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Gastrointestinal Amyloidosis with Multiorgan Involvement: A Case Report

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Abstract

Background: Systemic immunoglobulin light-chain (AL) amyloidosis is an uncommon plasma cell dyscrasia caused by deposition of misfolded monoclonal light chains within tissues, resulting in progressive organ dysfunction. Although cardiac and renal involvement are well recognized, clinically significant gastrointestinal involvement is uncommon and frequently overlooked because patients present with nonspecific symptoms that mimic more prevalent gastrointestinal disorders. Delayed diagnosis contributes to substantial morbidity and mortality, particularly in patients with multiorgan disease. We report a case of biopsy-confirmed systemic AL (lambda) amyloidosis involving the gastrointestinal tract, tongue, and myocardium that illustrates the critical role of early tissue diagnosis and multidisciplinary management. **Case Presentation:** We report a case of a 79-year-old Caucasian man with systemic AL (lambda) amyloidosis involving the myocardium, tongue, and gastrointestinal tract. The patient presented with progressive macroglossia, dysphagia, weight loss, and diarrhea. Upper endoscopy revealed granular, friable mucosa in the gastric antrum. Biopsies demonstrated amyloid deposition confirmed by Congo red staining with apple-green birefringence under polarized light. Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS) verified AL (lambda) amyloidosis, and bone marrow biopsy revealed 35% - 40% lambda-restricted plasma cells, consistent with plasma cell myeloma. During hospitalization, the patient experienced recurrent ventricular arrhythmias requiring advanced cardiac life support and subsequent dual-chamber implantable cardioverter-defibrillator implantation. He was treated with a cyclophosphamide, bortezomib, and daratumumab (Dara-CyBorD) regimen, resulting in gradual improvement of gastrointestinal symptoms and stabilization of cardiac and hematologic parameters. Despite therapy, the patient ultimately succumbed to complications of advanced systemic AL amyloidosis. **Conclusion:** This case highlights the importance of maintaining high clinical suspicion for gastrointestinal amyloido-

sis in patients with unexplained gastrointestinal symptoms and systemic features such as macroglossia or cardiac involvement. Tissue biopsy with Congo red staining and LC-MS/MS analysis remains the diagnostic gold standard. Early recognition, targeted plasma cell-directed therapy, and multidisciplinary management are essential to improving outcomes in systemic AL amyloidosis with gastrointestinal involvement.

Keywords

Gastrointestinal Amyloidosis, AL Amyloidosis, Lambda Light-Chain, Macroglossia, Plasma Cell Myeloma, Congo Red Staining, LC-MS/MS, Cardiac Involvement, Cyclophosphamide, Bortezomib, Daratumumab (Dara-CyBorD)

1. Introduction

Amyloidosis is a heterogeneous group of disorders characterized by extracellular deposition of insoluble fibrillar proteins that disrupt normal tissue architecture and organ function [1]. The classification of amyloidosis depends on the precursor protein, with over 30 types identified [2]. Among these, AL (light-chain) amyloidosis is the most common systemic form in developed countries and arises from clonal plasma cells producing misfolded immunoglobulin light chains [3]. These abnormal proteins circulate and deposit in multiple organs, leading to progressive dysfunction. Cardiac and renal involvement are the most frequent and are key determinants of morbidity and mortality [4].

Gastrointestinal involvement in AL amyloidosis is less common, reported in approximately 8% - 12% of patients, but can significantly affect quality of life and clinical outcomes. Gastrointestinal manifestations are often nonspecific, including diarrhea, malabsorption, weight loss, dysphagia, gastrointestinal bleeding, or motility disturbances [5] [6]. These symptoms frequently overlap with common gastrointestinal disorders, contributing to delayed diagnosis. Endoscopic findings are variable and may include mucosal friability, edema, thickening, luminal narrowing, or erosions [7]. Consequently, histologic evaluation through biopsy is essential for diagnosis.

Tissue confirmation relies on Congo red staining demonstrating apple-green birefringence under polarized light, while liquid chromatography tandem mass spectrometry (LC-MS/MS) allows precise amyloid subtyping [8]. Accurate subtype identification is critical for distinguishing AL amyloidosis from AA or ATTR amyloidosis, which have different prognoses and treatment strategies [9]. Early diagnosis is particularly important given the availability of plasma cell–directed therapies that can slow organ progression and improve survival.

