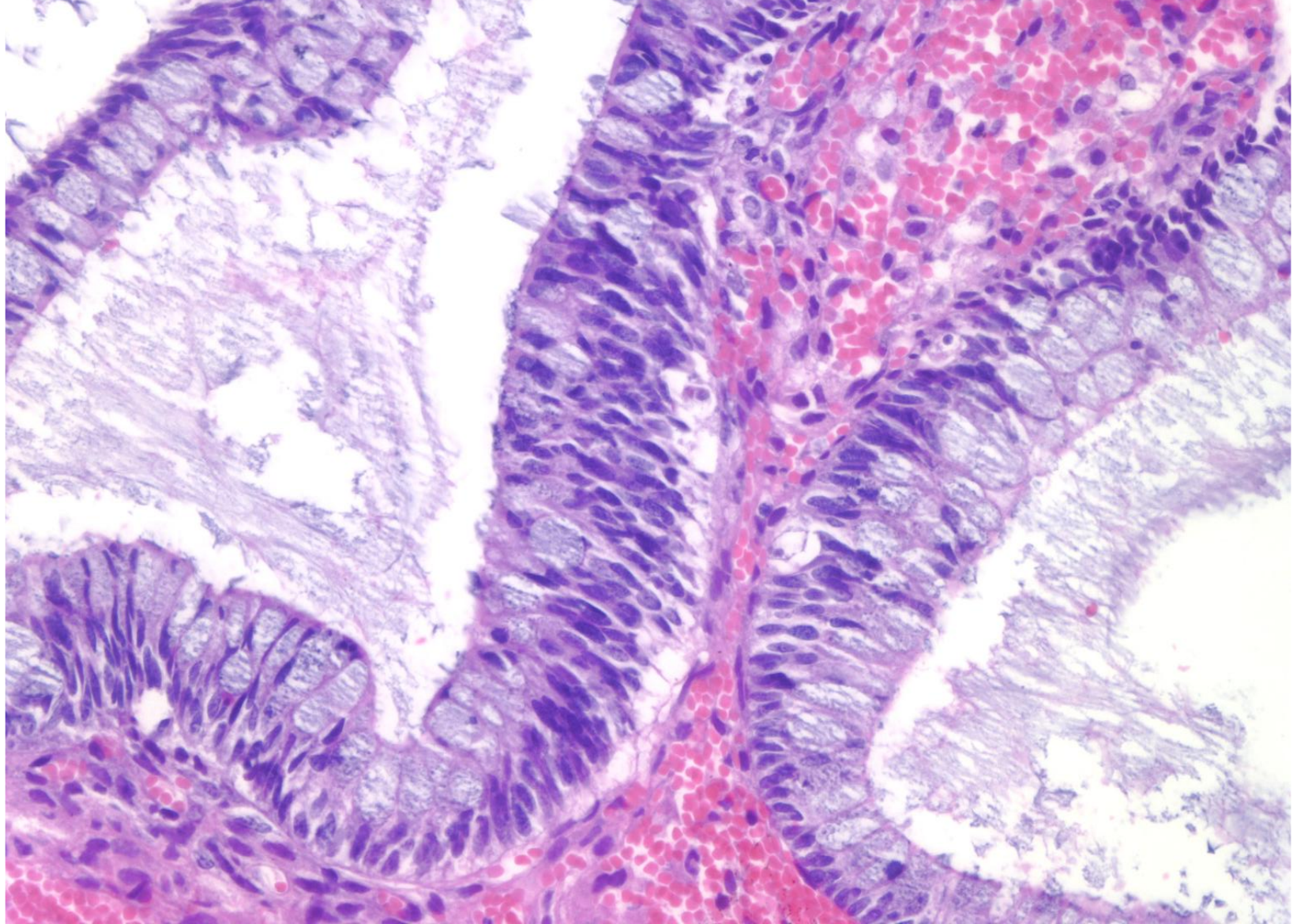
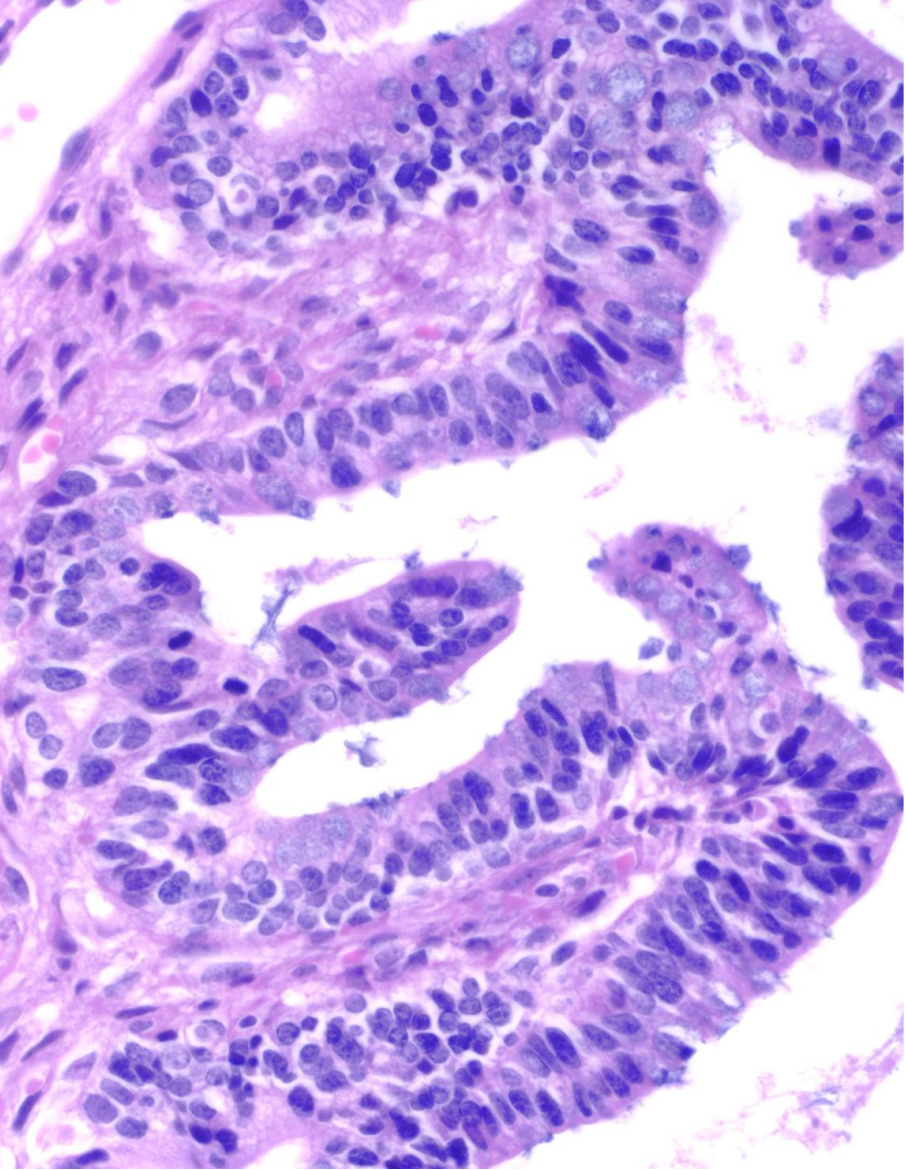
(Ronnett et al. Am J Surg Pathol. 2008,32:1835-53)

