SOCIEDAD ESPAÑOLA DE ANATOMIA PATOLOGICA
ZARAGOZA, 2011

SEMINARIO DE PATOLOGIA DEL PERITONEO Y RETROPERITONEO

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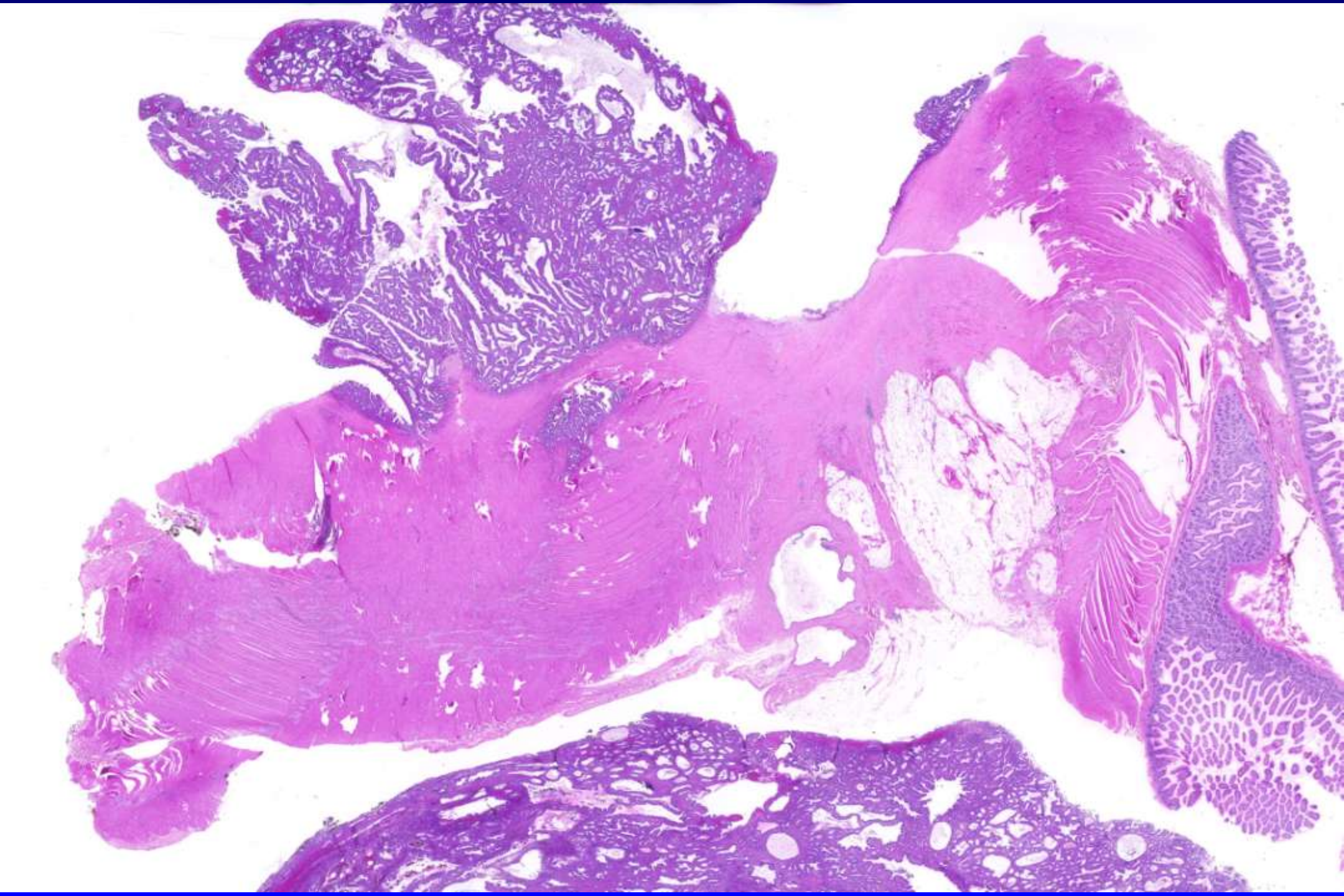
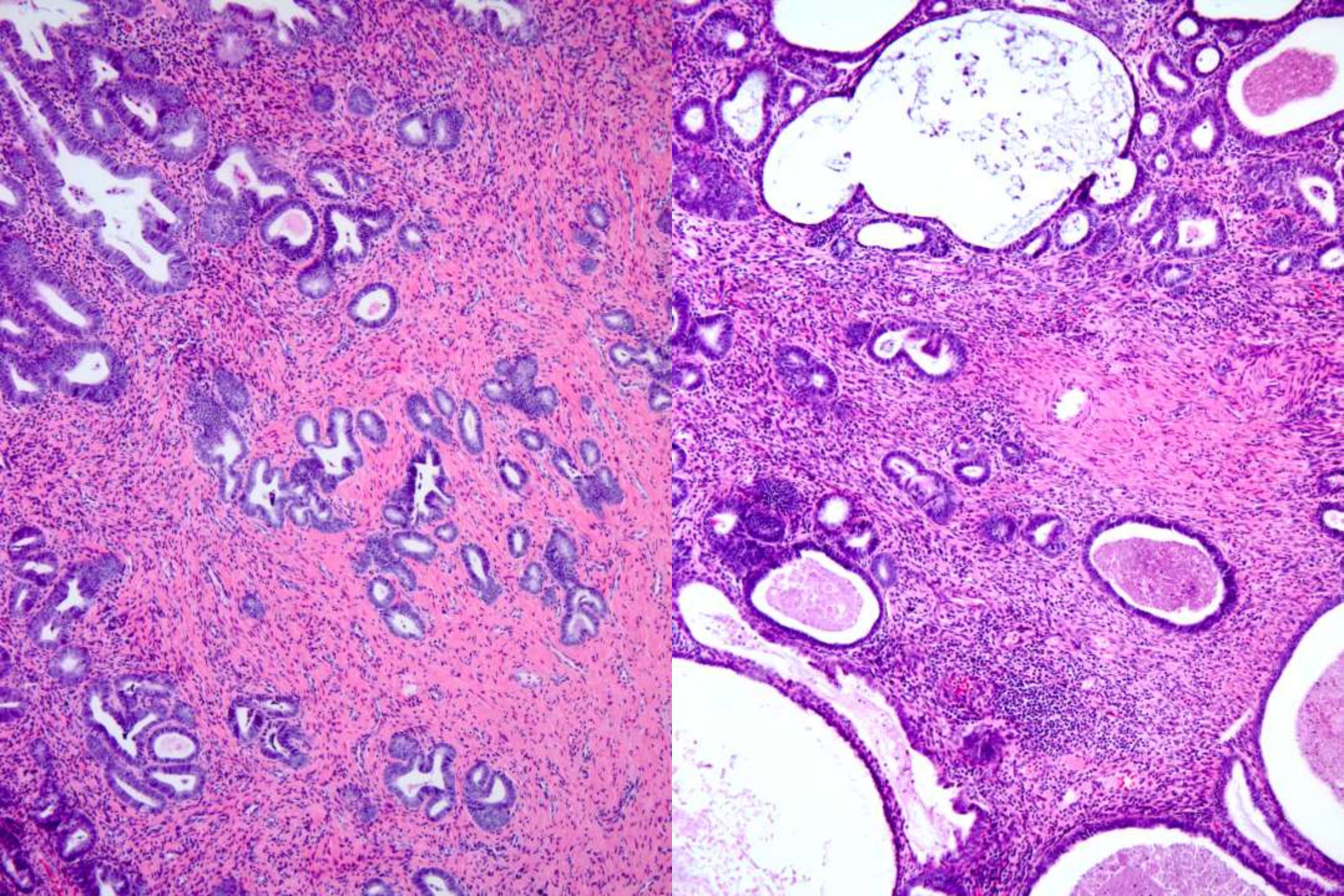
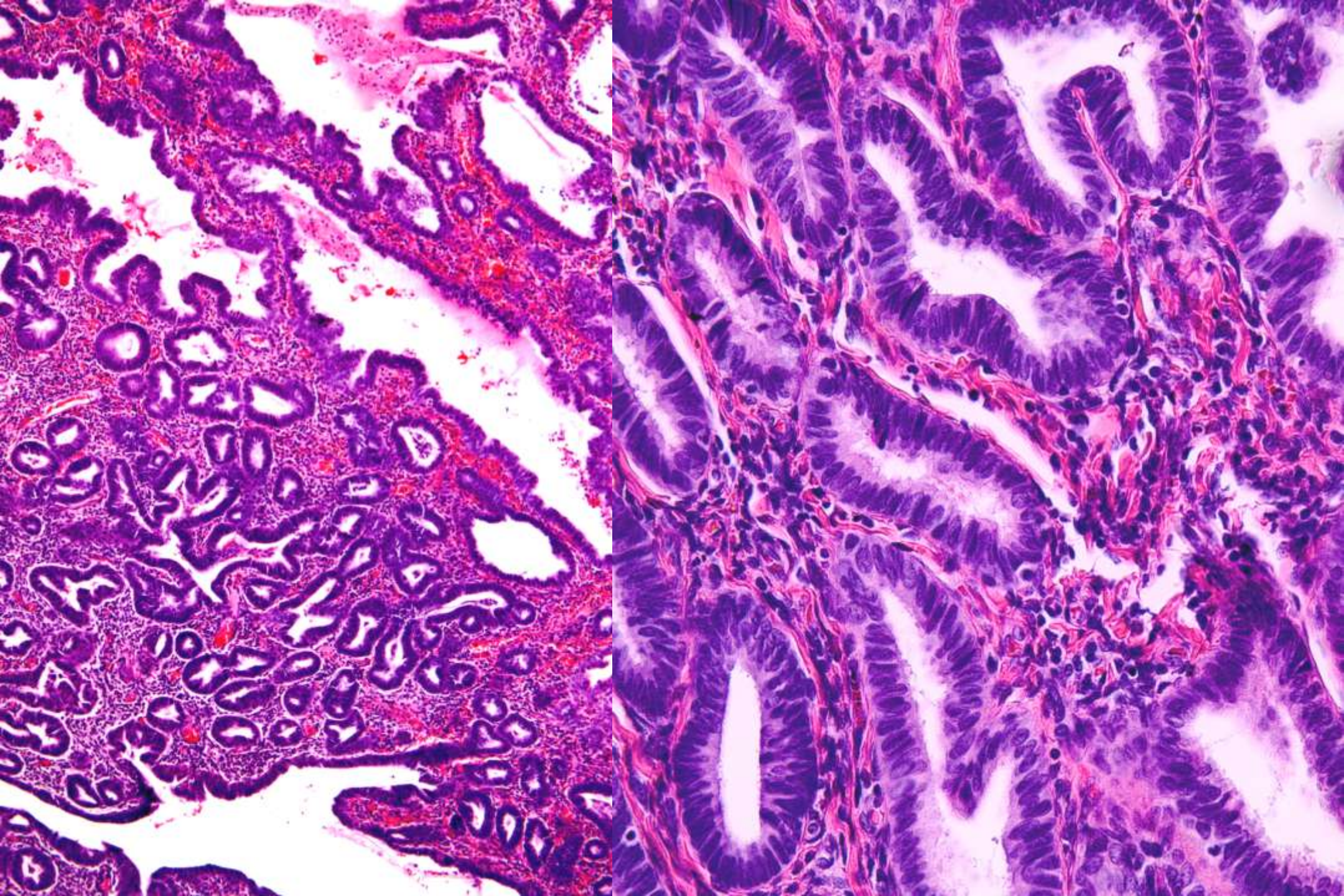
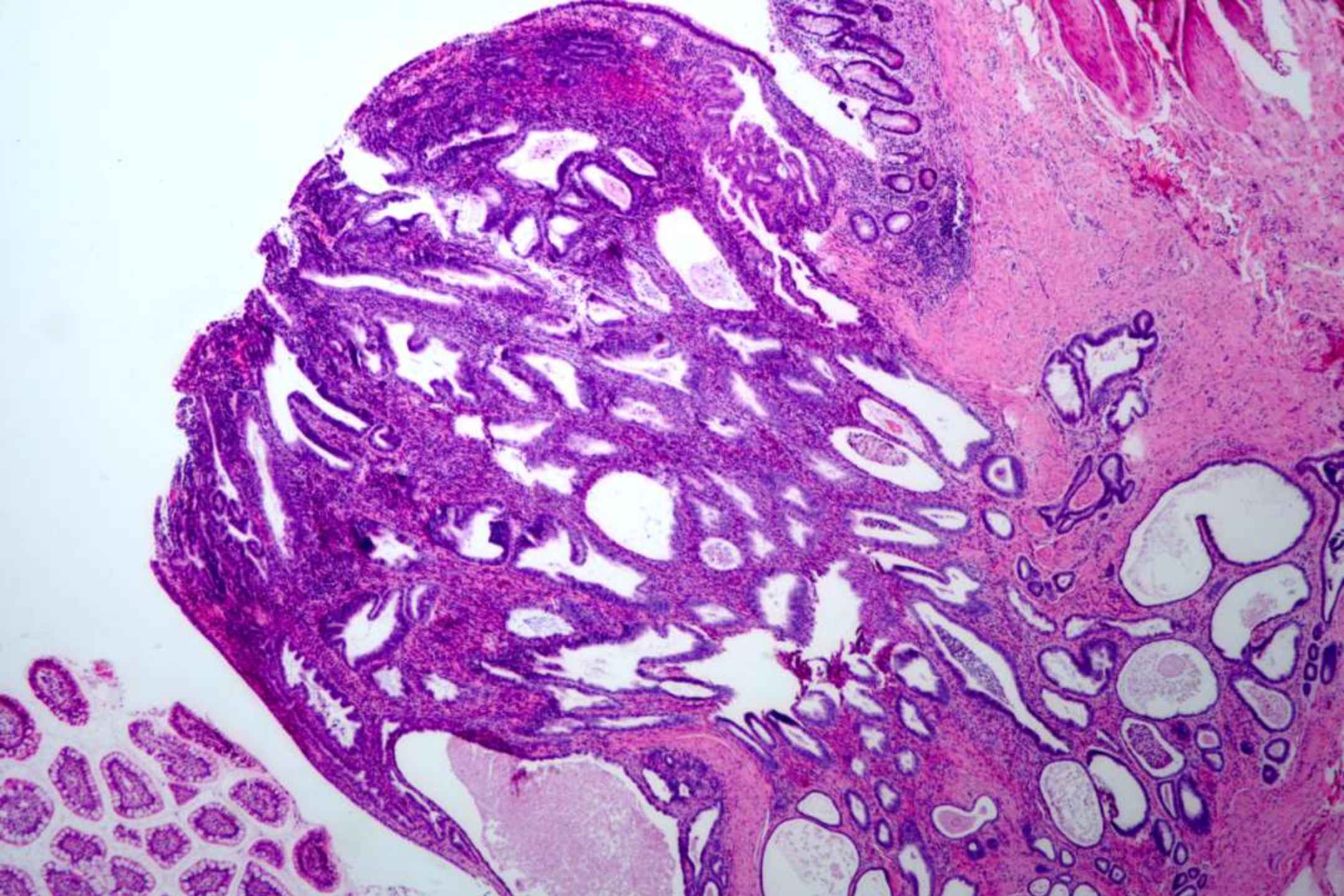
CLINICAL HISTORY

A 59 year old woman that had her uterus removed for endometriosis presented with symptoms and signs related to bowel obstruction. On physical examination, a mass was noted in the lower abdomen. A CT-scan showed a partially poorly defined mass attached to the wall of the large bowel. The patient underwent partial resection of the terminal ileum.







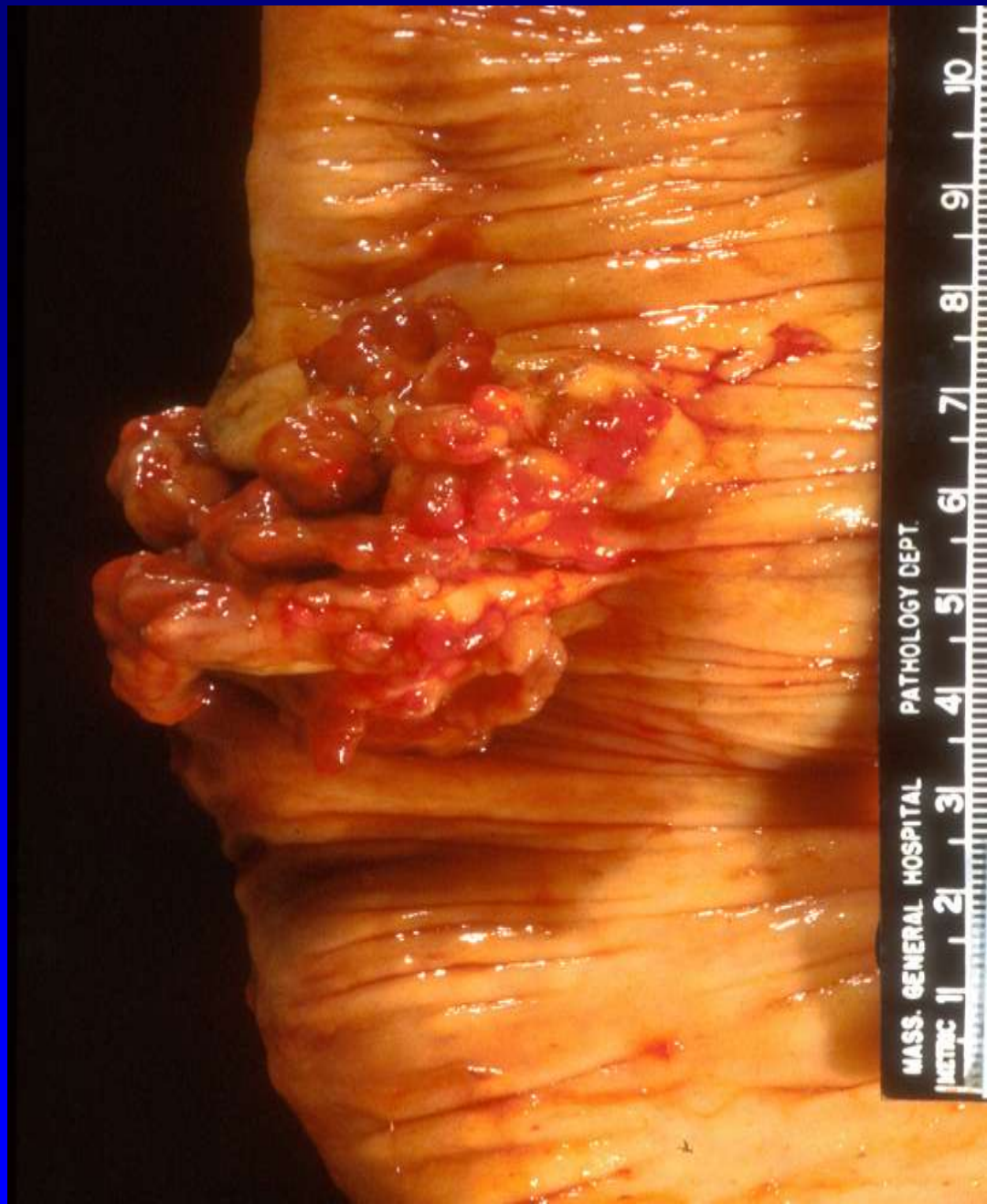


DIAGNOSIS

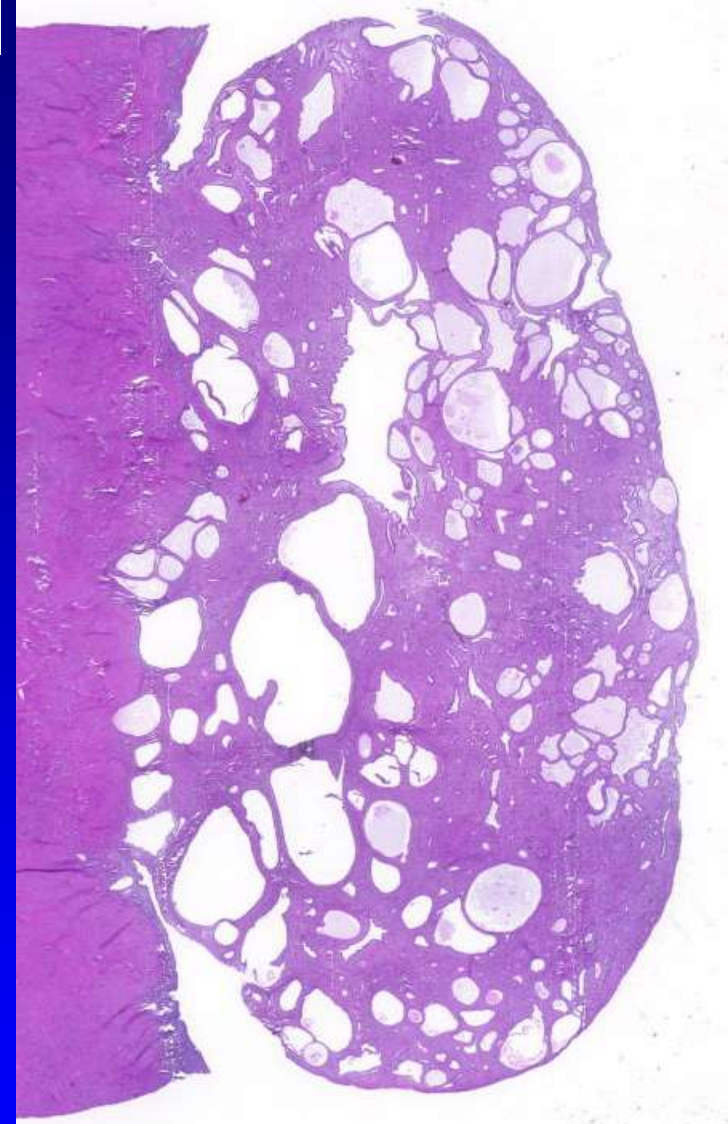
BOWEL SEROSA:
POLYPOID ENDOMETRIOSIS
with associated HYPERPLASIA

PERITONEAL POLYPOID ENDOMETRIOSIS

INTESTINAL POLYPOID ENDOMETRIOSIS



OVARIAN POLYPOID ENDOMETRIOSIS



ENDOMETRIAL POLYP

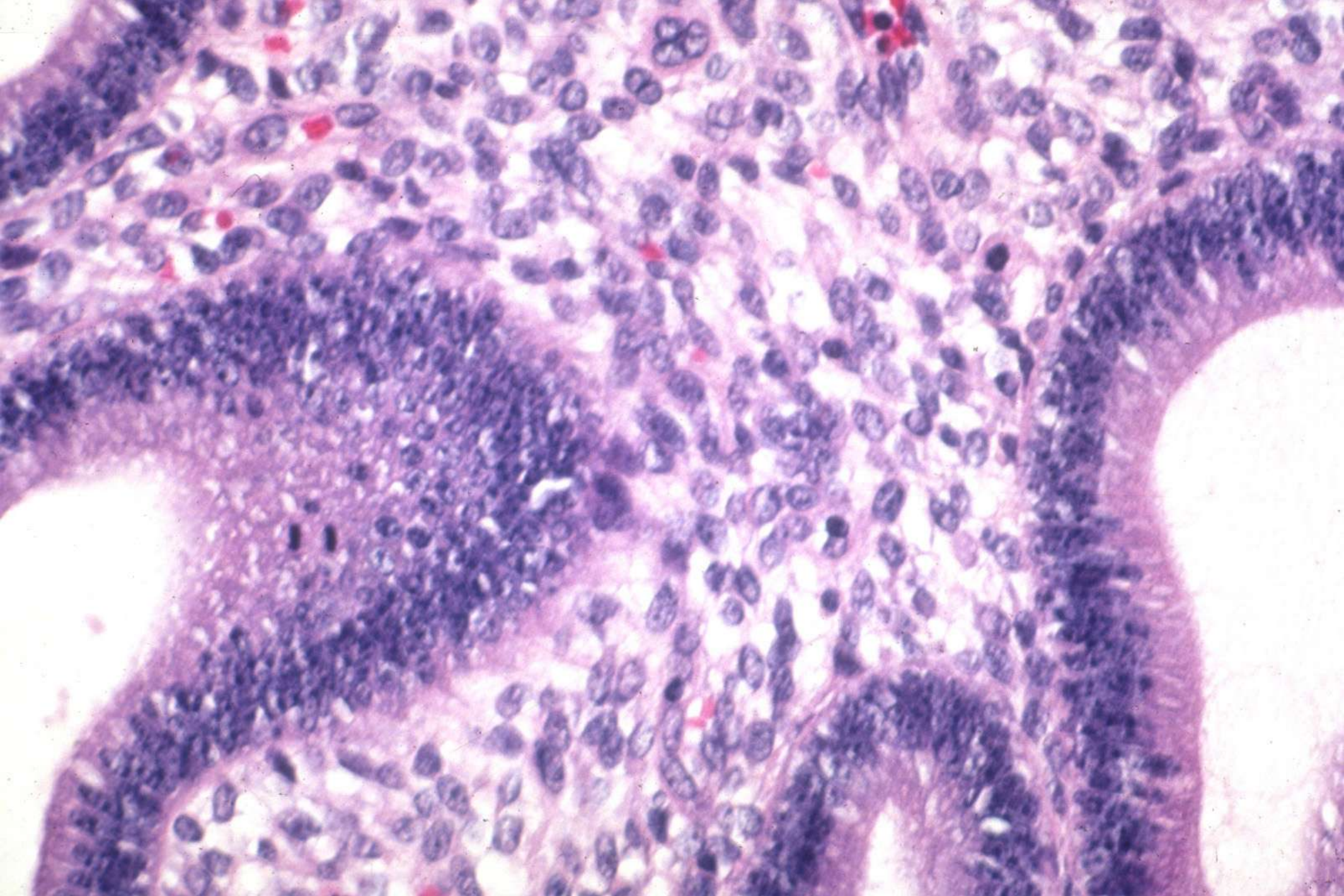
POLYPOID ENDOMETRIOSIS

- In contrast to conventional endometriosis tends to affect older women (>50 years)
- Often present with signs and symptoms related to a mass
- Rectosigmoid colon more commonly involved, followed by ovary and peritoneum
- Differential diagnosis includes endometrioid adenofibroma, mesodermal low-grade adenosarcoma, low-grade endometrioid stromal sarcoma with glandular differentiation

ENDOMETRIOSIS: AN OVERVIEW

- Presence of endometrial tissue outside the endometrium and myometrium
- Affects 10-15% of women
- Most commonly involved organs include:

  ovary, uterine ligaments, rectovaginal septum, cul-de-sac, and peritoneum
- CA-125 frequently elevated
- Rare clinical complications are massive serosanguineous ascites, right pleural effusion, and hemorrhage



ENDOMETRIOSIS
DIAGNOSTIC PROBLEMS

STROMA

Elastosis

Smooth muscle metaplasia

Myxoid change

Absence of /or only stroma (micronodular)

Foamy/pigmented histiocytes

Decidual change including signet ring cells

Necrotic pseudoxanthomatous nodules

EPITHELIUM

Pregnancy

Postmenopausal/treatment

Metaplastic

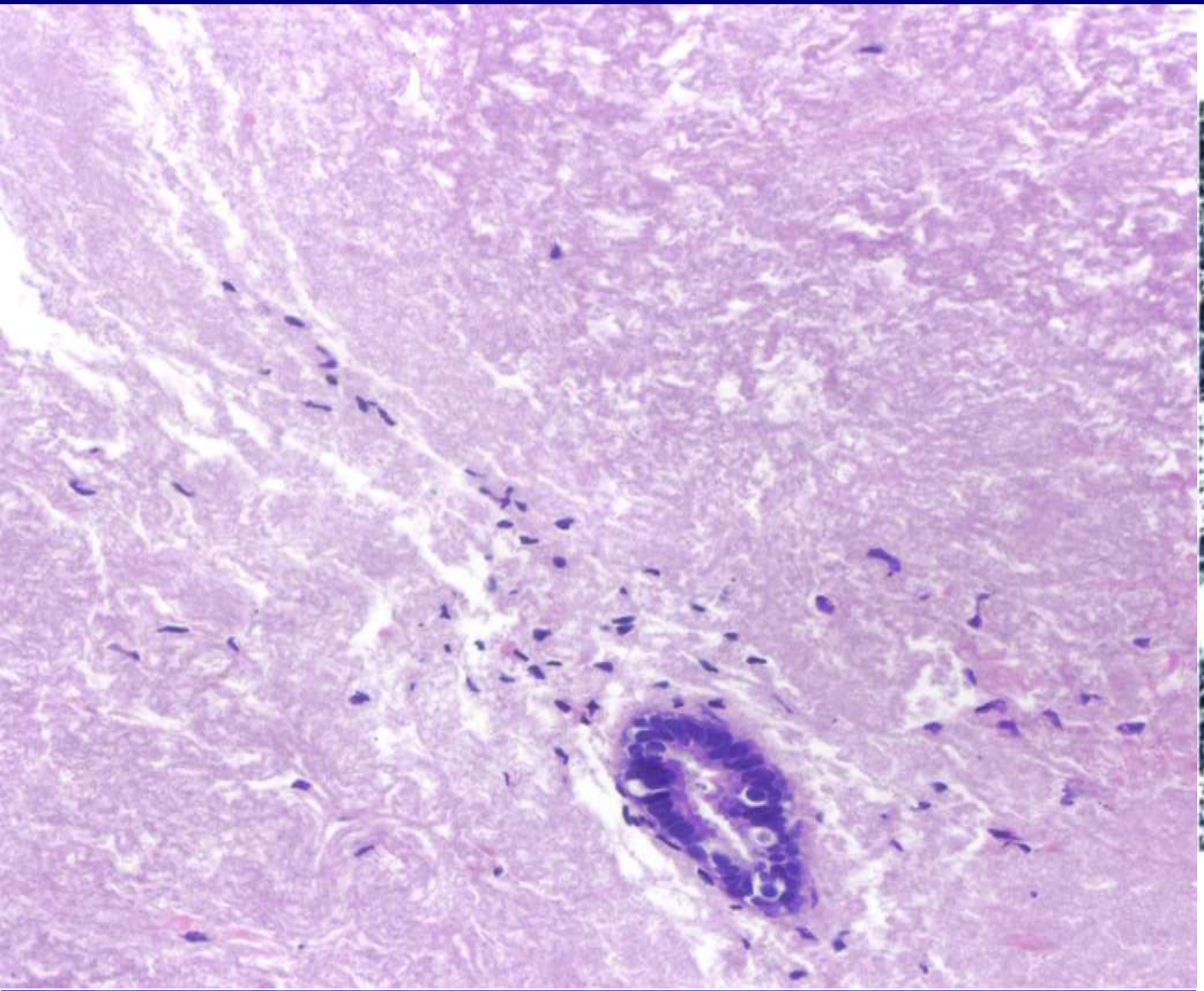
Cytologic atypia

Hyperplasia

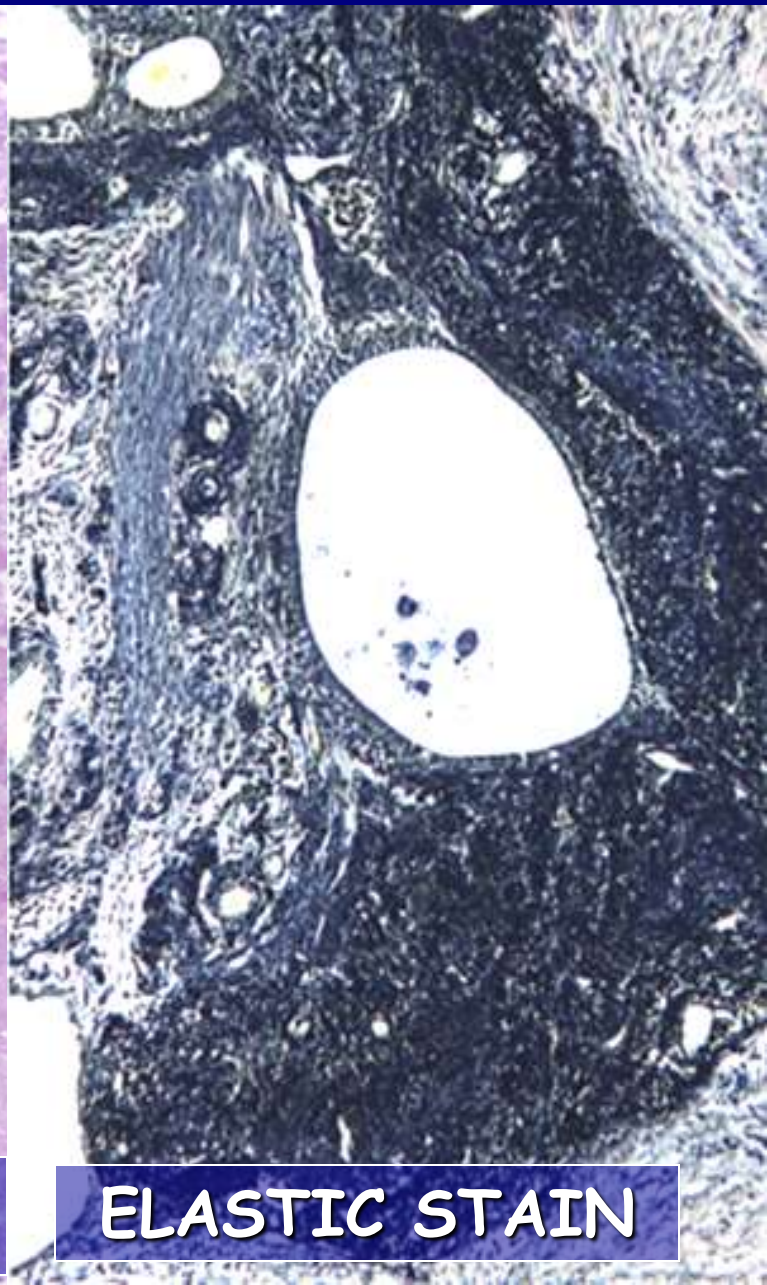
OTHER HISTOLOGIC FINDINS ASSOCIATED WITH ENDOMETRIOSIS

- Liesegang rings
- Calcification and ossification
- Association with leiomyomatosis peritonealis diffusa, peritoneal glial implants and splenic nodules
- Mesothelial hyperplasia
- Multiloculated peritoneal inclusion cysts
- Blood vessel and perineural invasion
- Premalignant and malignant transformation

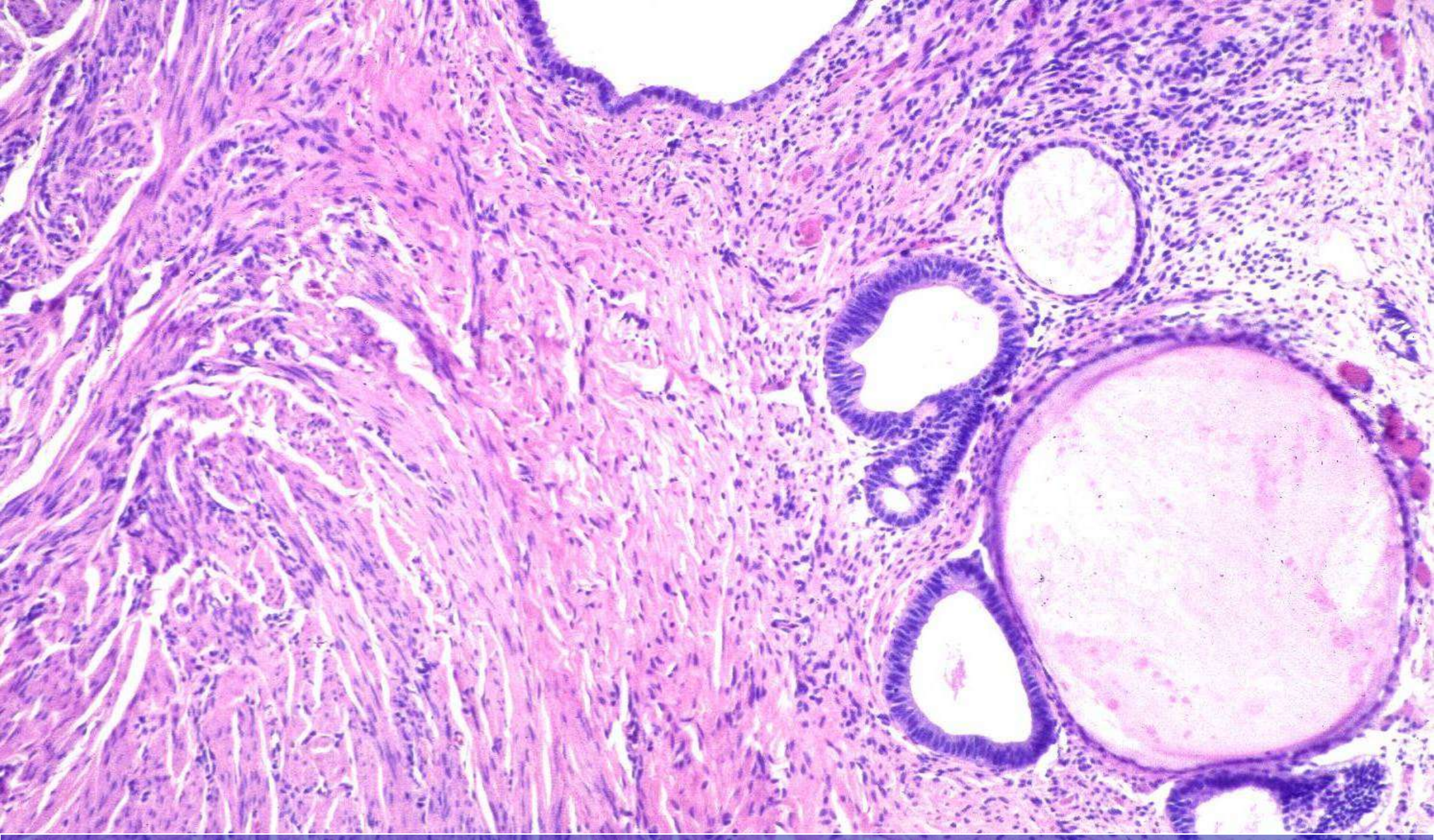
ELASTOSIS IN ATROPHIC ENDOMETRIOSIS



May cause concern for desmoplastic stroma

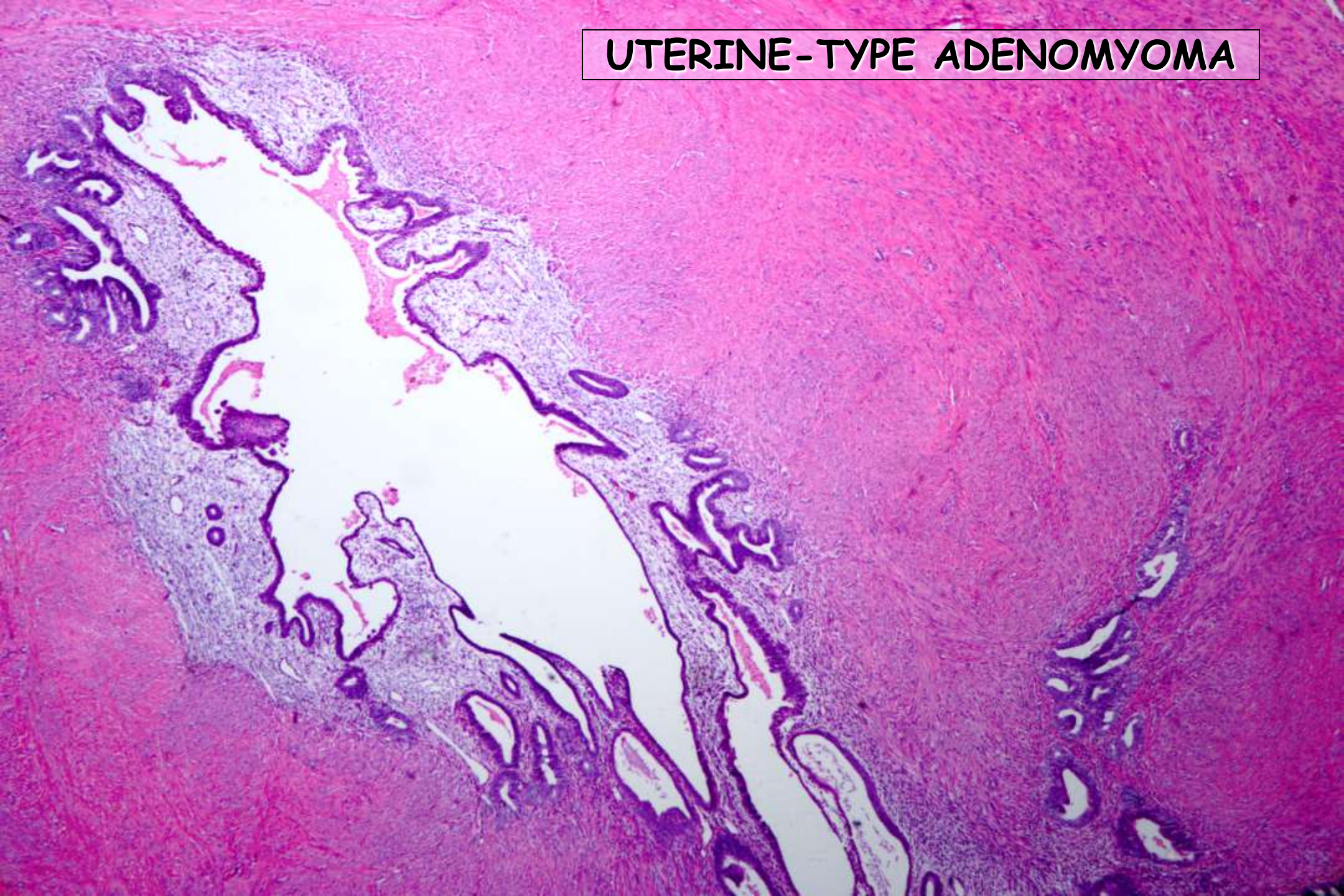


ELASTIC STAIN

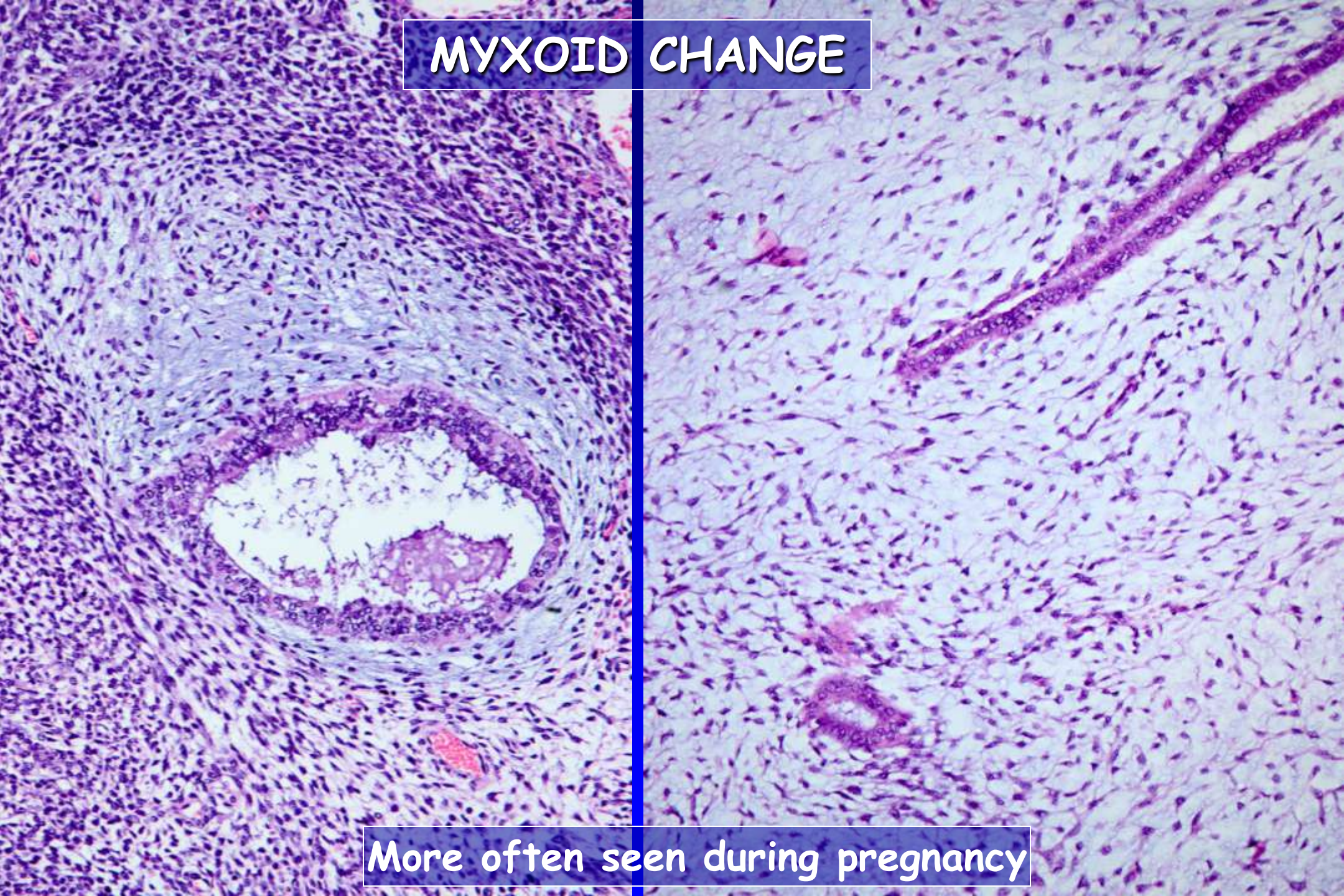


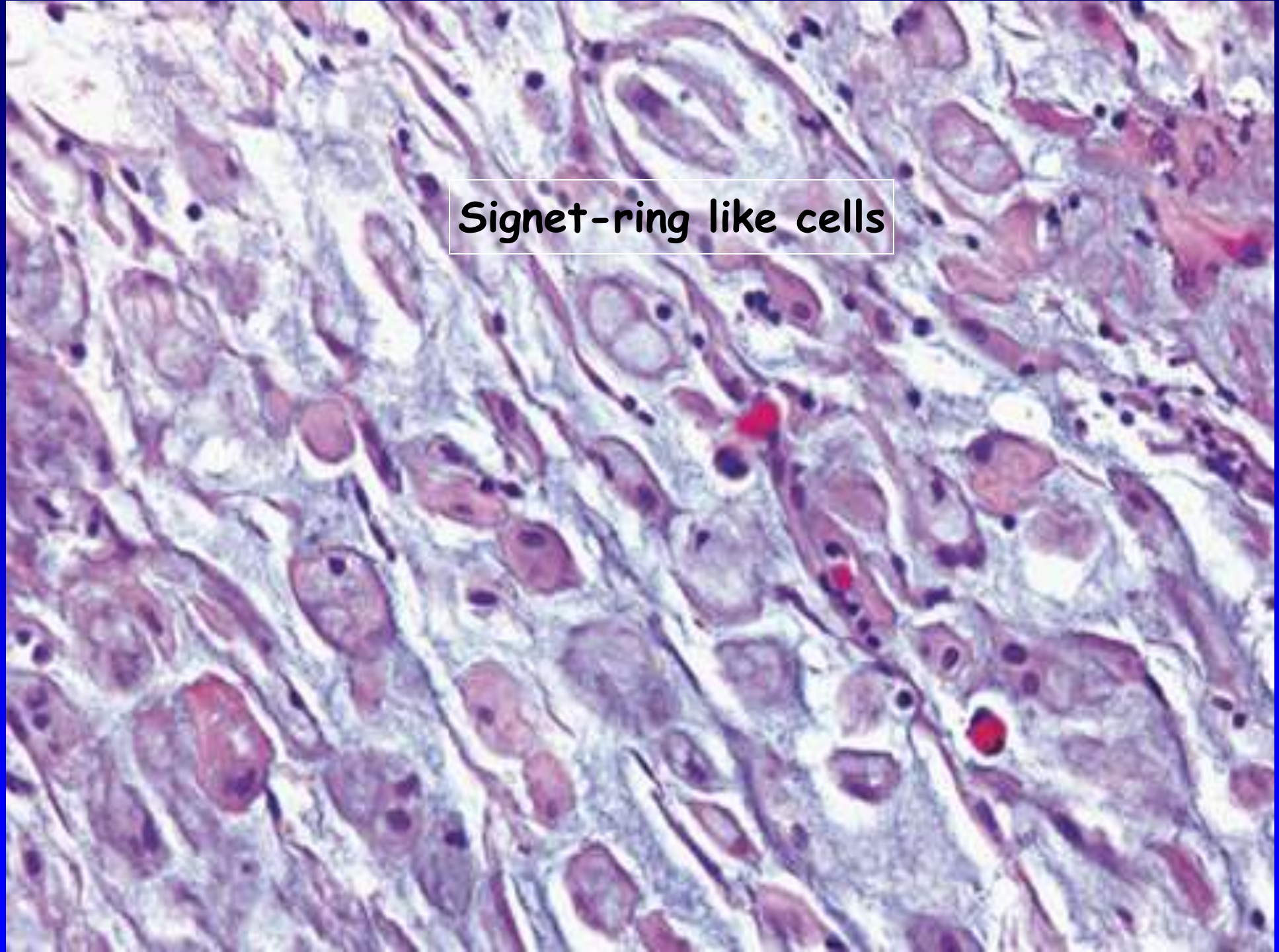
SMOOTH MUSCLE METAPLASIA: if extensive may raise possibility of uterus-like mass or adenomyoma

