

# Prostate Got You STUMPEd?

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# Disclosures

- I do not have financial/other relationships with the manufacturer(s) of commercial product(s) or provider(s) of commercial service(s) that would affect my views discussed in this educational activity.

# Objectives

- Case Presentation
- Prostate Stromal Sarcoma/ Stromal Tumor of Uncertain Malignant Potential (STUMP)
  - Etiology/incidence
  - Clinical presentation
  - Gross and histologic features
  - Differential Diagnoses
  - Grading and Staging
  - Prognosis and treatment
- So what?

# Case Presentation

71-year-old male veteran with history of

- HTN/HLD/Obesity
- Chronic back pain
- PTSD
- Agent orange exposure
- Benign prostatic hyperplasia
  - Urinary retention/incontinence
  - Using self catheterization

# Agent Orange

- Herbicide used by the US military to clear vegetation during the Vietnam war
- Exposure increases risk of multiple diseases
  - Birth defects
  - AL amyloidosis
  - Hematopoietic neoplasms
  - Chloracne
  - Diabetes Mellitus type 2
  - Ischemic heart disease
  - Parkinson's disease
  - Peripheral neuropathy
  - Porphyria cutanea tarda
  - Lung Cancer
  - Prostate cancer
  - Soft tissue sarcoma



# Agent Orange

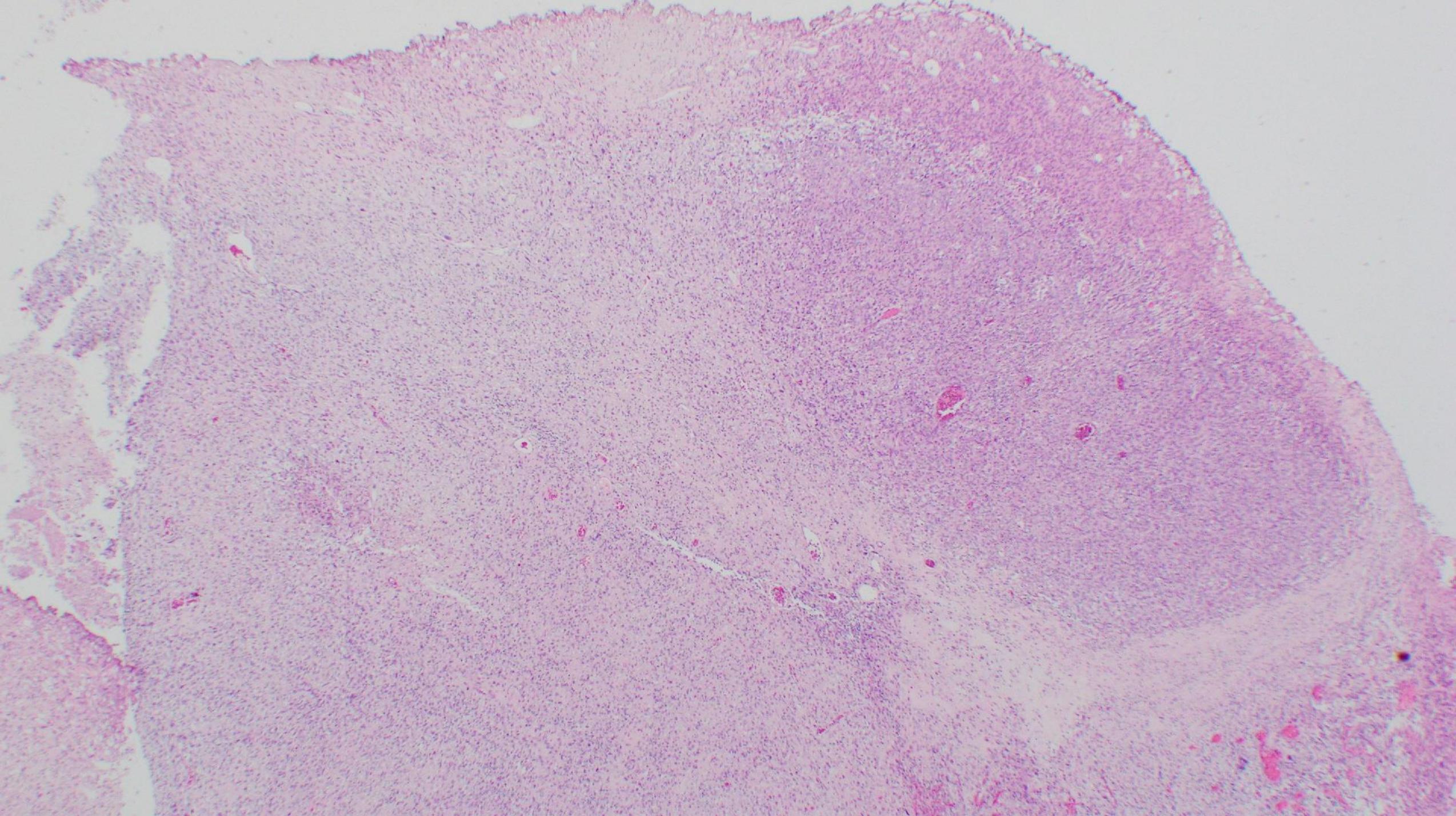
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  - **Prostate cancer**
  - **Soft tissue sarcoma**

