

# Multiple Myeloma Presenting as Acute Tubulointerstitial Nephritis and Normal Serum Protein Electrophoresis

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Multiple myeloma is uncommon in individuals younger than 40 years. Renal involvement is common in this disease, but acute tubulointerstitial nephritis is very rare. In 20% of patients, only the light chain is produced and serum protein electrophoresis is normal; however, in urine protein electrophoresis of these patients, the M spike is present. We reported a case of multiple myeloma in a 39-year-old man with acute tubulointerstitial nephritis. Serum protein electrophoresis was normal and there was no bone lytic lesion. Remission of multiple myeloma was achieved after treatment with thalidomide and dexamethasone; however, kidney failure was not improved and the patient was maintained on hemodialysis.

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## INTRODUCTION

Multiple myeloma (MM) is a plasma cell dyscrasia that is most often seen in old age.<sup>1</sup> Lytic bone lesion, anemia, kidney failure, and recurrent infection are usually common.<sup>2,3</sup> Diagnosis of MM is based on the presence of at least 10% plasma cell in bone marrow, presence of monoclonal protein in serum or urine, and end organ damage.<sup>4-6</sup> Kidney failure and infection are the major causes of death in these patients.<sup>3</sup> Causes of kidney failure include hypercalcemia, hyperuricemia, light chain deposition disease, myeloma cast nephropathy and amyloidosis. Kidney failure may be the first presentation of disease.<sup>7</sup> Severity and response to treatment of kidney disease have been correlated with patient survival, ie, it has been shown that the mean survival time of patients with irreversible kidney failure is about 4 month.<sup>8,9</sup> Acute tubulointerstitial nephritis in MM is rare and most reported cases in this regard are chronic tubulointerstitial nephritis. We reported an unusual case of MM presented with acute tubulointerstitial nephritis, without lytic bone lesion and with a normal serum protein electrophoresis (SPEP).

## CASE REPORT

The patient was a 39-year-old man who was referred to nephrology clinic due to acute kidney failure. Findings of physical examination and laboratory results were as follows: blood pressure, 140/95 mm Hg; body temperature, 37.1°C; extremities, 2+ edema in the legs; serum creatinine, 3 mg/dL; serum calcium, 9.2 mg/dL (corrected with serum albumin); serum phosphorus, 4.5 mg/dL; serum albumin, 3.8 mg/dL; serum uric acid, 6.4 mg/dL; serum potassium, 4.2 mg/dL; hemoglobin, 9.5 g/dL; erythrocyte sedimentation rate, 75 mm/h. Furthermore compensatory metabolic acidosis was detected. In urinalysis, there was trace proteinuria and microscopic urine sediment showed pyuria; however, neither hematuria nor casts were seen. Ultrasonography showed normal-sized kidneys with increased cortical echogenicity.

In order to find the potential cause of kidney failure, kidney biopsy was done, which showed glomeruli with normal tuft. Some of the glomeruli had thickened Bowman capsules. There was not any proliferation in intracapillary or extracapillary region. The mesangial area was intact. The capillary

lumina were intact. External side of the glomerular basement membrane was smooth. In the interstitial area, tubules were severely damaged. In the tubular lumen, necrotic materials shed tubular cells, and hyaline casts was observed. Some of the necrotic materials enrolled to the hyaline cast made mixed substances. About 30% of the tubules showed chronic changes as thickened and wrinkled tubular basement membranes. Most parts of the interstitium were occupied by lymphocytic infiltration, some of them invaded to tubules. Vessels had normal morphology. Pathological diagnosis was acute tubulointerstitial nephritis in association with some degrees of chronicity of the interstitial area (Figure 1).

The patient had no history of medication use and no findings of systemic disease that causes acute tubulointerstitial nephritis. Prednisolone, 60 mg/d, was started; however, no improvement of kidney failure was seen and the patient underwent hemodialysis. To explain the cause of tubulointerstitial nephritis and co-existence of unexpected anemia, the patient was evaluated for MM. Skull radiography was normal without any lytic lesion. The SPEP was normal, but urine protein electrophoresis (UPEP) revealed monoclonal spike (Figure 2). The type of the light chain of immunoglobulin in urine was kappa. Bone marrow aspiration and biopsy showed that 40% of cellularity of the bone marrow was plasma cells (Figure 3).