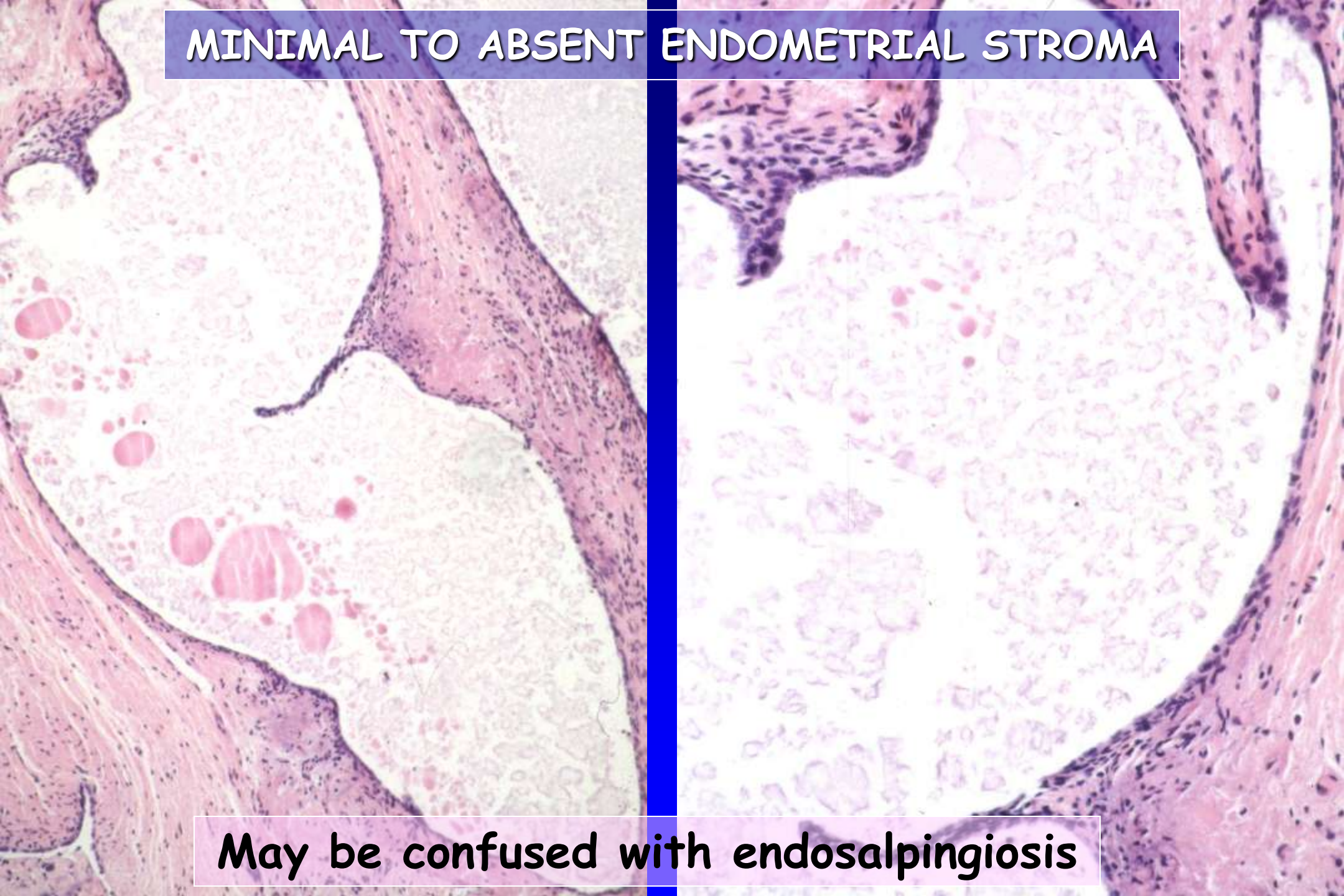
UTERINE-TYPE ADENOMYOMA



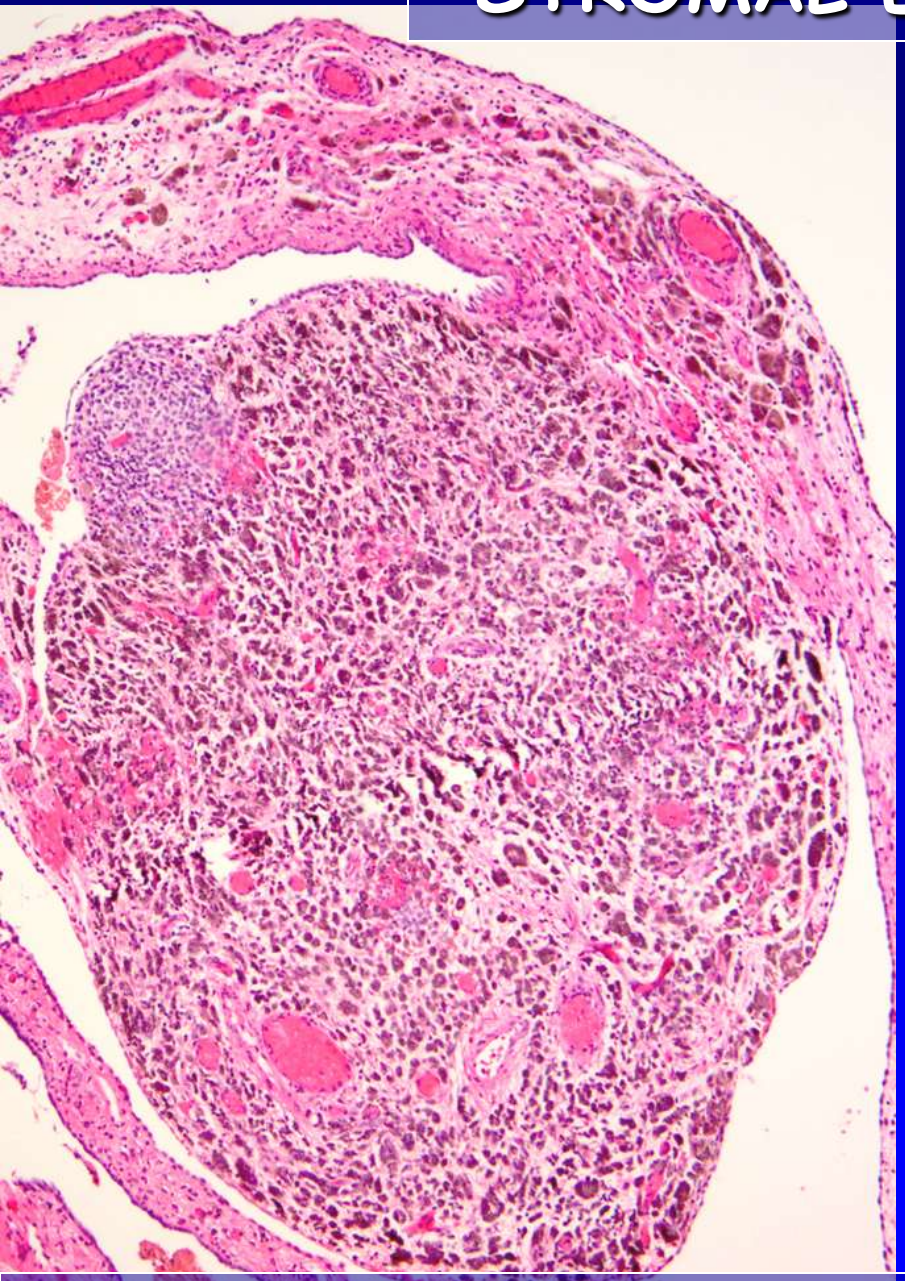
UTERINE-TYPE ADENOMYOMA

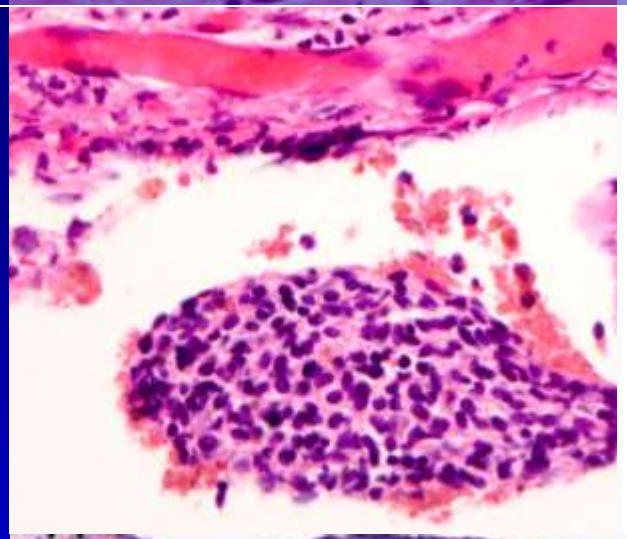

MYXOID CHANGE
More often seen during pregnancy

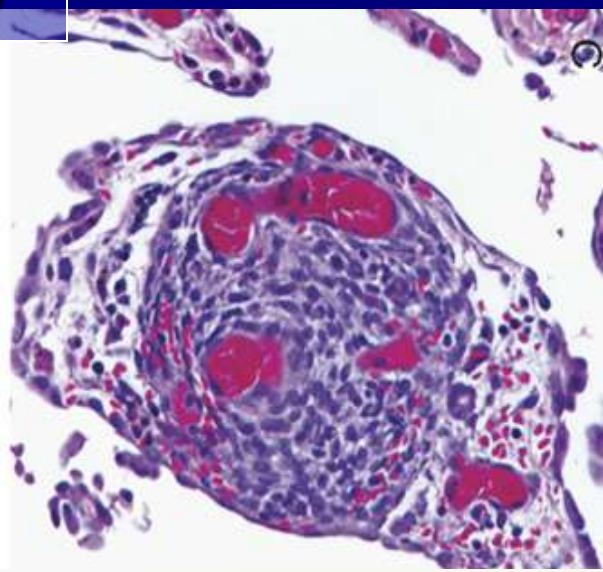

Signet-ring like cells

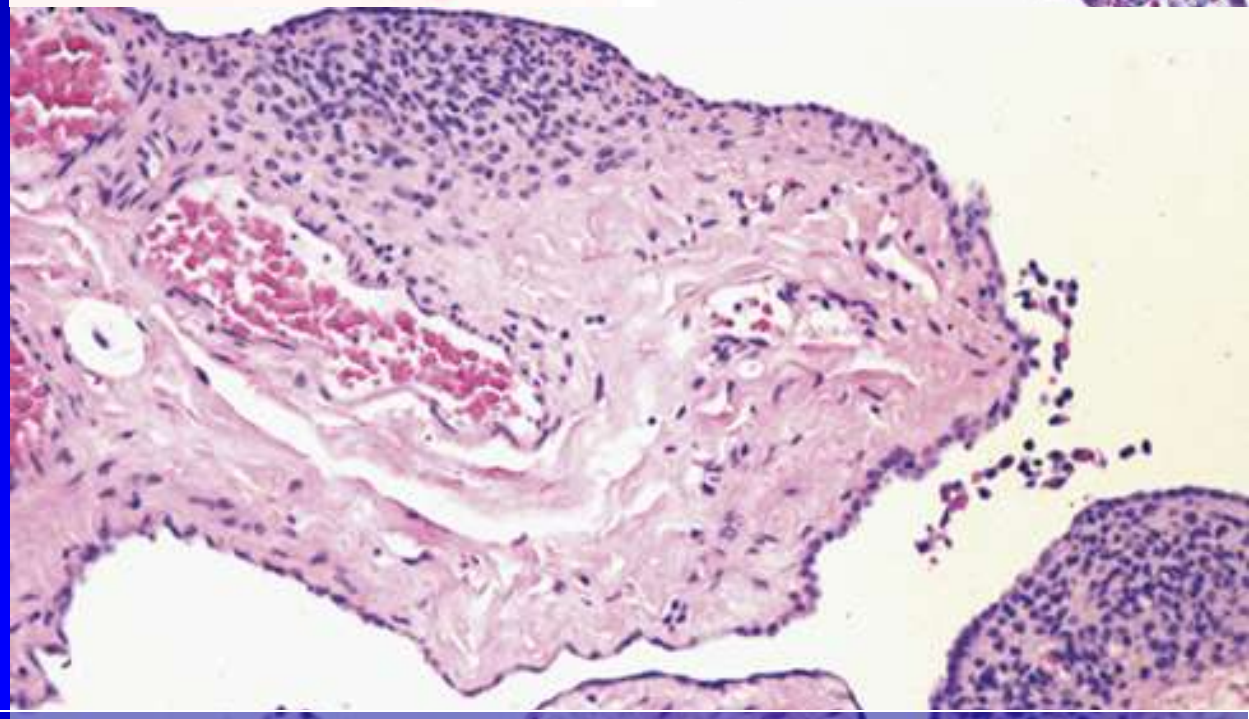

MINIMAL TO ABSENT ENDOMETRIAL STROMA
May be confused with endosalpingiosis

STROMAL ENDOMETRIOSIS

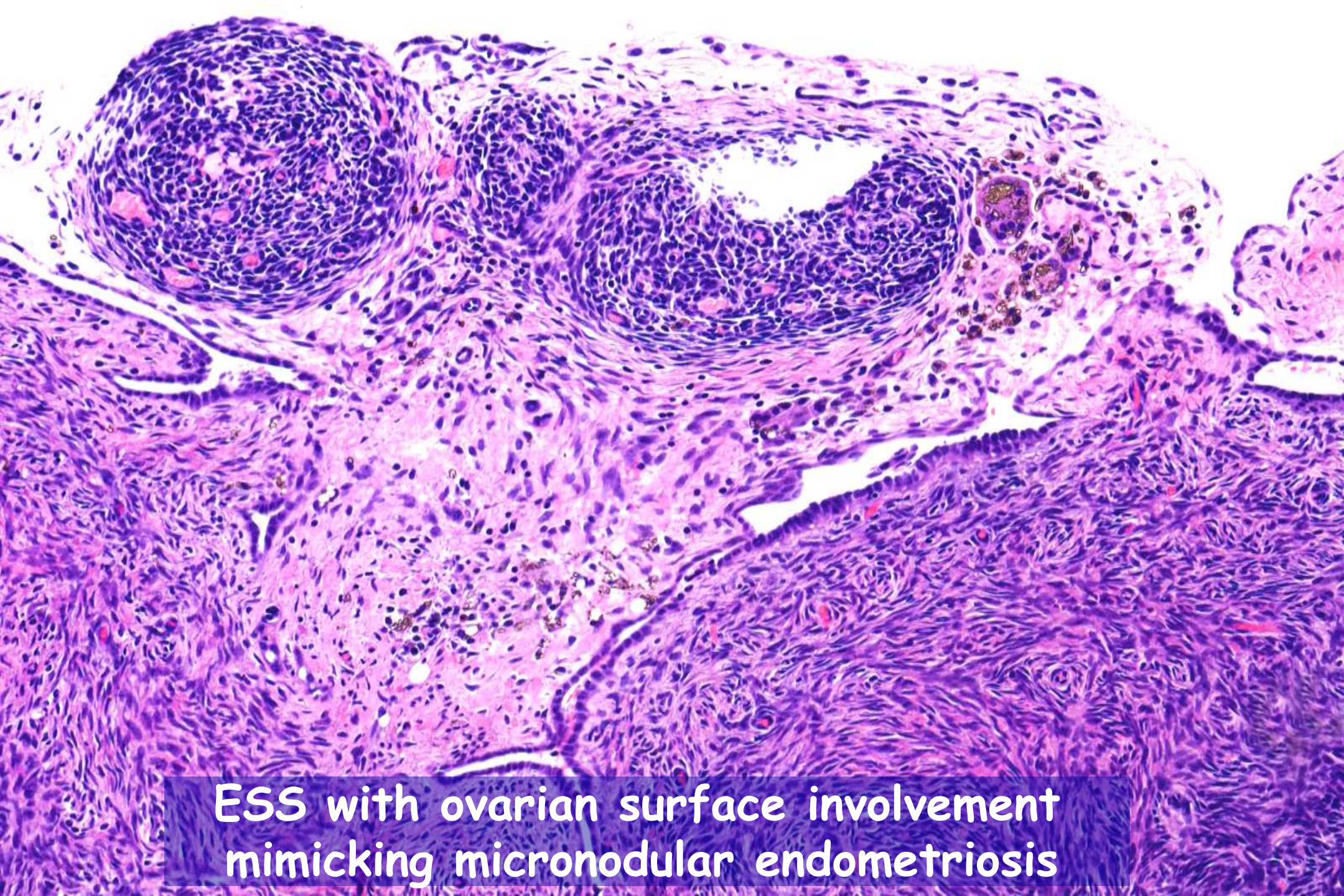






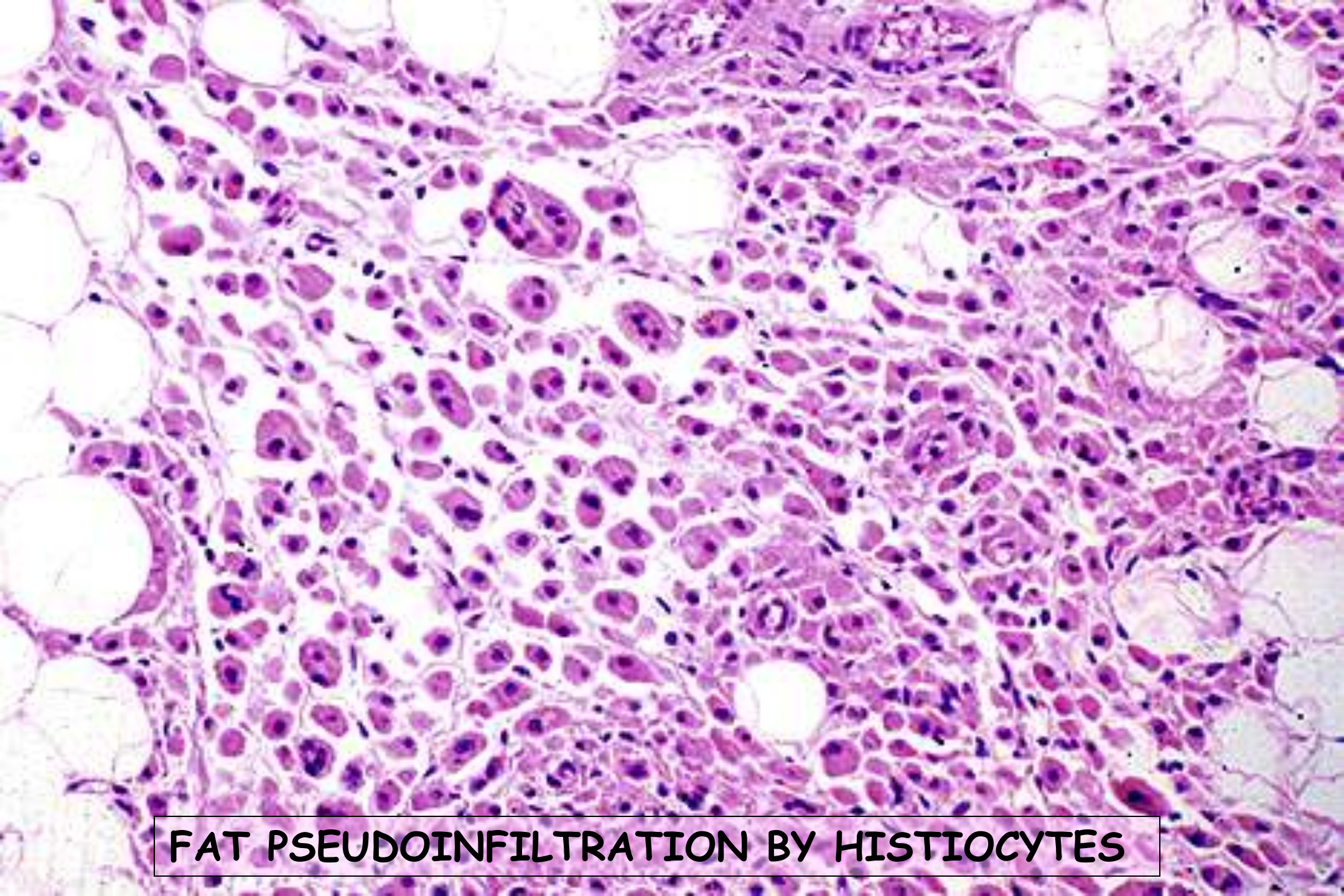


Confused with low-grade endometrial stromal sarcoma especially in small biopsies


ESS with ovarian surface involvement
mimicking micronodular endometriosis

STROMAL ENDOMETRIOSIS

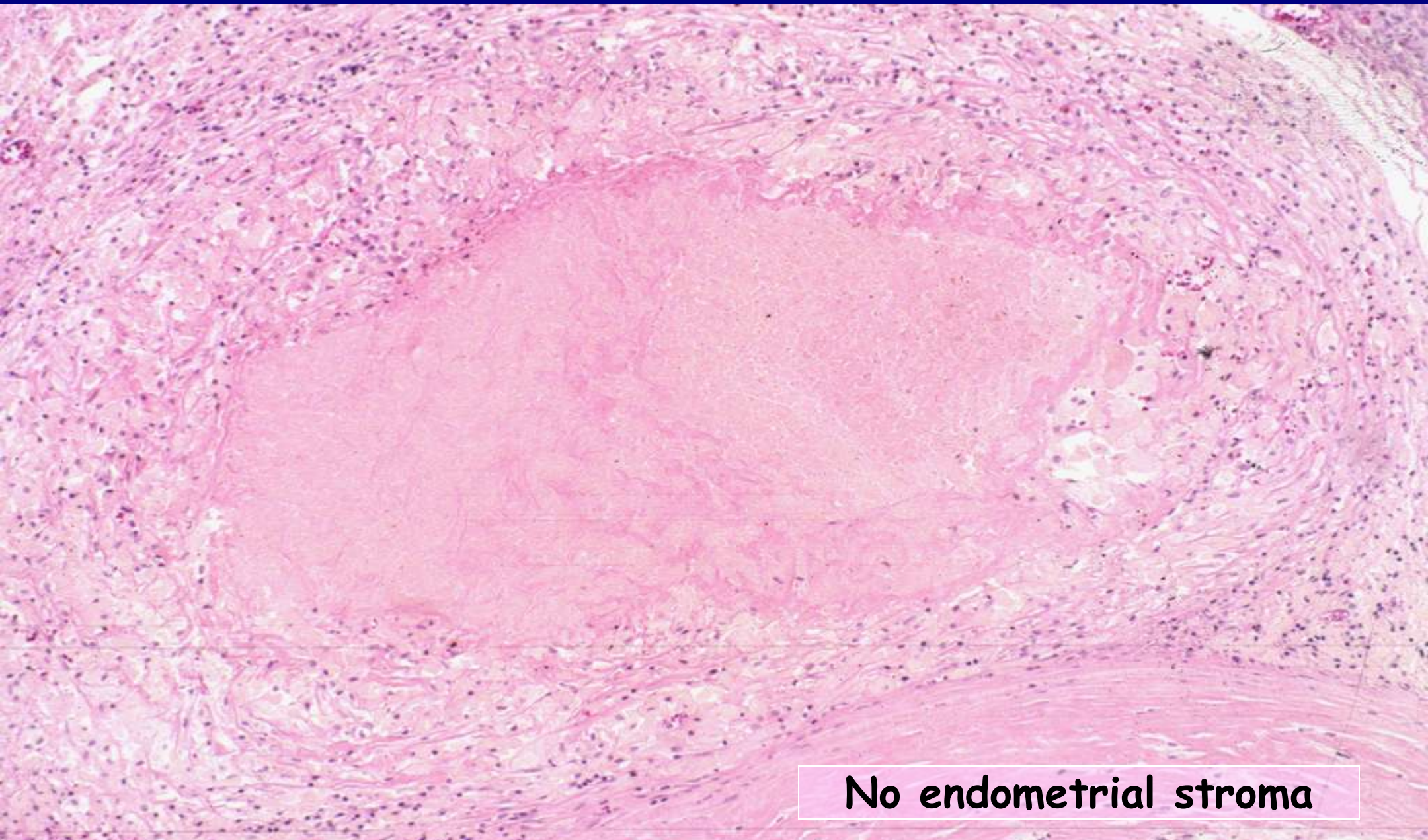
- Typically found in peritoneal surfaces, omentum, ovary, and cervix
- Frequently accompanied by characteristic arterioles, foci of hemorrhage, and/or pigmented histiocytes
- May be confused with endometrial stromal sarcoma, lymphoid infiltrate or even a “small blue cell tumor”
- Deeper sections may show endometrial glands and CD10 positivity will support the endometrial stromal nature of the proliferation



FAT PSEUDOINFILTRATION BY HISTIOCYTES

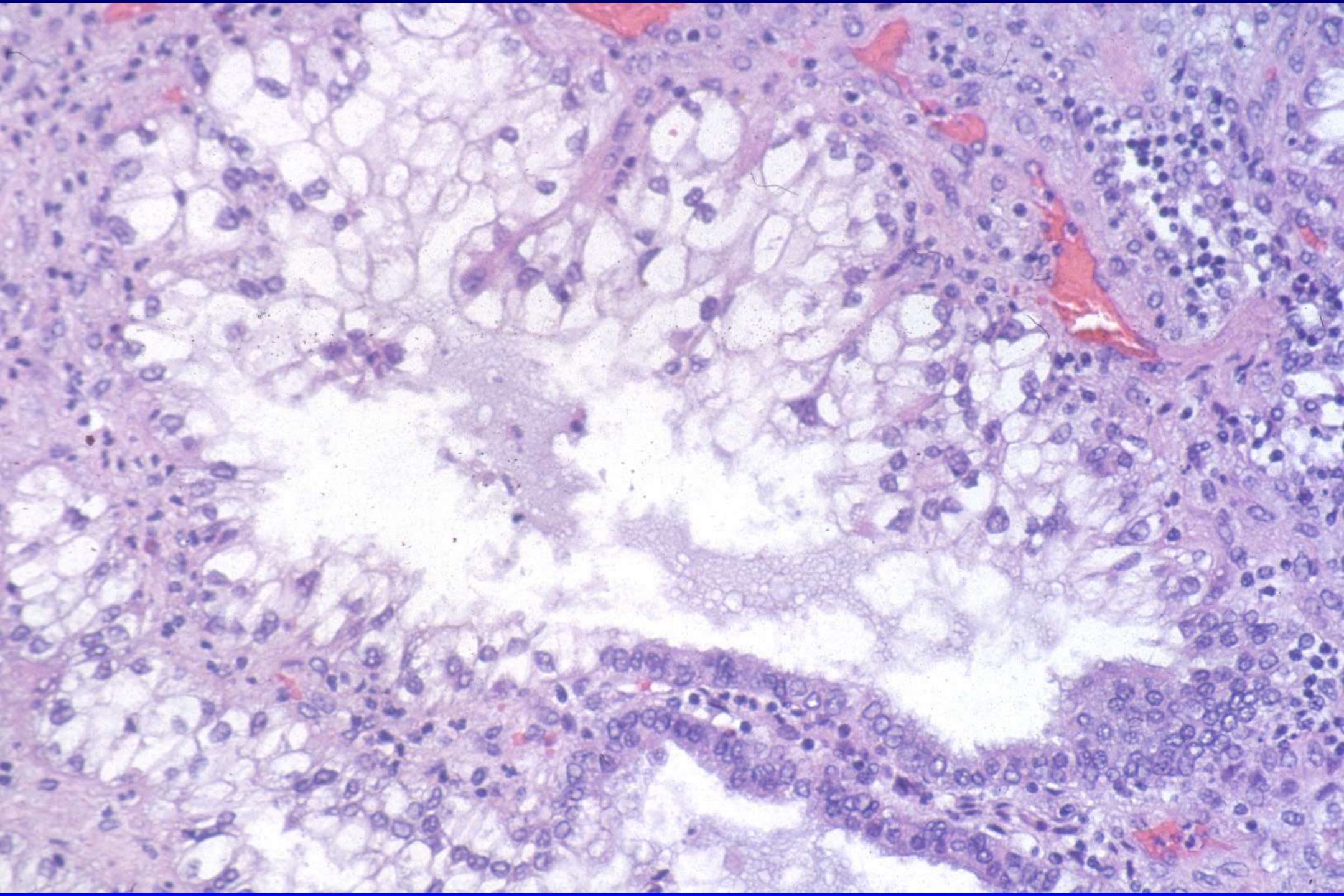
NECROTIC PSEUDOXANTHOMATOUS NODULES

NECROTIC PSEUDOXANTHOMATOUS NODULES

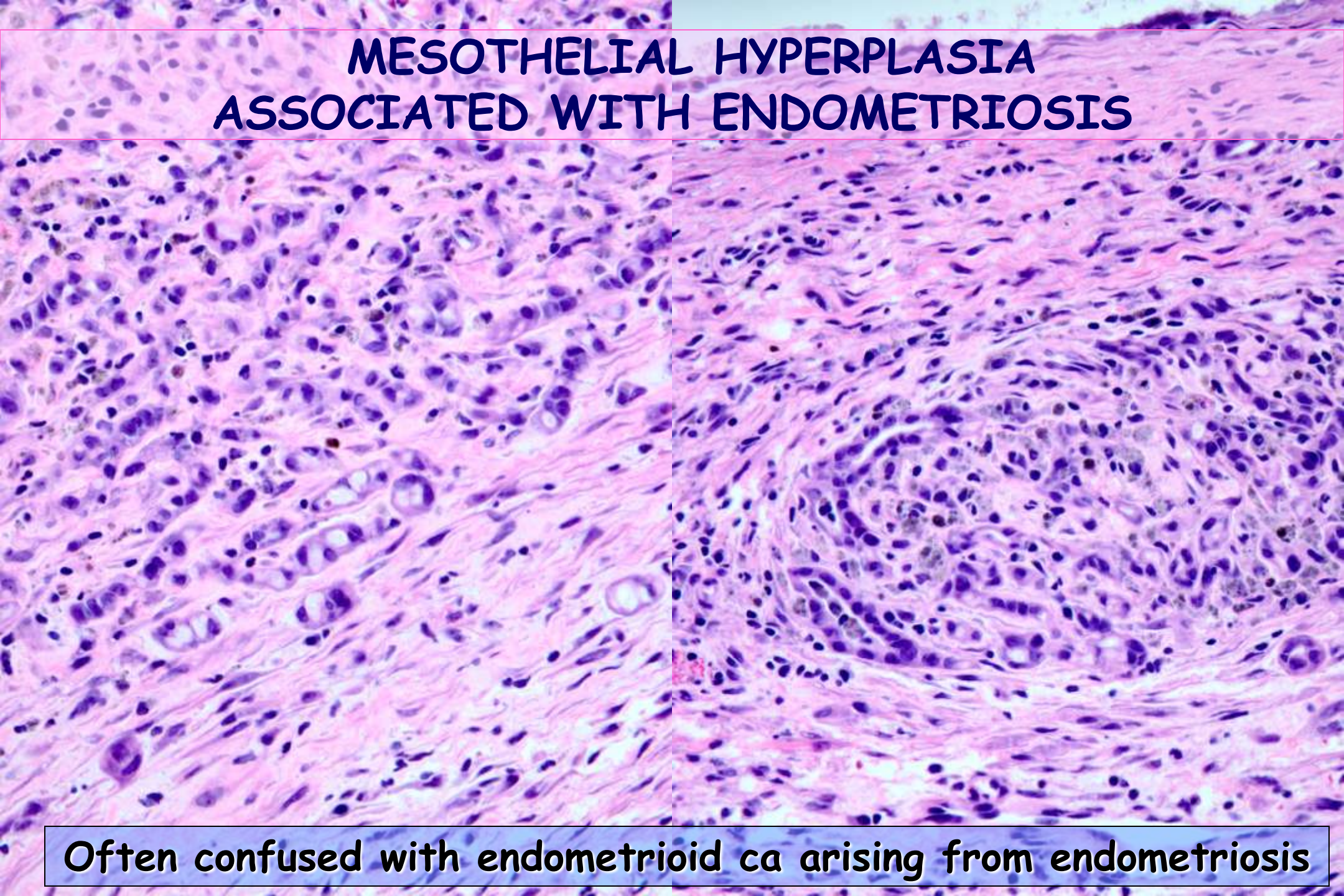


NECROTIC PSEUDOXANTHOMATOUS NODULES

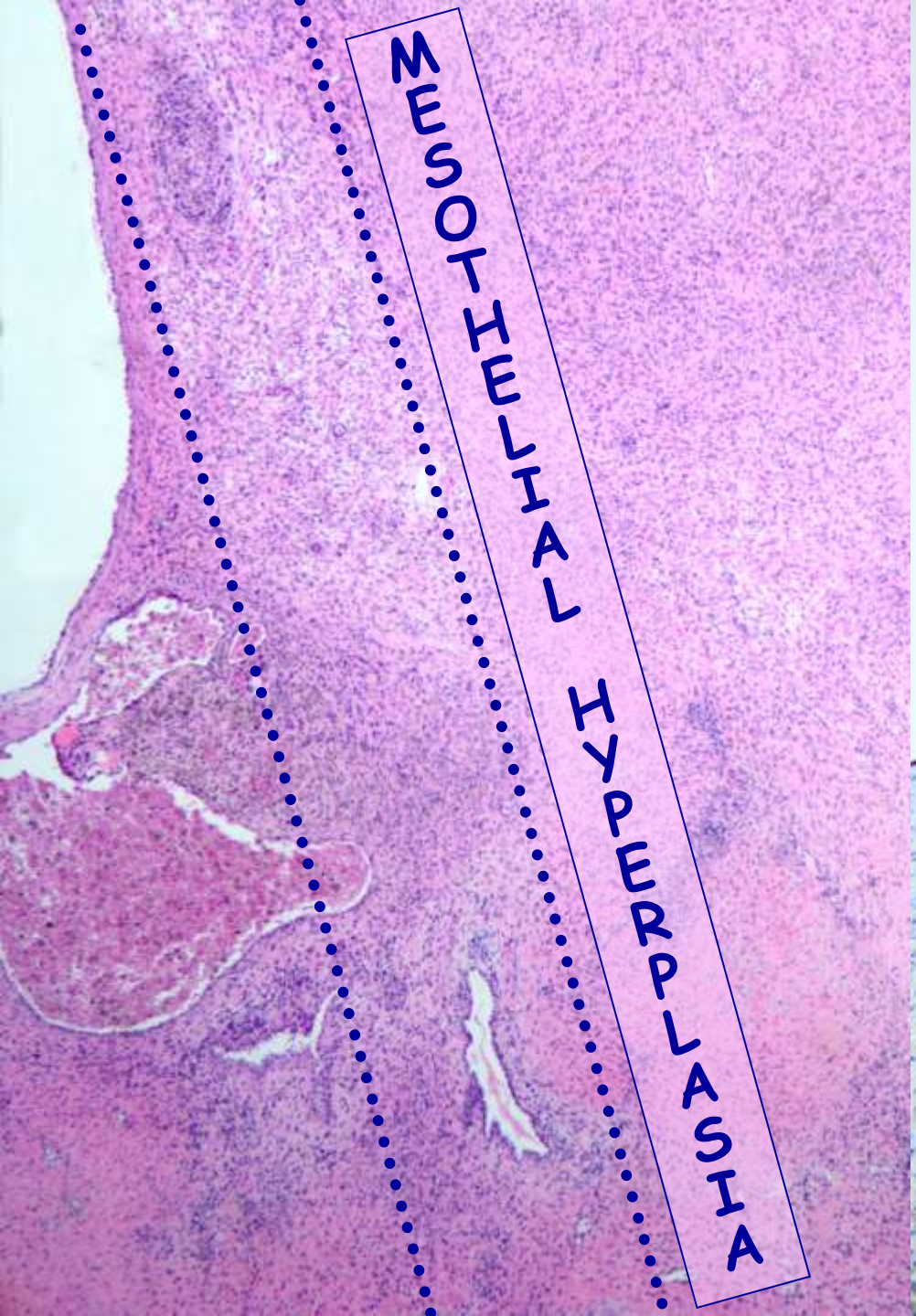
- Older women when compared to majority of patients with endometriosis (> 55 years)
- May mimic “carcinomatosis” or metastatic melanoma at the time of surgery
- Differential diagnosis: granulomas infectious or non-infectious origin or infarcted appendix epiploica

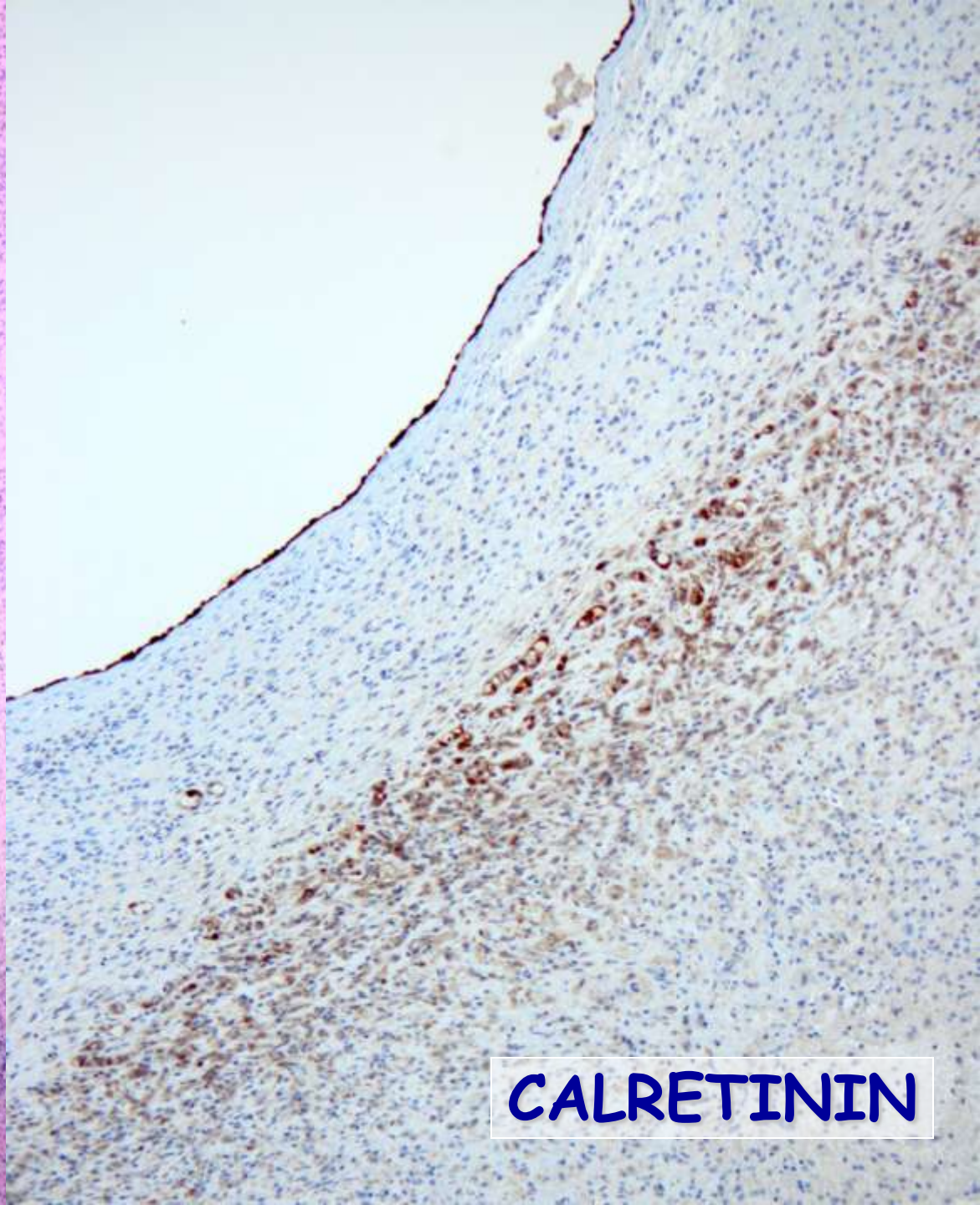


MESOTHELIAL HYPERPLASIA ASSOCIATED WITH ENDOMETRIOSIS



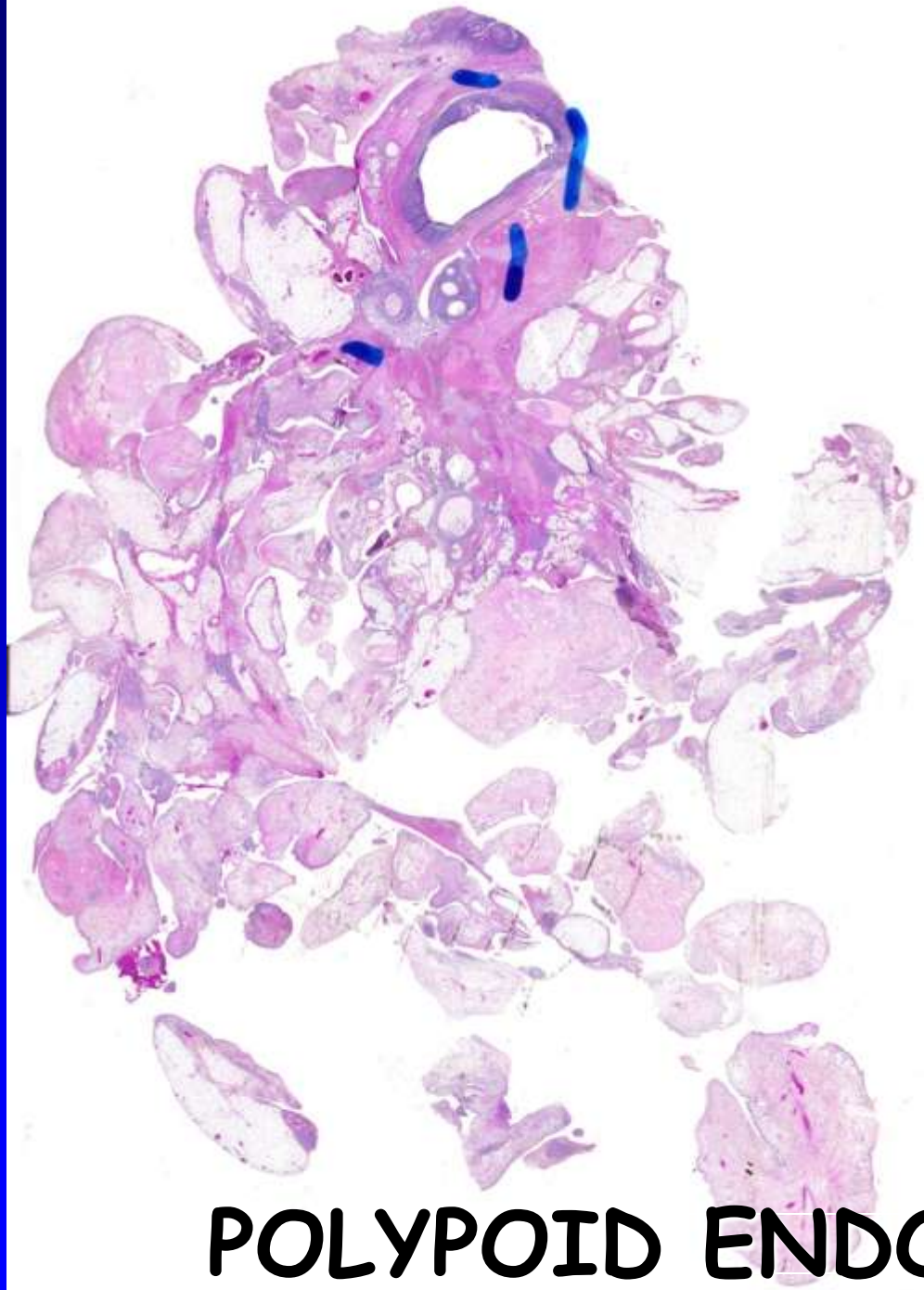
Often confused with endometrioid ca arising from endometriosis


MESOTHELIAL HYPERPLASIA

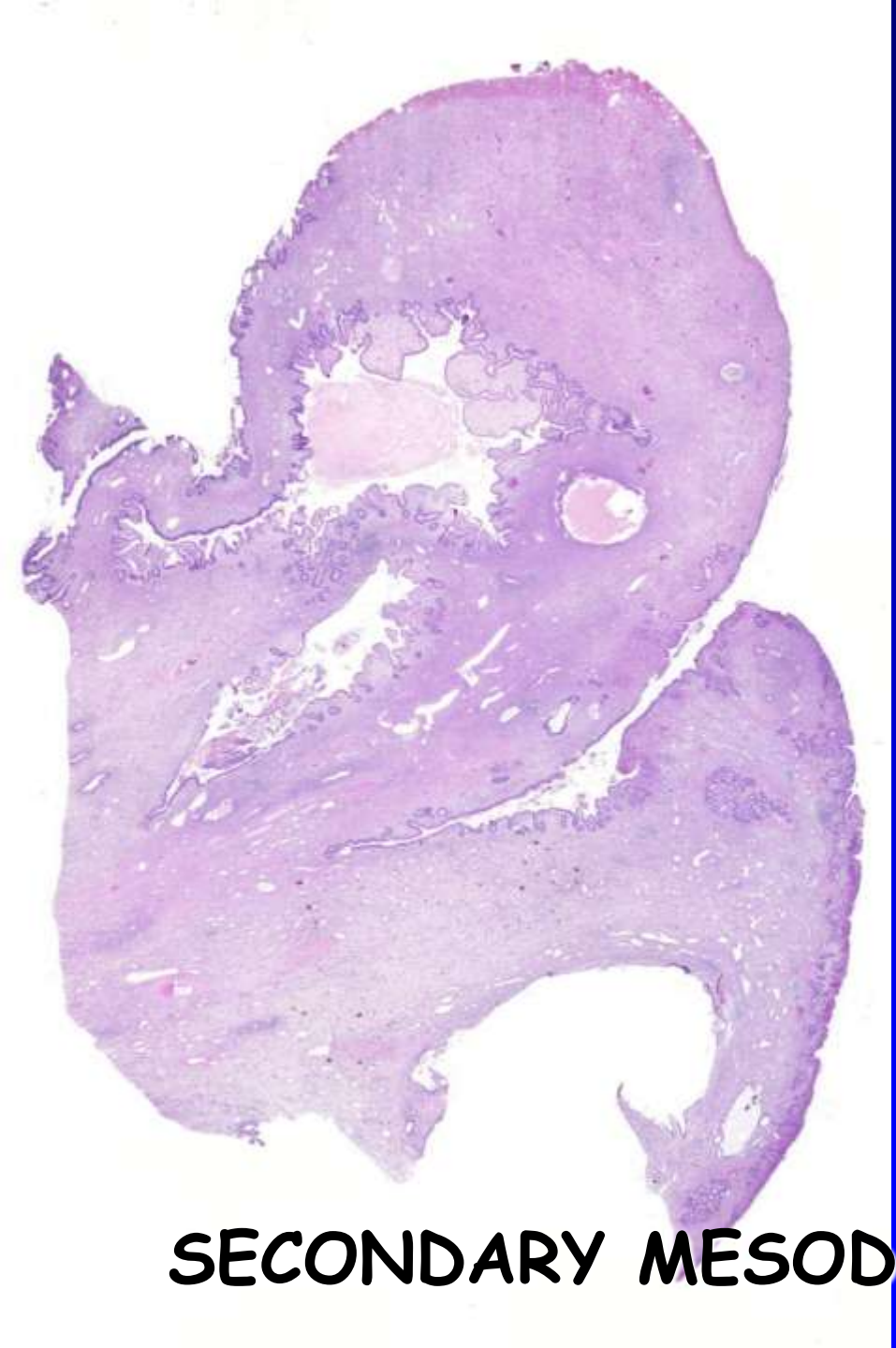

CALRETININ

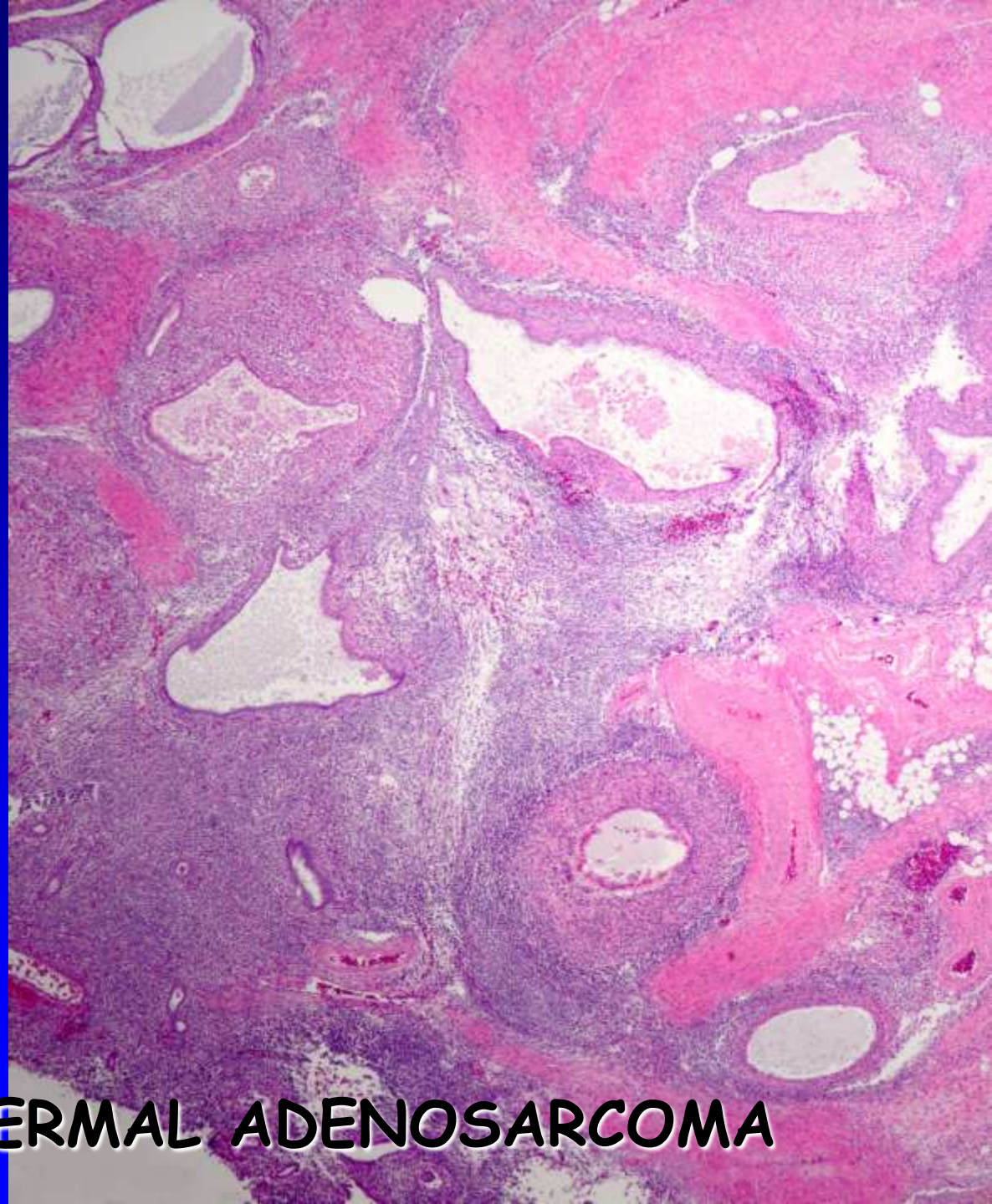
MALIGNANT TRANSFORMATION IN ENDOMETRIOSIS

- Approximately 75% of tumors arising from endometriosis originate in the ovary, followed by the rectovaginal septum
- Affects ~ 1% of women with ovarian endometriosis
- The most common malignancy is endometrioid adenocarcinoma, followed by clear cell carcinoma
- Other tumors include serous cystadenoma, mucinous tumors, squamous cell carcinoma, endometrioid stromal sarcoma, mesodermal adenosarcoma and malignant mixed mesodermal tumor

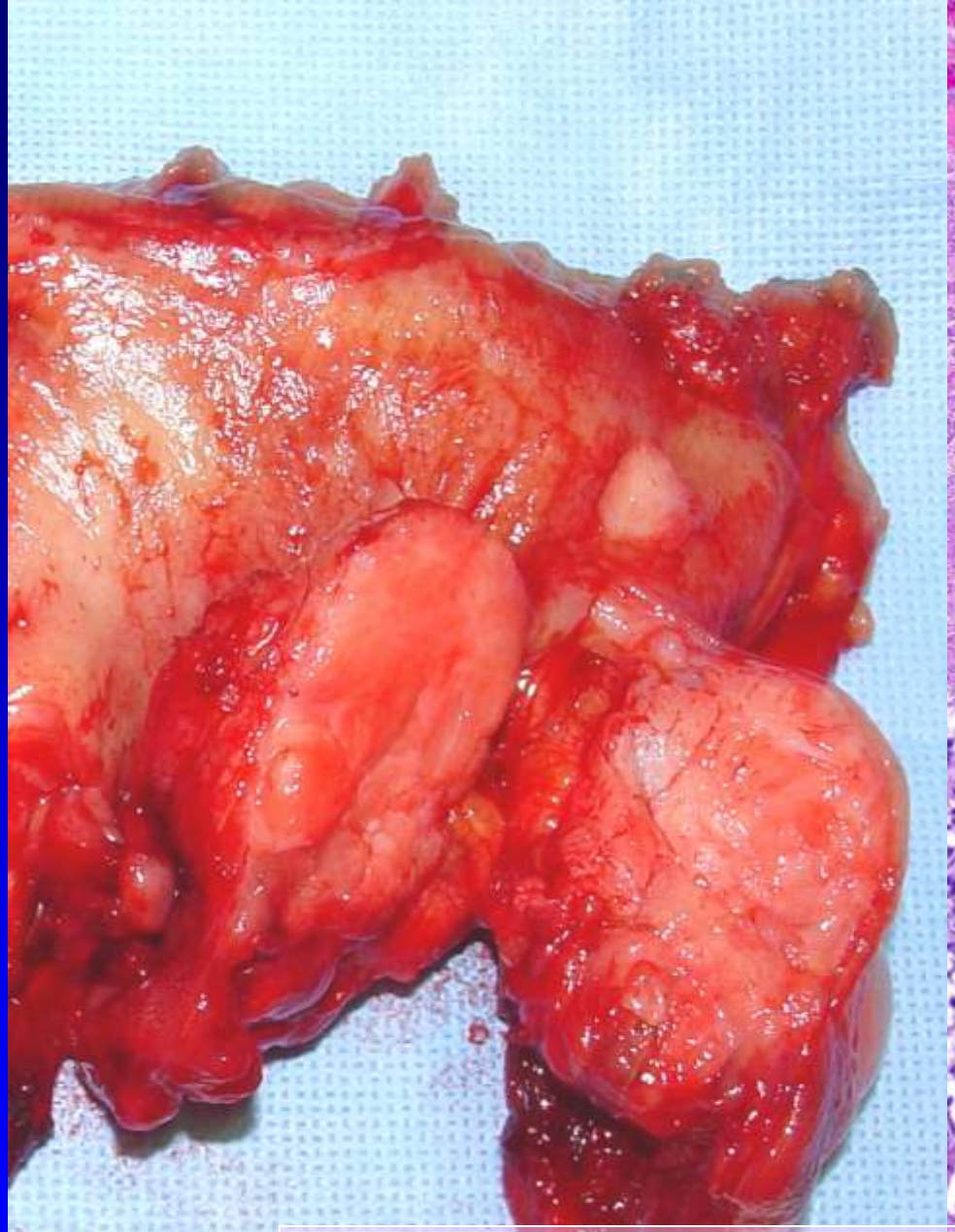


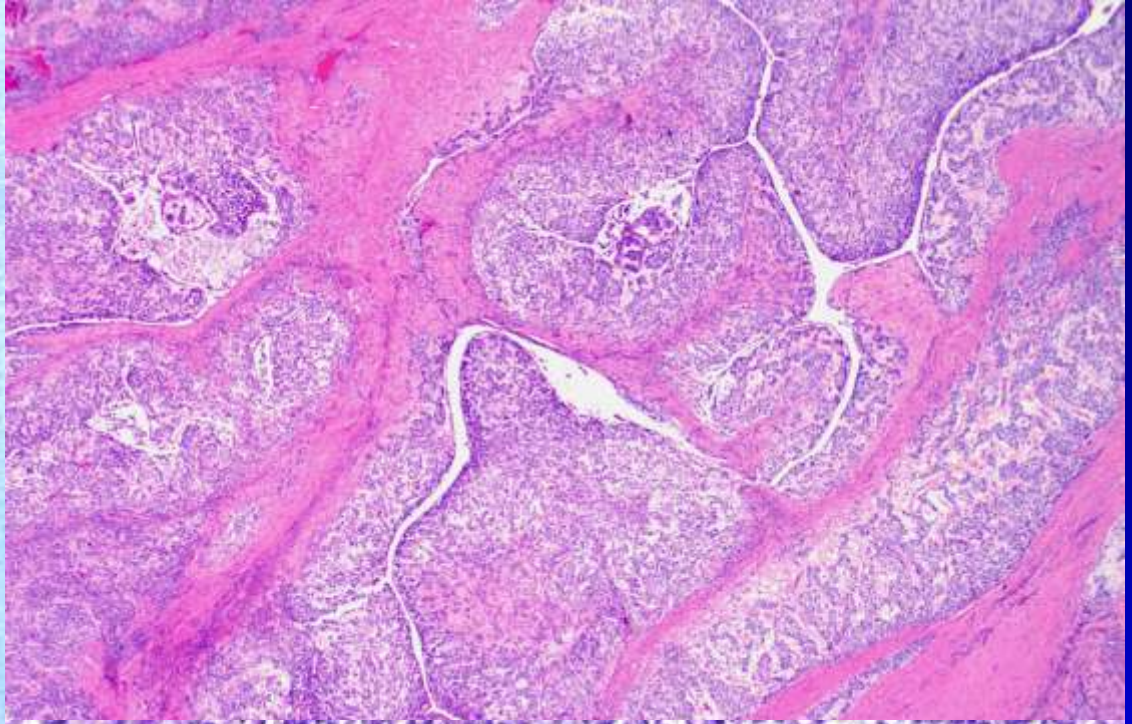
POLYPOID ENDOMETRIOSIS with….

