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Case report

Unconventional Presentation of Smoldering Multiple Myeloma: A Case Study

Samia Abbas *, Sarah Nisar, Kamran Naseem and Maryam Samad

Department of Radiology, Bahawal Victoria Hospital, Bahawalpur, Punjab, Pakistan

*Correspondence: samiyaabbas875@gmail.com

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Abstract: Haematological malignancy multiple myeloma (MM) affects elderly people and causes abnormal plasma cell development in the bone marrow. Despite its low prevalence, MM causes severe illness and death. Patients often experience anaemia, bone discomfort, and renal failure. Acute kidney injury (AKI) and myeloma cast nephropathy result in significant renal complications that require quick identification and treatment. This 52-year-old woman originally resembled smoldering multiple myeloma (SMM) but later had acute renal failure due to myeloma cast nephropathy. Haemodialysis continued despite timely chemotherapy initiation since renal function did not improve. Hypercalcemia and lytic bone lesions were absent in our patient, making the diagnosis difficult. SMM has a much lower incidence than MM, according to the literature. Early identification and treatment are crucial for high-risk SMM patients who develop MM. Our report illustrates the diagnostic difficulty of atypical MM, especially when traditional indicators are normal or absent. A primary symptom of renal involvement can delay identification and therapy. This case shows that MM diagnosis and treatment require strong clinical suspicion and full assessment, including a kidney biopsy when necessary. Clinicians must report unexpected MM presentations and consider it a diagnosis in patients with significant symptoms.

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Introduction

Plasma cells in the bone marrow proliferate uncontrollably in multiple myeloma (MM). It is affected by gender, race/ethnicity, and age, with older people having a higher rate (Liu *et al*., 2019). Men have the condition more than women (Padala *et al*., 2021). This second most prevalent blood cancer accounts for 1% of all cancer diagnoses, 2% of cancer deaths, and 12–15% of oncological and haematological problems. Anaemia (73%), pain in the bone (58%), elevated creatinine (48%), weakness or general weakness (32%), excessive calcium levels (28%) along with weight loss (24%, with more than half of those studied losing 9 kg or more) were the symptoms and signs of multiple myeloma in a retrospective study of 1,027 patients at a single institution. Hepatomegaly (4%), splenomegaly (1%), lymph drainage (1%), and fever (0.7%) were observed in 5% or fewer patients (Kyle *et al*., 2003). In a French study of 1,038 different myeloma patients, 25% met the 2014

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International Myeloma Discussion Group (IMWG) renal impairment criterion of a serum creatinine level above 2 mg/dL or an eGFR, or estimated glomerular filtration rate, below 40 ml/min/1.73 m². In this group, 12.9% needed dialysis. Dialysis dependence occurs in 6–8% of those with multiple myeloma patients, according to other research (Leung and Rajkumar, 2023).

Three events define MM in the new IMWG criteria: 1. Clonal bone marrow plasma cells ≥60%, 2. Abnormal serum free light chain (sFLC) ratio ≥100 (kappa) or <0.01 (lambda), 3. MRI scans with focal lesions >5 mm. Any one of these factors is enough to diagnose MM, regardless of symptom or CRAB traits (Rajkumar, 2020). Acute kidney injury (AKI) risk and recovery can be predicted by serum FLC levels. Serum FLC ≤ 50 mg/dL seldom causes AKI. The risk of AKI increases dramatically when FLC levels exceed 80–200 mg/dL (Leung and Rajkumar, 2023). A kidney biopsy is the best way to distinguish light chain cast nephropathy (LCCN), a condition called monoclonal gammopathy of renal significance (MGRS), and other acute kidney injury (AKI) causes (Royal *et al*., 2020).

The clinical manifestations of multiple myeloma are varied. Smoldering multiple myeloma (SMM) is recognized by a serum monoclonal (SM) amino acids level of 3 g/dL or higher and/or Molecular bone marrow plasma cells (BMPCs) within 10% along with 60%, without first end-organ damage (CRAB criteria) or other markers of complications(Rajkumar *et al*., 2015). The NCDB projected 0.9 cases per 100,000 people for SMM. The European survey found 0.4 incidences per 100,000 persons (Blum *et al*., 2018) compared to 7 per 100,000 for multiple myeloma.

