CASE REPORT

Primary Renal Synovial Sarcoma: A Rare Oncologic Mimicry

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Primary renal synovial sarcoma is a rare condition. Early diagnosis is difficult because it mimics the features of other common renal tumors. There are less than 70 cases reported internationally to date and the first locally. Herein, we describe a case of a 64 year old female, diagnosed case of renal cell carcinoma and underwent laparoscopic radical nephrectomy. Final histopathology however revealed a primary renal synovial sarcoma, confirmed by immunohistochemistry and flourescence in situ hybridization. There are no established treatment guidelines for this condition due to the limited number of cases reported. The role of adjuvant chemotherapy is controversial and unclear.

Key words: Primary renal synovial sarcoma, immunohistochemistry, fluorescence in situ hybridization, adjuvant chemotherapy

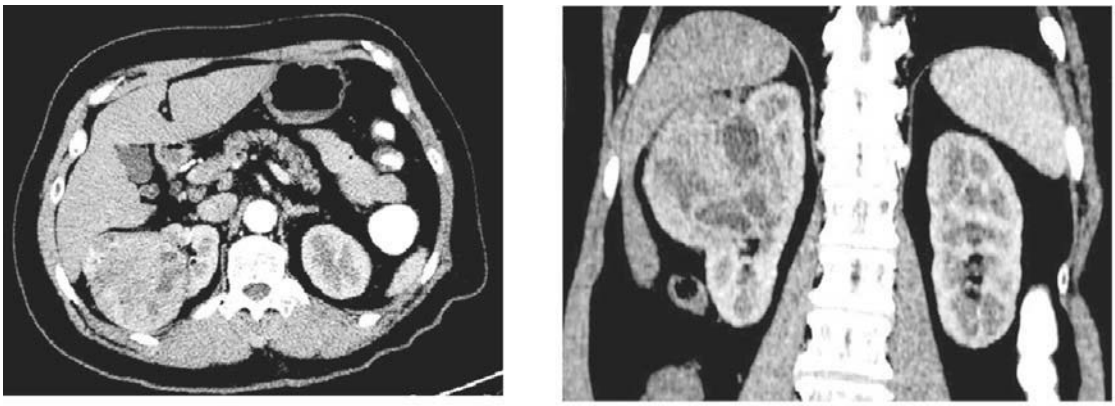
Introduction

Synovial sarcoma is a malignant soft-tissue neoplasm that usually arises in the para-articular regions of the extremities, usually in close association with tendon sheaths, bursa, and joint capsules. These tumors are rarely diagnosed in unexpected sites including the visceral organs like lungs and kidneys.[1] Primary renal synovial sarcoma is an extremely rare tumor and its presentation is similar to that of other renal tumors particularly renal cell carcinoma. To date, knowledge about this rare malignancy remains limited. The diagnosis is confirmed by supplementary immunohistochemistry and cytogenetic study.[2]

The Case

A 64 year old female presented with a 4 week history of dull aching right flank pain and hematuria. Abdominal examination revealed a palpable mass in the right lumbar region. An initial ultrasonography scan of the abdomen showed a 7cm x 6cm solid mass suspicious of renal cell carcinoma. Computed tomography (CT) scan of the abdomen showed a heterogeneously enhancing mass in the midportion of the right kidney measuring 7.5cm x 6.9cm x 7.4cm confined within the renal capsule and with no extension into the adjacent structures (Figures 1 and 2). Neither enlarged lymph nodes nor thrombus was present. The patient subsequently underwent laparoscopic radical right nephrectomy with no complication and good outcome.

On gross pathologic examination, the specimen labeled "right kidney" measured 14cm x 10cm x 7cm and weighed 300 g. The capsule strips with ease and showed a tan-gray, rough, nodular outer surface. On cut section, the tumor grossly resembled a classic renal cell carcinoma, with a solitary, tan to cream-white, soft to firm, well-circumscribed mass located at the superior to mid-pole of the kidney, measuring 9cm x 9cm x 6cm. Histological examination of the tumor,



A B

Figure 1. Abdominal CT scan shows a midportion right renal mass (arterial phase). A. Axial view, B. Coronal view.