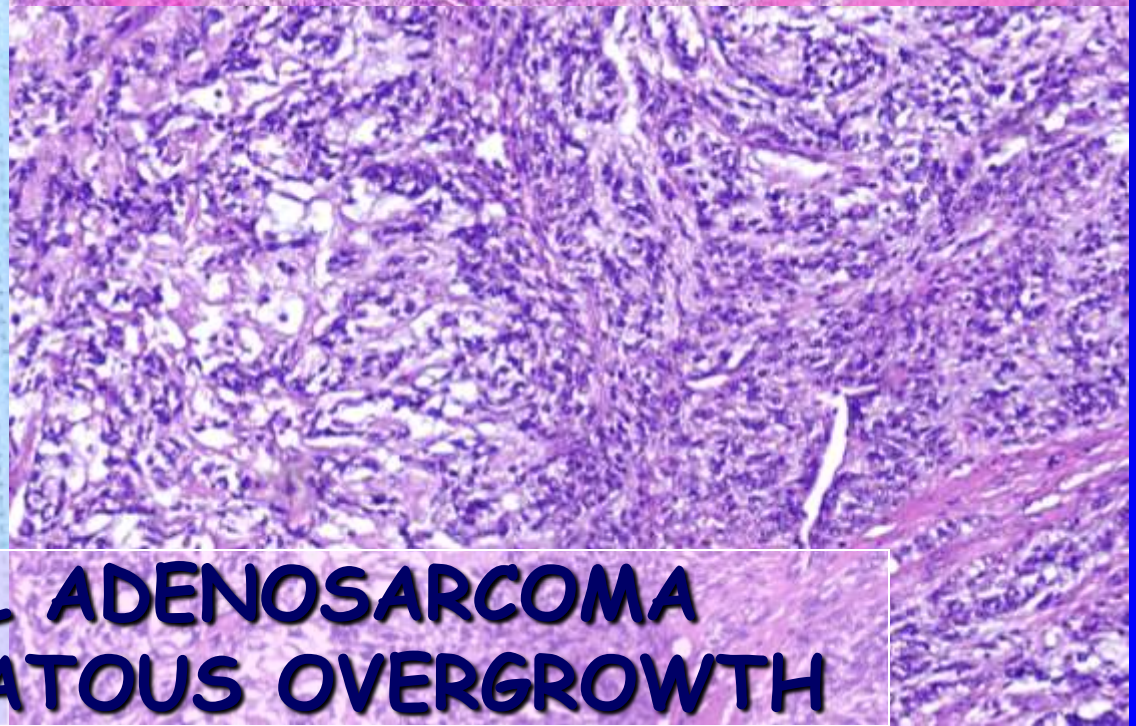




SECONDARY MESODERMAL ADENOSARCOMA







MESODERMAL ADENOSARCOMA WITH SARCOMATOUS OVERGROWTH

ENDOMETRIOSIS:

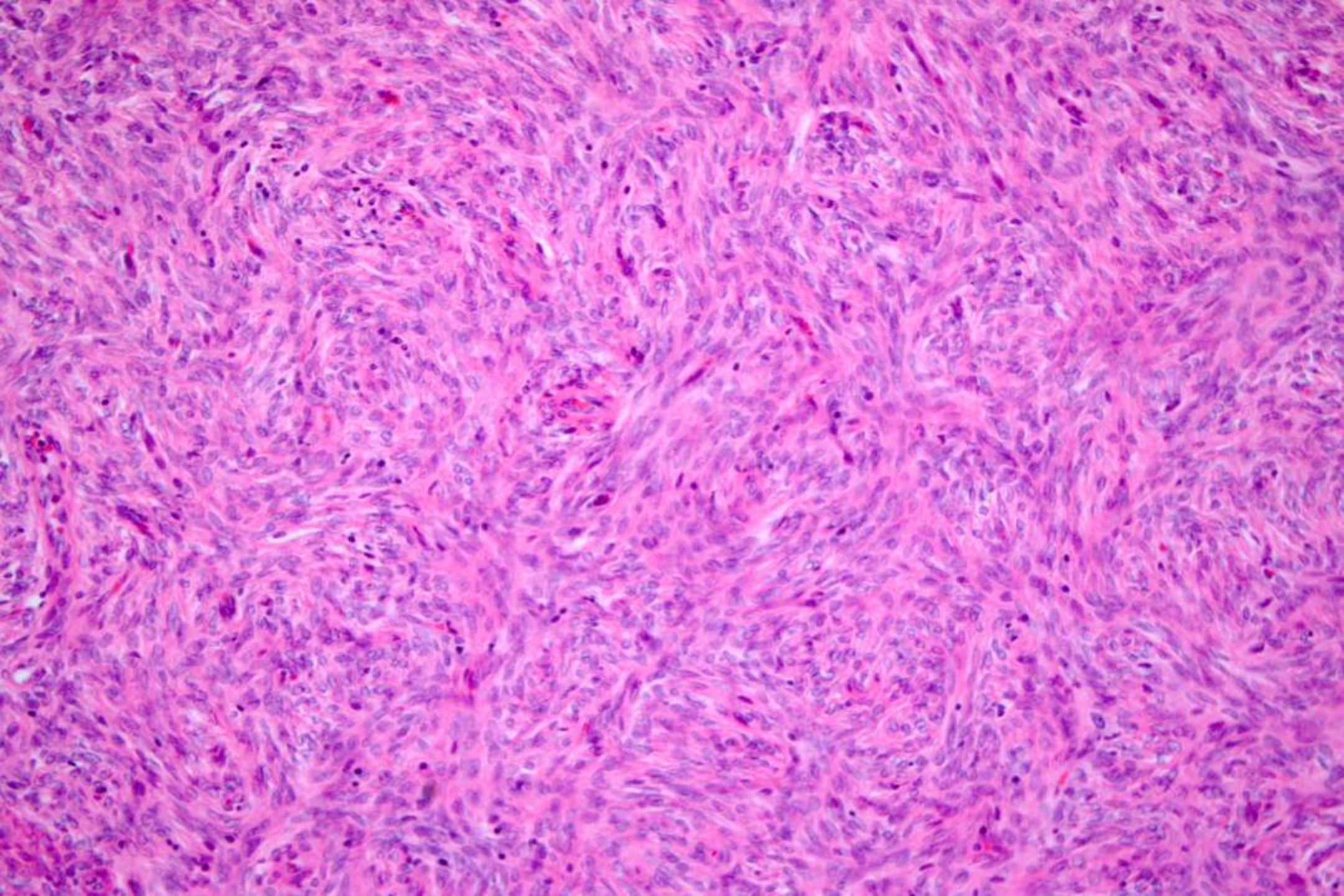
- **Typical endometriosis does not pose diagnostic problems**
- **Myxoid change and elastosis are helpful clues in the diagnosis of atrophic endometriosis**
- **Although unusual forms of endometriosis are uncommon it is important to recognize them**
- **When studying a pelvic/peritoneal tumor is important to keep in mind the possibility of endometriosis or endometriosis-related neoplasm in the differential diagnosis**

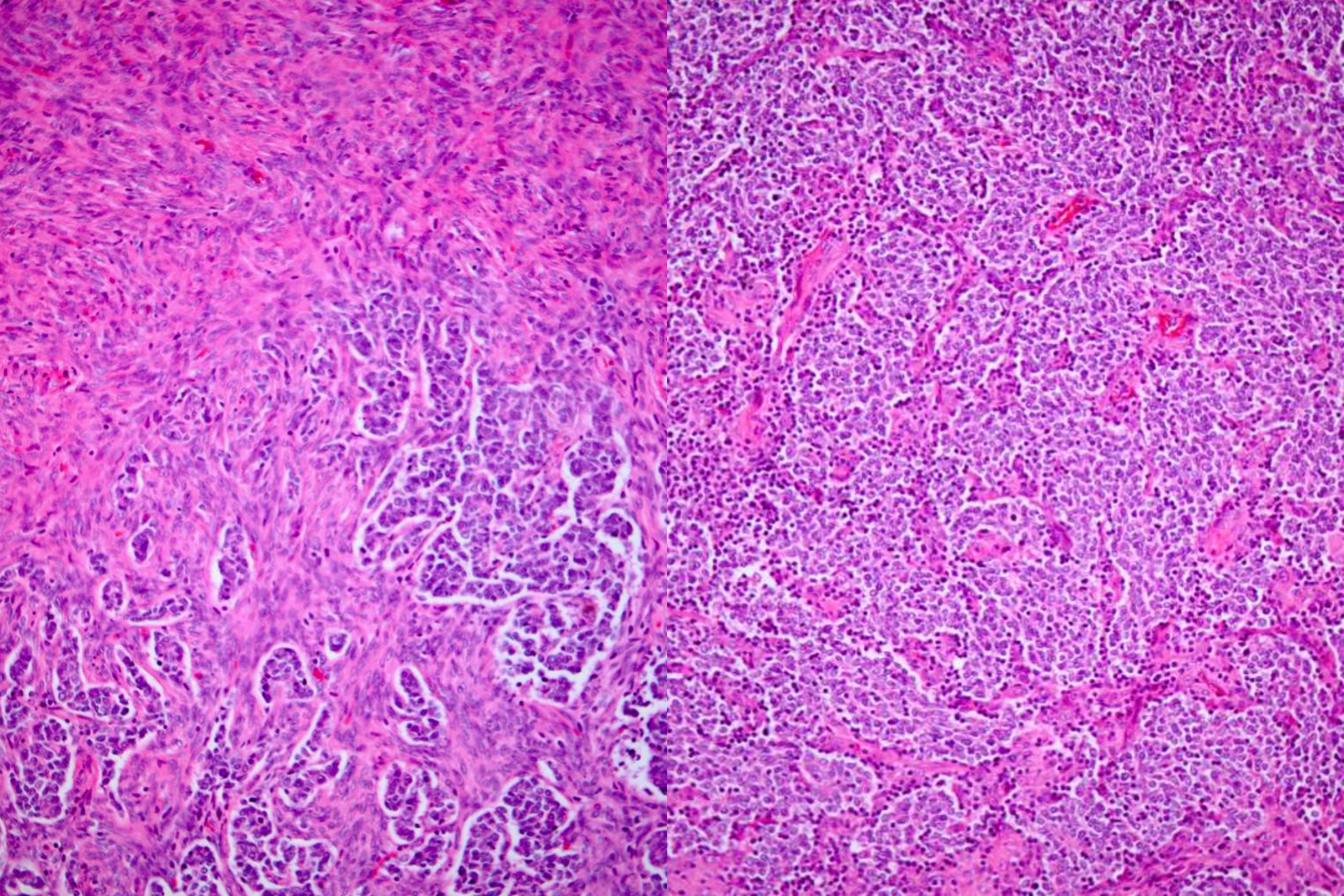
CLINICAL HISTORY

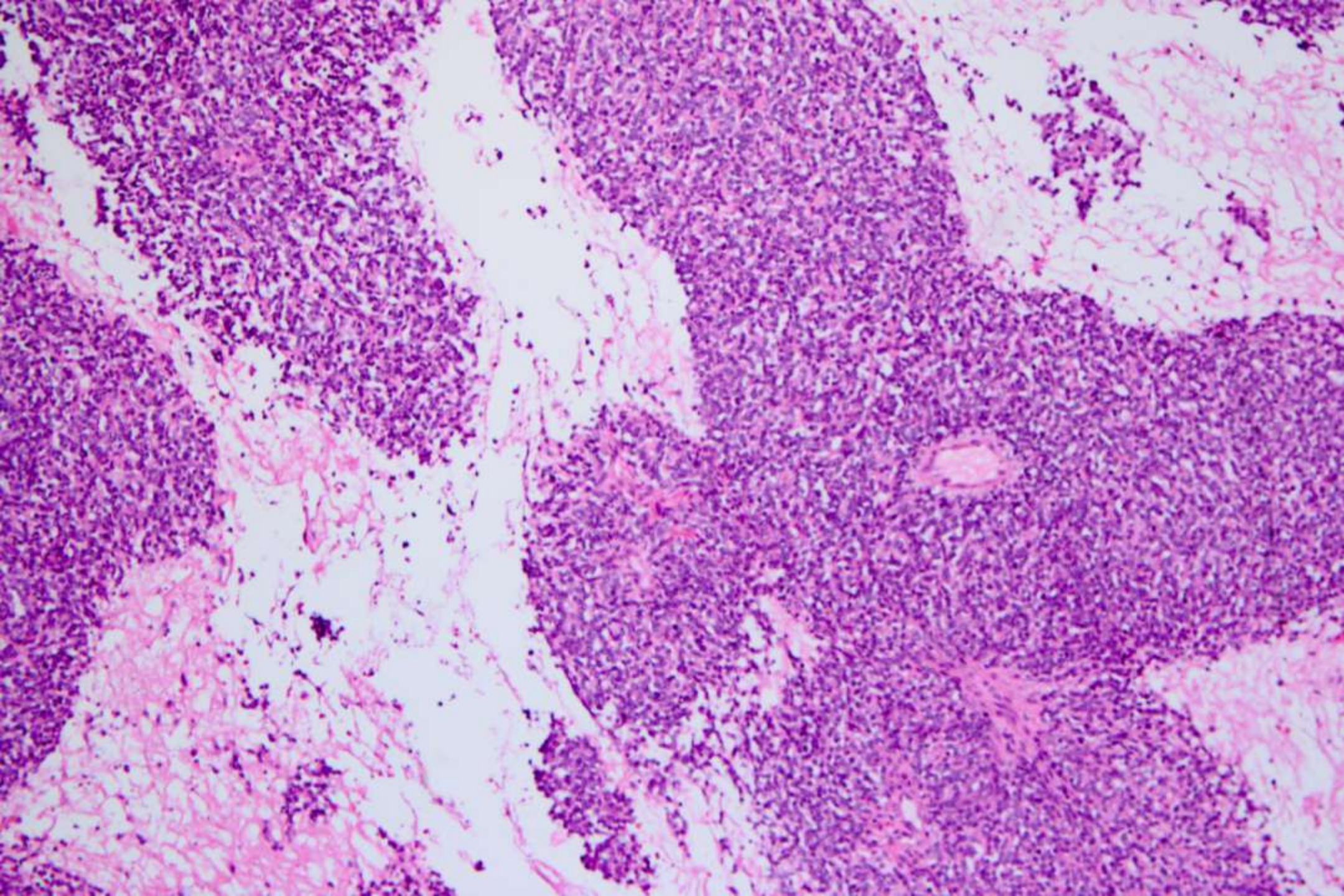
56 year old woman with increasing abdominal girth was found to have a large pelvic mass on physical exam and a marginally elevated CA125. On CT-scan a 28 x 22 x 19 cm heterogeneous mass was seen replacing most of the middle lower abdomen.

She underwent total abdominal hysterectomy with bilateral adnexectomy and resection of abdominal mass attached to a thin stalk from the rectovaginal septae.

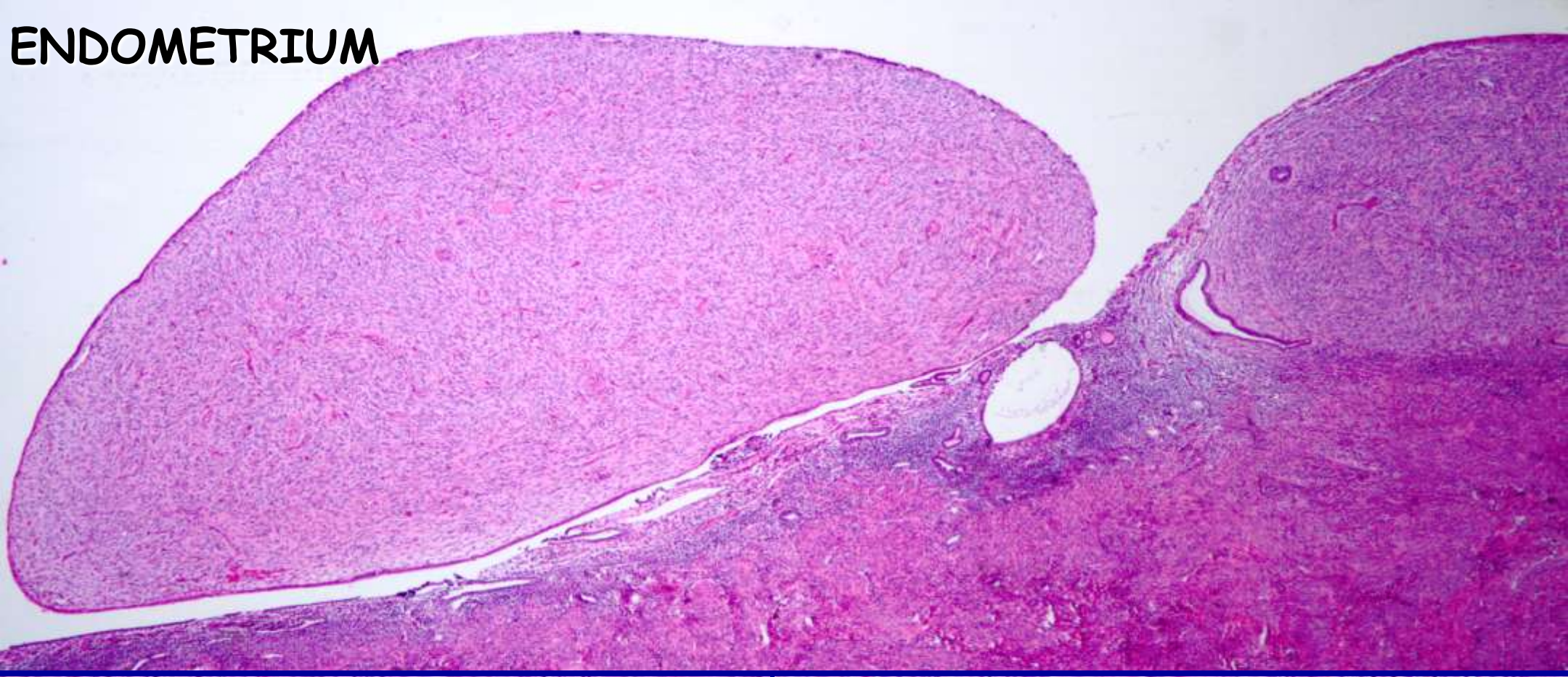

Mass General Hospital Pathology Department

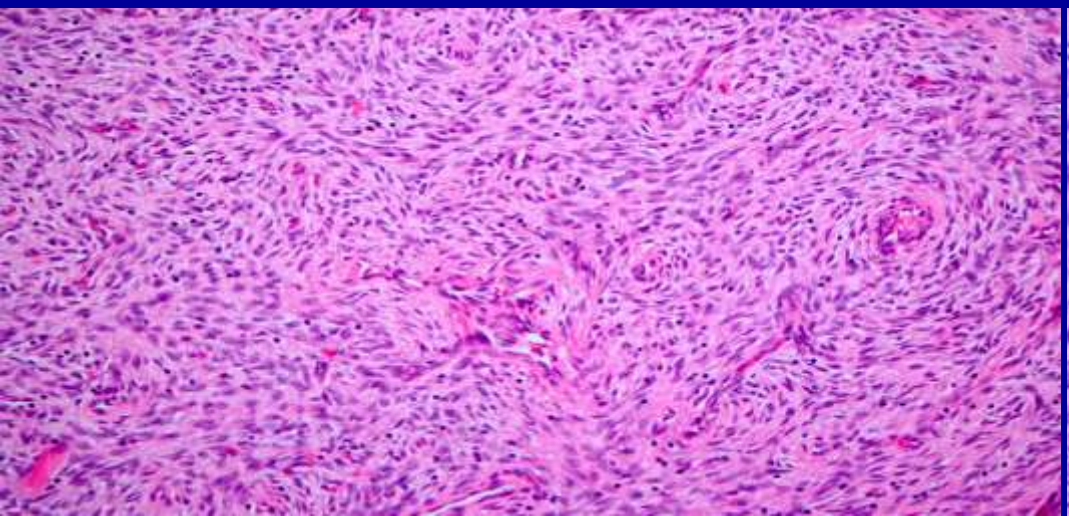


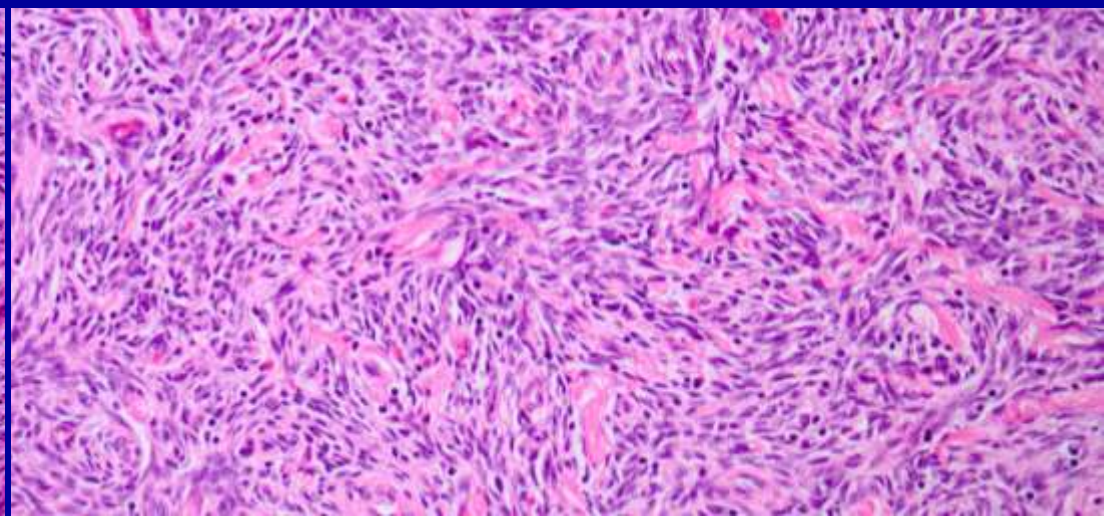


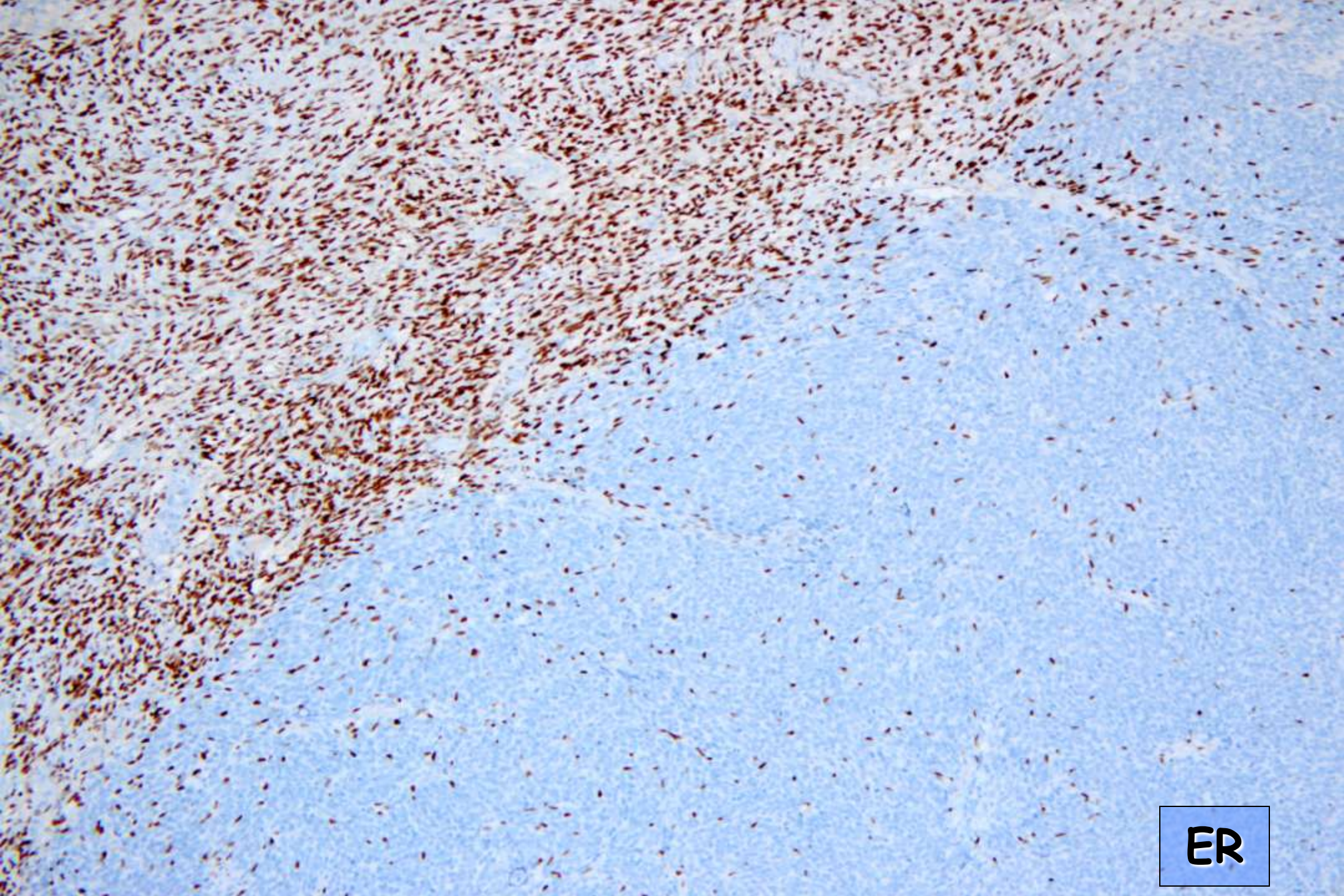


ENDOMETRIUM





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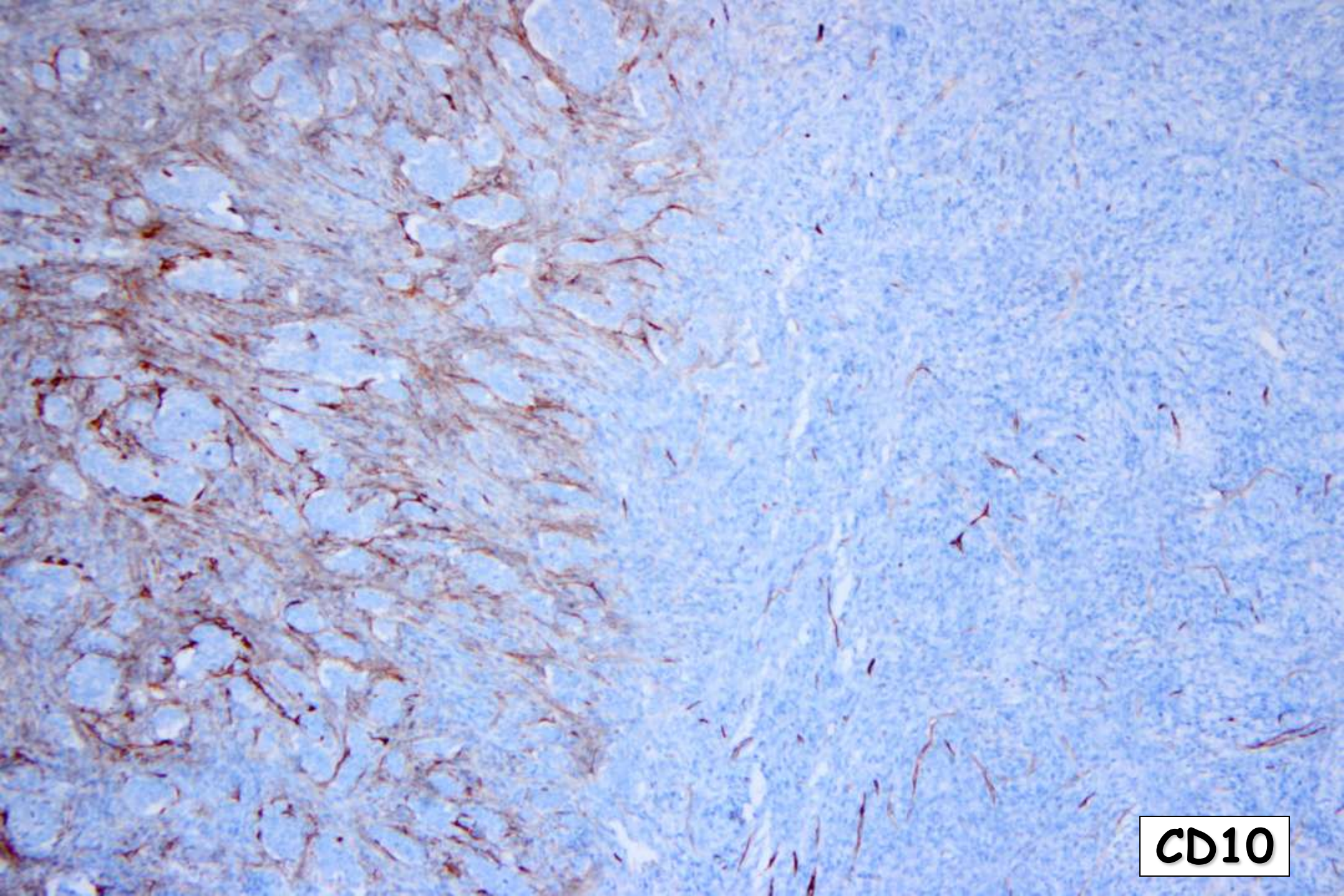
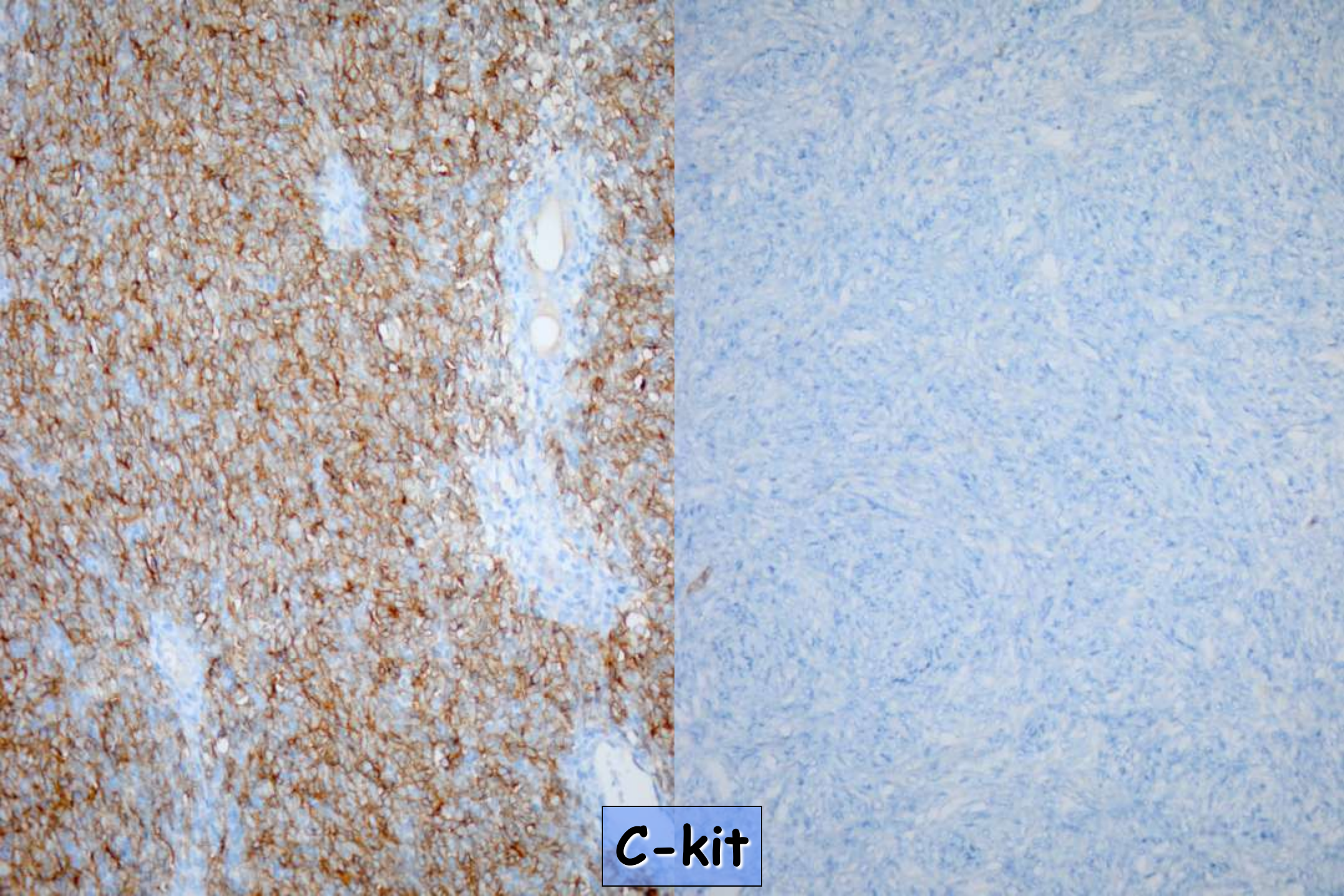

CD10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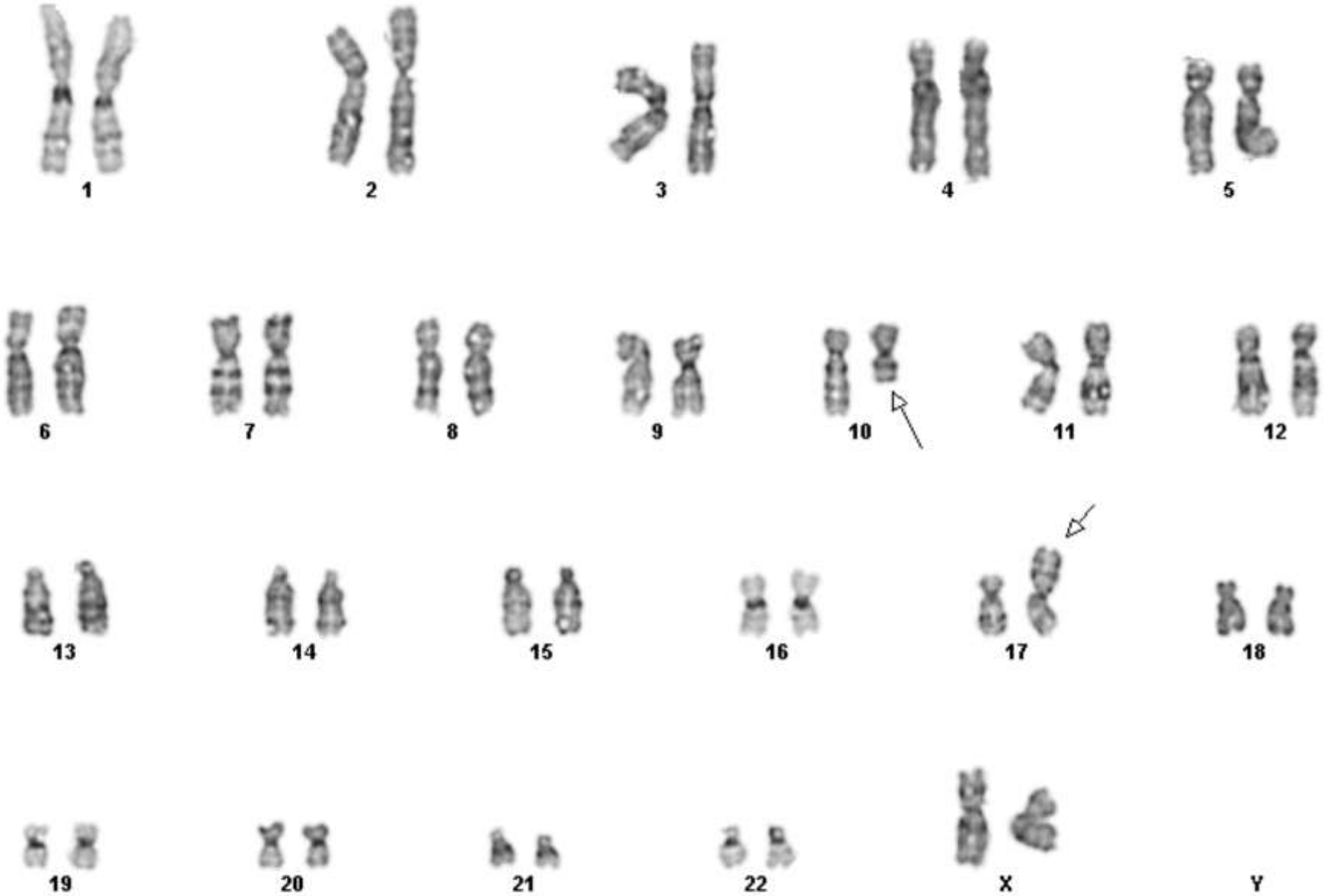
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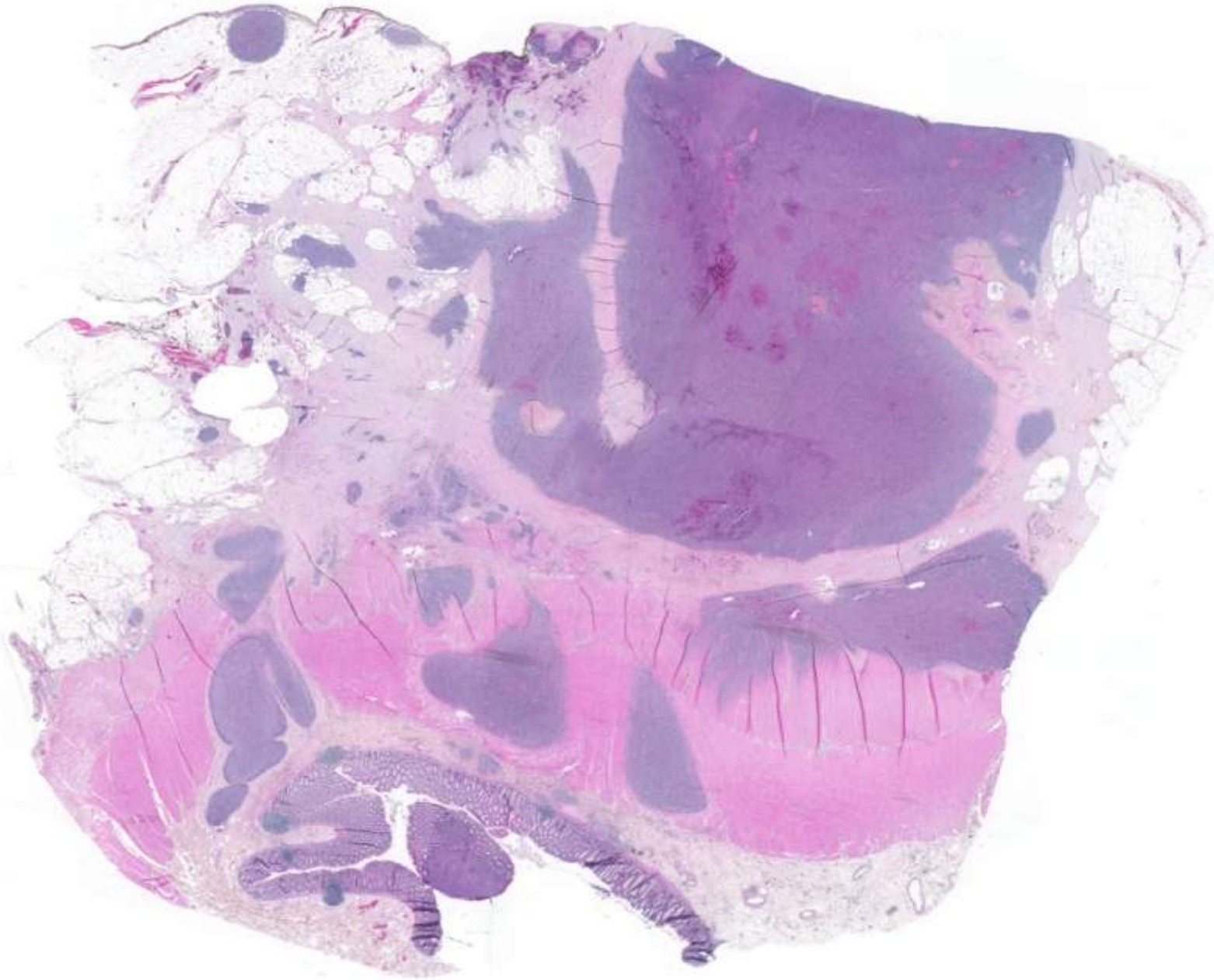
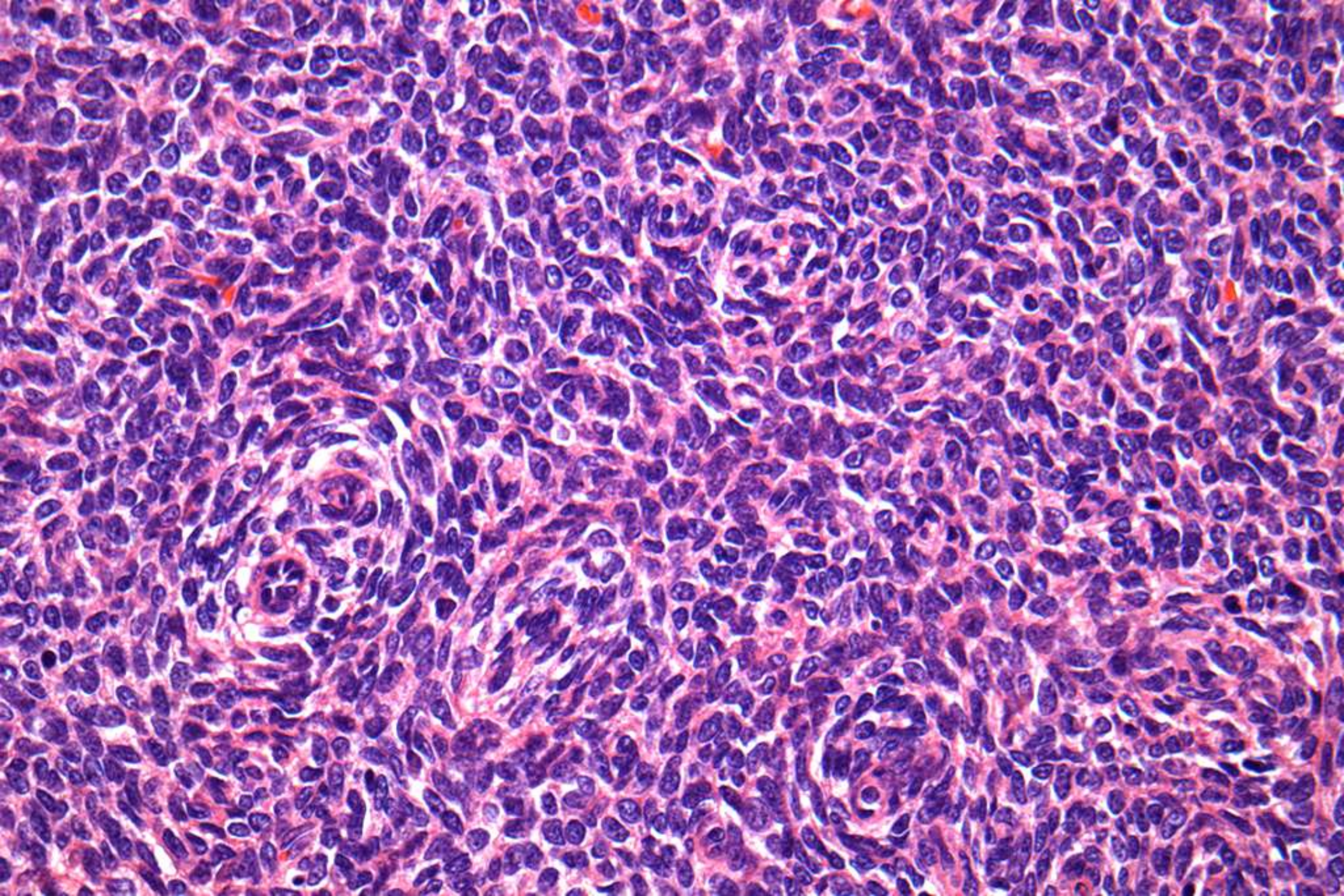
DIAGNOSIS

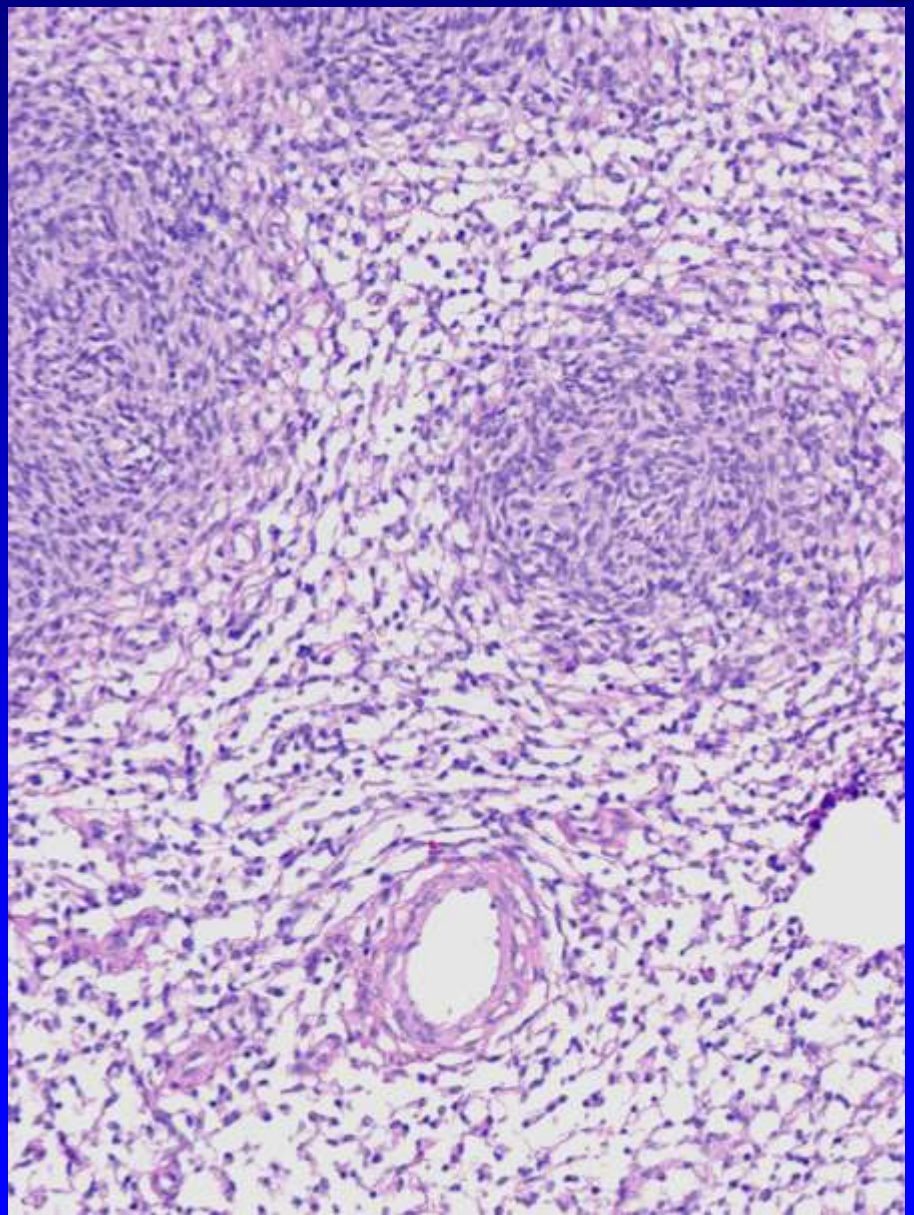
PELVIS:

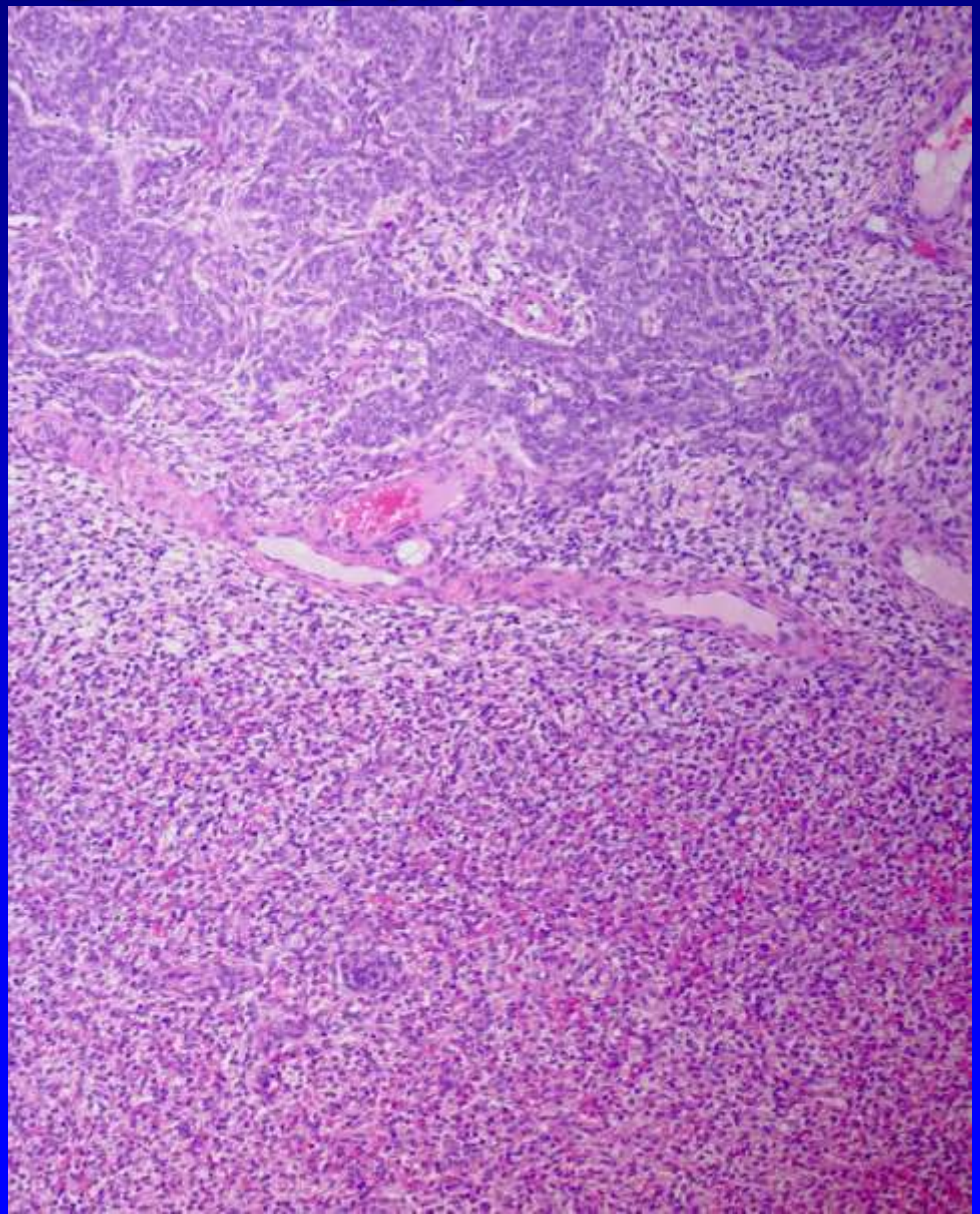
LOW-GRADE ENDOMETRIAL STROMAL SARCOMA (FIBROUS) WITH TRANSFORMATION TO HIGH-GRADE





PELVIC ENDOMETRIOID STROMAL SARCOMA



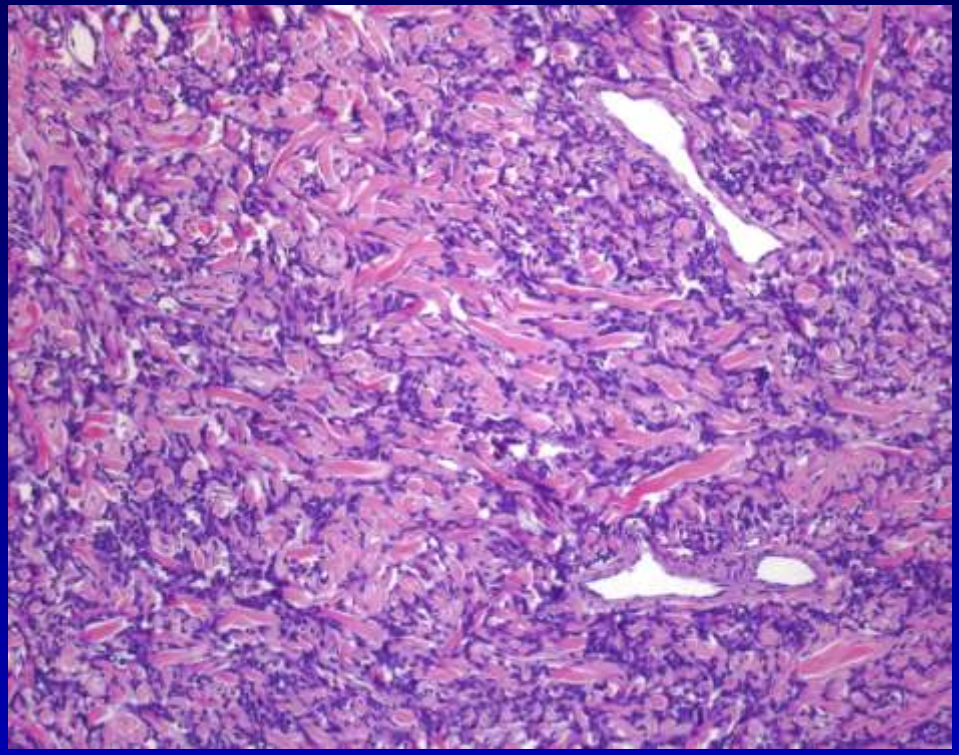


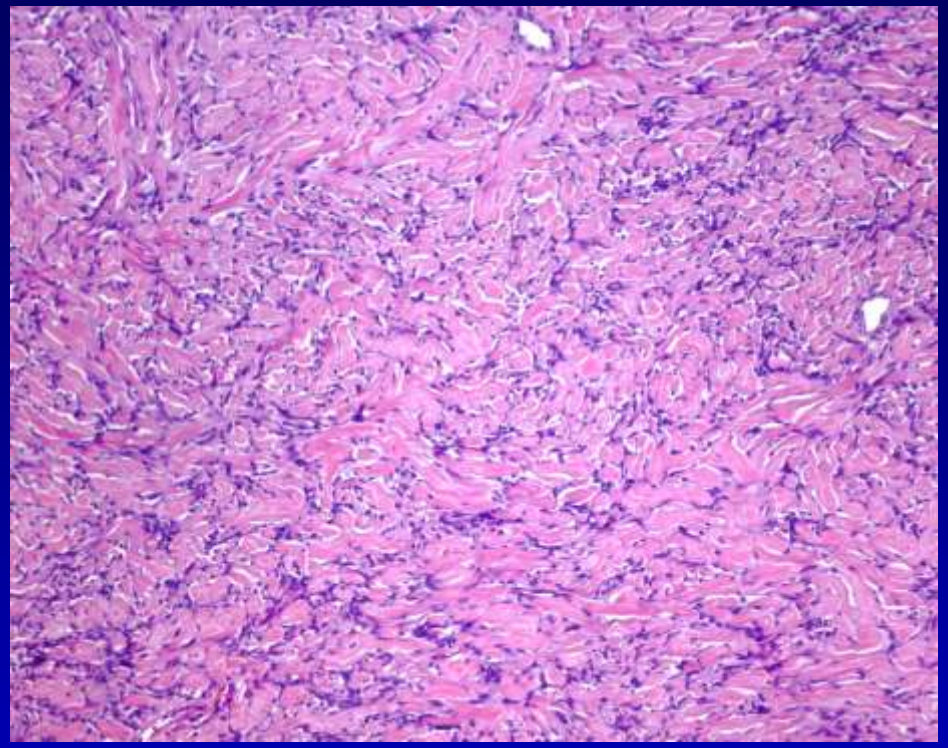
ENDOMETRIOID STROMAL SARCOMA

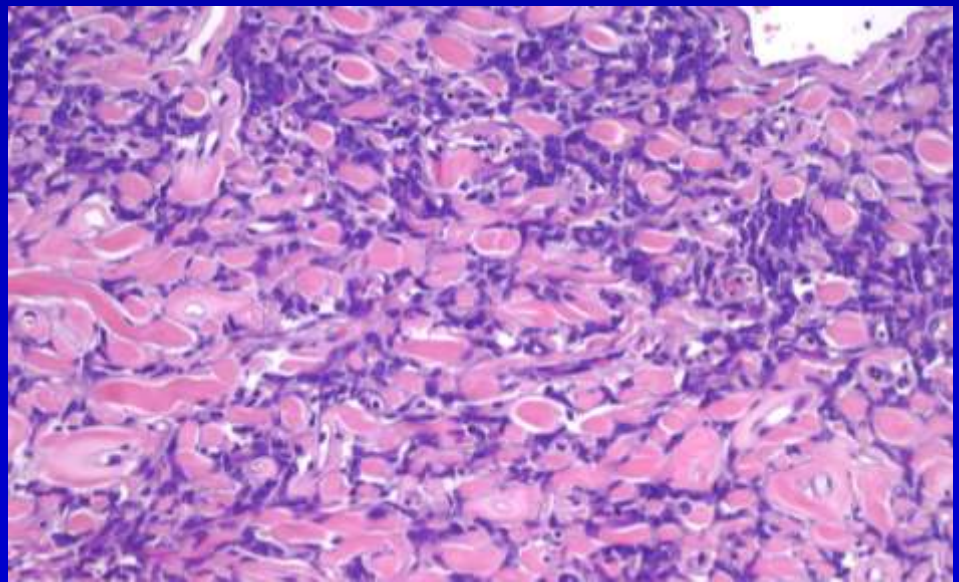
Differential Diagnosis:

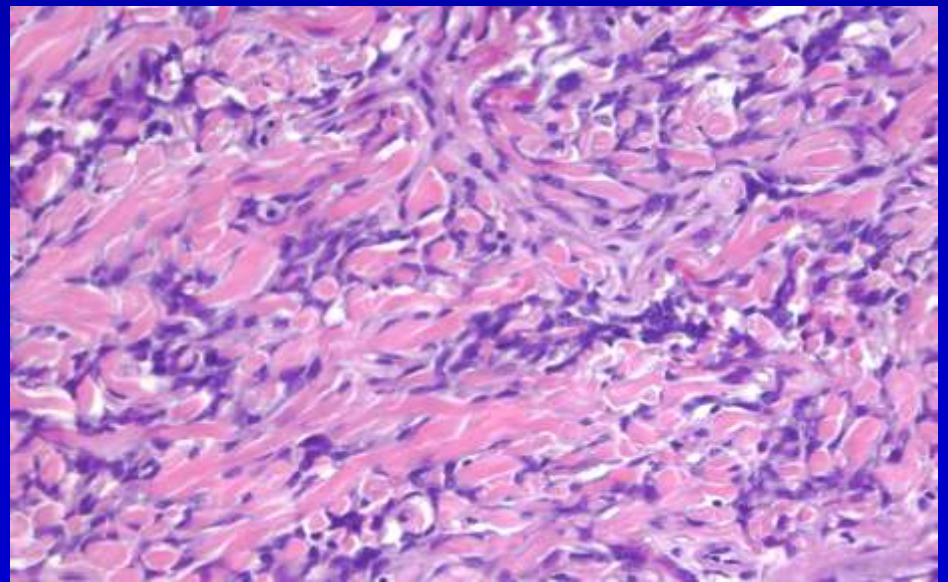
- Gastrointestinal stromal tumor
- Solitary fibrous tumor
- Other sarcoma (s)
- Metastatic granulosa cell tumor (if sex cord-like differentiation)
- Adenosarcoma (if glandular differentiation)

SOLITARY FIBROUS TUMOR



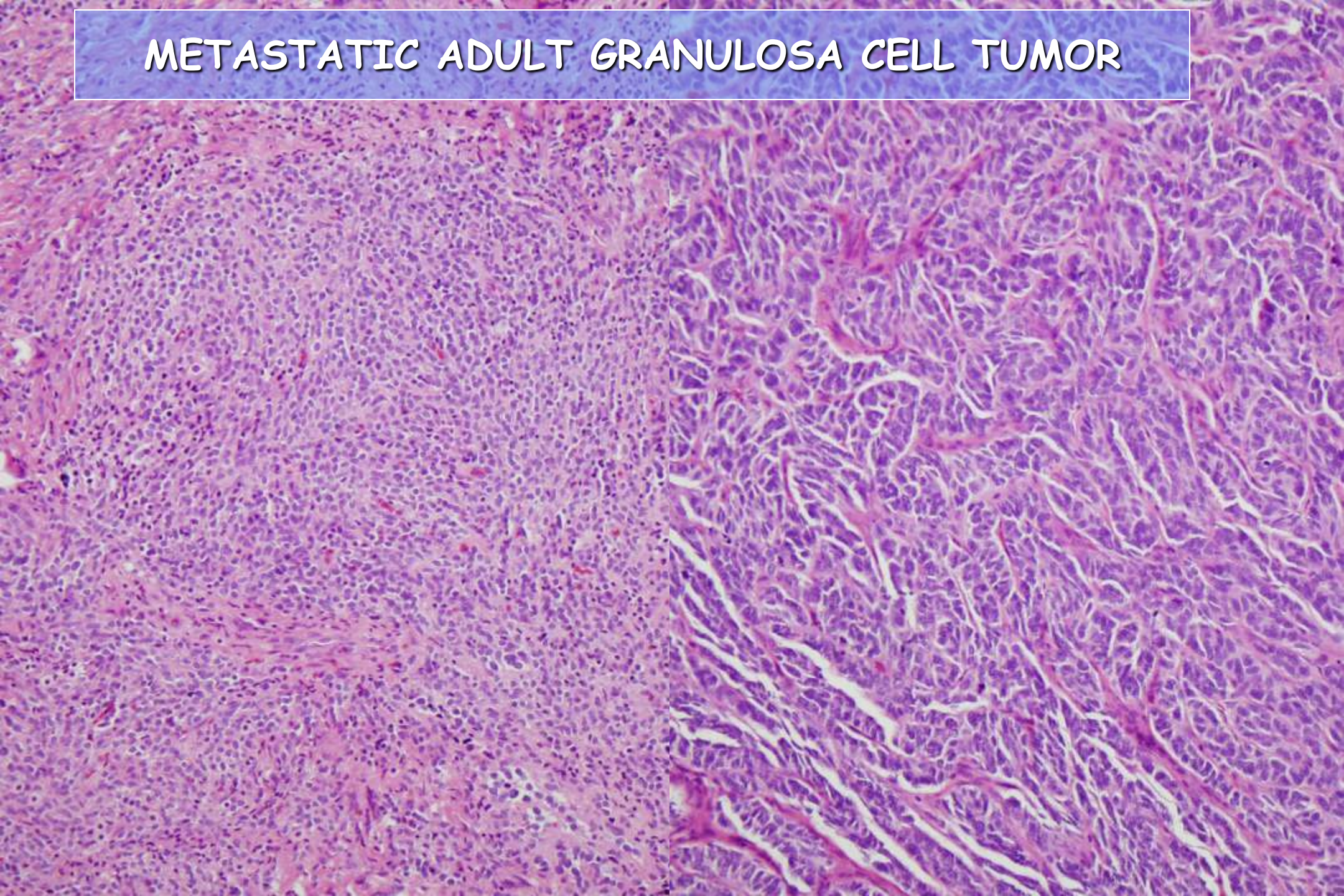






	ESS	SFT
Previous history	+	-
Multifocal	+	-
Histologic pattern	Homogeneous	Haphazard
ER	+	-
PR	+	-/+
CD10	+	-/+
CD34	-	+
Bcl-2	+	+

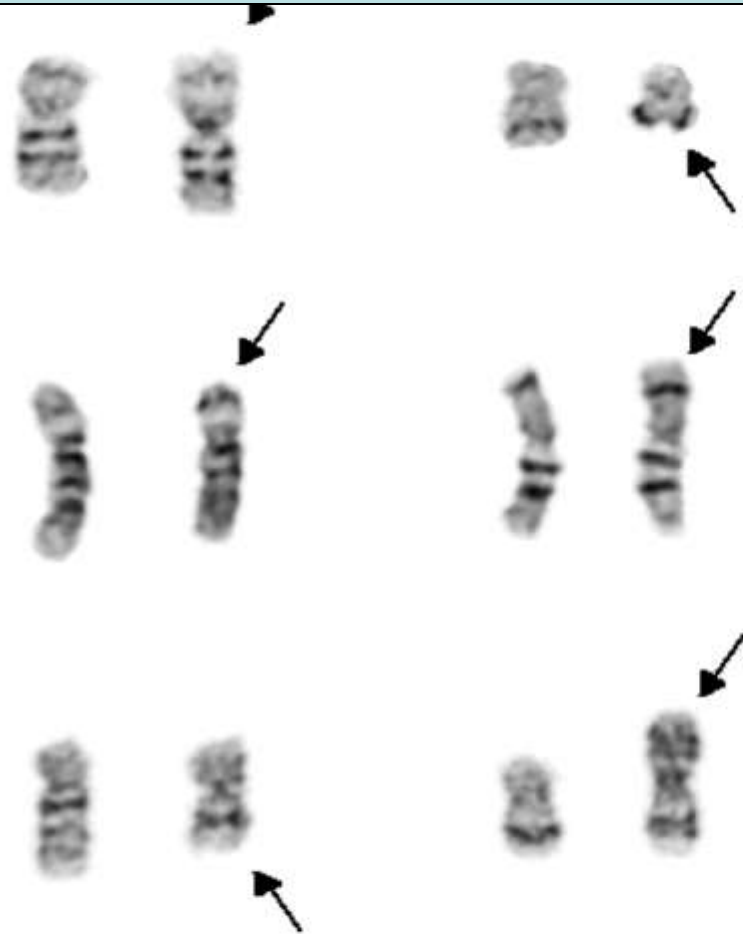
METASTATIC ADULT GRANULOSA CELL TUMOR



Endometrial/oid Stromal Tumors: Cytogenetic & Molecular Aberrations

- **Translocations resulting in gene fusion reported in ESNs, ESSs and rare UESs:**
  - **t(7;17)(p15;q21) → *JAZF1-SUZ12* fusion**
  - **t(6;7)(q21;p15) → *PHF1-JAZF1* fusion**
  - **t(6;10;10)(p21;q22;p11) → *PHF1-EPC1* fusion**
  - **t(10;17)(q22;p13) → ???-*YWHAE* fusion**

TRANSLOCATIONS IN ESTs



t(7;17)(p15;q21)

JAZF1-SUX12

t(6;7)(p21;p15)

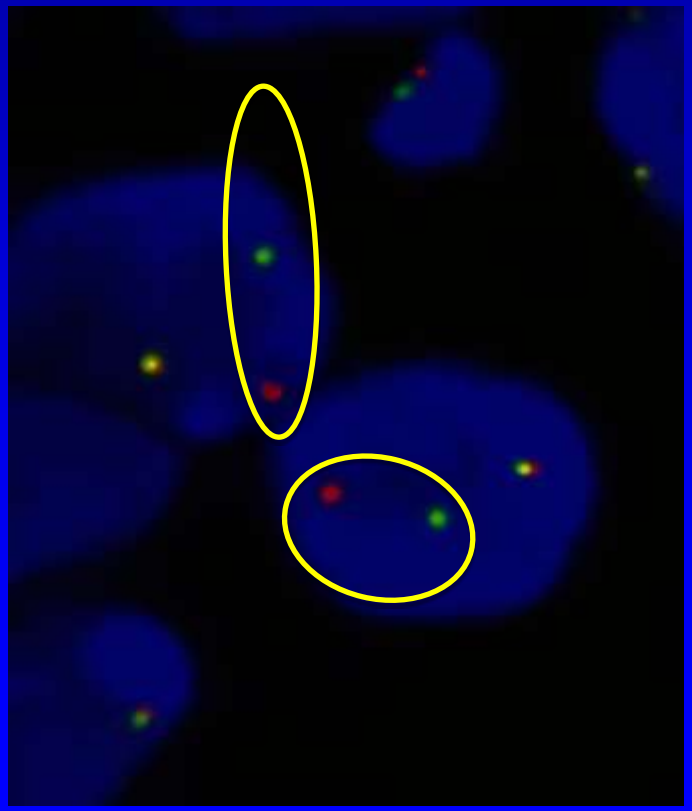
PHF1-JAZF1

t(10;17)(q22;p13)

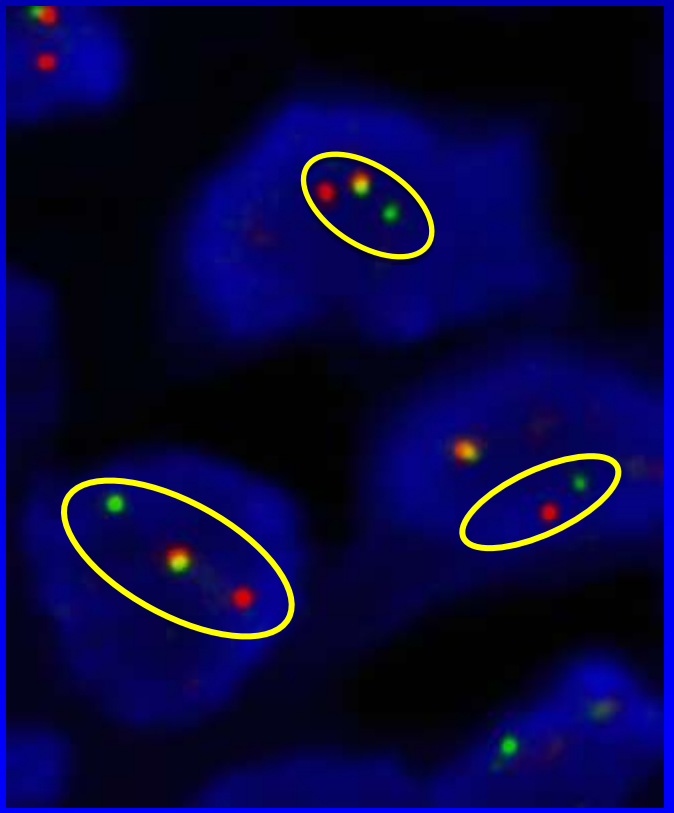
YWHAE-FAM22A/B

ENDOMETRIAL STROMAL TUMORS
Break-Apart FISH Assay

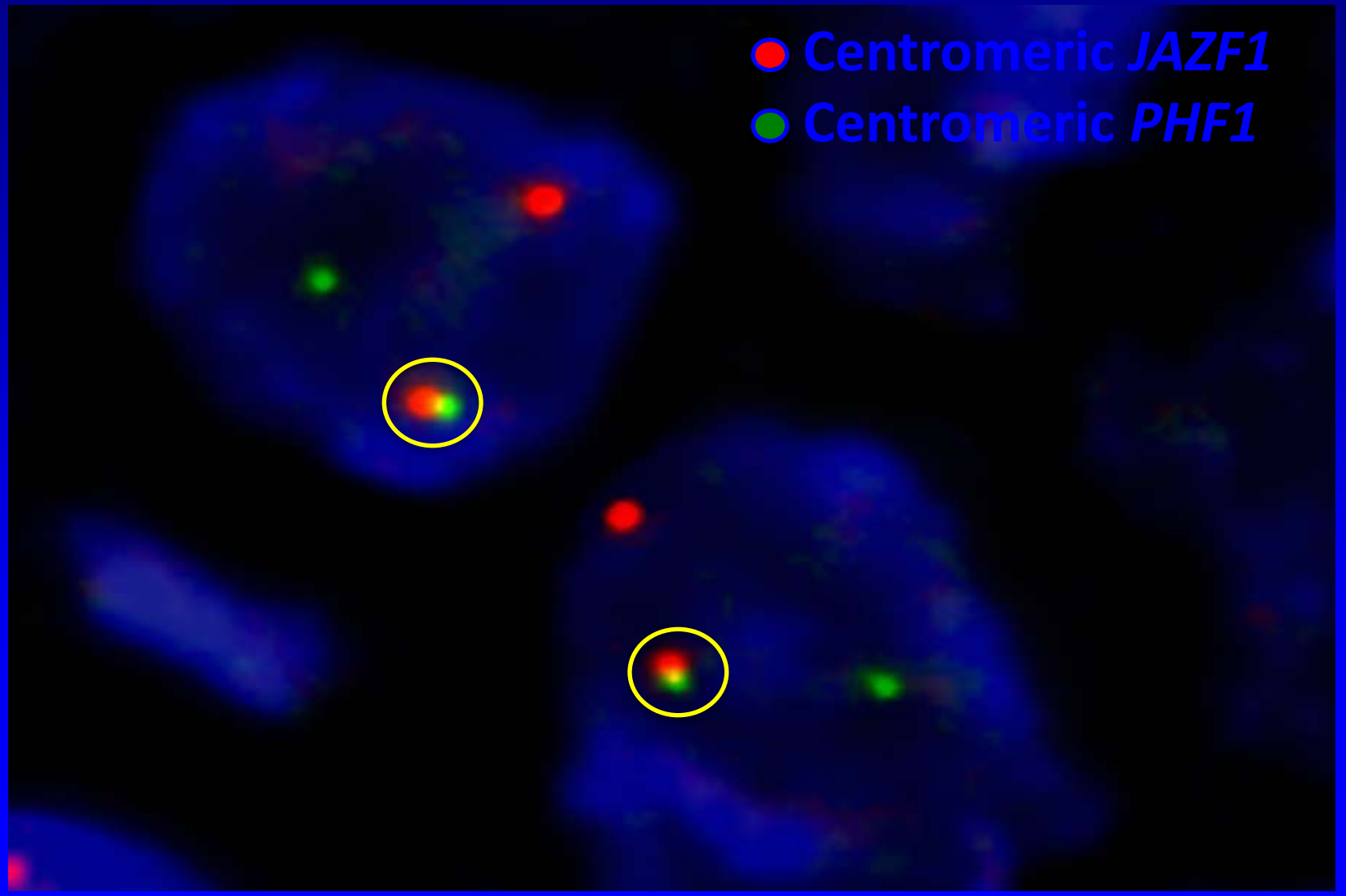
JAZF1
Rearrangement



PHF1
Rearrangement



JAZF1-PHF1 Gene Fusion by Fusion FISH Assay



FISH Results by Tumor Type

	#	Positive	*JAZF1-SUZ12*	*JAZF1-PHF1*	*EPC1-PHF1*	*JAZF1* only	*PHF1* only
ESN	**20**	**9/16 (56%)**	**8**	**-**	**-**	**1**	**-**
Primary ESS	**43**	**24/38 (63%)**	**14**	**4**	**2**	**1**	**3**
Metastatic ESS	**15**	**7/13 (54%)**	**3**	**-**	**-**	**1**	**3**
UES	**5**	**0/5**	**-**	**-**	**-**	**-**	**-**

Chiang S et al, Am J Surg Pathol 2011

FISH Results: Tumors with Classic Morphology

	#	Positive	*JAZF1-SUZ12*	*JAZF1-PHF1*	*EPC1-PHF1*	*JAZF1* only	*PHF1* only
ESN	11	4/8 (50%)	4	-	-	-	-
Primary ESS	29	19/25 (72%)	10	3	2	1	3
Metastatic ESS	11	6/10 (60%)	2	-	-	1	3

Chiang S et al, Am J Surg Pathol 2011

FISH Results: Tumors with Variant Morphology

	#	Positive	*JAZF1-SUZ12*	*JAZF1-PHF1*	*JAZF1* only
ESN	**9**	**5/8 (63%)**	**4**	**-**	**1**
Primary ESS	**14**	**5/13 (38%)**	**4**	**-**	**-**
Metastatic ESS	**4**	**1/3 (33%)**	**1**	**1**	**-**

Chiang S et al, Am J Surg Pathol 2011

FISH Results by Variant Histologic Feature

	#	Positive	*JAZF1-SUZ12*	*EPC1-PHF1*	*JAZF1* only
Smooth muscle	13	7/12 (58%)	5		1
Fibrous/myxoid	10	5/9 (56%)	5		
Sex-cord	6	2/5 (40%)	1	1	
Epithelioid	2	2/2 (100%)	1		
Glands	3	0/3			
Skeletal muscle	1	0/1			
Fat	1	0/1			

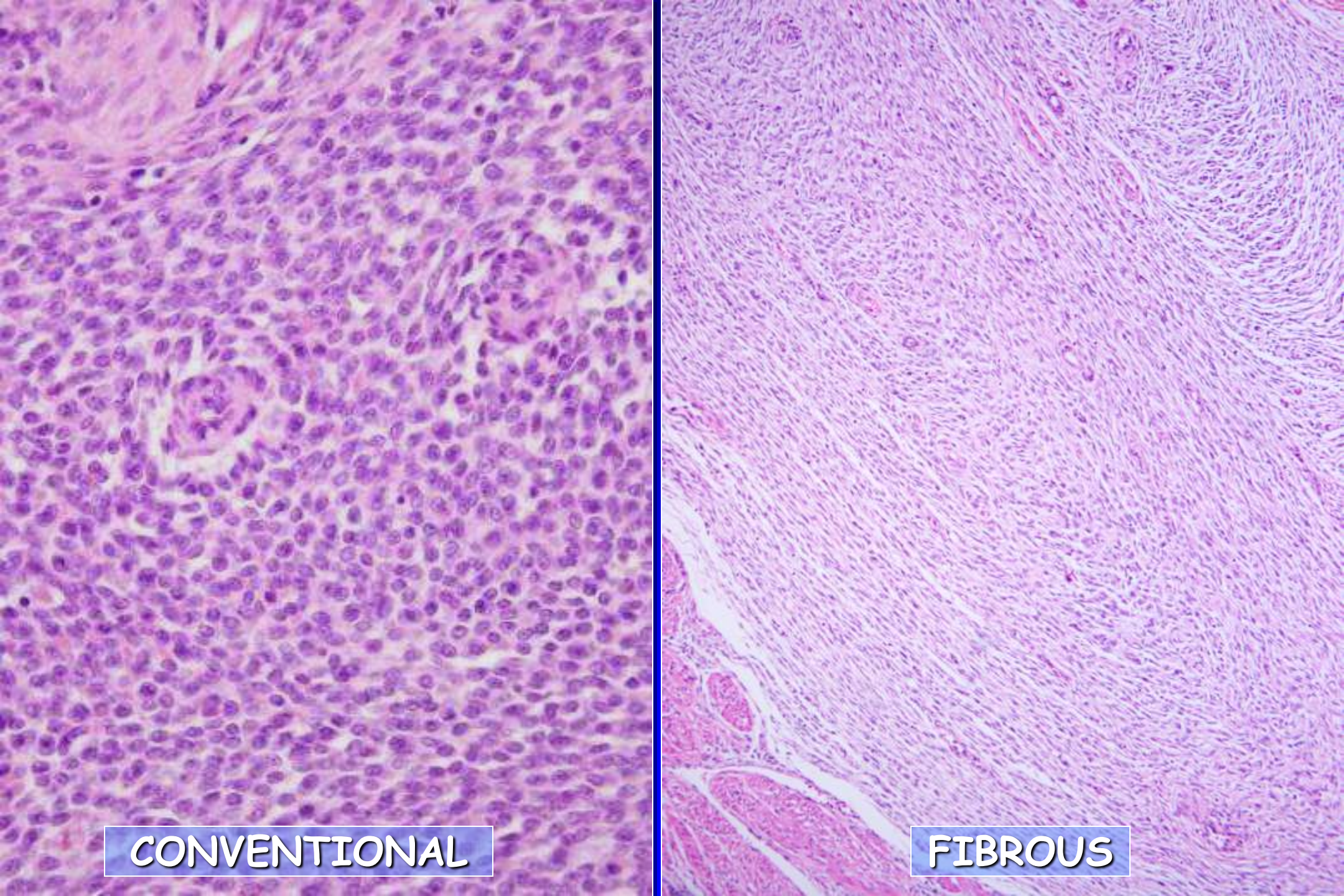
Chiang S et al, Am J Surg Pathol 2011

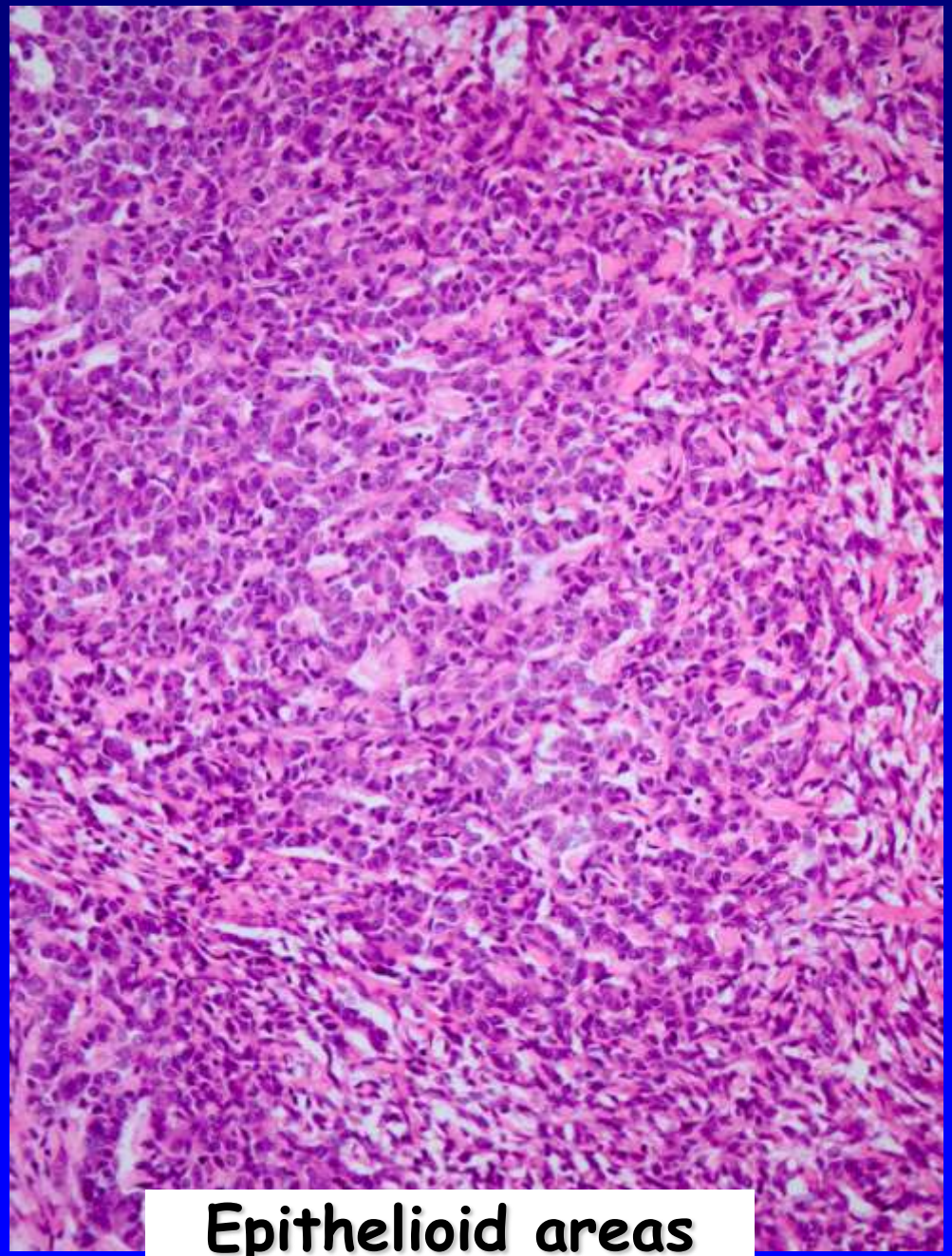
Histologic Features of ESS Characterized by YWHAE Rearrangement-Distinction from Usual LG-ESS with JAZF1 Rearrangement

Cheng-Han Lee et al, Modern Pathol, 2011,A

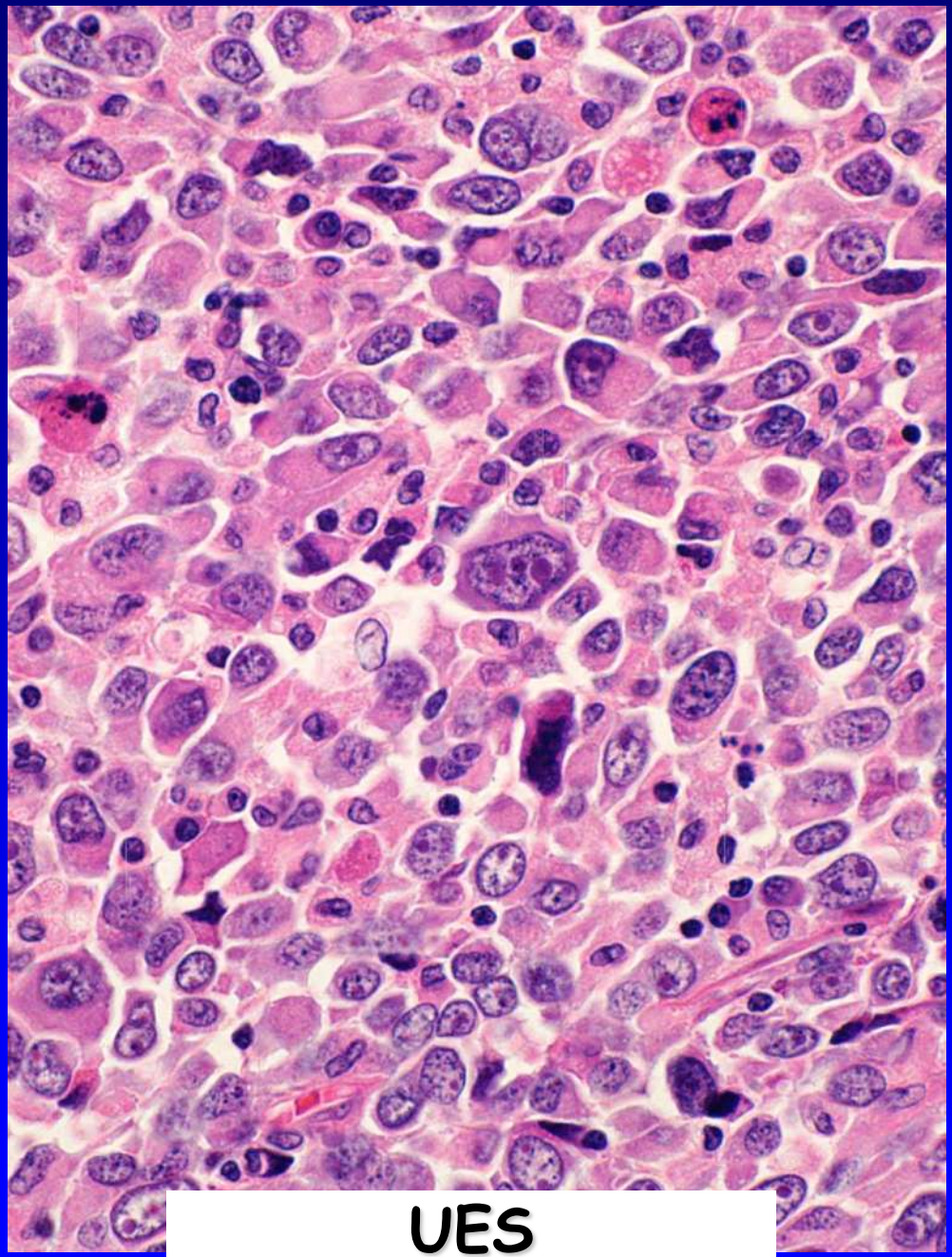
11 tumors:

- **Epithelioid areas with cells arranged in nests**
- **Cells with moderate amount of cytoplasm, large nuclei (when compared to conventional ESS) with irregular contours, and increased mitotic activity**
- **Tumor cell necrosis**
- **Associated fibromyxoid areas in some tumors**


CONVENTIONAL
FIBROUS



Epithelioid areas



UES

ENDOMETRIAL STROMAL TUMORS

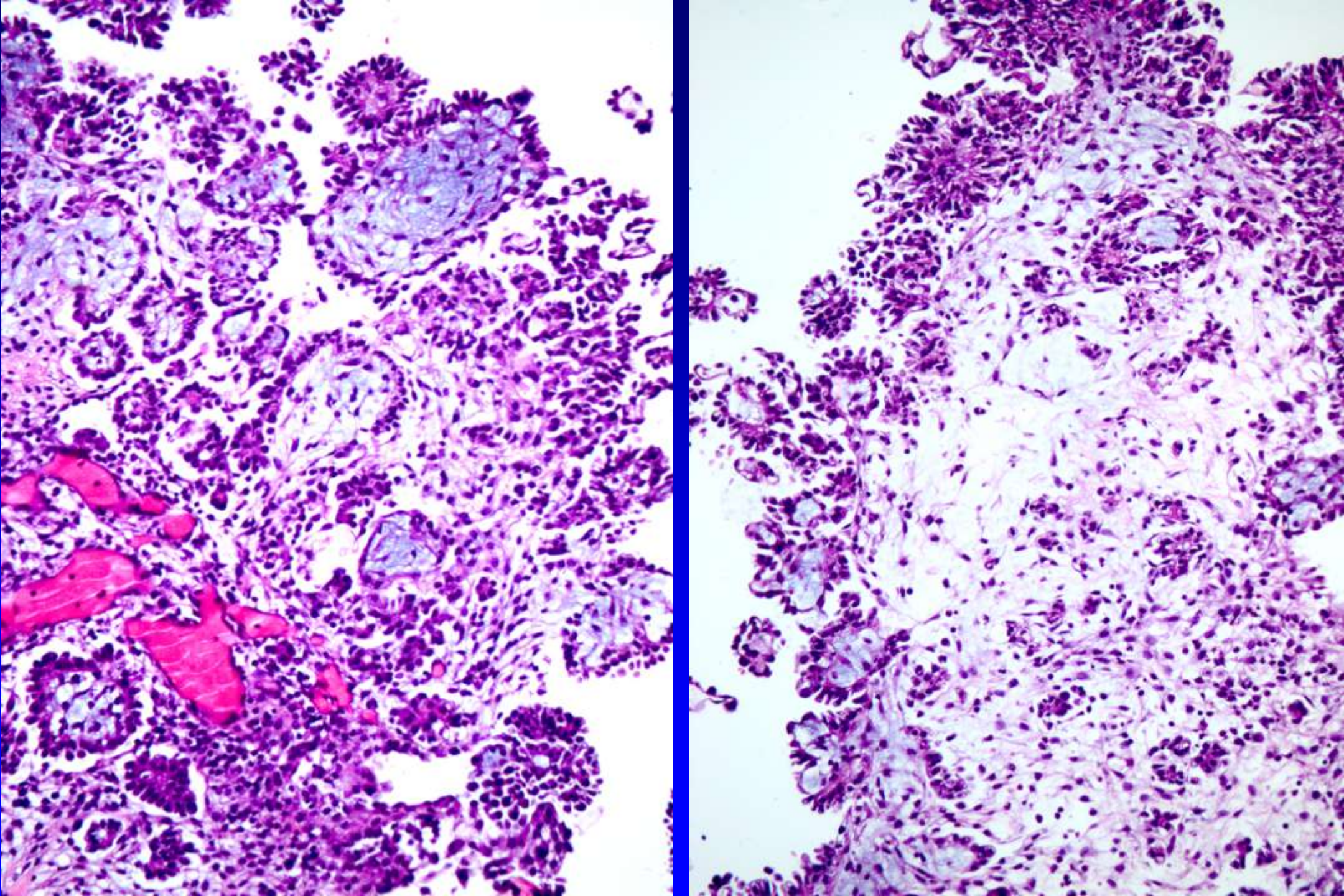
MOLECULAR ASPECTS:

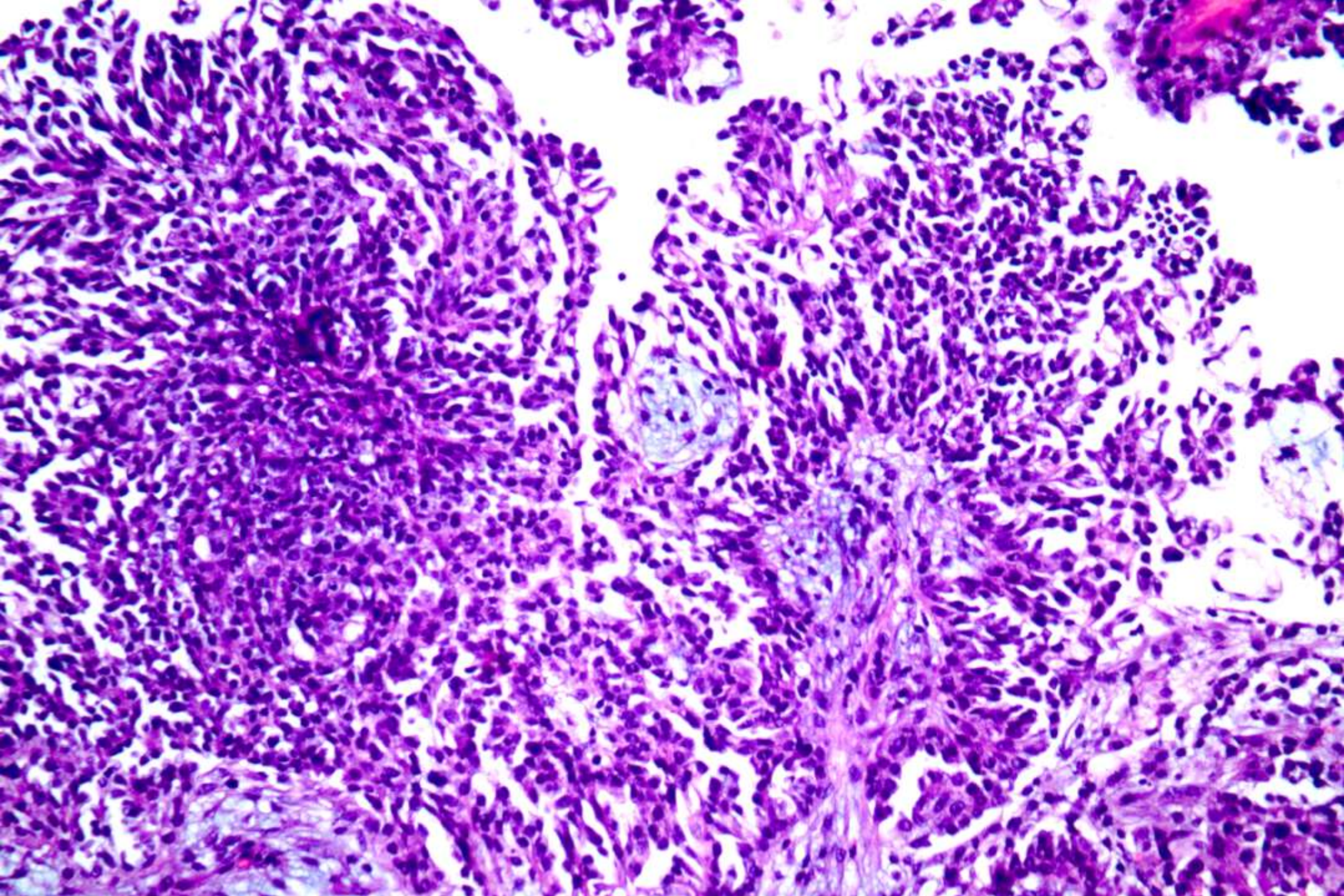
- **Gene rearrangements are present in 70% of ESNs and 50% of ESSs**
  - ***JAZF1-SUZ12* >>> *JAZF1-PHF1, EPC1-PHF1***
  - ***JAZF1, PHF1* rearranged with unknown partners**
- **Gene rearrangements are found more frequently in classic than variant endometrial stromal tumors**
  - **No obvious correlation between specific gene rearrangements and variant features EXCEPT for tumors associated with YWHAE rearrangement (epithelioid areas, tumors cell necrosis, and some fibrous)**

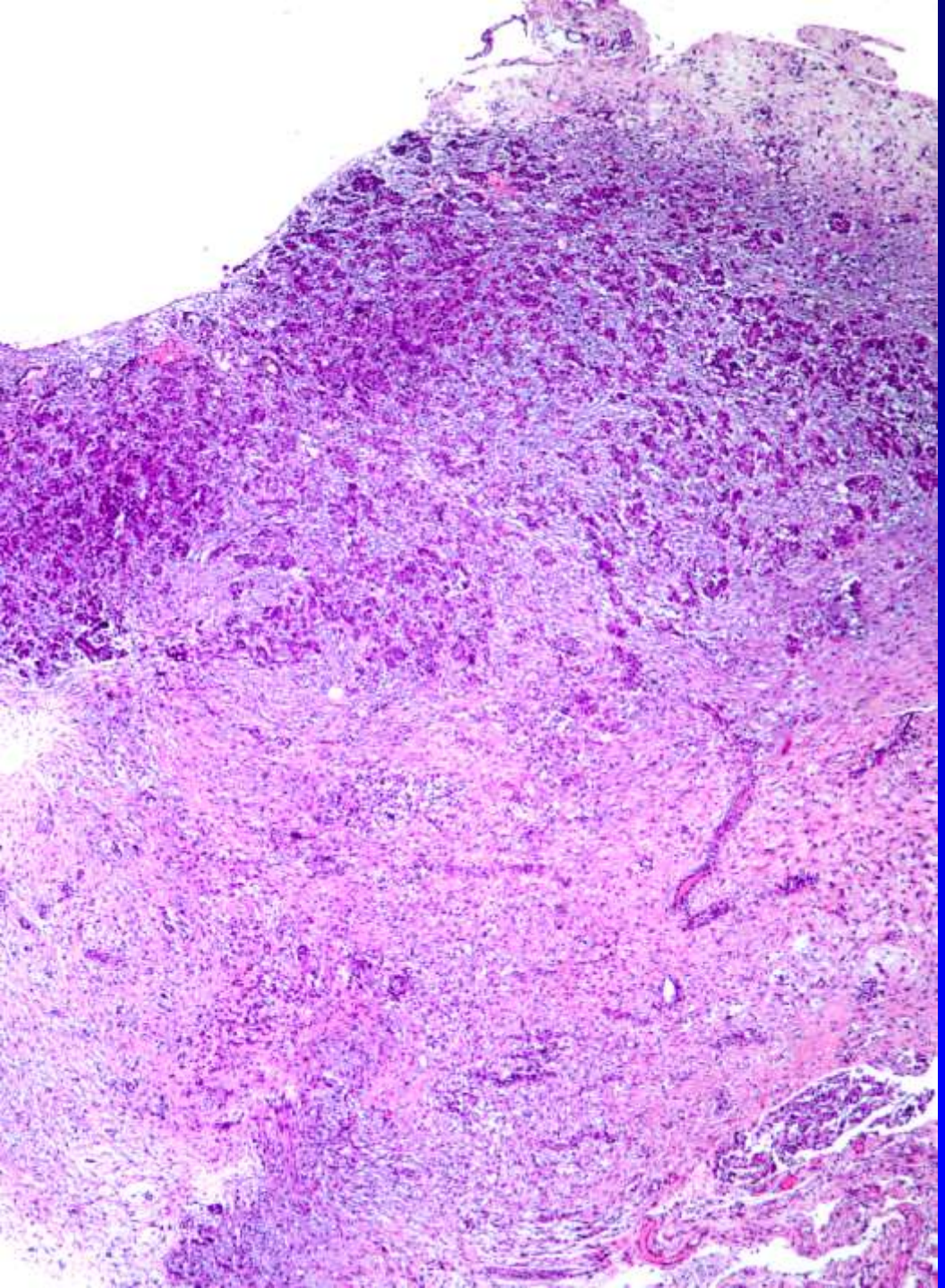
CLINICAL HISTORY

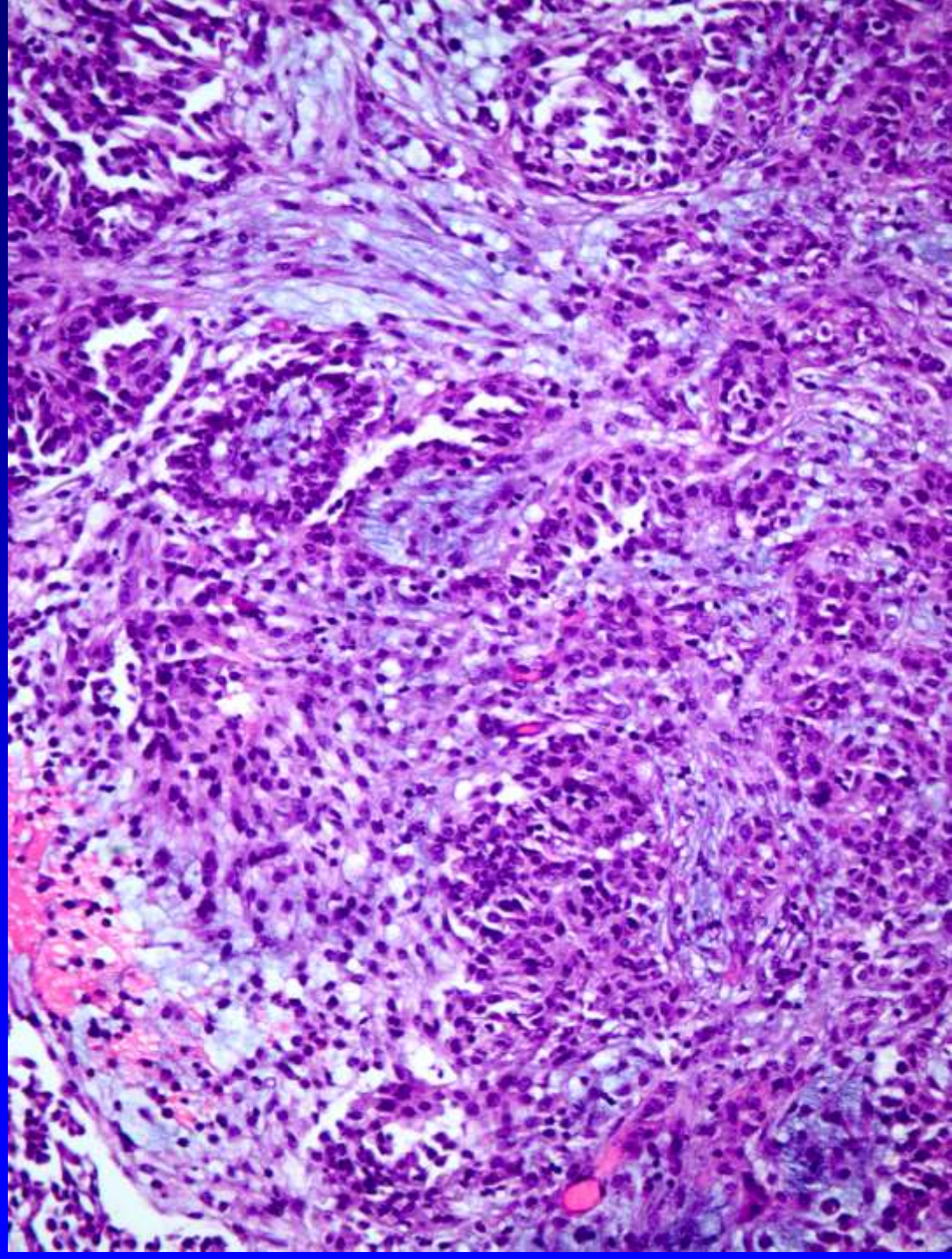
45 year old woman with a prior history of squamous cell carcinoma in situ of the vulva, presented with progressive ascites.

