***Case Report***

# INTERSTITIAL NEPHRITIS PRESENTING AS BILATERAL RENAL MASSES IN A PEDIATRIC PATIENT WITH CROHN'S DISEASE

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**Abstract:** This paper describes a teenage boy with Crohn's disease treated with adalimumab who presented with elevated creatinine and hypocalcemia, and was found to have bilateral renal masses on imaging, concerning for malignancy. Biopsy, however, was performed and pathology was consistent with interstitial nephritis. Both extraintestinal manifestations of Crohn's disease and medication-induced interstitial nephritis were considered as potential causes of the renal disease in this case. The radiographic presentation of interstitial nephritis as discrete bilateral masses is unusual, and we are not aware of any other reports of interstitial nephritis presenting on imaging in this manner.

**Keywords:** interstitial nephritis, Crohn's disease, adalimumab, renal mass

**INTRODUCTION** When primary malignant renal tumors occur during the 2nd decade of life, they are most commonly renal cell carcinomas and less frequently, Wilms tumors [1]. Imaging cannot easily distinguish between these types of tumors, and generally reveals a solid intrarenal mass. Renal masses on imaging would not, however, be the typical appearance of interstitial nephritis (IN).

We present the case of a teenage boy with Crohn's disease treated with adalimumab who presented with discrete renal masses, found while undergoing evaluation for elevated creatinine (1.35 mg/dL) and hypocalcemia (5.3 mg/dL). The MRI result, as well as the potential increased risk of malignancy in patients treated with TNF-blockers, both contributed to primary concerns of malignancy in this case [2]. Pathology was consistent, however, with IN and not malignancy.

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The radiographic presentation of the IN, in this case, was very unusual, as IN can present as a striated nephrogram on Imaging [3] but has not been described as discrete masses. We are not aware of any other cases of IN reported appearing this way on imaging.

**CASE PRESENTATION** A 14 year-old male patient with autism and Crohn's disease (CD) was referred to the emergency room by his nephrologist after he was found to have a right renal mass on ultrasound. The patient was initially evaluated by nephrology due to hypocalcemia and elevated serum creatinine. His history was notable for CD, diagnosed approximately 6 years earlier, which was treated with adalimumab. He was tolerating the medication well and had not had a flare from CD in over 18 months. The patient denied fever, gastrointestinal bleeding, change in bowel habits, gross hematuria, joint swelling, or oral lesions.

In the emergency department, vital signs were evaluated: temperature 35.9$^{o}$C, blood pressure 115/82 mm Hg; heart rate 95 bpm; and oxygen saturation 99% on room air. Laboratory work demonstrated an elevated creatinine, 1.35 mg/dL, and hypocalcemia, 5.3 mg/dL. A CBC was significant for anemia with hemoglobin 10.8 g/dL and MCV 93.6 µm3.

Ultrasound was notable for right-sided mid-pole 2 x 2.4 x 2.6 cm hypoechoic renal lesion.

The patient was admitted for further evaluation. MRI was performed and showed numerous bilateral solid renal masses measuring up to 3.2 cm, concerning for malignancy (Figure 1). A biopsy was performed, and pathology was notable for non-granulomatous focal moderate interstitial inflammation with acute and chronic inflammatory cells including eosinophils and rare sclerosed glomeruli.

The patient was started on high-dose steroids for acute kidney injury secondary to acute interstitial nephritis, which was most likely drug-induced, although extra-intestinal manifestations of CD were also considered. Adalimumab was discontinued for the suspected drug-induced pathology. Mycophenolate mofetil was added after two months due to poor response to steroids alone. Unfortunately, the patient developed persistent renal failure and was referred for a transplant.

**DISCUSSION** Extraintestinal manifestations of Inflammatory Bowel Disease (IBD) have been described in up to 45% of patients. Renal disease as an extraintestinal manifestation of IBD includes cases of interstitial nephritis and may reflect systemic inflammation, autoimmune processes, or drug-related toxicity [4,5].

Acute IN is characterized by an inflammatory process occurring in the kidney interstitium leading to a decline in the renal function. The causes of IN vary; drug hypersensitivity reactions are the most common cause of IN [6]. Tumor necrosis factor (TNF) blockers, used in the treatment of various conditions including Crohn's Disease, have been published in various reports of drug-induced IN [7]. Treatment with TNF blockers in children may increase the risk of both malignancy and interstitial nephritis [2,7].

