Primary Renal Synovial Sarcoma: "A Rare Pathological Entity?"

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Abstract

Primary renal synovial sarcoma is a rare pathological entity with less than 50 cases reported. We report a case of primary renal synovial sarcoma in a 27–year-old male, who underwent radical nephrectomy with a preoperative-diagnosis of renal cell carcinoma. The tumour was identified as primary renal synovial sarcoma with renal vein invasion on histopathology. Diagnosis was confirmed by immunohistochemistry but not supported by molecular studies. Patient was treated by an ifosfamide based chemotherapy regime. This case demonstrates that primary renal synovial sarcoma should form an important differential diagnosis of renal tumours, particularly in the younger age group. Although there are no established guidelines about the comprehensive management of this tumor due to the limited number of cases reported, postoperative Ifosfamide based chemotherapy regimens have been effective.

Key words: *Primary synovial sarcoma, kidney, SYT/SSX gene fusion*

Introduction

Primary renal synovial sarcoma is a rare neoplasm with prevalence of 1-3% of malignant renal tumours[1]. Synovial sarcomas (SS) are malignant soft tissue tumours that occur primarily in the extremities around the para-articular regions of the large joints in young adults. Rarely these tumors have been described in a variety of unusual locations bereft of synovial tissue, such as head and neck, ventricle of the brain, pleura, lung, heart, mediastinum, esophagus, stomach, abdominal wall, peritoneal cavity, retro peritoneum, vulva, penis, prostate, and kidney[2,3]. Primary renal synovial sarcoma is extremely rare and has a poor prognosis. The diagnosis of this tumour is based on immunohistochemistry and molecular studies. We report a patient with PRSS with tumour thrombus in the renal vein who was treated by multimodal therapy.

Case report

A 27 year Asian Indian male presented with left flank mass of 3 months duration and two episodes of frank hematuria. Examination revealed an anaemic patient with a large non-tender, hard, irregular, bimanually palpable lump occupying the left hypochondrium, umbilical and lumbar regions. Patient was anaemic (Hb-8gm/dl). Ultrasonography demonstrated a large mixed echogenic mass arising from the left kidney. Abdominal computed tomography (CT) (Figure-1A, B) showed a large heterogeneously enhancing mass lesion of 13x15x12 cm replacing the entire non functioning left kidney with a non-enhancing thrombus in the left renal vein extending up to the inferior venacava (IVC).

A preoperative diagnosis of renal cell carcinoma was arrived at. On exploration the tumor mass was seen replacing the left kidney with palpable tumour thrombus in the left renal vein extending into the inferior venacava (IVC). Left radical nephrectomy with excision of left renal vein containing thrombus along with a cuff of IVC was performed after due control of IVC. Macroscopic examination revealed a fleshy tumour with hemorrhage and necrosis of size 15x16x13 cm replacing the entire renal parenchyma.

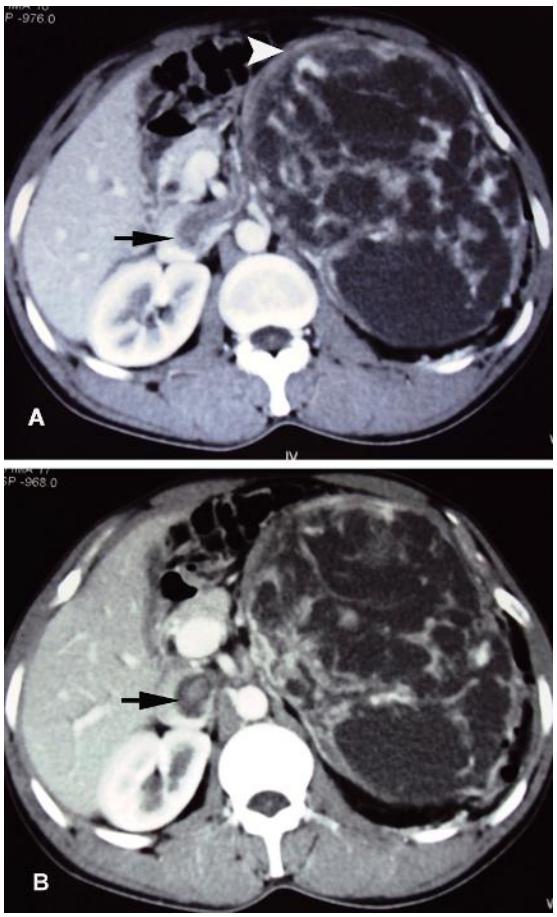

Figure 1. A)& B) Axial spiral CT scan of abdomen at two different levels showing large heterogeneously enhancing mass lesion occupying the entire non functioning left kidney (White arrow head) with a non-enhancing thrombus in the left renal vein extending up to the inferior vena cava (Black arrow).