Physical examination revealed distended abdomen with diffuse non –specific changes on PET scan and moderately elevated CA125. At laparoscopy, she was found to have 1.8 liters of ascites and an erythematous and focally granular peritoneum. Several biopsies were taken.









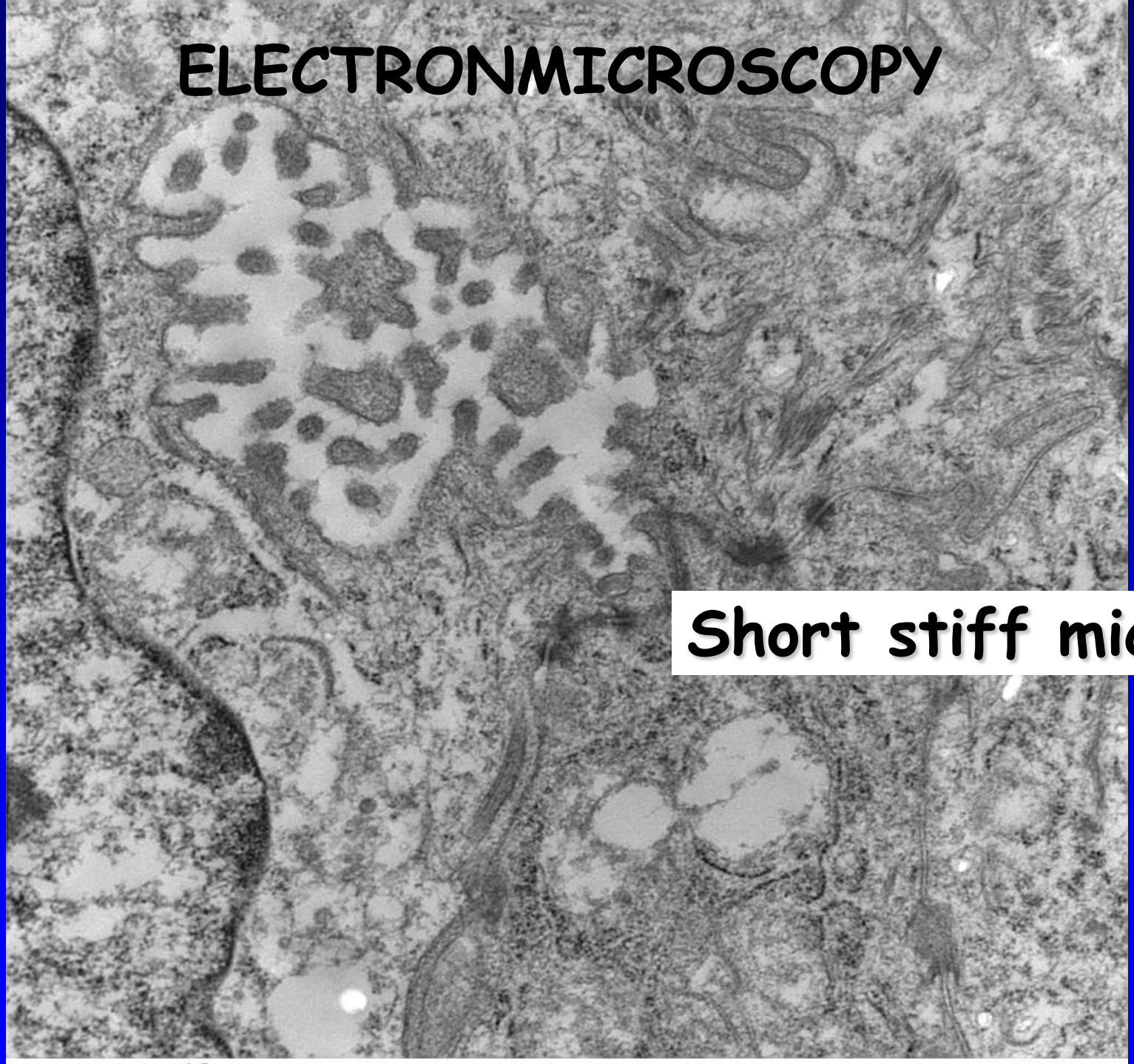
IMMUNOCHEMISTRY:

- **Calretinin +**
- **CK5/6 +**

  (weak and focal)
- **BerEP4 +**
- **B74.2 +**

  (weak and focal)
- **CD15 -**

ELECTRONMICROSCOPY



Short stiff microvilli

DIAGNOSIS

PERITONEUM:

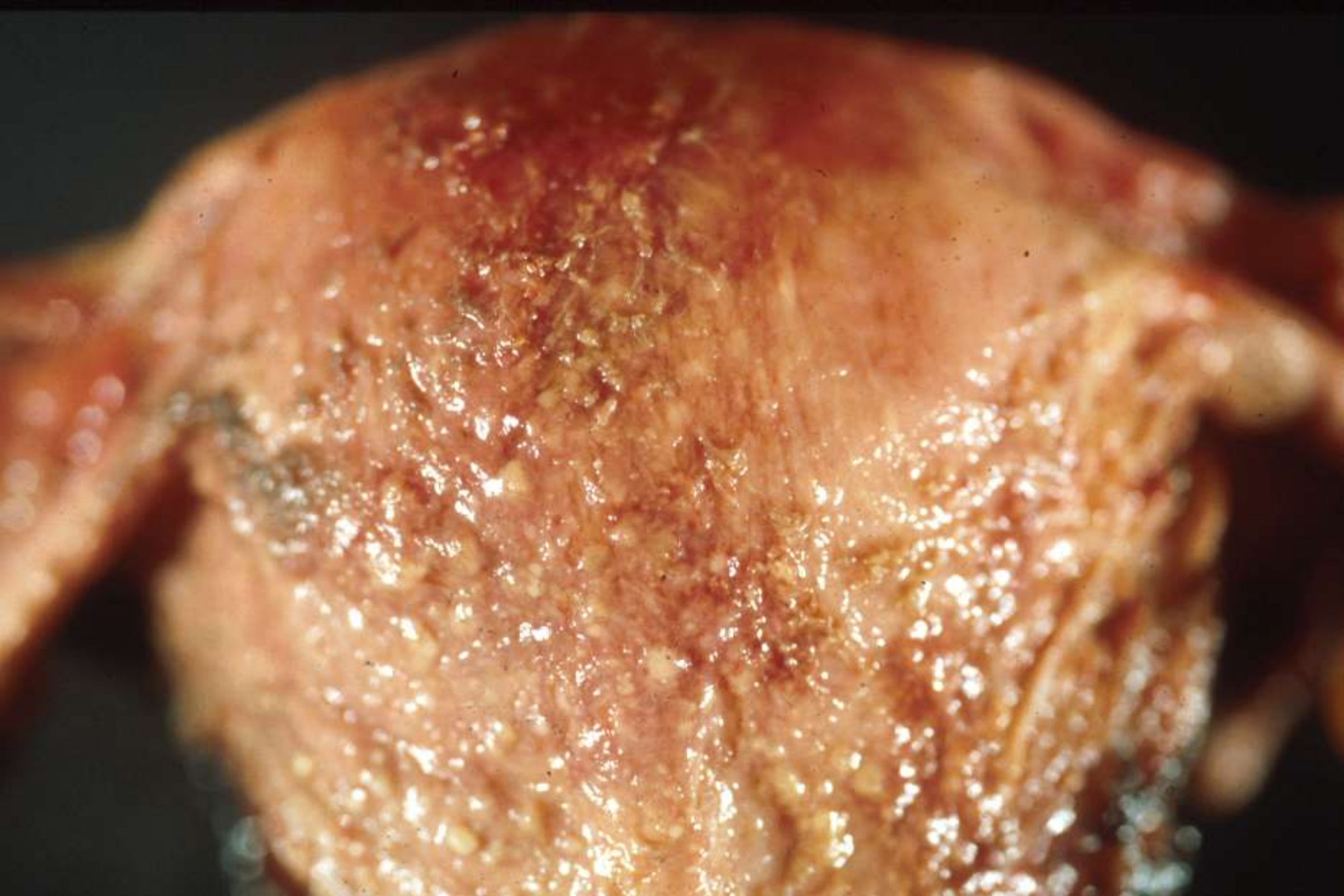
SEROUS CARCINOMA, LOW-GRADE

CONSISTENT WITH INVASIVE IMPLANTS OF PRIOR OVARIAN SEROUS BORDERLINE TUMOR

PERITONEAL SEROUS PROLIFERATIONS

Classification

- **Endosalpingiosis**
- **Serous tumors of borderline malignancy**
- **Low grade serous carcinoma including psammocarcinoma**
- **High-grade serous carcinoma**



PERITONEAL SEROUS BORDERLINE T (SEROUS MICROPAPILLOMATOSIS)

- **Age: 16-77 years (mean 31-40 years)**
- **S/S: Infertility**

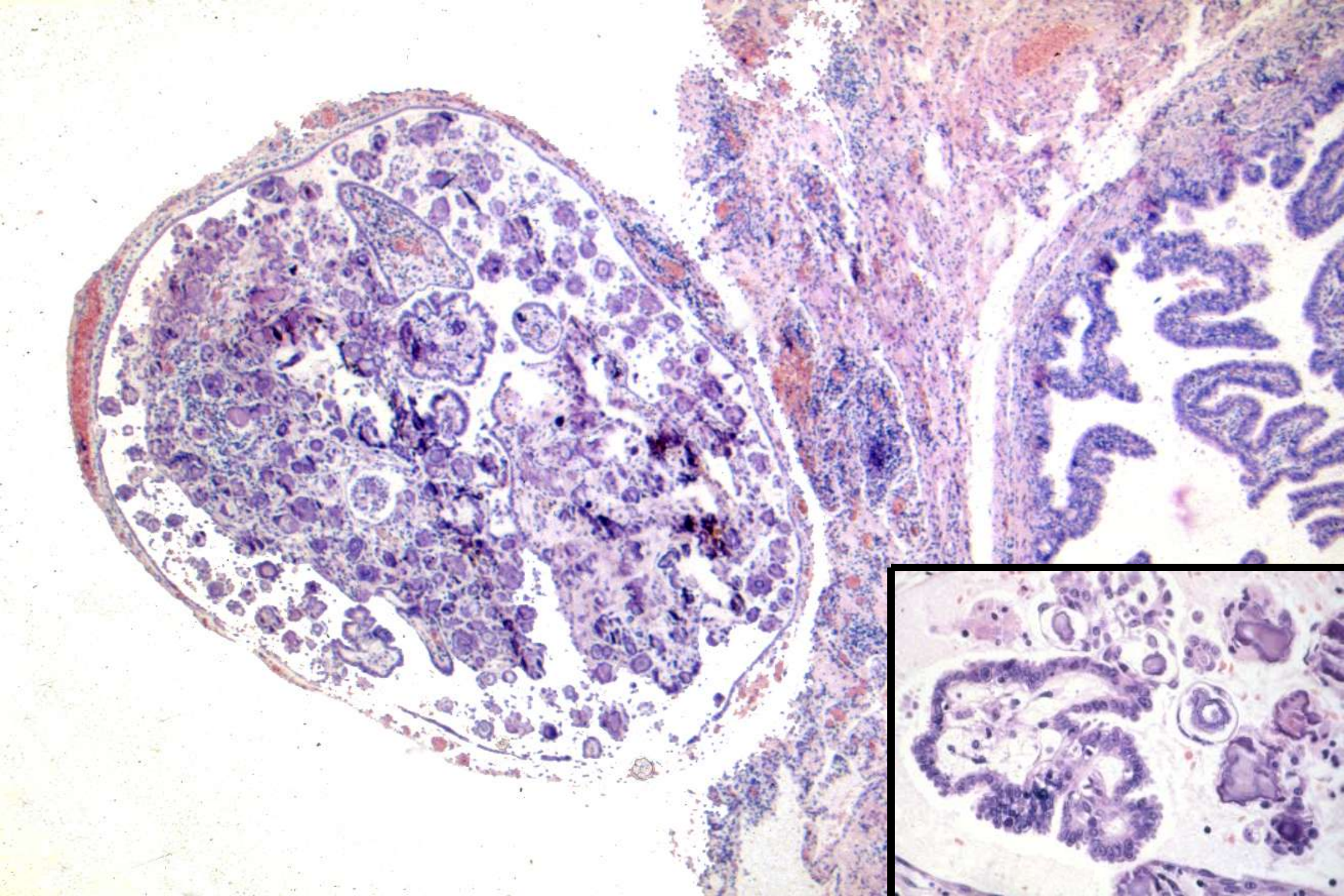
  Abdominal pain

  Incidental (37-53%)
- **Follow-up: Occasionally may undergo malignant transformation (more often low-grade serous carcinoma)**

PERITONEAL SEROUS BORDERLINE T (SEROUS MICROPAPILLOMATOSIS)

- **Widespread extra-ovarian peritoneal involvement and normal-sized ovaries that are free of tumor or show surface involvement similar to that seen in the extra-ovarian peritoneum**

*** This definition excludes the finding of a papillary serous BL tumor of the ovary**

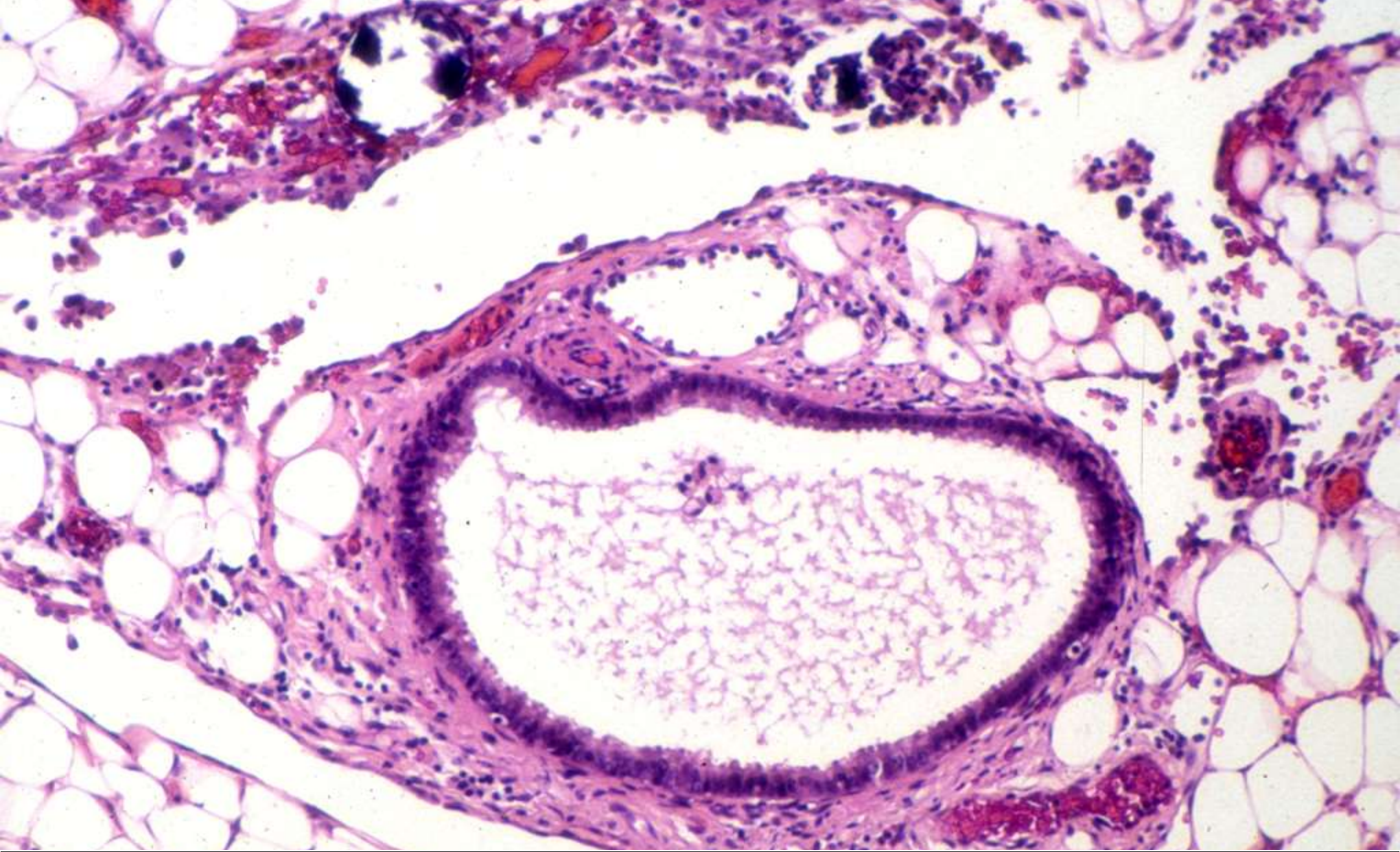


DIFFERENTIAL DIAGNOSIS

- **Endosalpingiosis**
- **Florid mesothelial hyperplasia**
- **Well-differentiated papillary mesothelioma**

- **Low-grade serous carcinoma**
- **Psammocarcinoma**

INVASIVE

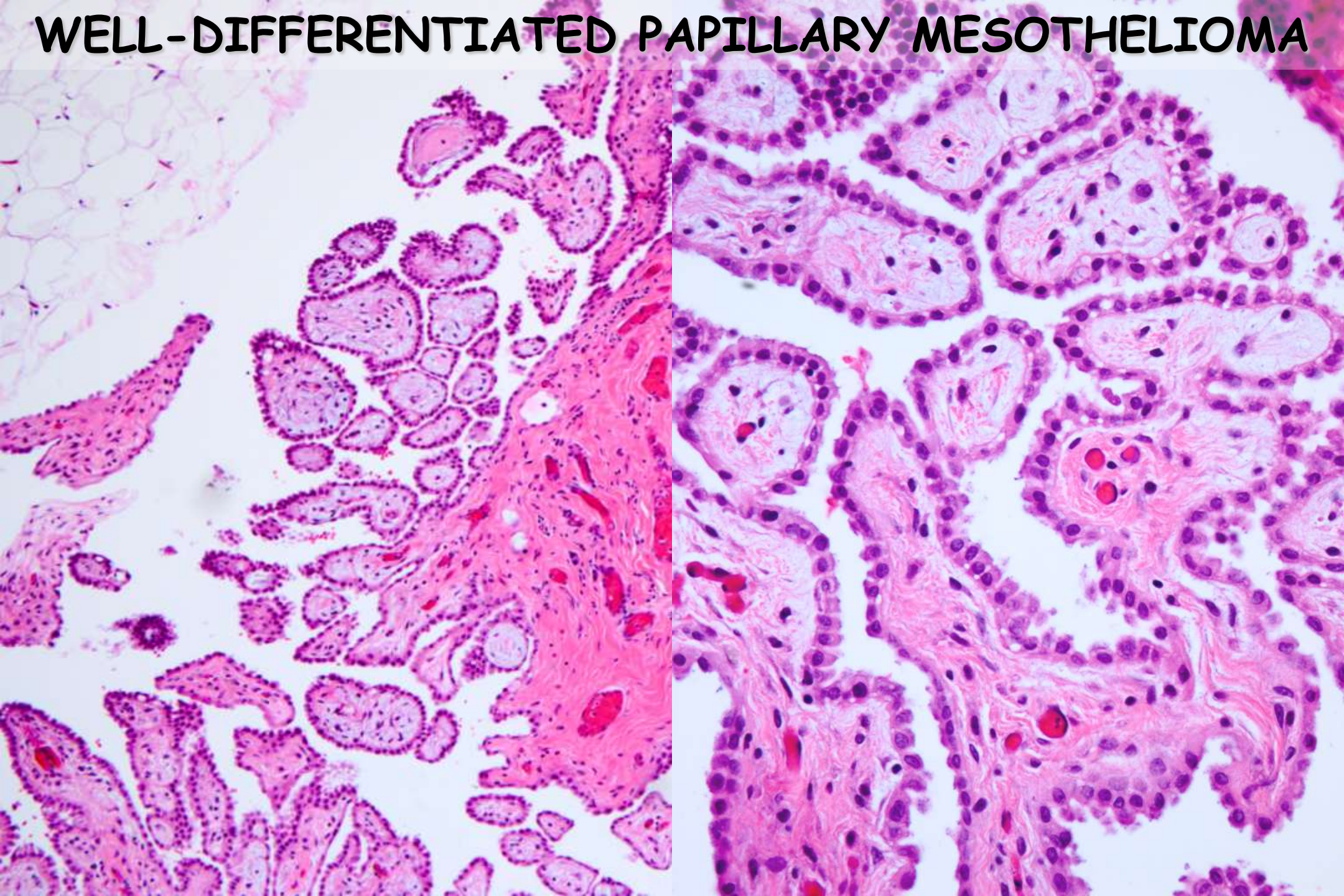


ENDOSALPINGIOSIS

ENDOSALPINGIOSIS vs BORDERLINE SEROUS PAPILLARY TUMOR

Any degree of papillarity, tufting or detachment of cell clusters in a tubal-type proliferation merits the diagnosis of serous papillary tumor of borderline malignancy

WELL-DIFFERENTIATED PAPILLARY MESOTHELIOMA

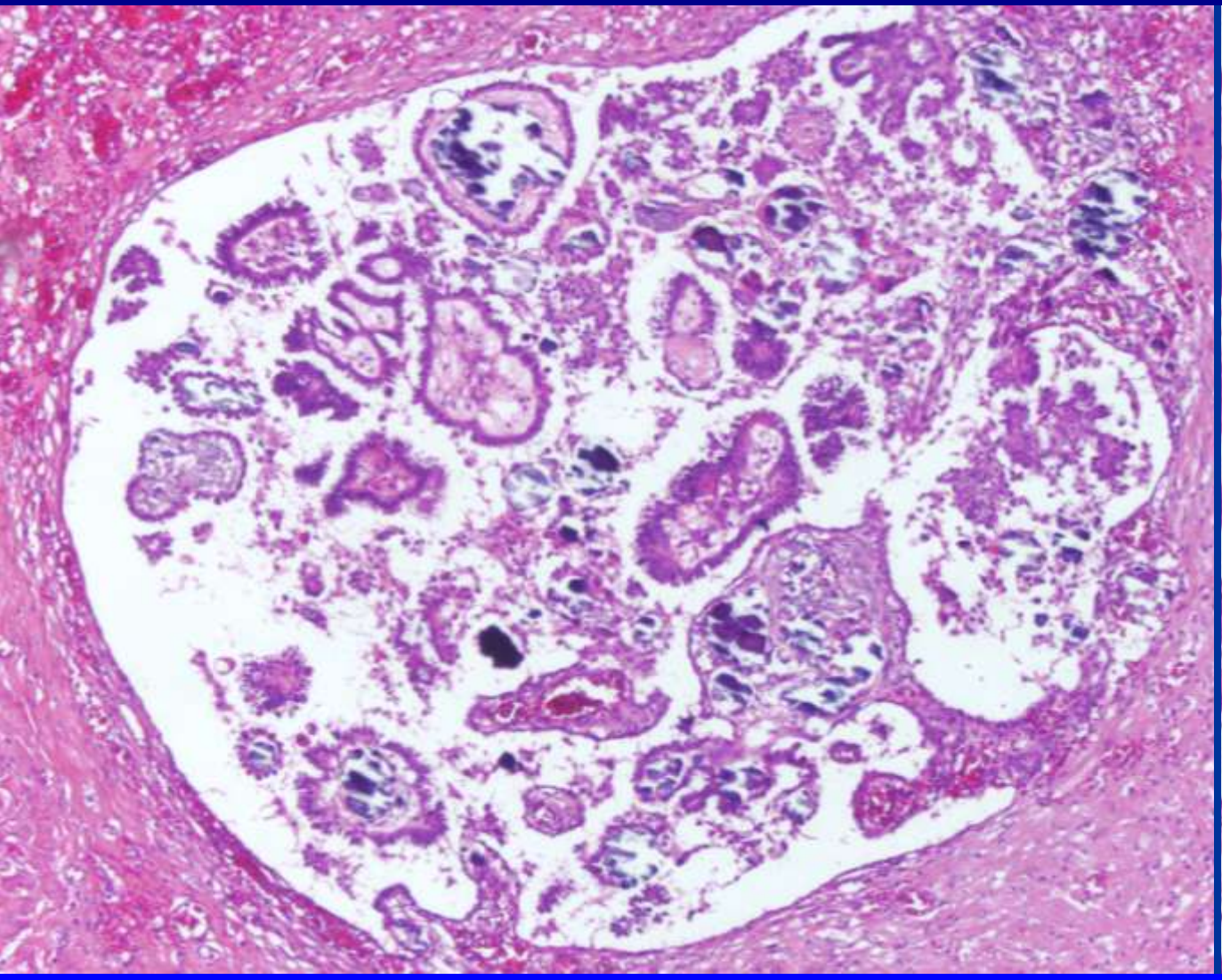


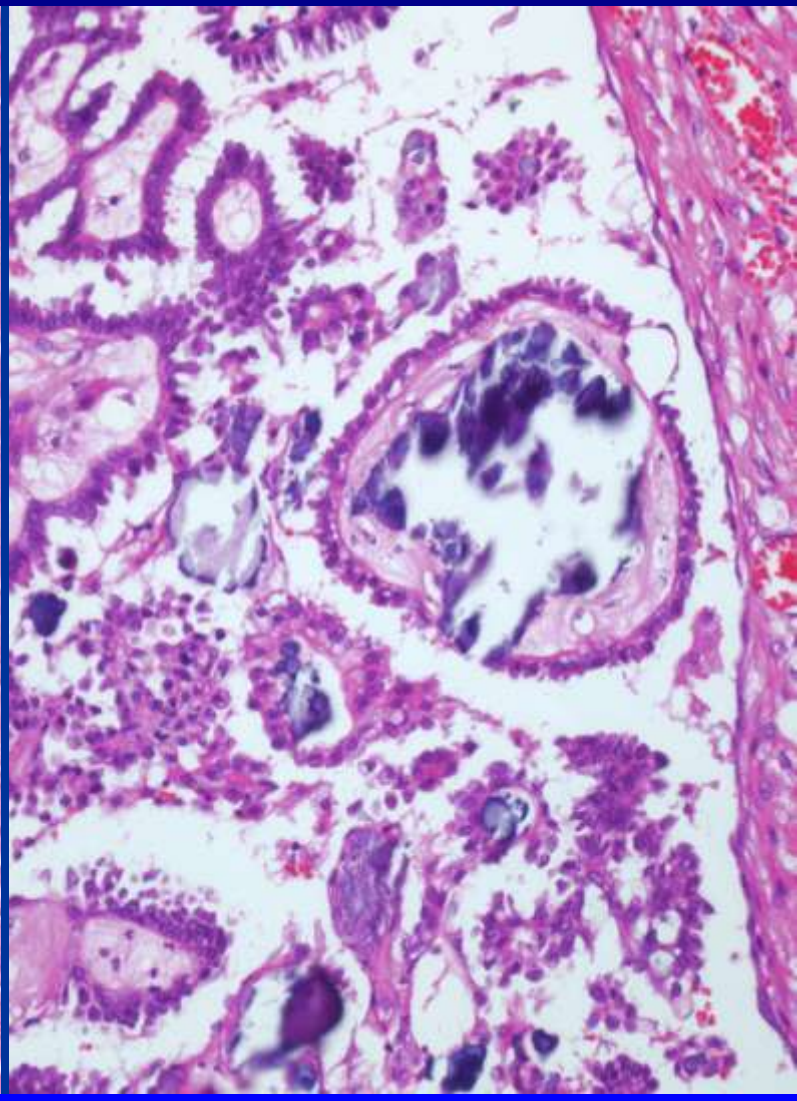
PRIMARY PERITONEAL BORDERLINE TUMOR

VS

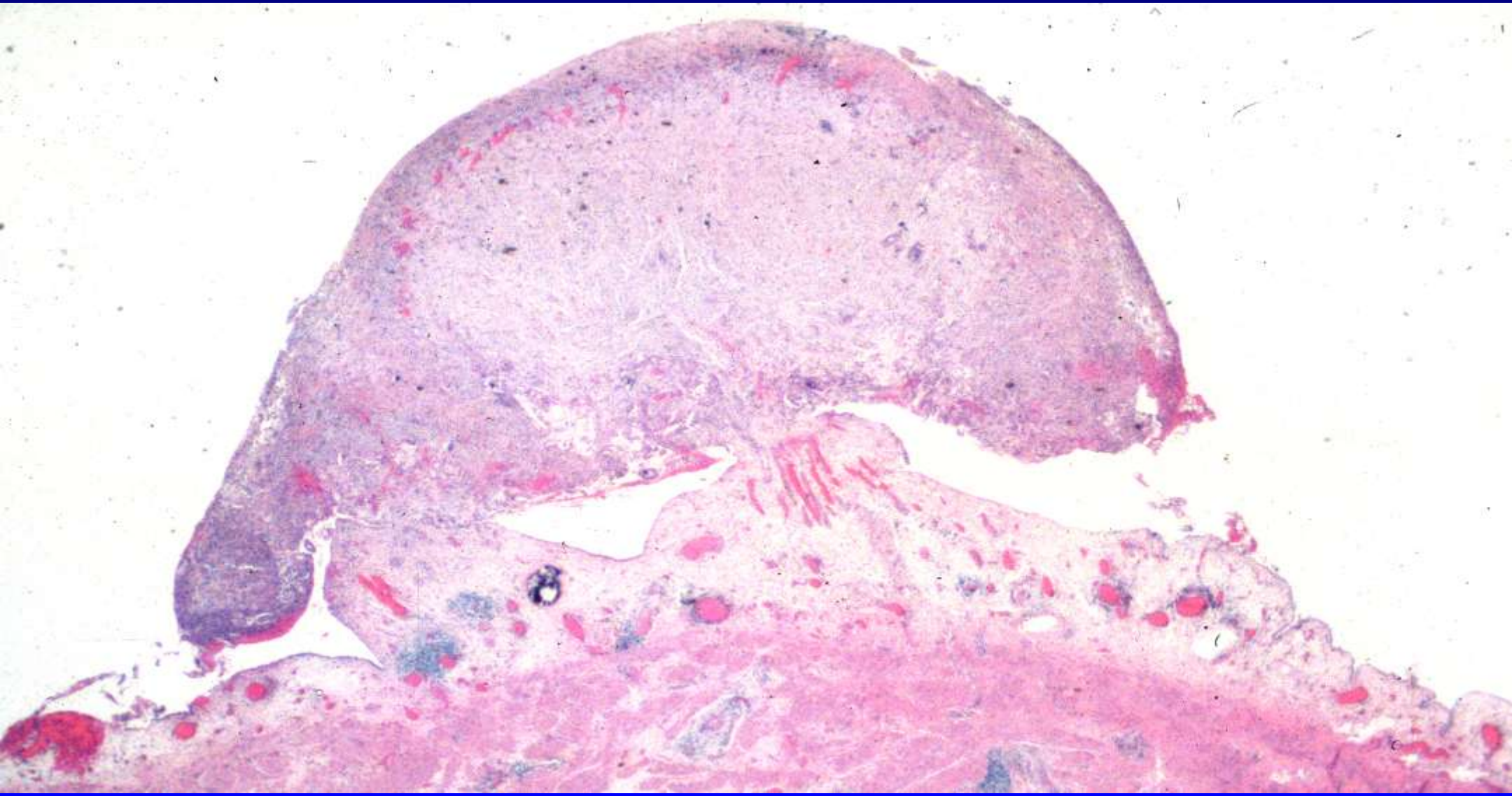
NON-INVASIVE IMPLANTS OF OVARIAN SEROUS BORDERLINE

NON-INVASIVE EPITHELIAL IMPLANT

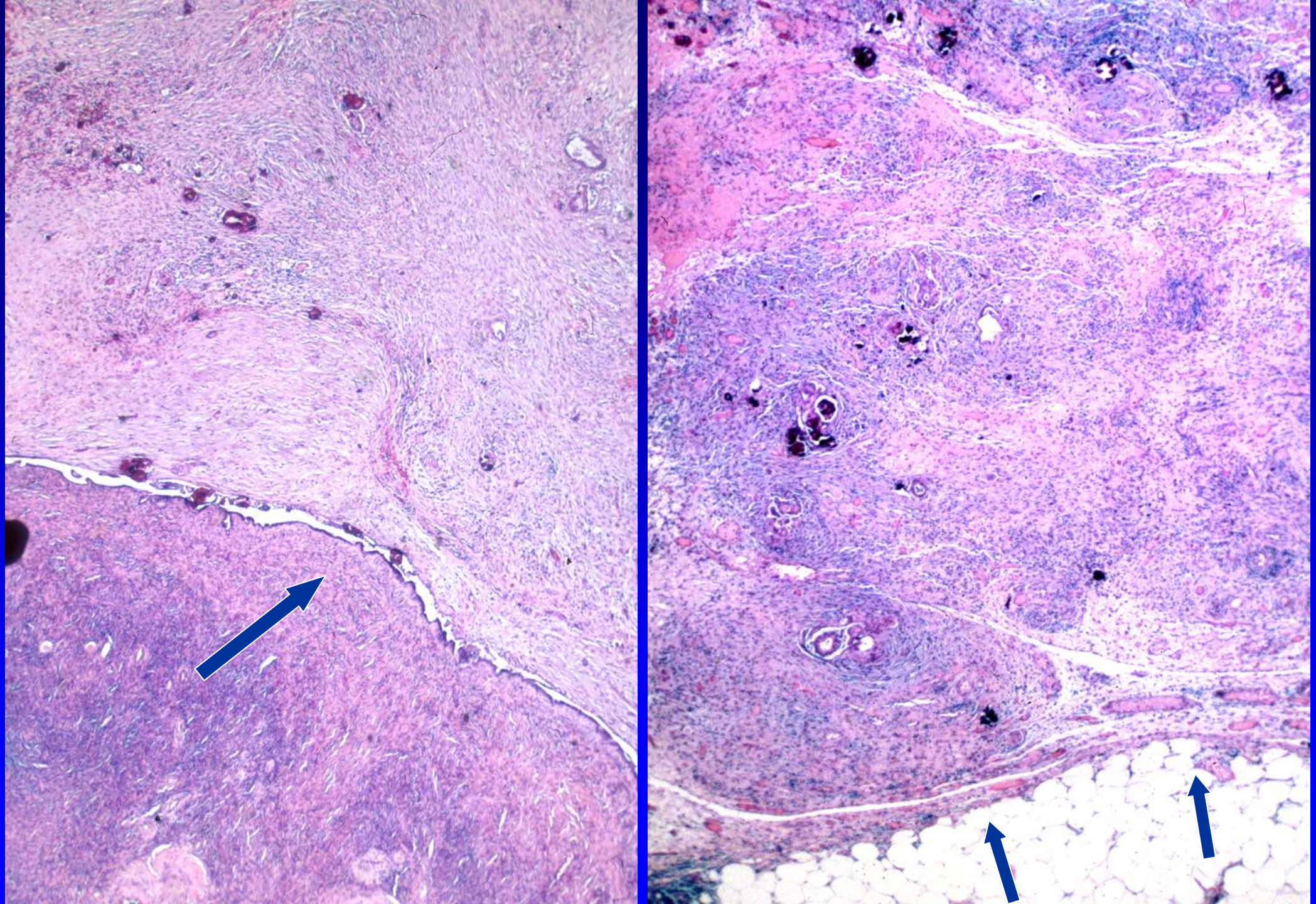




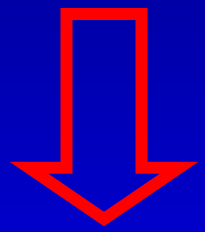
NON-INVASIVE DESMOPLASTIC IMPLANT



Sharp interphase: "stuck" on top of peritoneal surface



IMPORTANT CLINICAL HISTORY AND EXLORATION OF THE OVARIES



To distinguish non-invasive implants from an ovarian borderline tumor from a primary borderline tumor of the peritoneum

IMPLANTS IN OVARIAN SEROUS BORDERLINE TUMORS

- **Non-invasive implants have an histologic appearance identical to primary serous borderline tumors of the peritoneum**

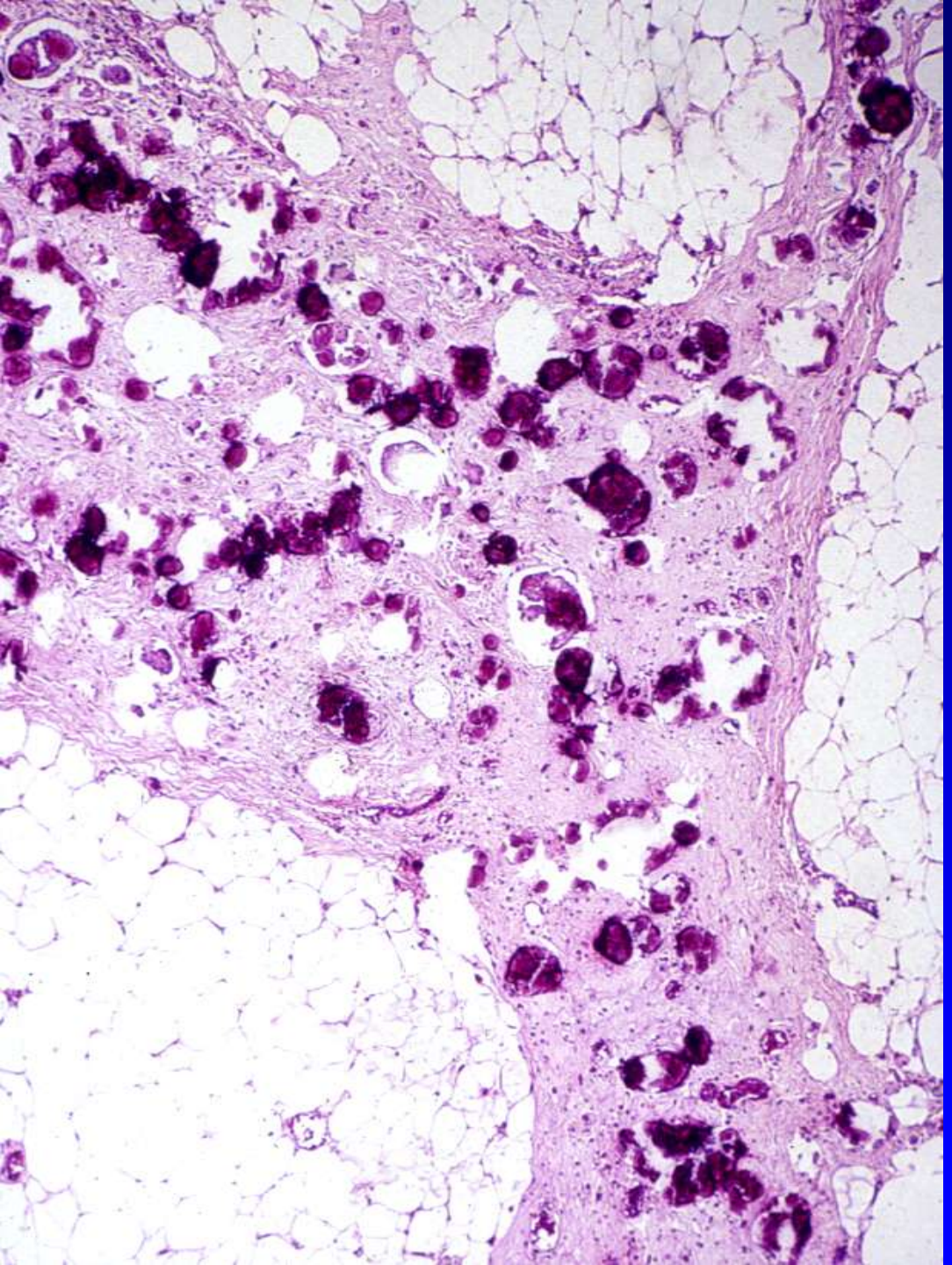
- **Invasive implants have an histologic appearance identical to primary serous carcinoma of the peritoneum**

⇩

Clinical information is always relevant to adequately classify these tumors

PERITONEAL SEROUS PSAMMOCARCINOMA

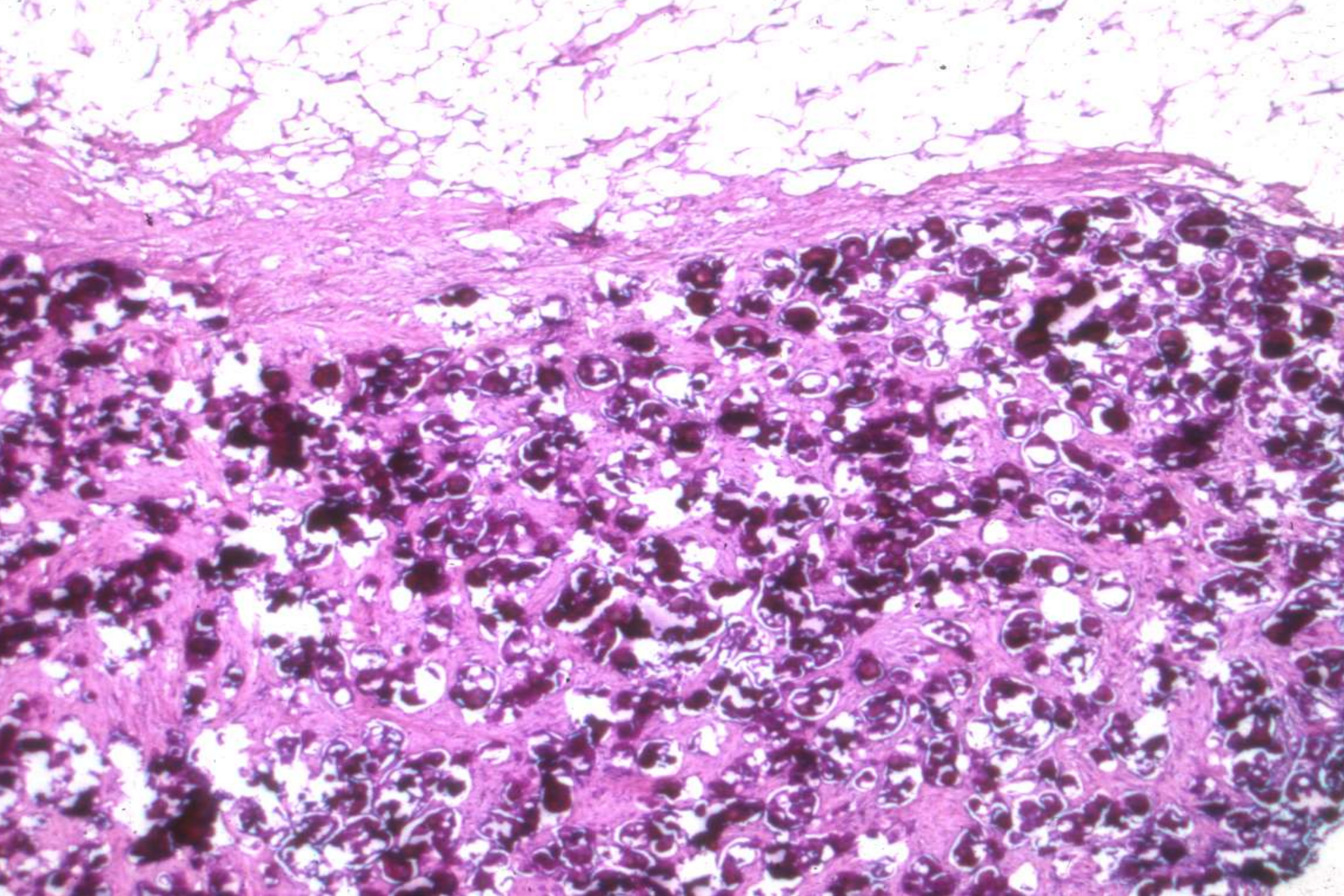
- **Age:** **18-76 years**
  (mean 48-57 years)
- S/S: **Abdominal mass**
  Increasing abdominal girth
  Incidental (43%)
  Psammoma bodies on pap
- **Location:** **Peritoneum or ovary**