Multiorgan involvement, particularly cardiac infiltration, is associated with a poor prognosis. Cardiac amyloidosis may present with restrictive cardiomyopathy, arrhythmias, or heart failure, significantly complicating management [10].

Gastrointestinal involvement further increases morbidity through malnutrition, diarrhea, and reduced tolerance to therapy. Therefore, early recognition and a multidisciplinary approach involving gastroenterology, hematology, cardiology, and nutrition are essential to optimize outcomes.

2. Case Presentation

A 79-year-old Caucasian male with a history of atrial fibrillation and heart failure with preserved ejection fraction presented with progressive macroglossia, dysphagia, unintentional weight loss, and intermittent diarrhea over several months. On presentation, he was hypotensive with a blood pressure of 84/56 mmHg, tachycardic with a heart rate of 108 beats per minute, and oxygenating adequately on room air with an oxygen saturation of 95%. His past medical history included hypertension, chronic atrial fibrillation, and prior coronary angiography revealing no obstructive coronary artery disease with a myocardial bridge in the mid-left anterior descending artery. Home medications included apixaban, amiodarone, and metoprolol.

Initial cardiac evaluation included right and left heart catheterization, which demonstrated elevated left ventricular end-diastolic pressure of 20 mmHg and no obstructive coronary disease. Transthoracic and transesophageal echocardiography revealed a left ventricular ejection fraction of 45% - 50%, concentric left ventricular wall thickening, mild diffuse hypokinesis, abnormal myocardial texture suggestive of infiltrative disease, left atrial dilation, and mild mitral and aortic regurgitation. Cardiac magnetic resonance imaging demonstrated an ejection fraction of 64% with abnormal myocardial nulling consistent with an infiltrative pattern and mild pulmonary edema. A technetium-99m pyrophosphate scan was negative for transthyretin amyloidosis. The lower ejection fraction measured by echocardiography likely reflected technical limitations and altered loading conditions during acute illness, whereas cardiac MRI provides a more accurate volumetric assessment and is considered the reference standard for ventricular ejection fraction.

Laboratory evaluation demonstrated hypercalcemia with a calcium level of 11.3 mg/dL. Cardiac biomarkers were elevated, with brain natriuretic peptide ranging from 319 to 525 pg/mL and high-sensitivity troponin between 70 and 86 ng/L. Electrolytes showed potassium levels ranging from 2.7 to 4.4 mmol/L, and a complete blood count revealed mild anemia with hemoglobin of 10.9 g/dL. Coagulation studies demonstrated a slightly prolonged prothrombin time and elevated INR. Bone marrow biopsy demonstrated 35% - 40% lambda-restricted plasma cells with hypercalcemia, anemia, and multiple lytic bone lesions on imaging, fulfilling International Myeloma Working Group diagnostic criteria for plasma cell myeloma rather than plasma cell dyscrasia alone. Flow cytometry confirmed a clonal plasma cell population expressing CD38 and CD138, with negative expression of CD19 and positive expression of CD56. Fluorescence in situ hybridization revealed gains of chromosomes 9 and 15 and loss of 16q. Congo red staining of

the bone marrow demonstrated one non-diagnostic focus.

Given the presence of macroglossia, an oral tongue biopsy was performed, demonstrating Congo red positive amyloid deposits with apple-green birefringence under polarized light. Mass spectrometry confirmed AL (lambda) amyloidosis. Gastrointestinal evaluation included esophagogastroduodenoscopy, which revealed normal duodenal mucosa, amyloid deposition in the gastric antrum, mucosal edema in the gastric body without evidence of Helicobacter pylori infection, and intestinal metaplasia of the distal esophagus consistent with Barrett's esophagus, as demonstrated in Figure 1. Histopathology confirmed amyloid deposition in the gastric antrum, with Congo red positivity and apple-green birefringence.

