GI Case Presentation

Spindle Cell Lesions of the Colon

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Case Introduction

- A 27-year-old woman presented with lower gastrointestinal bleeding.
- A large mass was detected in the ascending colon, and the initial pathology report described a poorly differentiated carcinoma.
- She subsequently underwent a right hemicolectomy.

Gross Examination

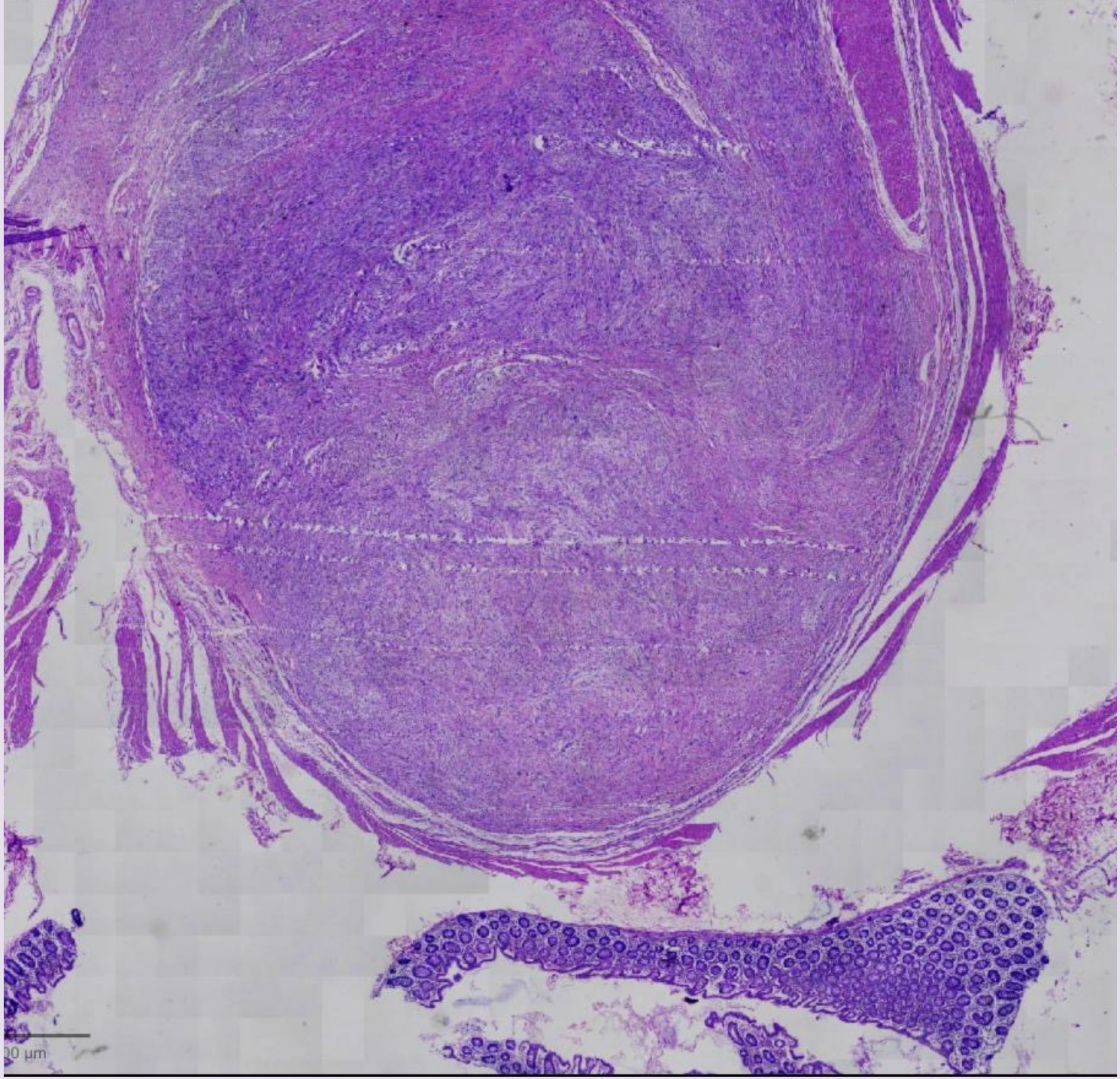
- The specimen, received in formalin, consisted of a right colonic segment measuring 45 cm in length, with measurements of 2 cm and 3 cm at the resection margins.
- A 6 cm segment of ileum was also identified.
- Serial sectioning revealed a large mass measuring 10 cm in greatest dimension.

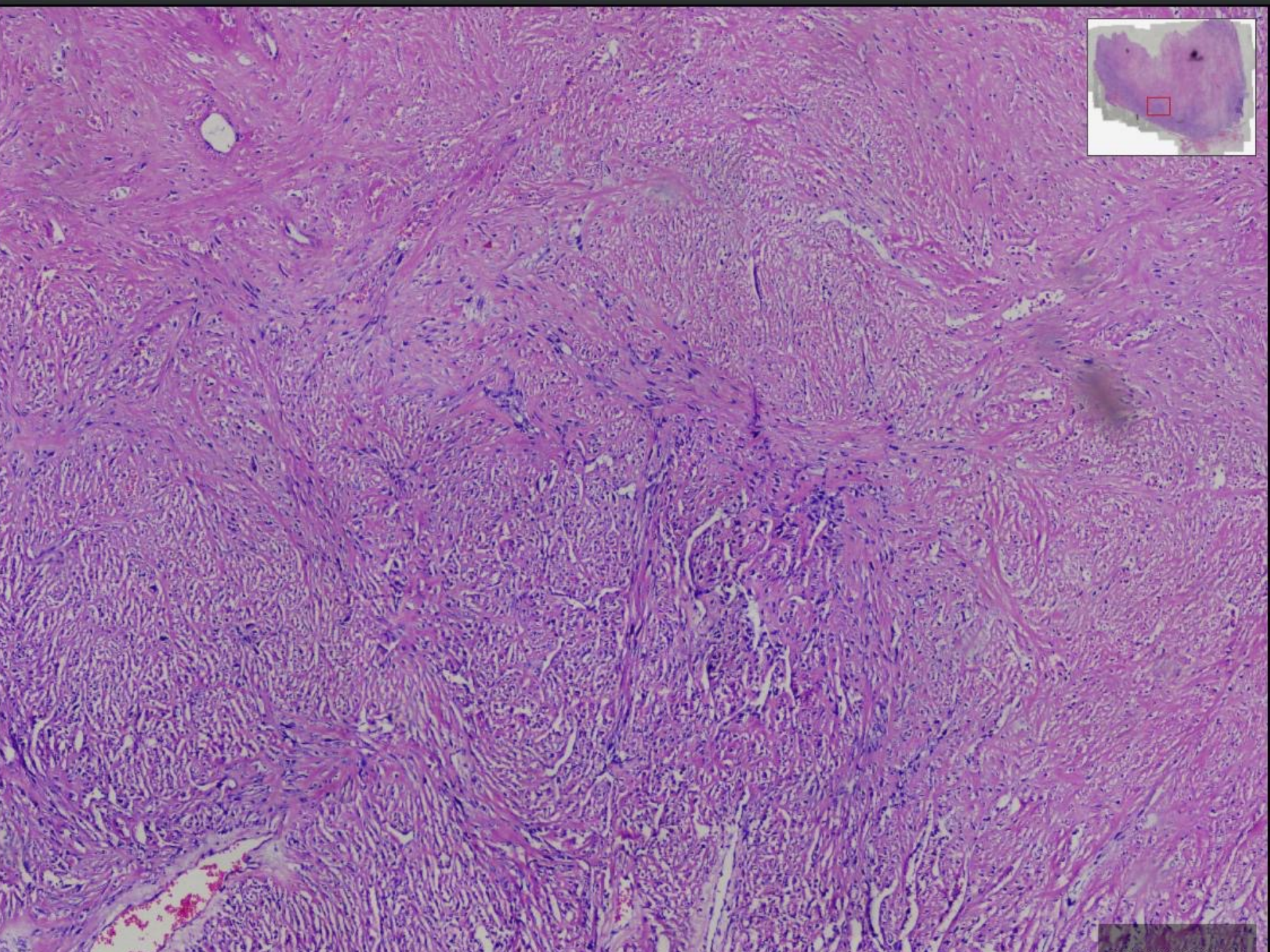
Gross Examination (continued)

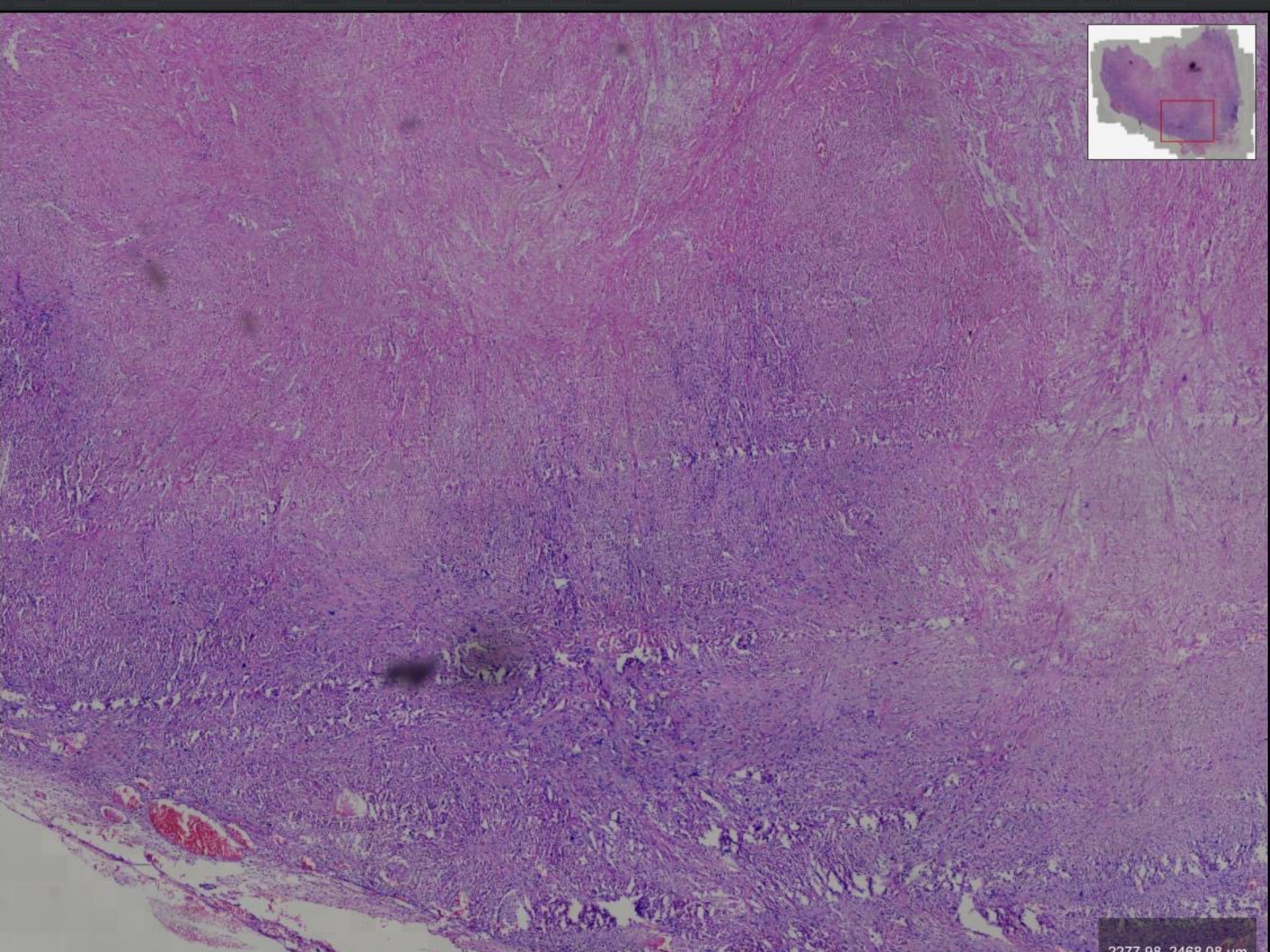
- The mass protruded into the lumen, causing narrowing and near obstruction.
- The cut surface was friable and beefy, with necrosis and hemorrhage.
- The overlying mucosa was completely ulcerated and hemorrhagic.