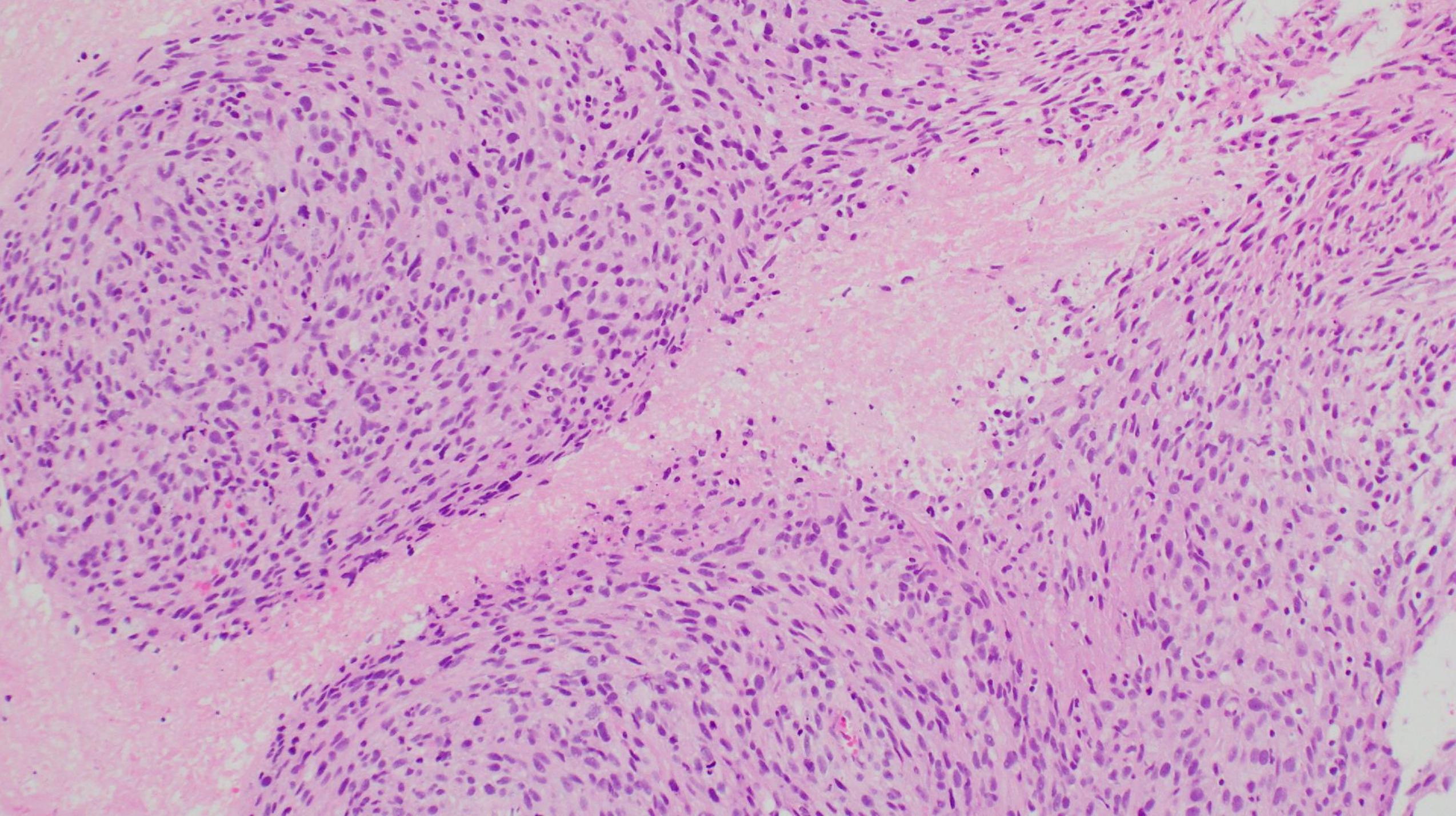


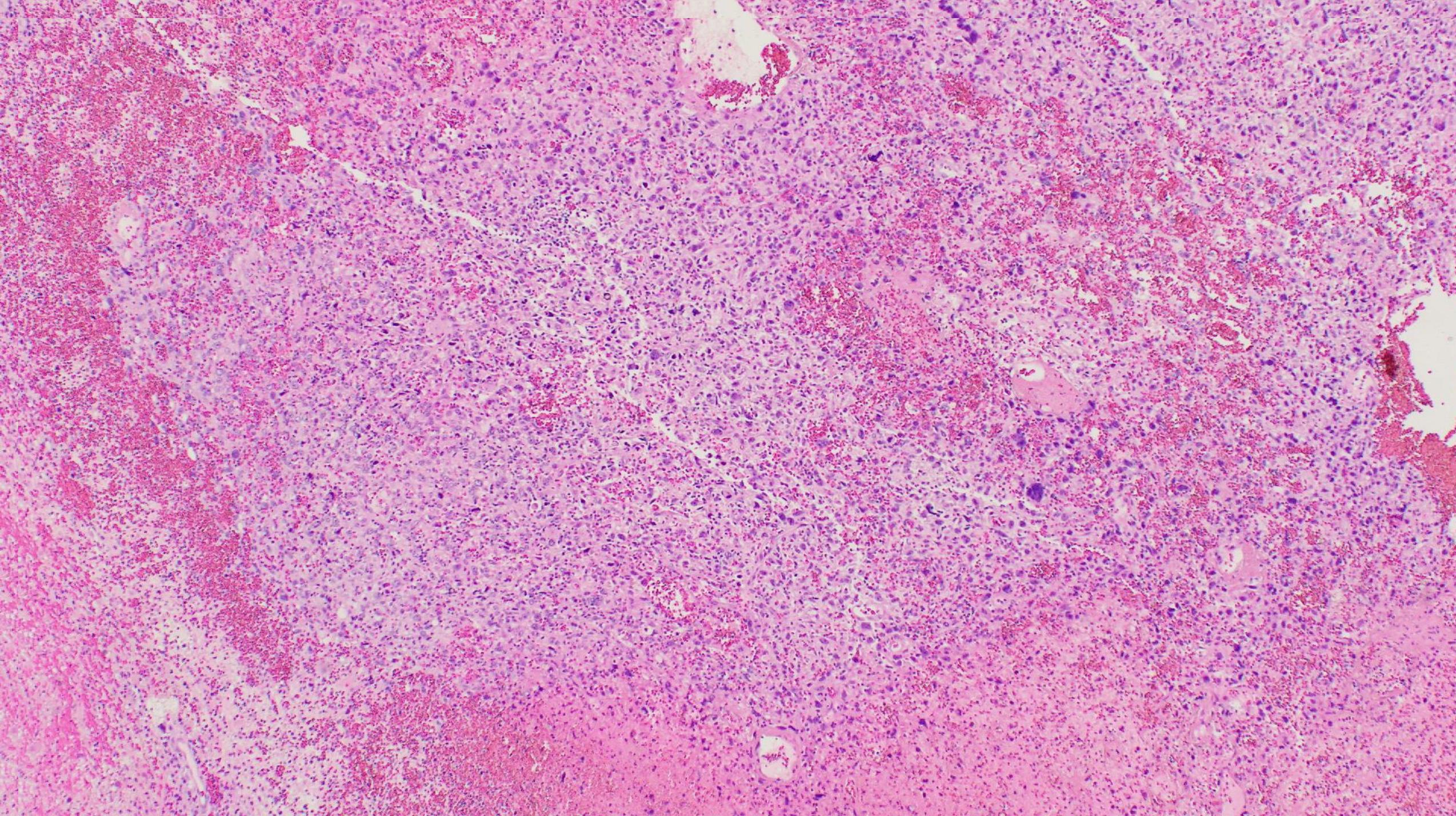
# Case Presentation

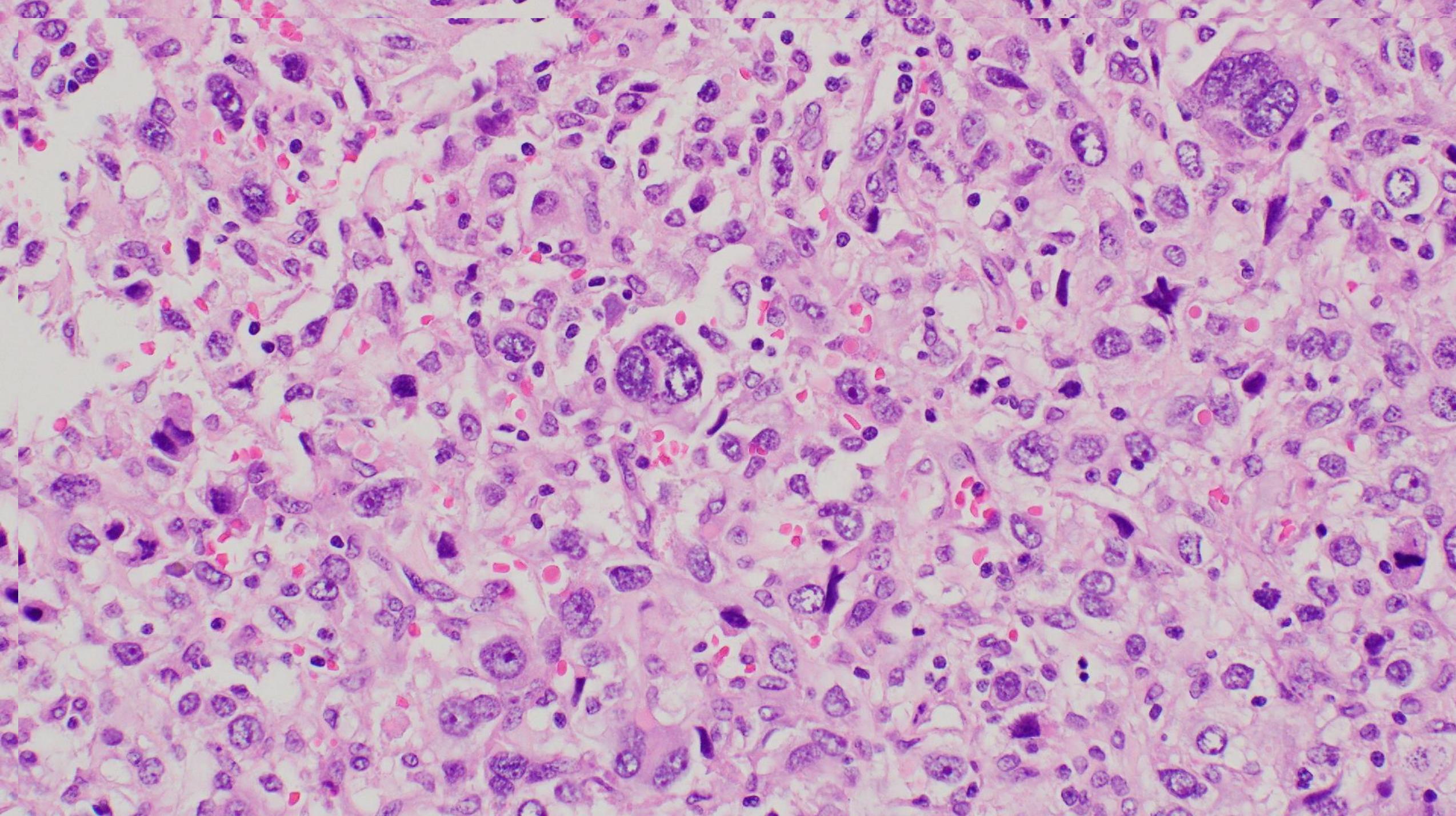
Presented for re-evaluation of urinary incontinence and hematuria.

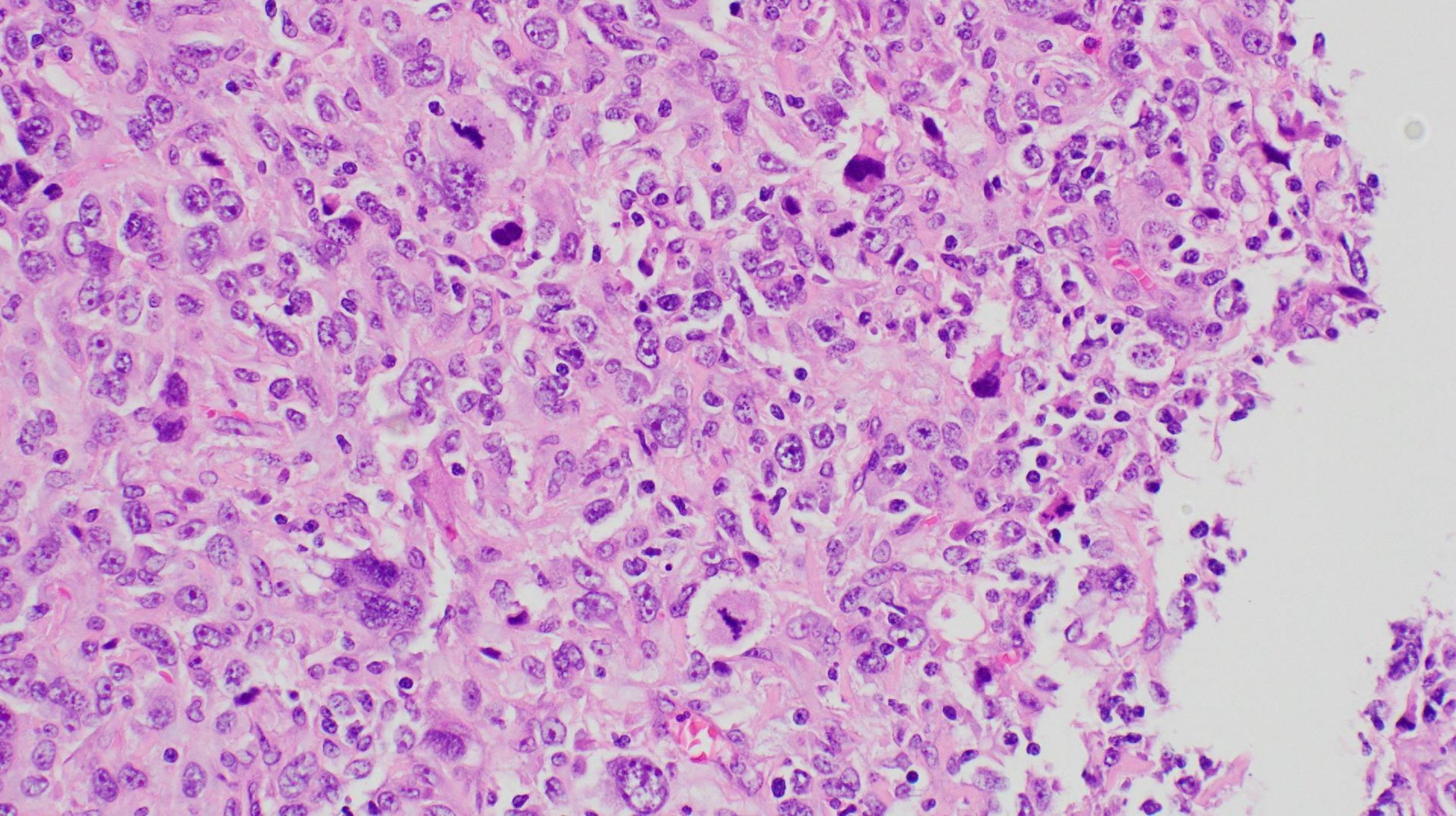
- Imaging
  - Lumbosacral x-ray: degenerative changes L5-S1
  - CT urogram: Left prostate gland concerning for malignancy
  - Cystoscopy: abnormal white/yellow tissue in prostatic fossa concerning for malignancy
- Urine cytology (x2)
  - Negative for malignancy
- Recommended for transurethral resection of prostate