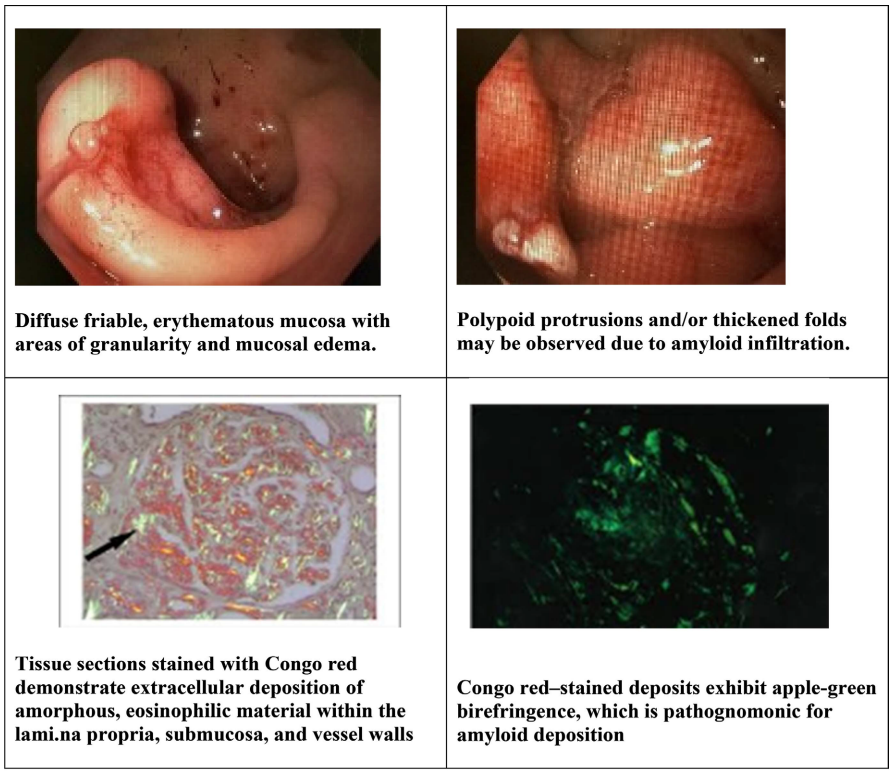

Figure 1. Upper endoscopy demonstrating granular, friable mucosa in the gastric antrum. Targeted biopsies confirmed AL (lambda) amyloid deposition.

During hospitalization, the patient developed gastric pneumatosis noted on a PET scan, necessitating brief intensive care unit admission. He experienced recurrent ventricular arrhythmias, including pulseless ventricular tachycardia and ventricular fibrillation, requiring advanced cardiac life support and multiple defibrillations. After stabilization, a dual-chamber implantable cardioverter-defibrillator was implanted for secondary prevention of cardiac arrhythmias. Electrolyte management, rate control, and close monitoring were emphasized throughout his care.

Systemic chemotherapy was initiated with a regimen of cyclophosphamide, bortezomib, and daratumumab. The patient tolerated the therapy well and demon-

strated gradual improvement in oral intake, gastrointestinal function, and clinical stability. Nutritional support was provided via Dobbhoff tube feeds during periods of oral intolerance. Over the subsequent hospital course, he demonstrated decreased tongue swelling, improved bowel movements, and stable hematologic parameters. Due to complications of advanced systemic AL amyloidosis, the patient unfortunately passed away.

3. Investigations

Serial echocardiography revealed persistent left ventricular wall thickening and diffuse hypokinesis, with left atrial dilation and moderate mitral thickening. Right ventricular systolic pressures were mildly elevated. Electrocardiography showed low-voltage QRS complexes, accelerated junctional rhythm, and frequent premature ventricular complexes. Cardiac magnetic resonance imaging confirmed the presence of an infiltrative myocardial pattern with abnormal nulling, supporting the diagnosis of cardiac amyloidosis. Computed tomography imaging of the chest, abdomen, and pelvis demonstrated gastric wall thickening and narrowing, sigmoid colonic wall thickening, multiple lytic lesions of the bones, and small bilateral pleural effusions. PET imaging incidentally identified gastric pneumatosis, which was resolved with supportive care.

Histopathologic evaluation of the tongue and gastric biopsies confirmed AL (lambda) amyloid deposition. Congo red staining demonstrated apple-green birefringence, and LC-MS/MS confirmed the amyloid subtype. Bone marrow evaluation revealed clonal plasma cells consistent with multiple myeloma, confirming the underlying hematologic disorder responsible for AL amyloidosis.