Case study

In October 2023, a 52-year-old housewife with a 5-year previous history of poorly controlled hypertension arrived with fever, nausea, vomiting, decreasing urine output, and generalized weakness for three months. Her little hand, wrist, and foot joints had hurt for two years, and she routinely took NSAIDs. Additional systemic signs were absent. Exam revealed 120/90 mmHg blood pressure, 68 beating per minute pulse, normal temperature, and sixteen inhalations per minute respiration. The rest of her systematic exam was normal.

Lab tests showed:

- Hemoglobin: 5.5 g/dL
- Total leukocyte count (TLC): 5,900/µL
- Platelets: 138,000/µL
- Serum calcium: 8.9 mg/dL (corrected)
- Serum phosphorus: 5.4 mg/dL
- Serum albumin: 3.0 g/dL
- Serum creatinine: 14.4 mg/dL
- Urea: 219 mg/dL
- Urinalysis: Protein 3+, RBCs negative, pus cells 8-10
- 24-hour urinary protein: 7.28 g
- Anti-HCV: Negative
- HBsAg: Negative
- HIV: Negative

Ultrasound of the kidneys showed bilateral normal size kidneys with intact corticomedullary differentiation. Given her symptoms, hemodialysis was initiated and she received 4 units of blood. Further investigations revealed:

- iPTH: 81.5 pg/mL (normal range: 15-68)
- Serum CK: 127 U/L (normal range: 29-168)
- Serum anti-CCP: 0.9 U/mL (normal range: <5)
- ANA: Negative
- ENA Quantix: Negative

She became anuric and dependent on dialysis. A renal biopsy, performed under ultrasound guidance, revealed tubulointerstitial nephritis with hard casts in the tubular lumina, indicative of myeloma cast nephropathy.

She received 1 mg/kg/day prednisolone. Diagnostic testing included whole-body X-rays, blood protein a process known as serum lambda and kappa light chains, and anatomical bone marrow biopsy. No lytic lesions were found on X-rays. Hypoproteinemia and hypoalbuminemia were found on serum protein electrophoresis, with no monoclonal band and gamma globulins decreased. Total protein 5 g/dL, albumin 3.2 g/dL, and gamma globulins 0.4 g/dL were the test results. Serum lambda and kappa light chained levels were 18.29 and 76.76 mg/dL, respectively. A bone marrow biopsy suggested multiple myeloma.

Discussion

Multiple myeloma is a blood cancer that causes bone pain, anaemia, hypercalcemia, renal failure, and recurrent infections due to plasma cell growth in the bone marrow. These symptoms are absent in SMM. MM and SMM are diagnosed by clinical presentation and test findings. We describe a 48-year-old woman who had SMM-like clinical and laboratory findings but had acute renal failure. Myeloma cast nephropathy was verified by renal histology. Her renal function continued to decline after treatment.

According to research, SMM affects 0.9 per 100,000 people, as opposed to 7 per 100,000 for the disease. A 2013–2022 Mayo Clinic research in Rochester, MN, using the 2018 Clinic 20/2/20 risk assessment criteria for 406 SMM patients. The median follow-up was 3.9 years. Out of 71 untreated high-risk patients, 51 developed bone lesions (37%), anaemia (35%), excess calcium (8%) and renal failure (6%). In addition, 24% met MM criteria with ≥60% marrow plasmacytosis and/or a free spite chain ratio >100, while 45% showed clinically relevant symptoms such hypercalcemia, or impaired renal function, or bone lesions. (Rajkumar *et al*., 2023).

Our patient had no typical clinical or laboratory features, such as elevated calcium levels, bony lytic lesions, or elevated serum permitted light chains, and renal biopsy revealed myeloma cast nephropathy, highlighting the difficulties in diagnosing MM, especially early on when classical music markers may still be normal. This case underscores the difficulties in identifying atypical presentations of MM and emphasizes the importance of recognizing renal involvement as a critical presenting feature. It also highlights the implications of such atypical presentations for timely diagnosis, management and prognosis.

Conclusion

This case report emphasizes the importance of a complete diagnosis strategy and considering MM in unusual clinical characteristics. This approach enables early detection and intervention. A thorough diagnostic assessment is crucial for confirming the diagnosis and guiding suitable treatment strategies. Identifying unusual presentations of MM is essential for enhancing diagnostic accuracy and ultimately enhancing patient outcomes through timely intervention.

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