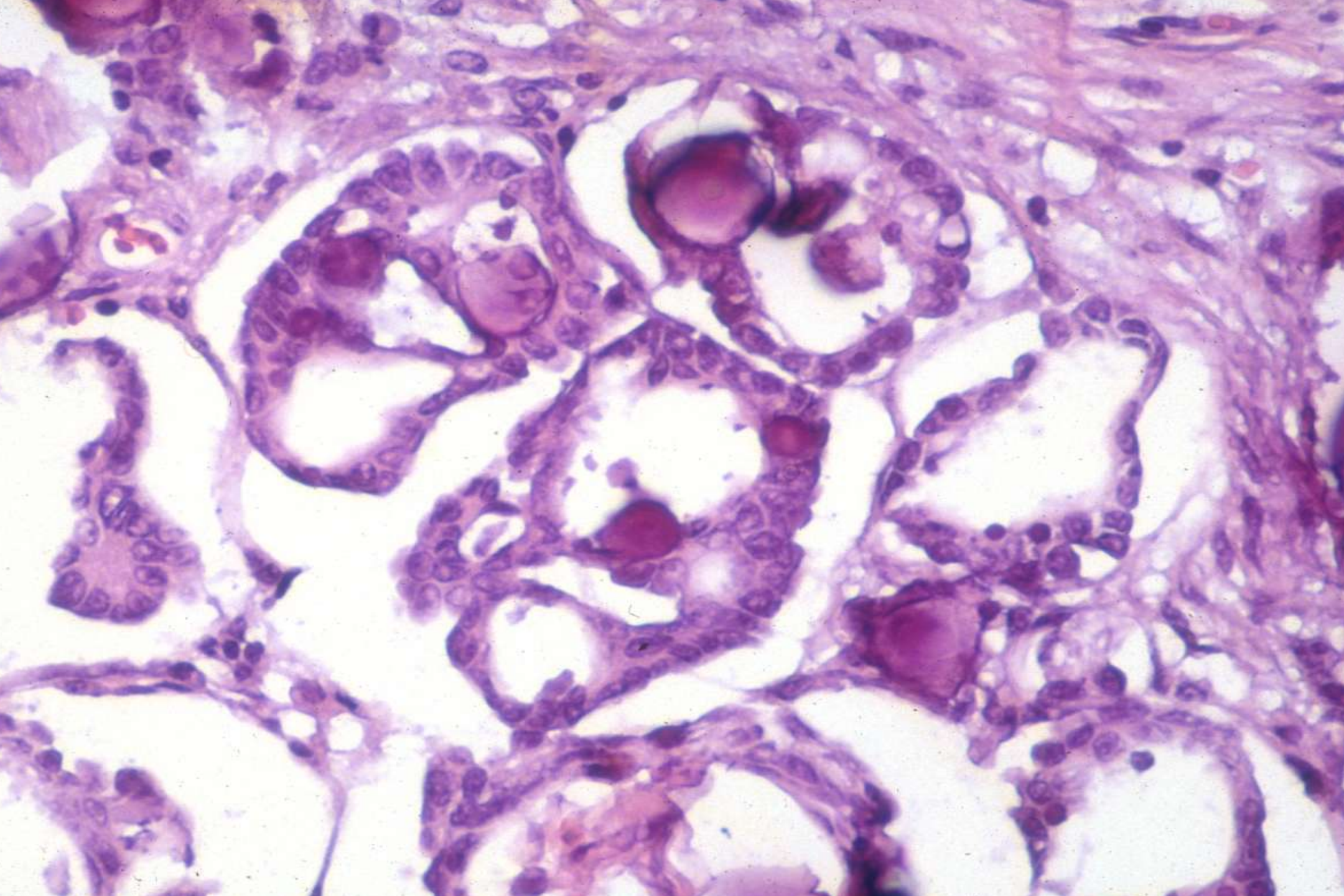


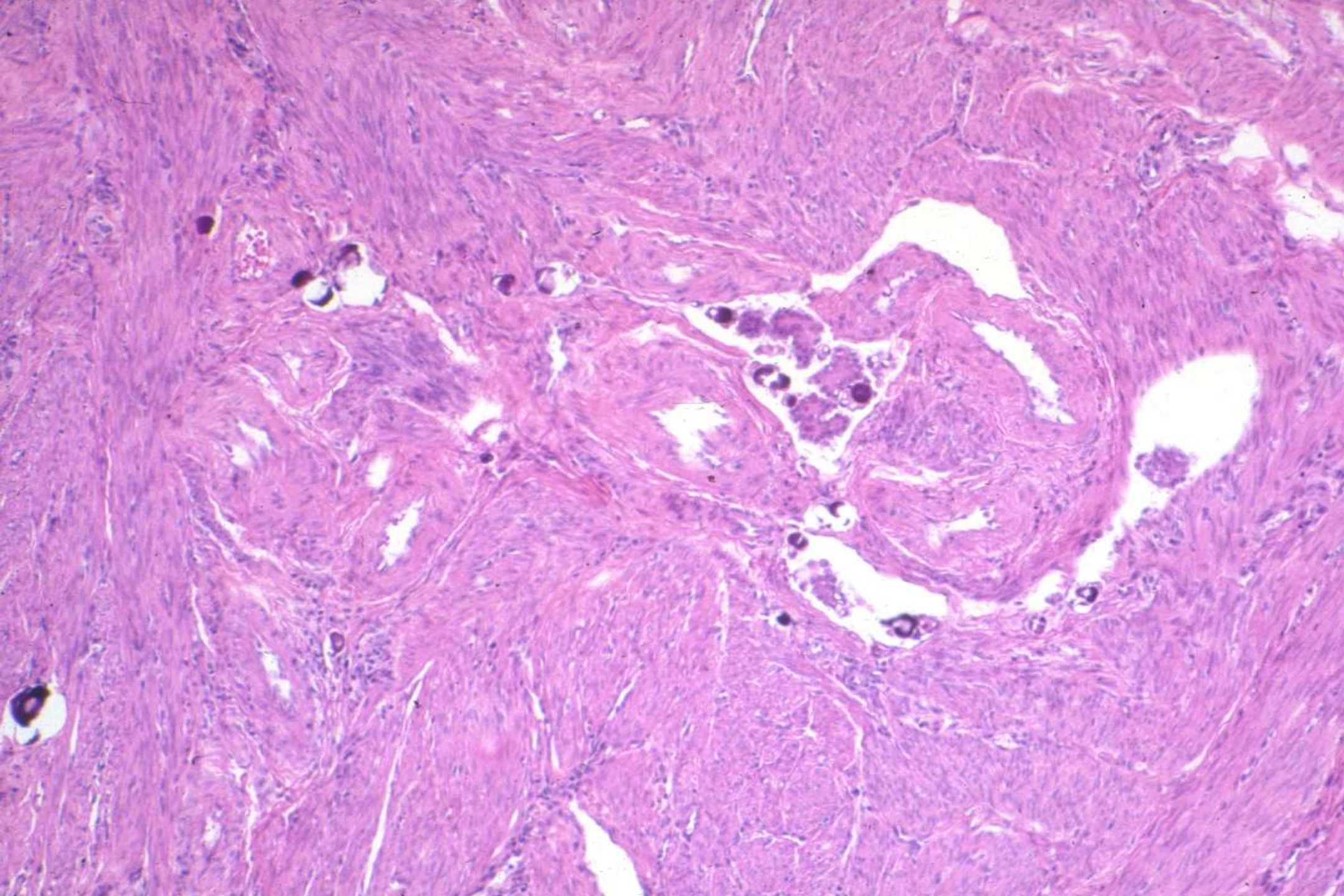
Psammocarcinoma

Diagnostic Criteria:

1. >75% tumor epithelium associated with psammoma bodies
2. No more than moderate cytologic atypia
3. Tissue/lymphovascular invasion present
4. Occasional solid epithelial proliferation (nests<15 cells)



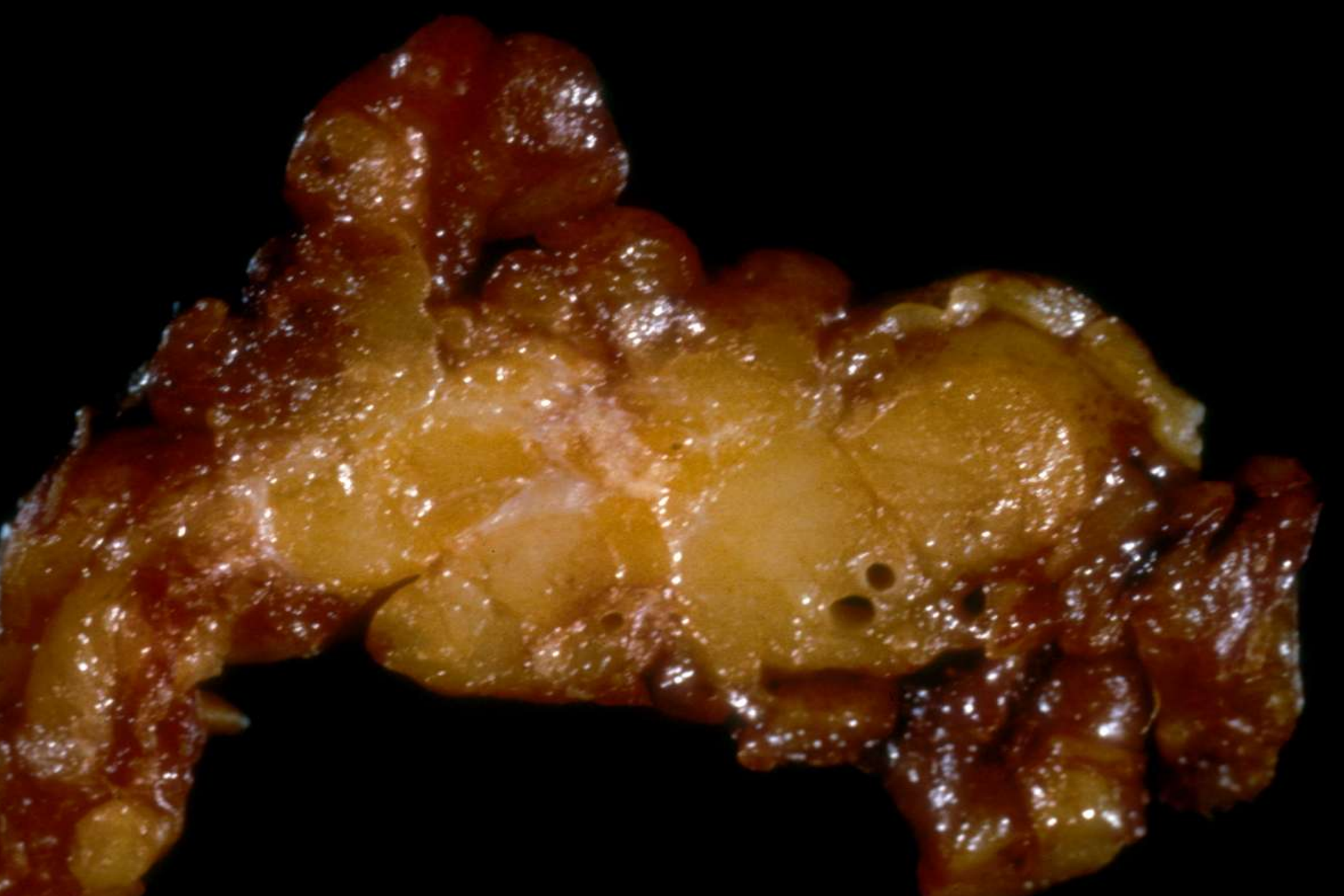


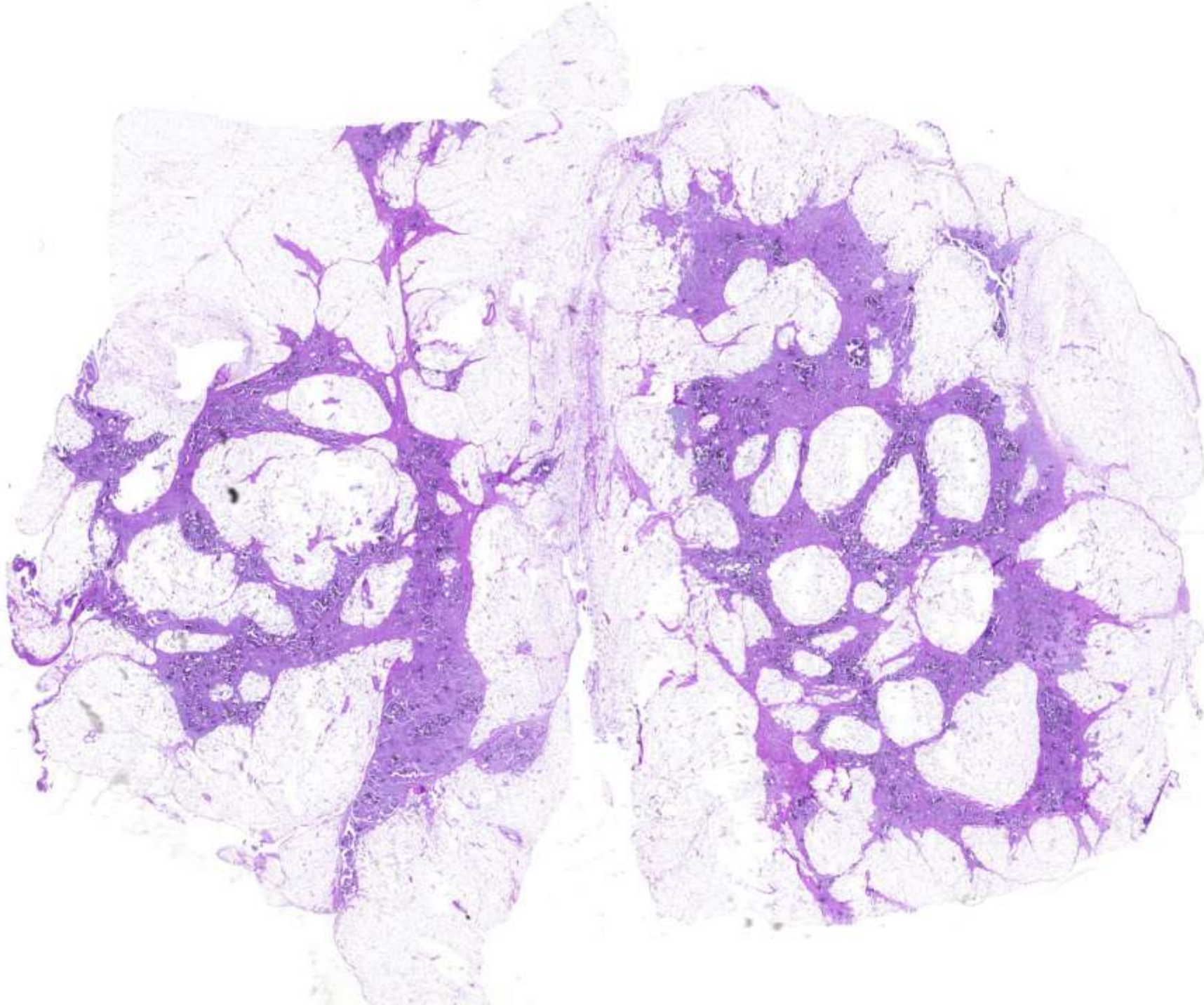


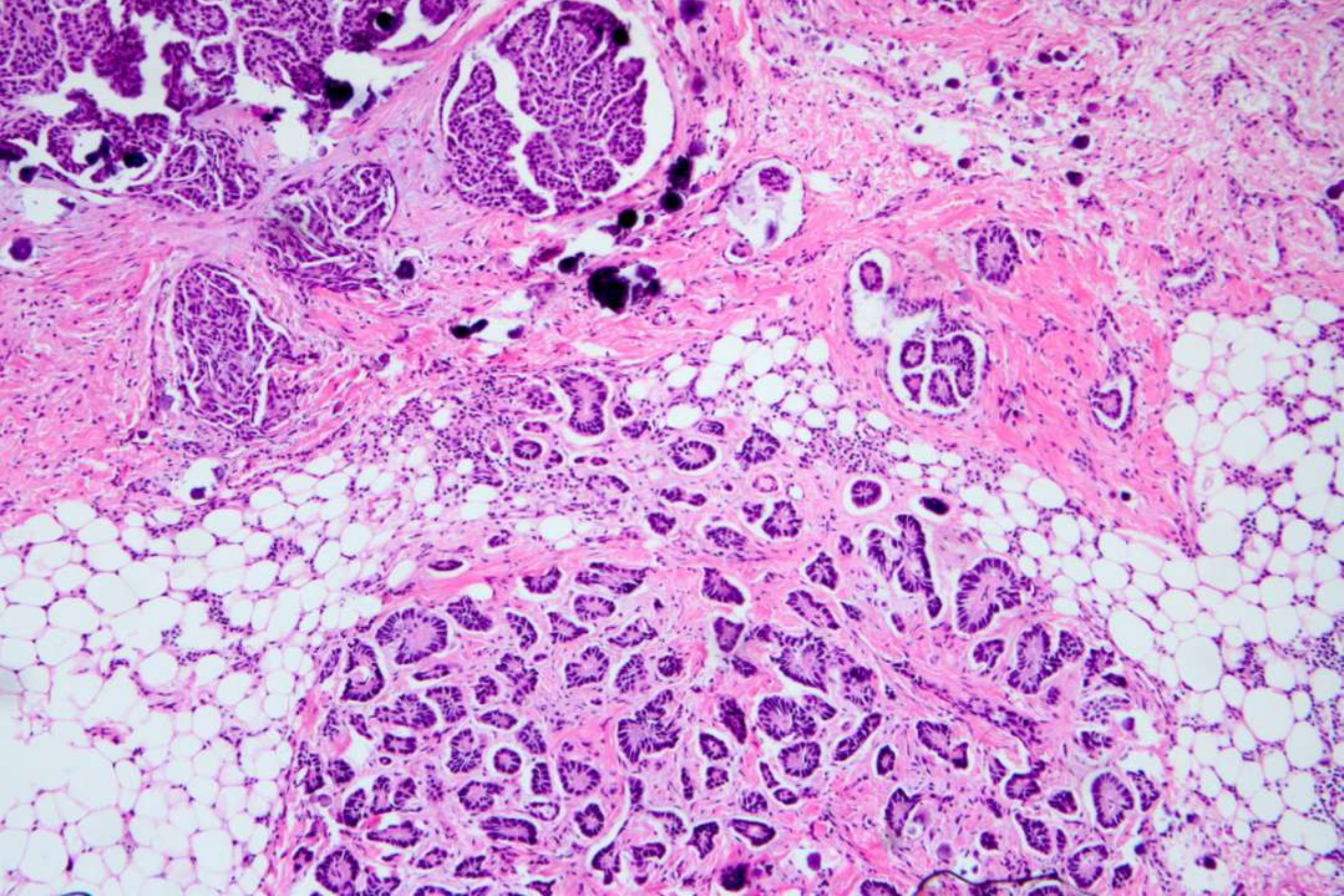
GRADE I PERITONEAL SEROUS CA

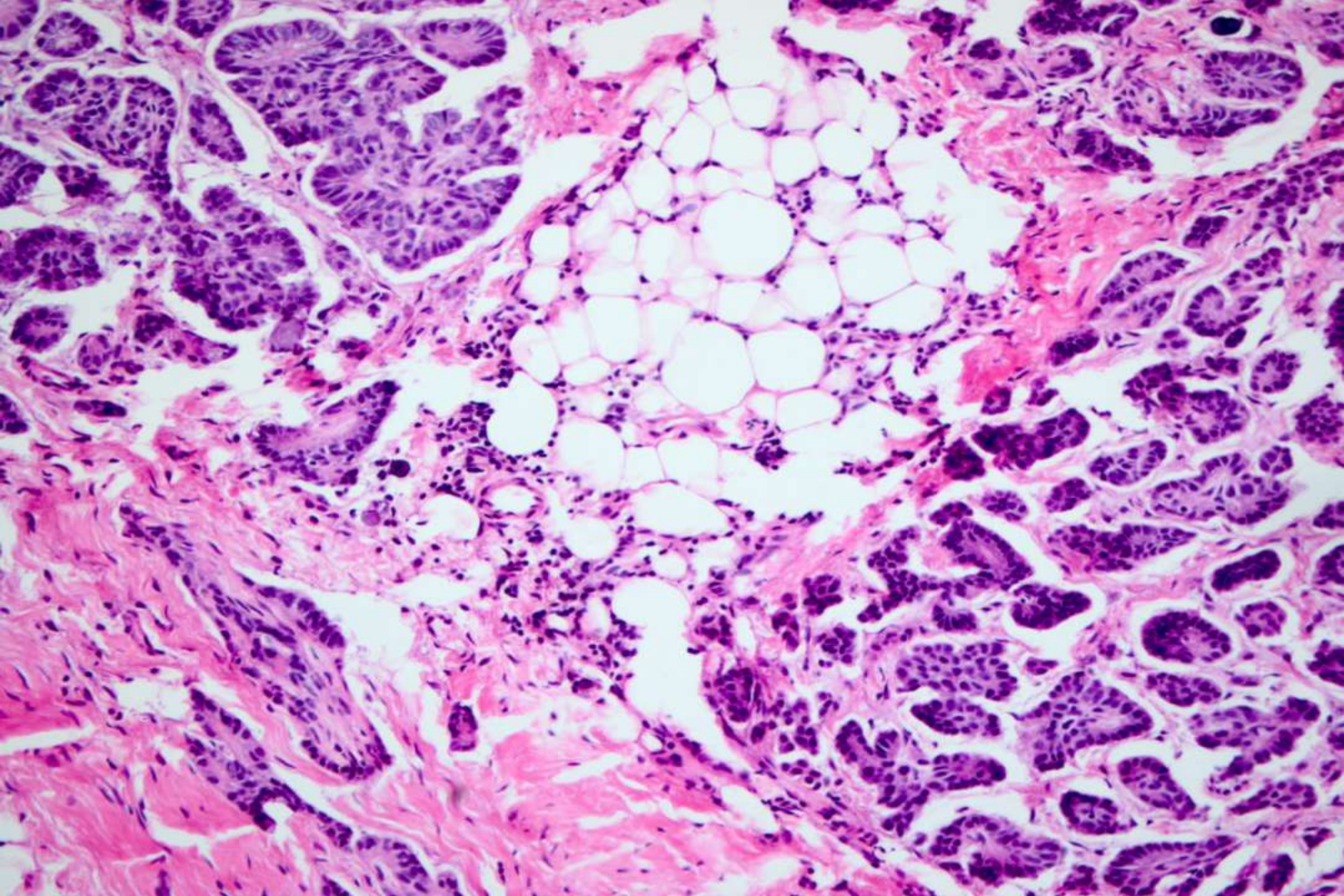
Weir et al., Am J Surg Pathol 1998

- **Morphologic resemblance to invasive implants of ovarian serous borderline tumors**
- **No high grade nuclear atypia**
- **Tissue and lymphovascular invasion**
- **May show extensive psammomatous calcification**
- **Adequate sampling necessary with highest yields of invasive foci in *omental* samples**

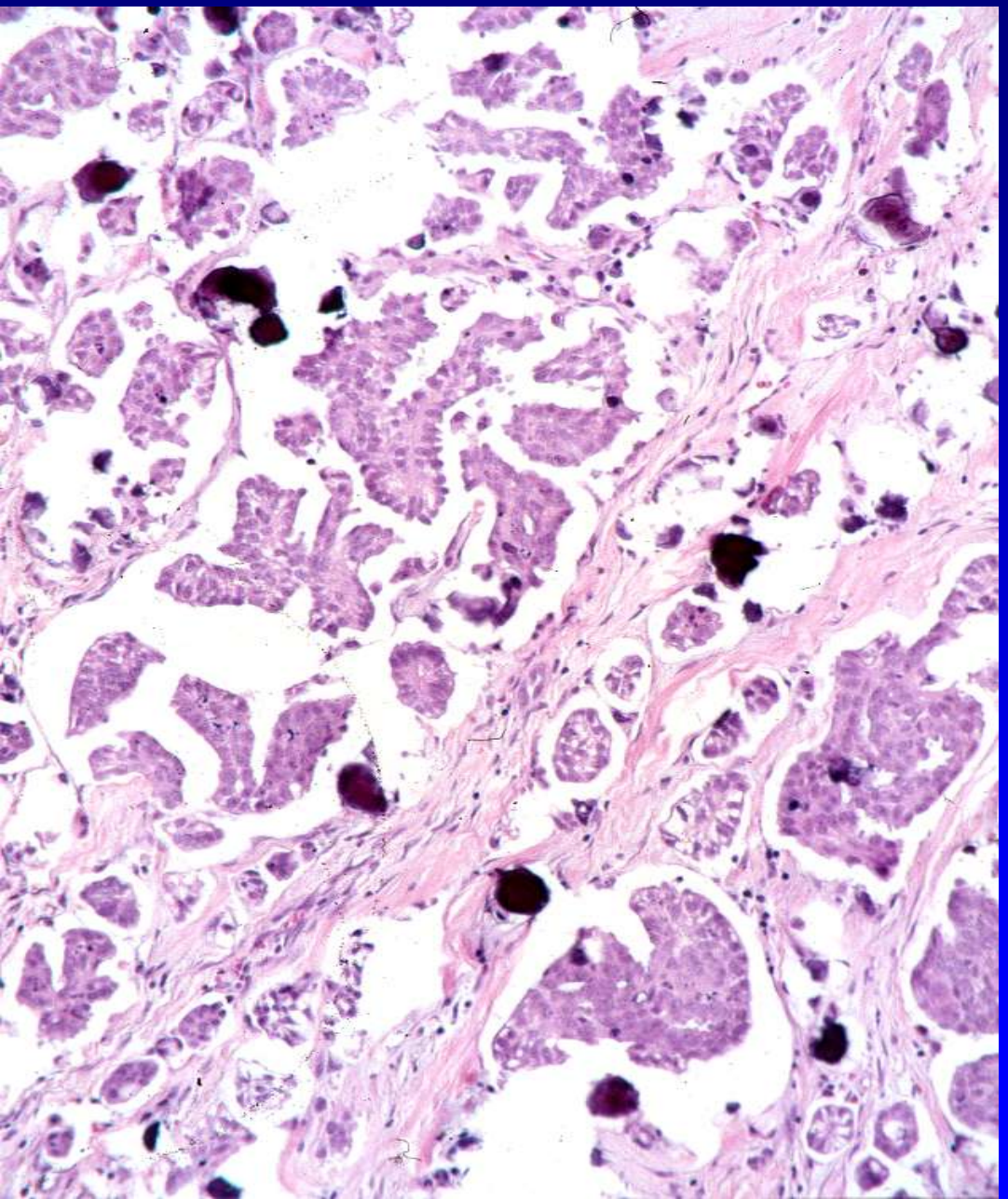


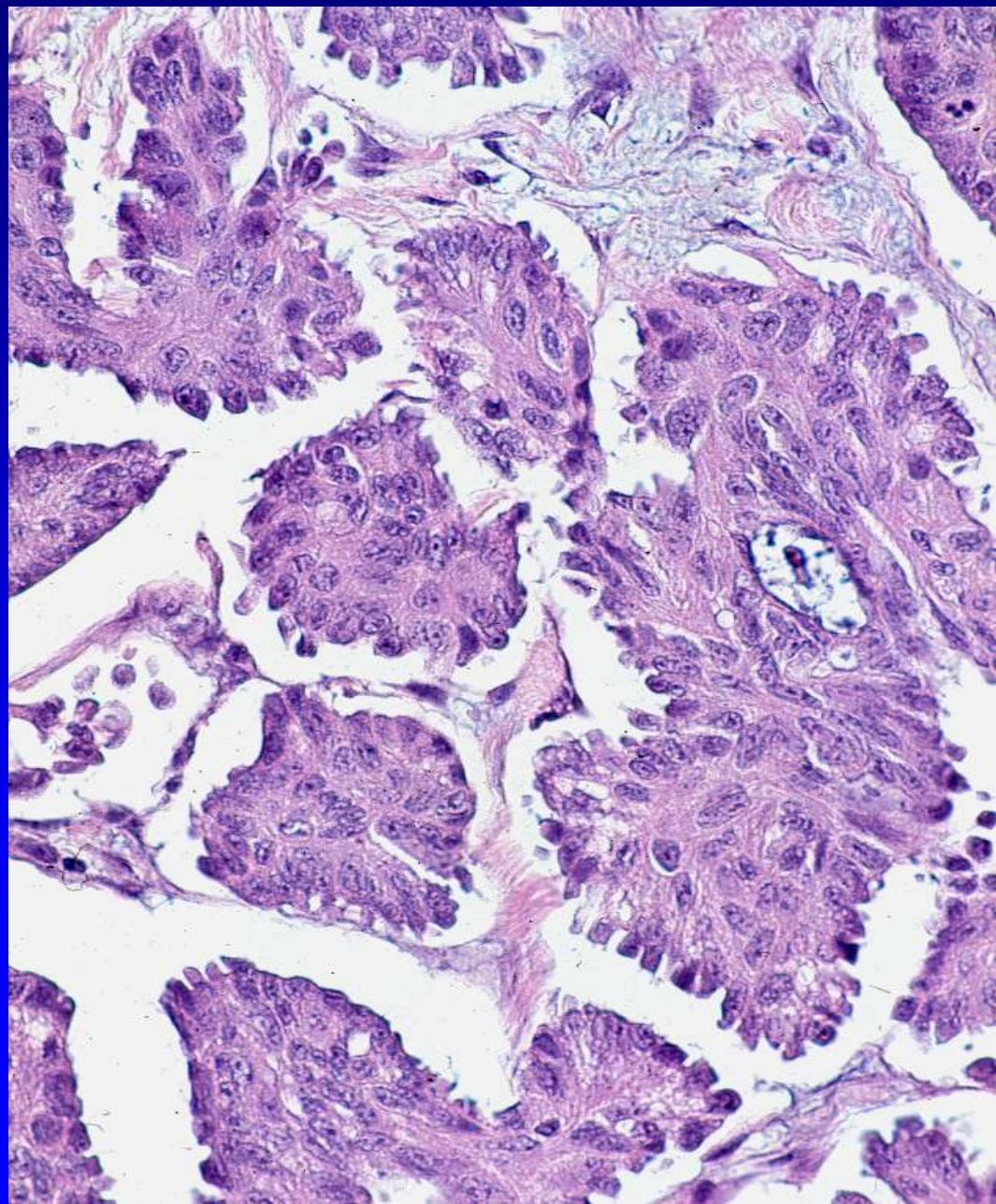


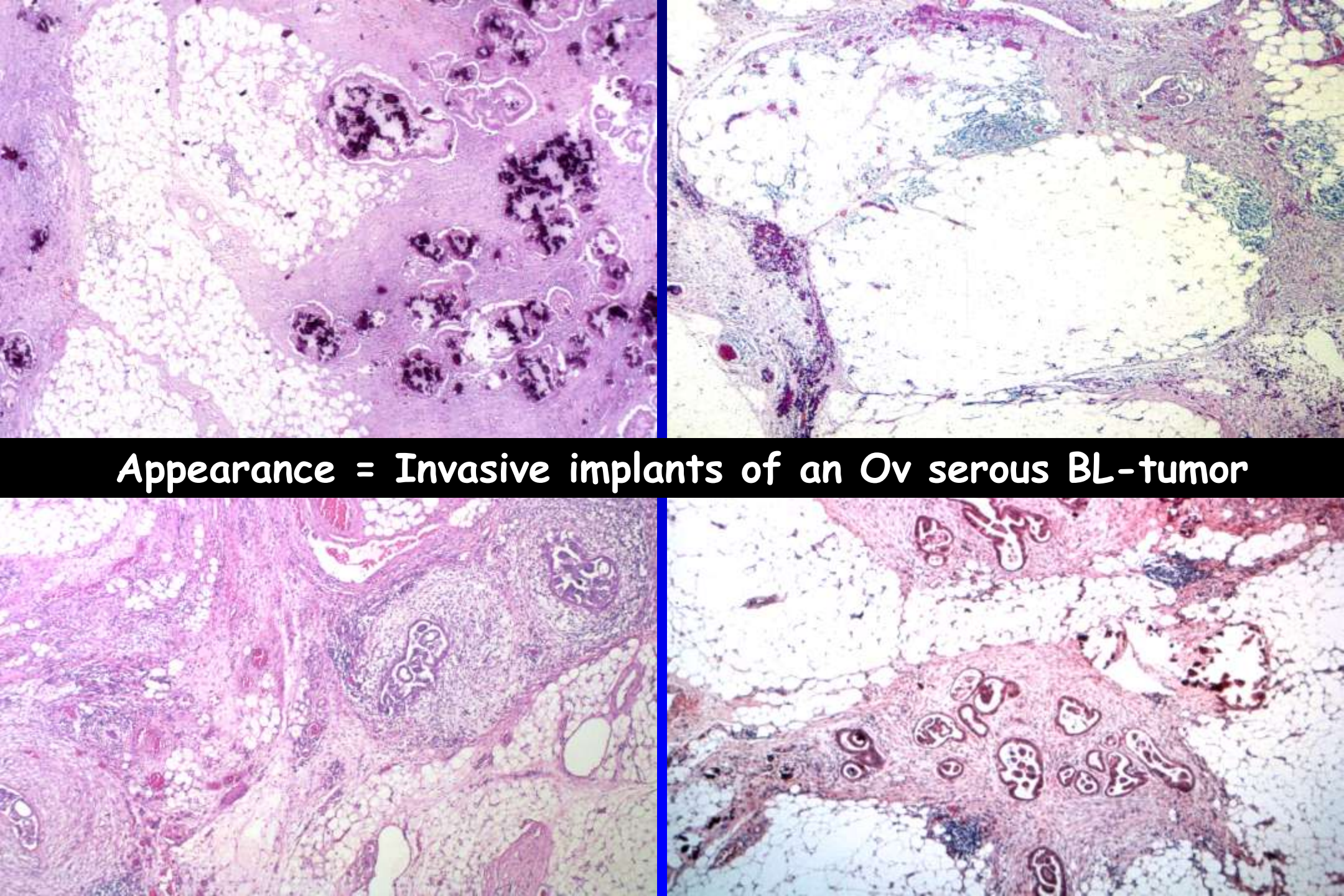




Low-Grade Peritoneal Serous Carcinoma





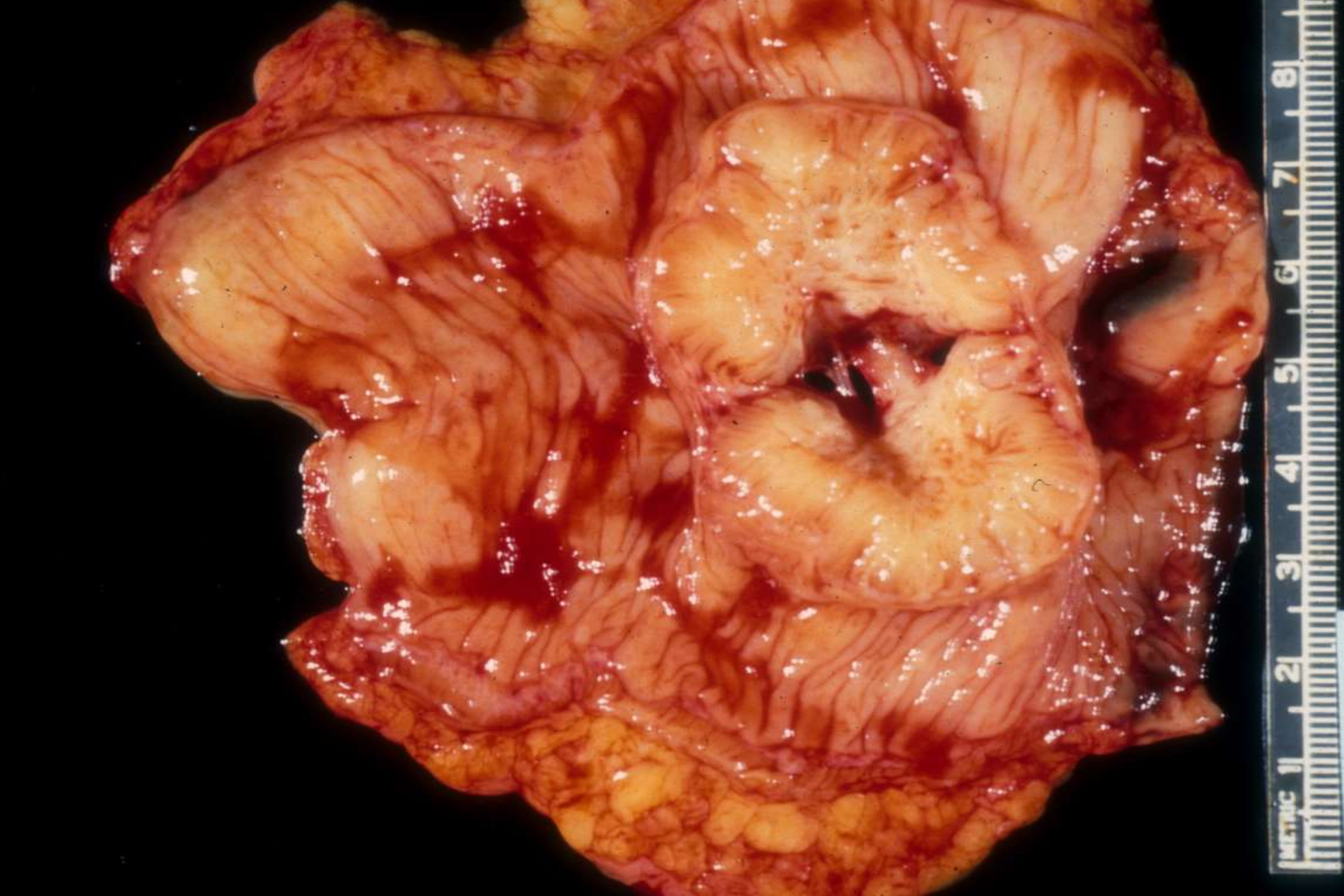


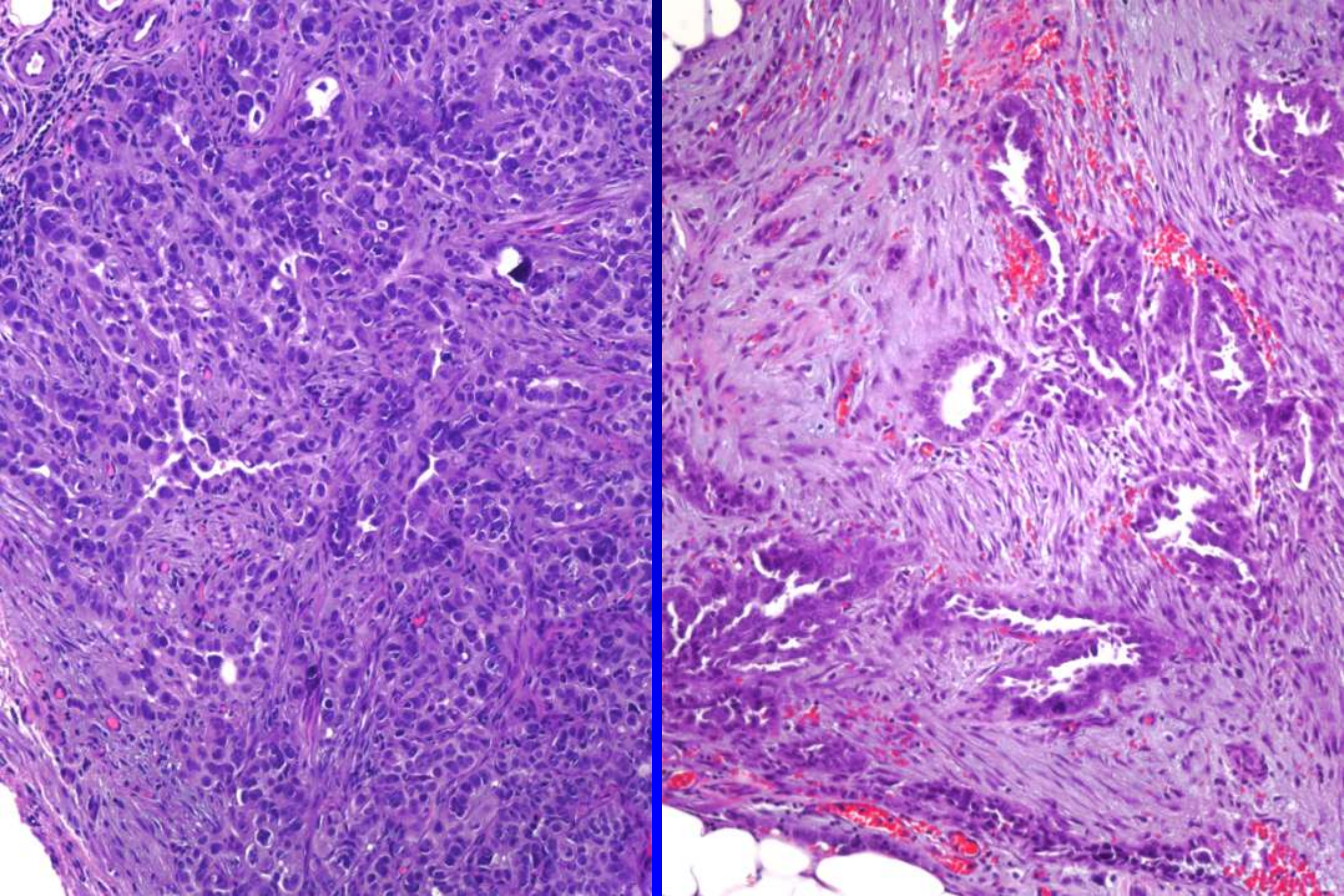
Appearance = Invasive implants of an Ov serous BL-tumor

HIGH-GRADE PERITONEAL SEROUS CARCINOMA

- **Age: 55-60 years**
- **S/S: Abdominal distention or mass, or ascites**

  Clinically apparent
- **BRCA related**





SEROUS CARCINOMA:GRADING

Malpica A, Am J Surg Pathol 2004;28:496-504

- **LOW-GRADE:**

  Mild to moderate nuclear atypia and
  ≤ 12 mitoses/10 HPFs

- **HIGH-GRADE:**

  Severe nuclear atypia and > 12 mitoses/10HPFs

GOOD REPRODUCIBILITY


cm
1
2
3
4

CRITERIA FOR PERITONEAL VS OVARIAN SEROUS CARCINOMA

- **Ovaries are normal in size or enlarged by a benign process**
- **Extraovarian involvement > ovarian surface involvement**
- **Microscopically:**
  - **- Ovarian tumor is absent**
  - **- Cortical involvement is < 5 x 5 mm**
  - **- Tumor is predominantly serous**

PERITONEAL SEROUS CARCINOMA

Histogenesis

- **Many are polyclonal proliferations=multifocal**
- **Peritoneal serous carcinomas in patients with BRCA1 mutations:**

  - more frequently polyclonal than in patients without mutation (63 vs 7%)

  - greater frequency of p53 mutations (89 vs 47%)

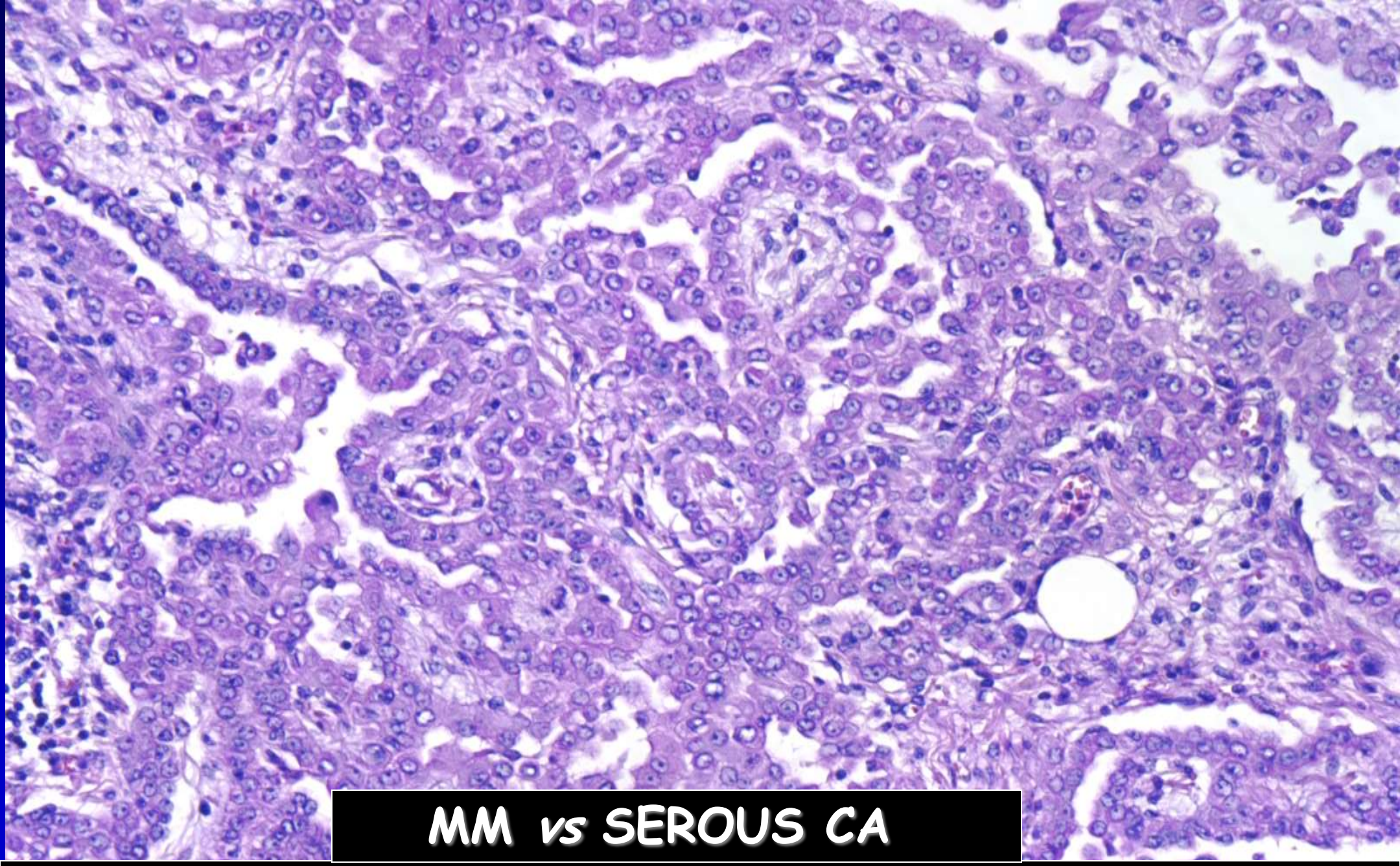
  - may have a unique molecular pathogenesis

PERITONEAL HIGH-GRADE SEROUS CA

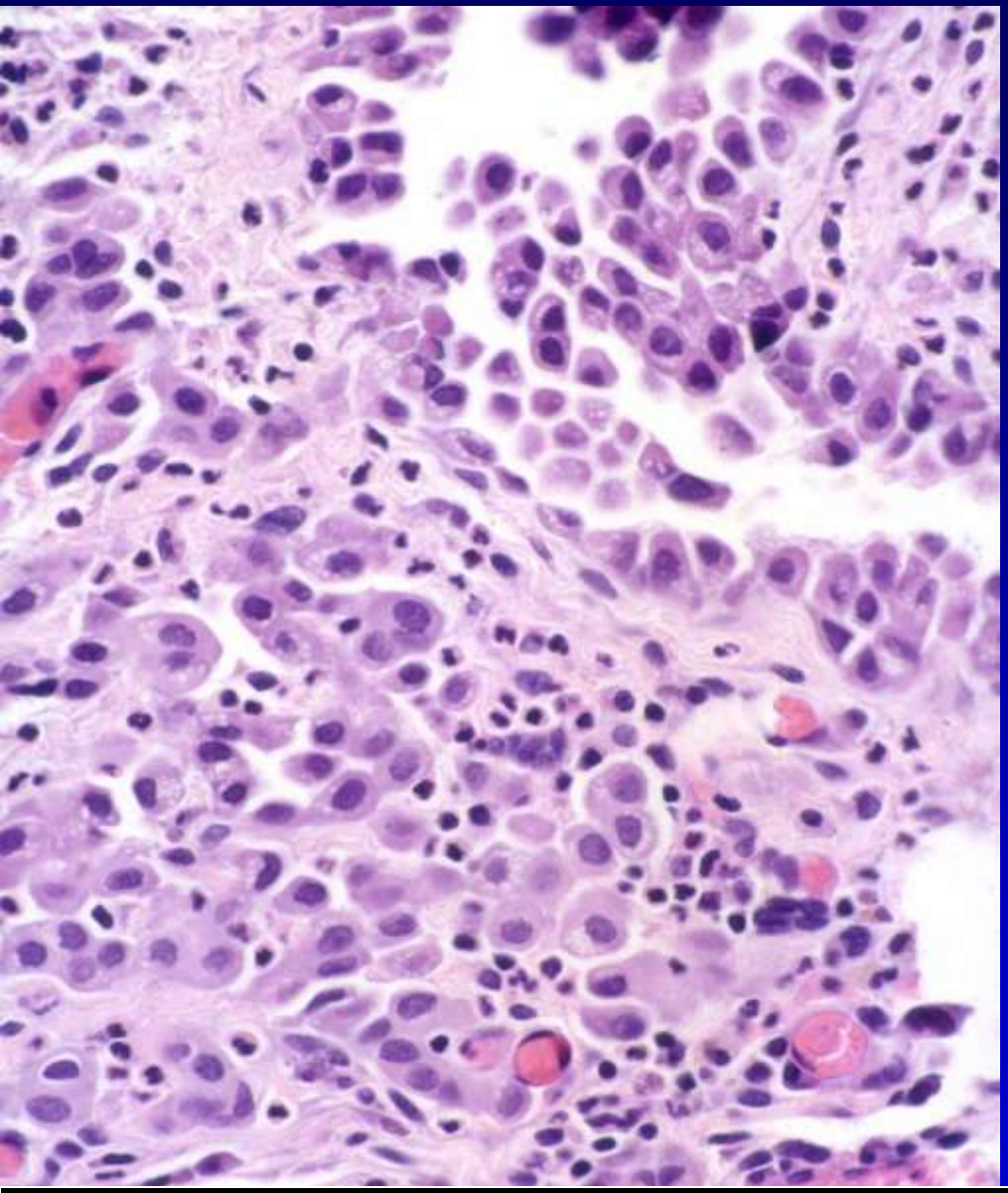
Differential Diagnosis

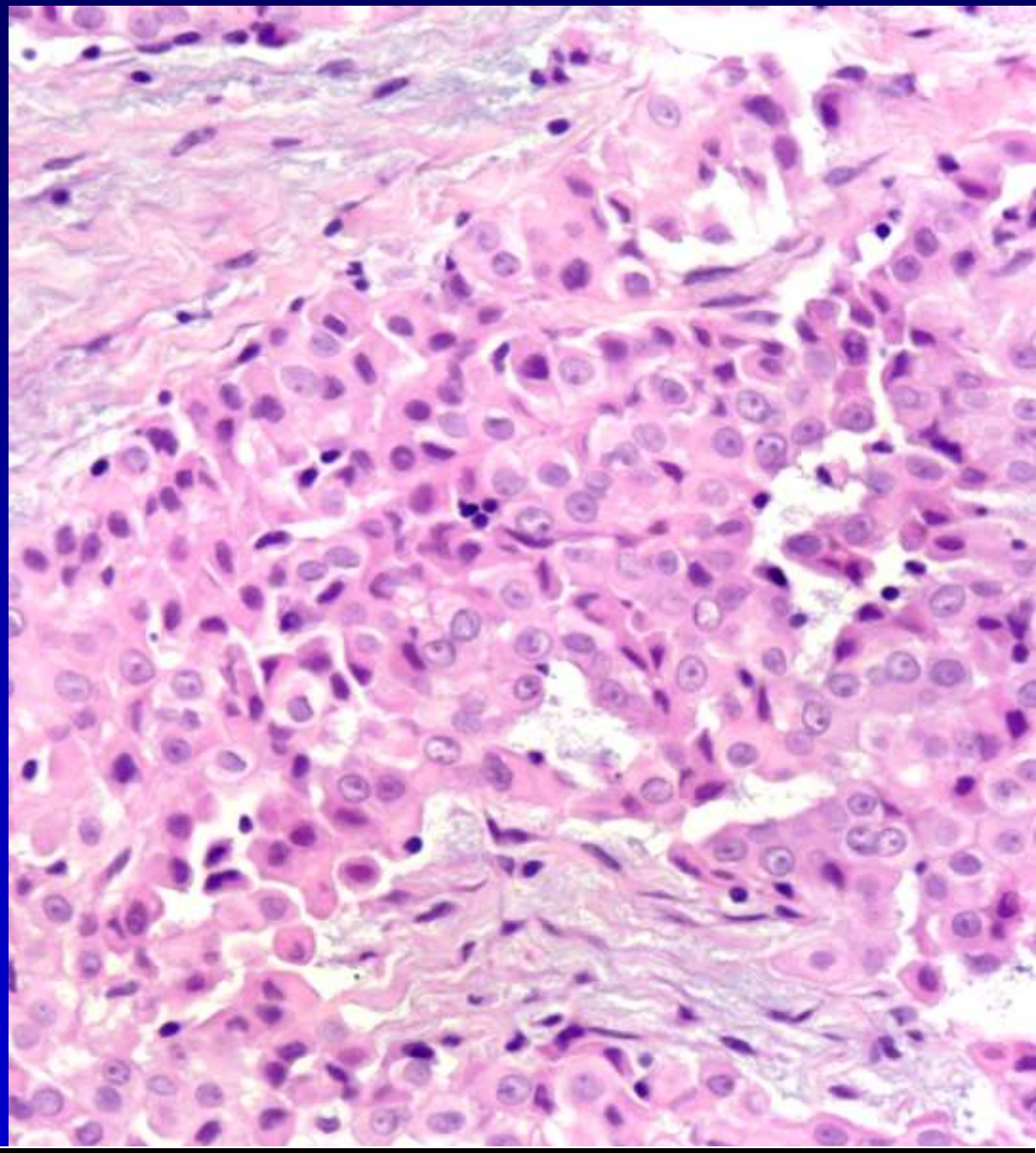
Malignant mesothelioma

Metastatic carcinoma


MM vs SEROUS CA
NO HIERARCHICAL BRANCHING; NO BUDDING

DIFFUSE MALIGNANT MESOTHELIOMA





Atypia often mild to moderate and mitotic activity 1-5/10HPFs

PERITONEAL DMM *vs* CARCINOMA

	PDMM	Carcinoma
• Architecture	Blunt papillae	Hierarchical
•		slit like spaces
• Hyalinization	Present	Absent
• Stratification	Absent or minimal	Common
• Atypia	Mild to moderate	Severe
• Nuclei	Relatively uniform	Pleomorphic
• Psam bodies	Rare	Frequent

