

AMSER Rad Path Case of the Month

48 Y.O. Female presenting w/ waxing and waning RLQ
pain and irregular periods

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Patient Presentation

- 48 Y.O. nulligravid female w/ no known significant past medical history presents with waxing and waning RLQ abdominal pain.
- The pain is usually at night, feels like a menstrual cramp but stronger, w/ additional stabbing sensations, and sometimes wraps around lower back.
- Pain has gradually gotten worse over the past several months.

Pertinent Labs

- HCG: 1 mIU/mL
- Tumor markers (CEA, CA 125, CA 19 9, AFP): normal

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

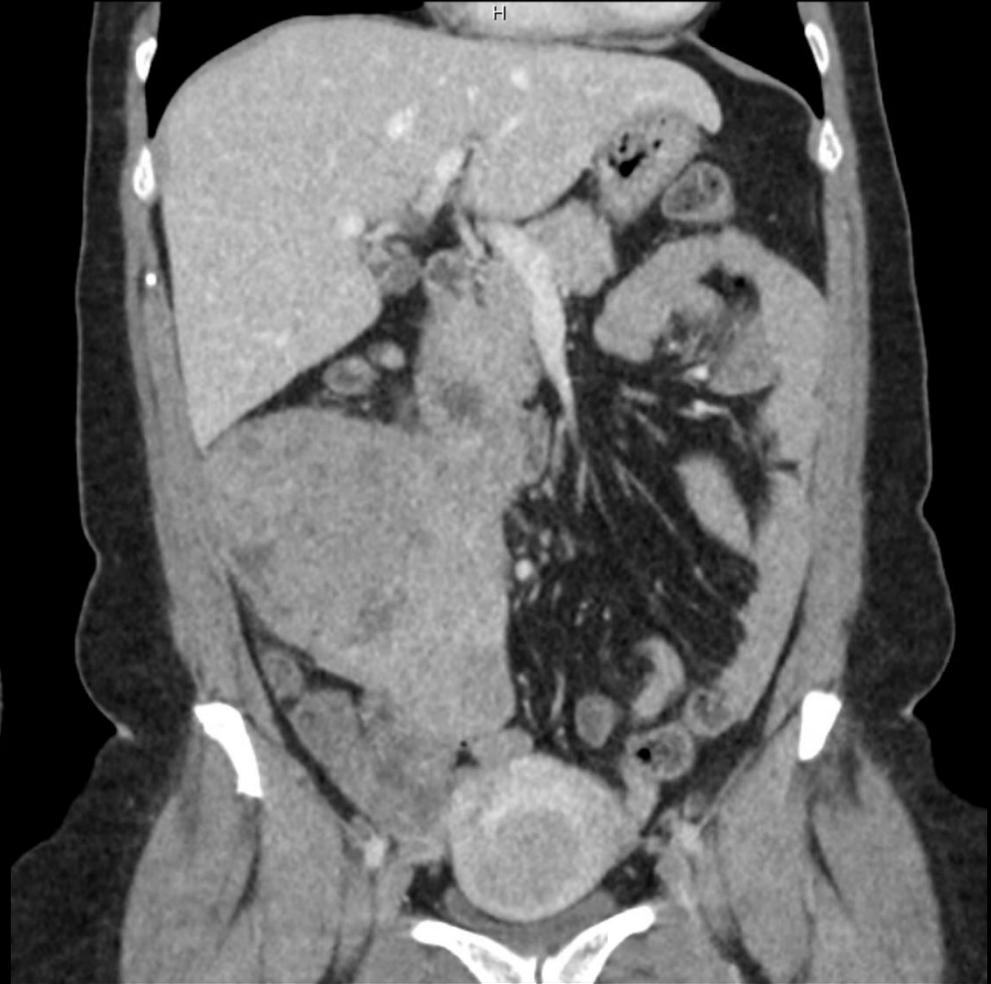
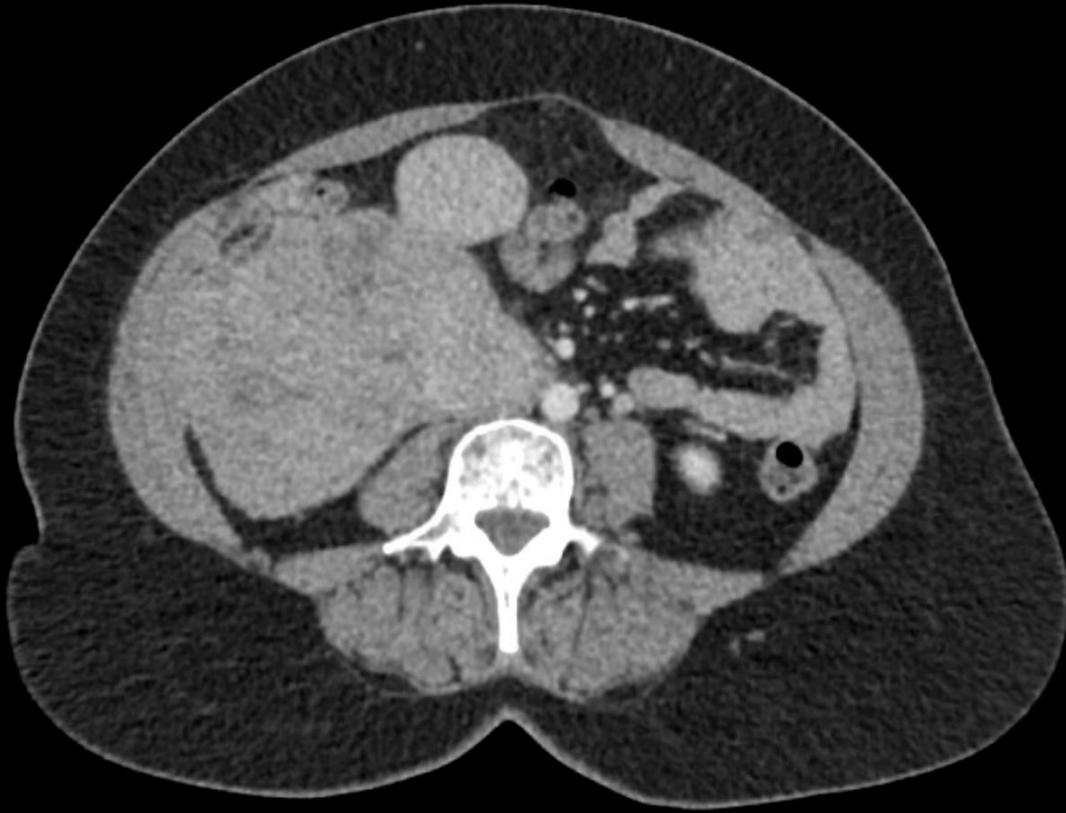
Variant 1:

Right lower quadrant pain. Initial imaging.

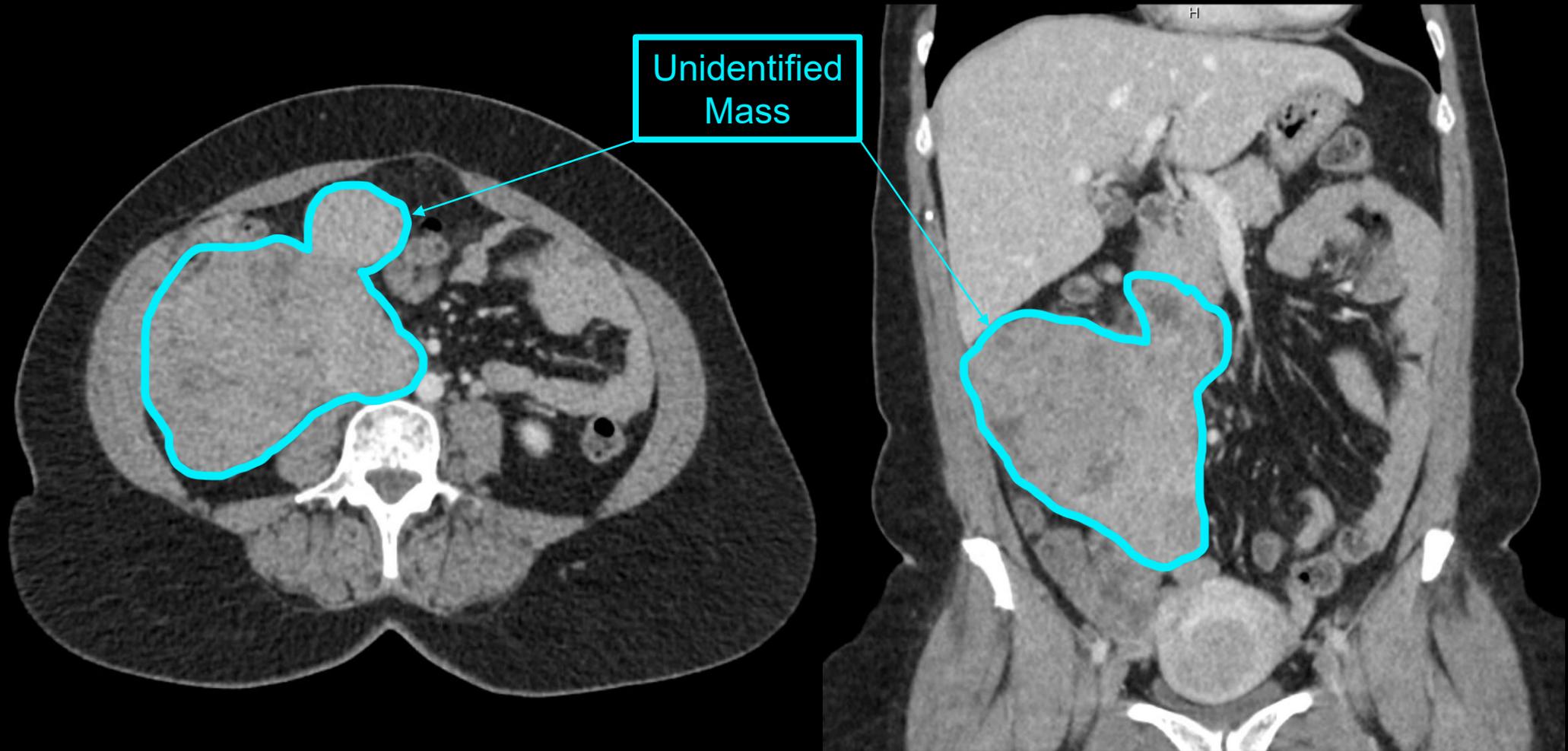
Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	☢☢☢
US abdomen	May Be Appropriate	○
US pelvis	May Be Appropriate	○
MRI abdomen and pelvis without and with IV contrast	May Be Appropriate	○
MRI abdomen and pelvis without IV contrast	May Be Appropriate	○
CT abdomen and pelvis without IV contrast	May Be Appropriate	☢☢☢
Radiography abdomen	Usually Not Appropriate	☢☢
Fluoroscopy contrast enema	Usually Not Appropriate	☢☢☢
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢
WBC scan abdomen and pelvis	Usually Not Appropriate	☢☢☢☢

This imaging modality was ordered.

