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Collision Tumor With Renal Cell Carcinoma and Plasmacytoma: Further Evidence of a Renal Cell and Plasma Cell Neoplasm Relationship?

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ABSTRACT

Renal solitary extramedullary plasmacytomas belong to a group of plasma cell neoplasms, which generally have been associated with renal cell carcinoma. We present a case report of a patient with collision tumor histology of extramedullary plasmacytoma and clear cell renal cell carcinoma, the first in the known literature. Standard work-up for a plasma cell neoplasm was conducted and the mass was resected. The patient remains disease-free at 28 months post-surgery. The report calls into question pre-surgical renal mass biopsy protocol and suggests a relationship between renal cell carcinoma and plasma cell neoplasms.

Introduction

Renal solitary extramedullary plasmacytomas (SEPs) are rare plasma cell neoplasms with only 25 cases reported in the literature.[1] All prior cases have been primary or secondary SEPs with uniform pathology. Here we discuss the evaluation, treatment and 28 month follow-up of a patient with a first ever documented collision tumor of extramedullary plasmacytoma and clear cell renal cell carcinoma (RCC).

Case report

A 51-year-old obese (BMI = 40) male initially presented to an outside clinic for evaluation of intermittent gross hematuria. Follow-up CT imaging (Fig. 1) revealed an 8 cm left renal mass, Renal score R (3) + E (2) + N (3) + A (p) + L (3) = 11p. Cytology in a fine needle biopsy was consistent with monoclonal plasma cell proliferation. Serum protein electrophoresis showed monoclonal expansion of a small IgG. Further diagnostic PET/CT imaging was negative for metastases.

The patient's care was transferred to the UC San Diego oncologic clinic for further evaluation. Initial work-up revealed a neck acneiform rash, proteinuria, and elevated acute phase reactants.

Despite a normal CBC and negative PET/CT, a concern for multiple myeloma (MM) led to further investigations. A bone marrow biopsy showed mild hypercellularity with a slightly increased number of polyclonal plasma cells. Flow cytometry was negative with 0.2% polyclonal plasma cells and a lack of abnormal or increased immature cell populations. Cells had a 46 XY karyotype. No evidence of monoclonal plasma cells was found. He subsequently underwent open left partial nephrectomy for presumed extramedullary plasmacytoma and was discharged post-operative day 6 without complication.

The resected mass (Fig. 2) had negative surgical margins with a brown-yellow well-circumscribed lesion identified in the cortex. Tumor dimensions were 8.0 x 7.2 x 6.5 cm. Tumor histology was conducted with light microscopy and hemotoxylin and eosin (HE) staining (Fig. 3A and B). The tumor pathology revealed a Fuhrman grade 2 clear cell renal cell carcinoma, pT2aNxMs, with a distribution of intermingled, nodular, and perivascular plasma cell proliferation. The plasma cell nodules were found to be monoclonal

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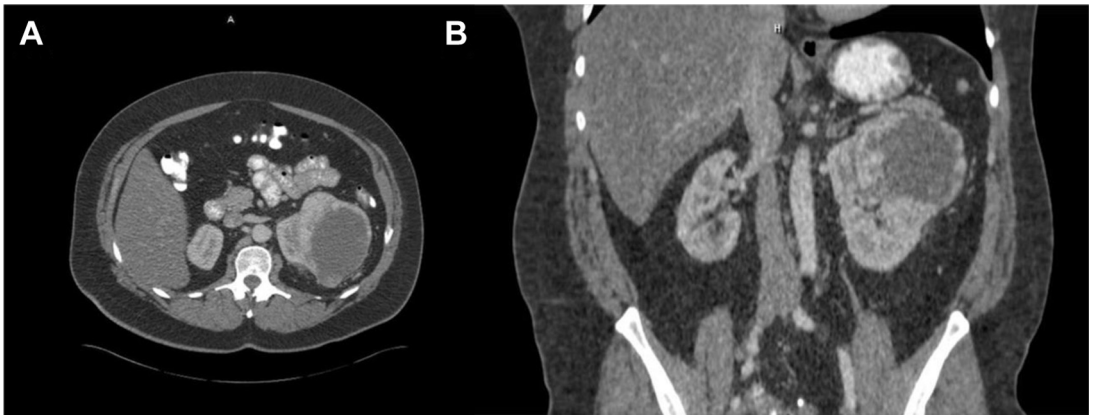