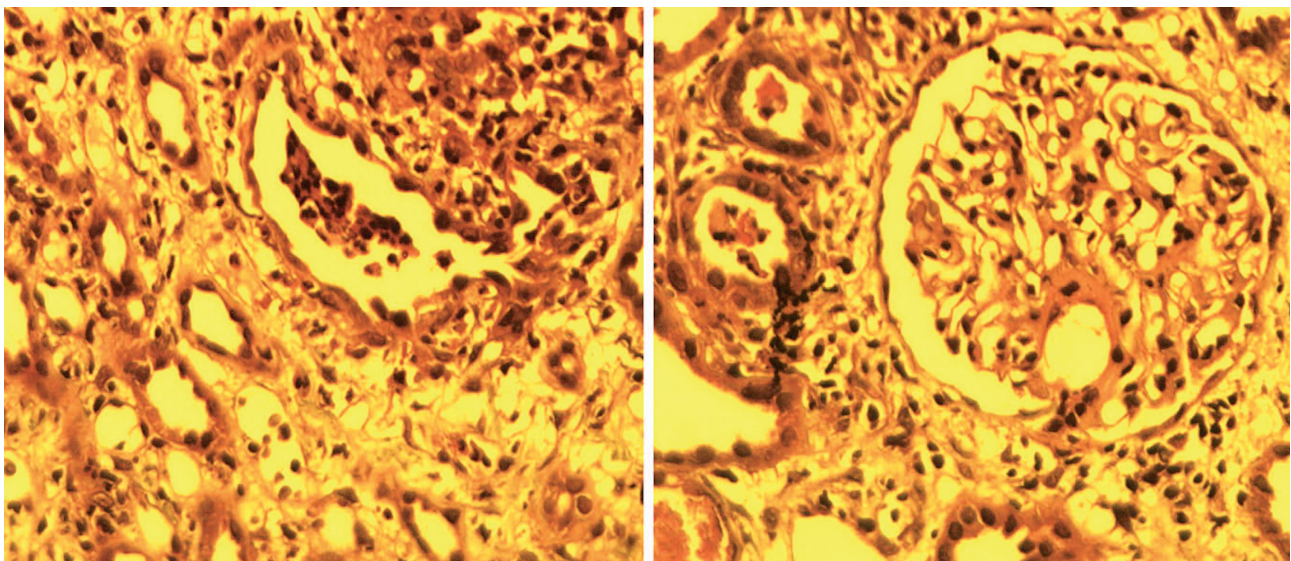


Figure 1. First kidney biopsy. Left, Acute tubulointerstitial nephritis. Right, Normal glomeruli.

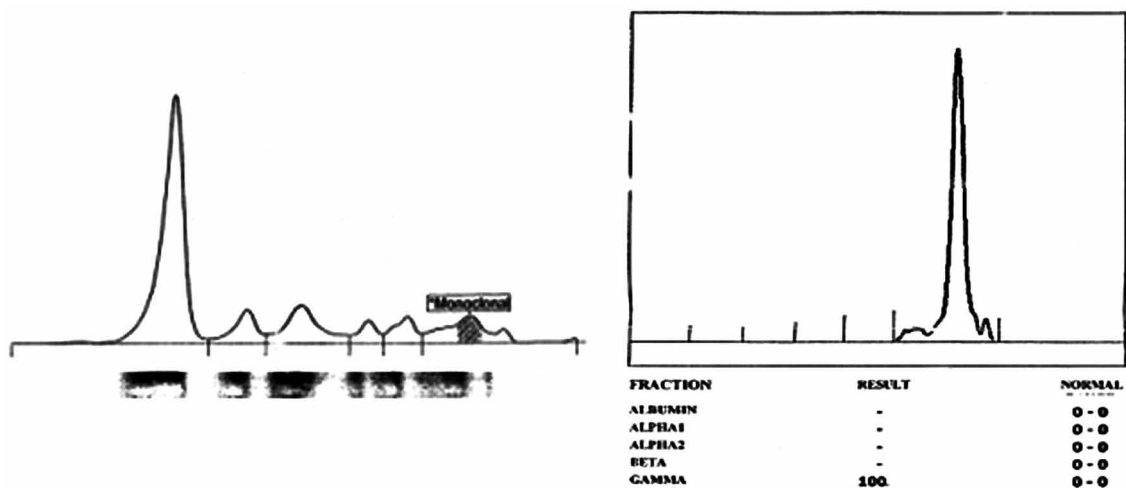
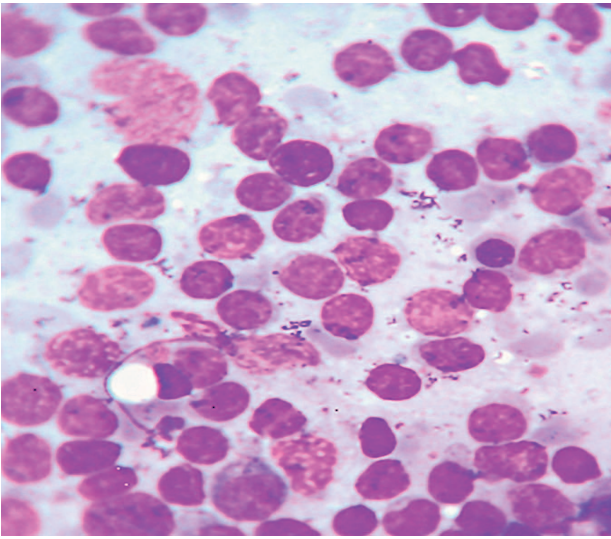
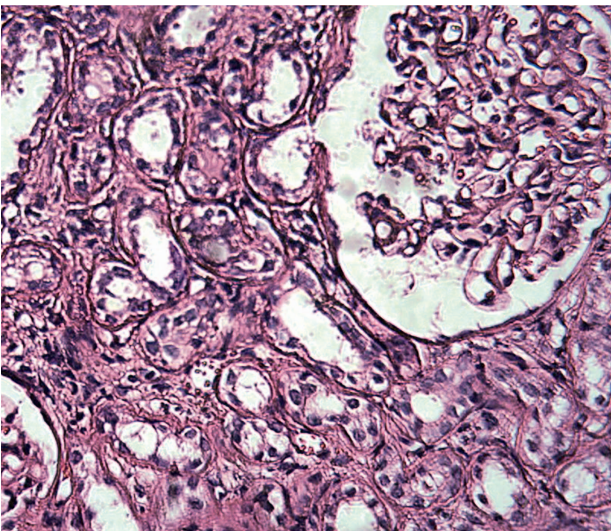


