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Primary Renal Synovial Sarcoma and RCC with Sarcomatoid Differentiation: A Case Series of Rare Occurrences

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Abstract: ***Primary renal synovial sarcoma and Renal cell carcinoma (RCC) with sarcomatoid differentiation are rare renal tumors comprising only 1% and 4% of all renal tumours respectively. Both of which are highly aggressive variants. These tend to metastasise early and carry poor prognosis with short survival of patient. Primary renal synovial sarcoma harbours characteristic translocation t (X; 18) (p11; q11) whereas RCC with sarcomatoid originates from epithelial - mesenchymal transition (EMT) therefore contains both epithelial (carcinoma) and mesenchymal (sarcomatoid) features. Both the tumors lack any specific imaging or clinical findings thus require specific pathological tests for correct diagnosis and early detection for better outcome of patient. One case report of each tumor is presented.***

Keywords: Primary Renal Synovial Sarcoma, Renal cell carcinoma with sarcomatoid differentiation, Renal cell carcinoma

1. Introduction

Renal cell carcinoma (RCC) accounts for 3% of all adult cancers and 85% of all kidney tumours. Incidence of RCC is lower in Asian region, particularly in India, probably due to lack of reporting. The most common histopathologic type of RCC was clear cell carcinoma (68.8%), followed by papillary (20%) and chromophobe (8%) carcinoma. [1]

Synovial Sarcoma is the fourth most common type of soft tissue sarcoma accounts for 6- 10% of soft - tissue sarcomas primarily affecting the extremities in young adults. [2] Primary Renal Sarcoma is rare tumor comprising only 1% of all renal tumours and carries poor prognosis. [3]

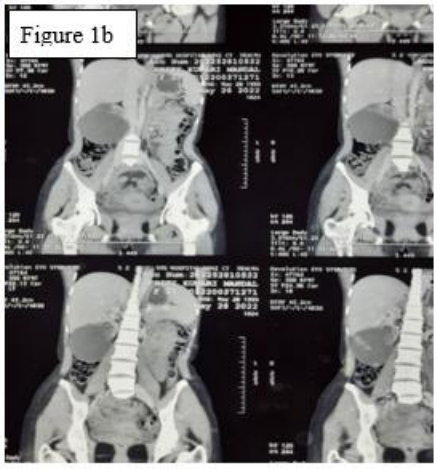
Renal cell carcinoma (RCC) with sarcomatoid differentiation belongs to the most aggressive phenotypes of RCC. [4] Sarcomatoid dedifferentiation appears in approximately 4% of all RCCs with a median survival is commonly 6–13 months. [5] and 40% of these RCC were seen in patients under 50 years of age. [6]

Here, we are presenting these 2 rare cases, which are renal synovial sarcoma and renal cell carcinoma with sarcomatoid differentiation, diagnosed in the Department of pathology, SMS medical college and hospitals, Jaipur.

2. Case Series

Case 1 – A 24 year- old female presented with chief complaint of right flank pain since last 4 - 5 months. There was no history of fever and hematuria. The pain was not associated with alerted bowel/bladder habit. There were no aggravating factors. The pain relieved on taking analgesics. Past history, family histoy and other significant history - not present.

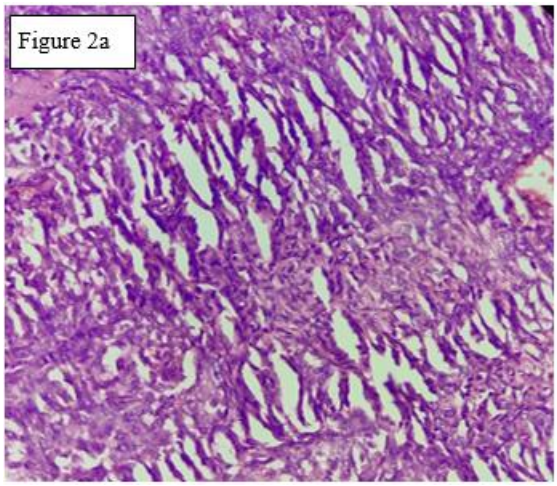
CECT abdomen revealed:
Approx 98x86mm size cyst in lower pole of right kidney not showing contrast enhancement, suggestive of right renal cortical cyst. (FIG 1)



Right side partial nephrectomy was performed and sent in the department of pathology for histopathological examination.