MALIGNANT MESOTHELIOMA *vs* SEROUS CA

- **Positive serous carcinoma markers present a higher degree of sensitivity and specificity than mesothelioma markers**

- **MOC-31, Ber-EP4 and ER: Best serous carcinoma markers for distinguishing serous ca from peritoneal epithelioid mesothelioma**

- **Calretinin: Most useful among mesothelioma markers. A negative staining strongly excludes mesothelioma**

- **Recently h-caldesmon and D2-40 have been found to be very helpful in the differential diagnosis between malignant mesothelioma (+) and serous ca (-)**

MESOTHELIOMA *vs* SEROUS CA

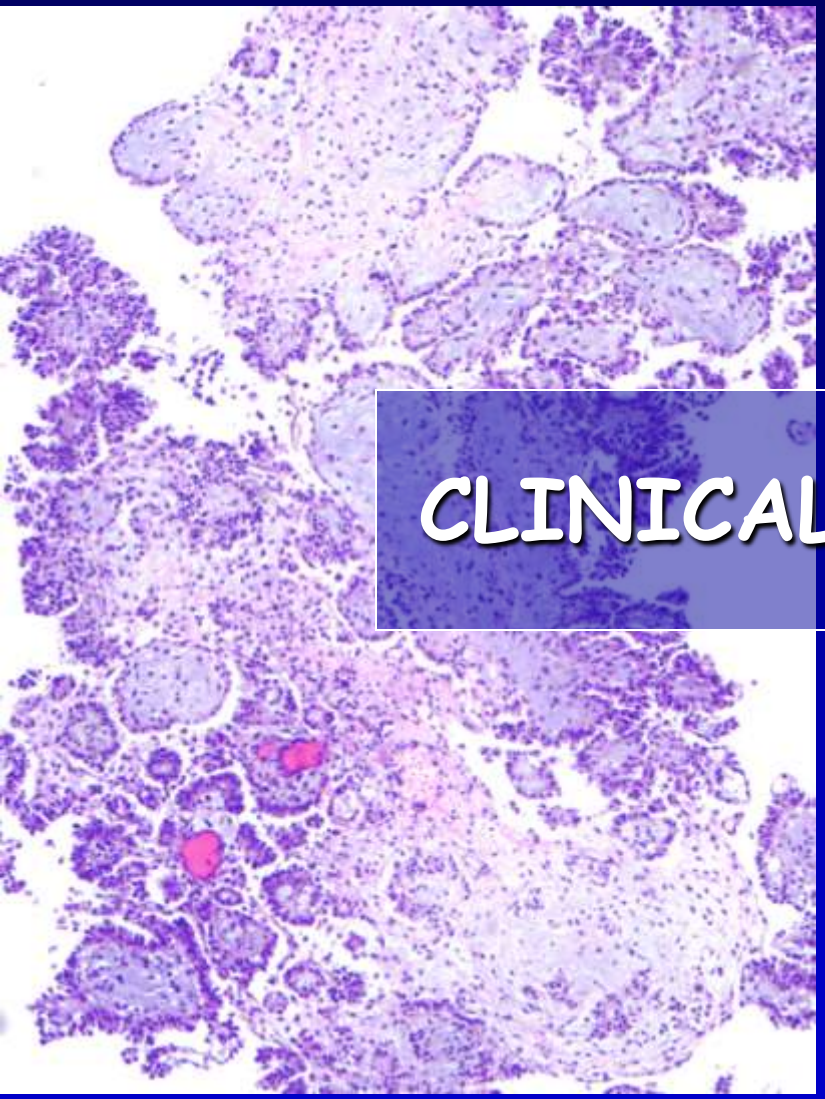
Most useful immunohistochemical panel includes a combination of:

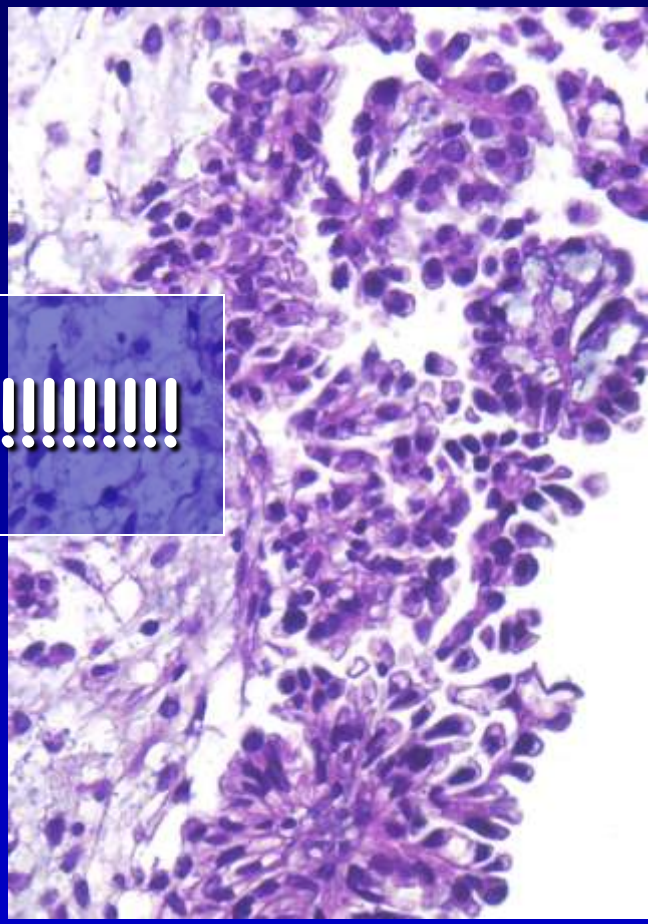
MOC-31 or Ber-EP4

ER

CALRETININ

SEROUS TUMOR vs MESOTHELIOMA





CLINICAL HISTORY!!!!!!!!!!!!!!!!!!!!

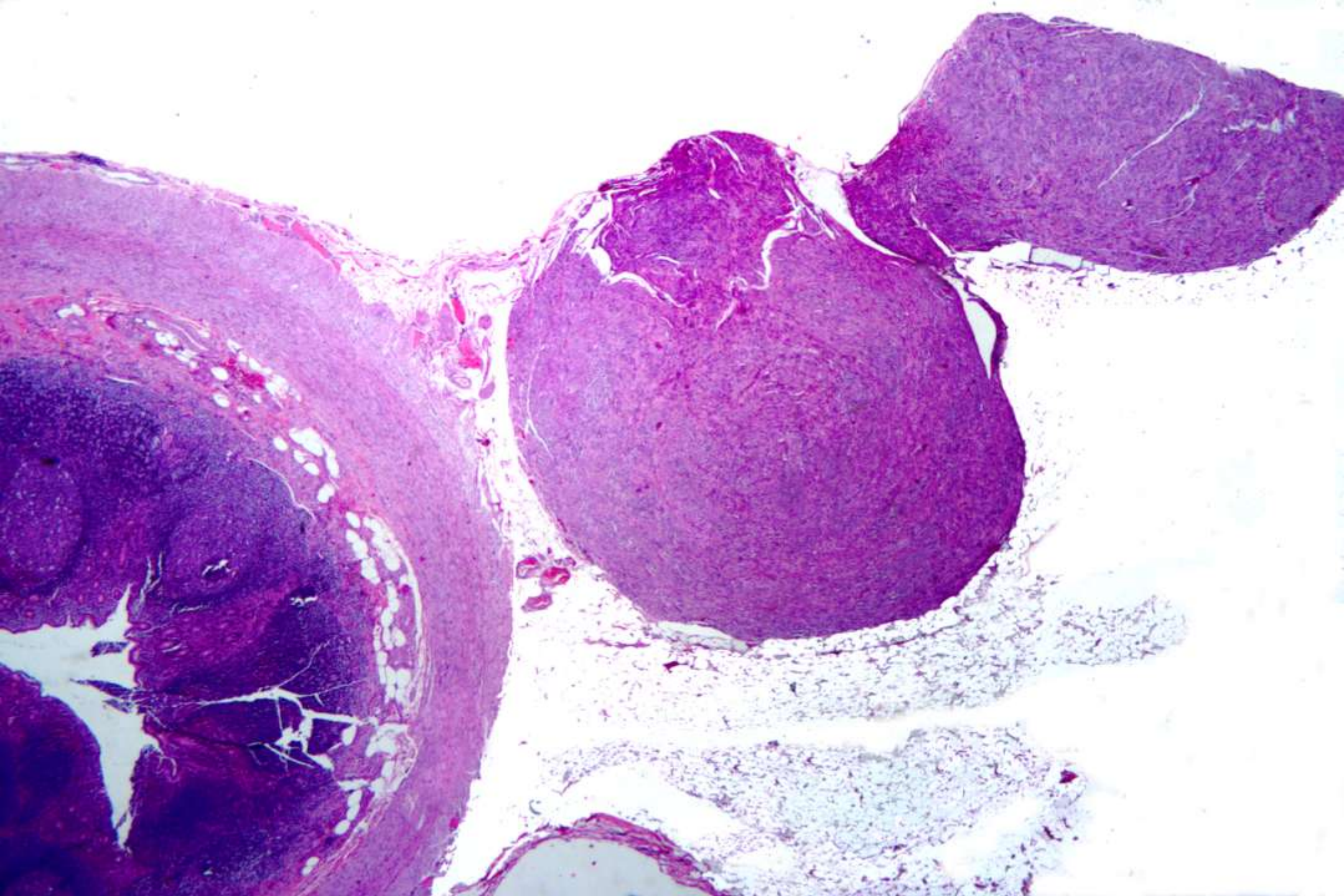
IMMUNO:

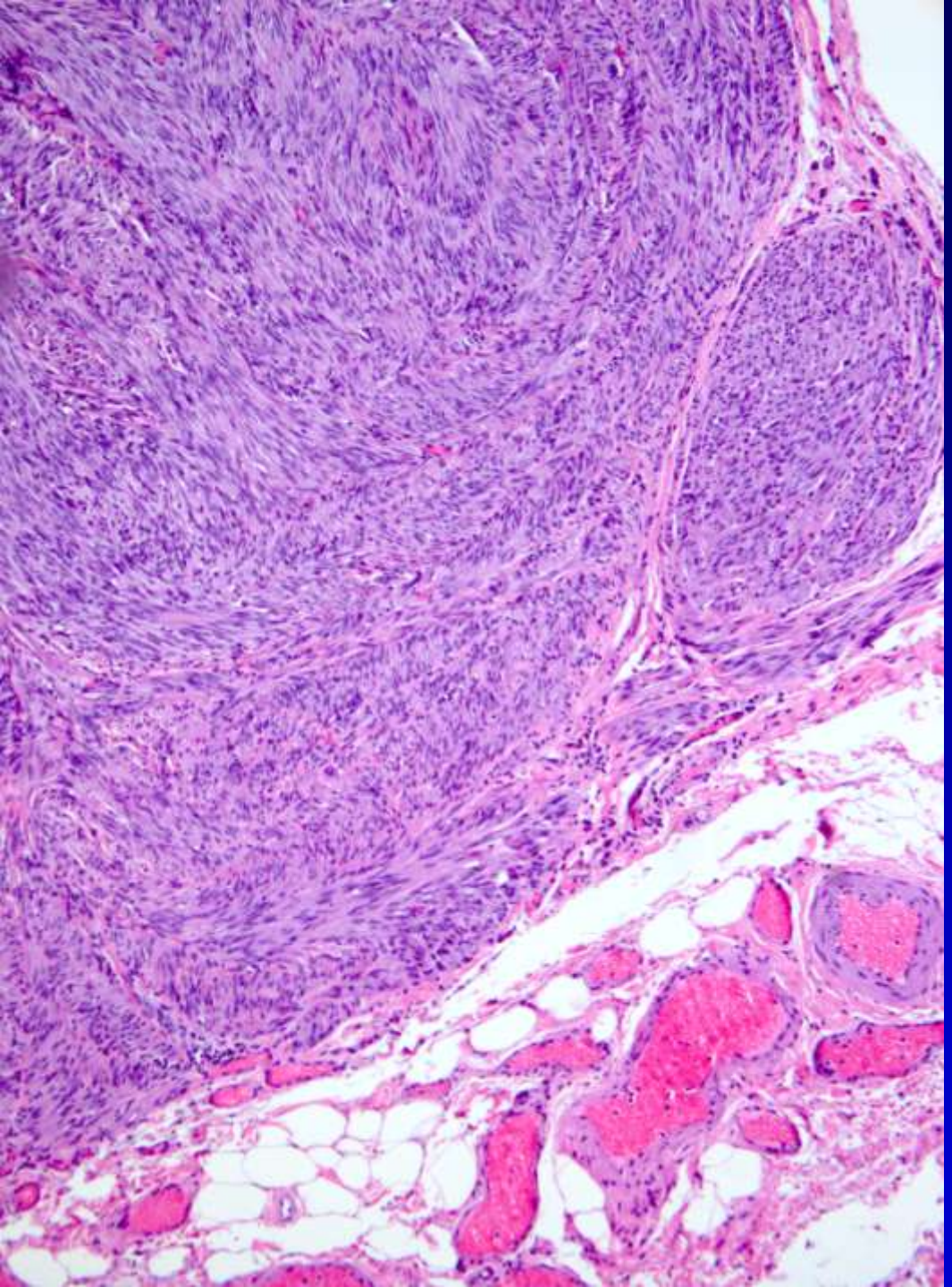
BerEP4 +; Calretinin +; CK5/6 focally +
B72.3 only a few + cells; CD15 -

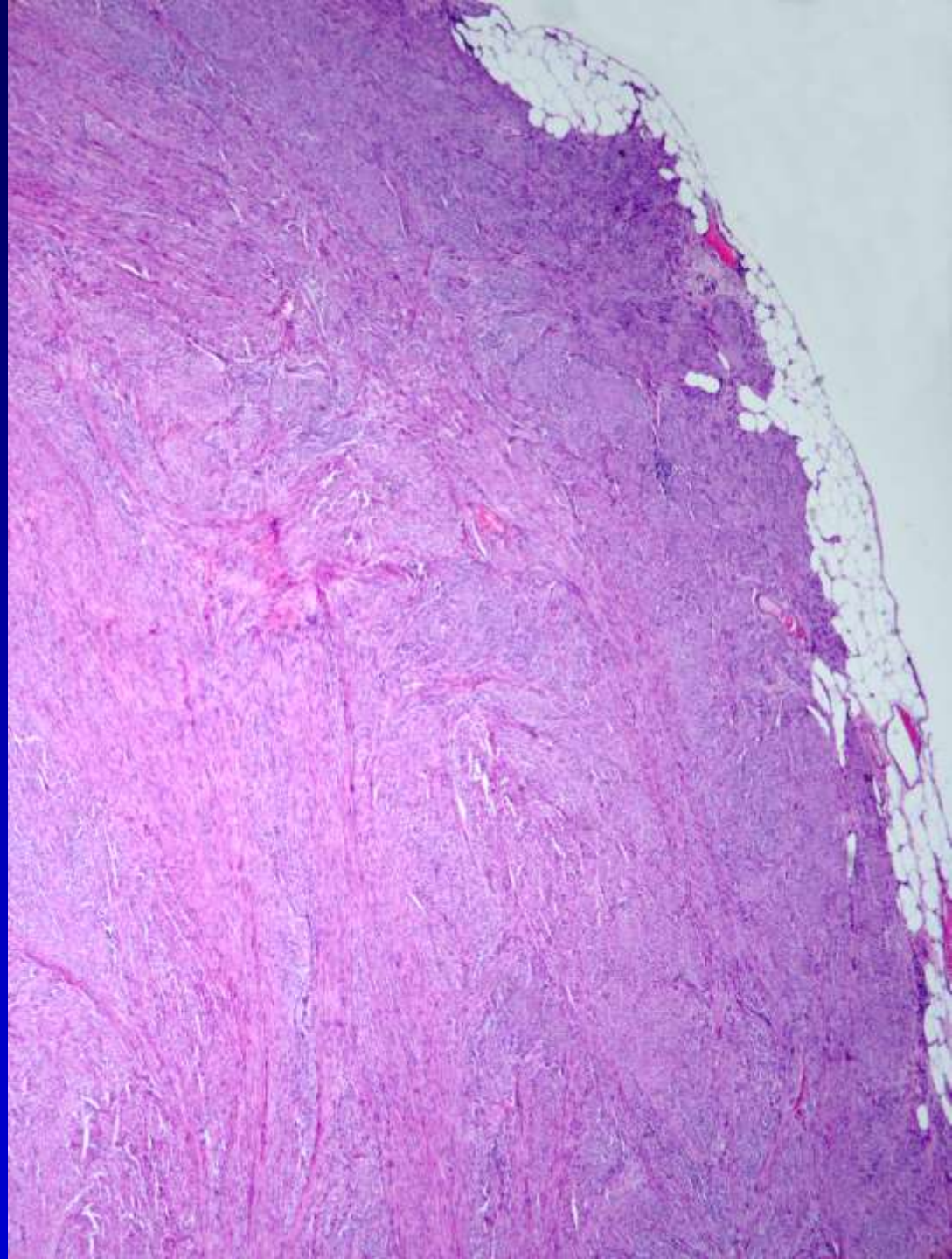
CLINICAL HISTORY

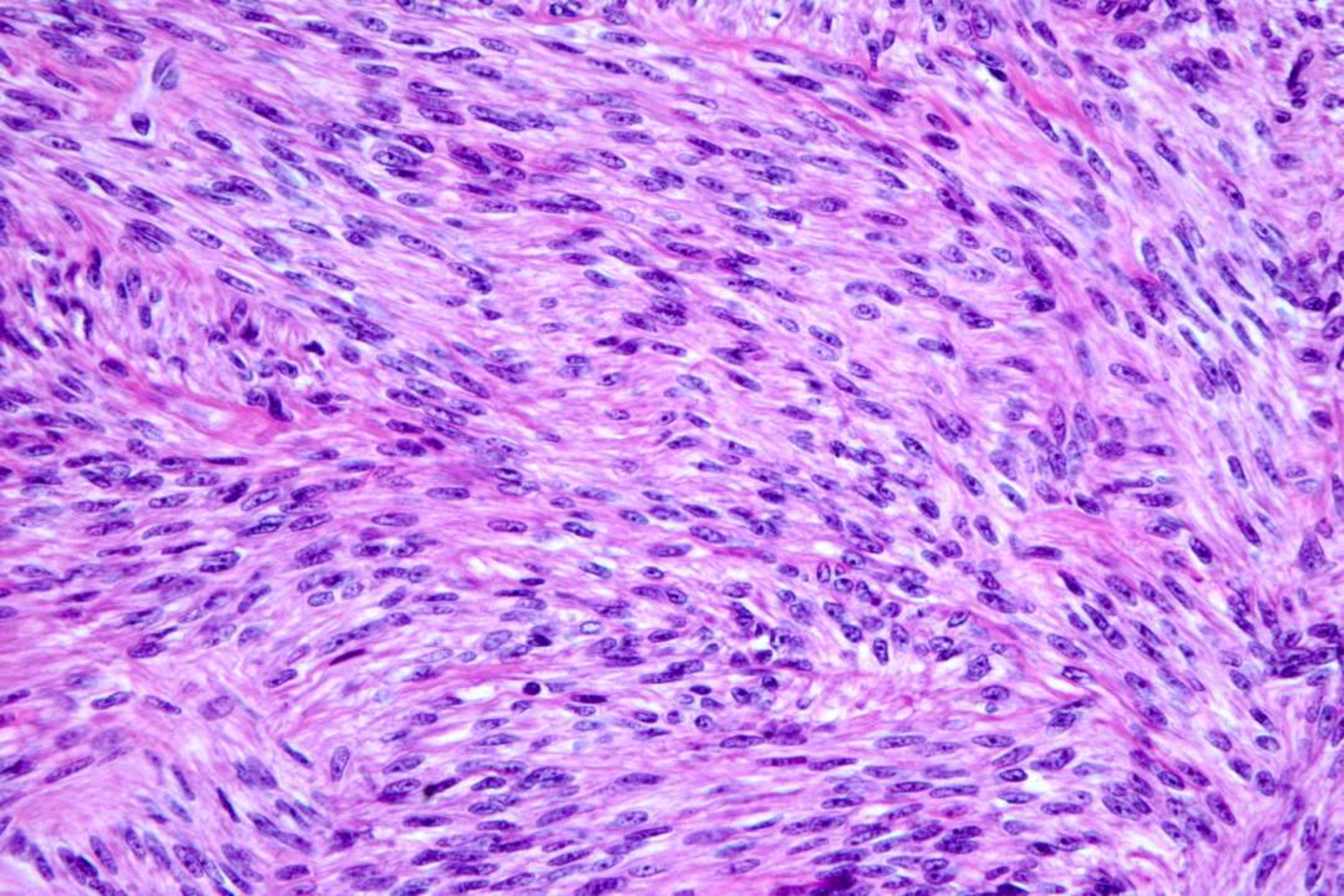
A 40 year old patient with prior hysterectomy for leiomyomas at 30 years of age, presented with fullness and fluttering in her abdomen. On physical exam, her abdomen was distended and free fluid was noted. An abdomino-pelvic CT-scan showed thickening of the vaginal cuff as well as multiple soft tissue masses present throughout the retroperitoneum and mesentery and a confluent group of masses in the right pericolic gutter measuring 7.0 x 3.6 cm.

The patient underwent excision of the masses as well as bilateral salpingo-oophorectomy.









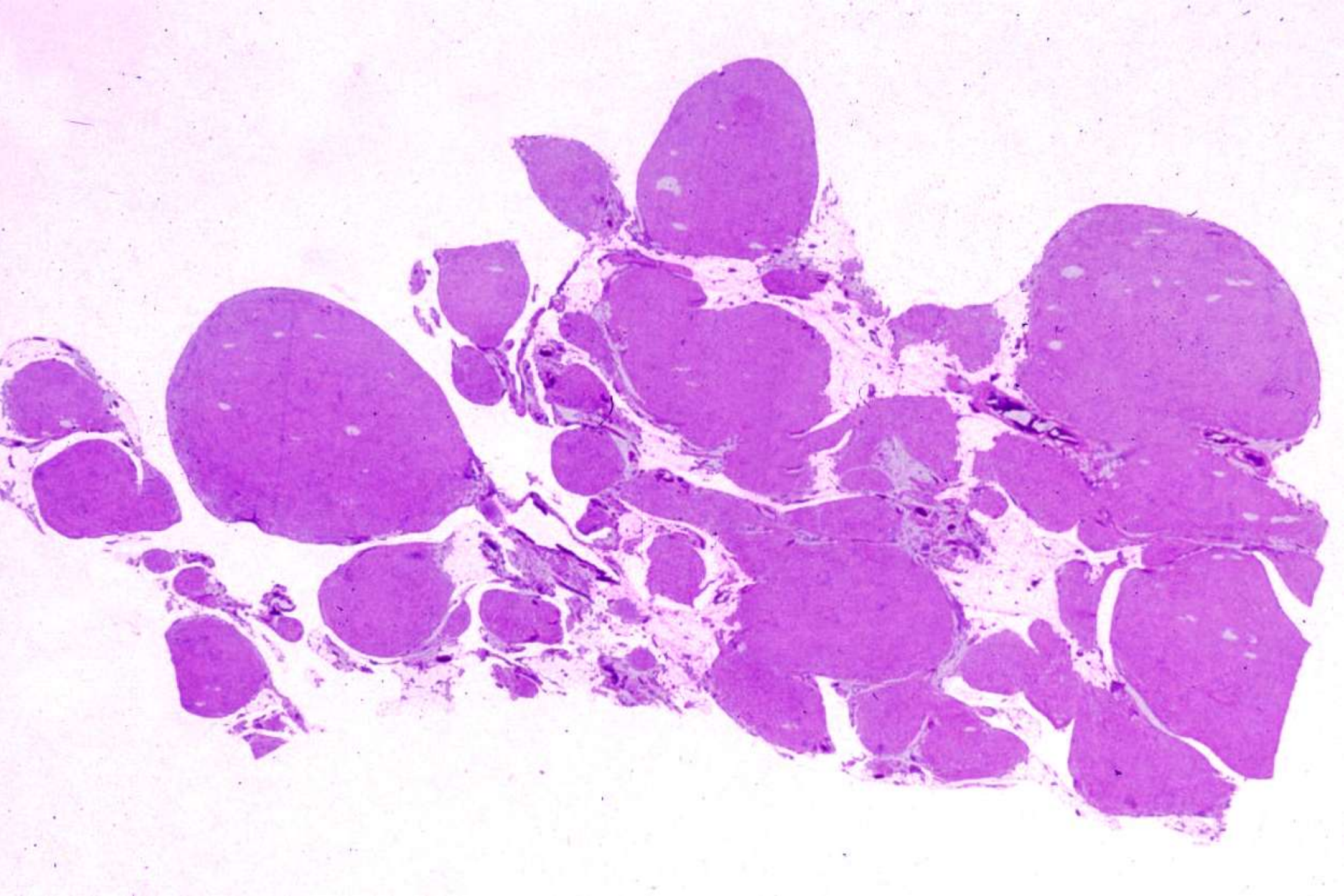
DIAGNOSIS

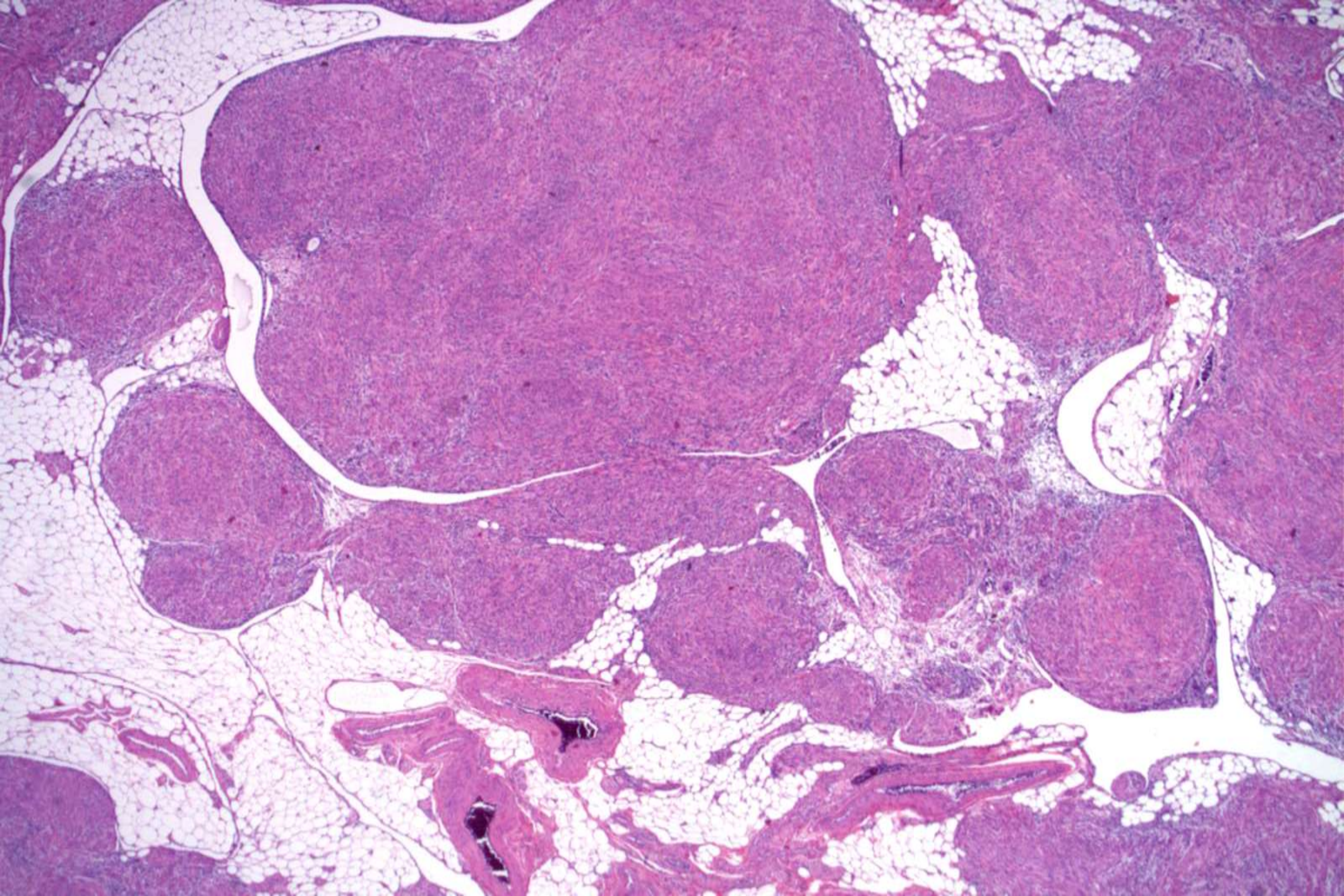
PERITONEUM:
DIFFUSE LEIOMYOMATOSIS

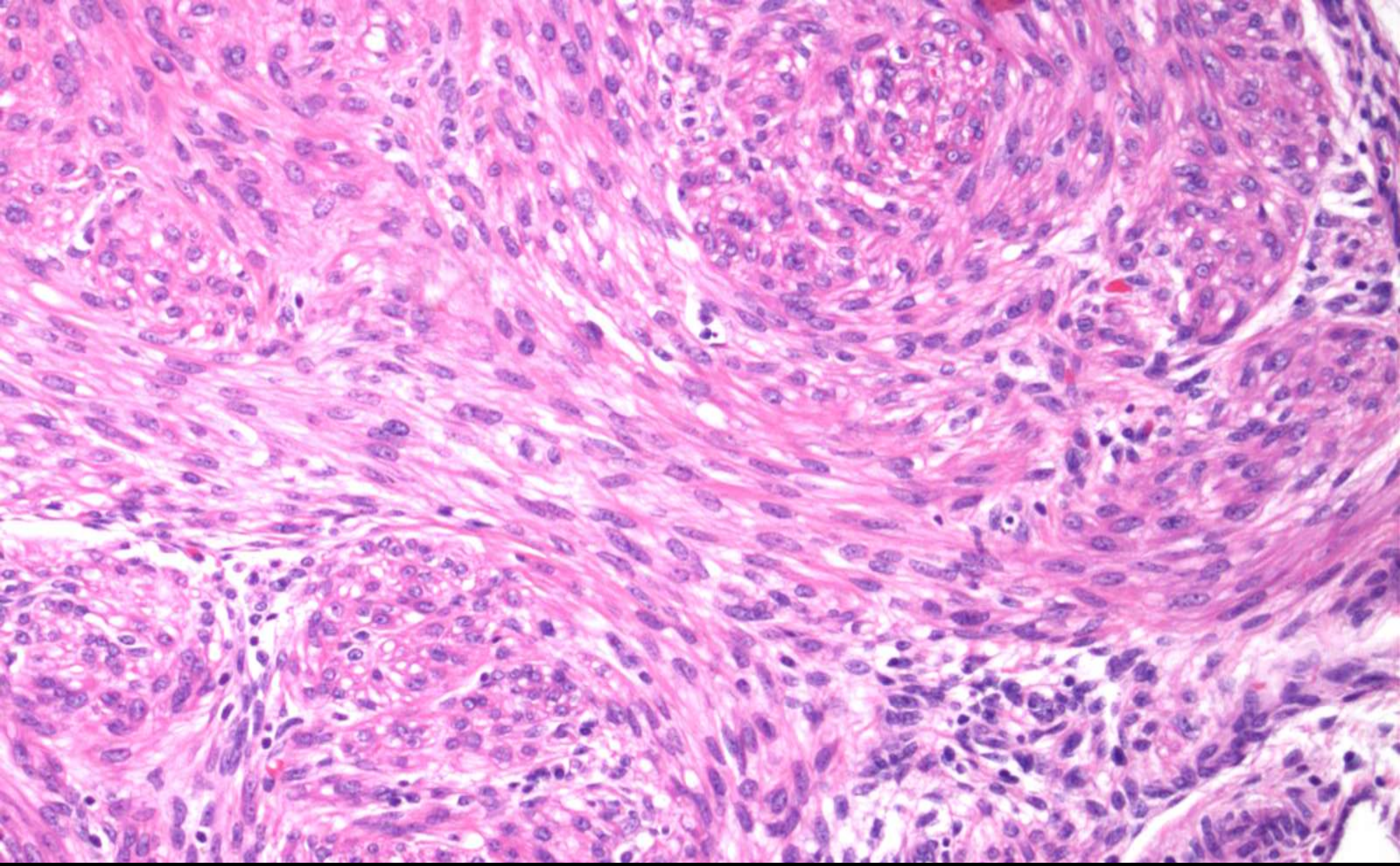
DIFFUSE PERITONEAL LEIOMYOMATOSIS

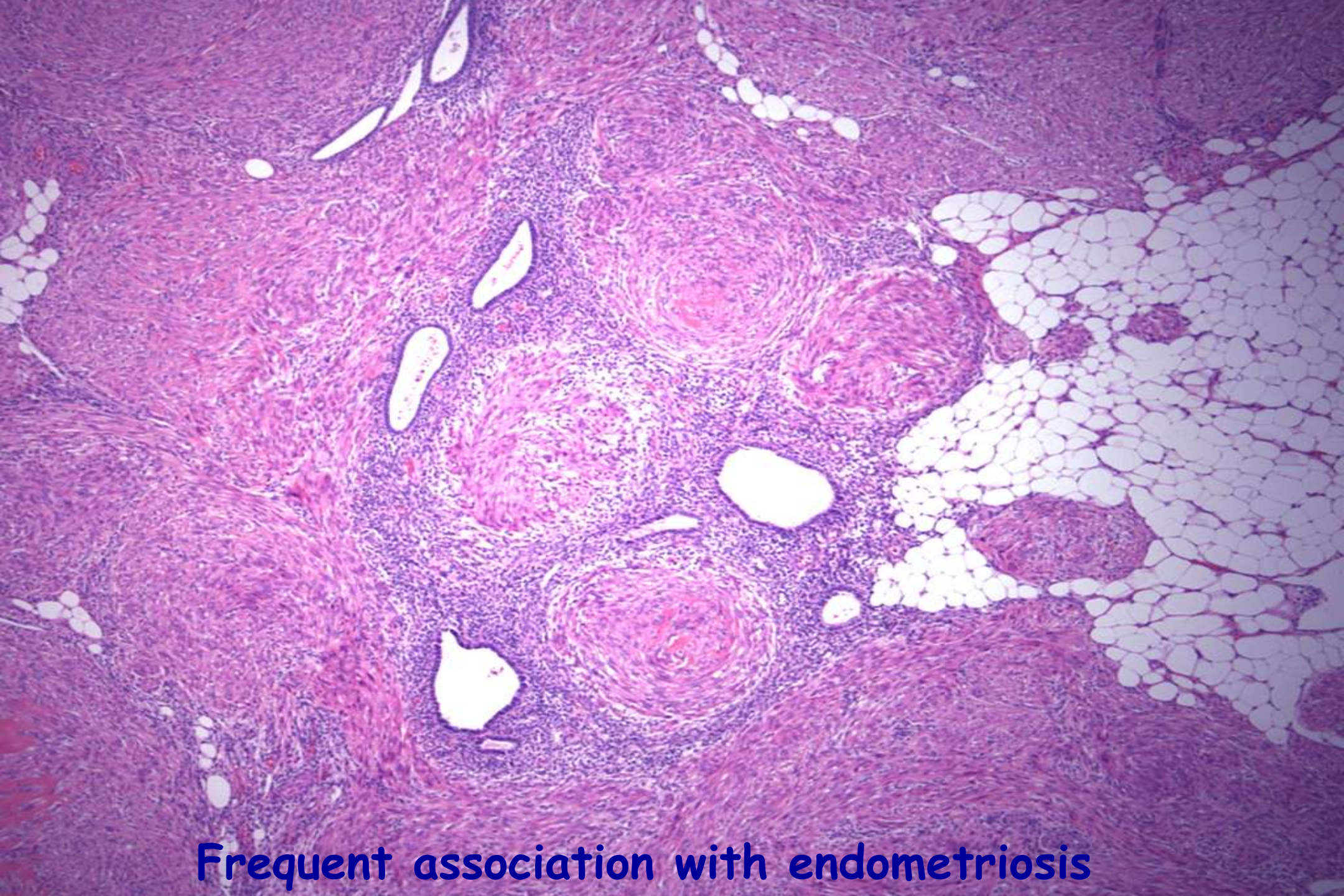
- Women of reproductive age
- Frequently pregnant or history of oral contraceptives
- Familial clustering of DPL in association with Raynaud's
- syndrome and prurigo nodularis
- Typically asymptomatic or vague symptoms
- Strong association with increased hormonal production

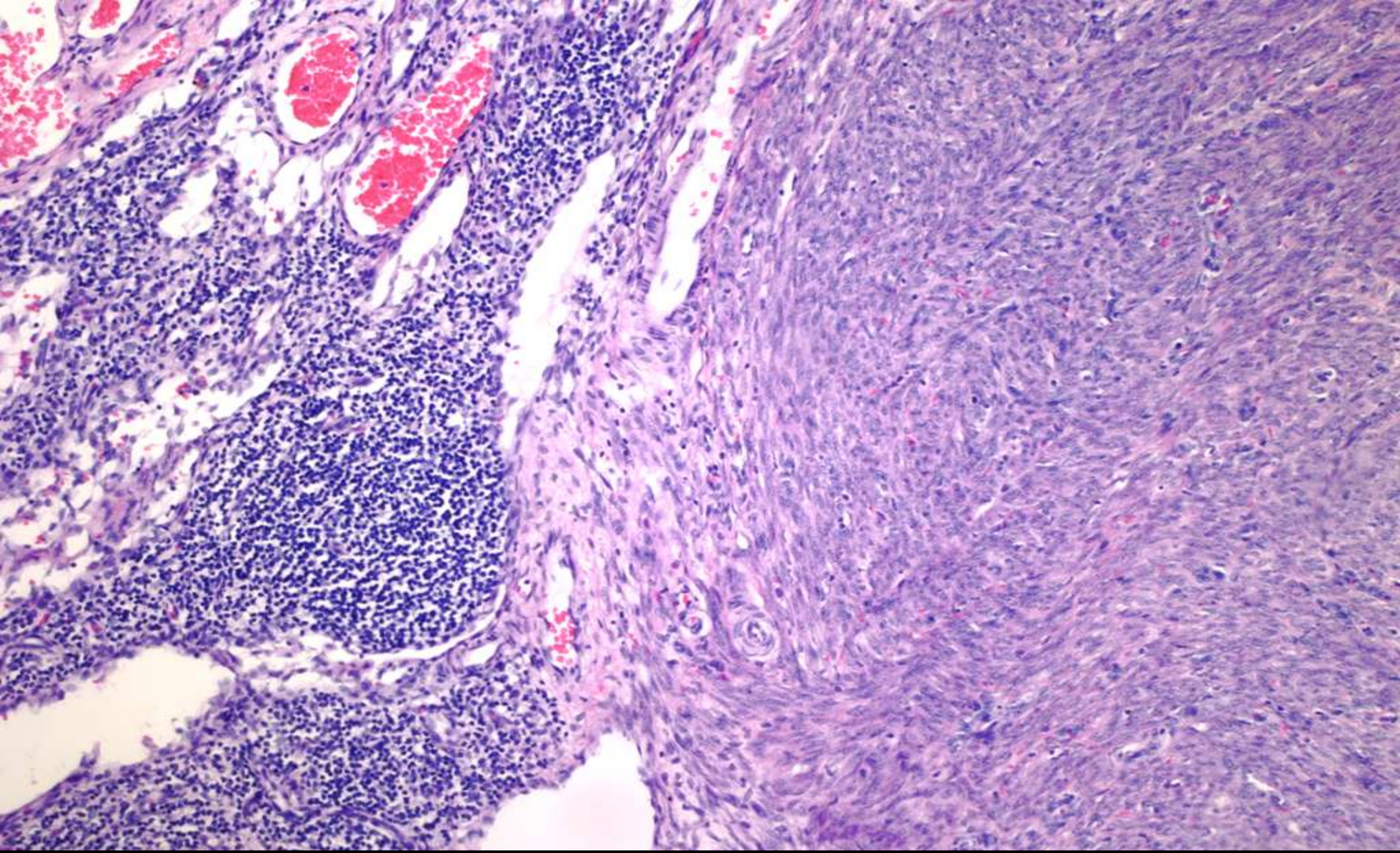
DIFFUSE PERITONEAL LEIOMYOMATOSIS






NO CYTOLOGIC ATYPIA + < 3 MITOSES/10HPFs


Frequent association with endometriosis



LYMPH NODE INVOLVEMENT

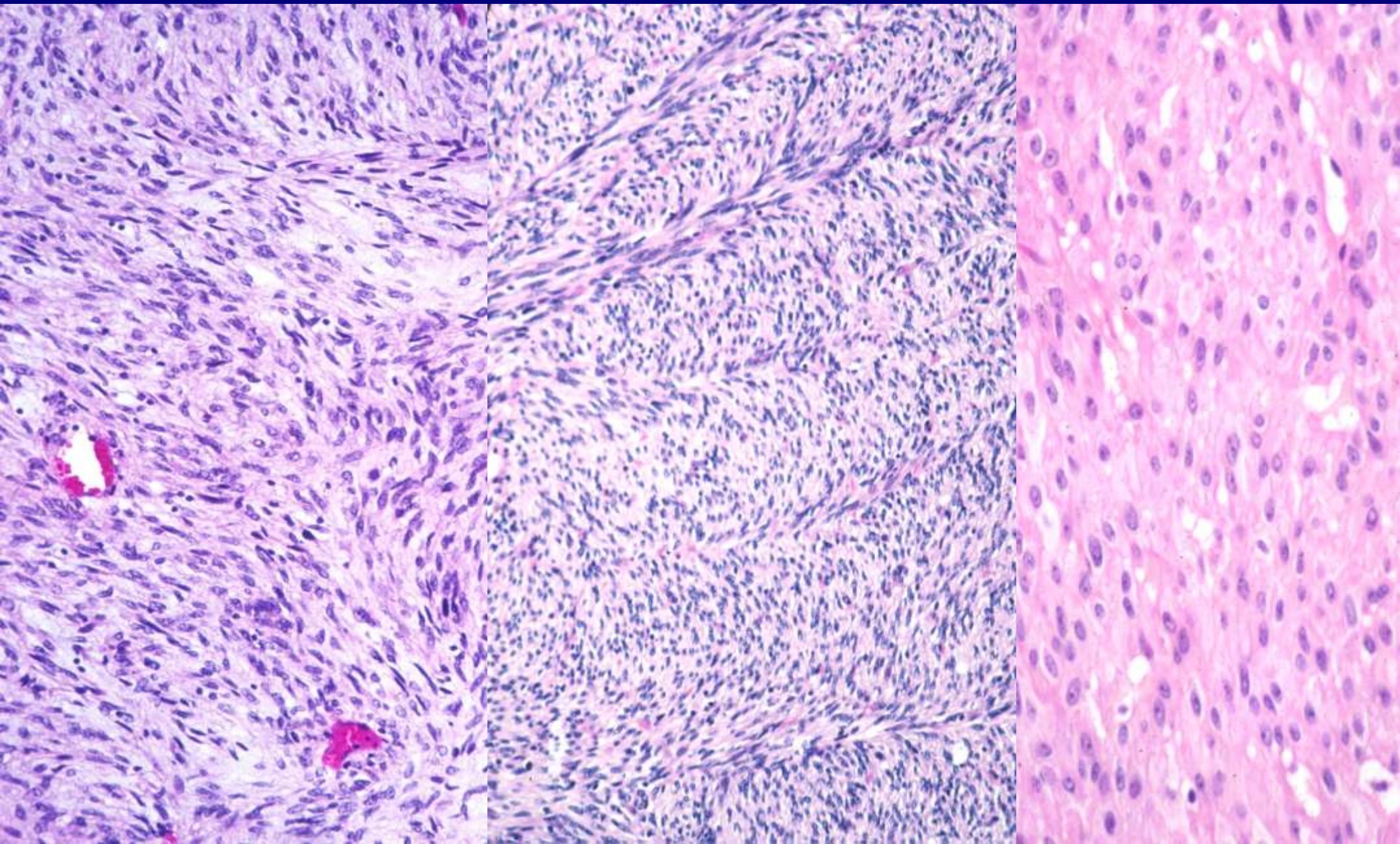
DIFFUSE PERITONEAL LEIOMYOMATOSIS

Differential Diagnosis

Gastrointestinal stromal tumor
Benign metastasizing leiomyoma
Intravenous leiomyomatosis
Abdominal/retroperitoneal uterine-type leiomyoma
Primary abdominal/retroperitoneal leiomyosarcoma
Metastatic leiomyosarcoma
Parasitic leiomyoma