- 11/29 tumors with limited invasion (3-7 mm); extensive AIS
- Most ovarian tumors diagnosed after diagnosing cervical tumor
- 9/11 unilateral ovarian tumors, up to 30 cm
- All HPV-related (typically high-risk: 16, 18, 45)
- 7/11 patients alive without evidence of disease (10-85 months); two recurrences

Endocervical Adenocarcinoma Metastatic to Ovary

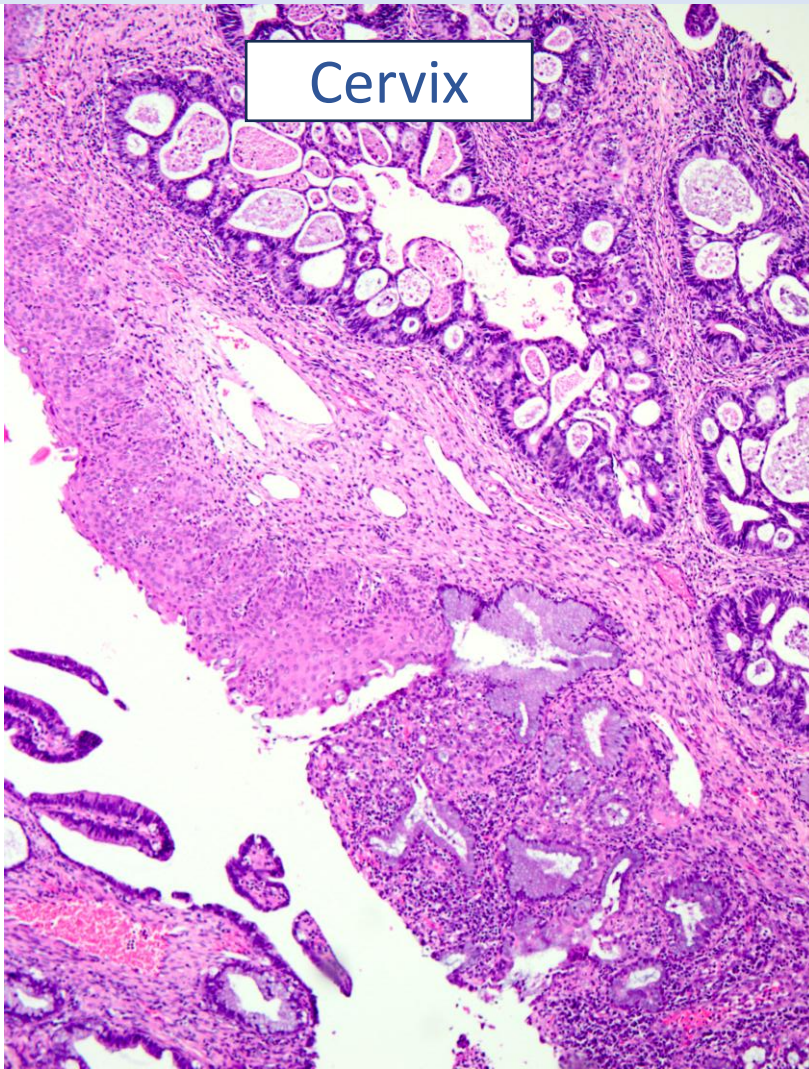


Metastatic Usual-Type Endocervical Adenocarcinoma: Discordant Architecture and Cytology

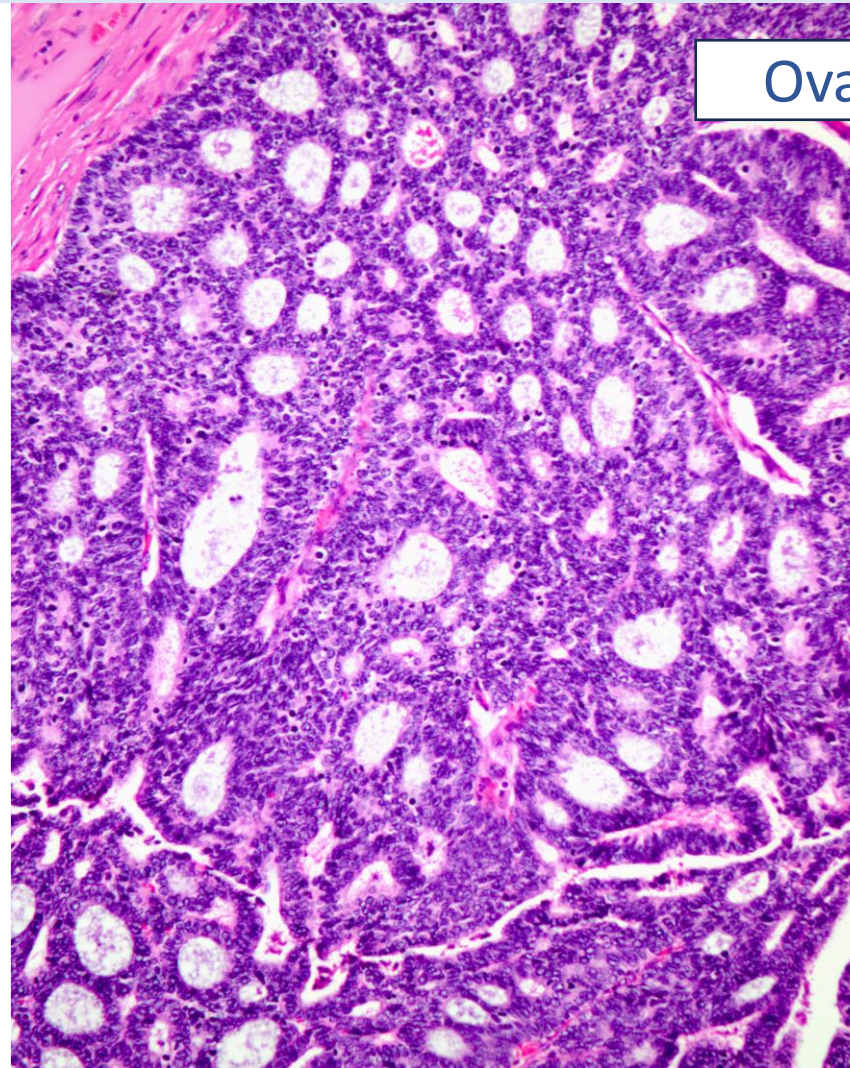


HPV-Related Endocervical Adenocarcinoma (Silva Pattern A) with Ovarian Involvement Appears to Have a More Indolent Nature, At Least In a Subset of Patients (Colonization, no Stromal Invasion or LVI)