On histopathology the tumor was highly cellular and showed short interlacing fascicles of spindle cells at some places with areas of sheets of large polygonal cells. There was evidence of marked cellular atypia and brisk mitotic activity with cystic spaces in some areas (Figure-2A, B) suggestive of monophasic PRSS. Renal vein invasion and metastasis in a single lymph node was also observed. On immunohistochemistry and molecular studies the tumor cells expressed Vimentin and Bcl-2, CD-99/Mic-2 strongly and epithelial membrane antigen (EMA) focally but did not express Cytokeratin, FLI-1, CD-34 and CD-10. There was no translocation between SYT gene on chromosome 18 and SSX, SSX1 and SSX2 gene on chromosome X which was non confirmatory for SS. The patient received a chemotherapeutic regimen of ifosfamide and doxorubicin.

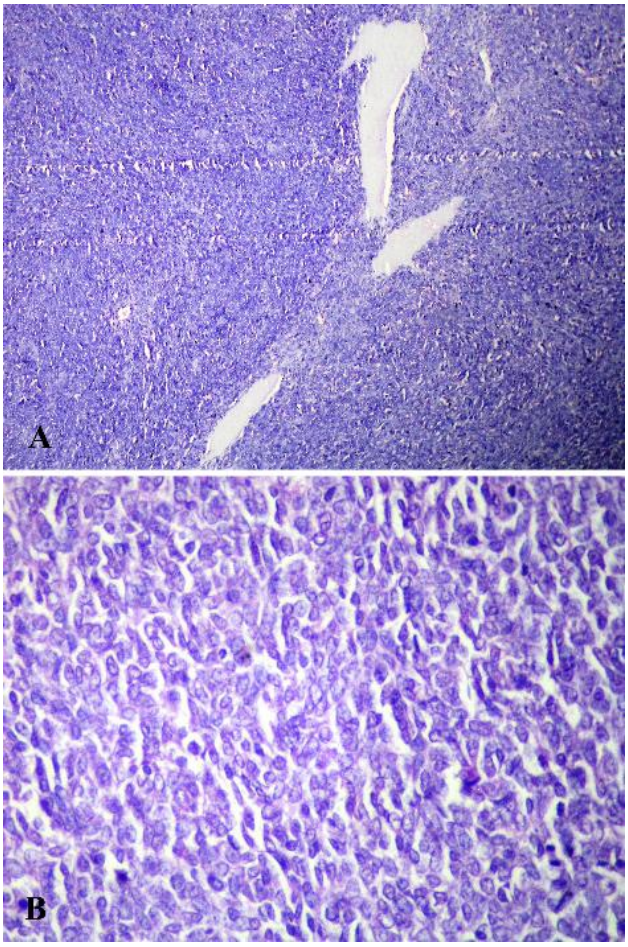

Figure 2. A) Microphotograph 20X (Haematoxylin-Eosin) showing showed dilated renal collecting tubules with cuboidal attenuated lining-hobnail appearance. B) Microphotograph 40X (Haematoxylin-Eosin) showing short interlacing fascicles of spindle cells and sheets of large polygonal cells with marked cellular atypia and brisk mitotic activity.

Discussion

Primary renal cell sarcomas are rare tumors; primary renal synovial sarcomas even more so. Since it was first reported in 1999 by Faria et al, approximately 44 cases have been reported till date[4]. The diagnosis can prove to be difficult owing to the rarity of the tumor, similar presentations as compared to other renal tumors and because no clinical or even imaging characteristics are diagnostic.

Primary Renal Synovial Sarcoma (PRSS) usually involves adolescents and young adults with the age at presentation ranging from 17 to 61 years[5]. The patients commonly presents with abdominal pain, flank pain and/or hematuria. CT, the most common diagnostic tool used, demonstrates heterogeneous, enhancing masses with solid and cystic components originating from the kidney with various degree of infiltration. Biopsy, immunohistochemistry and molecular studies form the basis of diagnosis of renal SS[6].Depending on the cellular predominance and differentiation, they can be classified into biphasic SS (epithelial and spindle cell population), monophasic spindle SS, monophasic epithelial SS and poorly differentiated SS1. Poorly differentiated SS may show one of the three morphologic patterns: a large cell / epithelioid / rhabdoid pattern, a small cell pattern, and a high grade spindle cell pattern[2].

