

A Case Report of Heart Failure with Atrial Fibrillation and Peripheral Vascular Resistance

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ABSTRACT

Heart failure in elderly patients often presents with atypical manifestations due to the high prevalence of comorbid conditions. Symptoms may be subtle and under-reported. Timely diagnosis of heart failure and treatment of comorbidities are crucial for effective management. We describe a 75-year-old female with a history of similar complaints who presented with pedal edema, shortness of breath, and fatigue. Investigations revealed atrial fibrillation, severely reduced left ventricular function, and increased forearm vascular resistance suggesting peripheral vascular disease. Laboratory tests showed decreased uridine diphosphate levels. This case highlights the diagnostic challenges of heart failure in elderly patients with multiple comorbidities. Atypical presentations are common and timely recognition of underlying heart failure is needed to optimize management and prevent exacerbations. Treatment of comorbid conditions like atrial fibrillation and peripheral vascular disease may also help improve outcomes.

Keywords: Comorbidity, Differential Diagnosis, Elderly patients, Heart failure, Multiple coronary disease.

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INTRODUCTION

Heart failure in elderly patients is often accompanied by multiple comorbidities that complicate diagnosis and management.¹ Atrial fibrillation and peripheral vascular disease are common comorbidities in the elderly with heart failure, occurring in up to 30-50% of cases.² The presence of multiple conditions in the same patient results in complex interactions that can exacerbate symptoms, lead to atypical presentations, and affect treatment responses. As the population ages, there is a need for greater awareness of the challenges in diagnosing and managing heart failure in the context of comorbidities in the elderly.³ This case report aims to highlight diagnostic and management considerations in elderly patients with complex, multimorbid presentations of heart failure. Objectives include describing atypical manifestations, discussing complex interactions between heart failure and comorbidities, emphasizing the importance of timely diagnosis and treatment, and increasing awareness of the need for a tailored approach to managing heart failure in the elderly.

CASE PRESENTATION

A 75-year-old female with a history of similar complaints in the past presented with pedal edema, shortness of breath, and fatigue for 1 week. Examination revealed elevated jugular venous pressure, bilateral basal crackles, and irregularly irregular pulse. Electrocardiogram showed atrial fibrillation and echocardiogram revealed severely reduced left ventricular function. Laboratory tests showed decreased uridine diphosphate levels. Measurement of forearm vascular resistance was increased, indicating peripheral vascular disease.

Elderly patients with heart failure often present with atypical manifestations due to the high prevalence of comorbid conditions like atrial fibrillation and peripheral vascular disease. A broad differential diagnosis should be considered.⁴ A comprehensive geriatric assessment is performed on this patient to rule out other diagnoses. Comorbidities in the elderly result in complex interactions that can exacerbate heart failure symptoms, lead to under-reporting of symptoms and affect treatment responses.⁵ Timely diagnosis of heart failure and optimization of management of comorbid conditions is key to improving outcomes in the elderly. A tailored approach is often needed.⁶ Symptoms like pedal edema, shortness of breath, and fatigue are nonspecific and can be caused by heart failure as well as comorbidities. A multidisciplinary evaluation is required.⁷ Measurement of biochemical markers like uridine diphosphate



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can aid in diagnosis, prognosis, and monitoring of treatment effectiveness in complex heart failure cases.^{8,9}

In retrospect, the following things could have been done differently in this case: earlier diagnosis and optimization of heart failure management to minimize exacerbations and progression,¹⁰ more aggressive treatment of comorbid atrial fibrillation and peripheral vascular disease to reduce heart failure symptoms and risk of hospitalization,¹¹ a comprehensive geriatric assessment to identify geriatric syndromes and optimize management of chronic conditions,¹² close post-discharge monitoring and follow-up to adjust heart failure medications, manage comorbidities and identify recurrent symptoms early,¹³ involvement of a multidisciplinary team including cardiologists, vascular medicine specialists and geriatricians for a more tailored approach.¹⁴

DISCUSSION

This case presents several important considerations in the diagnosis and treatment of heart failure in an elderly patient with multiple comorbidities. The patient's main presenting symptoms of pedal edema, shortness of breath, and fatigue appear atypical for heart failure at first glance. However, in the context of similar previous episodes, these signs indicate that the patient likely had longstanding, undiagnosed heart failure. The combination of symptoms from worsening heart failure and comorbidities likely contributed to the delay in accurate diagnosis.

Atrial fibrillation, a common comorbidity in the elderly with heart failure, was discovered in this patient. Atrial fibrillation can exacerbate heart failure in two ways: i) By impairing the heart's ability to fill with blood between contractions which reduces cardiac output, and ii) By causing an irregular heartbeat which decreases the efficiency of pumping. Therefore, controlling the rate and rhythm of atrial fibrillation through medication and/or device therapy is important for optimizing heart failure management.^{10,11} Beta-blockers, calcium channel blockers, and cardioversion are important for cases like these, given their impact on cardiac output and efficiency.¹² For heart failure treatment, guideline-directed medical therapy including Angiotensin Converting Enzyme Inhibitors (ACEI)/Angiotensin Receptor Blockers (ARBs), beta-blockers, and aldosterone antagonists should be optimized in addition to diuretics as needed.^{13,14}

The presence of increased forearm vascular resistance suggests the patient also had peripheral vascular disease, another prevalent comorbidity in the elderly. Peripheral vascular disease can worsen heart failure in two ways: 1) By reducing blood flow to the limbs and organs which decreases systemic perfusion, and 2) By elevating ventricular filling pressures as the heart must work harder to pump blood through narrowed vessels. Thus, optimizing peripheral circulation through the treatment of peripheral vascular disease is critical for managing heart failure. Risk factor modification (e.g. smoking cessation, BP/lipid

lowering), exercise rehabilitation, and endovascular or surgical revascularization may reduce afterload and improve systemic perfusion, heart failure symptoms, and functional status.^{14,15}

The presence of multiple complex, interacting cardiovascular conditions likely contributed to the patient's suboptimal response to initial treatment and progression of symptoms. A comprehensive geriatric assessment to address all illnesses and therapies in a coordinated manner, along with the involvement of a multidisciplinary team including cardiologists, vascular medicine specialists, and geriatricians, were likely needed to optimize the management of all conditions and improve outcomes for this complex elderly patient. A high index of suspicion, thorough diagnostic workup, and holistic, team-based approach are vital for accurate diagnosis and successful treatment of heart failure in elderly patients with multiple comorbidities.

CONCLUSION

Heart failure in the elderly often presents diagnostic challenges due to atypical symptoms and multiple comorbidities. Timely recognition, treatment of comorbid conditions, and optimization of heart failure management are essential for improving outcomes in such complex cases.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

ACEI: Angiotensin Converting Enzyme inhibitors; **ARBs:** Angiotensin Receptor Blockers.

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