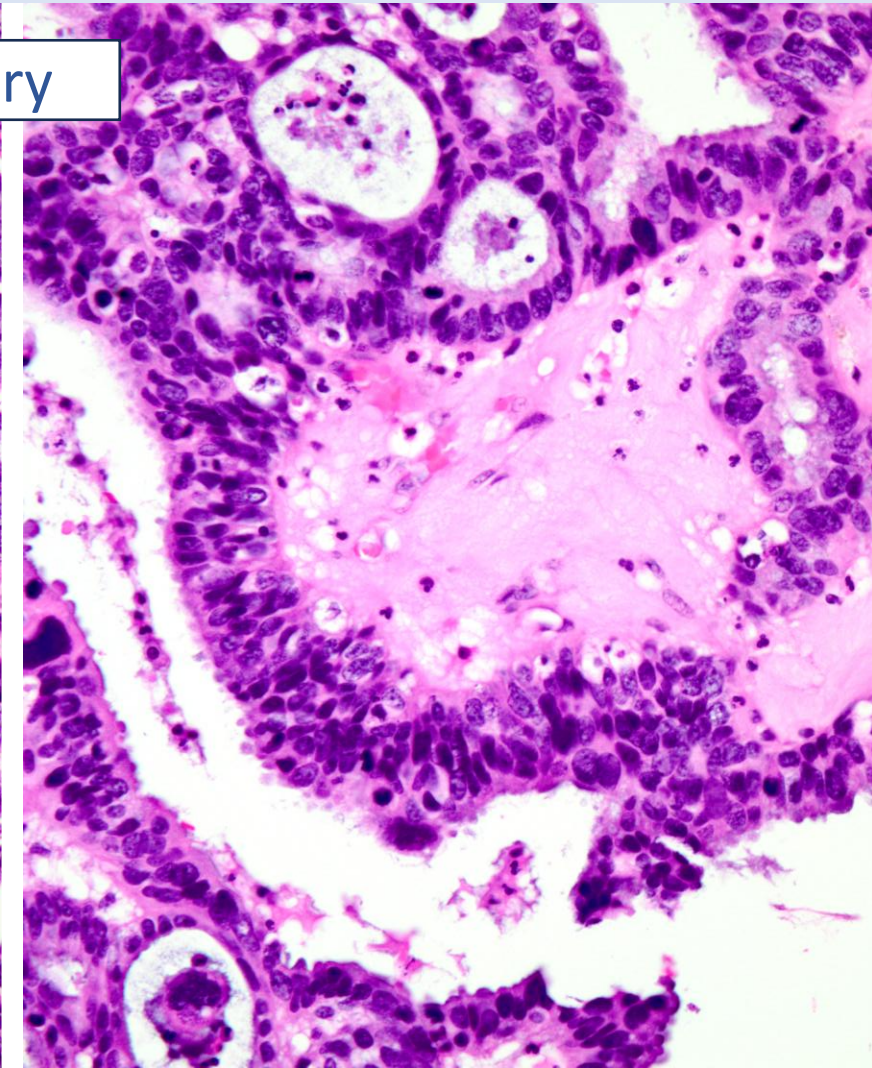
(Neil et al. Histopathology. 2024;84(2):369-80)

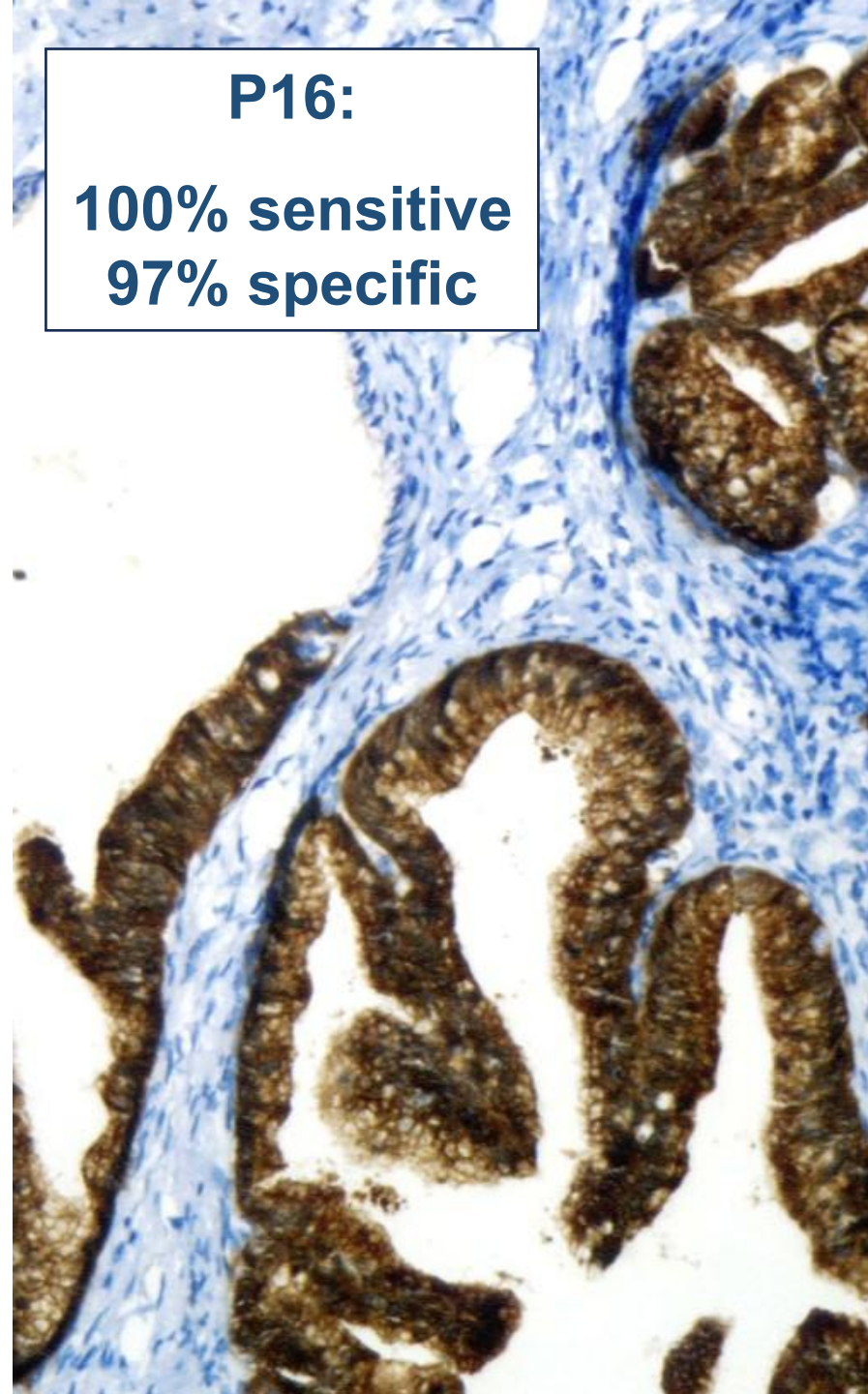
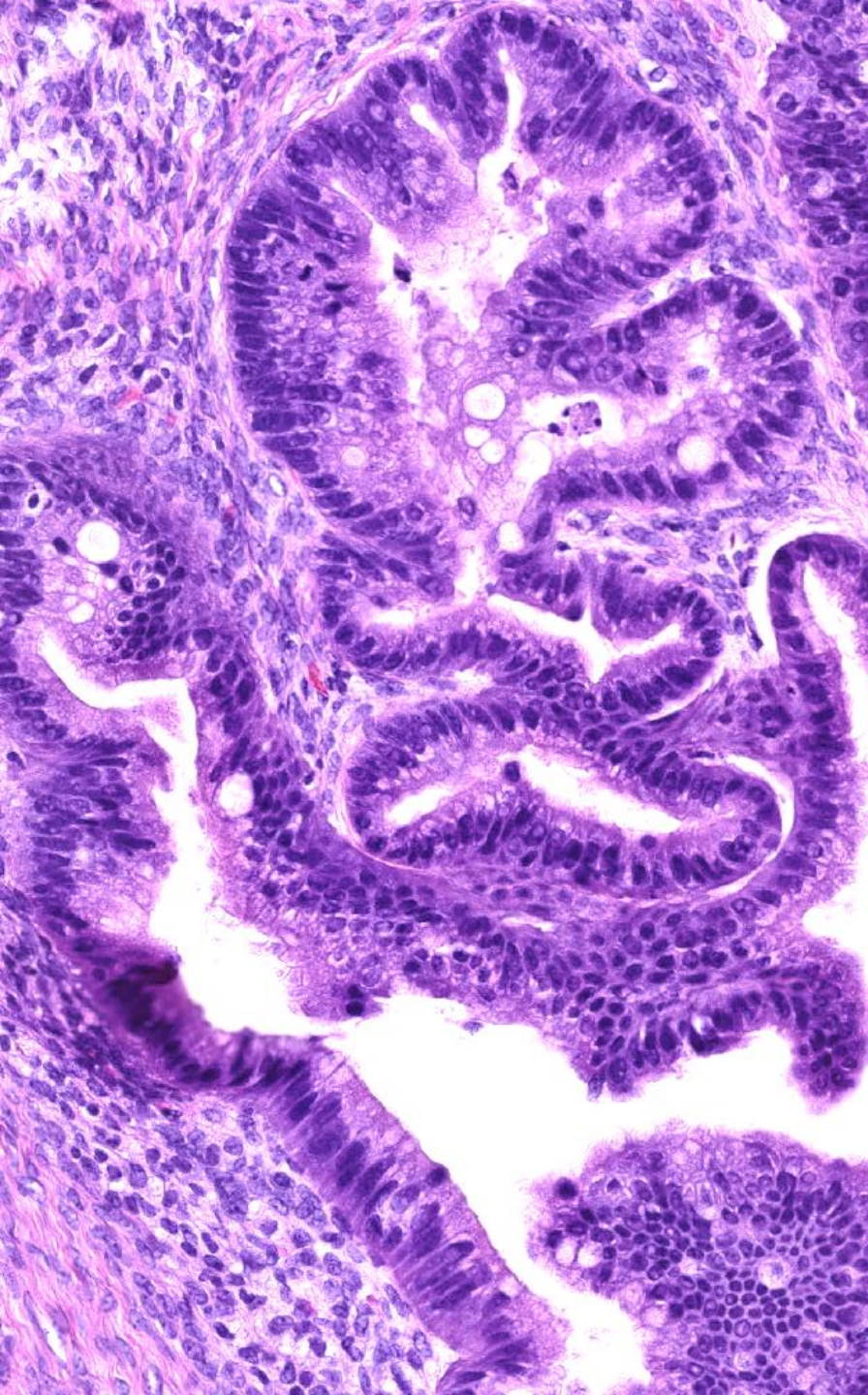