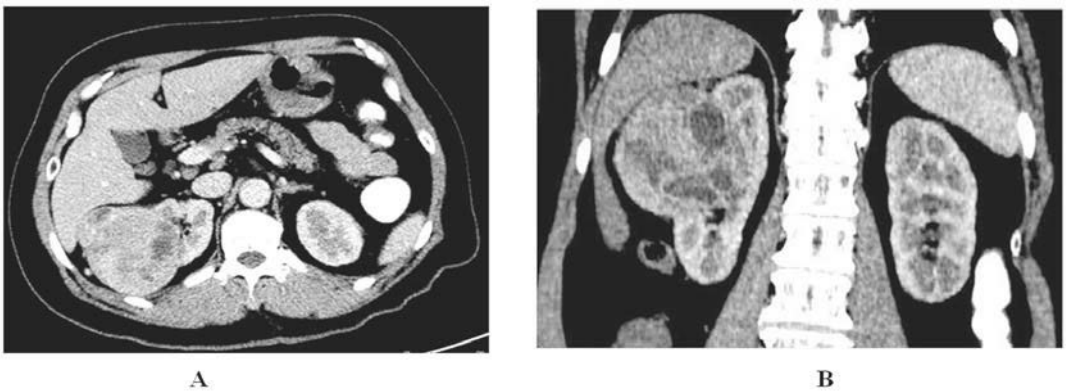


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Figure 2. Abdominal CT scan shows a midportion right renal mass (venous phase). A. Axial view, B. Coronal view.

stained with hematoxylin and eosin, revealed a solid and compact sheets of neoplastic cells with a dual cell population, composed of highly atypical polygonal and monomorphic spindle-shaped cells with abundant mitotic figures (Figure 3). No lymphovascular space invasion was seen. Immunohistochemistry staining was performed to detect the nature of the tumor cells and to exclude the differential diagnoses, which included Renal Cell Carcinoma with sarcomatoid differentiation, Leiomyosarcoma, Malignant Peripheral Nerve Sheath Tumor, Ewing's sarcoma, Hemangiopericytoma and Synovial sarcoma. The tumor tested positive for Vimentin, Cytokeratin, CD99, Bcl2 and Epithelial Membrane Antigen, and with negative expression for E-cadherin, CD34, S-100, Desmin, Smooth Muscle Antigen, Renal Cell Carcinoma Antigen and Caldesmon (Table 1). Given the following immuno-morphologic features, a diagnosis of Renal Synovial Sarcoma was suspected. Cytogenetic testing of the hybrid protein SYT-SSX via Fluorescent in-situ Hybridization (FISH), the gold standard confirmatory test, was done and confirmed the gene translocation between chromosome 18 and 11 (Figure 4) conclusive for renal synovial sarcoma.

Discussion

Primary Renal Synovial Sarcoma (PRSS) is a very rare neoplasm and was originally described by Argani et al in 1999 and was published in 2000.[3] It occurs 1-3% of all malignant renal neoplasm.[4] Since its description, fewer than 70 cases have been published in the medical literature

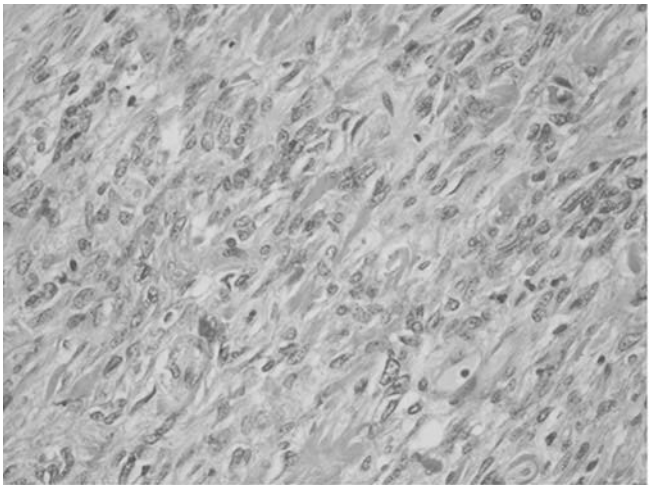

Figure 3. High Power Magnification image of the tumor showing abundant spindle-shaped cells.