# Case Presentation

## Immunohistochemistry

Positive: SMA, vimentin

Negative: Pancytokeratin, HMWK, p63, desmin,  
GATA3, PSA, PSAP, S100, CD34

## Diagnosis

**Prostate, transurethral resection:  
High grade sarcoma**

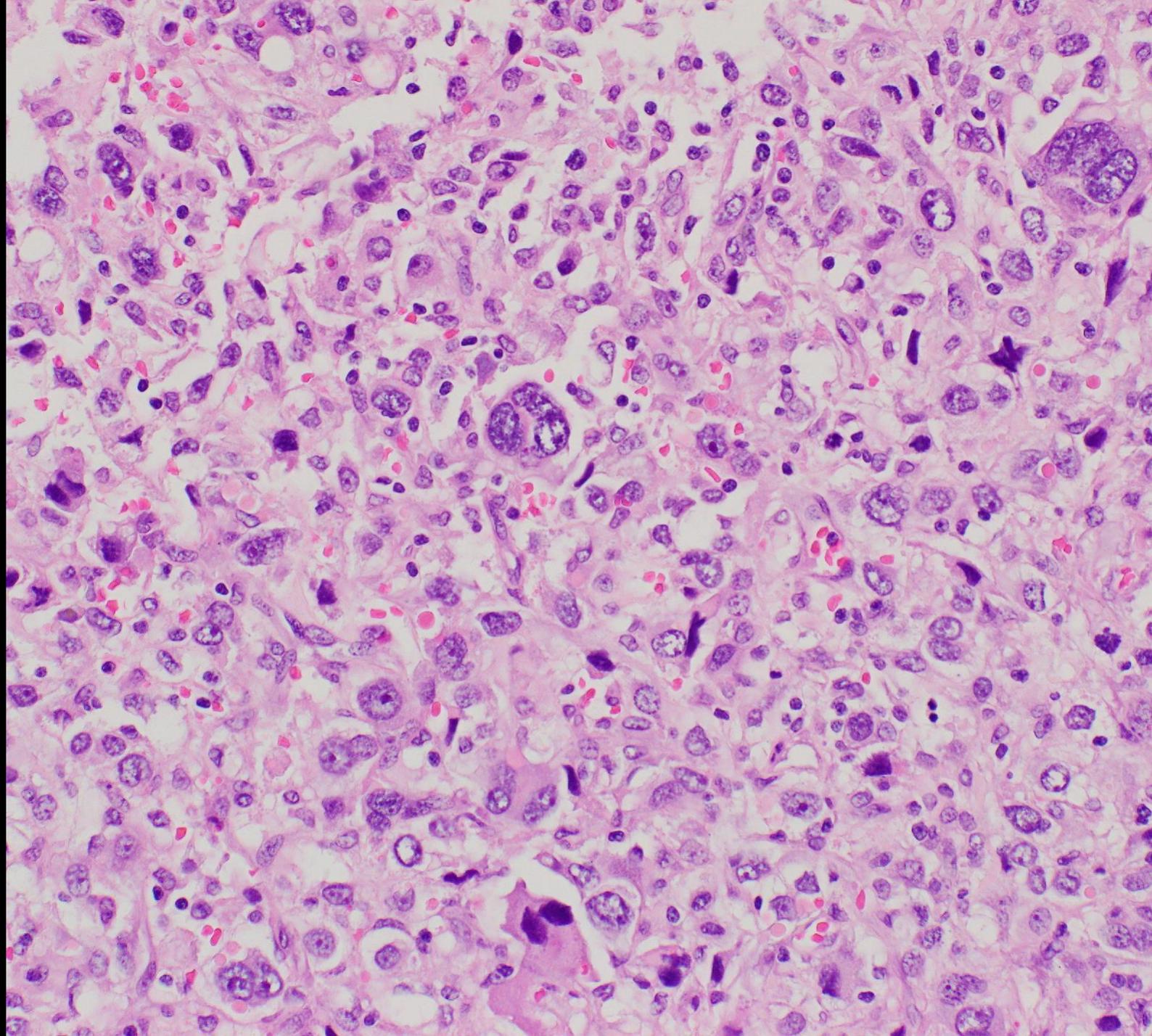
# Prostate Stromal Neoplasms

Neoplastic proliferation of the mesenchymal elements of the prostate gland

- 2 categories in WHO classification
  - Stromal Tumor of Uncertain Malignant Potential (STUMP)
  - Prostate Stromal Sarcoma (PSS)

# Epidemiology

- Very rare
  - <0.2% of prostate malignancies
- Peak incidence in the 6th and 7th decades.
- May be related to prostatitis, perineal trauma, previous prostate biopsy, or radiation



# Clinical Presentation

- Urinary retention
- Hematuria or hematospermia
- Palpable rectal mass.
- PSA not necessarily elevated

# Diagnosis

## Histology

### Florid Hyperplasia

- Lobulated or nodular architecture
- Characteristic vascular pattern with small round blood vessels +/- hyalin thickening

### STUMP

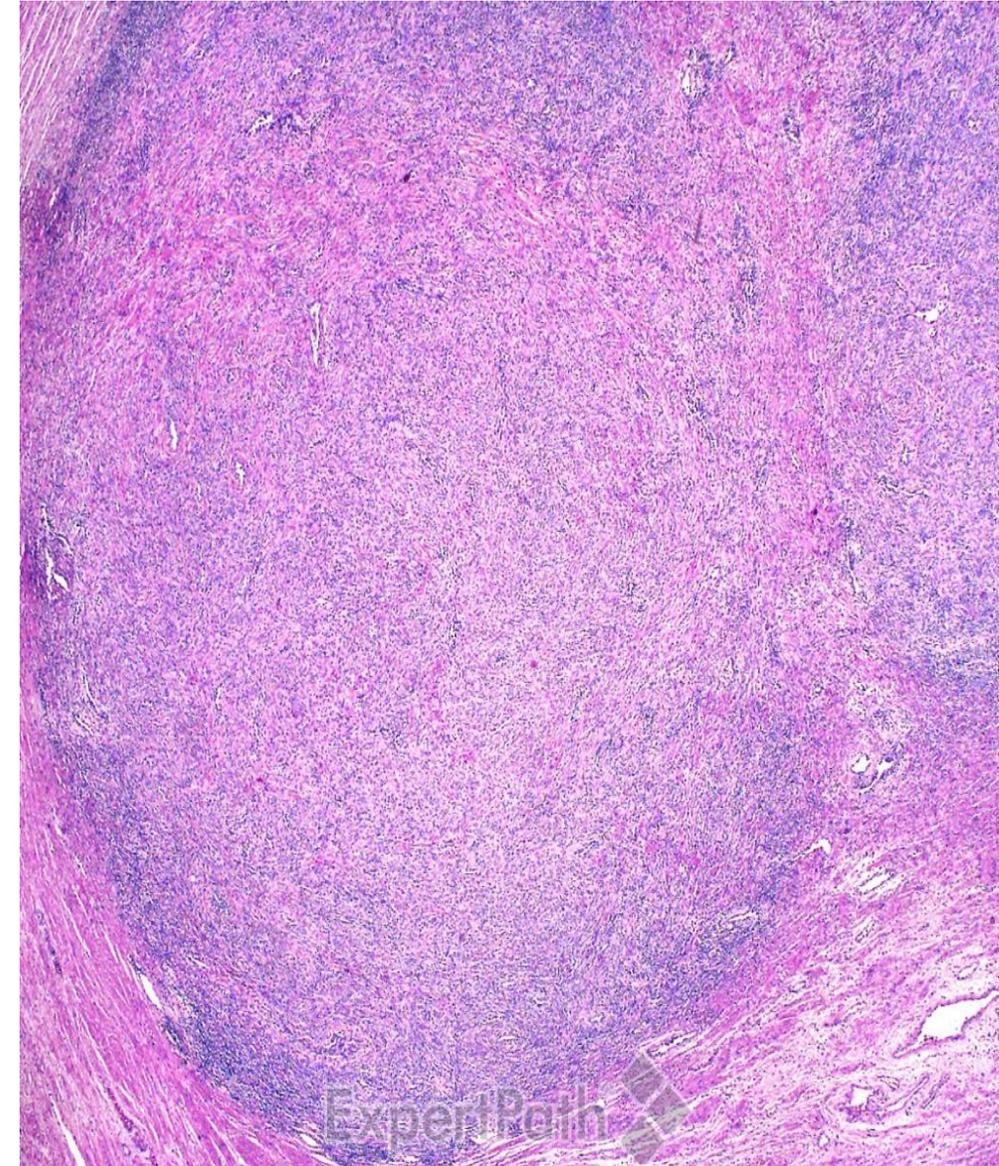
- More diffuse growth pattern
- Does not contain characteristic small blood vessels

