CASE REPORT
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Periprostatic Solitary Fibrous Tumor Mimicking Prostatic Mass: A Case Report

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Abstract

Solitary fibrous tumors (SFTs) are rare mesenchymal neoplasms commonly arising from the pleura, but can occasionally occur in extrapleural sites, including the pelvis. Periprostatic SFTs are exceptionally rare and may mimic prostatic masses on imaging and clinical examination, leading to diagnostic confusion. We report a case of a 60-year-old male presenting with acute urinary retention and a history of lower urinary tract symptoms. Imaging revealed a large pelvic mass displacing the bladder and effacing fat planes with the prostate. A transrectal ultrasound-guided biopsy suggested a spindle cell tumor, and immunohistochemistry (IHC) confirmed the diagnosis of SFT with diffuse STAT6 positivity. The patient underwent cystoprostatectomy with ileal conduit diversion. Intraoperative findings revealed a mass inseparable from the prostate and bladder. Histology showed a mitotic index of 9/10 high-power fields, consistent with a potentially malignant SFT. Postoperative recovery was uneventful, and follow-up imaging showed no recurrence. Periprostatic SFTs are exceedingly rare and can mimic prostatic neoplasms. Diagnosis requires integration of imaging, histology, and STAT6 IHC. Radical surgical resection remains the cornerstone of treatment, especially in large or potentially malignant tumors. Long-term follow-up is warranted due to recurrence risk.

Keywords: Periprostatic mass, extrathoracic SFT, cystoprostatectomy

Introduction

Solitary fibrous tumors (SFTs), initially described by Klemperer and Coleman (1) in 1931 as pleural tumors have been increasingly recognized in extrathoracic locations including the prostate (2). Fewer than 40 cases of prostatic SFT have been reported to date (3). The pathogenesis involves the NAB2-STAT6 fusion gene resulting from chromosome 12q13 rearrangements (4). Most SFTs exhibit benign behaviour, though a subset demonstrates malignant potential (5). Diagnosis relies on histology and immunohistochemistry (IHC). Here, we present a rare case of a periprostatic SFT, initially suspected to be prostatic in origin and managed with open cystoprostatectomy and urinary diversion, with the final diagnosis confirmed by histopathology and STAT6 IHC.

Written informed consent for publication of clinical details and images was obtained from the patient. The patient provided written informed consent to participate. No funding was received for this study.

All data generated or analysed during this study are included in this article. Further data are available from the corresponding author upon reasonable request.

Case Presentation

A 60-year-old male presented with acute urinary retention and was catheterized with a 16 Fr Foley catheter. He reported a one-year history of progressively worsening lower urinary tract symptoms (LUTS), for which he had not sought prior evaluation. Digital rectal examination revealed a markedly enlarged, firm prostate. Laboratory investigations, including complete blood count, renal function, and serum prostate-specific antigen (PSA), were within normal limits (PSA: 0.789 ng/mL). Ultrasonography of the kidneys, ureters, and bladder showed a significantly enlarged prostate measuring 9×9×10 cm (estimated volume: 407 cc). Pelvic magnetic resonance imaging (MRI) revealed a large, well-circumscribed, lobulated, solid-cystic lesion in the rectovesical space, extending from

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the coccyx to the inferior border of the L5 vertebra (Figure 1). The lesion showed heterogeneous enhancement with areas of haemorrhage and focal calcification. It displaced the urinary bladder anteriorly and effaced the fat planes with the seminal vesicles and prostate, raising concern for a prostatic or periprostatic neoplasm.

A 12-core transrectal ultrasound-guided biopsy was performed. Histology revealed a spindle cell neoplasm with moderate nuclear atypia and a mitotic count of 3 per 10 high-power fields (HPF). IHC showed diffuse nuclear positivity for STAT6 and was negative for c-KIT, DOG1, Desmin, SMA, and SOX10: findings consistent with a SFT. Whole-body fluorodeoxyglucose positron emission tomography demonstrated a heterogeneously enhancing pelvic mass with low-grade metabolic activity, necrotic foci, and calcifications. The prostate was not clearly distinguishable from the lesion, supporting a neoplastic mass arising from or closely abutting the prostate.

Based on imaging and histopathology, the patient underwent open cystoprostatectomy with ileal conduit urinary diversion via a lower midline approach. Intraoperatively, a large pelvic mass inseparable from the prostate and bladder was excised en bloc. A rectal injury occurred during dissection and was managed with a loop sigmoid colostomy. Gross examination of the resected specimen revealed a 12×12×5 cm mass (Figure 2). Microscopic evaluation showed haphazardly arranged ovoid to spindle cells with indistinct borders, moderate atypia, and staghorn-like hyalinized vasculature (Figure 3). The mitotic index was 9 per 10 HPF. No necrosis was noted. IHC was positive for STAT6, confirming the diagnosis of a SFT (Figure 4).

