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CASE REPORT

Extra-gastrointestinal stromal tumor arising in the prostate: an unusual anatomical location

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ABSTRACT

Gastrointestinal stromal tumors (GISTs) are tumors of mesenchymal origin arising from the walls of the gastrointestinal (GI) tract, with stomach being the most common site followed by the small intestine. Those with similar morphology identified outside the GI tract are termed extra-gastrointestinal stromal tumors and are often located in the mesentery, omentum, pelvis, retro-peritoneum, rectovaginal septum, perivaginal soft-tissue, and very rarely the prostate. Due to their malignant potential, it is utmost essential to diagnose such extra-intestinal occurrences, with immunochemistry being an effective tool in its diagnosis. We herein report a case of GIST of the prostrate in a 75-year-old male presenting with dysuria and urinary retention and discuss the role of immunohistochemistry markers that aid in diagnosis and its differentiation from other malignant conditions involving the prostrate. This case serves best to promote awareness of GIST in unusual anatomical locations to help early diagnosis and prompt subsequent management.

Key words: Extra-gastrointestinal stromal tumors, gastrointestinal stromal tumors, prostate

Introduction

Gastrointestinal stromal tumors (GISTs) represent 1-3% of gastrointestinal (GI) neoplasms [1]. They are most commonly benign (70-80%) and if small often discovered incidentally. About 20-30% of GISTs are malignant, which can grow to very large size before becoming symptomatic. The stomach is the most common site of origin, followed by the small bowel. Extra-gastrointestinal stromal tumors (EGISTs) incidence is about 10% and can arise from the mesentery, omentum, pelvis, retro peritoneum, rectovaginal septum, perivaginal soft-tissue, and very rarely the prostate [2-5]. Due to a lack of awareness that GIST can be present in these sites, EGISTs presenting in these unusual anatomic locations are likely to be misdiagnosed [6]. In this report, we are presenting an EGIST found in the prostate needle biopsy.

Case Report

A 75-year-old man presented with dysuria, rectal fullness, increased frequency, and urgency of micturition, constipation, and hematuria for about a month. Patient had no similar complaints in the past. His general condition and vitals were normal. His family members did not have any similar complaints. On digital rectal examination, a markedly enlarged prostate was noticed. Transrectal ultrasonography revealed round, enlarged, heterogeneous, and hypoechoic prostate of size 6.2 × 5.0 × 4.5 mm with an intact capsule and no evidence of metastasis. Serum prostate-specific antigen level was 0.84 ng/ml. We received 8 cores of transrectal ultrasound-guided prostate biopsy bits for histopathological examination. Hematoxylin and eosin stained sections, special stains, and immunohistochemistry were reviewed. Microscopic examinations were done by two independent observers in correlation with the clinical and radiological (computerized tomography metaiodobenzylguanidine and magnetic resonance imaging) details.

On gross examination, each core biopsy bits was ranging from 0.7 to 0.8 cm in length with gray white to reddish appearance. On microscopic examination, normal prostatic areas were replaced by cellular tumor with areas of hemorrhage and necrosis. The tumor cells were spindle-shaped with little atypia and showed mainly fascicular arrangement. Mitotic counts were fewer than 5/50 high-power fields [Figures 1 and 2]. In view of microscopic findings, and correlating with clinical and radiological details, these malignant tumor cells were thought to be originating from the prostrate and of spindle cell origin. On immunohistochemistry study, the tumor cells were strongly positive for CD117/c-kit and CD34, weakly positive for smooth muscle actin (SMA), and negative for desmin [Figures 3 and 4]. The possibility of secondary involvement by a rectal GIST was excluded by radiological and intra-operative findings and a final diagnosis of EGIST originating from the prostate was made.