4. Management

The patient was initiated on systemic chemotherapy with cyclophosphamide, bortezomib, and daratumumab. Dexamethasone was administered intravenously in pulsed doses as part of the regimen. Dexamethasone was administered from initiation of therapy as part of the Dara-CyBorD regimen. Following approximately 2 cycles administered over 8 weeks, the patient experienced improved oral intake, decreased diarrhea, reduced tongue swelling, and improved nutritional status. Supportive care included nutritional support with enteral tube feeding during periods of poor oral intake, correction of electrolytes, and careful cardiac monitoring. The dual-chamber implantable cardioverter-defibrillator protected against recurrent life-threatening arrhythmias. The patient's gastrointestinal symptoms gradually improved, and oral intake was re-established. Hematologic parameters remained stable, and the patient continued outpatient chemotherapy with close follow-up from hematology, cardiology, and gastroenterology teams. During the initial weeks of treatment, hemoglobin remained stable, no further malignant ventricular arrhythmias occurred following ICD implantation, and gastrointestinal symptoms improved sufficiently to resume oral intake. Despite this early clinical stabilization, progressive multiorgan AL amyloidosis ultimately resulted in death.

5. Discussion

Gastrointestinal (GI) involvement in systemic AL amyloidosis is relatively uncommon but clinically significant. GI manifestations can vary widely depending on the site and extent of amyloid deposition. Patients may present with nonspecific symptoms such as diarrhea, constipation, weight loss, early satiety, malabsorption, or gastrointestinal bleeding. In our patient, the presenting features included progressive macroglossia, dysphagia, weight loss, and diarrhea, which are classic but nonspecific [11]. This variability in presentation frequently delays diagnosis, highlighting the need for heightened clinical suspicion in patients with systemic features suggestive of amyloidosis, such as cardiac involvement or unexplained neuropathy.

Endoscopic evaluation plays a central role in diagnosing gastrointestinal amyloidosis. Findings are often subtle, including mucosal friability, thickening, edema, and luminal narrowing, which may mimic other conditions such as gastritis, inflammatory bowel disease, or neoplasia. In our case, esophagogastroduodenoscopy revealed mucosal edema in the gastric body and amyloid deposition in the gastric antrum, confirmed by Congo red staining [12]. These findings emphasize that endoscopic biopsies are essential for definitive diagnosis, even when mucosal changes appear minor. The use of Congo red staining and polarized light to identify apple-green birefringence remains the gold standard for confirming amyloid deposits, and mass spectrometry allows precise subtyping, which is critical for directing therapy.

Histologically, gastrointestinal amyloid deposition predominantly affects the submucosa and vasculature, leading to a spectrum of complications. These can include impaired motility, mucosal fragility with bleeding, and nutrient malabsorption due to mucosal atrophy. Vascular deposition may increase the risk of ischemia or perforation, as occasionally observed with pneumatosis intestinalis. In our patient, gastric pneumatosis was incidentally identified on PET imaging, which was resolved with supportive care [13]. Such complications underscore the need for careful monitoring and supportive interventions, including nutritional support, correction of electrolyte imbalances, and cautious fluid management.

Systemic AL amyloidosis is almost invariably associated with an underlying plasma cell dyscrasia. In our patient, bone marrow biopsy revealed 35% - 40% lambda-restricted plasma cells, consistent with multiple myeloma. The presence of multiorgan involvement, including the heart, tongue, and GI tract, reflects the aggressive nature of the disease. Cardiac infiltration is particularly prognostic, as it increases the risk of arrhythmias and heart failure [14]. In this case, recurrent ventricular arrhythmias necessitated implantable cardioverter-defibrillator placement, highlighting the importance of comprehensive multidisciplinary care in patients with systemic AL amyloidosis.

Therapeutically, management of GI amyloidosis relies on addressing the underlying plasma cell clone while providing symptomatic care for gastrointestinal dysfunction. Regimens such as cyclophosphamide, bortezomib, and daratumumab

have demonstrated efficacy in reducing amyloidogenic light chain production, allowing stabilization or regression of organ involvement [15]. Supportive care for gastrointestinal symptoms is critical, including enteral nutrition during periods of poor oral intake, monitoring for bleeding, and management of diarrhea or constipation. In our patient, enteral feeding via a Dobbhoff tube was necessary due to dysphagia and oral mucositis, demonstrating the importance of individualized nutritional strategies.

Prognosis in gastrointestinal AL amyloidosis is largely influenced by the extent of systemic involvement, particularly cardiac infiltration. Early recognition and tissue diagnosis are essential to allow prompt initiation of therapy, which can improve both organ function and overall survival. Our case illustrates the complexity of managing gastrointestinal amyloidosis in the context of systemic disease, including life-threatening cardiac complications [16]. Multidisciplinary collaboration among gastroenterology, hematology, cardiology, and critical care teams is vital to optimize outcomes. Clinicians should maintain a high index of suspicion for GI involvement in patients with systemic AL amyloidosis presenting with unexplained gastrointestinal symptoms.