Result

The tumor cells showed high nuclear atypia with spindle cell morphology on HP examination. On IHC, the cells exhibited negative immunostaining for p63 and CD10 hence ruled out urothelial malignancy and RCC respectively. Negative immunostaining for CK, CD99, desmin and CD34 excluded epithelial origin, wilms tumor, myogenic and haematopoeitic origin of tumor respectively. The tumor cells showed positive nuclear staining with TLE which is a marker for synovial sarcoma. On the basis of histopathology and IHC, a final diagnosis of synovial sarcoma was made.



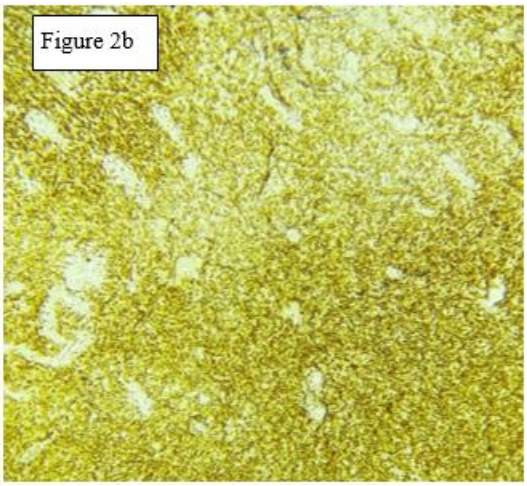


Figure 2: Tumor cells shows atypical features and positive immunoreactivity for TLE

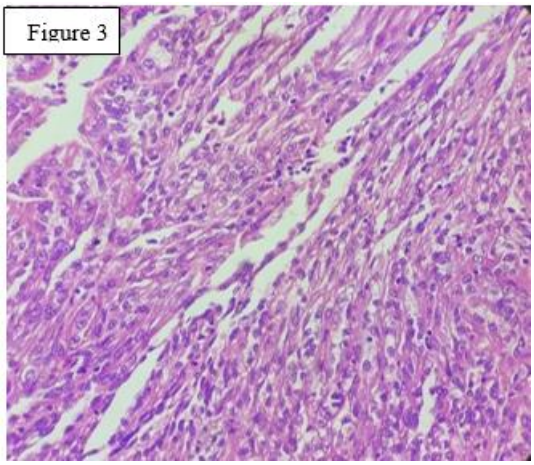
Case 2 - A 65 year old female presented with chief complaints of pain abdomen at right lumbar region since 3 months. There was history of loss of apetite and weight since last 3 months. Past history and family history - insignificant.

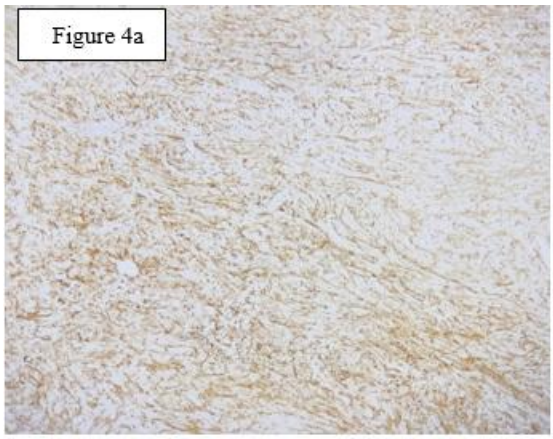
On further evaluation, CT abdomen revealed a heterogenous soft tissue density mass ms.68x72x64 mm at upper pole of right kidney with multiple subcentimetric enlarged LN in mesentric and bilateral inguinal region.
Grossly growth involving the upper and middle pole of kidney involving cortex and medulla.

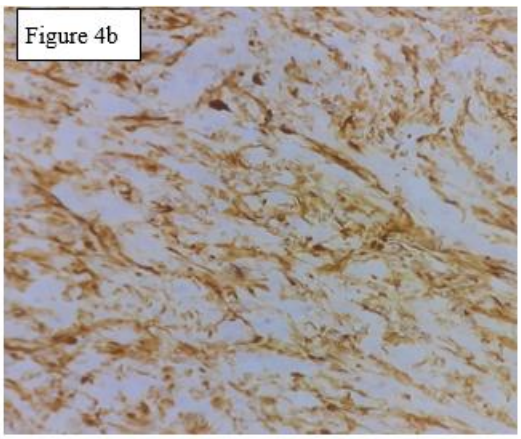
Result

Microscopic findings - high power view shows tumor cells with spindle shaped nuclei, anisocaryosis, open chromatin and prominent nucleoli. (FIG 3)

On applying immunohistochemistry - Tumor cells shows immunoreactivity for pax 8 and vimentin (FIG 4).