The patient's postoperative course was uneventful. A contrast-enhanced computed tomography of the abdomen and pelvis performed four months later, prior to colostomy reversal, showed no evidence of recurrence.

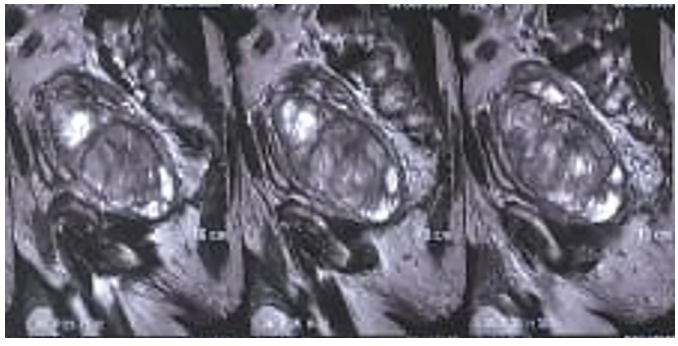

Figure 1. Pelvic MRI: Large heterogenous solid-cystic lesion in rectovesical space with hemorrhage and calcification

MRI: Magnetic resonance imaging

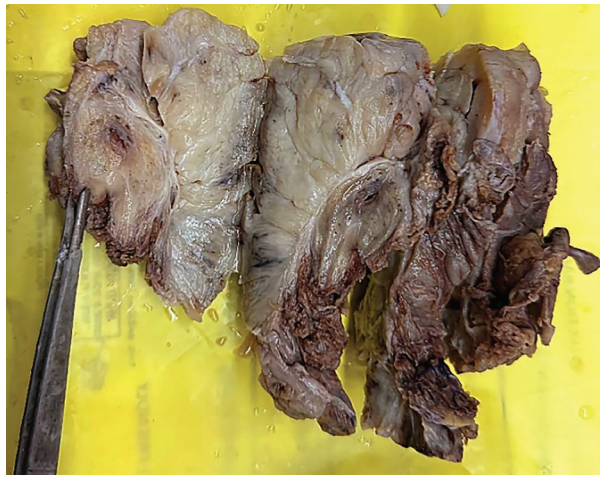

Figure 2. Macroscopic examination reveals solid tumor measuring 12x12x5 cm

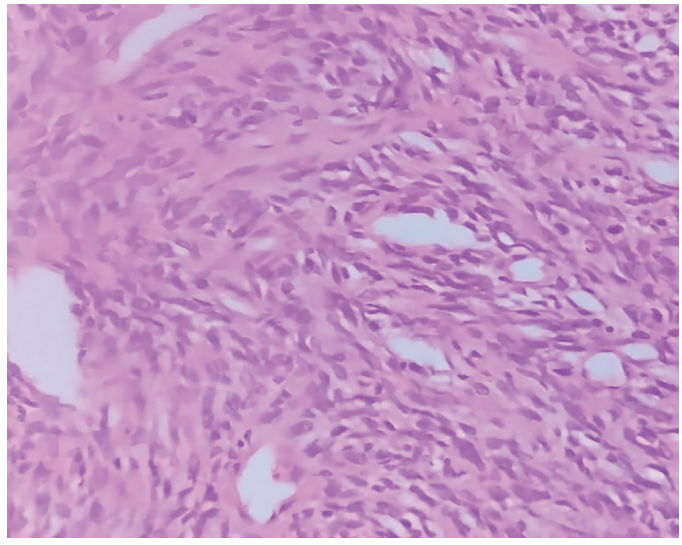

Figure 3. H&E stain ovoid to fusiform spindle cells with indistinct borders arranged haphazardly, accompanied by hyalinized vasculature

H&E: Hematoxylin and eosin

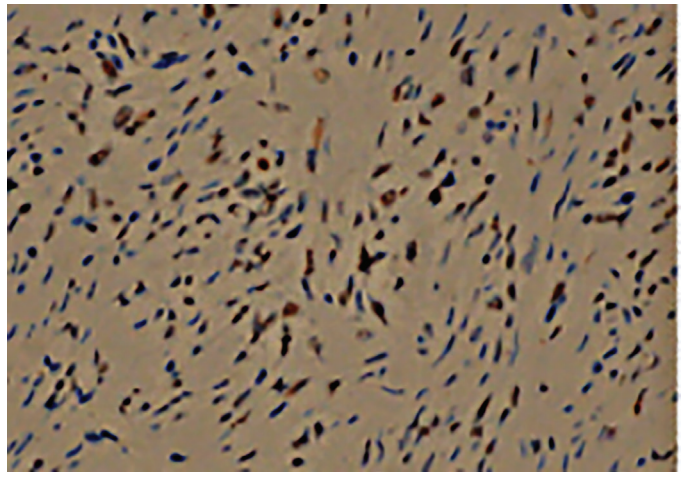

Figure 4. Immunohistochemistry showing STAT6 positivity

Discussion

SFTs are rare spindle-cell neoplasms that typically originate from the pleura but have been documented in various extrapleural sites, including the genitourinary tract, as noted by Klemperer and Coleman (1) and later by Gold et al. (2). Within this domain, prostatic SFTs are extremely uncommon, with fewer than 40 cases reported in the literature to date as reviewed by Peng et al. (3). Even rarer are SFTs arising from the periprostatic tissue, which can mimic prostatic origin both clinically and radiologically, as seen in our case.