Figure 1. Contrast-enhanced computed tomography of the abdomen/pelvis at presentation. A) Axial view showing an 8 cm enhancing left mass. B) Coronal view indicating upper pole location.

lambda immunoglobulin light chain producing cells via immunohistochemistry (IHC) and chromogenic *in situ* hybridization (CISH) (Fig. 3C and D). However, single plasma cells scattered in other areas were polyclonal. Epstein Barr Virus encoded RNA (EBER) staining was negative.

At 28 month follow-up, the patient has no evidence of disease and is without complication. Follow-up creatinine and GFR are unchanged from baseline.

Discussion

Here we report the first known case of a collision tumor with RCC clear cell and plasmacytoma. To our knowledge, this is the first reported finding of such pathology.

Limited data exist connecting RCC with plasmacytoma or MM. However, a recent retrospective study following 57,190 patients with primary RCC and 34,156 with primary MM found those with a primary RCC have a higher risk of developing MM (incidence ratio = 1.51) and vice versa (incidence ratio = 1.89).[2] In our case study, with a patient presenting with plasmacytoma and RCC, the two neoplasms could have arisen by an initial lesion followed by the development of the other, related tumor. Larger studies into the duality between RCC and MM are needed to further elucidate their true relationship. In the present literature, there are no common risk factors or mechanisms for RCC and plasmacytoma/MM.

Furthermore, the relationship of renal cell carcinoma and extramedullary plasmacytoma in terms of origin and propagation is still speculative. However, a potential mediator that could serve as a common link is, IL-6. Acting as a pleiotrophic anti-apoptotic cytokine, IL-6 has been implicated in a variety of tumors, including RCC and MM, to play a significant role in both RCC and plasmacytoma/MM. Increased expression of IL-6 for both tumor types indicates a source of potential further investigation for mechanisms of RCC and plasma cell tumor development.[3]

According to AUA guidelines, in the setting of T1 renal masses, needle biopsies are indicated to aid in patient counseling as well as clinical decision making.[4] However, given that our patient presented with a clinical T2 mass, surgical treatment without biopsy was potentially indicated. Additionally, even with fine needle aspiration (FNA) biopsy, the initial pathology was incorrect, which puts into question sole use of an FNA biopsy. The improper FNA conducted by the outside clinic highlights an example of how FNA biopsies of larger renal masses are not indicated.

At 28 month follow-up, there has been no diagnosis of multiple myeloma. In a previous review of renal solitary extramedullary plasmacytomas, those treated by surgical resection had

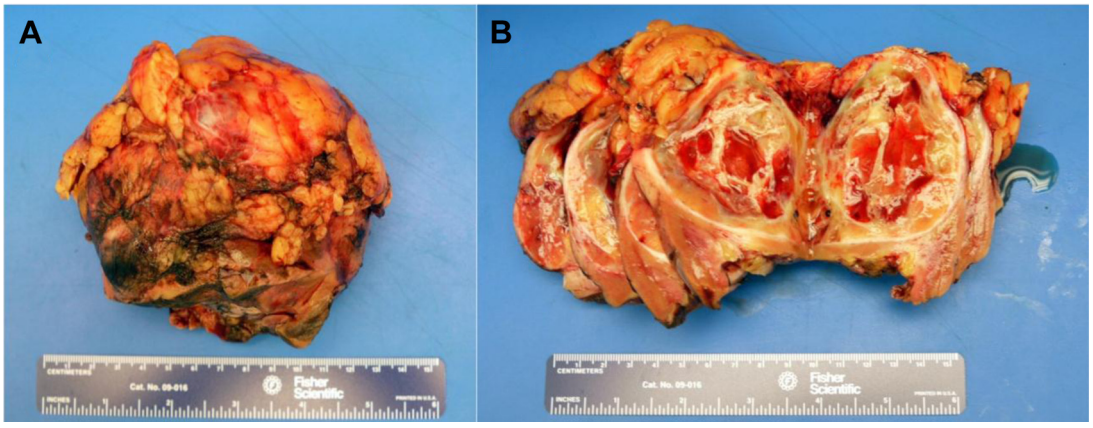

Figure 2. Gross pathological findings post partial nephrectomy. A) View of intact mass. B) Mass dissected, showing areas of central necrosis and tumor incorporating cholesterol.