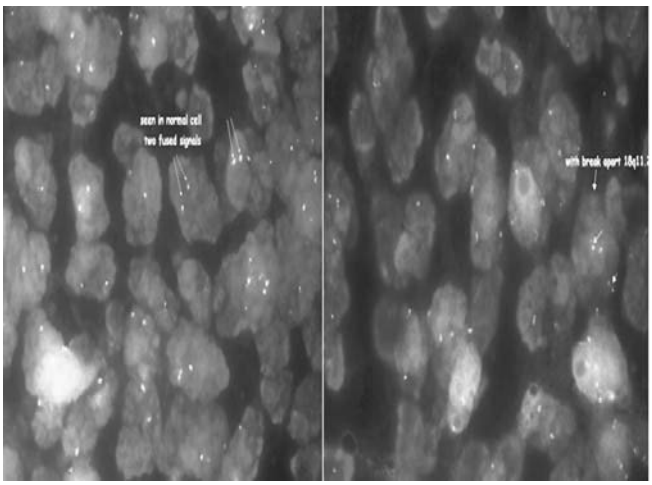

Figure 4. Actual images of patient's specimen subjected to Fluorescence in-situ hybridization showing the chromosome translocation.

Table 1. Immunohistochemistry result of the Tumor compared with other renal neoplasm and with synovial sarcoma. (Source: Dabbs Diagnostic Immunohistochemistry, 4th Edition 2013, p. 238)

	TUMOR	RCC w/ Sarcomatoid Features	Leiomyo-sarcoma	MPNST	PNET	Hemangio-pericytoma	SYNOVIAL SARCOMA
Vimentin	+	+	+	+	+	+	+
CD99	+	-	+/-	+/	+	_	+
Bcl2	+	-	+/-	+/	+/-	+/-	+
EMA	+	+	_	+/	_	_	+
CK	+	+	_	+/	_	_	+/-
E-cadherin	_	+	_	_	_	_	+/-
CD34	_	_	+/	_	+	+	_
S-100	_	_	+/	+	_	_	_
Desmin	_	_	+	+	_	_	+/-
SMA	_	_	+	_	_	+/-	_
RCCA	_	+	_	_	_	_	_
Caldesmon	_	_	+	_	_	_	_
Inhibin	_	+/-	_	_	_	_	_

Abbreviation:
EMA - Epithelial Menbrane Antigen
SMA - Smooth Muscle Antigen
RCCA - Renal Cell Carcinoma Antigen
MPNST - Malignant Peripheral Nerve Sheath Tumor
PNET - Primitive Neuroectodermal Tumor

as case reports or case series (5). In the local setting, it is the first documented case in our institution and no such case has ever been reported in the Philippine Journal of Urology.

The diagnosis can prove to be difficult owing to the rarity of the tumor, similar presentation as compared to other renal tumors and because no clinical or even imaging characteristics are diagnostic.[6] PRSS usually involves adolescents and young adults with the age at presentation ranging from 17 to 61 years.[7] Pain is the most common symptom (67%) followed by hematuria (38%) and palpable renal mass (25%). Fever and hypertension (2%) were also reported in some patients.[5]

PRSS is classified as biphasic synovial sarcoma, monophasic spindle synovial sarcoma and monophasic epithelial synovial sarcoma. As PRSS comes under the spectrum of spindle cell tumors, morphology alone is not sufficient for a definite diagnosis. In many instances a reliable diagnosis is not possible without ancillary immunohistochemistry and cytogenetic studies.[7] Immunohistochemical studies of PRSS cases have consistently shown positivity for Bcl2, CD99, CD56, Vimentin and focal positivity for EMA. They do not stain for desmin, actin, CD34 and CD31.[8] However immunohistochemical staining, while helpful in identification, cannot make an accurate diagnosis alone due to lack of highly sensitive and specific markers.[9]