Cervix

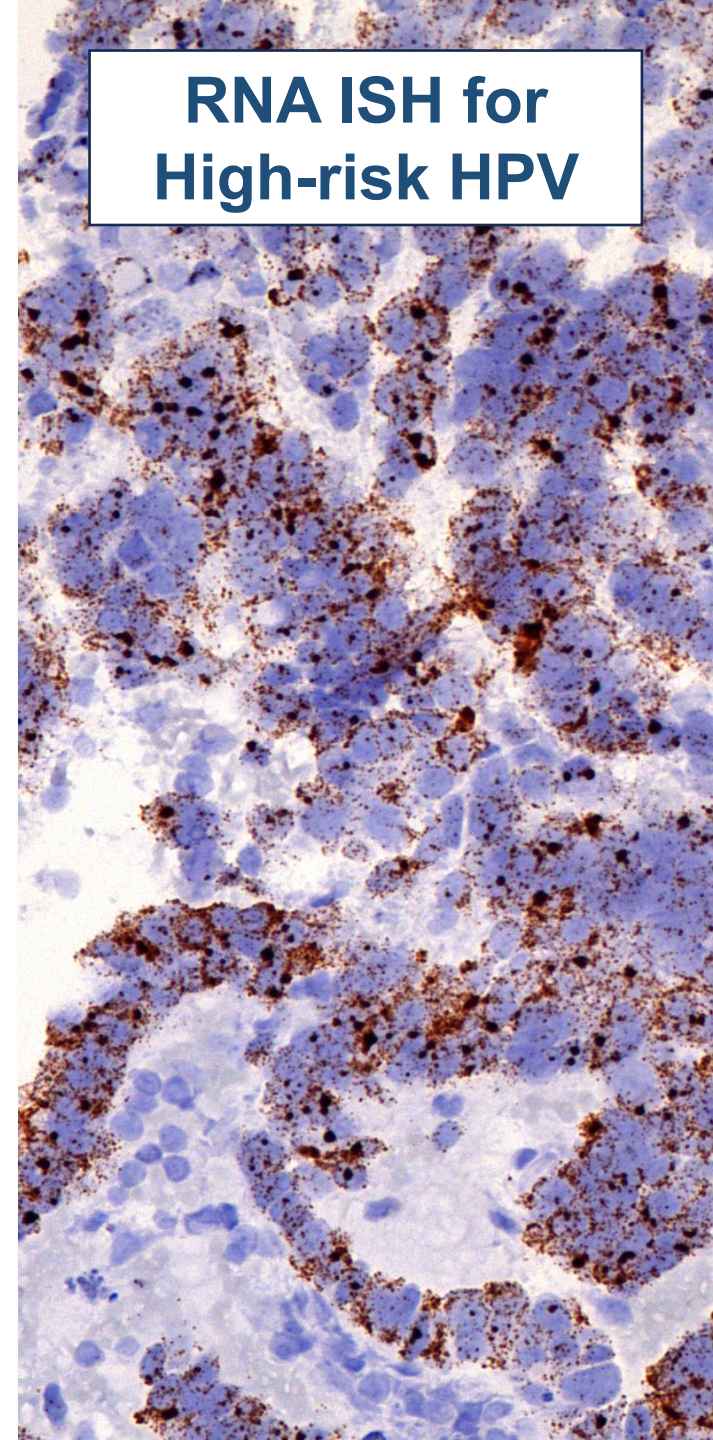


Ovary