# Diagnosis

## Histology

### Florid Hyperplasia

- Lobulated or nodular architecture
- Characteristic vascular pattern with small round blood vessels +/- hyalin thickening

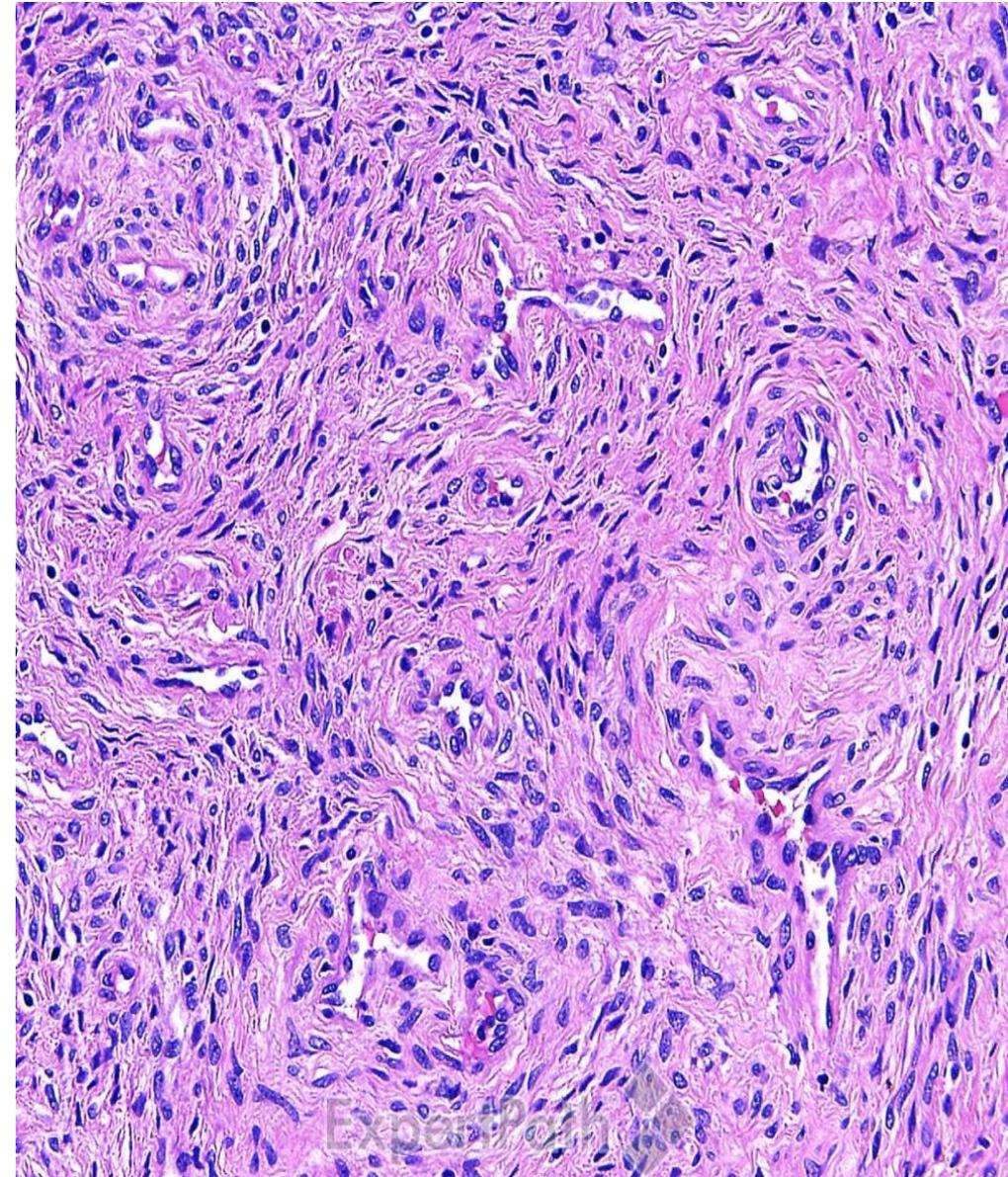


# Diagnosis

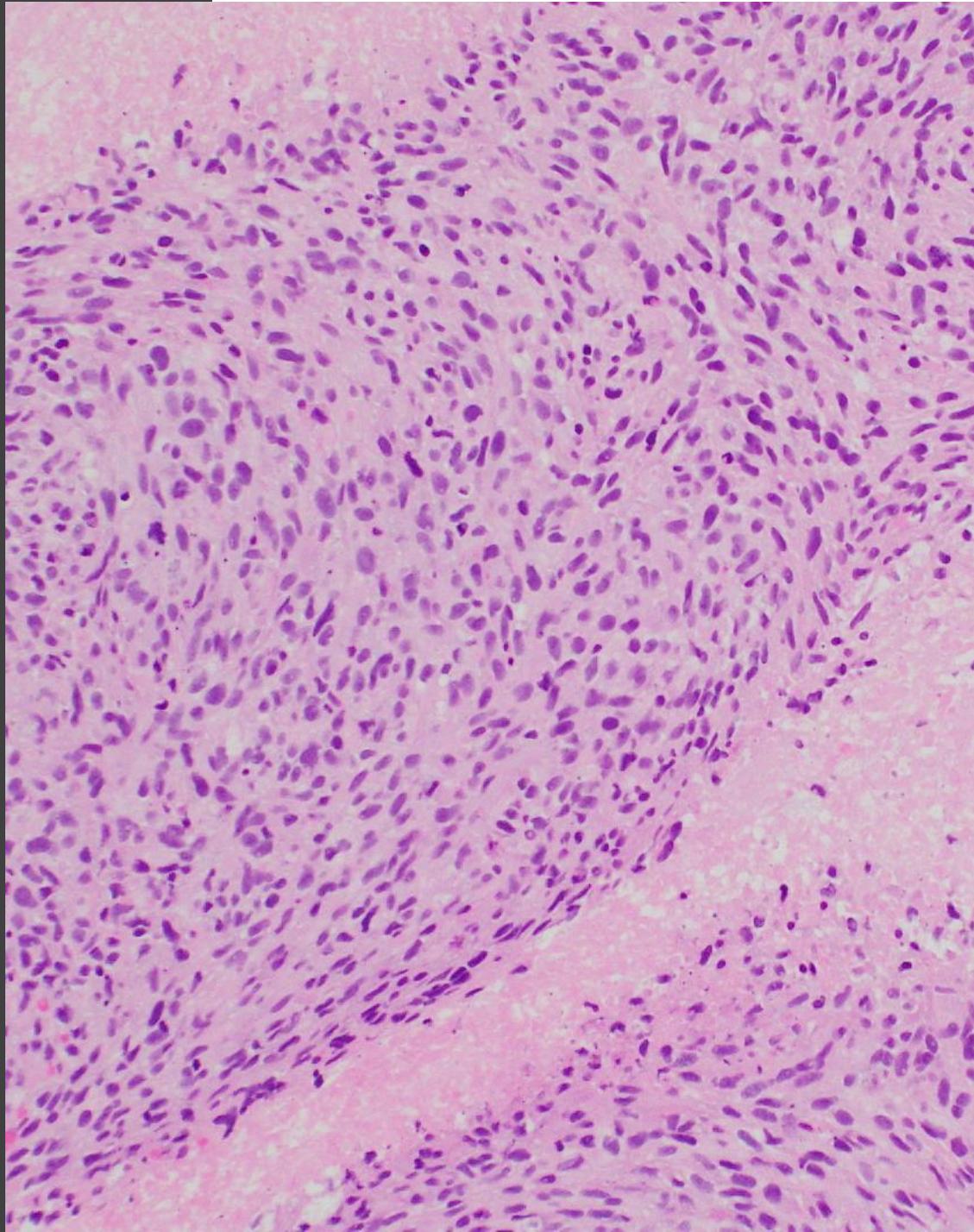
## Histology

### Florid Hyperplasia

- Lobulated or nodular architecture
- Characteristic vascular pattern with small round blood vessels +/- hyalin thickening