6. Conclusions

Gastrointestinal involvement in AL (lambda) amyloidosis is a rare but clinically significant manifestation of systemic amyloidosis. This case demonstrates that GI symptoms, such as diarrhea, dysphagia, weight loss, and early satiety, may be the initial presentation and can be subtle or nonspecific. Early recognition is challenging but essential, as delayed diagnosis can result in progressive organ dysfunction and complications including nutritional deficiencies, gastrointestinal bleeding, and impaired quality of life. Clinicians should maintain a high index of suspicion in patients presenting with unexplained gastrointestinal symptoms alongside systemic features suggestive of amyloidosis, such as macroglossia or cardiac abnormalities.

Endoscopic evaluation with targeted biopsy remains the cornerstone of diagnosis. In our patient, Congo red staining with apple-green birefringence and LC-MS/MS confirmed AL (lambda) amyloidosis in the gastric mucosa. Histopathologic confirmation not only establishes the diagnosis but also guides treatment decisions, including the initiation of plasma cell-directed therapy. This highlights the importance of a multidisciplinary approach involving gastroenterology, hematology, and pathology in the timely diagnosis of gastrointestinal amyloidosis. Early initiation of plasma cell-directed therapy, such as daratumumab-based CyBorD regimens, combined with comprehensive supportive care, including nutritional optimization, electrolyte correction, cardiac surveillance, and multidisciplinary collaboration among gastroenterology, hematology, cardiology, pathology, and nutrition specialists, may improve symptom control, preserve organ function, and prolong survival. Nevertheless, as illustrated by this patient, advanced cardiac involvement remains a major determinant of prognosis despite modern therapeu-

tic advances.

Management of gastrointestinal AL amyloidosis requires both targeted systemic therapy and comprehensive supportive care. Chemotherapy regimens such as cyclophosphamide, bortezomib, and daratumumab are effective in suppressing the underlying plasma cell clone and limiting further amyloid deposition. Supportive measures, including enteral nutrition, electrolyte management, and monitoring for complications such as gastrointestinal perforation or bleeding, are critical to optimize patient outcomes. In cases with concurrent cardiac involvement, vigilant cardiac monitoring and prophylactic measures, including implantable cardioverter-defibrillator placement, are often necessary.

Finally, this case underscores the importance of an integrated, multidisciplinary approach in managing systemic AL amyloidosis with gastrointestinal involvement. Early tissue diagnosis, aggressive treatment of the underlying plasma cell disorder, and vigilant supportive care can improve functional outcomes and overall survival, even in elderly patients with multiorgan disease. Gastrointestinal manifestations, while often overshadowed by cardiac or renal involvement, should not be underestimated, as timely intervention can significantly enhance patient quality of life and prevent life-threatening complications. Increased awareness of this rare entity among gastroenterologists and general clinicians may facilitate earlier diagnosis, expedite appropriate therapy, reduce diagnostic delays, and ultimately improve outcomes in patients with systemic AL amyloidosis.

Authors Contributions

Ebiuwa Osula conceived the case report, performed the literature review, and drafted the manuscript. Ebiuwa Osula contributed to data collection, interpretation of clinical findings, and manuscript revision. Bhavtosh Dedania provided expert clinical guidance, critically reviewed the manuscript for important intellectual content, and supervised the project. Muhammad Ali, Ali Hassan, Ritesh Pahwani, Rafael Cardosa Losada, Cletus Atta, and Bhavtosh Dedania, read and approved the final manuscript.

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Patient Consent

Written informed consent for publication was obtained from the patient.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Wechalekar, A.D., Gillmore, J.D. and Hawkins, P.N. (2016) Systemic Amyloidosis. *The Lancet*, **387**, 2641-2654. https://doi.org/10.1016/s0140-6736(15)01274-x

[2] Muchtar, E., Dispenzieri, A., Magen, H., Grogan, M., Mauermann, M., McPhail, E.D., *et al.* (2020) Systemic Amyloidosis from a (AA) to T (ATTR): A Review. *Journal of Internal Medicine*, **289**, 268-292. https://doi.org/10.1111/joim.13169

[3] Gertz, M.A. (2022) Immunoglobulin Light Chain Amyloidosis: 2022 Update on Diagnosis, Prognosis, and Treatment. *American Journal of Hematology*, **97**, 818-829. https://doi.org/10.1002/ajh.26569

