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Systemic Amyloidosis With Probable Cardiac Involvement: Diagnostic Approach in a Resource-Limited Setting: A Case Report

Malegna Temesgen Garuma[1] | Yonatan Debebe Regassa[2] | Sifessa Dessalegn Demshasha[1]

[1]Department of Internal Medicine, St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia | [2]Cardiology Unit, Department of Internal Medicine, Hawassa University, Hawassa, Ethiopia

Correspondence: Malegna Temesgen Garuma (malegna.temesgen@sphmmc.edu.et)

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ABSTRACT

Systemic amyloidosis, which may involve the heart as an infiltrative cardiomyopathy, is frequently underdiagnosed, particularly in low-resource settings where access to advanced imaging and laboratory investigations for amyloid subtyping is limited. We report a case of a 57-year-old man from Ethiopia who presented with progressive symptoms of heart failure with preserved ejection fraction (HFpEF). Electrocardiography demonstrated low-voltage QRS complexes with poor R-wave progression, while transthoracic echocardiography revealed concentric left ventricular hypertrophy with severe diastolic dysfunction. The marked discordance between the electrocardiographic and echocardiographic findings raised suspicion of infiltrative cardiomyopathy, specifically systemic amyloidosis with probable cardiac involvement. Advanced diagnostic modalities, including serum protein electrophoresis and free light-chain assay, were unavailable because of financial constraints; however, an abdominal fat pad biopsy with Congo red staining confirmed amyloid deposition. Critically, amyloid subtyping could not be performed. The patient was managed with optimized diuretic therapy, resulting in symptomatic improvement. This case highlights the diagnostic approach integrating basic clinical findings, electrocardiography, echocardiography, and minimally invasive biopsy to confirm systemic amyloidosis with probable cardiac involvement in resource-limited settings. Amyloid subtyping remains essential for disease-specific therapy. Early recognition and careful diagnostic interpretation are critical for guiding appropriate management and improving outcomes.

1 | Introduction

Amyloidosis is a heterogeneous group of disorders characterized by the extracellular deposition of misfolded protein fibrils, leading to progressive organ dysfunction. Cardiac involvement is one of the most severe manifestations of systemic amyloidosis and is associated with high morbidity and mortality rates. The two principal subtypes affecting the heart are immunoglobulin light-chain (AL) amyloidosis and transthyretin amyloidosis (ATTR), each requiring distinct disease-modifying therapeutic approaches [1, 2].

Clinically, cardiac involvement in amyloidosis often presents as heart failure with preserved ejection fraction (HFpEF) and restrictive physiology, frequently mimicking hypertensive or hypertrophic cardiomyopathy [3, 4]. Diagnostic delay is common

Abbreviations: AL, immunoglobulin light-chain amyloidosis; ATTR, transthyretin amyloidosis; CMR, cardiac magnetic resonance imaging; ECG, electrocardiography; HEENT, head, eyes, ears, nose, and throat; HFpEF, heart failure with preserved ejection fraction; LVEF, left ventricular ejection fraction; LVH, left ventricular hypertrophy; PHT, pulmonary hypertension; PND, paroxysmal nocturnal dyspnea; QRS, QRS complex (ventricular depolarization on ECG).

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Key Clinical Message

Systemic amyloidosis with probable cardiac involvement should be suspected in patients with HFpEF and discordant echocardiographic hypertrophy with low-voltage ECG. In resource-limited settings, diagnosis can be supported by clinical assessment, echocardiography, and fat pad biopsy, though lack of amyloid subtyping limits definitive treatment guidance.

and particularly pronounced in low- and middle-income countries, where access to cardiac magnetic resonance imaging, radionuclide scintigraphy, and specialized laboratory testing for amyloid subtyping is limited [5].

In sub-Saharan Africa, published reports on cardiac amyloidosis remain scarce, contributing to the under-recognition of the disease [6]. This case highlights a pragmatic diagnostic approach to confirm systemic amyloidosis using accessible tools in a resource-limited setting in Ethiopia, while acknowledging the critical limitation of being unable to determine amyloid subtype.

