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Single Case

Immunoglobulin A Lambda Multiple Myeloma in a Patient with HIV: An Unusual Cause of Massive Ascites

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Keywords

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Abstract

Multiple myeloma (MM) is a neoplastic proliferation of plasma cells with overproduction of monoclonal immunoglobulins and infiltration into the bone and other organs. Ascites can develop in patients with lymphoproliferative and solid malignancies involving the peritoneum. However, ascites is unusual in MM and rarely the initial presenting sign or symptom. The development of ascites can be due to peritoneal infiltration or secondary to hepatic involvement, heart failure, or kidney failure. Ascites in MM reflects a more aggressive stage, and the reported prognosis is poor, with a median survival of 1–2 months. Here we present a rare case of immunoglobulin A lambda MM presenting with massive myelomatous ascites.

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Introduction

Multiple myeloma (MM) is a neoplastic proliferation of plasma cells with overproduction of monoclonal immunoglobulins and infiltration into the bone and other organs. The disease accounts for approximately 1% of all cancers and usually affects patients older than 60 years of age [1]. Although ascites can develop in patients with lymphoproliferative and solid malignancies involving the peritoneum, it is very unusual in MM and rarely the initial presenting sign or symptom. The development of ascites can be due to peritoneal infiltration or secondary to hepatic involvement, heart failure, or kidney failure. Our review of the literature revealed few reported cases of MM with ascites as the presenting symptom. Herein we present a case of massive ascites at presentation in a patient with HIV. After considering a wide range of differential diagnoses, the ascites was determined to be myelomatous ascites, and the patient eventually received a diagnosis of immunoglobulin A (IgA) lambda MM.

Case Report

A 48-year-old woman was brought to our emergency department because of confusion and incoherent speech. A striking abdominal distention was noted. The patient was not known to have any underlying medical or psychological illnesses and previously had not had any symptoms or complaints. On physical examination, she was alert but disoriented, with no focal neurological deficit. Results of the cardiopulmonary examination were normal. Shifting dullness was elicited on abdominal examination, but the abdomen was soft and nontender. Results of the initial laboratory parameters revealed anemia with hemoglobin of 8.4 g/dL (normocytic/normochromic anemia), white blood cell count $10.3 \times 10^3/\mu\text{L}$ with left shift, and platelet count $181 \times 10^3/\mu\text{L}$. She had renal dysfunction with a serum creatinine level of 3.5 mg/dL. Liver chemistry revealed an albumin level of 2 g/dL, total protein 8.8 g/dL, total bilirubin 1.7 mg/dL, and aspartate aminotransferase 71 IU/mL; otherwise, she had normal liver enzymes. The ammonia level was 28 mol/L. The patient was positive for HIV-1 RNA, but <20 copies/mL were detected, with a CD4 count of 335 cells/mm³, and she had negative viral hepatitis markers. Computed tomography and magnetic resonance imaging of the head showed multiple, bilateral, acute lacunar infarcts with a distribution suggesting an embolic origin. The echocardiography showed no abnormalities, and normal results from the cerebrospinal fluid examination ruled out acute bacterial meningitis. To investigate the abdominal distension, computed tomography and ultrasound imaging of the abdomen were performed, which showed hepatomegaly with mild surface nodularity, massive ascites, and normal spleen size. Abdominal paracentesis was performed, and the fluid analysis results were as follows: white blood cell count 443 cells/mm³, absolute neutrophil count 389 cells/mm³, lactic dehydrogenase 221 IU/L, glucose 72 mg/dL, amylase 45 IU/L, albumin 1.7 g/dL, serum ascites albumin gradient (SAAG) 0.1, protein 6.8 g/dL, and adenosine deaminase activity level 15.8 IU/L (normal = 7.6). Ascitic bacterial and mycobacterial cultures were negative.