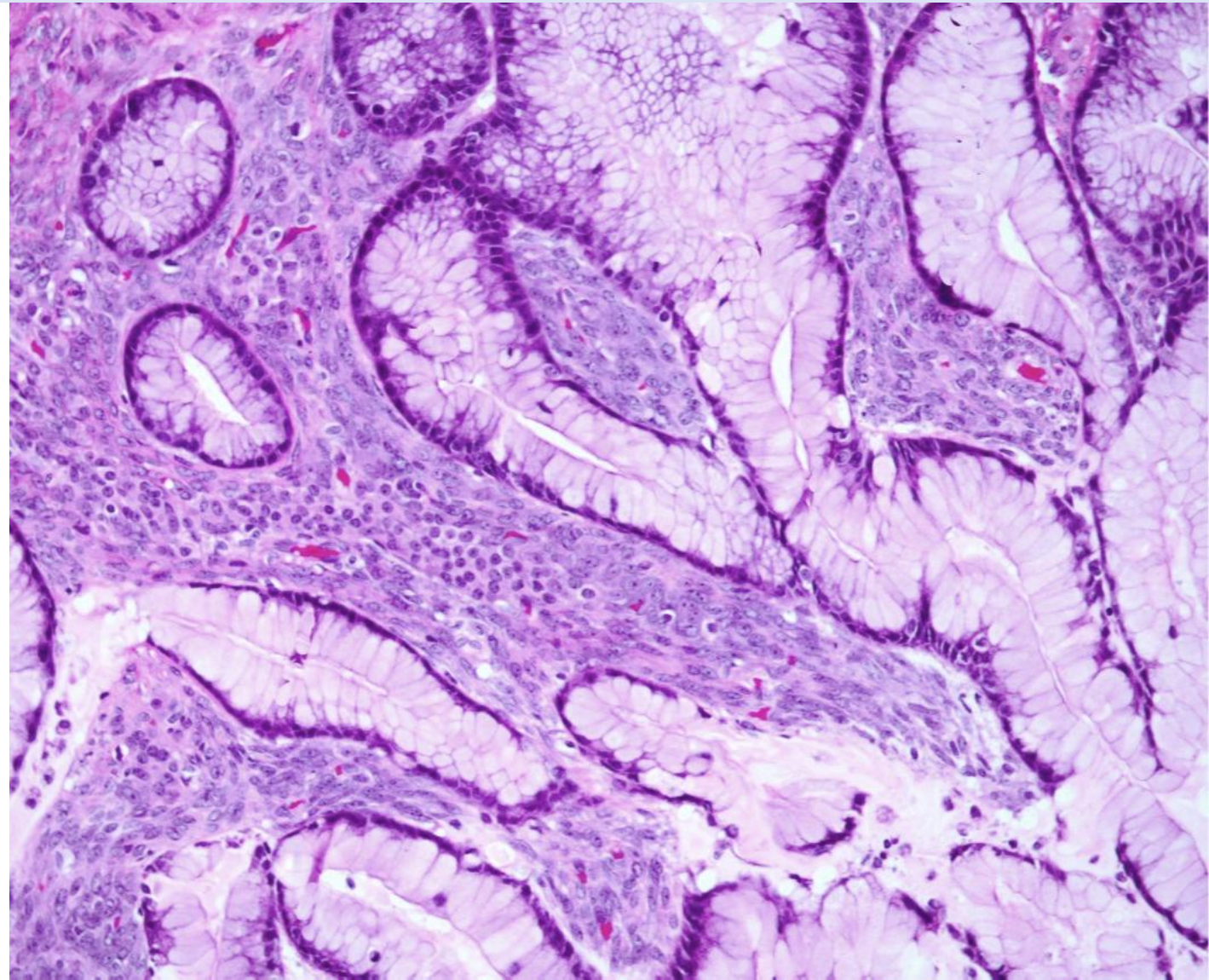
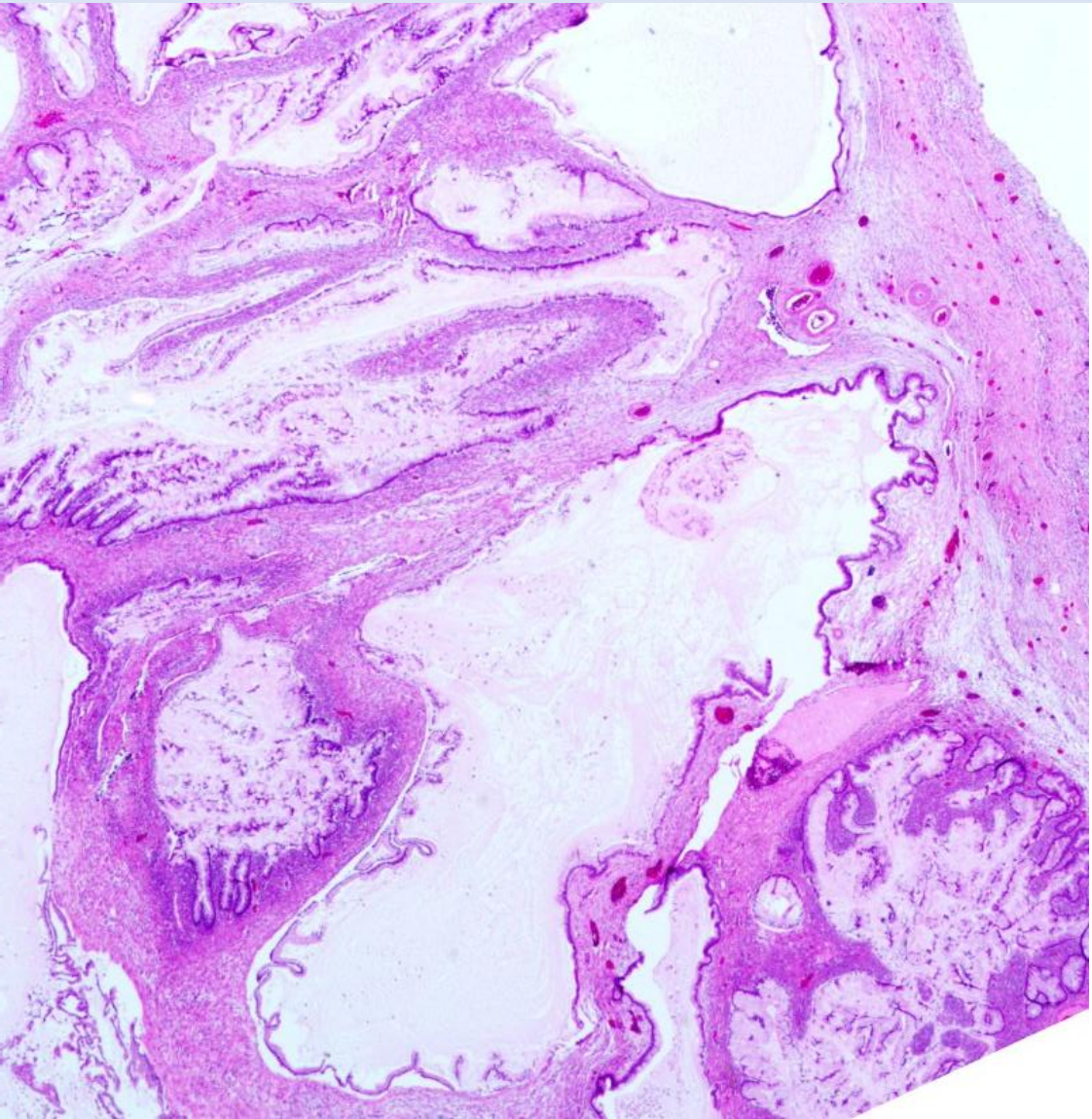


