Case Report

Extensive Loculated Ascites in Hepatic Amyloidosis

Saranya Buppajarntham, Pongsathorn Kue-A-Pai[1]

Department of Internal Medicine, Albert Einstein Medical Center, Philadelphia, Pennsylvania, [1]Bassett Medical Center, Columbia University, New York, USA

Abstract

Context: Amyloidosis is a disease of extracellular deposition of misfolded proteinaceous subunits, which could be systemic or localized disease. Though hepatic amyloidosis was not uncommon in autopsy series, most cases of hepatic amyloidosis were asymptomatic. Ascites, jaundice, portal hypertension, and gastrointestinal bleeding from esophageal varices were reported in literature. **Case report:** A 42-year-old man with end-stage renal disease on hemodialysis and recent small bowel obstruction presented with chronic abdominal pain. Computed tomography of abdomen and pelvis showed extensive loculated ascites and multiple small bowel loops tethered to adhesions and hepatomegaly. Finally, hepatic venography and liver biopsy confirmed hepatic amyloidosis with portal hypertension. The patient was waiting for liver transplant for definite treatment. **Conclusion:** We report a rare case of hepatic amyloidosis with prior small bowel obstruction presented with extensive loculated ascites and multiple small bowel loops tethered to adhesions.

Keywords: Amyloidosis, Ascites, Hepatic venous pressure gradient

Address for correspondence: Dr. Saranya Buppajarntham, Department of Internal Medicine, Albert Einstein Medical Center, 5501 Old York Road, Philadelphia, Pennsylvania 19141, USA. E-mail: BuppajaS@einstein.edu

Introduction

Amyloidosis is a disease of the extracellular deposition of low molecular weight proteinaceous subunits, which are misfolded into a β-sheet fibrillar structure. It could be localized deposition in one organ such as Alzheimer disease or involved several organs such as heart, kidney, skin as well as gastrointerstinal and neurologic tissues.[1] Currently, 30 different amyloidogenic proteins were reported.[2] The most common systemic amyloidogenic proteins are immunoglobulin light chain (AL) and amyloid A (AA)(2). The AL type is a primary amyloid, which is associated with elevated serum monoclonal immunoglobulin. Primary amyloidosis often occurred in multiple myeloma, Waldenström's macroglobulinemia and non-Hodgkin lymphoma. The AA type is secondary amyloid, which is associated with chronic inflammation and infection such as rheumatoid arthritis, inflammatory bowel disease and tuberculosis. Additionally, dialysis might induce amyloidosis by reduced excretion of β2-microglobulin, called dialysis-related amyloidosis.

Access this article online

Quick Response Code:

Website: www.najms.org

DOI: 10.4103/1947-2714.136923

Case Presentation

A 42-year old man has a history of cervical spine injury with residual paraplegia since teenage and end-stage renal disease on hemodialysis as well as small bowel obstruction with lysis of adhesion, six months ago. He presented to our institution for chronic abdominal pain and gradually abdominal distension for 3 months. His vital signs were stable and afebrile. On examination, his abdomen was extremely tense with generalized tenderness and dullness on percussion. No sign of chronic liver disease was observed. Due to a history of small bowel obstruction and the pain severity, immediate computed tomography (CT) of abdomen and pelvis with contrast were performed. Figures 1 and 2 demonstrated the CT imaging, which did not show any obstruction or perforation, but large amount of loculated ascites and multiple adhesions with multiple small bowel loops tethered to these adhesions as well as hepatomegaly without an evidence of cirrhosis or biliary tract obstruction. The laboratory results showed calcium 8.7 mg/dL, alkaline phosphatase 650 IU/L, total bilirubin 0.9 mg/dL, direct bilirubin 0.6 mg/dL, albumin 2 g/dL, globulin 5.3 g/dL, aspartate

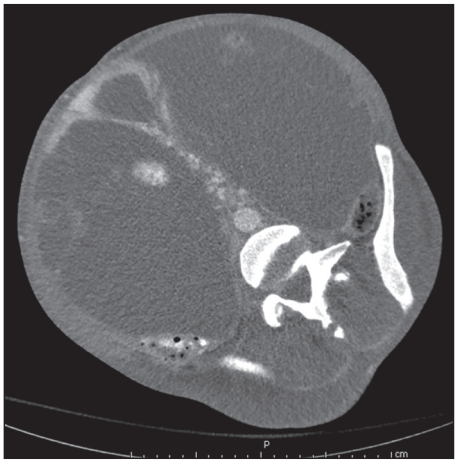

Figure 1: Computed tomography of abdomen (horizontal view) showed extensive loculated ascites and multiple small bowel loops tethered to adhesions