Because of the anemia, kidney failure, and albumin protein dissociation, serum protein electrophoresis was performed, which showed an M spike in the β_1 -globulin region (see Table 1 for detailed analysis). Serum immunoglobulin levels were as follows: IgM 20 mg/dL,

IgG 4.3 mg/dL, IgE 27 kU/L, and IgA 6,033 mg/dL. Protein electrophoresis of the ascitic fluid showed an M spike in the β -globulin region (Fig. 1). Serum, urine and peritoneal fluid immunofixation showed IgA lambda monoclonal proteins, which confirmed peritoneal infiltration of myelomatous cells. Bone marrow biopsy presented diffuse infiltration by well-differentiated plasma cells, which comprised 49–52% of the nucleated hematopoietic cells. Results of flow cytometry showed lambda light chain restriction consistent with MM. The serum β_2 -microglobulin level was 12.5 mg/L, and the skeletal survey was negative, indicating stage III MM according to both the Durie-Salmon staging system and the International Staging System. The patient was discharged to a nursing home and planned to receive follow-up care in the hematology clinic to begin treatment with bortezomib and dexamethasone.

Discussion

Multiple myeloma is a well-recognized malignancy that was first described in the literature by Samuel Sollyin in 1844 [2]. The incidence of MM in the United States is 6.5 per 100,000 people per year, representing 1.8% of all new cancer cases and approximately 2.1% of all cancer deaths. The overall 5-year survival rate is 48.5%. MM generally affects older adults, especially those aged 65–74 years [1]. Typical signs and symptoms at presentation are anemia, bone pain, kidney failure, and hypercalcemia. Ascites is rarely reported as the initial presentation of the disease.

The most common hematopoietic malignancies associated with HIV/AIDS are lymphomas. Although MM is rare in these patients, the risk of MM in patients with HIV/AIDS is higher than that of the general population [3, 4]. In these patients, the typical age at presentation is 40 years, and MM usually manifests with atypical features like effusions [5], blood hyperviscosity, and extramedullary plasmacytomas.

The few reports of ascites in MM describe its development as typically occurring during the course of the disease or after chemotherapy but only rarely as the initial presentation [6]. The most common cause of ascites in MM is peritoneal infiltration by plasma cells and accumulation of globulins in the peritoneal cavity. Other etiologies include heart or kidney failure, which can develop during the course of the disease. In addition, hepatic infiltration by plasma cells or the development of hepatic amyloidosis can lead to portal hypertension and subsequent ascites [7]. Infectious peritonitis (including tuberculosis and spontaneous bacterial peritonitis) may also be an underlying cause because of the increased risk of infection in patients with MM.

Myelomatous involvement of body cavity fluids is estimated to affect less than 1% of patients. Pleural effusions are twice as common as peritoneal ascites. Ascites due to peritoneal involvement in MM can be differentiated from secondary ascites due to hepatic involvement, heart failure, or kidney failure based on SAAG, total protein, and cell count (Table 2). The cytological detection of plasma cells in ascitic fluid can be difficult because of their highly atypical appearance and similarity to reactive mesothelial cells. Therefore, flow cytometry, immunofluorescence, or electron microscopy may be useful [8, 9]. In our case, the SAAG value was low because of globulin overproduction in the ascites. Protein electrophoresis and

immunofixation detected IgA lambda monoclonal protein, confirming malignant peritoneal infiltration due to MM.

Most of the available literature on myelomatous ascites consists of recent case reports with literature review and postmortem analysis of case series, which detected few cases of myelomatous ascites. In 1952, Hayes et al. [10] reviewed 182 cases of MM with extraosseous involvement and found only 3 cases with peritoneal infiltration. Churg and Gordon [11] reviewed 30 autopsies and found only 1 case of MM with peritoneal infiltration, and Thomas et al. [7] did not detect any cases of peritoneal infiltration in 64 autopsies, even though 9 of these patients had ascites. In 1990, Sasser et al. [12] reported 14 cases of MM that showed peritoneal involvement with ascites. A recent comprehensive literature review by Mitra et al. [13] found 65 cases of ascites in myeloma patients. Twenty-seven of these cases were due to peritoneal involvement, and ascites was reported as the presenting symptom in only 7 cases.