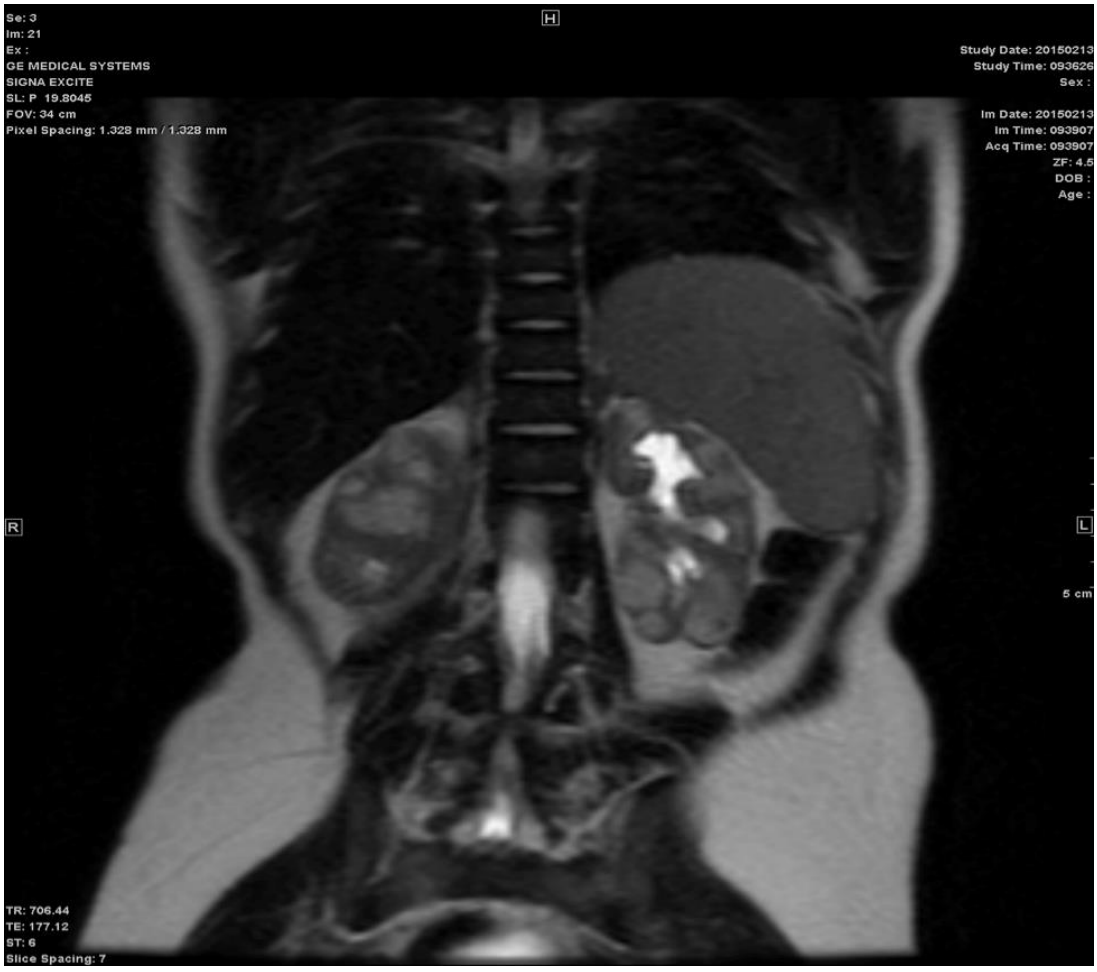


**Figure 1**. Coronal T2-weighted image of the abdomen demonstrates bilateral hyperintense renal masses of varying sizes.

In patients with CD diagnosed with interstitial nephritis, the IN can be related to the CD itself or the treatments administered [7,8].

The imaging findings, in this case, were not typical of IN.
IN can have serious long-term irreversible complications. It is crucial to consider the potential extraintestinal manifestations of both the underlying CD as well as the medications used for treatment to expedite evaluation and treatment and avoid future morbidity in similar cases.

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