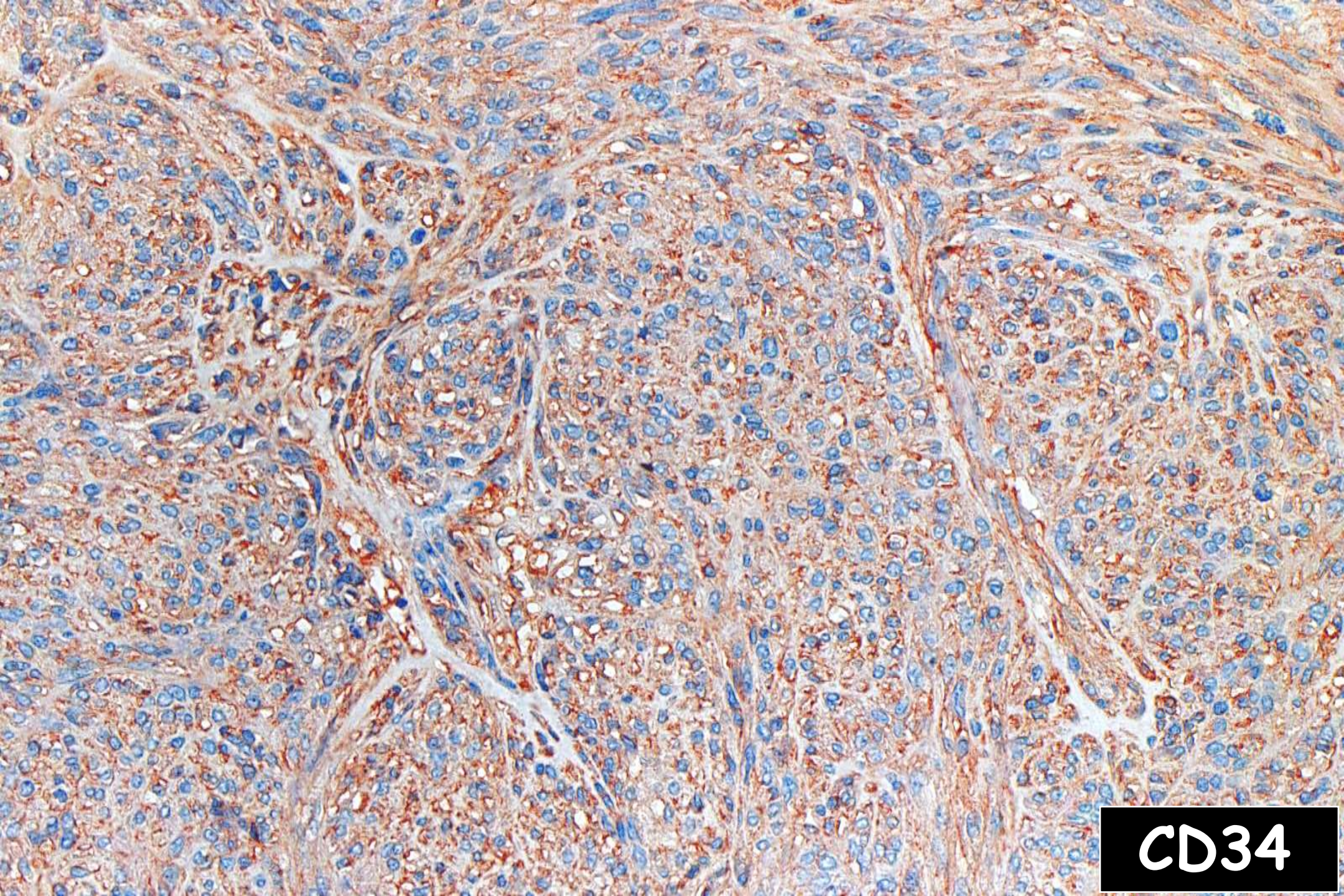

cm

GIST

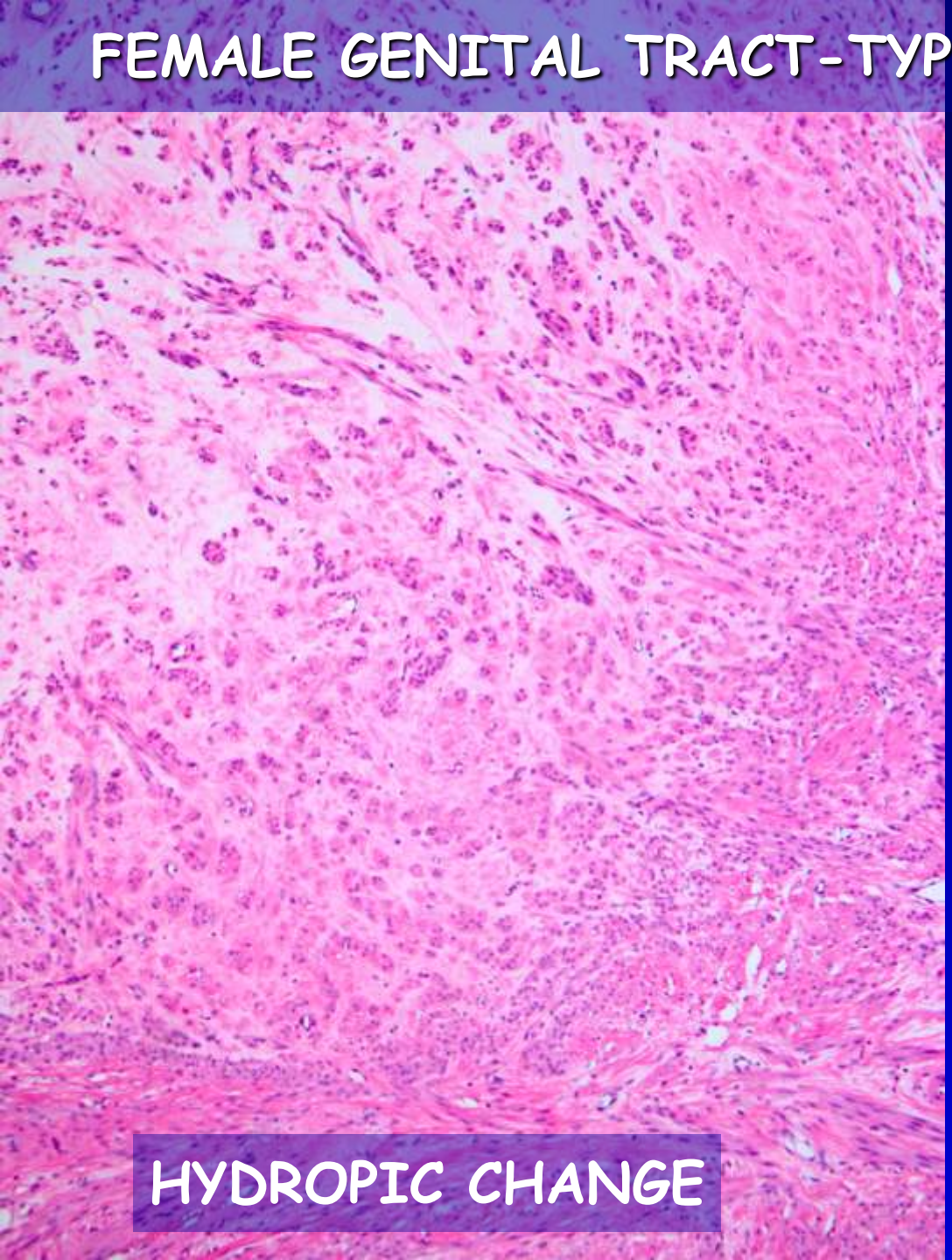


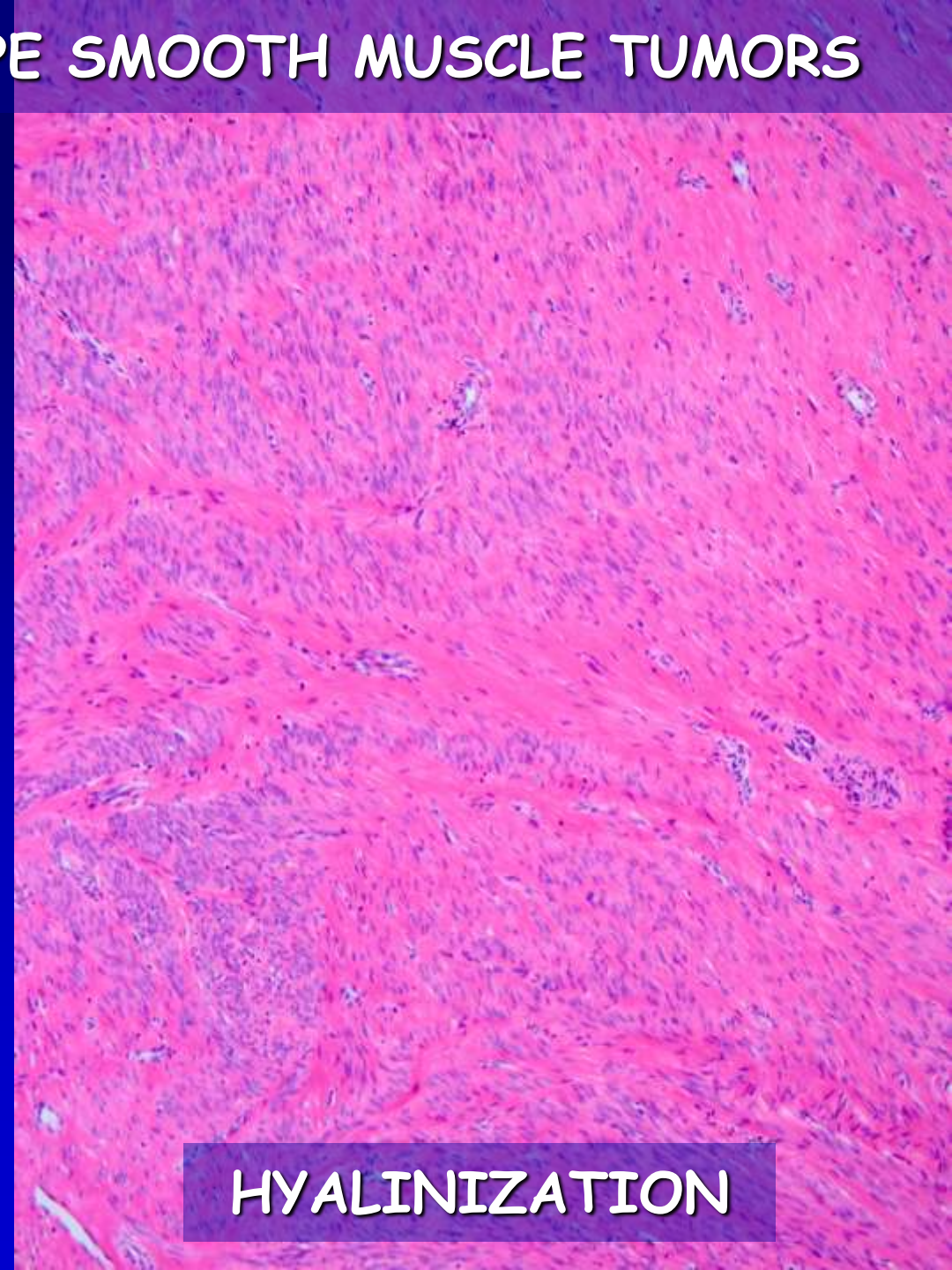
GIST Immunoprofile

	GIST	LPD
• C-Kit	95%	+/-
• CD34	75%	-
• Caldesmon	50%	+/-
• CD10	0%	+/-

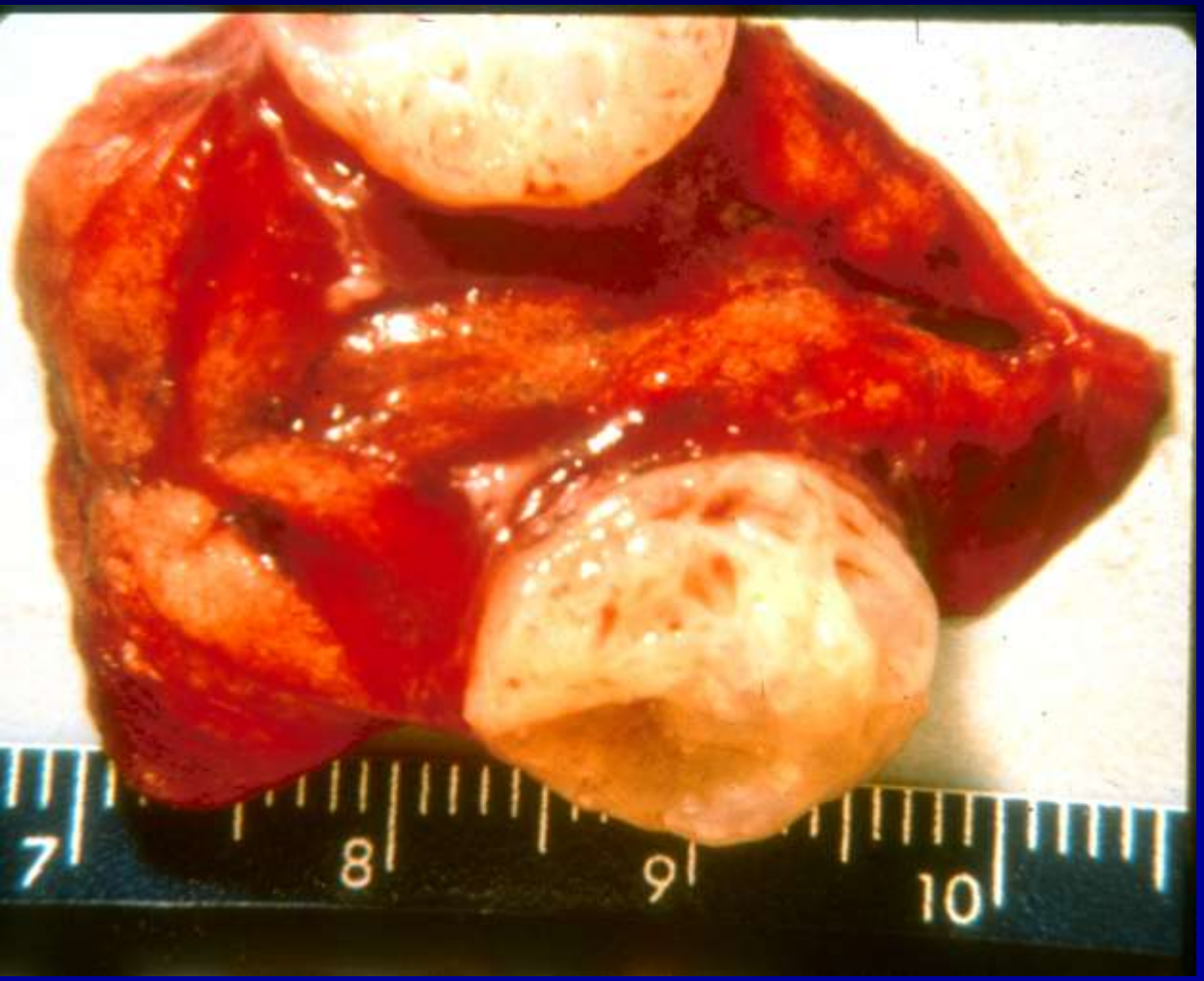

CD34

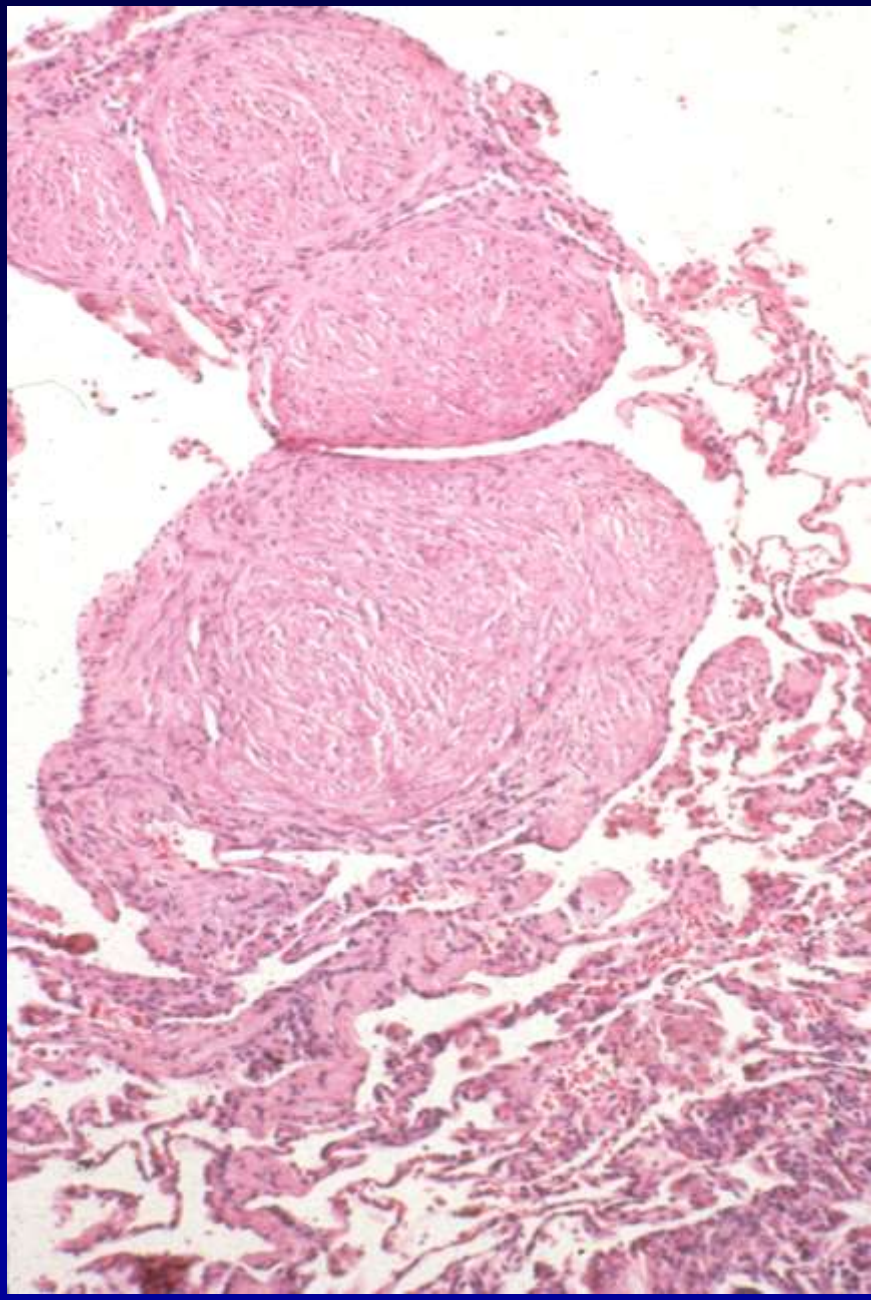
FEMALE GENITAL TRACT-TYPE SMOOTH MUSCLE TUMORS

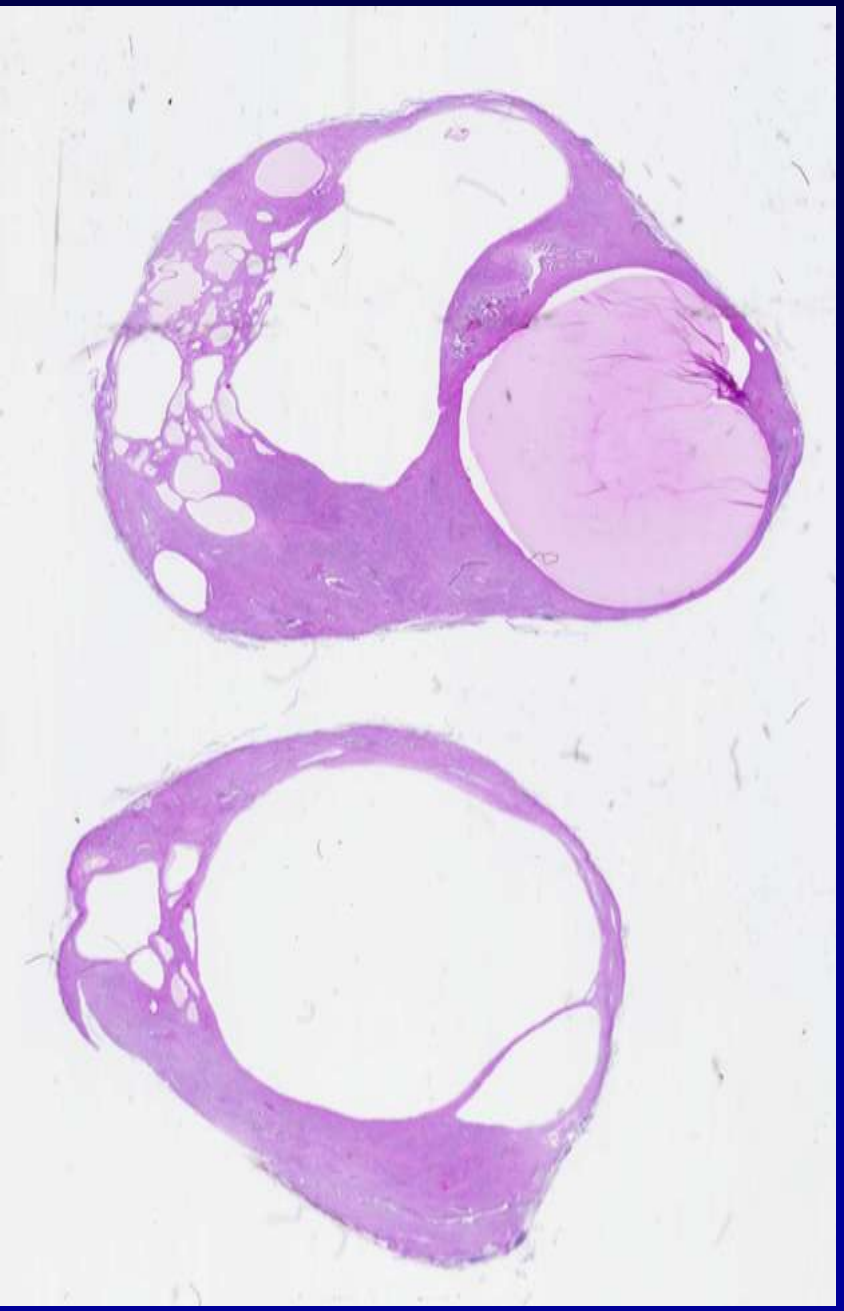


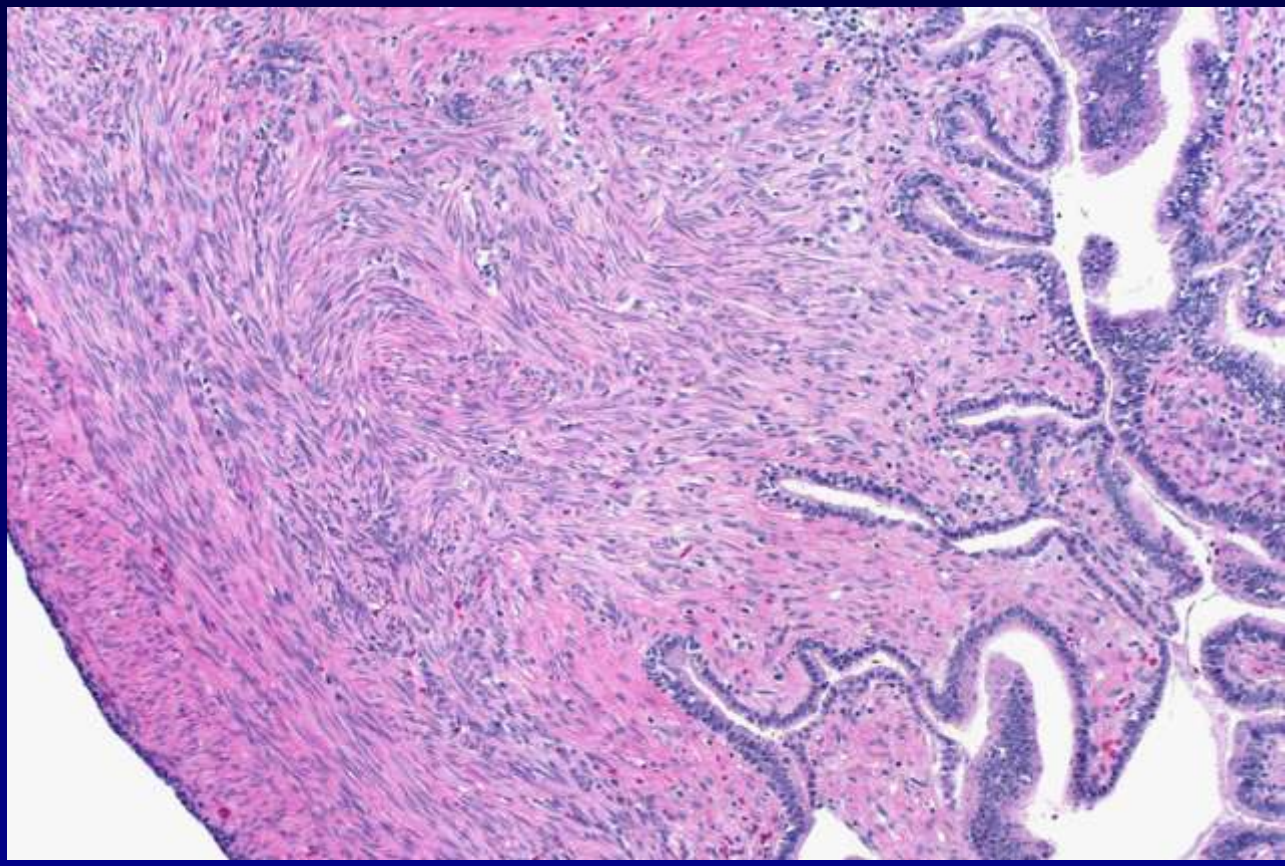


METASTASIZING LEIOMYOMA







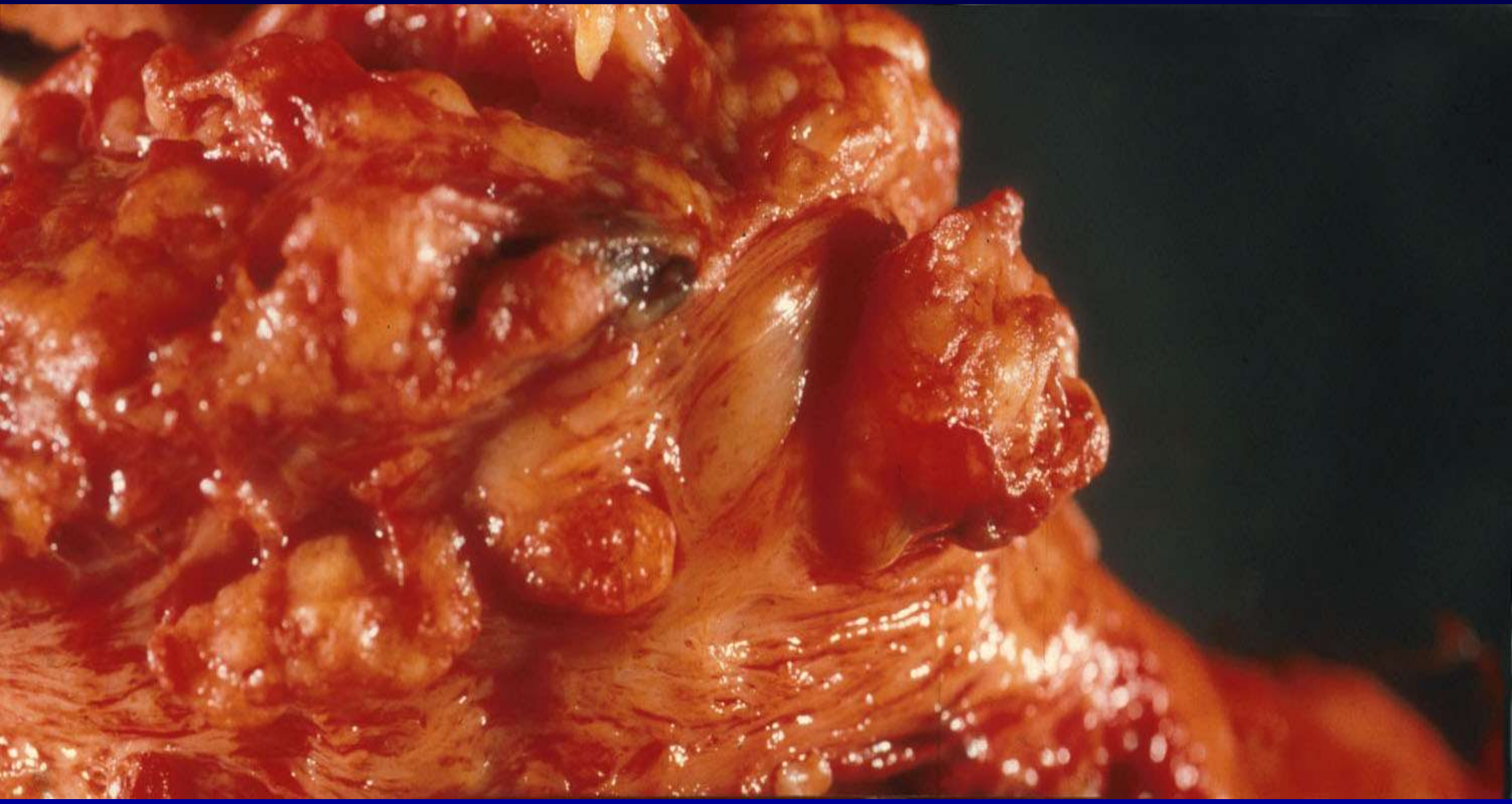


BENIGN METASTASIZING LEIOMYOMA

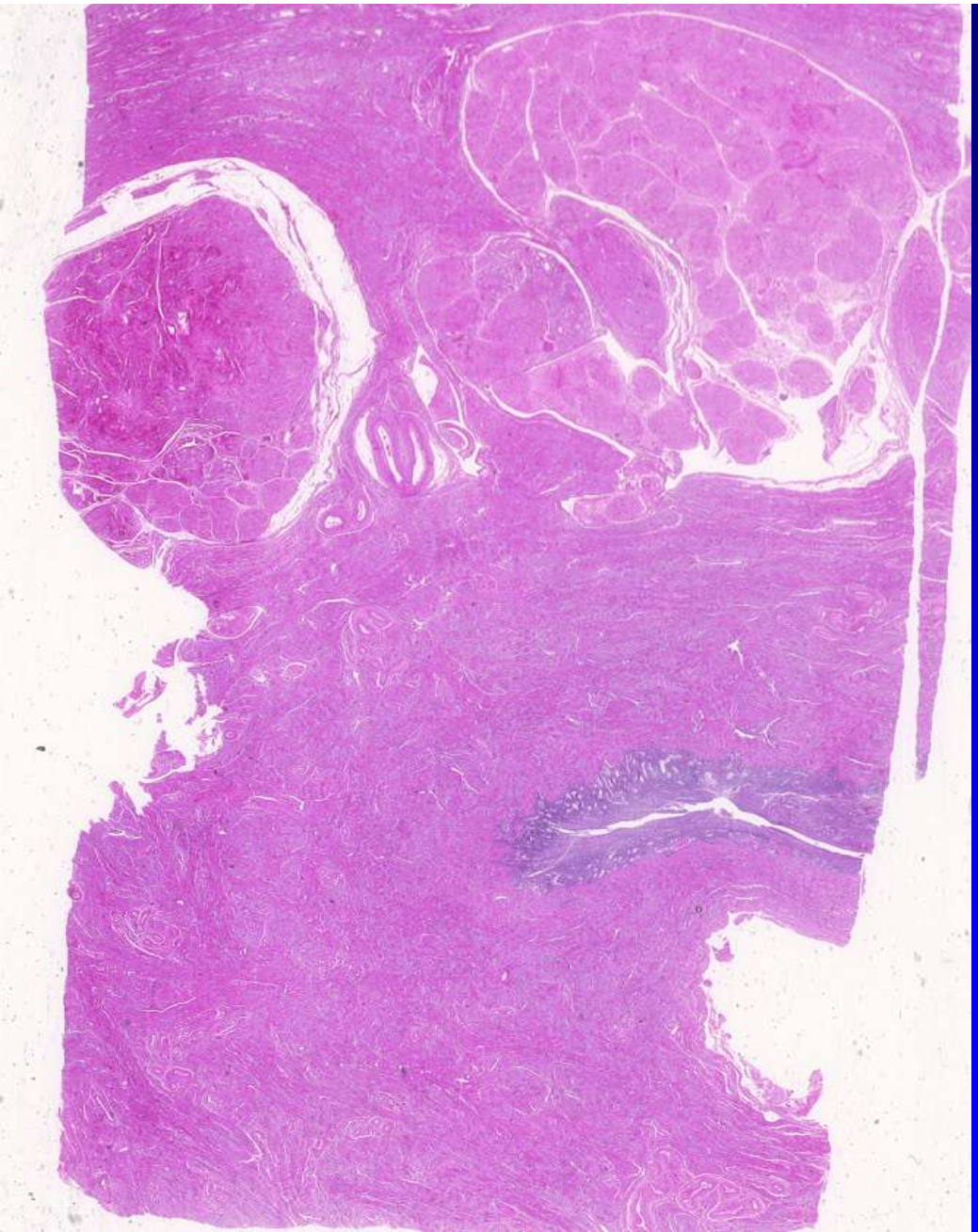
INTRAVENOUS LEIOMYOMATOSIS

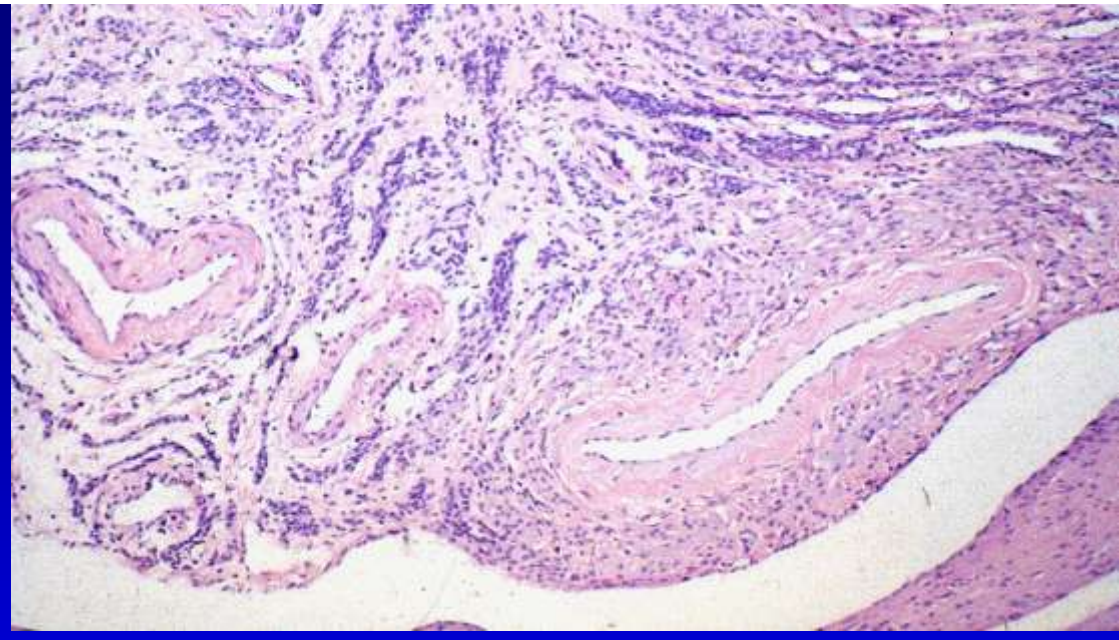
- ***Endothelium-lined proliferations of benign smooth muscle*** **within myometrial veins in absence of, or outside, leiomyomas.**
- **Presentation = typical leiomyomas; rarely, cardiac manifestations**
- **Usually grossly visible as worm-like plugs of tumor, sometimes with extrauterine extension; may not be appreciated on initial examination of the uterus**

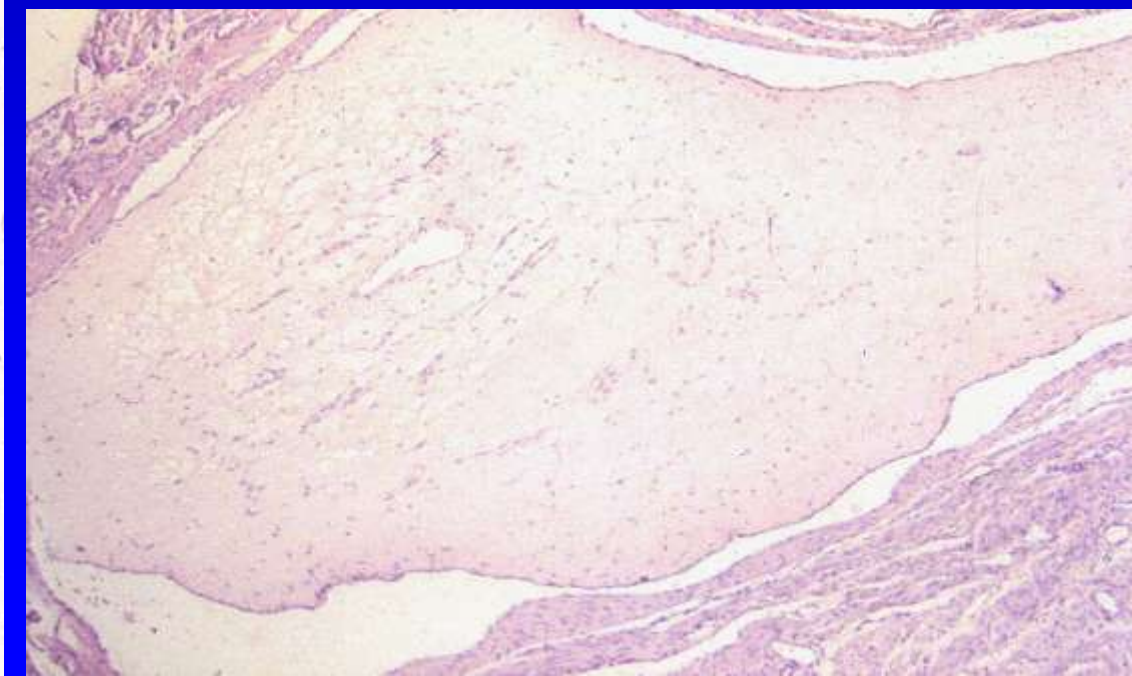
INTRAVENOUS LEIOMYOMATOSIS



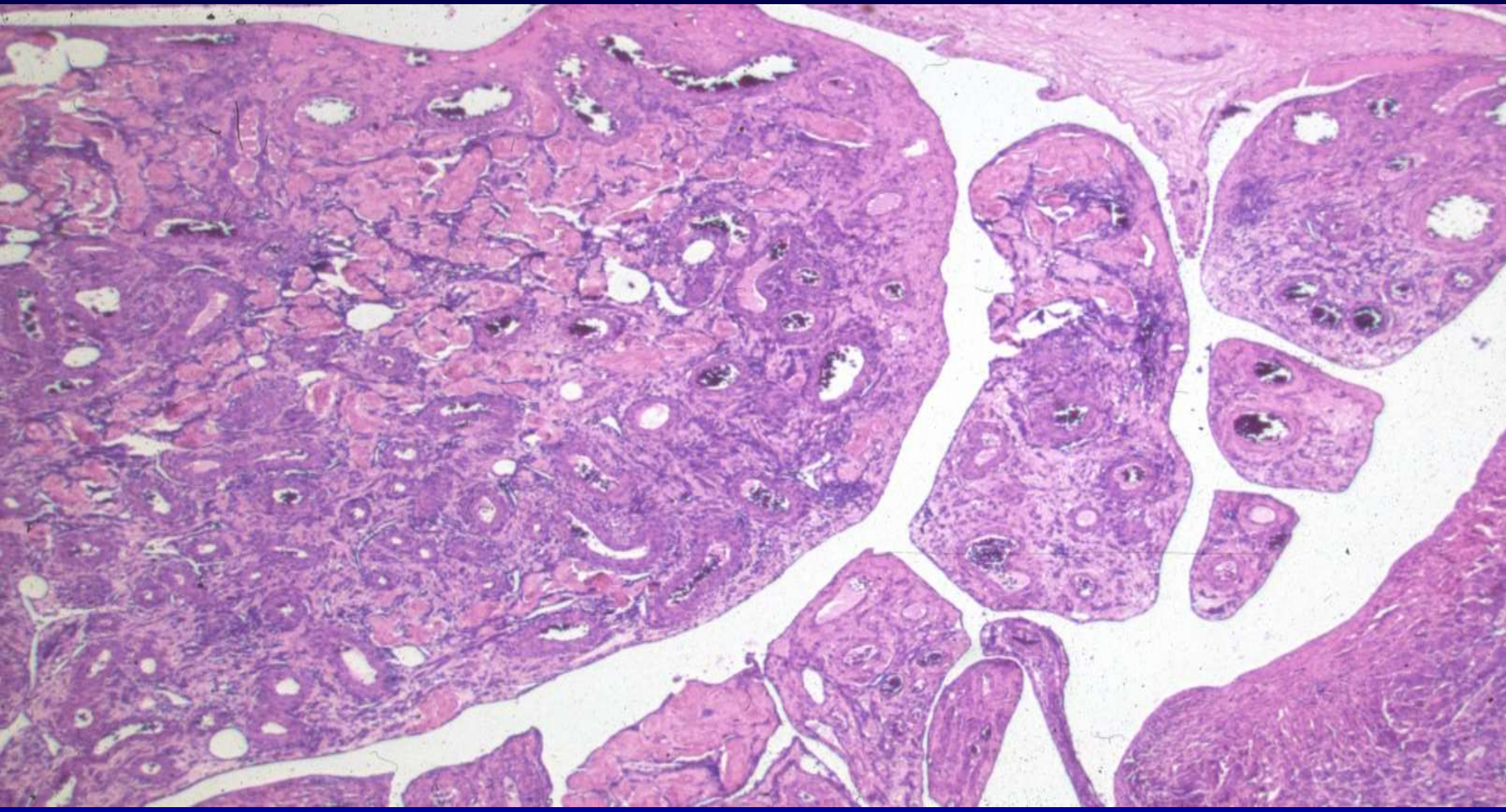
INTRAVENOUS LEIOMYOMATOSIS







INTRAVENOUS LEIOMYOMATOSIS



INTRAVENOUS LEIOMYOMATOSIS

Variants:

Cellular

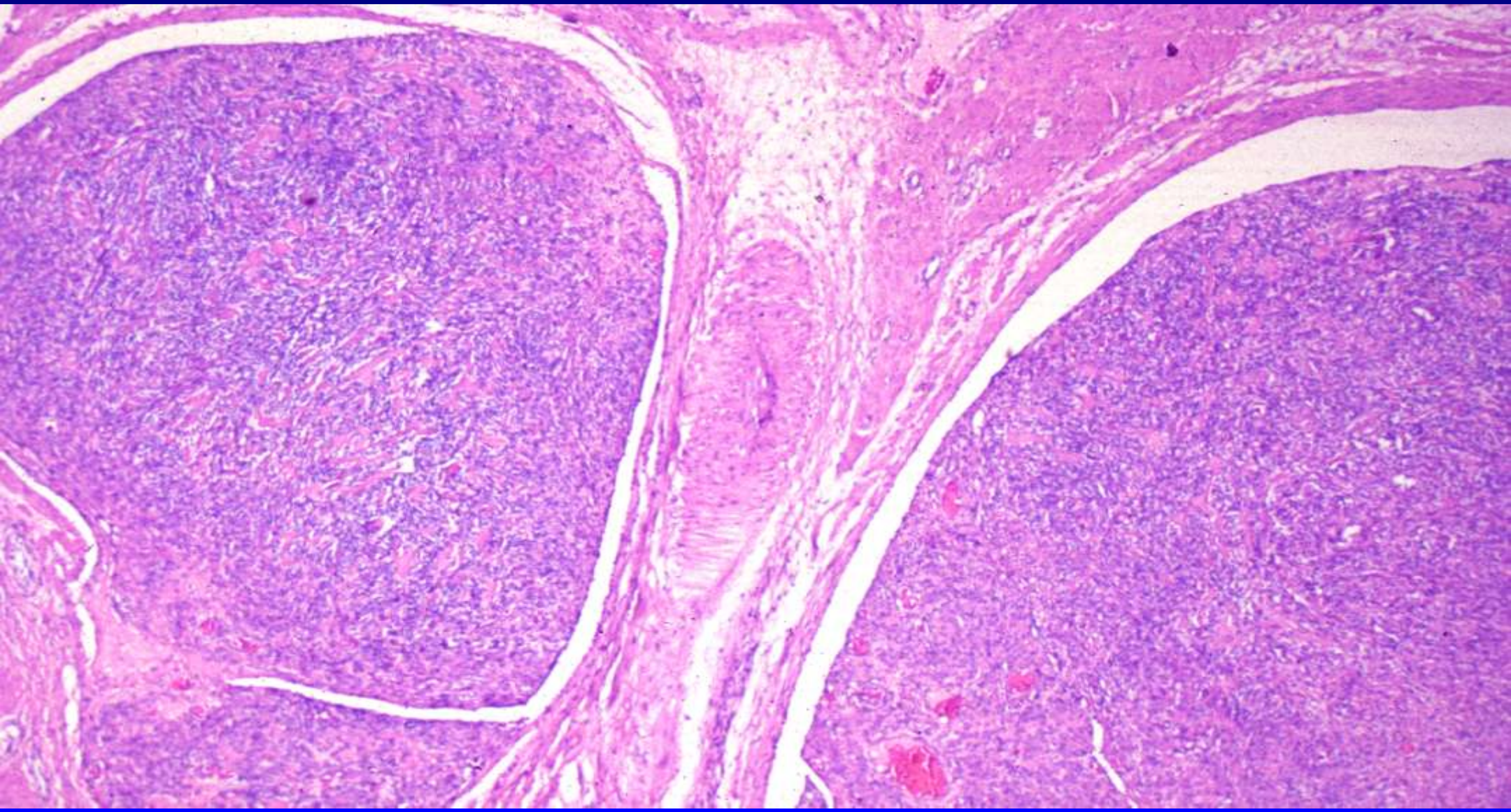
Epithelioid

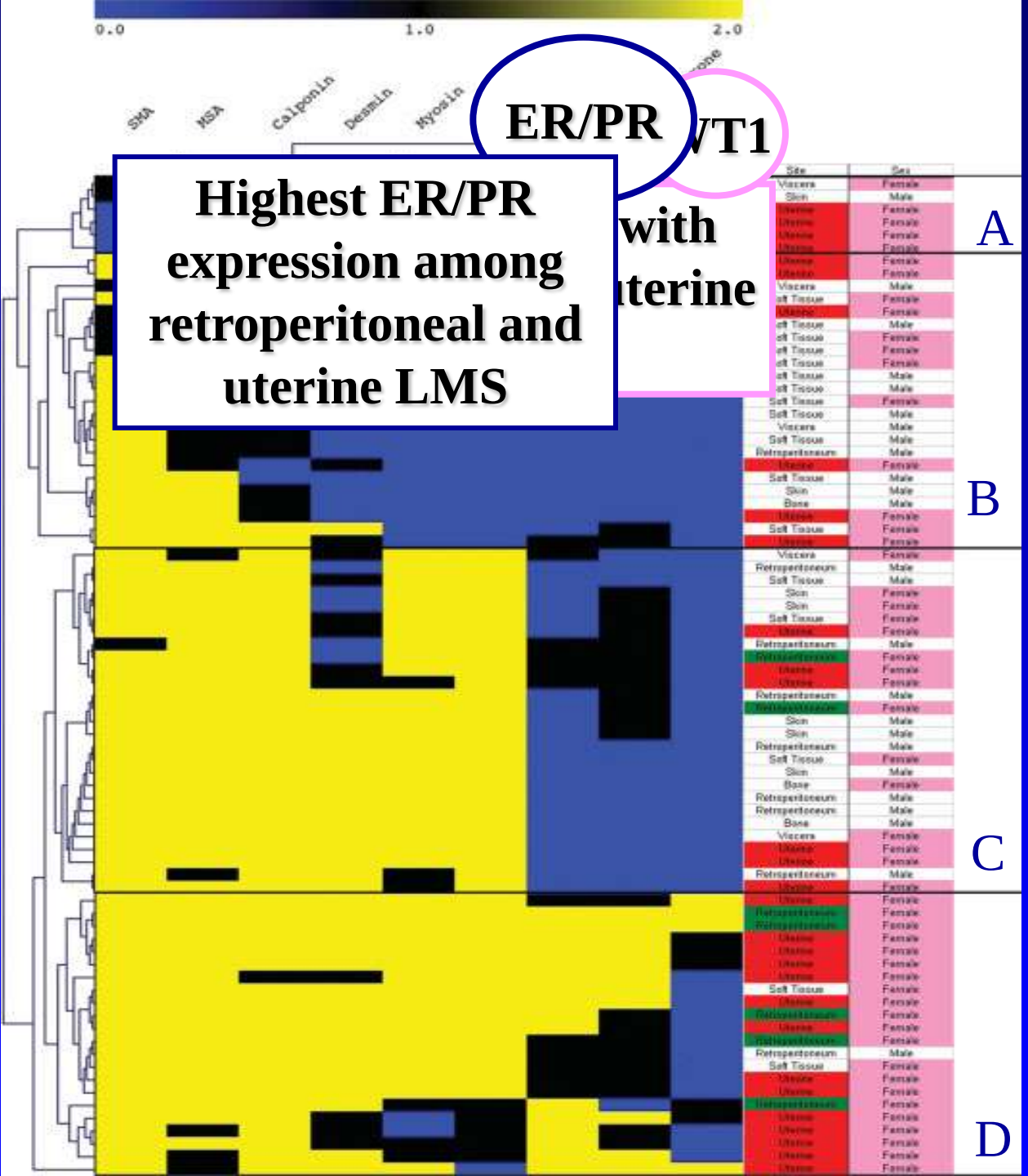
Myxoid

With bizarre nuclei

With fat

CELLULAR INTRAVENOUS LEIOMYOMATOSIS



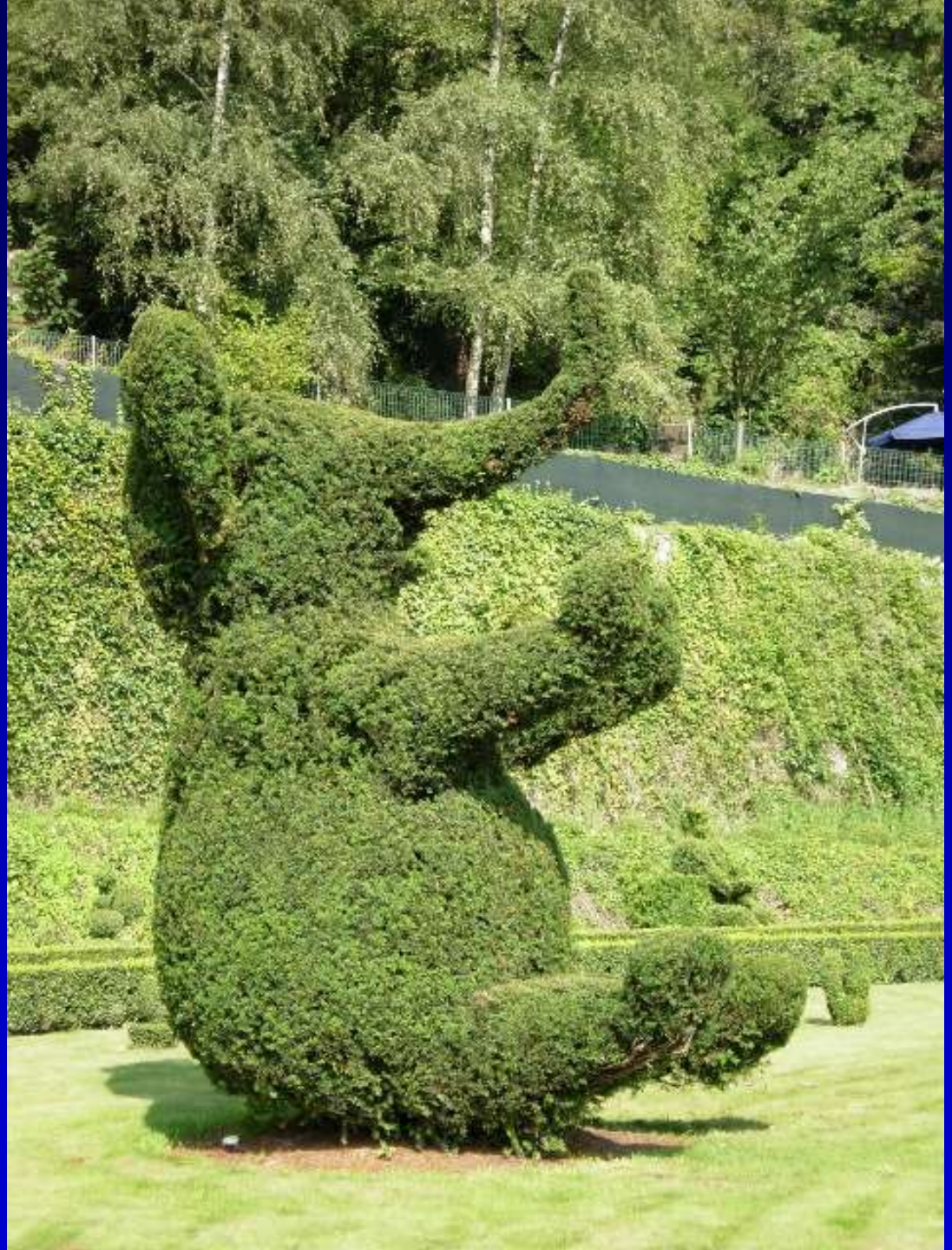


CLUSTER ANALYSIS OF IMMUNO-HISTOCHEMICAL MARKERS IN LEIOMYOSARCOMA DELINIATES SPECIFIC ANATOMIC AND GENDER SUBGROUPS

Smooth muscle markers, WT1, ER and PR

Carvalho JC, et al Cancer 2009, in press

BE CAUTIOS TO ESTABLISH THE DIAGNOSIS OF DIFFUSE PERITONEAL LEIOMYOMATOIS WHEN UNUSUAL CLINICAL FEATURES ARE PRESENT (e.g. older age, absence of exogenous or endogenous hormone exposure, nodules > 2 cm) !



GRACIAS !