The *NAB2-STAT6* gene fusion, found in all studied SFTs, acts as a key driver mutation by converting a transcriptional repressor into an activator, promoting cell proliferation and EGR-responsive gene expression 4. The clinical presentation of SFTs arising in the pelvis is often indistinguishable from benign prostatic hyperplasia or other space-occupying lesions. Most patients present with progressive LUTS, urinary retention, or a palpable pelvic mass (5,6). In our case, the patient presented with acute urinary retention and a grossly enlarged prostate on digital rectal examination, initially suggesting a prostatic aetiology.

Histologically, SFTs are characterized by a "patternless" architecture comprising spindle cells with staghorn-like vasculature. While core biopsy may suggest a spindle cell tumor, Galosi et al. (7) emphasized that IHC, particularly STAT 6 nuclear positivity, is crucial to distinguish SFTs from GIST and leiomyosarcoma. In our case, the IHC profile showed STAT6 positivity but was negative for c-KIT, DOG1, Desmin, and SOX10, helping exclude these differential diagnoses.

Takeuchi et al. (8) reported that SFT in the prostate could be removed with a complete resection and surgical margins. However, 10% of SFTs with histological features of malignancy may be unpredictable, exhibiting aggressive behaviour with local recurrence or distant metastasis, and it is recommended to follow up with all patients with SFTs. One of the unique challenges in periprostatic SFTs is surgical planning. Due to their close anatomical relationships, these tumors can encase or displace the prostate, bladder, rectum, and pelvic vasculature, increasing the risk of intraoperative complications. In our patient, a cystoprostatectomy with ileal conduit diversion was necessary because the mass was inseparable from the prostate and bladder, and a rectal injury occurred despite careful dissection, underscoring the complexity of pelvic tumor resections in such settings (9).

Histologic features associated with aggressive behaviour include increased mitotic activity, cellular atypia, necrosis, and dedifferentiation. Our patient's tumor showed a mitotic rate of 9/10 HPF and focal dedifferentiation, indicating a potential for malignancy despite the absence of necrosis. According to Demicco's risk assessment model, these features support the need for long-term surveillance post-resection (10).

Imaging plays a pivotal role but often lacks specificity. In our case, pelvic MRI revealed a large, heterogeneous, solid-cystic lesion in the rectovesical space with displacement of adjacent organs, including the bladder and rectum. Despite being centered in the periprostatic area, the loss of fat planes with the prostate created ambiguity regarding the true origin of the lesion. Such presentations often lead to misclassification as prostatic tumors, emphasizing the challenge of diagnosing periprostatic masses (11).

Metastatic disease was significantly associated with a mitotic count ≥4 per 10 HPF or malignant histology, most often affecting the lung and pleura, and occurred more frequently in patients with extrathoracic than thoracic SFTs (12). Moureau-Zabotto et al. (13) reported that prostatic SFTs likely behave similarly to other SFTs, with complete excision offering the best chance of cure, but long-term follow-up is essential due to the unpredictable prognosis and risk of recurrence or malignant transformation, irrespective of the histological features.

For smaller tumours, Gilbert et al. (14) demonstrated the feasibility of organ sparing resection. However, in cases like ours—where the mass is large, abutting multiple organs, and potentially malignant—aggressive surgical intervention with urinary diversion may be justified.

SFTs arising from the periprostatic tissue are exceptionally rare and pose diagnostic challenges due to their proximity to and mimicry of prostatic lesions. This case underscores the importance of a multidisciplinary approach that integrates clinical findings, advanced imaging, and IHC—particularly STAT6 staining—for accurate diagnosis. Although typically indolent, features such as high mitotic activity and focal dedifferentiation, as seen in this case, warrant complete surgical excision and long-term follow-up to monitor for recurrence or malignant transformation.

Ethics

Informed Consent: The patient provided written informed consent to participate.

Footnotes

Authorship Contributions

Surgical and Medical Practices: S.G., P.P., V.P., M.H.S.A., A.S., V.B., Concept: S.G., P.P., V.P., M.H.S.A., A.S., V.B., Design: S.G., P.P., V.P., M.H.S.A., A.S., V.B., Data Collection or Processing: S.G., P.P., V.P., M.H.S.A., A.S., V.B., Analysis or Interpretation: S.G., P.P., V.P., M.H.S.A., A.S., V.B., Literature Search: S.G., P.P., V.P., M.H.S.A., A.S., V.B., Writing: S.G., P.P., V.P., M.H.S.A., A.S., V.B.

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