P16:
100% sensitive
97% specific



RNA ISH for
High-risk HPV

Ovarian Metastases (~30%) of Gastric-type Endocervical Adenocarcinoma

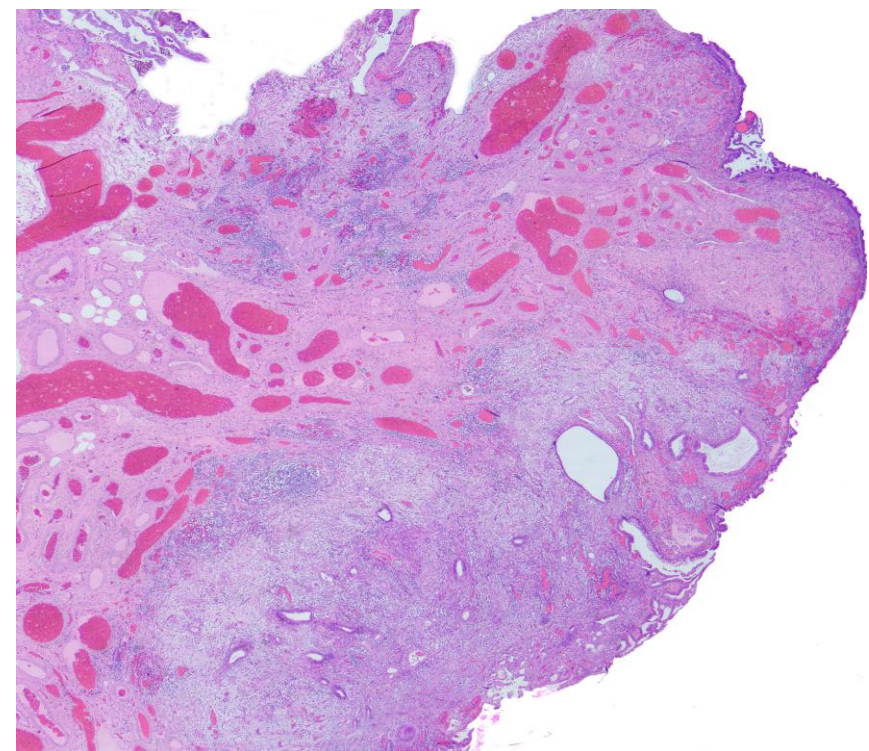
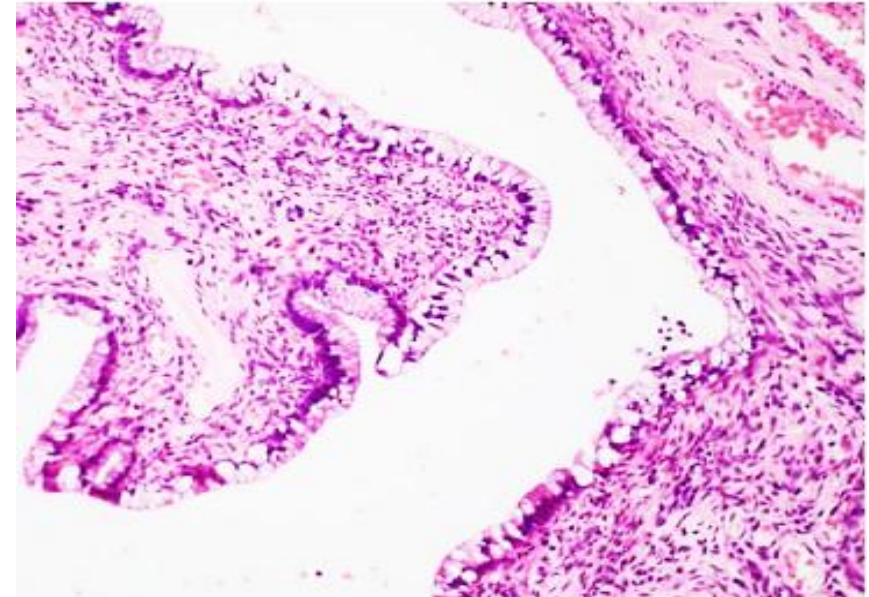