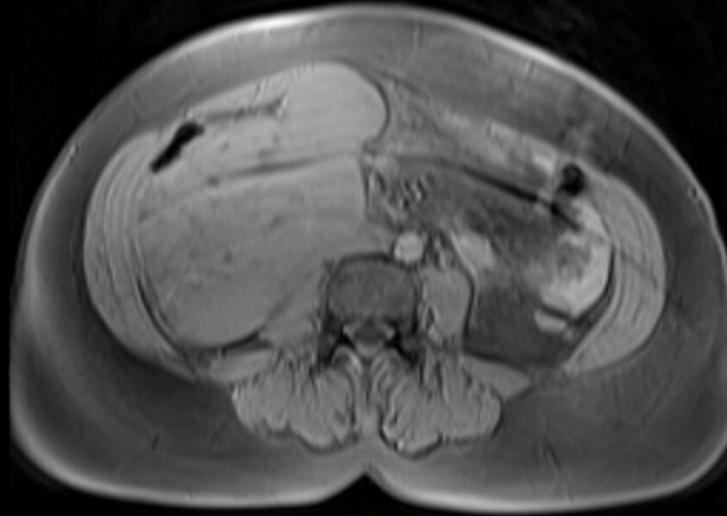
Findings (unlabeled): CTA



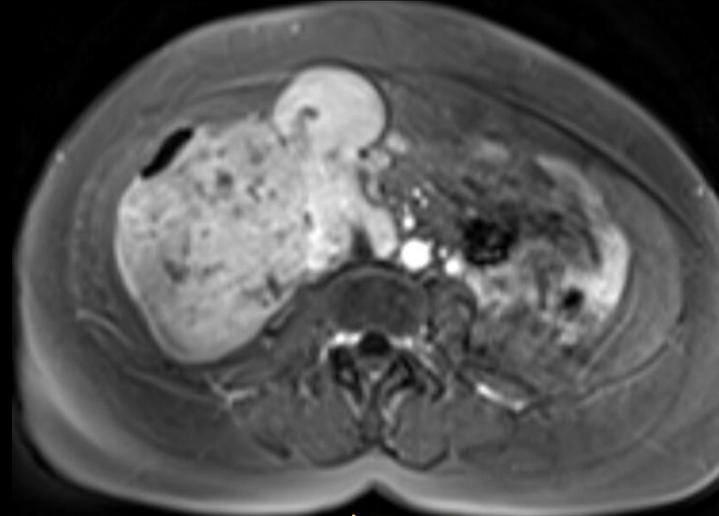
Findings (labeled): CTA



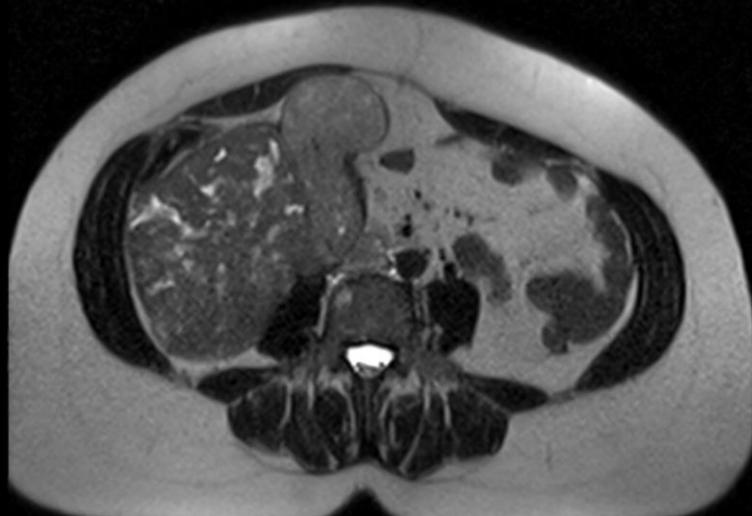
Findings (unlabeled): MRI



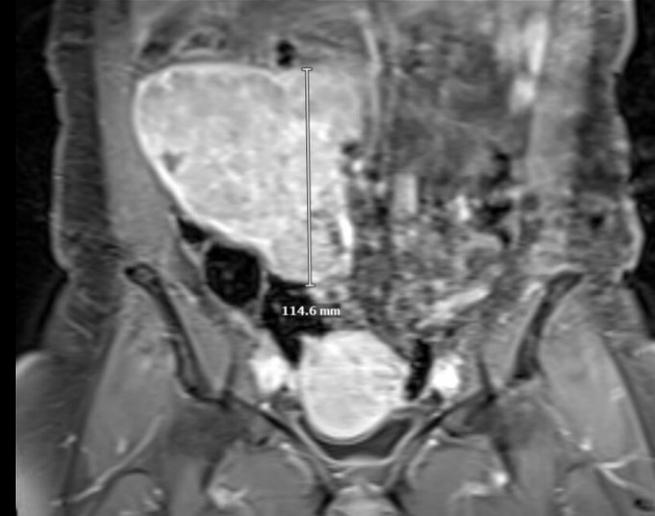
Ax FS Pre



Axial T1 FS



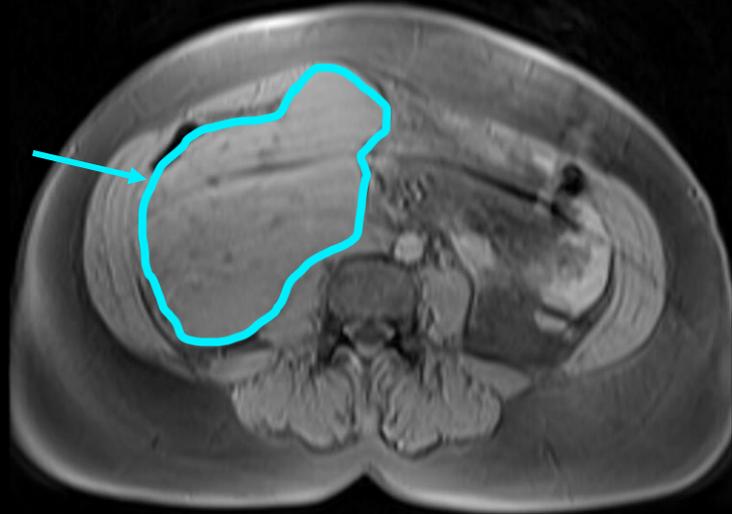