2 | Case History/Examination

A 57-year-old man from Ethiopia presented with a three-month history of progressive exertional dyspnea, paroxysmal nocturnal dyspnea, and orthopnea. He had been clinically diagnosed with heart failure 8 months earlier and was receiving oral furosemide and spironolactone. He denied any history of orthostatic hypotension, neuropathy, or vision changes.

On examination, his blood pressure was 85/65 mmHg, with a pulse rate of 98 beats per minute. The jugular venous pressure was elevated. His HEENT examination revealed periorbital purpura, but no macroglossia. Chest examination showed bilateral basal dullness with reduced air entry, consistent with pleural effusion. Cardiac auscultation was unremarkable, and grade 2 bilateral peripheral edema was noted. The patient was fully conscious and oriented. Examination did not reveal signs of carpal tunnel syndrome.

3 | Investigations

Baseline laboratory investigations, including complete blood count, renal and liver function tests, and serum electrolyte levels, were within the normal range. Urinalysis did not reveal significant proteinuria. Pleural fluid analysis showed transudative effusion, and infectious workup, including sputum acid-fast bacilli testing and GeneXpert analysis, was negative.

Electrocardiography demonstrated low-voltage QRS complexes with poor R-wave progression (Figure 1). Chest radiography revealed cardiomegaly and right pleural effusion. Transthoracic echocardiography (Figure 2) revealed moderate concentric left ventricular hypertrophy (interventricular septal thickness 16 mm, posterior wall thickness 15 mm), severe