In this case, the brisk mitotic activity, spindle cells and the evidence of cellular atypia points towards monophasic spindle SS. A panel of immunohistochemical staining was done for differential diagnosis. The tumor cells expressed Vimentin and Bcl-2, CD-99/Mic-2 strongly and epithelial membrane antigen (EMA) focally but did not express Cytokeratin, FLI-1, CD-34 and CD-10; smooth muscle actin (SMA), muscle specific actin (MSA), CD117 and S100. These findings helped to exclude the presence of a leiomyosarcoma, malignant peripheral nerve sheath tumor (MPNST), gastrointestinal stromal tumor (GIST) which along with Wilms' tumour, sarcomatoid renal cell carcinoma, congenital mesoblastic nephroma, hemangiopericytoma, and primitive neuroectodermal tumours comprise the differential diagnosis of PRSS[7,8]. However there is still no ideal immunohistochemical test to diagnose PRSS due to which the differentiation between certain tumours such as sarcomatoid mesothelioma and synovial sarcoma is extremely difficult because both types of tumors share the same immunostaining results and an unequivocal distinction can't be made. The gold standard in order to confirm the diagnosis of SS is to detect the specific t(X; 18) (p11.2; q11.2) translocation at molecular level. The t(X;18)(p11.2;q11.2) translocation is a cytogenetic hallmark of the SS and is present in more than 90% of the cases and it results in fusion of SYT gene located on chromosome 18 with some members of the SSX gene (SSX1, SSX2, or SSX4) on chromosome X.[2, 9] In this patient the molecular tests were non confirmatory for SS. The diagnosis of SS cannot be completely excluded by a negative RT-PCR, as its sensitivity is limited by the quality of RNA extracted from the paraffin blocks.

There are no established guidelines regarding management of this tumor given the limited number of cases reported. Primary surgical treatment is considered to be the treatment of choice; prognosis is poor with this treatment alone. The value

of chemotherapy is yet to be proven but SS may be sensitive to high doses of Ifosamide-based regimens with a response rate of 24%[2, 5]. In this patient a Left radical nephrectomy with excision of left renal vein containing thrombus along with a cuff of IVC was performed and the patient received a chemotherapeutic regimen of ifosamide and doxorubicin. But despite surgery and chemotherapy, the patient survived for only two and a half years. The prognosis despite treatment is poor with a 5yr survival rate of synovial sarcoma being 42-89%. Factors indicating poor prognosis include: tumor size (>5 cm), male gender, poor differentiation, large number of mitotic figures (> 10 per 10 high power fields), positive histological margins, neurovascular invasion and the SYT-SSX1 variant.[10]
Thus in conclusion, we have reported a case of monophasic spindle cell Primary synovial sarcoma of the kidney with a caval thrombus in a young male .Despite being extremely uncommon, they should be included in the differential diagnosis of benign and malignant spindle cell tumours of the kidney particularly in younger individuals. This study also emphasizes the importance of an accurate diagnosis, including both cytogenetic and molecular studies for prognostic and therapeutic implications.

References

1. Kataria T, Janardhan N, Abhishek A, Sharan GK, Mitra S. Pulmonary metastasis from renal synovial sarcoma treated by stereotactic body radiotherapy: A case report and review of the literature. J Can Res Ther 2010;6:75-9 (1-3)
2. Divetia M, Karpate A, Basak R, Desai SB. Synovial sarcoma of the kidney. Ann Diagn Pathol 2008;12:333-39.
3. Paláu L MA, Thu Pham T, Barnard N, Merino MJ. Primary synovial sarcoma of the kidney with rhabdoid features. Int J Surg Pathol 2007;15:421-28.
4. Pitino A, Squillaci S, Spairani C, et al. Primary synovial sarcoma of the kidney. A case report with pathologic appraisal investigation and literature review. Pathologica 2011;103(5):271-8
5. Dassi V, Das K, Singh BP, Swain SK. Primary synovial sarcoma of kidney: A rare tumor with an atypical presentation.Indian J Urol 2009;25:269–71.
6. M, Zamilpa I, Bunning J. Primary renal synovial sarcoma.Urology 2008;72:716.
7. 7.Elif Ozkan E, Mertsoylu H, Ozardali HI. A case of renal synovial sarcoma treated with adjuvant Ifosfamide and Doxorubicin. Intern Med. 2011;50(15):1575-80 .
8. Grampurohit VU, Myageri A, Rao RV. Primary renal synovial sarcoma. Urol Ann.2011;3(2):110-13.
9. Törnkvist M, Wejde J, Ahlén J, Brodin B, Larsson O. A novel case of synovial sarcoma of the kidney: impact of SS18/SSX analysis of renal hemangiopericytoma-like tumors. Diagn Mol Pathol 2004;13:47-51
10. Zia Z, Shakarchi JA, Bagree R, et al. Primary Synovial sarcoma of Kidney.Internet Journal of Urology [serial online]. 2007; 4(2)[about 1p]. Available at http://www.ispub.com/journal/the_internet_journal_of_urology/volume_4_number_2/article/case_report_primary_synovial_sarcoma_of_kidney.html. Accessed Nov 29, 2012.

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