Axial T2



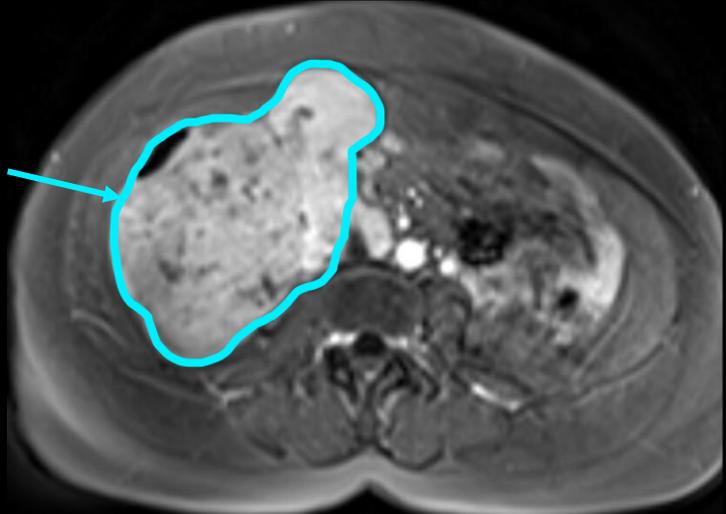
Coronal FS Post

Findings (labeled): MRI

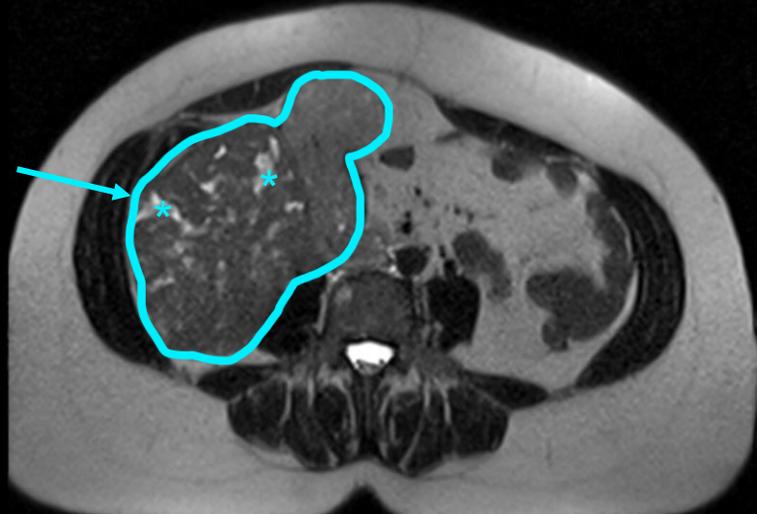
Solid, slightly heterogeneously enhancing mass w/ scattered areas of T2 hyperintensity (*) w/ areas of nonenhancement that may correlate w/ areas of necrosis