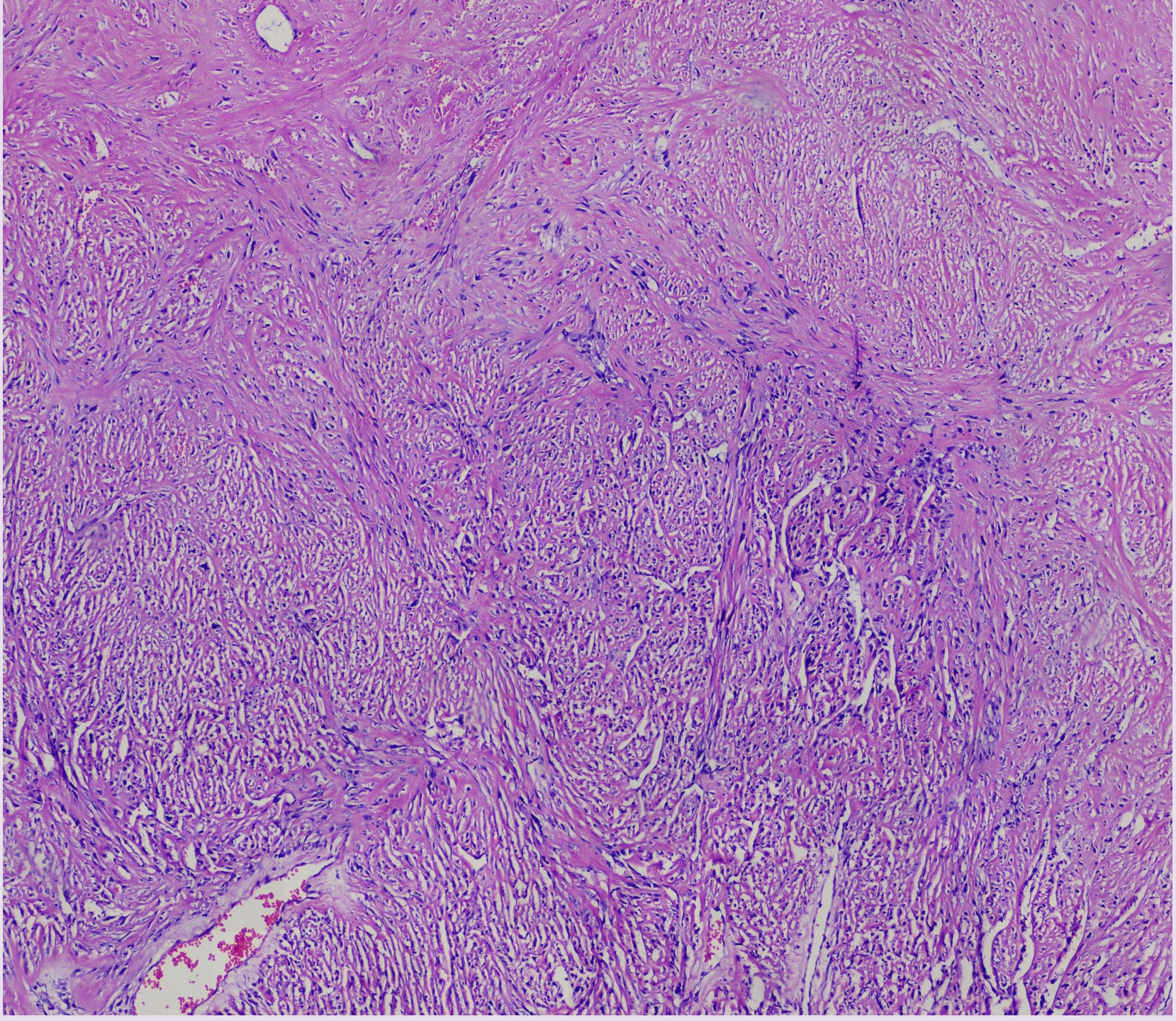
Tumor Location and Growth

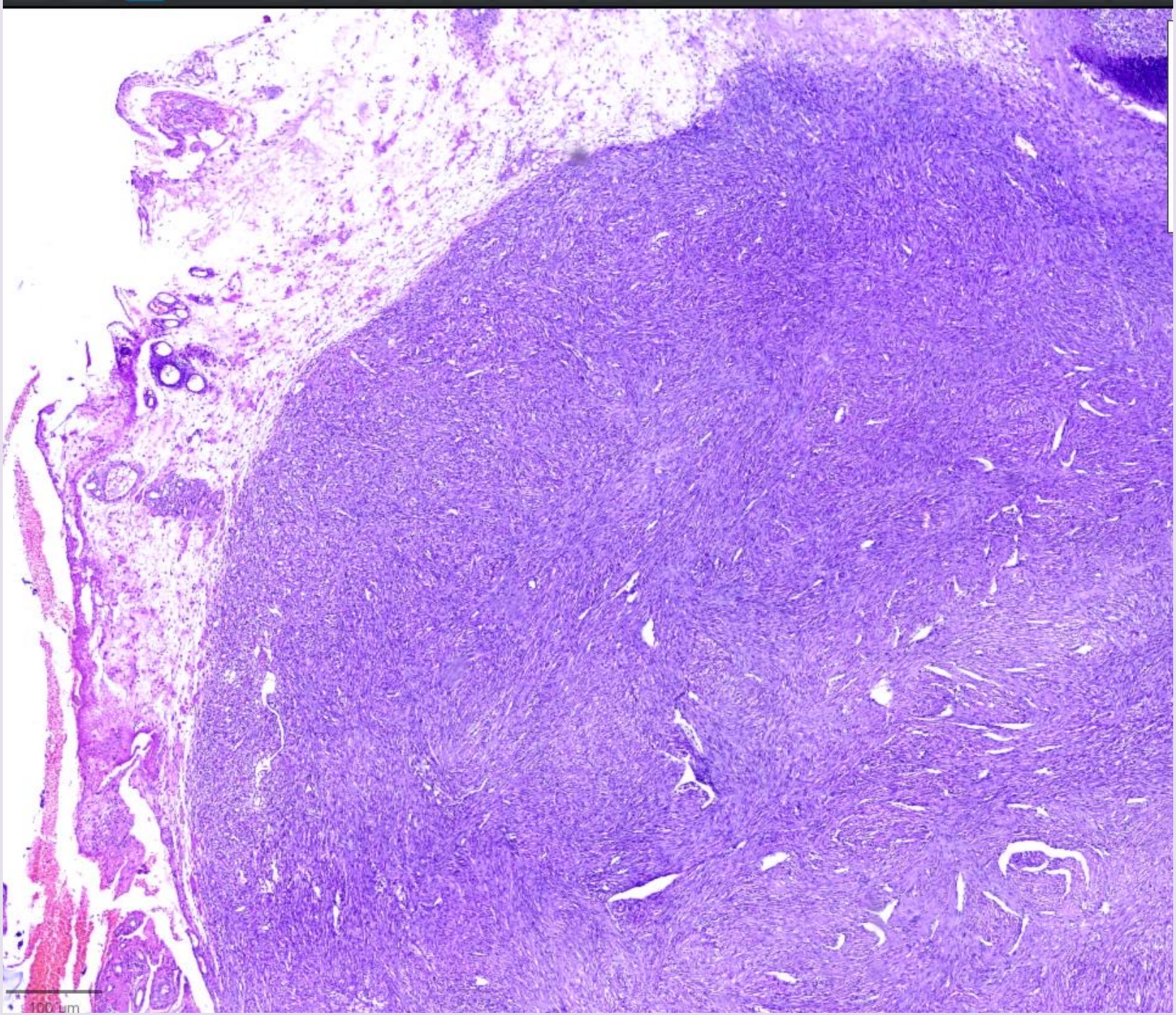
- The mass was submucosal in location and extended both inward and outward.