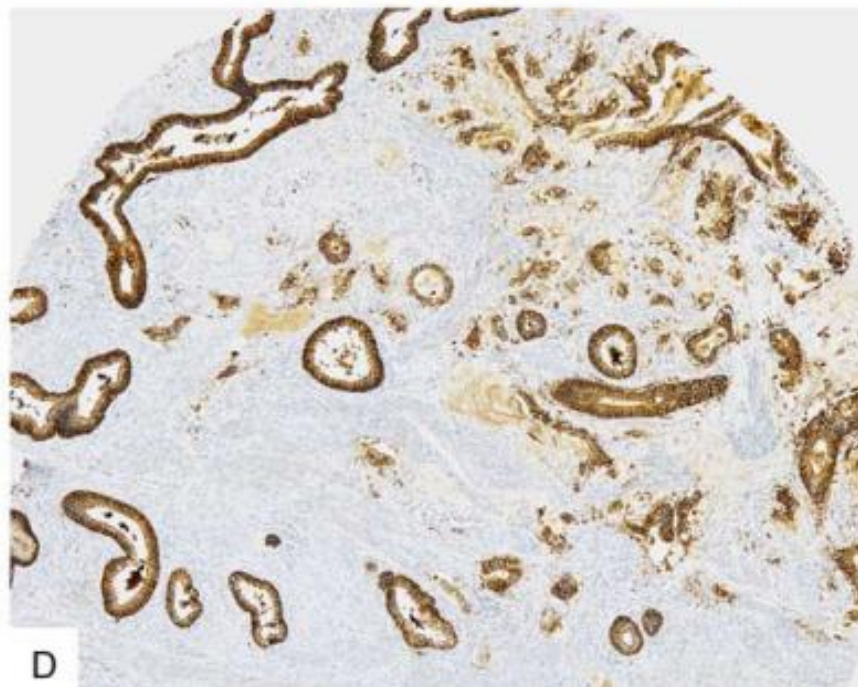
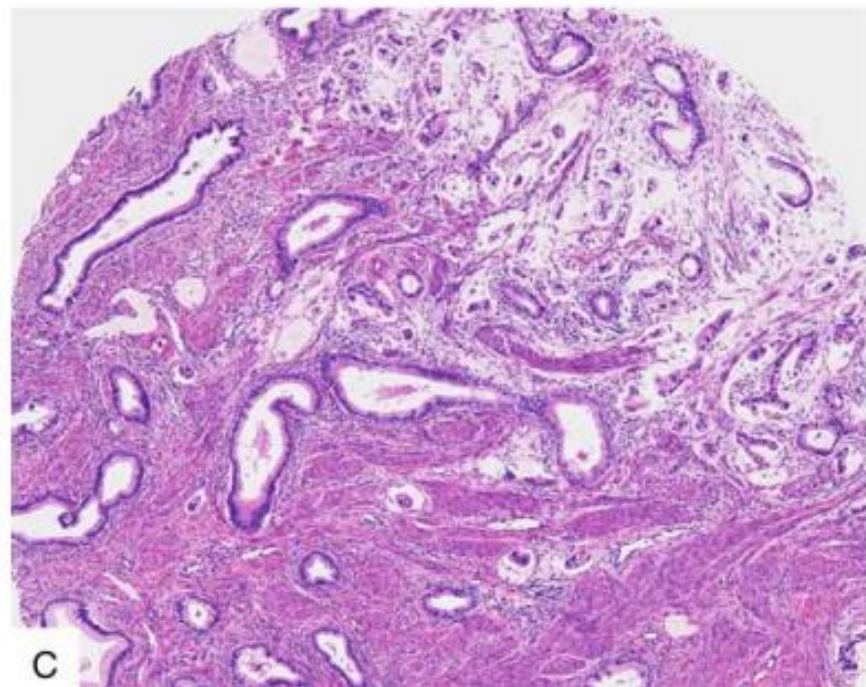
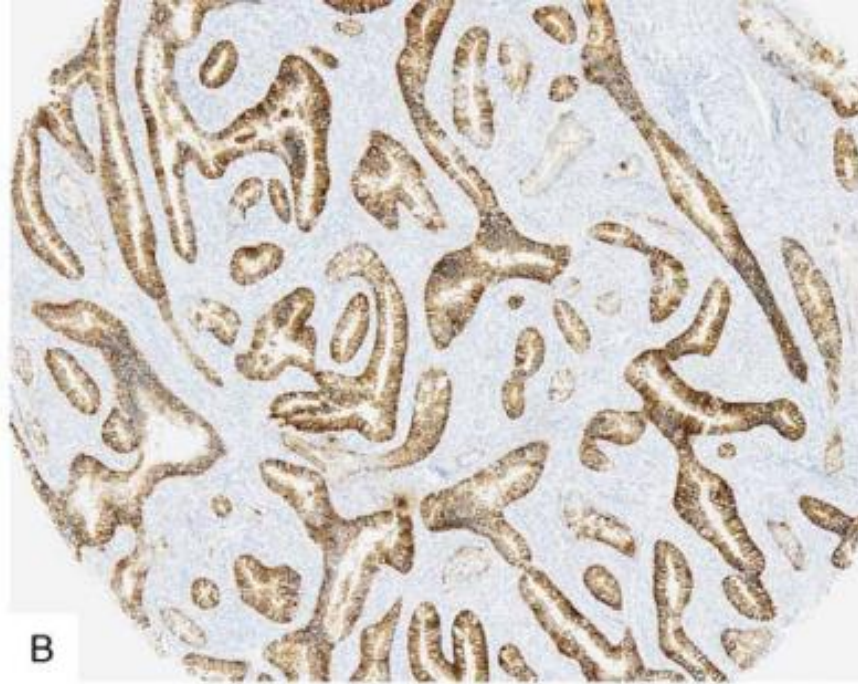
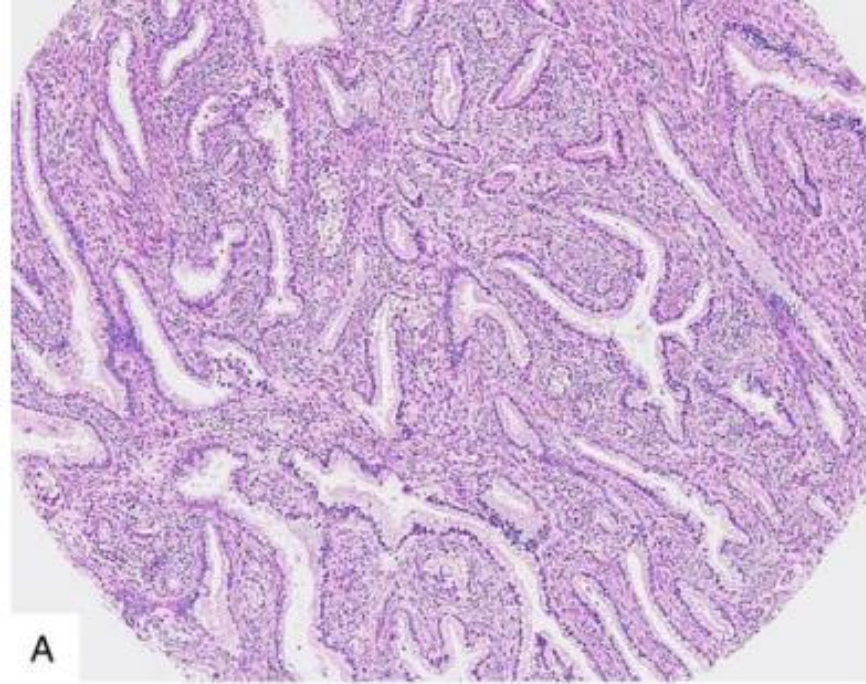
Fallopian Tube Mucosal Involvement in Cervical Gastric-type Adenocarcinomas

Report of a Series With Discussion of the Distinction From Synchronous In Situ Tubal Lesions

Simon Rajendran, MD, Yaser Hussein, MD,† Kay J. Park, MD,‡
and W. Glenn McCluggage, FRCPath**

- 7 examples
- Ovarian involvement could be seen as multiple cysts lined by bland and variably atypical (benign and borderline) mucinous epithelium mimicking a primary ovarian neoplasm
- In some cases, surface tumor involvement was noted and in most, foci of obvious destructive invasion were seen
- Colonization of fallopian tube and typically endometrial involvement