The current diagnostic gold standard for confirming the diagnosis of PRSS is the demonstration of the chromosome translocation t(X;18)(p11.2,q11.2) using fluorescence in situ hybridization (FISH) and/or reverse transcriptase polymerase chain reaction (RT-PCR), showing the fusion of the SYT gene on chromosome 18 to either the SSX1 or the SSX2 gene on chromosome Xp11 (SYT-SSX fusion). However, this method is limited in clinical practical work because of the cost, time and unavailability of special equipment.[10]

Since PRSS is a rare neoplasm, no definite medical therapy has been established. Only primary surgical resection of the tumor is the treatment of choice. In a case review done by Ozturk, it was revealed that the most important prognostic factor was surgical excision of the tumor. The most effective therapy for renal and retroperitoneal sarcomas is total and complete resection of the tumor.[11] However, the prognosis is very poor with this treatment is alone. In a study done by Iacovelli et al, 36% of patients developed recurrence after nephrectomy. The median disease free-survival for patients with no metastasis was 33.0 months and for patients who developed metastasis, the median disease free-survival was 6 months. The median overall survival was at 48 months.[5] According to Ozturk, sarcomas of the kidney are associated with a poorer prognosis in terms of survival and a lower life expectancy compared with other sarcomas of the urinary tract. The five-year survival rate is 82% in patients with retroperitoneal sarcoma, 73% in patients with sarcoma of the bladder, 44% in patients with prostate sarcoma and 39% in patients with sarcomas of the kidney.[11]

With regards to chemotherapy, controversy still exists on the clinical benefit of adjuvant chemotherapy on sarcoma. Initial studies, mostly based on anthracycline-only chemotherapy, did not show improvement on overall survival, despite a small gain on recurrence-free survival. Later studies, including anthracycline and ifosfamide-based chemotherapy, revealed a small gain on survival. Thus no consensus has been reached and debate is still on-going. There is no compelling evidence to show benefit survival with adjuvant chemotherapy because management guideline criteria for selecting patients for adjuvant systemic therapy are still evolving and different.[12] In a study done by Park et al, it was stated that, in principle, adjuvant chemotherapy can be recommended. Adjuvant therapy includes ifosfamide and doxorubicin. However, the value of chemotherapy in the adjuvant setting has yet to be proven with randomized controlled trials.[13]

Presently, the patient is doing well and with good performance status in clinical follow up. There is no evidence of disease progression and/or tumor recurrence 20 months after the surgery documented on repeat CT scan and ultrasonography of the abdomen done during her 2nd and 12th month follow up (Figure 5).

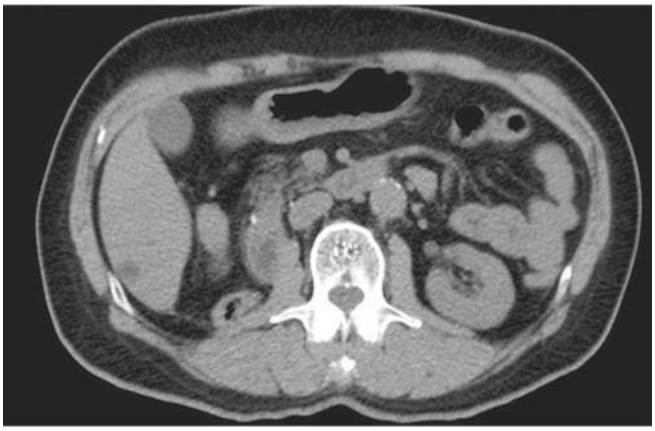

Figure 5. Abdominal CT scan repeated 2 months after nephrectomy.

Conclusion

Primary Renal Synovial Sarcoma is a very rare disease with a well-defined genetic background, clinically characterized by a very poor prognosis in patients with metastatic disease and by a high recurrence rate in patients with non-metastatic disease. Considering the limited number of cases reported, cooperative efforts and publication of cases with adequate follow-up are needed to clearly define prognosis and management strategies.

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