Letter to the editor

Artificial intelligence in diagnosing cardiac amyloidosis by standard echocardiography: opportunity or threat for sonographers?

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Dear Editor,

Cardiac amyloidosis (CA) remains an underdiagnosed cause of heart failure with preserved ejection fraction (HFpEF) (1). Standard transthoracic echocardiography (TTE) continues to serve as the first-line screening tool; however, classic red flags, including increased left ventricular (LV) wall thickness with normal or low voltage, reduced global longitudinal strain (GLS), and the relative apical sparing pattern, are frequently overlooked (2). The rapid integration of artificial intelligence (AI) into echocardiography laboratories raises a critical question: does AI represent an opportunity or a threat for sonographers?

AI as an Opportunity

AI algorithms can detect subtle CA patterns that may escape human visual assessment. A deep learning (DL) model using a single apical four-chamber video clip achieved an area under the receiver operating characteristic (ROC) curve (AUROC) of 0.93, 85% sensitivity, and 93% specificity during external validation across 18 global sites (3). Another model discriminated CA from hypertensive heart disease (area under the curve [AUC] 0.92), hypertrophic cardiomyopathy (AUC 0.91), and aortic stenosis (AUC 0.93) (4). A systematic review confirmed that AI models perform comparably to or better than professional cardiologists (5). For sonographers, AI functions as a real-time "second pair of expert eyes," transforming them from passive data collectors into active clinical screeners.

AI as a Threat

There are three principal threats. First, overreliance on AI may lead to false-positive findings. For instance, the apical sparing pattern has only 72% sensitivity and 66% specificity for CA, and 32% of non-CA controls exhibit the same pattern (6). Second, overreliance on automated measurements might weaken pattern recognition skills and potentially lead to a gradual loss of diagnostic proficiency. Third, professional autonomy is likely to weaken if AI-driven automated reports bypass sonographer input entirely, thereby reducing their role primarily to image acquisition. Furthermore, implementation barriers, including cost, interoperability with electronic health records (EHRs), regulatory challenges, and liability concerns, remain unresolved (7).

Conclusion

AI will not replace sonographers who understand CA pathology; however, it may replace those who refuse to adopt AI-assisted diagnosis. Therefore, AI literacy should be a fundamental part of sonography training. Sonography training should include basic principles of machine learning, recognition of AI-generated false positives, and integration of AI alerts into the clinical workflow. Table 1 presents the key opportunities and threats with supporting references.

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Table 1. AI Opportunities and Threats for Sonographers in Cardiac Amyloidosis Diagnosis

Category	Item	Description / Evidence	Reference(s)
Opportunities	Real-time detection	AI using a single apical four-chamber video clip achieves AUROC 0.93, sensitivity 85%, specificity 93% in global external validation	(3)
	Discrimination from mimics	Deep learning model discriminates CA from hypertensive heart disease (AUC 0.92), HCM (AUC 0.91), and AS (AUC 0.93)	(4)
	Outperforms traditional scores	AI model (AUROC 0.93) outperforms TTR-CA score (0.73) and increased wall thickness score (0.80)	(3)
	Improved CA detection	Systematic review: AI models perform comparably to or better than professional cardiologists	(5)
Threats	False positives / overreliance	Apical sparing pattern: only 72% sensitivity and 66% specificity for CA; 32% of non-CA controls show same pattern	(6)
	Implementation barriers	Persistent challenges: usability, cost, EHR interoperability, regulation, liability	(7)

AS. aortic stenosis; AUC: area under the curve; AUROC: area under the receiver operating characteristic curve; CA: cardiac amyloidosis; EHR: electronic health record; GLS: global longitudinal strain; HCM: hypertrophic cardiomyopathy; TTE: transthoracic echocardiography.

Conflicts of Interest

None declared

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AI Disclosure

The authors used QuillBotand Grammarly AI to edit grammar and improve the manuscript's quality. QuillBot refined language, Grammarly corrected grammatical and spelling .These tools did not generate the research content or interpret the findings. All final revisions and interpretations remain the authors' responsibility.

References

1. Kittleson MM, Ruberg FL, Ambardekar AV, et al. 2023 ACC expert consensus decision pathway on comprehensive multidisciplinary care for the patient with cardiac amyloidosis: A report of the american college of cardiology solution set oversight committee. *J Am Coll Cardiol*. 2023;81(11):1076-1126.
2. García-Pavía P, Rapezzi C, Adler Y, et al. Diagnosis and treatment of cardiac amyloidosis: a position statement of the ESC Working Group on Myocardial and Pericardial Diseases. *Eur Heart J*. 2021;42(16):1554-1568.
3. Slivnick JA, Hawkes W, Oliveira J, et al. Cardiac amyloidosis detection from a single echocardiographic video clip: a novel artificial intelligence-based screening tool. *Eur Heart J*. 2025;46(40):4090-4101.
4. Ioannou A, Khouri MG, Kitai T, et al. Diagnosis of Cardiac Amyloidosis on Echocardiography Using Artificial Intelligence. *Circ Cardiovasc Imaging*. 2026;19(4):e018991.
5. Abdalla Ibrahim FI, Hussen Ali MG, Awad Ali MH, et al. The Role of Artificial Intelligence in the Detection of Cardiac Amyloidosis: A Systematic Review. *Cureus*. 2025;17(2):e78488.
6. Cotella J, Randazzo M, Maurer MS, et al. Limitations of Apical Sparing Pattern in Cardiac Amyloidosis: A Multicenter Echocardiographic Study. *Eur Heart J Cardiovasc Imaging*. 2024;25(6):754-761.
7. Grogan M, Lopez-Jimenez F, Guthrie S, et al. Value of artificial intelligence for enhancing suspicion of cardiac amyloidosis using electrocardiography and echocardiography: a narrative review. *J Am Heart Assoc*. 2025;14(8):e036533.