Beyond the Bench: Rethinking Routine Pathology in Marginalized Patients

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Abstract:

The thorough macroscopic examination of surgical pathology specimens by a Pathologists' Assistant (PA) is critical for complete and accurate evaluation and diagnosis, especially when biases affect patient care. The PA's ability to detect subtle or nuanced abnormalities in tissue appearance is crucial in complex cases. This discernment and precise sectioning help pathologists diagnose the patient more efficiently and accurately. For mesenchymal tumors of the uterus, benign leiomyomas are most common, but the differential diagnosis can include other rare entities.[1] This case highlights a Smooth Muscle Tumor of Uncertain Malignant Potential (STUMP), a rare borderline tumor with both indolent gross and histological features. Histological examination revealed morphologic features intermediate between benign leiomyoma and malignant leiomyosarcoma, consistent with STUMP in the literature.[2] Although a benign leiomyoma was expected preoperatively, gross and microscopic examination revealed malignant potential.

Background:

Pathologists' Assistants (PAs) are certified allied healthcare professionals trained in macroscopic specimen evaluation and postmortem examination under the direction of pathologists.[3] Their role is critical for accurate and comprehensive evaluation of surgical and autopsy specimens, enabling the pathologist to make the proper diagnosis.

This case involves an African American woman in her third decade of life with a past medical history of bipolar disorder who presented to the emergency room with progressive abdominal distension. She presented hypotensive, tachycardic, with recent emesis, inability to eat, and 8/10 pain. Imaging confirmed the presence of a large uterine mass and hemoperitoneum. An ultrasound guided paracentesis removed 1030 mL of hemorrhagic fluid. Less than 2 hours later, a rapid response was called, and the patient was taken to the operating room for an exploratory laparotomy. The mass in the uterus had ruptured, resulting in a total abdominal hysterectomy with bilateral salpingectomy.

The removed uterus was significant for a 12.8 x 11.5 x 10.2 cm disrupted exophytic, dark red, lobulated mass, unlike typical leiomyomas. Following immunohistochemistry staining and histologic examination, the diagnosis of Smooth Muscle Tumor of Uncertain Malignant Potential (STUMP) was made.

Rationale and Hypothesis:

Following, surgery the hysterectomy specimen was sent for pathologic evaluation. The left cornu of the uterus received was disrupted with a large, dark red, rubbery, lobulated, exophytic mass with multiple areas of dark red, ragged material consistent with clotted blood. This uterine mass was signed out as a "Smooth Muscle Tumor of Uncertain Malignant Potential" (STUMP) due to many areas displaying pseudo-tumor cell necrosis and perivascular growth of tumor cells as seen in malignant smooth muscle tumors. STUMP have pathological characteristics similar to leiomyosarcoma, but do not meet the histological criteria for leiomyoma.[2] They have intermediate morphologic features making treatment and diagnosis difficult. Unlike leiomyoma, STUMP patients may experience recurrence which carries higher risk of complications and mortality.[2] No standardized care guidelines currently exist due to their rarity. Thus, thorough pathologic examination, in part by the PA, is crucial for determining prognosis and treatment.

Methodology:

The gross examination of the total hysterectomy followed the Grossing Guidelines set forth by the American Association of Pathologists' Assistants (AAPA) and was conducted under the direction of the pathologist. The cervical resection margins were differentially inked, the specimen was oriented, weighed, measured, photographed, and examined following fixation in formalin. Additional sections of the disruption site and mass were submitted following the initial microscopic examination. Immunohistochemistry staining was utilized to better identify the composition and origin of the mass.

Results:

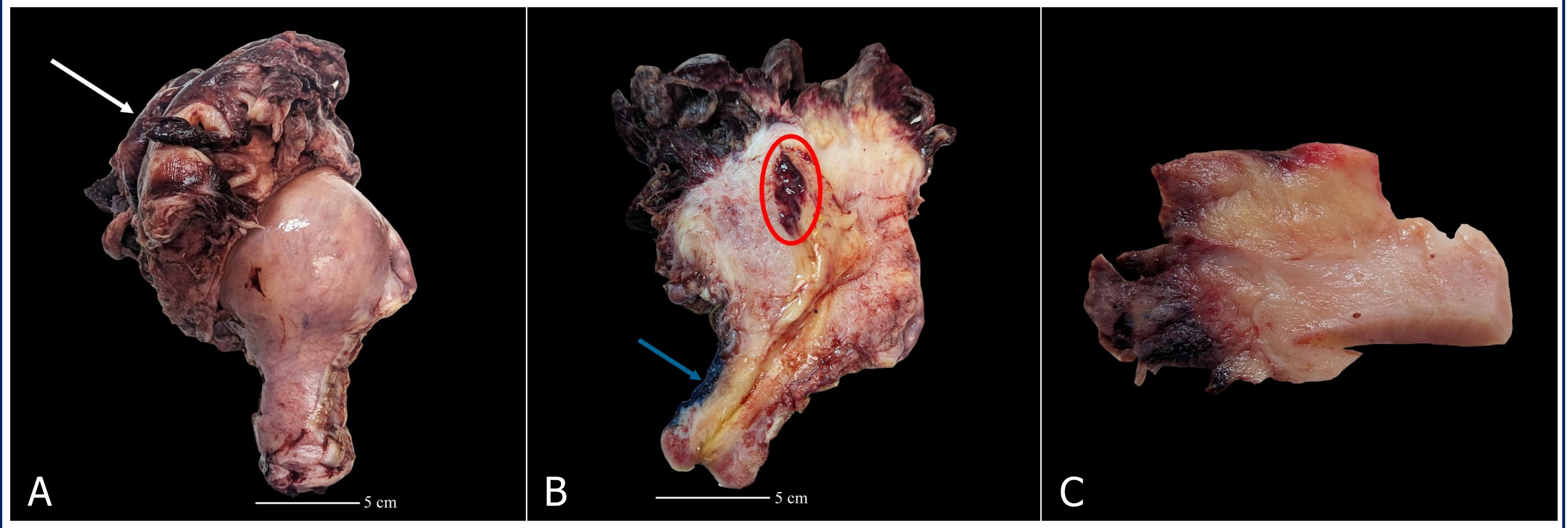


Figure 1. Photomacrographs of the resected uterus (L to R) **A.** Entire uterus with exophytic mass disrupting the left cornu (white arrow). **B.** Bivalved specimen with inked anterior cervical resection margin (blue arrow), infiltrative growth (green circle), and disruption (red circle). **C.** Section of the mass with adjacent tissue submitted for histological examination.

Synoptic Gross Description: The specimen is a 580.0 g uterus with attached cervix. The uterine body is 6.8 cm fundus to lower uterine segment, 7.2 cm cornu to cornu and 5.2 cm anterior to posterior. A 12.8 × 11.5 × 10.2 cm exophytic, dark red, rubbery, lobulated mass disrupts the left cornu and appears to arise from the anterior uterine wall. The cervix measures 4.3 (length) × 4.3 cm (diameter) with a 0.5 cm patent os; resection margins are inked (anterior blue, posterior black). The endometrium is plush and congested, up to 0.7 cm thick. The myometrium is up to 4.5 cm thick, with no additional gross lesions. A 3.1 cm thick layer of yellow-tan, lobulated soft tissue is present between the myometrium and a ragged area of possible clotted blood. Separately in the container is a 1700 g, 22.5 × 20.6 × 9.3 cm aggregate of dark red, rubbery material, partially encapsulated, with a hemorrhagic, mottled, solid cut surface. Representative sections are submitted as follows:

A1 anterior cervix
A2 posterior cervix
A3 anterior endomyometrium, full thickness
A4 anterior endomyometrium, partial thickness
A5 posterior endomyometrium, full-thickness
A6 posterior endomyometrium, partial thickness
A7-A9 interface of anterior uterus and site of disruption including attached lobulated mass
A10-A11 anterior uterine wall with area of yellow-tan, lobulated tissue
A12-A14 interface the posterior uterus and site of disruption including attached lobulated mass
A15-A19 representative sections from largest detached fragment
A20-A24 representative sections from second largest detached fragment
A25-A29 representative sections from third largest detached fragment
A30-A32 representative sections from remaining detached fragments