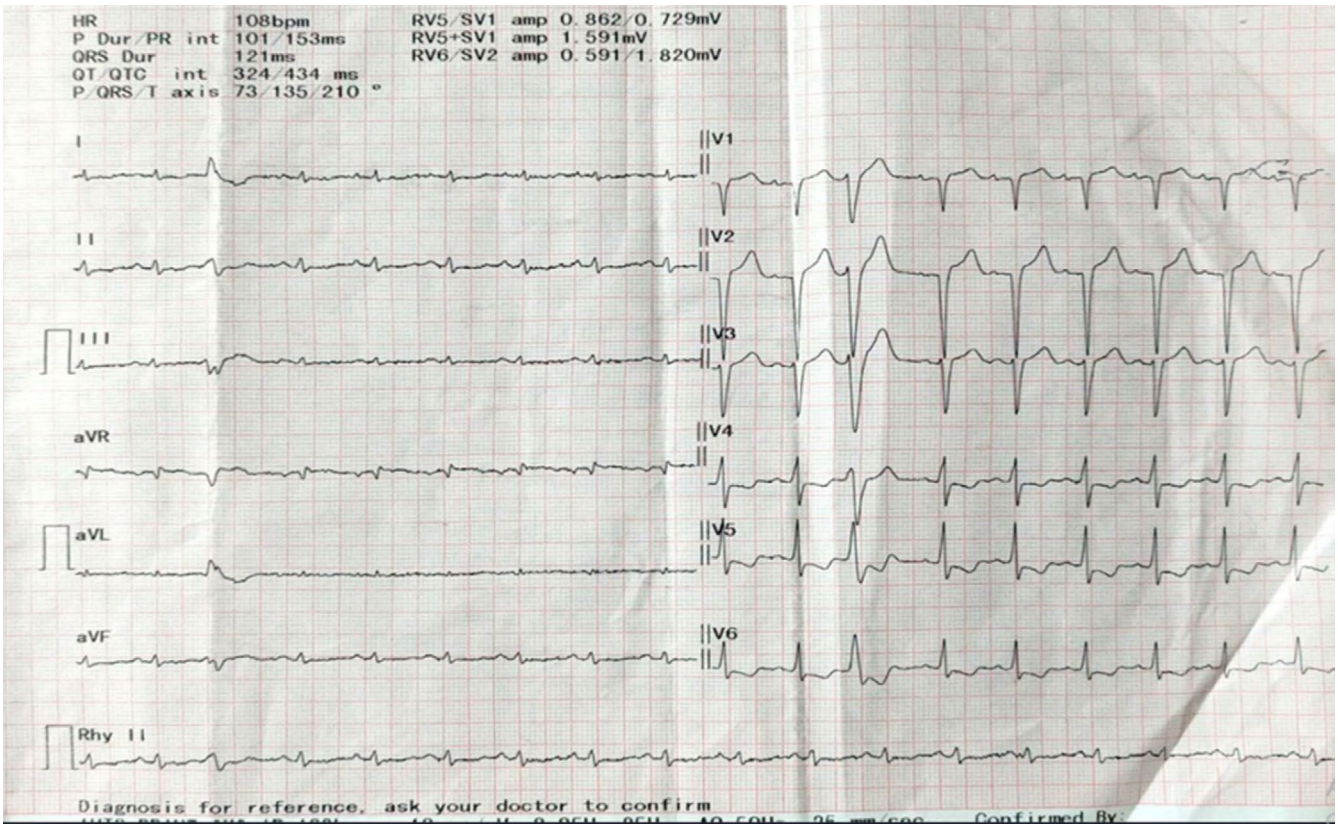


FIGURE 1 | Electrocardiogram at presentation demonstrating low-voltage QRS complexes and poor R-wave progression.

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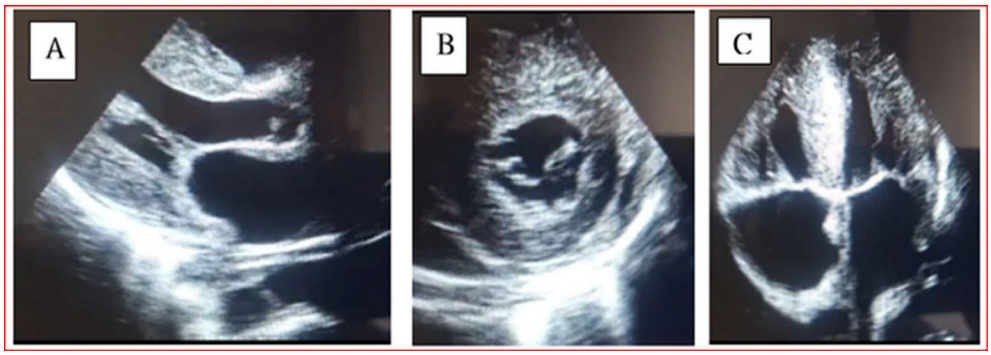


FIGURE 2 | Transthoracic echocardiography: (A) parasternal long-axis view, (B) parasternal short-axis view, and (C) apical four-chamber view showing concentric left ventricular hypertrophy (LVH) and bi-atrial enlargement.

(grade III) diastolic dysfunction with a restrictive filling pattern, biatrial enlargement (left atrial diameter 48 mm, right atrial diameter 50 mm), mild pericardial effusion, pulmonary hypertension (estimated pulmonary artery systolic pressure 62 mmHg) with mild secondary tricuspid regurgitation, and a preserved left ventricular ejection fraction (50%). Right ventricular function appeared normal. Strain imaging was not done as it was not available in our center at the time of diagnosis. The striking discordance between the myocardial wall thickness on echocardiography and low-voltage QRS complexes on electrocardiography raised suspicion of infiltrative cardiomyopathy.

The coronary angiography findings were normal. Serum protein electrophoresis, free light-chain assay, cardiac magnetic resonance imaging, and nuclear scintigraphy were not performed because of financial limitations. These tests are essential for determining amyloid subtype (AL vs. ATTR) and confirming cardiac-specific involvement. An abdominal fat pad biopsy obtained after discharge demonstrated Congo red–positive deposits within fibro-fatty tissue, consistent with amyloid deposition and supportive of the diagnosis of systemic amyloidosis (Figure 3). However, this biopsy did not provide subtype information.