# Diagnosis



## STUMP

- More diffuse growth pattern
- Does not contain characteristic small blood vessels

# Diagnosis

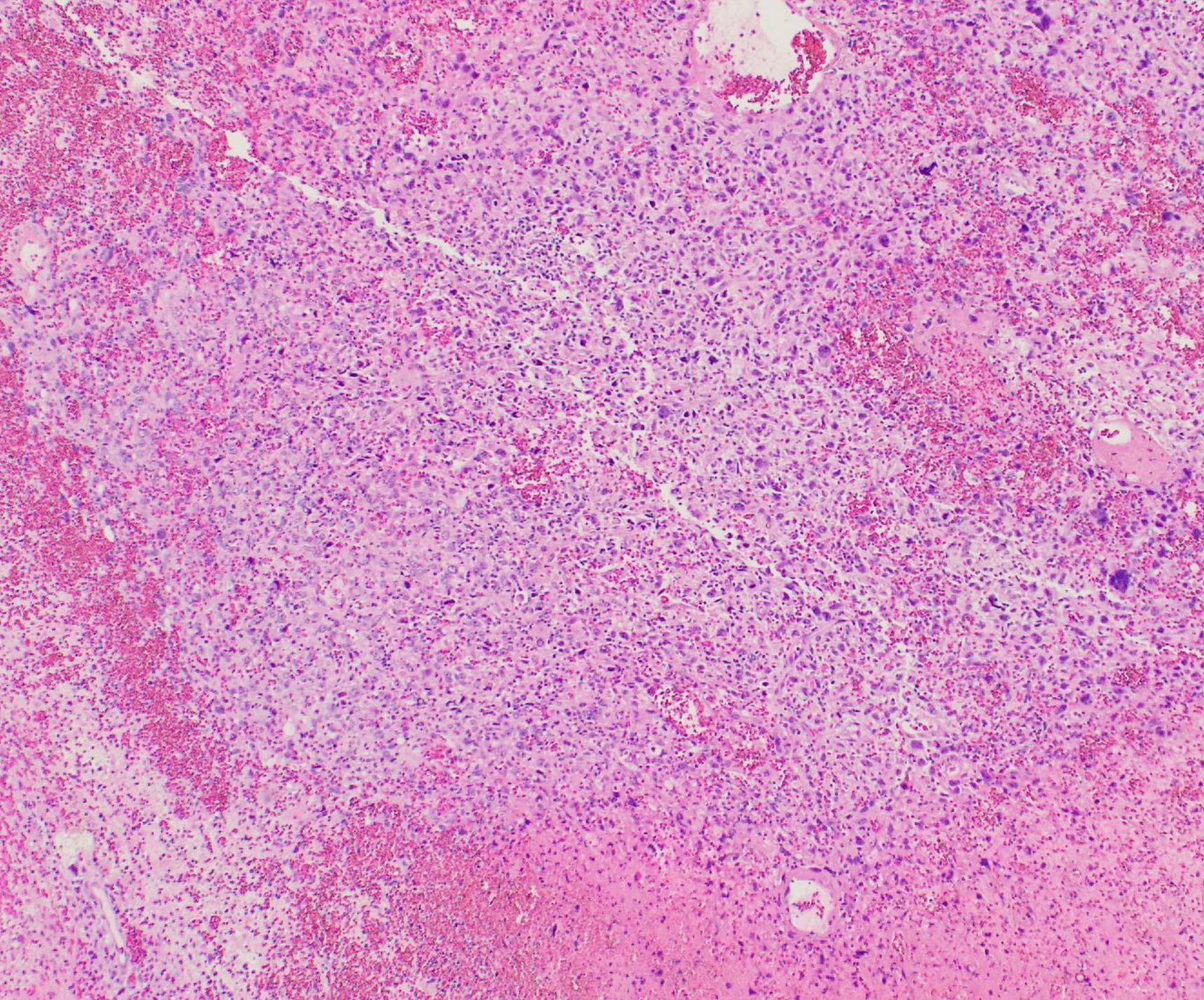
## Histology

### STUMP

- Histologic overlap with florid stromal hyperplasia
  - Bland nuclear features
  - Proliferation of stromal elements