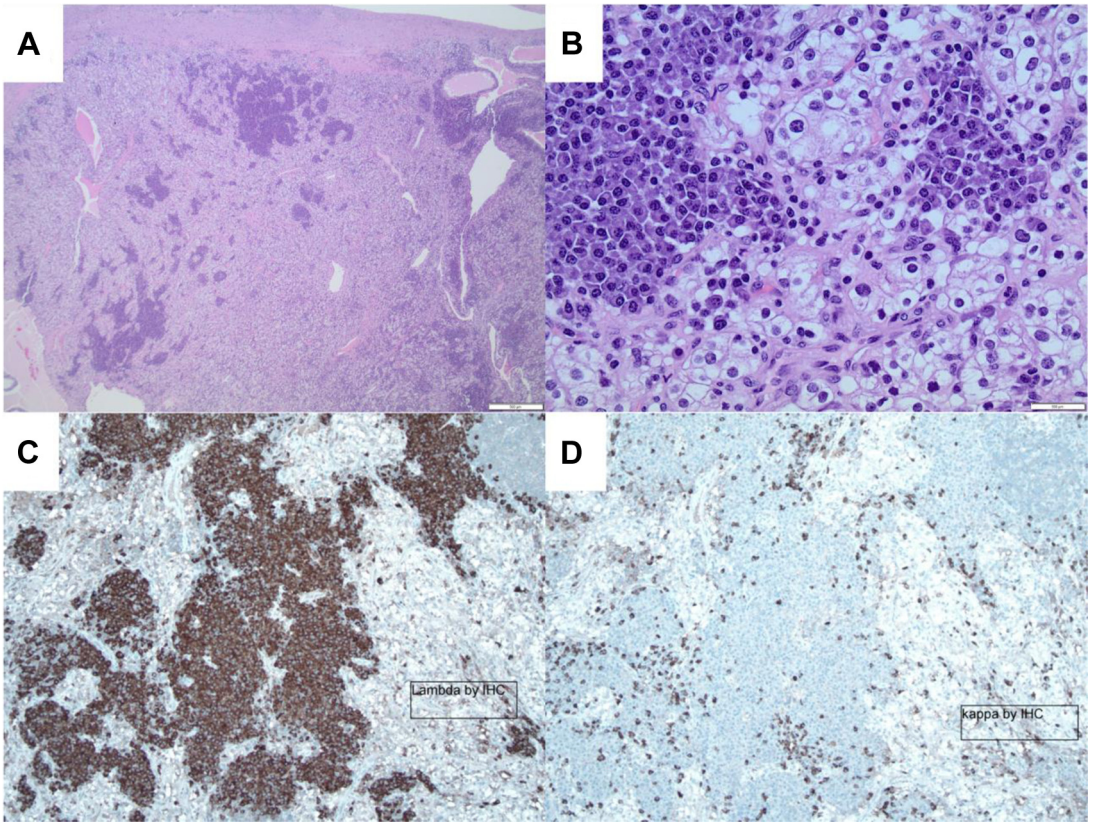

Figure 3. Microscopic examination for morphology, lambda chains, IHC and CISH, showing imbalance between kappa and lambda cell lineages (normally 3:2): A) H&E stain, 4×. B) H&E stain, 40×; note clustered plasma cells amid renal clear cells. C) IHC Kappa stain, 10×. D) IHC Lambda stain, 10×.

an 83% 3 year survival rate.[5] Further monitoring and clinical evaluation may be necessary to track the patient's course for future malignancy.

Conclusion

We present the first case of a collision tumor consisting of SEP intermingled within a clear cell RCC tumor, highlighting the need for further study of RCC and plasma cell neoplasms. A needle biopsy during initial work-up resulted in ambiguous results, calling into question the validity of biopsies for large renal masses. Surgical resection for renal SEP compares with equivalent survival rates for radiation.

Conflicts of interest

The authors have no conflicts of interest.

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