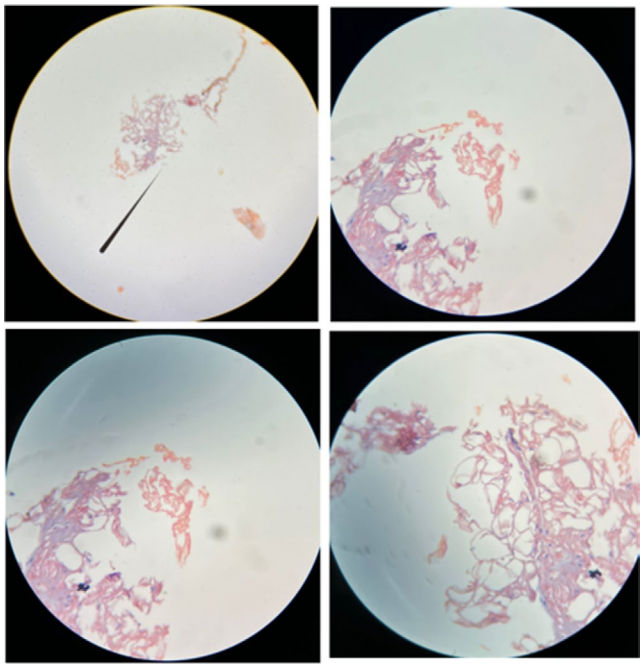


FIGURE 3 | Histopathological examination of the abdominal fat pad core needle biopsy. Sections of fibro-fatty tissue show hyalinized extracellular deposits exhibiting Congo red positivity, consistent with amyloid deposition. Representative photomicrographs are shown at approximately ×4 and ×10 magnification (upper left and upper right panels) and ×40 magnification (lower panels).

4 | Differential Diagnosis

Based on clinical presentation and age, both immunoglobulin light-chain (AL) and transthyretin (ATTR) amyloidosis were considered possible differential diagnoses. Neither could be definitively excluded. Disease-modifying therapy could not be initiated due to the unavailability of amyloid subtype characterization [3], which represents a significant clinical constraint. The patient was counseled about the limitations of the diagnostic approach and the inability to provide targeted therapy.

5 | Treatment

The patient was treated with intravenous loop diuretics during hospitalization, followed by optimized oral diuretic therapy (oral furosemide 40 mg twice daily and spironolactone 25 mg daily). He was discharged in a stable condition and scheduled for outpatient follow-up after 1 month to monitor clinical response to diuretics and functional status. His symptoms improved significantly, with resolution of orthopnea and reduction in pleural effusion on follow-up imaging.

6 | Discussion

This case highlights a classic but frequently overlooked presentation of systemic amyloidosis with probable cardiac involvement: heart failure with preserved ejection fraction (HFpEF) accompanied by disproportionate ventricular wall thickening on echocardiography and paradoxically low-voltage QRS complexes on electrocardiography. This electrocardiographic–echocardiographic discordance, as observed in our patient, is a well-recognized diagnostic clue suggesting cardiac infiltrative disease (including amyloidosis) and should prompt further

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evaluation when conventional causes of left ventricular hypertrophy are excluded [7, 8].

6.1 | Differential Diagnosis Considerations

The discordance between echocardiographic findings and ECG voltages helps exclude the more common diagnoses of hypertensive heart disease and hypertrophic cardiomyopathy. In hypertensive heart disease, ECG voltages typically increase proportionally to wall thickness, while in hypertrophic cardiomyopathy, symmetric hypertrophy and dynamic obstruction are characteristic features, neither of which were observed in our patient. The restrictive filling pattern, biatrial enlargement, preserved ejection fraction, and low systemic blood pressure further favor an infiltrative process rather than these common etiologies [7, 9].