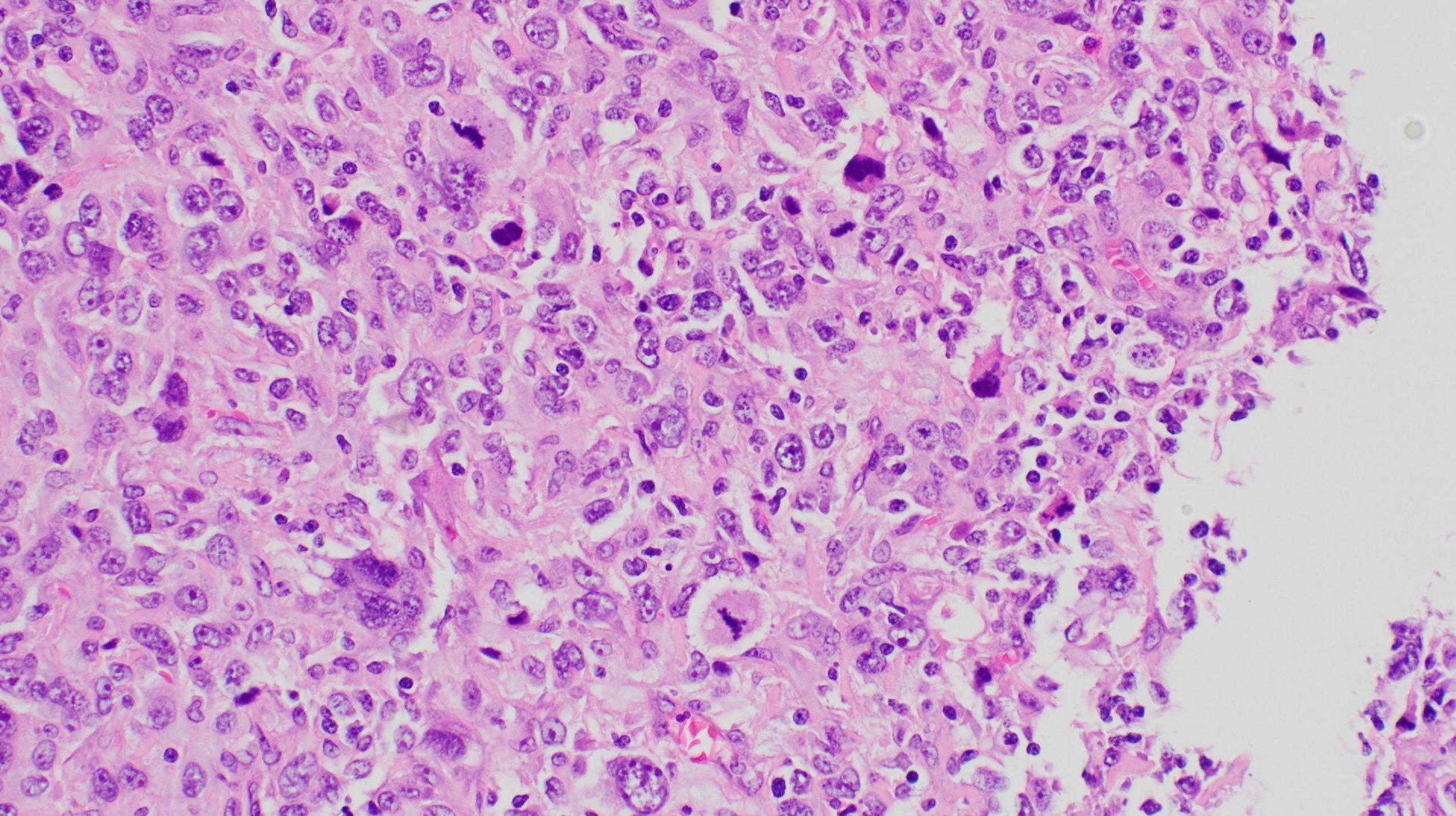
### Stromal Sarcoma

- Overtly malignant features are more easily distinguished from florid stromal hyperplasia
  - Greater cellularity
  - Cytological atypia
  - Mitotic activity
  - Tumor cell necrosis
  - Can have Phyllodes-like patterns



## Stromal Sarcoma

- Overtly malignant features are more easily distinguished from florid stromal hyperplasia
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# Diagnosis

## Immunohistochemistry

### **Positive Stains (usually)**

- Vimentin
- CD34
- Progesterone receptor
- Smooth muscle actin  
(STUMP> Sarcoma)
- Desmin (STUMP > Sarcoma)

### **Negative Stains**

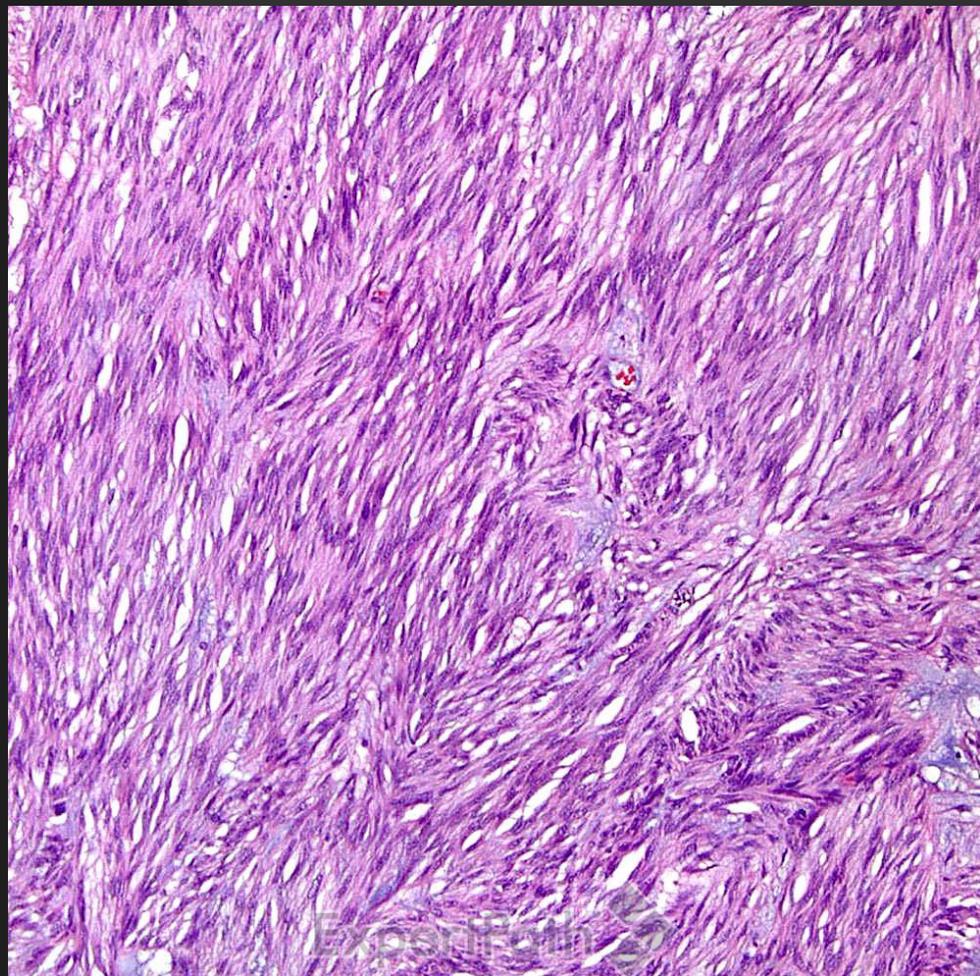
- S100
- Estrogen Receptor  
(usually)