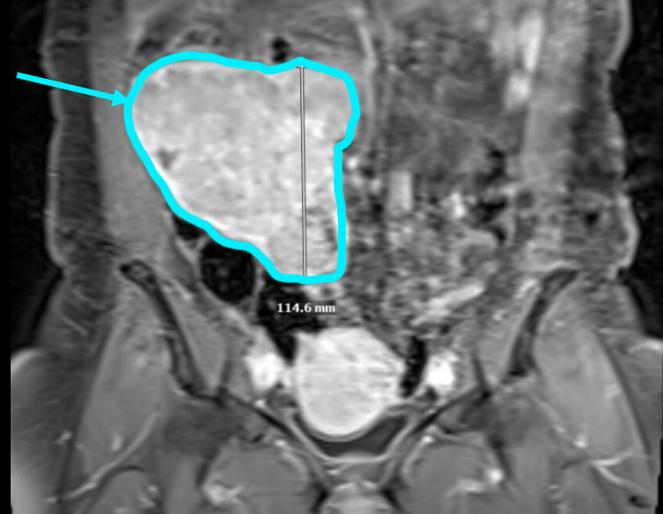
Ax FS Pre



Axial T1 FS



Axial T2



Coronal FS Post

Differential Dx Based on Imaging

- Lymphoma
- Metastasis
- Lipid-Poor Liposarcoma
- Leiomyosarcoma
- Malignant GIST

Biopsy (results withheld for now)