[4] Palladini, G., Dispenzieri, A., Gertz, M.A., Kumar, S., Wechalekar, A., Hawkins, P.N., *et al.* (2012) New Criteria for Response to Treatment in Immunoglobulin Light Chain Amyloidosis Based on Free Light Chain Measurement and Cardiac Biomarkers: Impact on Survival Outcomes. *Journal of Clinical Oncology*, **30**, 4541-4549. https://doi.org/10.1200/jco.2011.37.7614

[5] Suzuki, K., Wechalekar, A.D., Kim, K., Shimazaki, C., Kim, J.S., Ikezoe, T., *et al.* (2023) Daratumumab plus Bortezomib, Cyclophosphamide, and Dexamethasone in Asian Patients with Newly Diagnosed AL Amyloidosis: Subgroup Analysis of ANDROMEDA. *Annals of Hematology*, **102**, 863-876. https://doi.org/10.1007/s00277-023-05090-z

[6] Cowan, A.J., Skinner, M., Seldin, D.C., Berk, J.L., Lichtenstein, D.R., O'Hara, C.J., *et al.* (2013) Amyloidosis of the Gastrointestinal Tract: A 13-Year, Single-Center, Referral Experience. *Haematologica*, **98**, 141-146. https://doi.org/10.3324/haematol.2012.068155

[7] Koop, A.H., Mousa, O.Y. and Wang, M.H. (2018) Clinical and Endoscopic Manifestations of Gastrointestinal Amyloidosis: A Case Series. *Medicine and Pharmacy Reports*, **91**, 469-473. https://doi.org/10.15386/cjmed-951

[8] Dima, D., Goel, U., Ullah, F., Faiman, B., Basali, D., Mazzoni, S., *et al.* (2025) Presentation and Outcomes of Localized Immunoglobulin Light Chain Amyloidosis: 14-Year Experience of an Academic Center. *Hematological Oncology*, **43**, e70082. https://doi.org/10.1002/hon.70082

[9] Ebert, E.C. and Nagar, M. (2008) Gastrointestinal Manifestations of Amyloidosis. *The American Journal of Gastroenterology*, **103**, 776-787. https://doi.org/10.1111/j.1572-0241.2007.01669.x

[10] Falk, R.H., Alexander, K.M., Liao, R. and Dorbala, S. (2016) AL (Light-Chain) Cardiac Amyloidosis. *Journal of the American College of Cardiology*, **68**, 1323-1341. https://doi.org/10.1016/j.jacc.2016.06.053

[11] Kittleson, M.M., Maurer, M.S., Ambardekar, A.V., Bullock-Palmer, R.P., Chang, P.P., Eisen, H.J., *et al.* (2020) Cardiac Amyloidosis: Evolving Diagnosis and Management: A Scientific Statement from the American Heart Association. *Circulation*, **142**, e7-e22. https://doi.org/10.1161/cir.0000000000000792

[12] Kittleson, M.M., Ruberg, F.L., Ambardekar, A.V., Brannagan, T.H., Cheng, R.K., Clarke, J.O., *et al.* (2023) 2023 ACC Expert Consensus Decision Pathway on Comprehensive Multidisciplinary Care for the Patient with Cardiac Amyloidosis. *Journal of the American College of Cardiology*, **81**, 1076-1126. https://doi.org/10.1016/j.jacc.2022.11.022

[13] Martinez-Naharro, A., Hawkins, P.N. and Fontana, M. (2018) Cardiac Amyloidosis. *Clinical Medicine*, **18**, s30-s35. https://doi.org/10.7861/clinmedicine.18-2-s30

[14] Ash, S., Shorer, E., Ramgobin, D., Vo, M., Gibbons, J., Golamari, R., *et al.* (2021) Cardiac Amyloidosis—A Review of Current Literature for the Practicing Physician. *Clinical Cardiology*, **44**, 322-331. https://doi.org/10.1002/clc.23572

[15] Merlini, G. and Bellotti, V. (2003) Molecular Mechanisms of Amyloidosis. *New England Journal of Medicine*, **349**, 583-596. https://doi.org/10.1056/nejmra023144

[16] Kyle, R.A. and Greipp, P.R. (1983) Amyloidosis (AL). *Mayo Clinic Proceedings*, **58**, 665-683. https://doi.org/10.1016/s0025-6196(25)18847-2