The patient underwent radical retropubic prostatectomy after 2 weeks. The specimen was excised with clear resection margin to the rectal wall. The patient was followed up for 6 months

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CASE REPORT

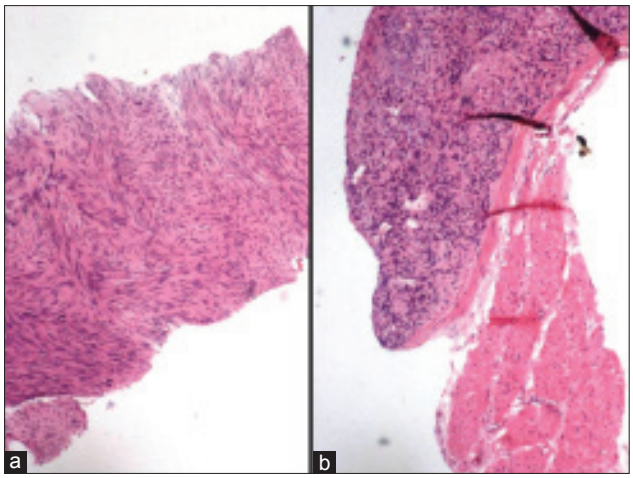

Figure 1 (a) Sections from prostate biopsy show highly cellular tumor tissue (H and E, ×100). (b) Section shows normal prostatic stroma and adjacent tumor tissue (H and E, ×100)

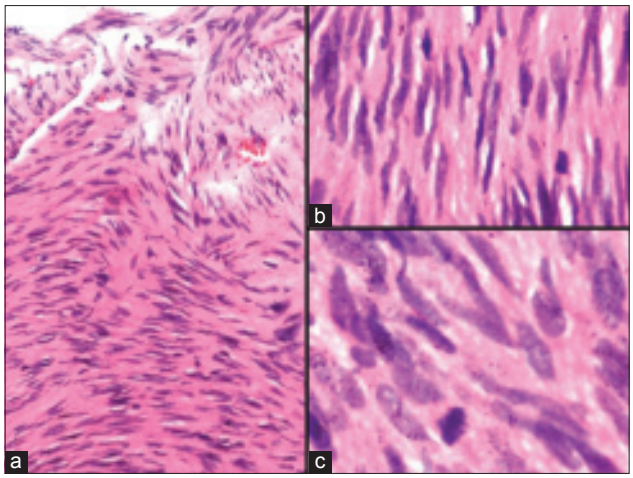

Figure 2 (a) Section shows tumor tissue composed of spindle cells arranged in fascicles with areas of hemorrhage (H and E, ×100). (b, c) High power views showing cells with nuclear atypia and mitotic figures (H and E, ×400) (H and E, ×1000)

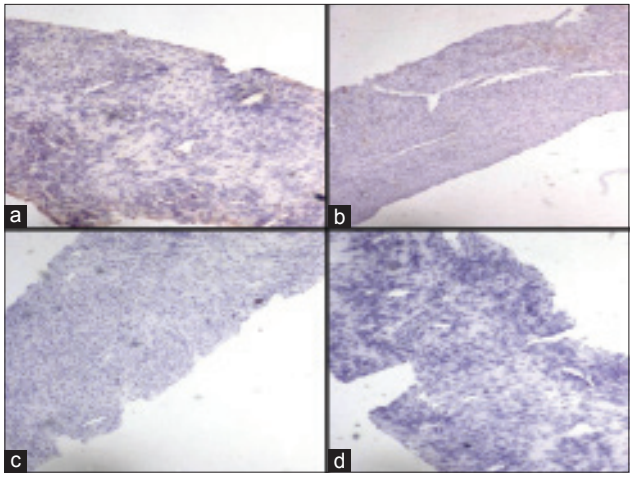

Figure 3 Immunohistochemical examination showing. (a) CD 34- positive. (b) SMA- Weakly Positive. (c) Desmin- Negative. (d) PR- Negative (H and E, ×100)