Abd Gen
C5-1
25Hz
RS

2D
60%
Dyn R 55
P Low
HGen
AS 0/0

TIS0.3 MI 1.1

M3

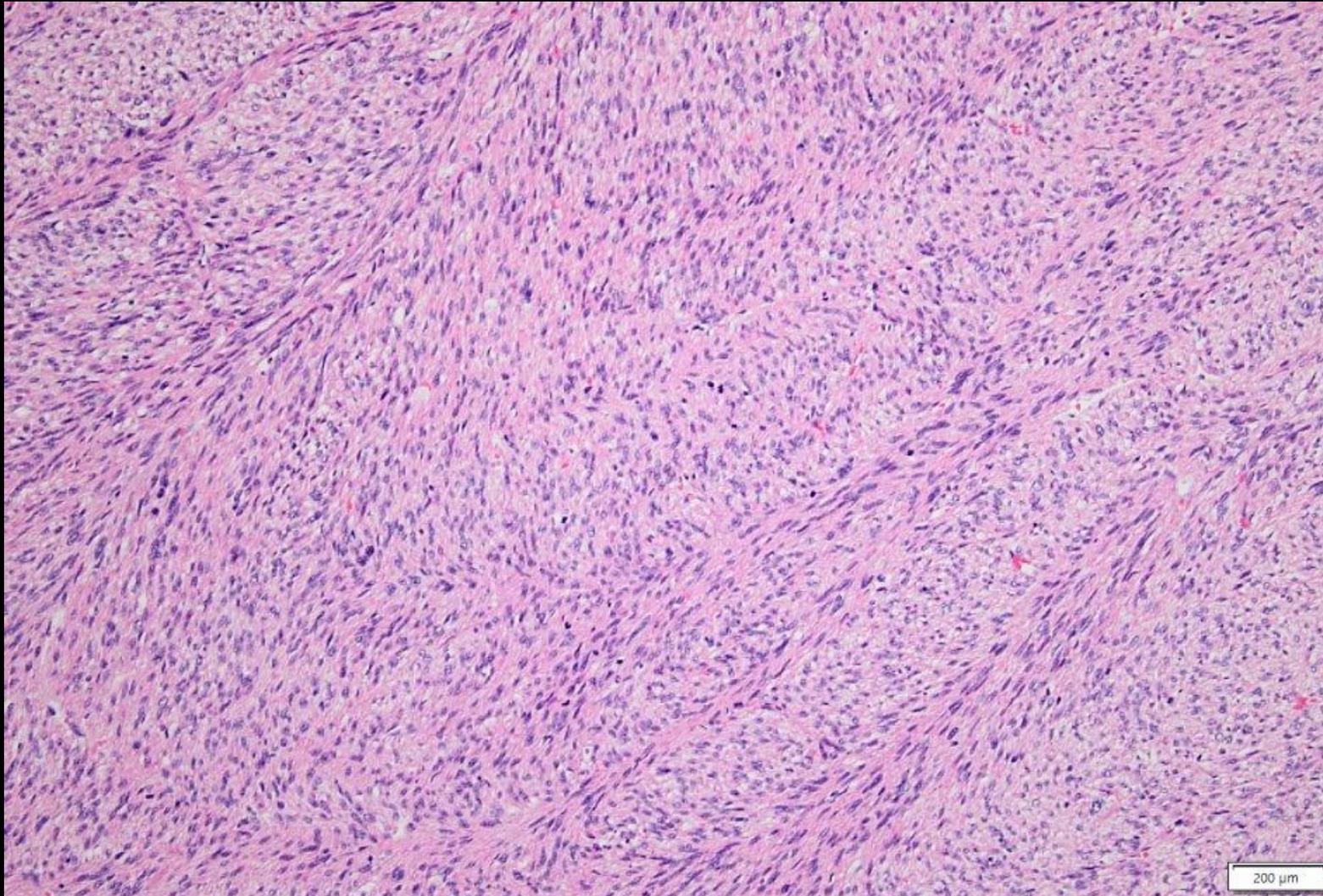


Patient later taken for laparotomy for surgical exploration and mass resection

Gross Image of Lesion and Resected Colon

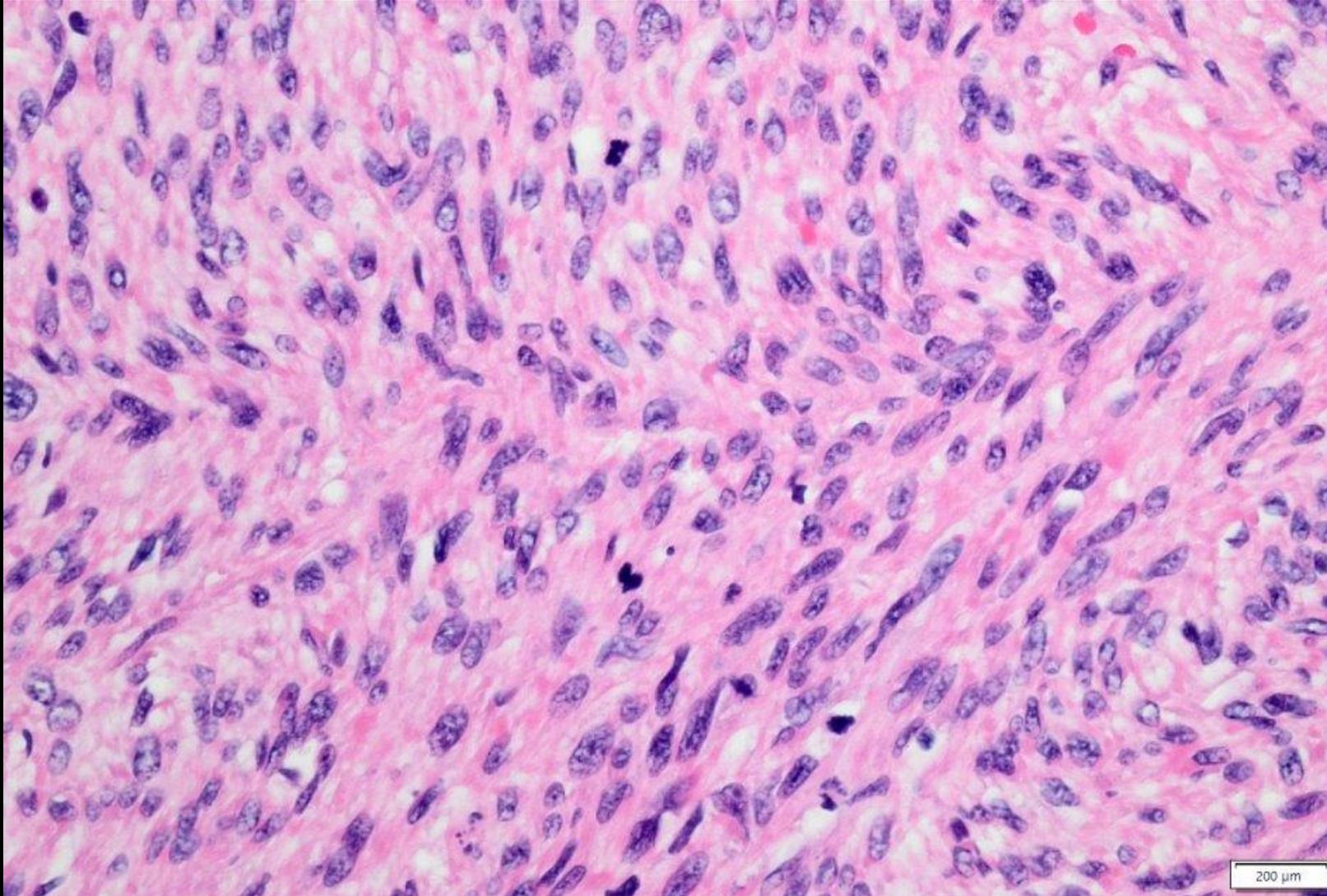


Pathology: Micro



- Fascicular architecture
- Cells are set in long intersecting fascicles parallel and perpendicular to the plane of section
- Spindle shaped cells with plump, blunt ended nuclei and moderate to abundant, pale to brightly eosinophilic fibrillary cytoplasm