The case was diagnosed as renal clear cell carcinoma with sarcomatoid differentiation on histopathological examination which was confirmed with immunohistochemistry.

3. Discussion

Primary renal synovial sarcoma lacks any specific imaging or clinical findings thus correct diagnosis requires specific pathological tests. These tumors harbour characteristic translocation t (X; 18) (p11; q11) described for synovial sarcoma resulting in fusion proteins like SYT - SSX1, SYT - SSX2 and SYT - SSX4. [7] The breakpoint of this translocation fuses the *SYT* gene from chromosome 18 to one of three homologous genes, *SSX1*, *SSX2*, and *SSX4* present on the X chromosome which act as aberrant transcriptional regulator. [8] Renal synovial sarcomas present as large masses ranging from 1 to 35 cm. Microscopically, tumors are characterized by mitotically active, monomorphic plump spindle cells with indistinct cell borders growing in intersecting fascicles. [9] Synovial sarcomas are histomorphologically grouped into 3 types; monophasic synovial sarcoma (MSS), biphasic synovial sarcoma (BSS) and poorly differentiated synovial sarcoma (PDSS). The recognition of monophasic fibrous synovial sarcoma and PDSS subtypes is often a diagnostic challenge for pathologists because they may easily be confused with other spindle to round cell sarcomas, especially malignant peripheral nerve sheath tumors, fibrosarcoma, leiomyosarcoma, liposarcoma, and Ewing sarcoma. [10] Thus requires IHC for accurate diagnosis.

The sRCC is not a distinct morphogenetic subtype of RCC. It originates from epithelial - mesenchymal transition (EMT), and therefore contains both epithelial (carcinoma) and mesenchymal (sarcomatoid) features on both the morphological and immunhistochemical level, which is distinctive from primary sarcoma of the kidney. [11]

Sarcomatoid features are present in approximately 4–5% of all RCCs commonly at between 54 and 63 years of age. Sarcomatoid dedifferentiation is often heterogeneously present within rccs, making routine imaging and biopsy unreliable for preoperative detection. Surgical resection for localized disease is the standard of care. [12]

The microscopic features of sRCCs often include both epithelial and sarcomatoid components. The regions of sarcomatoid dedifferentiation can be heterogeneous or uniform. . According to the 2016 WHO guidelines, the presence of any amount of sarcomatoid dedifferentiation is sufficient for diagnosis of RCC with sarcomatoid features and independently predicts poor survival compared to RCC without sarcomatoid features; thus, its description needs to be included in the surgical pathology report. [13, 14, 15]

Overall, the most common histology seen with sarcomatoid features is clear cell RCC, which comprises ~80% of all RCC cases [16] which was present in our case.

In the absence of a low - grade epithelial component IHC markers are useful, as a tumour with spindled morphology having differential diagnosis of sarcomatoidurothelial carcinoma, angiomyolipoma, dedifferentiated liposarcoma, sarcomatoid adrenocortical carcinoma and others. [17]

Thus, a diagnosis of sRCC relies heavily on the use of ancillary testing to establish renal histogenesis in the form of immunohistochemistry for transcription factors such as PAX2 and PAX8, which are both nephric - lineage, required for establishing renal origin lineage cells and therefore, a useful maker for renal epithelial tumours hence resolve this diagnostic dilemma. [18]

4. Conclusion

Primary renal synovial sarcoma and RCC with sarcomatoid differentiation both are rare entities and aggressive tumors, both are associated with poor prognosis of patient.

The mainstay of treatment for Primary renal synovial sarcoma is surgery. However, radiotherapy and chemotherapy can be useful as an adjuvant treatment in presence of metastases. [19]

Nephrectomy remains the best option with radiotherapy as a palliative treatment in RCC with sarcomatoid differentiation. However, Immunotherapy may be used to inhibit immune checkpoints.

Both these tumors posses high mortality, hence it is essential to diagnose tumors early by means of histopathology and confirmation with Immunohistochemistry for better outcome survival of patient.

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