0 µm

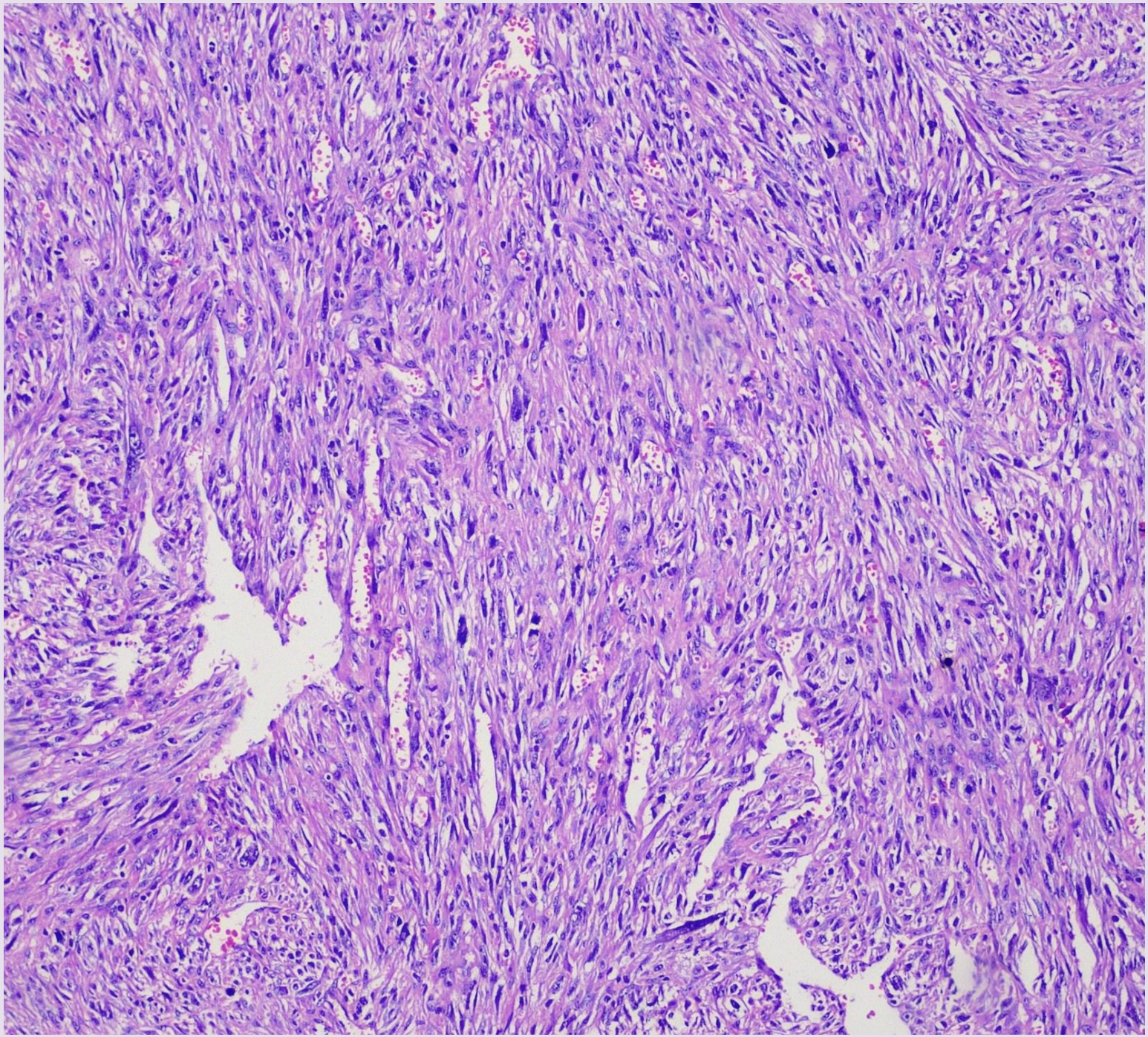


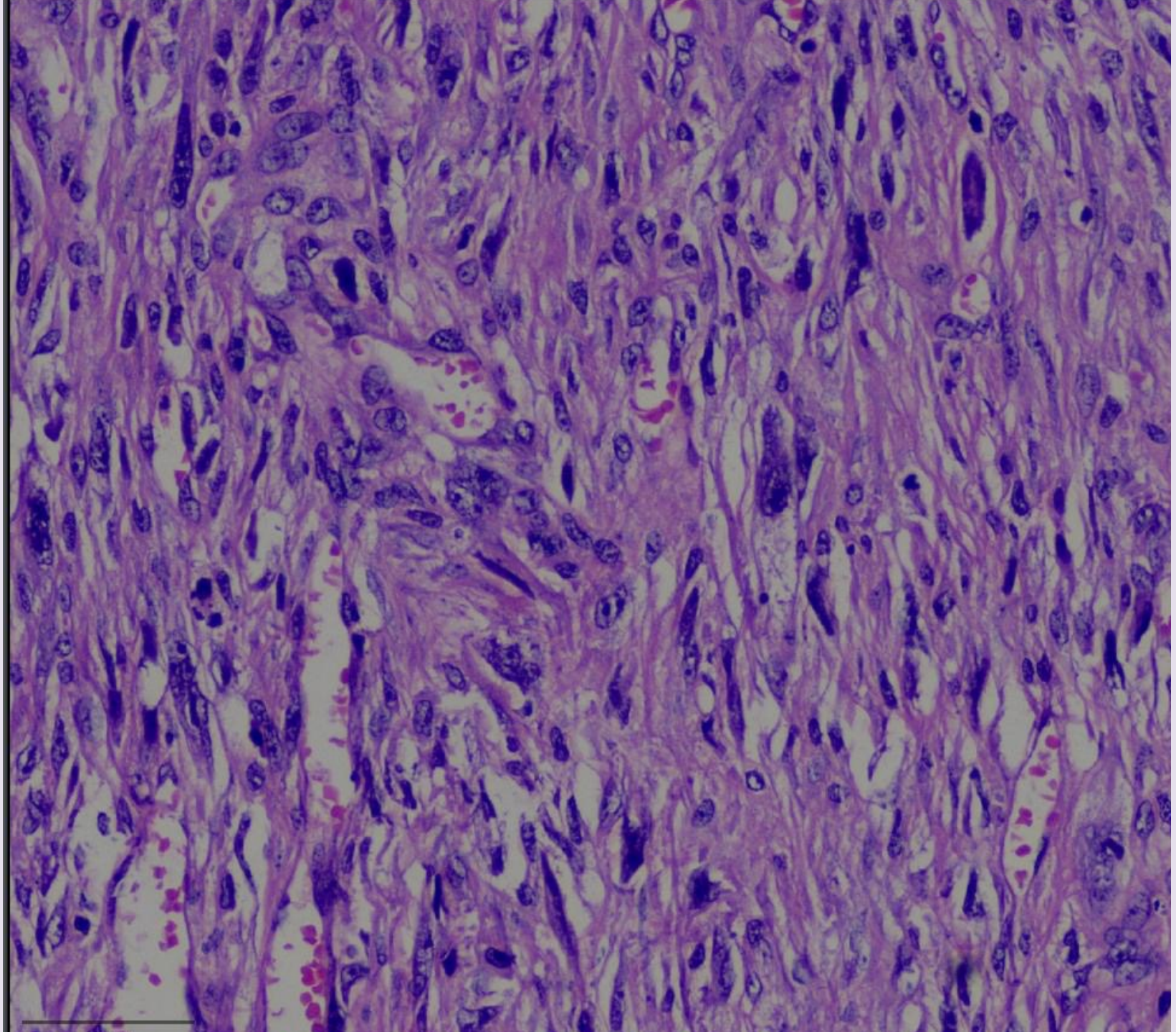


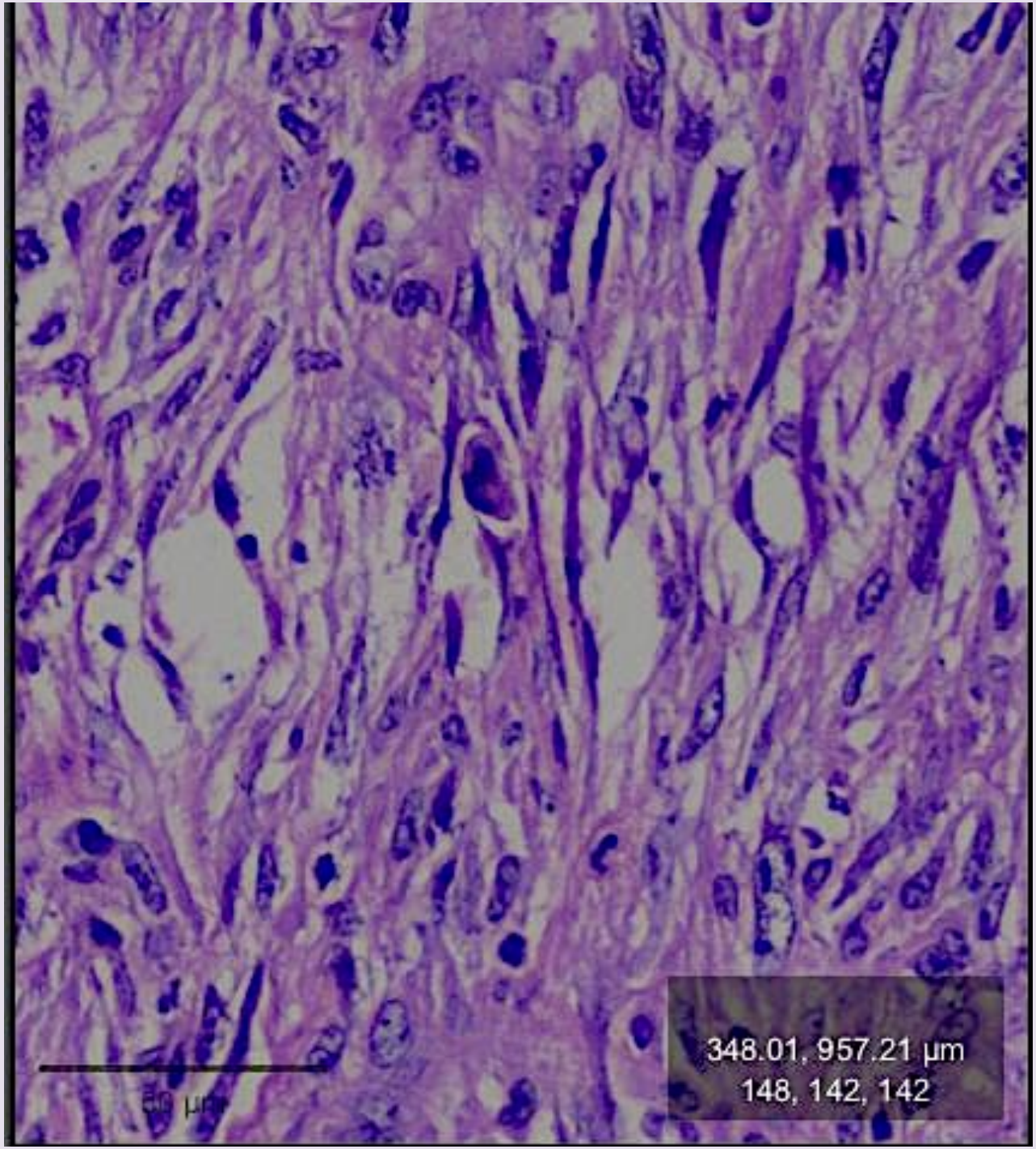


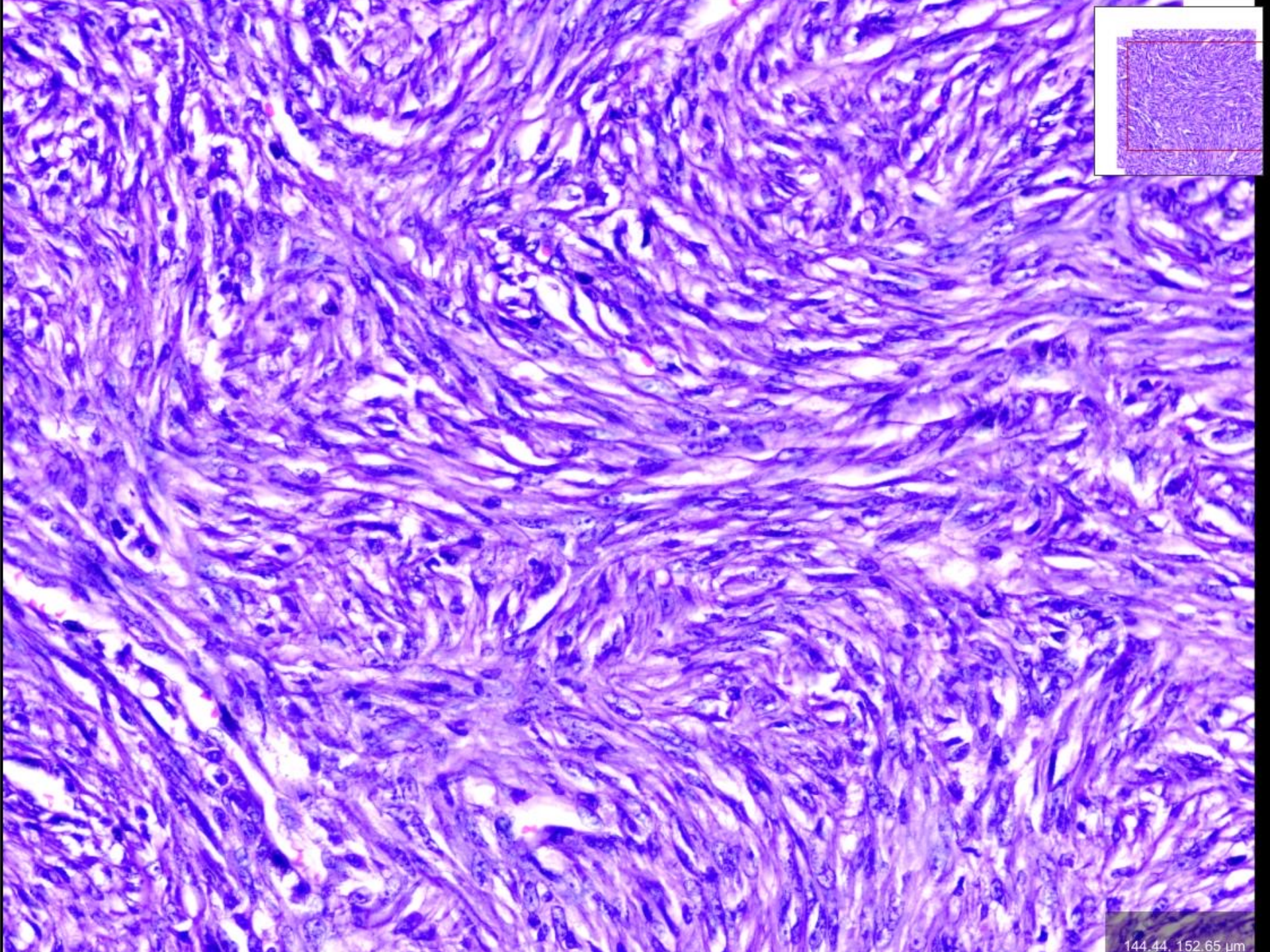

100 µm

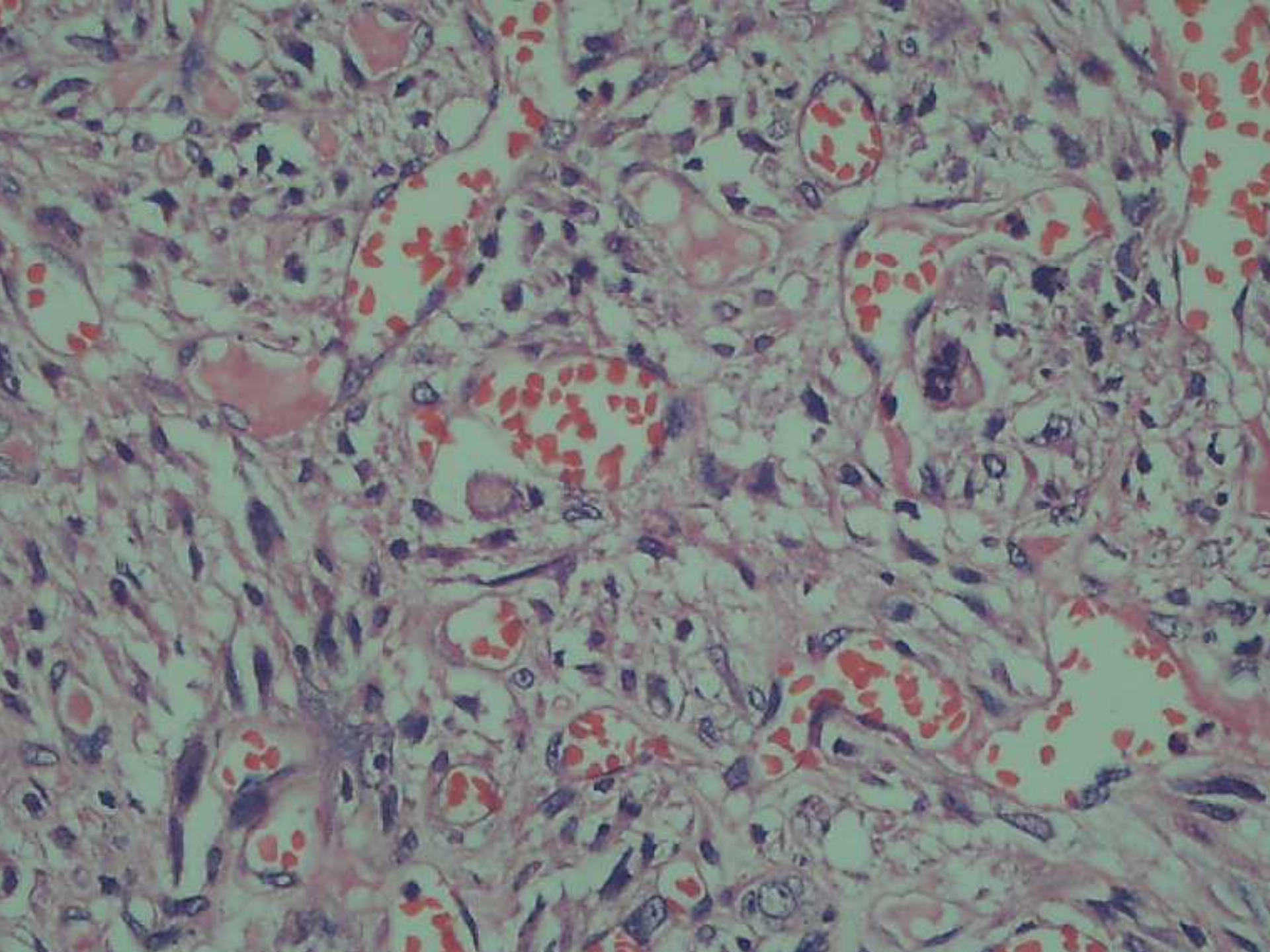







348.01, 957.21 µm
148, 142, 142


144.44, 152.65 µm



Differential Diagnosis

What are the differential diagnoses based on the H&E sections?

Differential Diagnosis

WHO Digestive System Tumours, 6th Edition