The diagnostic challenge is exacerbated by limited access to advanced investigations, such as cardiac magnetic resonance imaging, radionuclide scintigraphy, and serum free light-chain assays, which are commonly unavailable in many low-resource African settings [5]. In this context, heightened clinical suspicion combined with careful interpretation of readily available investigations is essential. Features including restrictive diastolic physiology, biatrial enlargement, preserved systolic function, hypotension, and refractory congestion in our patient further supported an infiltrative cardiomyopathy rather than hypertensive heart disease [9].

An abdominal fat pad biopsy was pivotal in confirming the diagnosis of systemic amyloidosis. This minimally invasive and cost-effective procedure has demonstrated high diagnostic accuracy for systemic amyloidosis confirmation, with reported sensitivities of up to 90% and specificities approaching 100% when Congo red staining with polarized light microscopy is used [10, 11]. However, it is critical to emphasize that fat pad biopsy confirms amyloid deposition but does NOT determine amyloid subtype (AL versus ATTR). Although sensitivity may be lower in isolated transthyretin cardiac amyloidosis, abdominal fat biopsy remains a valuable first-line diagnostic tool in resource-limited settings where endomyocardial biopsy is unavailable [2, 11]. In our case, while the fat pad biopsy confirmed amyloidosis, it could not differentiate between AL and ATTR subtypes, limiting our ability to implement specific disease-modifying therapies.

6.2 | Critical Limitation—Inability to Subtype Amyloid

While amyloid subtyping is required for disease-modifying therapy, confirming the diagnosis of systemic amyloidosis has immediate clinical relevance. First, it allows the avoidance of potentially harmful conventional heart failure therapies (such as certain inotropes or ACE inhibitors, which may worsen disease in amyloidosis). Second, it supports tailored diuretic-based management, as successfully implemented in this patient [12]. In our case, the inability to determine subtype (AL vs. ATTR) prevented us from offering targeted therapies such as bortezomib, dexamethasone, and thalidomide for AL amyloidosis, or tafamidis for ATTR amyloidosis. This represents a major clinical constraint in resource-limited settings. Increased awareness, pragmatic diagnostic strategies, and urgent efforts to improve access to subtyping methods are critical to improving outcomes in similar settings.

7 | Patient Perspective

The patient expressed relief after receiving a clear explanation of his prolonged symptoms and appreciated the diagnostic efforts despite the limited resources. He emphasized the importance of an early diagnosis to reduce prolonged uncertainty.

8 | Conclusion

Systemic amyloidosis with probable cardiac involvement should be considered in patients with unexplained heart failure with preserved ejection fraction and discordant electrocardiographic and echocardiographic findings. In resource-limited settings, a high index of clinical suspicion combined with careful clinical assessment, electrocardiography, echocardiography, and abdominal fat pad biopsy can enable confirmation of systemic amyloidosis and guide appropriate management. However, the critical inability to determine amyloid subtype in such settings severely limits the implementation of specific disease-modifying therapies. Efforts should focus on improving diagnostic access through regional referral pathways, international collaboration, and advocacy for affordable subtyping methods. Early recognition and cautious diagnostic interpretation remain important for guiding symptomatic management and improving patient outcomes and quality of life.

Author Contributions

Malegna Temesgen Garuma: conceptualization, data curation, formal analysis, investigation, methodology, project administration, resources, supervision, validation, visualization, writing – original draft, writing – review and editing. **Yonatan Debebe Regassa:** conceptualization, data curation, investigation, methodology, project administration, resources, validation, writing – review and editing. **Sifessa Dessalegn Demshasha:** data curation, investigation, methodology, resources, validation, writing – review and editing.

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The authors have nothing to report.

Ethics Statement

The authors have nothing to report.

Consent

Written informed consent was obtained from the patient for the publication of this case report and any accompanying images. A copy of the written consent is available for review by the editor-in-chief of this journal.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

All relevant data supporting the findings of this case report are included within the article. Additional information is available from the corresponding author upon reasonable request.

