Kidney Biopsy: The Key to Diagnosis of a Systemic Illness

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A 16-year-old Sudanese boy presented with fever, bone pain, and Acute Kidney Injury (AKI) for 2 months. He had tenderness in both knees, ankles, and chest wall. Serum creatinine—2.4 mg/dL, hemoglobin—10.6 gm/dL, white blood cells—8000 cells/mm3, platelets—190000/mm3, lactate dehydrogenase (LDH)—2755 U/L, serum uric acid—3.8 mg/dL, and urine analysis was unremarkable. Marrow aspirate and biopsy done from the posterior superior iliac spine in view of bone pains, Pyrexia of Unknown Origin, and raised LDH were unremarkable. A positron emission tomography (PET) scan showed increased uptake in both knees (Fig. 1), but a bone biopsy from the left distal end of the femur was not yielding. As he had AKI, a right-sided kidney biopsy was performed, a bedside touch imprint of the tissue showed large cells with multiple vacuoles within the cytoplasm and an enlarged nucleus with two–three inconspicuous nucleoli which was suggestive of infiltration with a high-grade neoplasm (Fig. 2). Histopathology revealed scattered glomeruli and tubules with an infiltration of sheets of small cells with scanty eosinophilic cytoplasm, enlarged hyperchromatic nuclei with inconspicuous nucleoli (Fig. 3). Immunohistochemistry of the renal biopsy was suggestive of a B cell neoplasm with a Ki-67 index of 95% and positivity for cellular Myelocytomatosis (proto-oncogene). He was subtyped as Burkitt lymphoma and was started on Lymphoma Malignancy B - 89 protocol, with a chemotherapy backbone of cyclophosphamide, vincristine, and prednisolone. He had severe Tumor Lysis Syndrome which was medically managed. Creatinine came down to 0.6 mg/dL post-Cyclophosphamide, Vincristine, Prednisolone prephase, thus permitting us to initiate a full dose of Rituximab - Cyclophosphamide, Oncovin (Vincristine), Prednisolone, Adriamycin (Doxorubicin), Methotrexate Phase 1 Induction regimen chemotherapy, which was uneventful.

This highlights the value of kidney biopsy in making the diagnosis of a systemic illness when other measures were unsatisfactory.

Fig. 1: 18F-fluorodeoxyglucose-PET showing diffuse increased uptake

Fig. 2: Touch imprint showing large leukemic cells with multiple vacuoles (A)

Fig. 3: Renal biopsy showing infiltration of the tubulointerstitium with leukemic cells (B) and normal glomerulus (C). Hematoxylin and eosin stain under 45x magnification