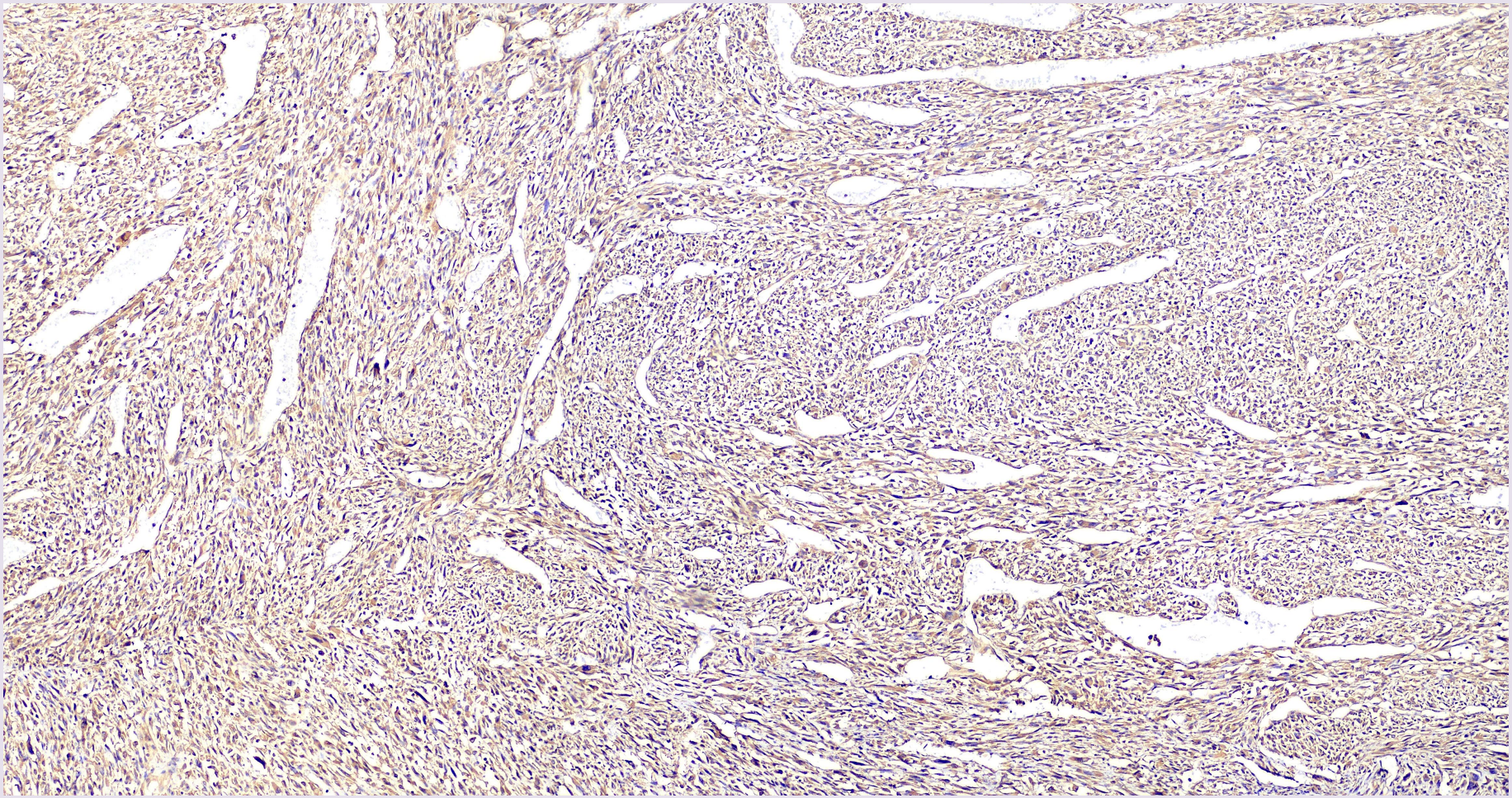
Mesenchymal tumors compatible with these histologic findings include:

- Gastrointestinal stromal tumor (including SDH-deficient GIST)
- Smooth muscle tumors (leiomyoma and leiomyosarcoma)
- Neural tumors

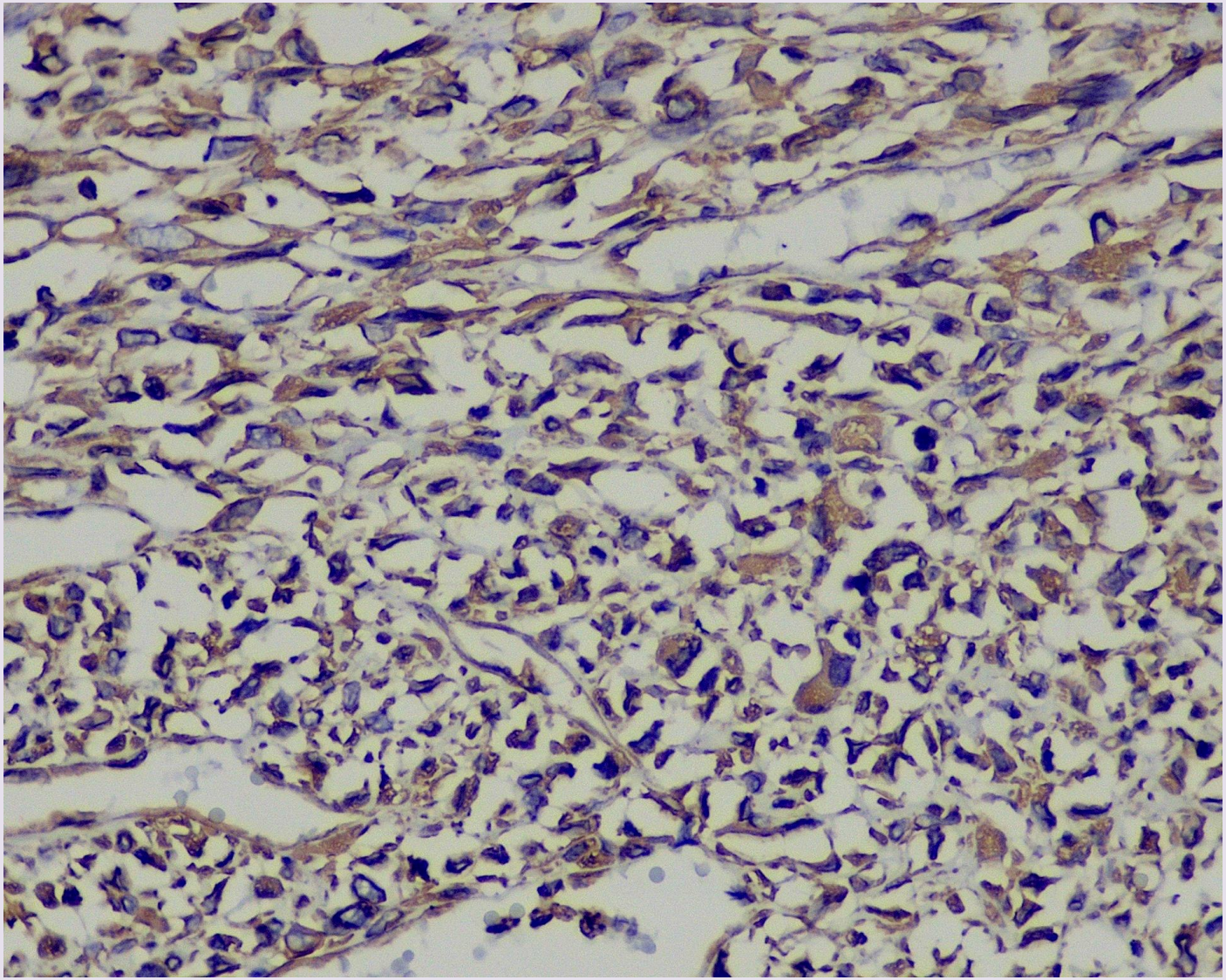
Additional Differential Diagnoses

- Carcinoma with sarcomatoid features
- Melanoma, considering the severe nuclear atypia and bizarre cells