Figure 2. Left, Serum protein electrophoresis showed no abnormality. Right, A gamma spike was noted on urine protein electrophoresis.



**Figure 3.** Bone marrow aspiration showed diffuse involvement of marrow with plasma cells.



**Figure 4.** Second kidney biopsy, 1 year after treatment of multiple myeloma showed chronic tubulointerstitial nephritis.

Diagnosis of MM was made based on the above findings and treatment with thalidomide and dexamethasone was started on. After 2 months treatment, bone marrow and UPEP were normal; however, kidney failure was not resolved and hemodialysis was continued. After about 1 year of treatment, bone marrow was in remission. Finally, a second kidney biopsy was done (Figure 4) and chronic tubulointerstitial nephritis with tubular atrophy and interstitial fibrosis was observed.

## DISCUSSION

We reported an unusual case of MM with acute

tubulointerstitial nephritis. Other interesting findings in this patient were the age under 40 years, absence of bone lytic lesion, normal SPEP, and lack of response to treatment of kidney failure with chemotherapy. Presence of hypertension and edema in our patient was probably due to significant kidney failure instead of tubulointerstitial nephritis. Kidney failure is common in MM due to different causes such as light chain deposition disease and myeloma cast nephropathy; however, acute tubulointerstitial nephritis is so rare. In our case, acute tubulointerstitial nephritis might be due to interstitial damage by excretion of large amounts of immunoglobulin light chains in urine.

Ardalan and Shoja also reported a case of MM with rheumatoid arthritis like articular manifestation and acute tubulointerstitial nephritis,<sup>10</sup> but most reports of tubulointerstitial nephritis in MM were chronic. Sakhuja and colleagues followed up 204 MM patients over 10 years and reported renal involvement in 55 and tubulointerstitial nephritis in 3 patients.<sup>11</sup> In Prakash and colleagues' study, only 1 of 26 patients with MM and kidney failure had chronic tubulointerstitial nephritis.<sup>12</sup> Border reported 4 patients with acute kidney failure and myeloma kidney on kidney biopsy.<sup>13</sup> In another study, kidney biopsy was done in 118 patients with MM and kidney failure and acute tubulointerstitial nephritis was not seen in any of the patients.<sup>14</sup> Result of renal pathology were myeloma kidney in 48 patients, amyloidosis in 35, light chain deposit disease in 22, chronic tubulointerstitial nephritis in 12, and cryoglobulinemia in 1.<sup>14</sup>

Multiple myeloma affects older adults. In epidemiological studies, the mean age of patients at diagnosis was about 60 years and only 2% of the patients were younger than 40 years.<sup>15</sup> Another characteristic of our patient was the SPEP and UPEP findings; in 20% of patients, only light chain is secreted by plasma cells and there is no M spike in SPEP. This type of MM is called *light chain myeloma*.<sup>16</sup> Musculoskeletal manifestations such as bone pain and bone lytic lesion are common and help to early diagnose the disease, but these findings were not in present in our case, either.

In conclusion, our patient had some unusual and interesting findings such as young age at presentation, type of kidney disease as acute tubulointerstitial nephritis, uncommon form of MM as light chain myeloma, and absence of

musculoskeletal manifestation. Based on these findings, we recommend that MM should be evaluated in kidney failure patients without an obvious cause, even in young adults.

#### CONFLICT OF INTEREST

None declared.

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