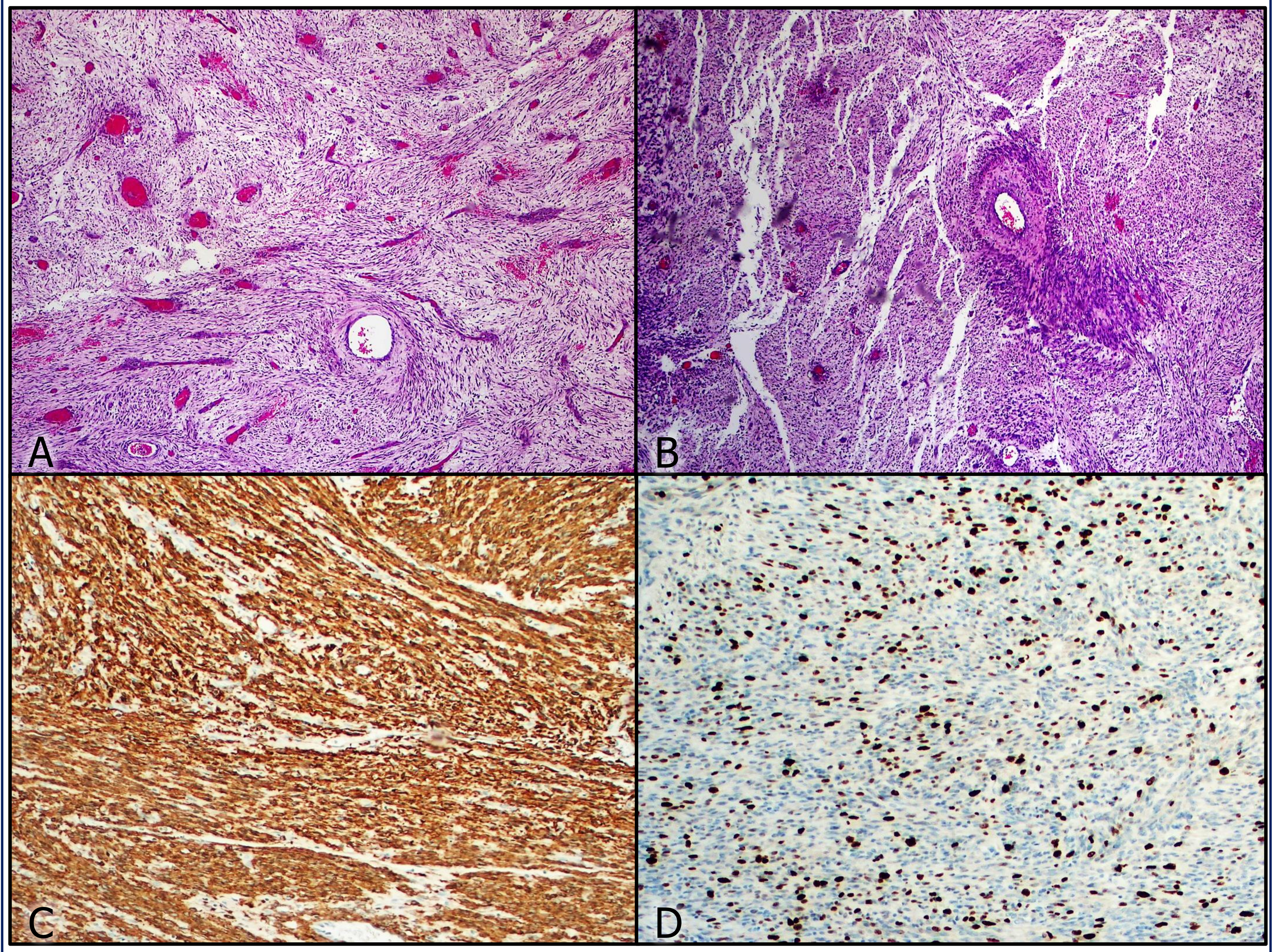
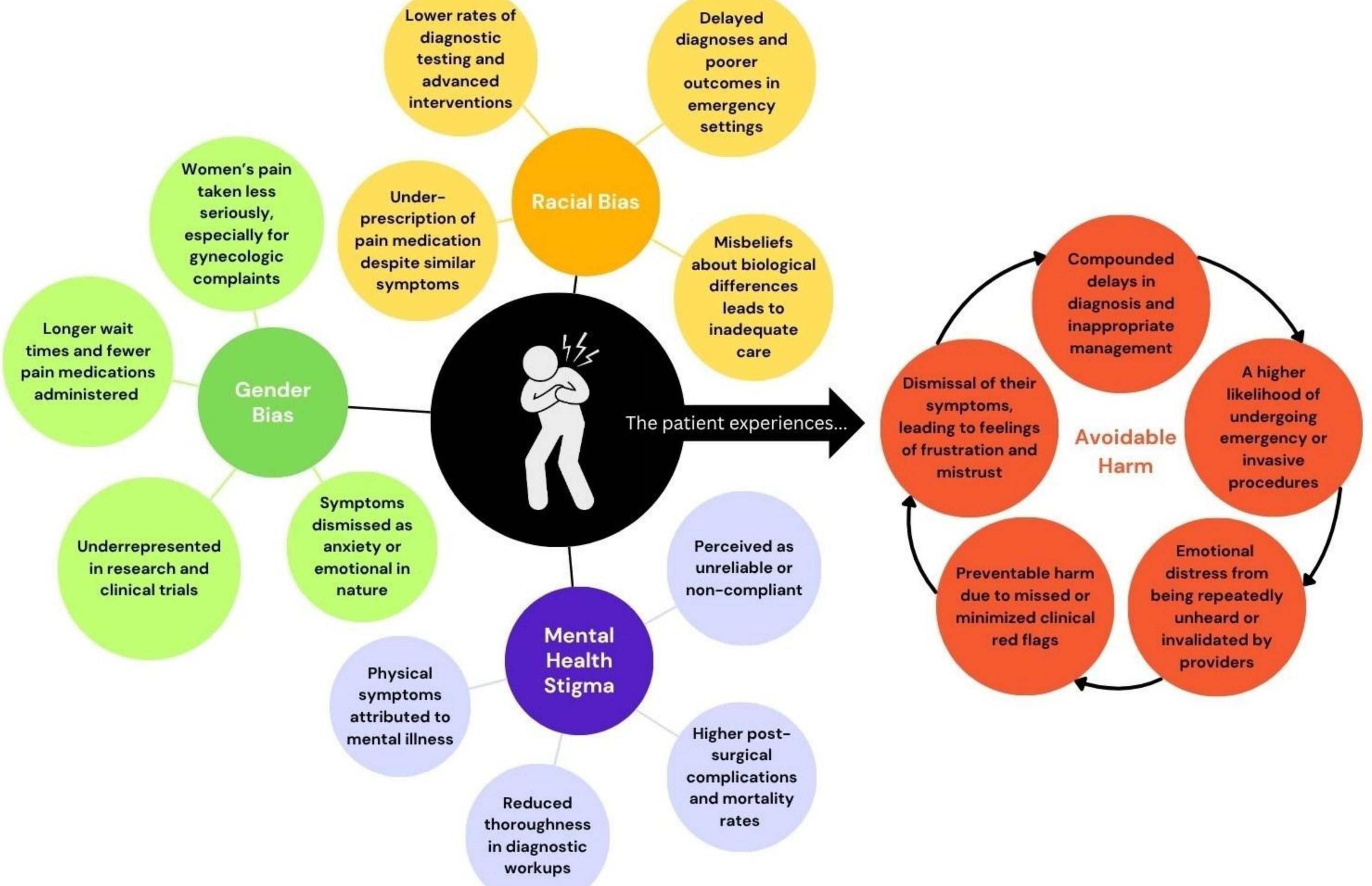