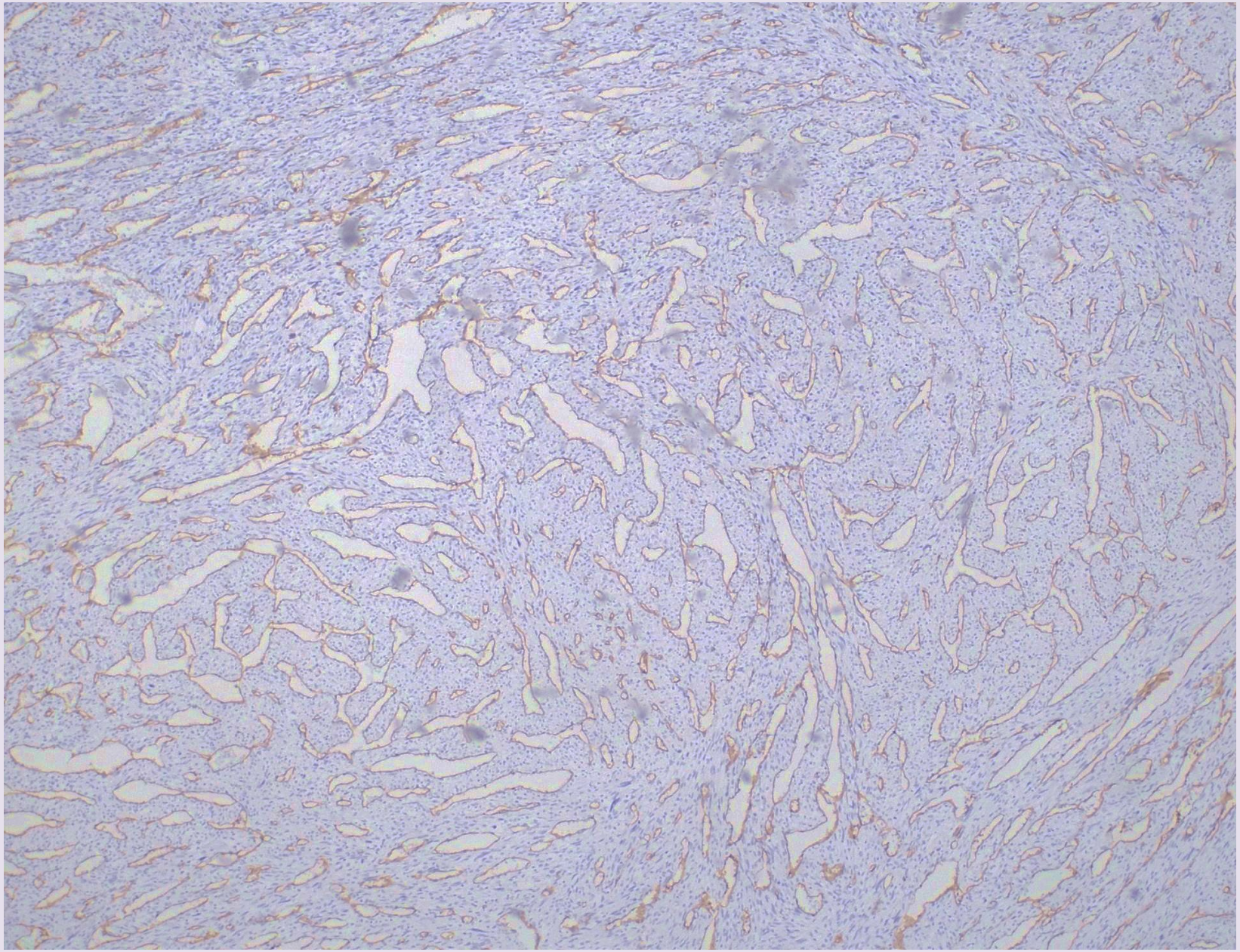
Vimentin



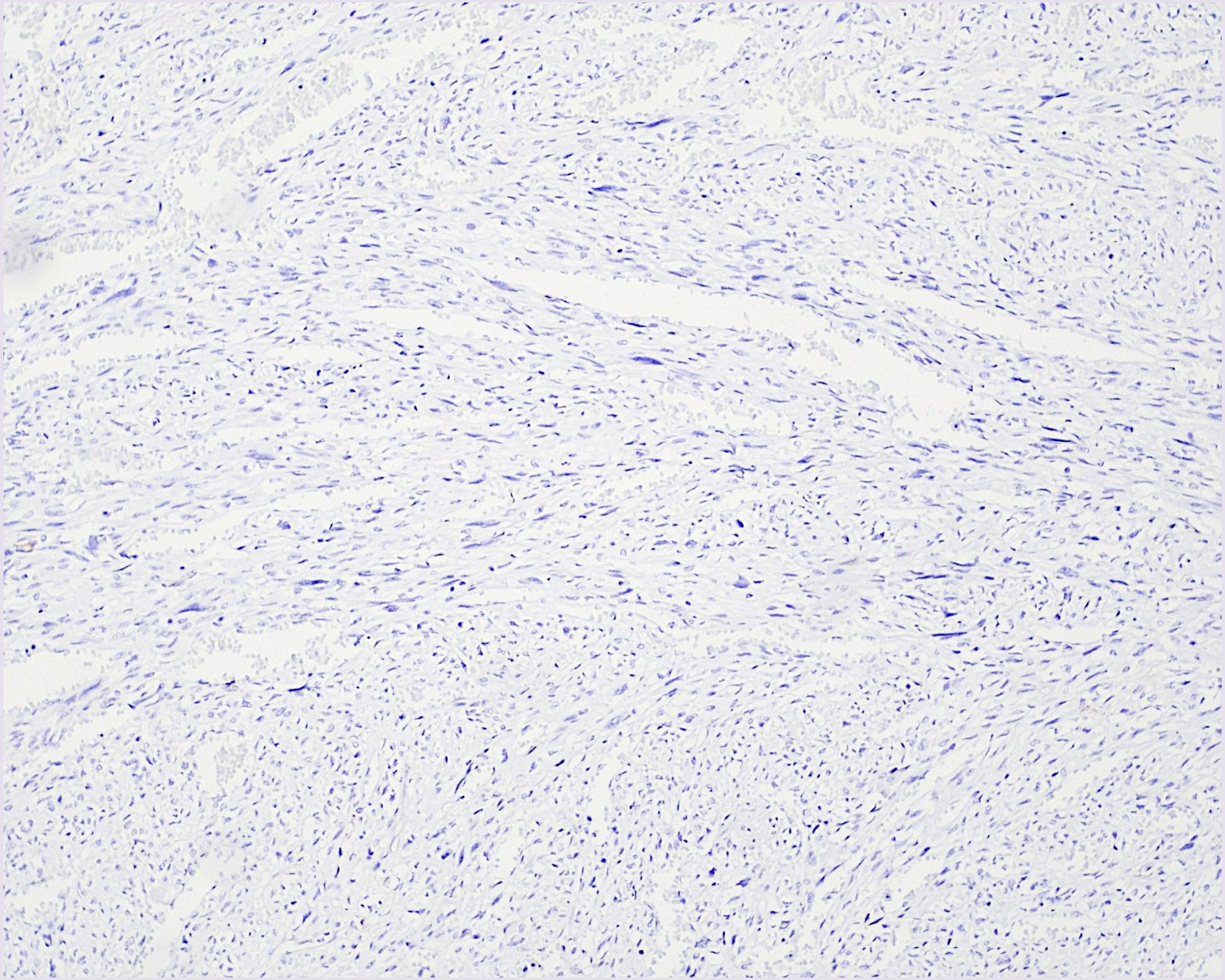
Vimentin



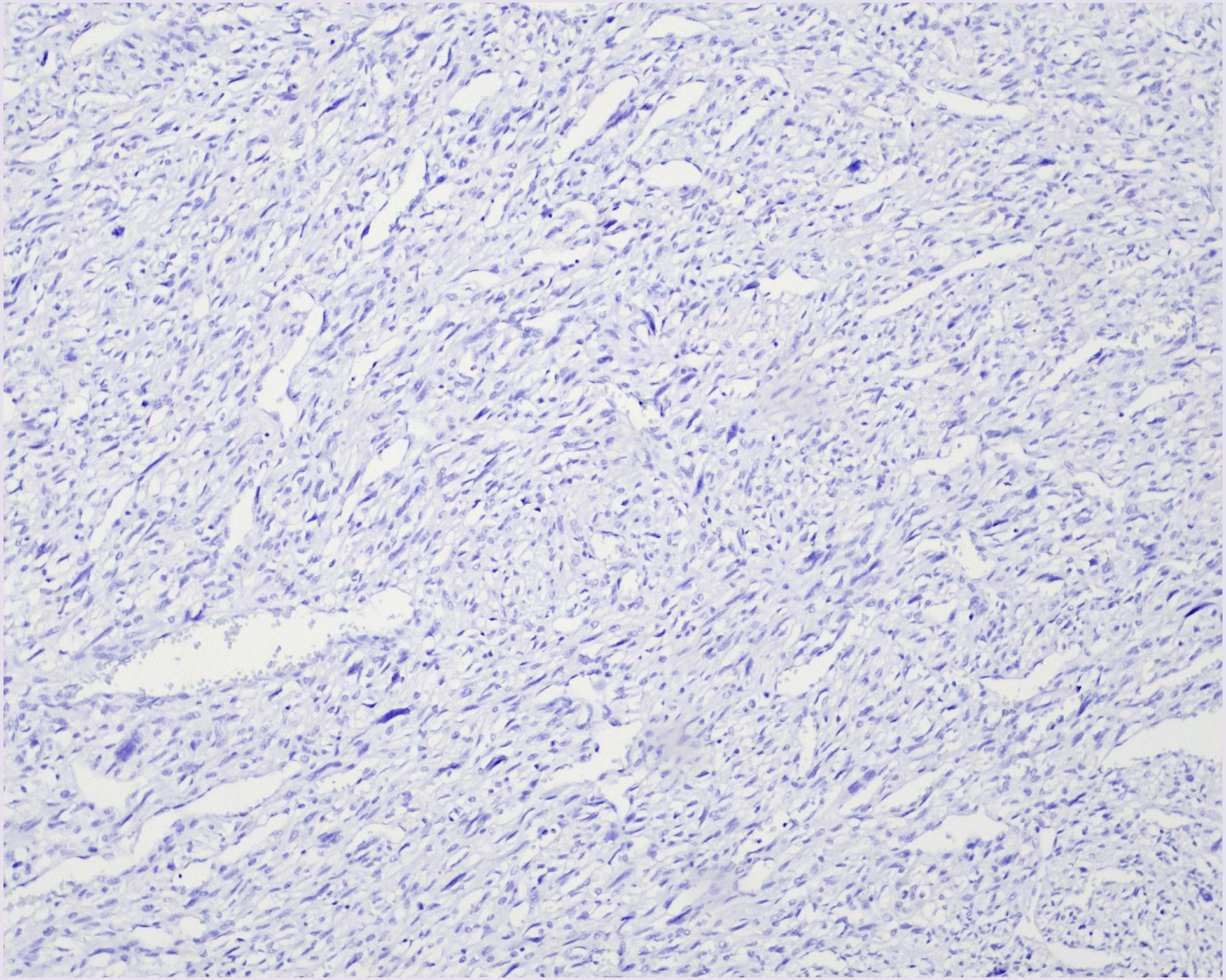
CD34



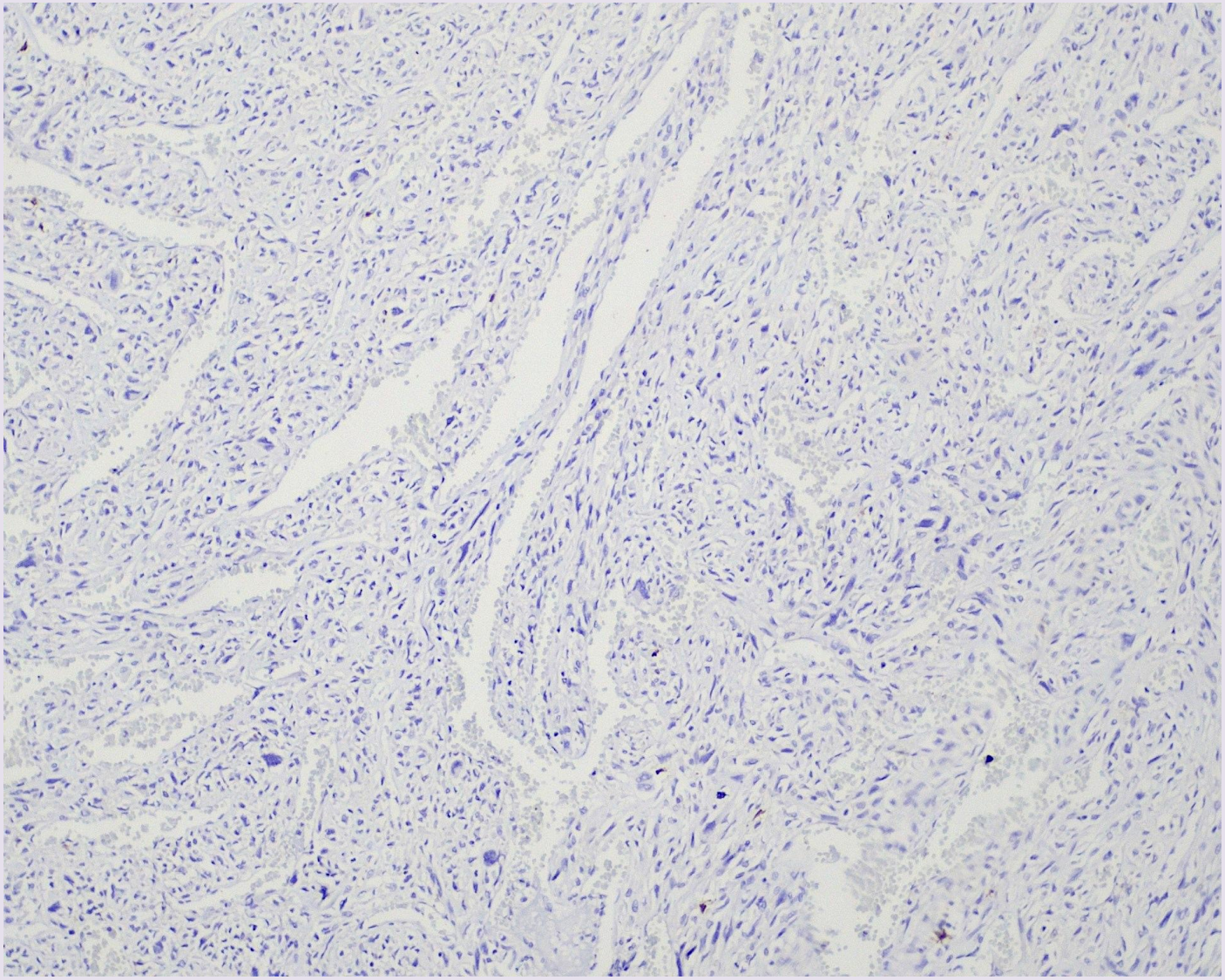
CD117



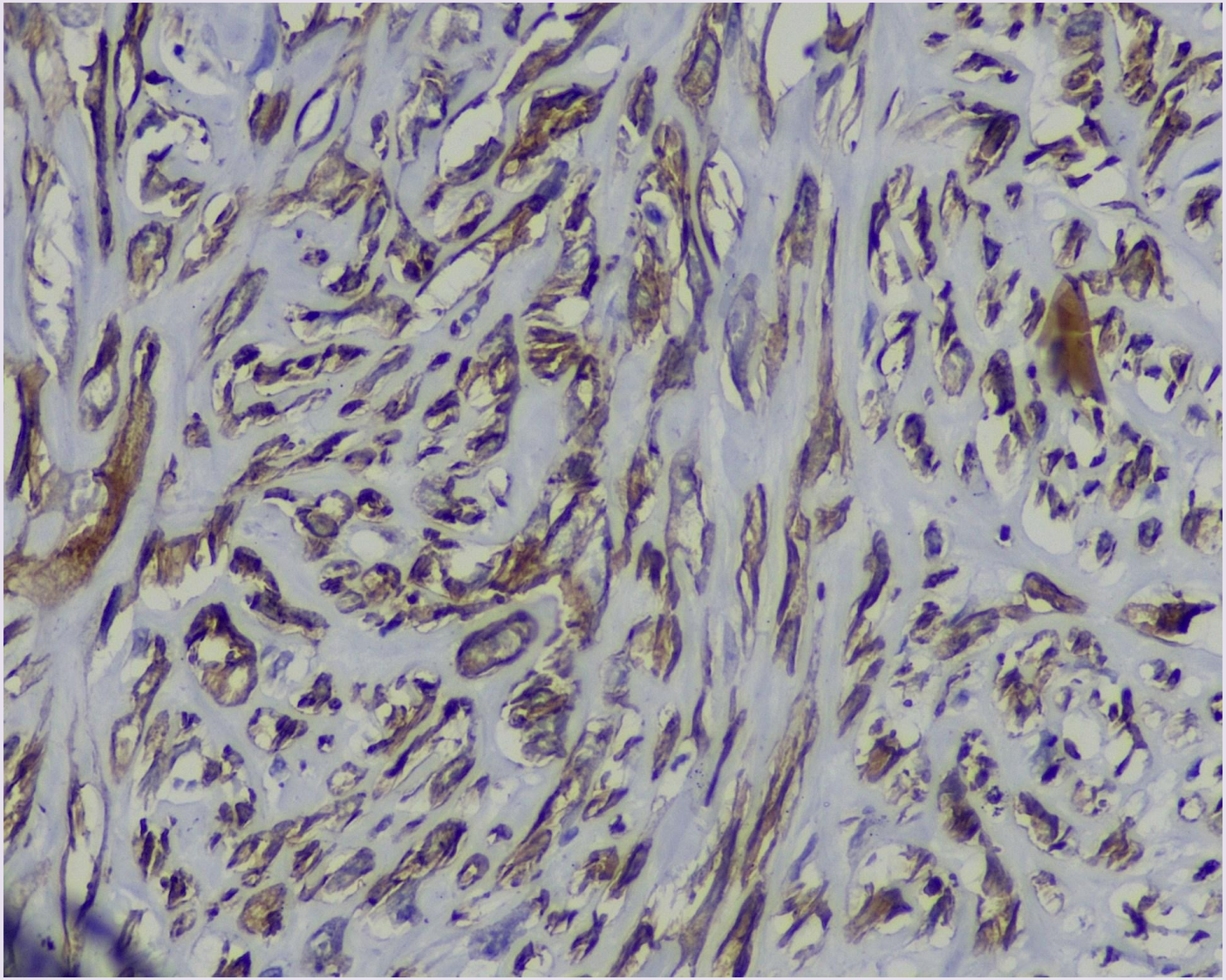
CK



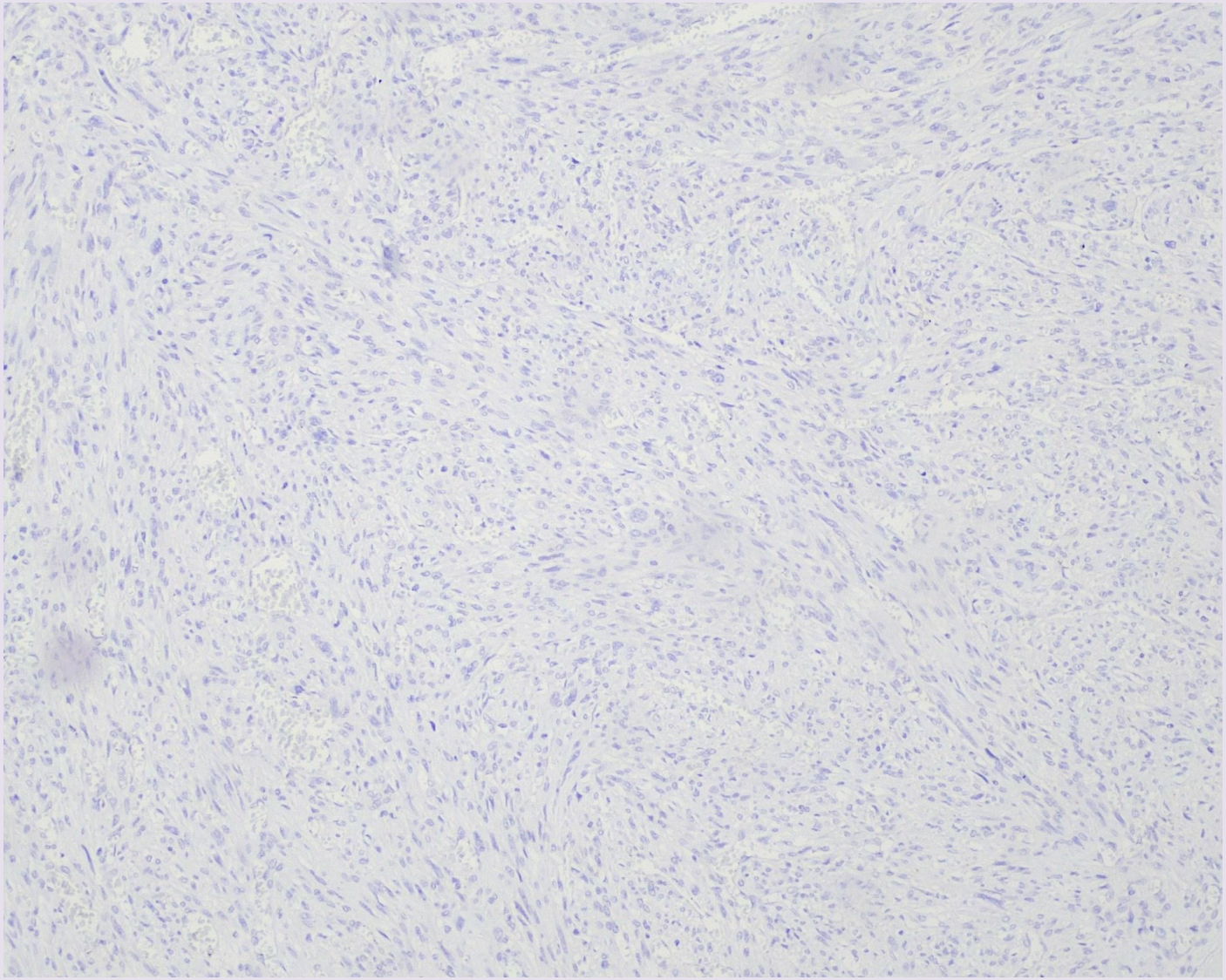
S100



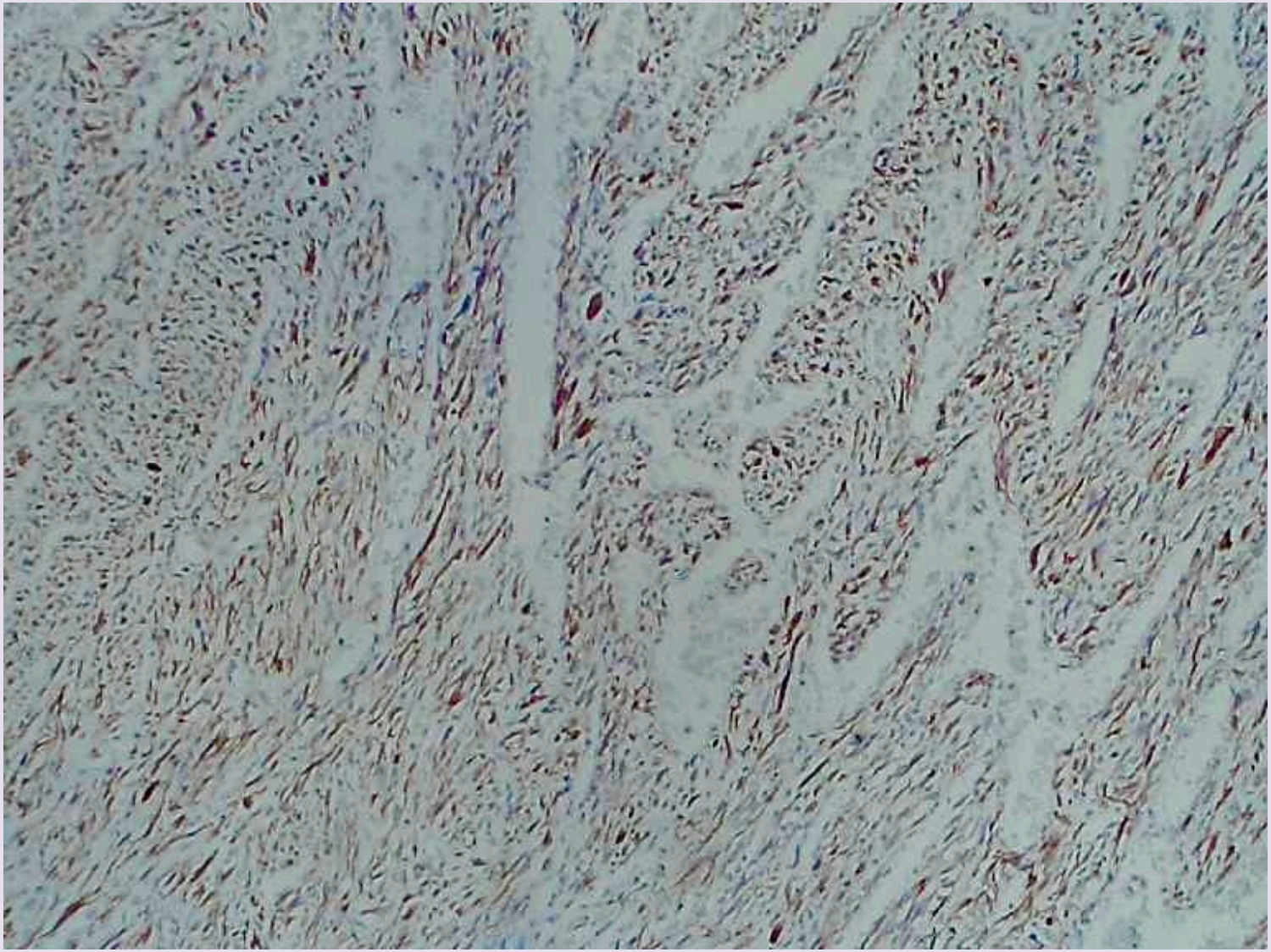
SMA



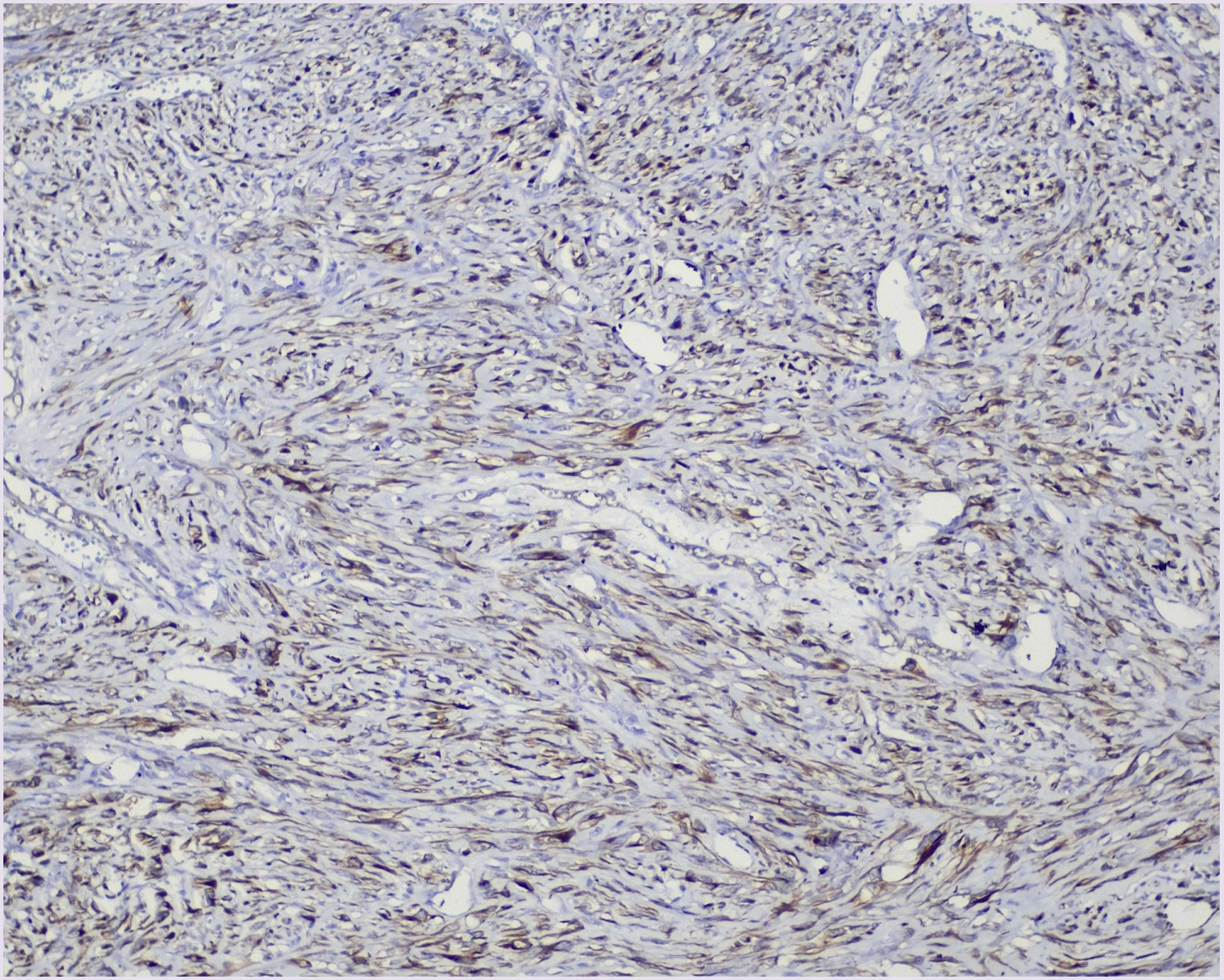
DOG1



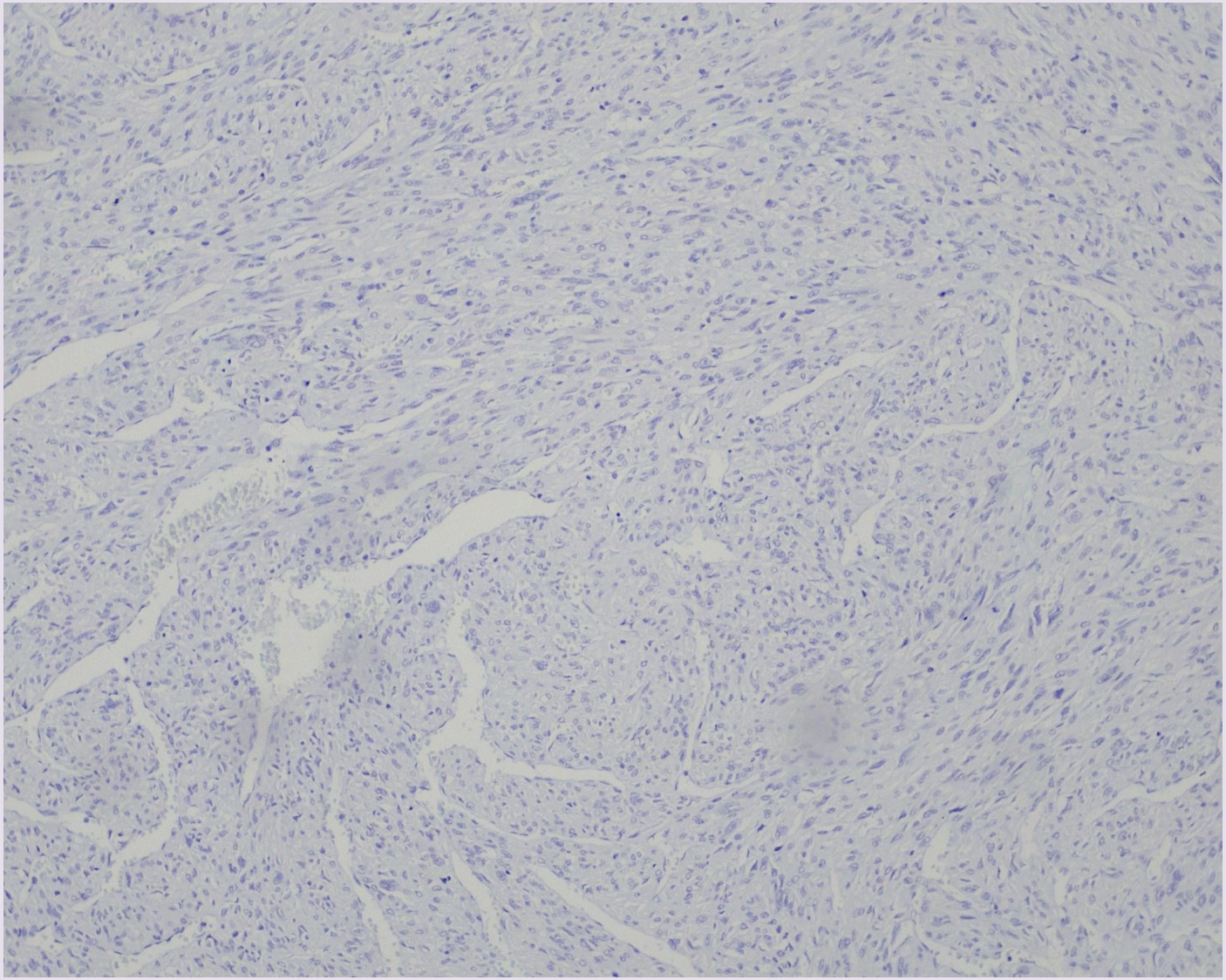
Desmin



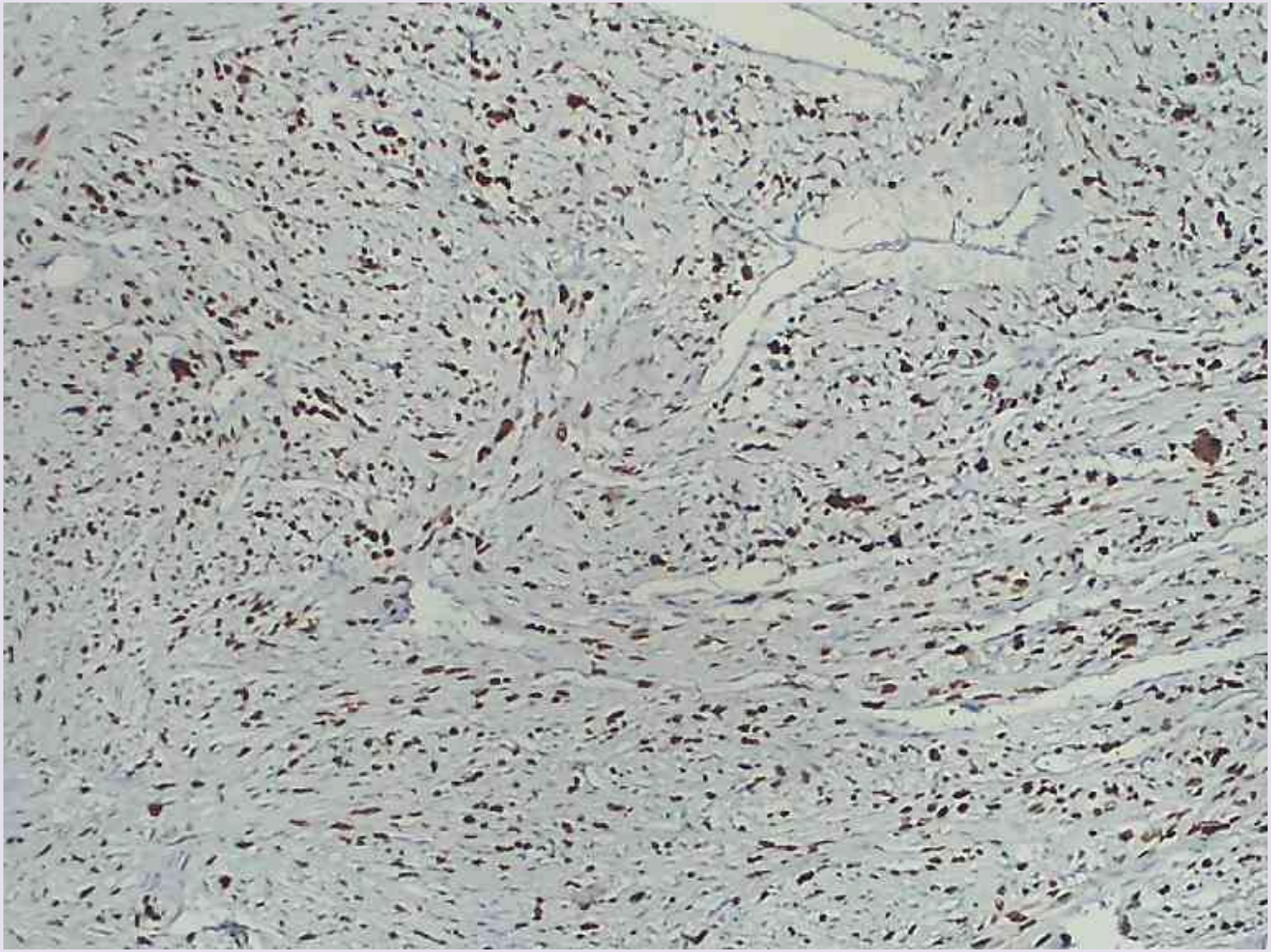
Desmin



H-Caldesmon



Ki-67 Index



Summary of IHC Findings

Vimentin: Positive
Desmin: Positive
SMA: Positive
S100: Negative
CK, CK7, CK20: Negative
CD34: Positive in vascular structures
CD117: Negative
DOG1: Negative
h-Caldesmon: Negative
Myogenin: Negative
MyoD1: Negative
Ki-67 index: Approximately 60%
SOX10: Negative
Melan-A: Negative

Final Diagnosis

Leiomyosarcoma

GI Mesenchymal Tumors

WHO Digestive System Tumours, 6th Edition

- Mesenchymal tumors are relatively rare in the GI tract and are far outnumbered by carcinomas.

- Gastrointestinal stromal tumor (GIST) is the most common sarcoma of the GI tract.

- Mesenchymal neoplasms have favored anatomic locations within the tubal gut as well as characteristic layers of involvement within the wall (mucosa, submucosa, muscularis, or serosa).

Favored Anatomic Locations and Layers of Involvement by Mesenchymal Neoplasms of the Gastrointestinal Tract

Neoplasm	Most Common Anatomic Location	Most Common Layers Involved
Gastrointestinal stromal tumor	Stomach (60%), jejunum and ileum (30%)	Muscularis propria and submucosa
Schwannoma	Stomach	Muscularis propria and submucosa
Gangliocytic paraganglioma	Duodenum	Submucosa