Current management of MM includes chemotherapy or bone marrow transplantation. However, despite aggressive therapy, the median survival rate remains low [14]. The development of ascites indicates a more aggressive stage, with median survival of 1–2 months, based on case reports [15]. Our patient was young, infected with HIV, and had an unusual presentation of massive ascites. She also had anemia and kidney failure, which is typical for MM but seldom listed in the differential diagnosis for HIV patients. The workup was mainly directed toward ruling out common causes of ascites (e.g., infections). Ultimately, we determined that the etiology of her ascites was myelomatous peritoneal infiltration. This presentation of MM has been reported in only 7 previous cases.

Conclusion

The incidence of ascites in MM is very low and signifies an aggressive natural course and poor prognosis. The case discussed here reinforces the importance of investigating ascites, which can be caused by peritoneal infiltration of plasma cells. Consideration of myelomatous ascites in such cases will aid rapid diagnosis and initiation of treatment for this aggressive form of the disease.

Statement of Ethics

The authors have no ethical conflicts to disclose.

Disclosure Statement

We confirm that this case is original. All authors have confirmed that the article has not been published elsewhere nor is it currently under consideration for publication elsewhere. All authors have made contributions to the article and have reviewed it before submission and agreed to its publication in this form. All authors declare that there is no conflict of interest regarding the publication of this paper.

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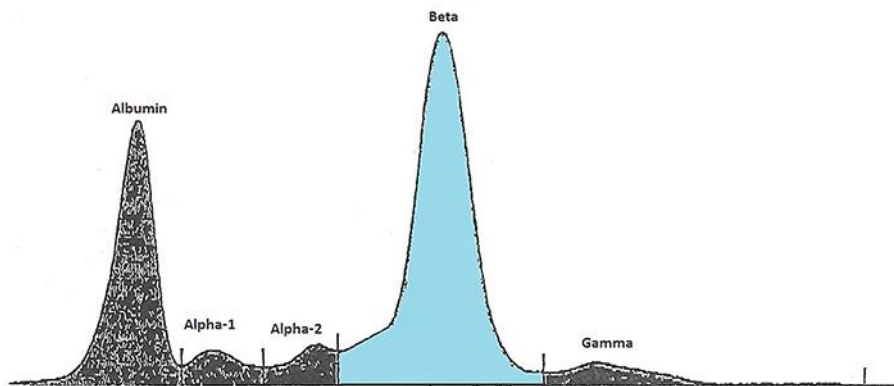


Fig. 1. Ascitic fluid protein electrophoresis showing M spike in the β -globulin region.

Table 1. Serum and ascitic fluid protein electrophoresis

Protein electrophoresis	Serum, g/dL	Normal range, g/dL	Ascitic fluid, g/dl
Total protein	8.9	6.1–8.1	6.6
Albumin	1.9	3.8–4.8	1.9
α ₁ -Globulin	0.5	0.2–0.3	0.3
α ₂ -Globulin	0.6	0.5–0.9	0.3
β-Globulin	5.6	0.4–0.6	3.7
γ-Globulin	0.4	0.8–1.7	0.4

Table 2. Typical ascitic fluid analysis results in various etiologies in MM

Etiology of ascites in MM	SAAG	Total protein, g/dL	WBC, cells/mm ³ ;PMN, %
Heart failure	>1.1	>2.5	<500;<50%
Kidney failure due to nephrotic syndrome	<1.1	<2.5	<500;<50%
Hepatic involvement with portal hypertension	>1.1	<2.5	<500;<50%
Spontaneous bacterial peritonitis	>1.1	<1	<500;>50%
Tuberculosis	<1.1	>1	>500;<50%
Peritoneal infiltration(myelomatous ascites)	<1.1	>1	>500;<50%

MM, multiple myeloma; PMN, polymorphonuclear neutrophils; SAAG, serum ascites albumin gradient; WBC, white blood cell count.