Pathology: Micro (high power)



- Moderate nuclear pleomorphism.
- Mitotic figures.
- Various proportions of spindle-shaped, cohesive, small or large sized cells arranged in parallel alignment
- Blunt ended nuclei

Final Diagnosis:

Leiomyosarcoma

Leiomyosarcoma: Overview

- Leiomyosarcoma is a soft tissue sarcoma, accounting for up to 10% - 20% of all sarcomas⁴; 8% of malignant soft tissue tumors⁵; **second most common retroperitoneal soft tissue sarcomas (after liposarcoma)**³
- Leiomyosarcomas are soft tissue sarcomas of smooth muscle (leiomyosarcoma are the most common primary malignancy of the IVC⁵) or mesenchymal origin^{2,4}
- Most common in **middle age and older** adults; female predominance¹
- The most common symptoms are pain, abdominal distention, bladder or bowel changes, GI bleeding, and vascular congestion and are due to **mass effect**³
- Can **recur** and **metastasize** (hematogenously); most commonly to lung, peritoneum, and liver³
- Retroperitoneal leiomyosarcomas have high recurrence rate and can be fatal due to difficulty in achieving a curative resection³

Leiomyosarcoma: Radiographic Notes

- Characteristically heterogeneous: enhancement of solid portions of the tumor admixed with non-enhancing areas of degeneration, hemorrhage, and necrosis³ (like our patient).
- Does not contain fatty elements³
- No specific MRI findings distinguish retroperitoneal leiomyosarcoma, however, most commonly⁶:
 - T1: isointense to muscle
 - T2: intermediate to hypointense to neighboring fat
 - T2 FS: predominantly hyperintense

Leiomyosarcoma: Micro Notes

- Composed of elongated spindle cells arranged in intersecting fascicles, similar to smooth muscle⁴
- Nuclei are typically elongated and hyperchromatic with abundant eosinophilic cytoplasm⁴
- Epithelioid cells or epithelioid cells admixed with spindle cells may be seen³
- High-grade tumors can demonstrate nuclear pleomorphism and may resemble other pleomorphic sarcomas³

References:

1. Kasper B, Achee A, Schuster K, Wilson R, van Oortmerssen G, Gladdy RA, et al. Unmet medical needs and future perspectives for leiomyosarcoma patients—A position paper from the National Leiomyosarcoma Foundation (NLMSF) and Sarcoma Patients EuroNet (SPAEN). *Cancers (Basel)*. 2021;13(4):886. doi:10.3390/cancers13040886
2. Kerrison WGJ, Wang L, Welter L, Al-Mulla F, Alsharif SS, Saif MW. The biology and treatment of leiomyosarcomas. *Cancer Treat Res Commun*. 2023;35:100692. <https://doi.org/10.1016/j.critrevonc.2023.103955>.
3. Levy AD, Manning MA, Al-Refaie WB, Miettinen MM. Soft-tissue sarcomas of the abdomen and pelvis: radiologic-pathologic features, part 1—common sarcomas: from the radiologic pathology archives. *Radiographics*. 2017;37(2):462-483. doi:10.1148/rg.2017160157
4. Menon G, Mangla A, Yadav U. Leiomyosarcoma. In: StatPearls. Treasure Island, FL: StatPearls Publishing; 2025. Updated February 28, 2024.
5. Reddy VP, Venkateswarlu P, Mahapatra K, et al. Leiomyosarcoma of the inferior vena cava: a case report. *World Journal of Surgical Oncology*. 2010;8:114. Published August 23, 2010. Accessed September 12, 2025. <https://pmc.ncbi.nlm.nih.gov/articles/PMC2838855/>
6. Weerakkody Y, Silverstone L, Knipe H, et al. Leiomyosarcoma. Radiopaedia.org. Updated July 30, 2025. Accessed August 14, 2025.