Polypoid ganglioneuroma	Colon	Mucosa
Mucosal perineurioma	Colon	Mucosa
Mucosal Schwann cell hamartoma	Colon	Mucosa
Granular cell tumor	Esophagus	Submucosa
Leiomyoma	Colon and rectum Esophagus	Muscularis mucosae Muscularis propria
Lipoma	Colon	Submucosa
Glomus tumor	Stomach	Muscularis propria
Inflammatory myofibroblastic tumor	Intraabdominal	Mesentery and omentum
Plexiform fibromyxoma	Stomach	Muscularis propria
Perivascular epithelioid cell tumor (PEComa)	Colon and rectum	Variable; mucosa and submucosa or entire thickness of bowel wall
Clear cell sarcoma–like tumor (malignant gastrointestinal neuroectodermal tumor)	Small bowel	Entire thickness of the bowel wall

GI Mesenchymal Tumors

- Most other sarcomas are not specific to the GI tract, but some, such as leiomyosarcoma, are not unusual in visceral locations.

Smooth Muscle Tumors

Definition

- Leiomyomas, leiomyosarcomas, and EBV-associated smooth muscle tumors are neoplasms showing pure smooth muscle differentiation, with varying malignant potential.
- EBV-associated smooth muscle tumors usually occur in the setting of immunosuppression.

Clinical Features

- The presentation of gastrointestinal mesenchymal tumors is often site-specific.
- Several tumor types present as painless masses with variable growth rates.

Tumor Growth and Secondary Involvement

- Malignant tumors can reach a large size, particularly in the abdominal cavity and retroperitoneum, where they may become quite large before causing symptoms.
- In most cases, sarcoma involvement of digestive system organs is secondary.
- Examples include direct invasion of the pancreas by retroperitoneal liposarcoma and bowel entrapment by mesenteric fibromatosis.