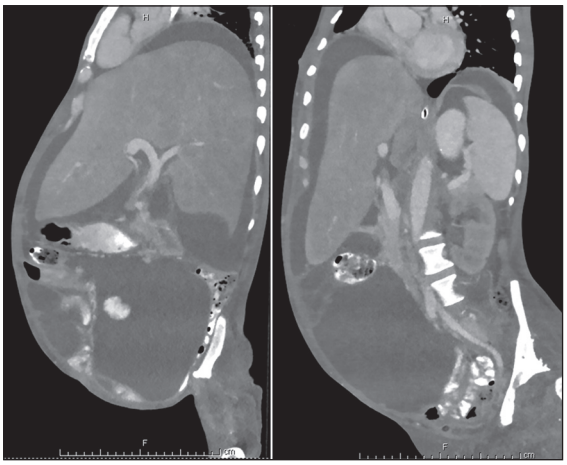

Figure 2: Computed tomography of abdomen (sagittal and coronal view) showed extensive loculated ascites, multiple small bowel loops tethered to adhesions and hepatomegaly

transaminase 20 IU/L, alanine transaminase 33 IU/L and international normalized ratio 1.3. All blood and ascetic fluid cultures were negative. Paracentesis with fluid analysis revealed transudative ascites without sign of infection (white blood cell count of 149 cell/cm^3 (Neutrophil 8%, Lymphocyte 5% and Monocyte 81%), albumin of 1.6 mg/dl). Additionally, 2D transthoracic echocardiography was normal. At this point, two potential causes of the ascites would be liver or kidney diseases. We thought that infiltrative liver disease with micro-biliary obstruction causing portal hypertension was the most compatible with our patient; given hepatomegaly on CT scan and obstructive picture from liver function test. Additionally, the patient gave more history that he had a kidney biopsy several years ago showed amyloidosis. Cirrhosis was less likely due to hepatomegaly and no sign of chronic liver disease. However, nephrogenic ascites was still in differential diagnosis. Hepatic venography was performed to search, if ascites caused by portal hypertension or nephrogenic cause. Hepatic venous pressure measurement showed mean of hepatic venous pressure gradient (HVPG) of 8 mmHg (normal range: 1-5mmHg); hepatic wedge pressure of 24/21 mmHg with mean of 22 mmHg; hepatic free pressure of 17/13 mmHg with mean of 14 mmHg. Transjugular liver biopsy with Congo red stain confirmed hepatic transthyretin amyloidosis. According to the imaging and pathology report, we believed that hepatic amyloidosis is a cause of the extensive ascites. We discussed with hepatology team and agreed that the patient required liver transplantation because of developed portal hypertension indicated poor prognosis of hepatic amyloidosis and familial type of amyloidosis potentially has benefit from liver transplantation. While he was waiting for hepato-renal transplantation, he received repeated therapeutic paracentesis to relieve the symptoms.

Discussion

Our patient had a history of amyloidosis before starting dialysis, so dialysis-related amyloidosis was less likely. There is several mutations lead to familial amyloidosis secreting amyloidogenic protein such as transtyretin, apolipoprotein A-I, and fibrinogen Aa.[1,3]

The gold standard for diagnosis is tissue biopsy that revealed apple green birefringence in Congo red stain. The abdominal fat pad aspiration is recommended in systemic disease, and affected organ biopsy should be performed in localized disease.[3] After the positive tissue biopsy, identification of amyloidogenic protein should be done by antibody-based amyloid typing including immunohistochemistry, immunofluorescense, Western blotting, immune-electron microscopy and other proteomic technologies such as mass spectrometry, protein sequencing and two-dimensional polyacrylamide gel electrophoresis.[4] ^{123}I-labeled serum amyloid P component (SAP) scintigraphy is a nuclear study for searching the affected organs in AL and AA types. SAP is a non-fibrillar glycoprotein found in all amyloid deposition sites in AL and AA types.[5]

Hepatic amyloidosis is not uncommon; in autopsy series, 65-70% of amyloidosis had hepatic involvement. The clinical manifestation includes involuntary weight loss, hepatomegaly, proteinuria and elevated alkaline phosphatase level;[6] rarely, jaundice[7] and portal hypertension with ascites and gastrointestinal bleeding from esophageal varices.[8-13]

