中文題目：以急性腎衰竭表現之多發性骨髓瘤：個案報告

英文題目：Acute kidney injury with oliguira as initial presentation of plasma cell myeloma: case report

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Introduction

Plasma cell myeloma is one of plasma cell disorder with malignant proliferation of plasma cells and excessive secretion of M protein. End-organ involvement including bone pain secondary to osteolytic lesion, anemia, hypercalcemia and renal insufficiency could be noted in patients with plasma cell myeloma. Among above symptoms, the most common one is bone pain. In this case, we present a rare case with mainly significant acute kidney injury (AKI) requiring emergent hemodialysis on presentation.

Case Presentation

A 74-year-old woman had history of type 2 diabetes mellitus and hypertension, under medication control and regular follow-up. The latest creatinine level before this admission course was 0.6 mg/ dL on 2022/3/28. Her HbA1c level was kept around 6.8% to 7.0% in past one year. This time, she was admitted on 2022/9/6 due to AKI, that the creatinine level upon admission was elevated to 12.98 mg/dL, also presenting with oliguria (about 300 ml per day) and uremic symptoms, including fatigue, nausea and vomiting. She had no bone pain; besides, her hemoglobin was 10.2 g/ dL and calcium was 10 mg/dL. Emergent hemodialysis was initiated soon after admission. There was no infection, nephrotoxic drug use or post renal obstruction. However, urine albumin-to-creatinine (ACR) and protein-to-creatinine (PCR) levels were 93.0 mg/g and 2775 mg/g, respectively. Besides, urine and serum protein electrophoresis and immunofixation also discovered a peak in gamma zone with free Lambda monoclonal gammopathy. β2-microglobulin was 17.4 mg/L and lactate dehydrogenase (LDH) was elevated to 231 U/L. Renal biopsy was performed on 2022/9/13 and light chain cast nephropathy was then impressed. Bone marrow biopsy was further performed on 2022/9/16 and the diagnosis of plasma cell myeloma, International Staging System (ISS) stage 3, was confirmed.

Discussion

About 20-40% patient with newly diagnosed plasma cell myeloma developed renal impairment [1]; however, oliguric AKI as an initial presentation of plasma cell

myeloma in the absence of other characteristic features has rarely been reported [2]. Besides, β2-microglobulin and LDH could reflect tumor mass or proliferation rate in plasma cell myeloma. Therefore, the ISS stage could reflect disease burden of plasma cell myeloma. There was one retrospective research to compare disease and symptom burden of patients with newly diagnosed plasma cell myeloma by ISS stage, which revealed stage 3 disease often presented with more severe anemia (8.7 g/dL at average) and renal impairment [3]. In our case, although she was diagnosed as stage 3 disease, the hemoglobin was not significantly decreased and both hemoglobin and calcium were at the borderline of myeloma defining event (hemoglobin < 10 g/dL and calcium > 11 mg/dL). Since there was no obvious clinical symptoms of bone pain or osteolytic lesion and the laboratory data was not specific, plasma cell myeloma might be overlooked initially.

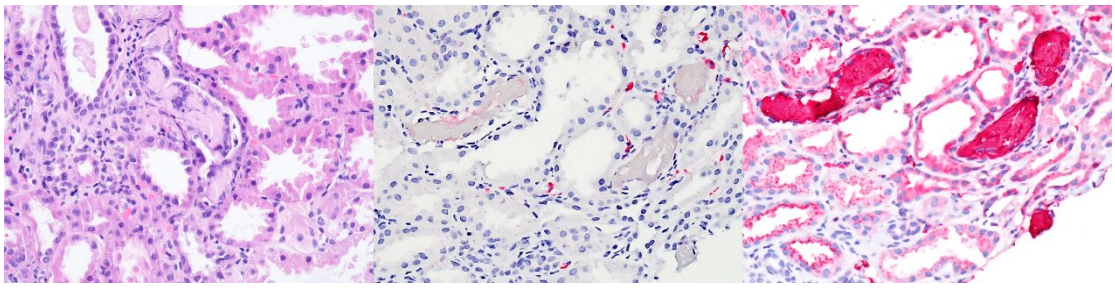
One retrospective cohort study that enrolled 1135 patients at the Mayo Clinic between January 2003 and December 2012 revealed that renal function at diagnosis of plasma cell myeloma would affect the overall survival. The median survival of creatinine clearance > 40 ml/min and < 40 ml/min was 122 months and 43 months, respectively [4]. In the aspect of renal outcome, UK NCRI Myeloma XI trial, which excluded patients with severe AKI or requirement for dialysis, revealed the fact that there was still 23.5% patients have improvement in renal function and 62% patients have no significant change [5]. However, previous study showed that once dialysis was required, only 17% patients could be finally dialysis independent [6]. Since creatinine level or eGFR at diagnosis is highly related to overall survival and renal outcome, early detection and treatment of plasma cell myeloma is important.

The incidence of plasma cell myeloma also increased with age. The annual incidence of multiple myeloma is 4.3 per 100,000 people and the incidence in elderly (>80 years old) is 49 per 100,000 population [7]. Therefore, we should keep the possibility of plasma cell myeloma in mind when encountering unexplained renal disease in elderly patient. About 5.9% elderly patients who received renal biopsy due to AKI revealed cast nephropathy and up to 40% of them had previously undiagnosed myeloma [8].

Here, we demonstrated a case of plasma cell myeloma with high disease burden but in absence of significant end-organ involvement except for kidney. Also, we emphasize that timely diagnosis of plasma cell myeloma is important for overall survival and renal outcome. Except the discrepancy between urine PCR and ACR, renal biopsy could definitely guide us to approach the correct diagnosis.

Conclusions: This case highlights the variable clinical presentation of plasma cell myeloma. In elderly patient with AKI with proteinuria, even without classic CRAB features, plasma cell myeloma should still be kept in mind.

Figure 1. Cast nephropathy



Acellular, crackable hypereosinophilic hyaline cast in the dilated tubular lumens surrounded by flattened tubular epithelial cells and macrophages. These casts are positive for lambda but negative for kappa light chain immunostains.

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