# Differential Diagnoses

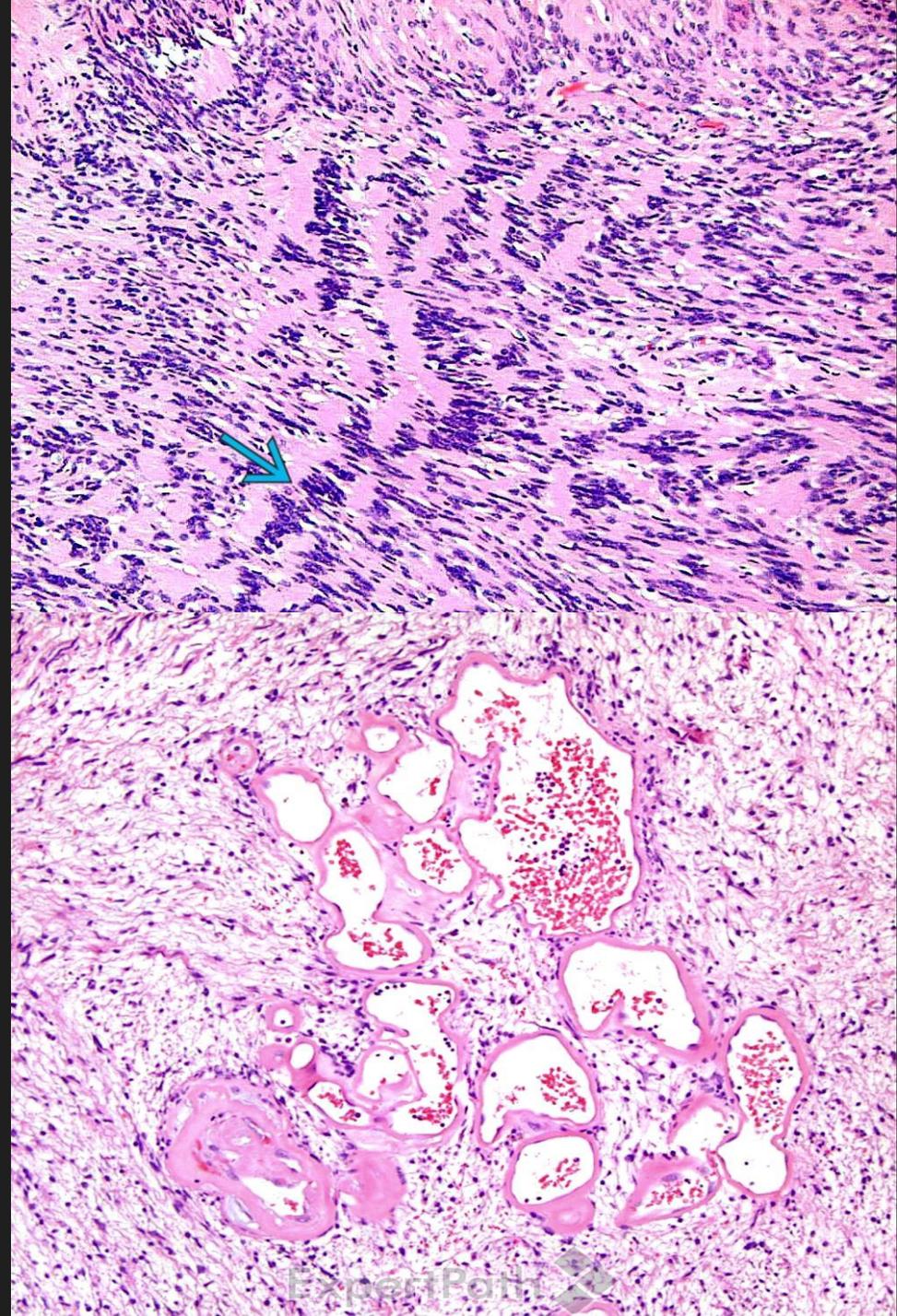
- Solitary fibrous tumor
- Gastrointestinal stromal tumors (GIST)
- Schwannomas
- Post-radiation sarcomas
- Sarcomatoid carcinoma
- Myofibroblastic proliferations
- Smooth muscle neoplasms
- Rhabdomyosarcomas
- Mixed epithelial stromal tumors of the seminal vesicle



- Solitary fibrous tumor
  - *Spindled cells, patternless pattern, angulated hemangiopericytic vessels.*
  - *STAT6, CD34, NAB2-STAT6 fusion*
- Gastrointestinal stromal tumors (GIST)
- Schwannomas
- Post-radiation sarcomas
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- Solitary fibrous tumor
- Gastrointestinal stromal tumors (GIST)
  - broad and variable morphologic spectrum
  - CD117 (characteristic), and DOG-1, CD34, (DOG-1 and CD34 can be seen in PSS)
- Schwannomas
- Post-radiation sarcomas
- Sarcomatoid carcinoma
- Myofibroblastic proliferations
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- Solitary fibrous tumor
- Gastrointestinal stromal tumors (GIST)
- Schwannomas
  - *Variable amounts of hypercellular Antoni A and hypocellular Antoni B areas*
  - *Large caliber blood vessels with mural hyalinization, nuclear palisading, “wavy” spindle cells, hypercellular and hypocellular zones.*
  - *S100 positive*
- Post-radiation sarcomas
- Sarcomatoid carcinoma
- Myofibroblastic proliferations
- Smooth muscle neoplasms
- Rhabdomyosarcomas
- Mixed epithelial stromal tumors of the seminal vesicle

# Differential Diagnoses

- Solitary fibrous tumor
- Gastrointestinal stromal tumors (GIST)
- Schwannomas
- Post-radiation sarcomas
  - *About 10 years following radiation therapy*
  - *Distinguishing between a sarcomatoid carcinoma and a post-radiation sarcoma may be impossible in some cases.*
- Sarcomatoid carcinoma
- Myofibroblastic proliferations
- Smooth muscle neoplasms
- Rhabdomyosarcomas
- Mixed epithelial stromal tumors of the seminal vesicle

# Differential Diagnoses

- Solitary fibrous tumor
- Gastrointestinal stromal tumors (GIST)
- Schwannomas
- Post-radiation sarcomas
- Sarcomatoid carcinoma
  - *Rare*
  - *May appear as an aggressive recurrence of acinar adenocarcinoma*
  - *Mixture of epithelioid and sarcomatous elements*
  - *Less differentiated cells may lose some markers*
- Myofibroblastic proliferations
- Smooth muscle neoplasms
- Rhabdomyosarcomas
- Mixed epithelial stromal tumors of the seminal vesicle

# Differential Diagnoses

- Solitary fibrous tumor
- Gastrointestinal stromal tumors (GIST)
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# Grading and Staging

## Federation of Cancer Centers Sarcoma Group (FNCLCC)

- 3 grades
  - differentiation
  - mitotic activity
  - necrosis

## American Joint Committee on Cancer (AJCC)

- Grade grouping for staging
  - Low grade: Grade 1
  - High grade: Grade 2, 3

## Treatment/Prognosis

- STUMP: indolent, generally cured with complete resection.
  - May be treated more conservatively.
  - Rare cases associated with sarcomatous dedifferentiation
- Sarcomas have fully metastatic potential
  - Surgical resection
  - +/- adjuvant therapy

## So What?

- Agent orange exposure can increase chances of multiple diseases
- Because of low incidence, may be poorly recognized
- Build IHC panel wisely
  - Vimentin, CD34, ER, PR, PSA, PSAP, GATA3
  - Solitary fibrous tumor? STAT6
  - GIST? CD117, DOG-1 (can be seen in PSS)
  - Schwannoma? S100
  - Melanoma? S100, SOX10, Melan A, etc

# References

Yang W, Liu A, Wu J, Niu M. Prostatic stromal sarcoma: A case report and literature review. *Medicine (Baltimore)*. 2018 May;97(18):e0495. doi: 10.1097/MD.00000000000010495. PMID: 29718840; PMCID: PMC6392530.

Gaudin, Paul, Rosai, Juan and Epstein, Jonathan. "Sarcomas and Related Proliferative Lesions of Specialized Prostatic Stroma: A Clinicopathologic Study of 22 Cases." *American Journal of Surgical Pathology* **22.2** (1998): 148-162. Journals@Ovid Full Text. Web. 06 September. 2020

Guillou L, Coindre JM, et al. Comparative study of the National Cancer Institute and French Federation of Cancer Centers Sarcoma Group grading systems in a population of 410 adult patients with soft tissue sarcoma. *J Clin Oncol*. 1997 Jan;15(1):350-62. doi: 10.1200/JCO.1997.15.1.350. PMID: 8996162

Kallen, Michael E. MD\*; Hornick, Jason L. MD, PhD† The 2020 WHO Classification, *The American Journal of Surgical Pathology*: August 12, 2020 - Volume Publish Ahead of Print - Issue -doi: 10.1097/PAS.0000000000001552

McKenney, J. Mesenchymal tumors of the prostate. *Mod Pathol* **31**, 133–142 (2018). <https://doi.org/10.1038/modpathol.2017.155>

A high-magnification histological micrograph showing a dense population of cells with prominent, dark purple nuclei and pink cytoplasm/extracellular matrix. The cells are arranged in a somewhat disorganized pattern, typical of a tissue section stained with hematoxylin and eosin (H&E).

Thank you!  
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