Portal hypertension is an indicator for poor prognosis in hepatic amyloidosis. The pathogenesis of portal hypertension in amyloidosis is decreased sinusoidal space (sinusoidal type) by deposition of amyloid in

space of Disse.[13] To date, elevated HVPG is the standard diagnosis of portal hypertension with level >10mmHg as clinical significance (normal range: 1-5 mmHg). HVPG is the difference between hepatic wedge pressure and hepatic free pressure which measured by transjugular hepatic venography.[14]

The treatment of amyloidosis depends on the type of amyloidogenic protein. For AA type, the definite treatment is elimination of underlying chronic infection or inflammation. The treatment of plasma cell dyscrasia is recommended in AL type. For familial type, there is no specific treatment; however, liver transplantation is suggestive in patients who secrete amyloidogenic protein from liver.[15]

Conclusion

Hepatic amyloidosis is not an uncommon condition; however, ascites from hepatic amyloidosis is rare. We report a rare case of hepatic amyloidosis with prior small bowel obstruction presented with extensive loculated ascites and multiple small bowel loops tethered to adhesions.

References

1. Merlini G, Bellotti V. Molecular mechanisms of amyloidosis. N Engl J Med 2003;349:583-96.
2. Sipe JD, Benson MD, Buxbaum JN, Ikeda S, Merlini G, Saraiva MJ, *et al*. Amyloid fibril protein nomenclature: 2012 recommendations from the Nomenclature Committee of the International Society of Amyloidosis. Amyloid 2012;19:167-70.
3. Bellotti V, Nuvolone M, Giorgetti S, Obici L, Palladini G, Russo P, *et al*. The workings of the amyloid diseases. Ann Med 2007;39:200-7.
4. Picken MM, Westermark P. Amyloid detection and typing: Summary of current practice and recommendations of the consensus group. Amyloid 2011;18 Suppl 1:48-50.
5. Hazenberg BP, van Rijswijk MH, Piers DA, Lub-de Hooge MN, Vellenga E, Haagsma EB, *et al*. Diagnostic performance of I-123-labeled serum amyloid P component scintigraphy in patients with amyloidosis. Am J Med 2006;119:355. e15-24.
6. Park MA, Mueller PS, Kyle RA, Larson DR, Plevak MF, Gertz MA. Primary (AL) hepatic amyloidosis: Clinical features and natural history in 98 patients. Medicine (Baltimore) 2003;82:291-8.
7. Hirano K, Ikemura M, Mizuno S, Tada M, Isayama H, Watanabe T, *et al*. Two cases with hepatic amyloidosis suspected of having primary sclerosing cholangitis. Hepatol Res 2013;43:911-6.
8. Melkebeke P, Vandepitte J, Hannon R, Fevery J. Huge hepatomegaly, jaundice and portal hypertension due to amyloidosis of the liver. Digestion 1980;20:351-7.
9. Itescu S. Hepatic amyloidosis. An unusual cause of ascites and portal hypertension. Arch Intern Med 1984;144:2257-9.
10. Carey E, Plesec T, Menon KV. Elevated alkaline phosphatase in a man with ascites. Gastroenterology 2013;144:e5-6.
11. Culafic D, Perisic M, Boricic I, Culafic-Vojinovic V, Vukcevic M. Primary amyloidosis presenting with cholestasis and hyperkinetic portal hypertension. J Gastrointestin Liver Dis 2007;16:201-4.
12. Damlaj M, Amre R, Wong P, How J. Hepatic ALECT-2 amyloidosis causing portal hypertension and recurrent variceal bleeding: A case report and review of the literature. Am J Clin Pathol 2014;141:288-91.
13. Bion E, Brenard R, Pariente EA, Lebrec D, Degott C, Maitre F, *et al*. Sinusoidal portal hypertension in hepatic amyloidosis. Gut 1991;32:227-30.
14. de Franchis R, Dell'Era A. Invasive and noninvasive methods to diagnose portal hypertension and esophageal varices. Clin Liver Dis 2014;18:293-302.
15. Herlenius G, Wilczek HE, Larsson M, Ericzon BG, Familial Amyloidotic Polyneuropathy World Transplant Registry. Ten years of international experience with liver transplantation for familial amyloidotic polyneuropathy: Results from the Familial Amyloidotic Polyneuropathy World Transplant Registry. Transplantation 2004;77:64-71.

How to cite this article: Buppajarntham S, Kue-A-Pai P. Extensive loculated ascites in hepatic amyloidosis. North Am J Med Sci 2014;6:346-8.

Source of Support: Nil. **Conflict of Interest:** None declared.