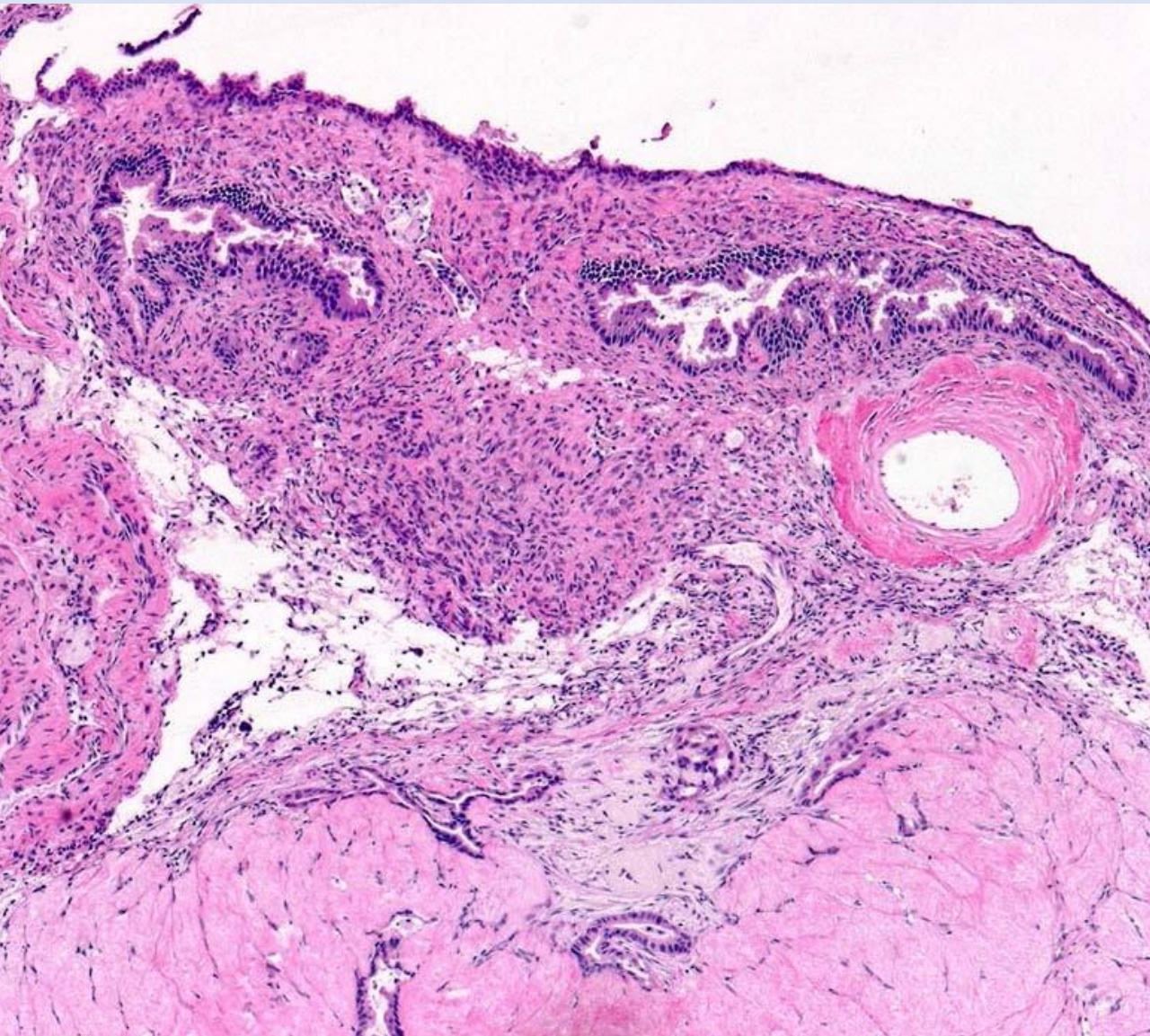


Claudin-18 as a promising marker for endocervical gastric-type adenocarcinoma... especially if strong and diffuse (in primary tumors).....but also positive in ovarian mucinous tumors - thus, NOT HELPFUL

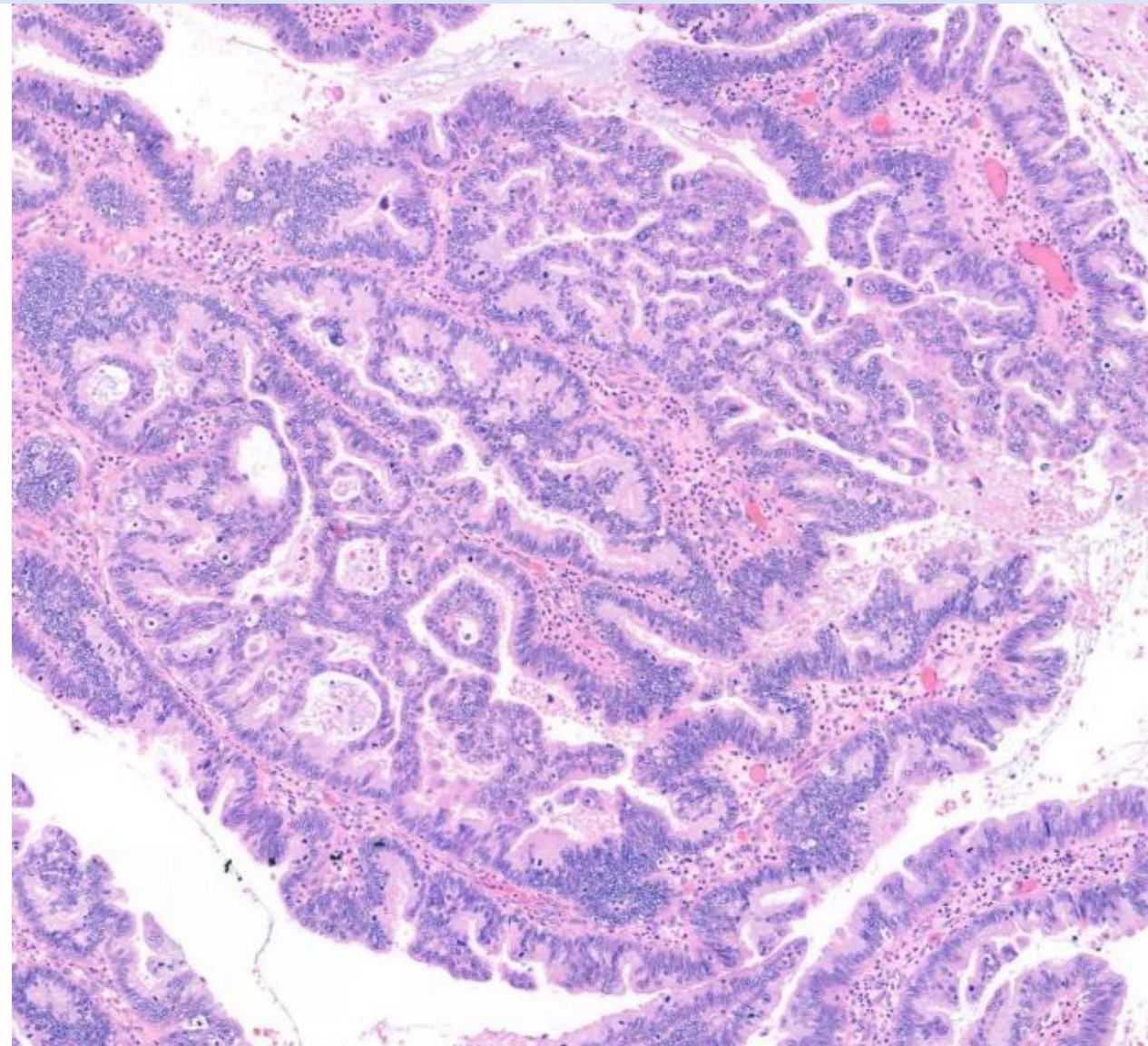
Pitfalls: “Maturation phenomenon”

- **Microscopically, metastatic mucinous carcinomas can simulate:**
 - ✓ Mucinous cystadenoma
 - ✓ Borderline mucinous tumor
 - ✓ Borderline mucinous tumor with intraepithelial carcinoma
 - ✓ Borderline mucinous tumor with microinvasion

**Metastatic Pancreatic
Carcinoma Mimicking
Mucinous Cystadenoma**



**Metastatic Endocervical
Adenocarcinoma Mimicking
Mucinous Borderline Tumor**



Summary

- Metastatic mucinous tumors may closely mimic primary mucinous ovarian tumors
- Before establishing a diagnosis of primary mucinous ovarian tumor (carcinoma most frequently), always exclude the possibility of metastases
- Clinical-radiologic correlation is crucial
- Immunohistochemistry and molecular tools may be helpful but be aware of significant overlap

The background of the slide is a dense, repeating pattern of small, stylized flowers in various shades of pink, magenta, and light purple. In the center of the slide, there is a white rectangular box with rounded corners and a thin black border. Inside this box, the text "Thank you!" and "Questions?" is written in a bold, dark blue font.

Thank you!

Questions?