

## Acute Kidney Injury in Rectal Cancer-Associated Minimal Change Disease: A Case Report

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### Abstract

A 75 year-old man presented with shortness of breath and increased bilateral lower extremity edema for 3 weeks. He was found to have nephrotic syndrome with a 24-hour urine protein excretion of 14 g. The serum creatinine had increased to 2.0 mg/dL from a baseline of 1.0 mg/dL within one month. Based on the initial presentation with shortness of breath and tachycardia, the patient was empirically treated with intravenous heparin infusion for suspected pulmonary embolism. The patient developed bleeding per rectum. Heparin was discontinued. A colonoscopy revealed a 6 cm rectosigmoid mass with biopsy showing moderately differentiated adenocarcinoma. A renal biopsy showed normal glomeruli on light microscopy and 100% foot process effacement on electron microscopy, consistent with minimal change disease (MCD). Treatment was initiated with prednisone 80 mg daily (1 mg/kg/d) and furosemide 40 mg twice daily orally. The patient underwent surgery and adjuvant chemoradiation. Lower extremity edema improved greatly over one month. Serum albumin increased to 2.6 g/dL. Urine protein to creatinine ratio was 0.3. The serum creatinine returned to 1.0 mg/dL at baseline. Prednisone had been gradually tapered to 5 mg/day.

Paraneoplastic glomerular disease is a rare manifestation of malignancy that is frequently mistaken from other glomerular diseases. In patients with nephrotic syndrome, especially elderly, the possibility of underlying malignancy should be considered. Colorectal cancer-associated MCD is uncommon and has been reported in only 6 cases to date. We present another case of rectal cancer-associated MCD with acute kidney injury and nephrotic syndrome. Considering that MCD is more steroid responsive than other nephrotic diseases, early recognition and diagnosis may help to expedite effective therapy. Also, ablation of the tumor frequently results in remission of MCD.

**Keywords:** Acute kidney injury; Minimal Change Disease; Rectal Cancer

### Introduction

Minimal change disease (MCD) is a major cause of nephrotic syndrome in both children and adults [1]. The characteristic histologic lesion in MCD is diffuse effacement of the epithelial foot processes on electron microscopy [2]. Most cases of MCD are idiopathic, however there have been causes of secondary MCD identified, including medications, immunizations, neoplasm, and infection. 18 percents of adults with MCD are observed to have acute kidney injury [3].

### Case Presentation

A 75-year-old Caucasian man with chronic stable angina, hypertension and hypothyroidism presented to Emergency Department (ED) with shortness of breath and increased bilateral lower extremity edema for 3 weeks. His home medications included aspirin, diltiazem, levothyroxine, rosuvastatin, and ranitidine. He was found to have nephrotic syndrome with a serum albumin of 1 g/dL and a 24-hour urine protein excretion of 14 g. Microscopic urinalysis demonstrated 10-20 white blood cells/hpf and scant red blood cells. The serum creatinine had increased to 2.0 mg/dL from a baseline of 1.0 mg/dL within 1 month. Immunologic tests were negative, except for the presence of antinuclear antibodies (1:320) but without anti-DNA antibodies. Ultrasonography revealed normal sized kidneys with normal parenchymal thickness and echogenicity bilaterally.

Based on the initial presentation with shortness of breath and tachycardia, the patient was empirically treated with intravenous heparin infusion for suspected pulmonary embolism. The patient developed bleeding per rectum. Heparin was discontinued. A ventilation/perfusion (V/Q) scan showed low probability pulmonary embolism. A colonoscopy revealed a 6-cm rectosigmoid mass (Figure 1) with biopsy showing moderately differentiated adenocarcinoma.

The diagnosis of adenocarcinoma of the rectosigmoid colon stage IIA was made.

A CT-guided percutaneous renal biopsy was performed. Findings showed normal glomeruli on light microscopy. Electron microscopy showed 100% foot process effacement, consistent with minimal change disease (MCD) (Figure 2a-b). Treatment was initiated with prednisone 80 mg daily (1 mg/kg/d) and furosemide 40 mg twice daily orally. Adenocarcinoma treatment was initiated with 5-fluorouracil (5-FU) and radiotherapy. The patient subsequently underwent a low

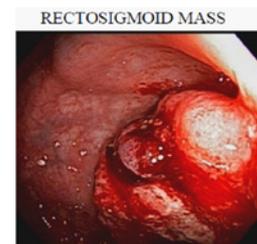


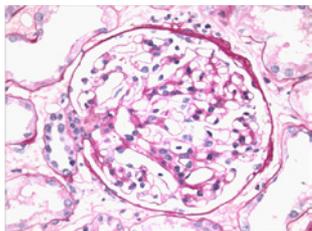
Figure 1: A colonoscopy revealed a 6 cm rectosigmoid mass.

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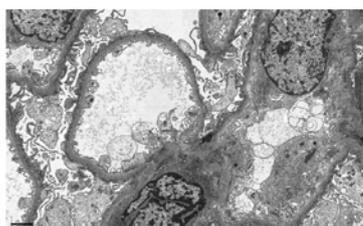
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**Figure 2a:** A Light Microscopy revealed normocellular glomerulus.



**Figure 2b:** Electron microscopy showed 100% foot process effacement, consistent with minimal change disease (MCD).

anterior resection with loop ileostomy and was planned for 6 months of adjuvant Folfox combination chemotherapy (5-FU, leucovorin, and oxaliplatin). Lower extremity edema was improved greatly over one month. At a 4 month follow-up visit, the patient continued to do well. Serum albumin was increased to 2.6 g/dL. Urine protein to creatinine ratio was 0.3. The serum creatinine returned to 1.0 mg/dL at baseline. Prednisone had been gradually tapered to 5 mg/day.

## Discussion

Paraneoplastic glomerular disease is a rare manifestation of malignancy that is frequently mistaken from other glomerular diseases. Failure to identify paraneoplastic glomerular disease can subject patients to ineffective therapy and delay cancer diagnosis. In patients with nephrotic syndrome, especially elderly, the possibility of underlying malignancy should be considered. Approximately 10% of nephrotic syndromes in adults are associated with malignant tumors [4].

Case reports and literature reviews have shown an association between MCD and malignancies, particularly hematologic malignancies, such as Hodgkin's disease, non-Hodgkin lymphomas, or leukemias [5-7]. Conversely, MN has been more commonly linked with solid tumors [8]. Rare cases of MCD associated with solid tumors, including renal cell carcinoma, mesothelioma, and bronchogenic, colon, bladder, lung, breast, pancreatic, duodenal, and prostate cancer, have been reported [9].

Colorectal cancer-associated MCD is uncommon and has been reported in only 6 cases to date [10]. We present another case of rectal cancer-associated MCD with acute kidney injury and nephrotic syndrome. Vascular endothelial growth factor (VEGF) is one potential candidate for the pathogenesis of paraneoplastic MCD. Taniguchi et al. [11] reported a case with rectal adenocarcinoma associated with MCD. The VEGF level was elevated at the time of presentation. After tumor resection, proteinuria disappeared and VEGF levels decreased to normal. Whether MCD is indeed a consequence of VEGF overexpression in cancer cells remains to be determined [12].

Considering that MCD is more steroid responsive than other

nephrotic diseases, early recognition and diagnosis may help to expedite effective therapy. Also, ablation of the tumor frequently results in remission of MCD [12].

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