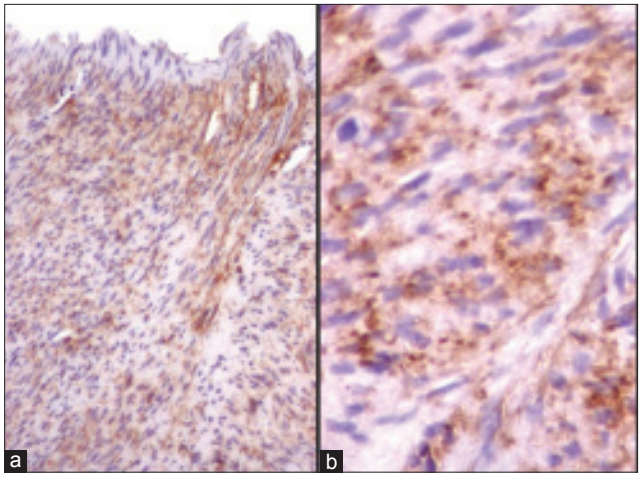

Figure 4 (a) Tumor exhibiting strong positivity for CD117 (H and E, ×100). (b) High power view showing CD117 positivity (H and E, ×400)

and has been in good condition except for experiencing mild urinary incontinence.

Discussion

Our case demonstrates the diagnostic dilemma faced by pathologists in diagnosing a case of GIST, especially when present in rare anatomical locations like the prostate. GIST, a mesenchymal tumor originating from the GI tract is characterized by the presence of fusiform, epithelioid, spindle cells in addition to expression of c-kit protein by the tumor cells. Combination of c-kit and CD34 serves as reliable markers aiding in the diagnosis of GIST. Recently introduced, Nestin is a specific and sensitive marker for GIST diagnosis [7].

Approximately 10% of GIST are extra-intestinal (EGISTs) and arise from the mesentery, omentum, pelvis, retro peritoneum, and rarely seen in rectovaginal septum, perivaginal soft-tissue, bladder, urethra, appendix, and prostate [2-5]. Due to the rarity of GIST arising from the prostrate, these are often not included in the differentials of stromal tumors seen on prostate needle biopsy. According to Miettinen et. al., GIST is the tumor of Cajal cells and these cells differentiate from the common interstitial precursor cells, which also give rise to smooth muscle cells. The latter hypothesis could explain also why GISTs can arise in prostate [8]. Vander reported the first case of prostatic GIST and highlighted the administration of Sr-571 in view of multiple hepatic metastases [4].

While it is critical to differentiate GIST of the prostrate from other tumor like conditions including post-operative spindle cell nodule, specific interstitial tumors namely unconfirmed

interstitial hyperplasia and interstitial sarcoma of the prostate, the demonstration of c-kit expression in extra-GI lesions validates their existence. Immunohistochemistry remains the most effective tool in differentiating these lesions from the rest with positivity for CD117 demonstrated by most GISTs and a vast majority showing immuno-reactivity for CD34 (60-70%) and SMA (30-40%), while only a small percentage (1-2%) consistent with positivity for S-100 protein and desmin [9]. In contrast, post-operative spindle cell nodule demonstrates positivity for keratin while specific interstitial tumor of the prostate to CD34 stain [7]. In the presented case, the tumor cells strongly expressed CD117 and CD34, and were weakly positive to SMA with no expression for desmin; thus aiding in the diagnosis of primary GIST of the prostate.

Rectal or extra-intestinal GIST can often mimic prostatic lesion clinically. In our index case, the possibility of secondary involvement by a rectal GIST and other interstitial neoplasm of the prostate was excluded by radiological, intra-operative, morphological, and immunohistochemical findings [10].

Conclusion

Immunohistochemistry plays a critical role in diagnosing a case of GIST especially when arising from remote and unusual areas like the prostrate and also aids in differentiating GIST of the prostrate from morphologically similar tumors arising from other unusual anatomic sites. Early diagnosis is crucial in view of their malignant potential, their unique clinical management and to limit their possible spread.

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Authors' Contribution

PKP and SY contributed to the draft of the manuscript. S provided surgical details of the case. SK helped revise the manuscript. All authors have read and approved the final version of the manuscript.

Consent

The authors certify that a written informed consent was obtained from the parents of the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editor-in-chief of this journal.

Competing Interests

The authors declare that they have no competing interests.

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