References

1. M. M. Kittleson, M. S. Maurer, A. V. Ambardekar, et al., "Cardiac Amyloidosis: Evolving Diagnosis and Management: A Scientific Statement From the American Heart Association," *Circulation* 142, no. 1 (2020): e7–e22, https://doi.org/10.1161/CIR.0000000000000792.

2. F. aus dem Siepen and T. Hansen, "Diagnosing AL and ATTR Amyloid Cardiomyopathy: A Multidisciplinary Approach," *Journal of Clinical Medicine* 13, no. 19 (2024): 5873, https://doi.org/10.3390/jcm13195873.

3. F. L. Ruberg, M. Grogan, M. Hanna, J. W. Kelly, and M. S. Maurer, "Transthyretin Amyloid Cardiomyopathy: JACC State-Of-The-Art Review," *Journal of the American College of Cardiology* 73, no. 22 (2019): 2872–2891, https://doi.org/10.1016/j.jacc.2019.04.003.

4. J. Llerena-Velastegui and K. Zumbana-Podaneva, "Advances in the Diagnosis and Management of Cardiac Amyloidosis: A Literature Review," *Cardiology Research* 15, no. 4 (2024): 211–222, https://doi.org/10.14740/cr1664.

5. S. Markos, Y. Belete, B. Bikamo, and D. Ataro, "Navigating the Diagnostic and Management Challenges of Suspected Cardiac Amyloidosis in Resource-Limited Settings: Ethiopia Experience," *Clinical Case Reports* 12, no. 11 (2024): e9582, https://doi.org/10.1002/ccr3.9582.

6. E. C. Madu and K. Mezue, "Uneven Burden of Cardiac Amyloidosis in People of African Descent - Global Imbalance in Resources and Access," *BMC Global Public Health* 1, no. 1 (2023): 15, https://doi.org/10.1186/s44263-023-00016-3.

7. L. Pagura, A. Porcari, M. Cameli, et al., "ECG/Echo Indexes in the Diagnostic Approach to Amyloid Cardiomyopathy: A Head-To-Head Comparison From the AC-TIVE Study," *European Journal of Internal Medicine* 122 (2024): 68–77, https://doi.org/10.1016/j.ejim.2023.09.02.

8. N. Belfeki, N. Ghriss, M. Monchi, et al., "State of the Art of Cardiac Amyloidosis," *Biomedicine* 11, no. 4 (2023): 1045, https://doi.org/10.3390/biomedicines11041045.

9. S. H. Barberato, A. L. de Souza Beck, V. T. Hotta, and D. D. C. Rassi, "A Critical Review of Echocardiographic Findings for Diagnosing Cardiac Amyloidosis," *International Journal of Cardiovascular Sciences* 37 (2024): 20240047, https://doi.org/10.36660/ijcs.20240047.

10. H. Paulsson Rokke, N. Sadat Gousheh, P. Westermark, et al., "Abdominal Fat Pad Biopsies Exhibit Good Diagnostic Accuracy in Patients With Suspected Transthyretin Amyloidosis," *Orphanet Journal of Rare Diseases* 15, no. 1 (2020): 278, https://doi.org/10.1186/s13023-020-01565-8.

11. J. Wang, D. Chen, F. Dong, and H. Chi, "Diagnostic Sensitivity of Abdominal Fat Aspiration Biopsy for Cardiac Amyloidosis: A Systematic Review and Meta-Analysis," *International Journal of Surgical Pathology* 32, no. 2 (2024): 286–293.

12. S. S. Gill, E. Fellin, L. Stampke, Y. Zhao, and A. Masri, "Clinical Clues and Diagnostic Workup of Cardiac Amyloidosis," *Methodist DeBakey Cardiovascular Journal* 18, no. 2 (2022): 36–46, https://doi.org/10.14797/mdcvj.1061.

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