Figure 2. Photomicrographs (L to R) **A.** H&E showing infiltrative growth. **B.** H&E showing perivascular invasion. **C.** Positive SMA Immunohistochemistry Staining. **D.** Ki67 IHC staining demonstrating a 60-70% proliferation rate

Microscopic Description and Summary: H&E stains show a subserosal smooth muscle tumor that ruptured due to extensive secondary infarction, causing hypocellularity, edema, and hemorrhage. Viable areas are composed of long fascicles with areas of perivascular growth of tumor cells. The tumor lacks cytologic atypia or significant mitotic activity (up to 3 mitoses/10 HPFs). Ki-67 is elevated (~20%), possibly due to the infarction and reactive in nature. The tumor is diffusely positive for smooth muscle actin and desmin, confirming smooth muscle cell origin. Despite appreciable mitotic activity or cytologic atypia, due to the rupture the tumor may reoccur, and close follow-up is advised.

Discussion:

Biases in healthcare negatively affect diagnostic accuracy, treatment outcomes, and patient trust across multiple populations. Individuals with mental health disorders often experience worse outcomes and face "diagnostic overshadowing," where physical symptoms are overlooked due to psychiatric labels.[4] Women's pain, especially gynecologic, is frequently undertreated, and medical training often fails to address sex and gender differences in care.[5,6] Racial bias further compounds these disparities, with Black patients receiving less pain management and facing harmful misconceptions rooted in outdated beliefs.[7,8] The presented patient experienced the cumulative impact of these biases, and her hysterectomy despite vocalizing distress over several weeks underscores how systemic prejudice can lead to serious harm.



Leiomyomata are typically routine findings, with a predictable clinical course, often requiring minimal intervention. However, assumptions about routine specimens can be dangerous, especially in addition to the discussed systemic biases. This mass proved to be a STUMP entity that ultimately ruptured, resulting in a hysterectomy at a young age. Though we do not have her personal testimony, her case reflects how intersecting stigmas have the ability to obscure clinical judgment and contribute to preventable harm.

Conclusion:

This case highlights the disparity that exists in treating women of color, especially those with psychiatric diagnoses. The pain of women, people with psychiatric diagnoses, and people of color is often underestimated, frequently leading to delays in diagnosis and treatment. When these stigmas intersect, the result can be an unnecessarily dangerous medical situation with a potentially preventable outcome. This case underscores the need for increased awareness, education, and systemic change to ensure that all patients receive equitable and unbiased care. Pathologists' assistants have a responsibility to see beyond our bench and evaluate every case as a unique entity, as free from bias as possible, recognizing that even seemingly simple cases often have a complex story. As healthcare professionals, we are equally responsible for remaining conscientious of our biases and to evaluate what we see around us as to not become complacent in a traditionally unjust system.

References:

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