Behavior

- Malignant tumors such as leiomyosarcoma and angiosarcoma infiltrate, recur locally, and commonly metastasize (in more than 20% of cases).
- Adult patients often die of their disease.

Grading

- The most widely used system for grading soft tissue sarcomas is the three-tiered system developed by the French Fédération Nationale des Centres de Lutte Contre le Cancer (FNCLCC).
- It combines tumor differentiation, mitotic count, and necrosis to classify tumors as low, intermediate, or high grade.
- This system does not apply to GISTs.

Staging

AJCC 9th Edition

- Among intra-abdominal tumors, visceral primaries are staged according to the extent of invasion beyond the organ of origin.
- Mesenteric, pelvic, or peritoneal sarcomas are staged according to the size criteria used for retroperitoneal sarcomas.

Macroscopic Appearance

- Leiomyosarcomas are usually relatively large, ranging from 30 to 190 mm, with an average size of 60 mm.
- They may present as polypoid intraluminal tumors or as ulcerating, sessile, solid, or cystic masses.

Macroscopic Appearance (continued)

- They are predominantly centered in the muscularis propria.
- Extension through the serosa and into the mucosa may occur.
- The cut surface is variably tan-white and firm, and necrosis may be present.

Histopathology

- Histologic features depend in part on the underlying pattern of genomic alterations.

- Sarcomas with complex genomic alterations, such as leiomyosarcoma and angiosarcoma, generally show variable degrees of nuclear pleomorphism, mitotic activity, and necrosis.

Histopathology

Leiomyosarcoma

- Leiomyosarcomas consist of fascicles of spindle cells showing varying degrees of smooth muscle differentiation, with brightly eosinophilic cytoplasm and blunt-ended nuclei.

Histopathology (continued)

Leiomyosarcoma

- In contrast to leiomyoma, leiomyosarcoma shows varying degrees of nuclear atypia (enlarged, hyperchromatic nuclei), cytologic pleomorphism, high cellularity, tumor necrosis, and high mitotic activity.
- Ulceration of the overlying mucosa is common.

Immunohistochemistry

Smooth Muscle Markers

- Leiomyosarcoma cells express SMA, usually in a multifocal or diffuse pattern.
- Desmin expression is variable and occurs in approximately 80% of cases.
- Caldesmon expression is variable and occurs in at least 50% of leiomyosarcomas.

Immunohistochemistry

Other Markers

- CD34, KIT, DOG1, and S100 protein are usually negative, although focal CD34 expression occasionally occurs.
- ***Keratin expression occurs in 30-40% of leiomyosarcomas.***

Essential Diagnostic Criteria

Leiomyosarcoma

- Cellular tumors with long, intersecting fascicles of spindle cells
- Pleomorphic, enlarged nuclei
- Increased mitotic activity, sometimes accompanied by tumor necrosis

Desirable Diagnostic Criteria

- Expression of SMA, desmin, and/or h-caldesmon
- Negativity for KIT (CD117) and DOG1

Prognosis and Prediction

- Because primary GI leiomyosarcoma is rare, prognostic data are limited.
- Most patients have an aggressive clinical course, with death from disease occurring in the majority of patients.
- Histologic features such as mitotic count and degree of atypia alone have not correlated well with accurate prognostication.
- Metastatic disease usually involves the liver, lungs, and peritoneal cavity.