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LETTER TO THE EDITOR

Caution in the use of sedation and endomyocardial biopsy for the management of pediatric acute heart failure caused by endocardial fibroelastosis

Xiao-Xuan Xin, Yo-Yeng Se

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Abstract

Endocardial fibroelastosis (EFE) is commonly considered to be an inflammatory reactive lesion of hyperplasia and deposition of tissue fibers and collagen in the endocardium and/or subendocardium, which is strongly associated with endocardial sclerosis, ventricular remodeling and acute and chronic heart failure, and is one of the important causes for pediatric heart transplantation. Early diagnosis and treatment are the key factors in determining the prognosis of the children. In this paper, we would like to highlight the potential unintended consequences of the use of sedation and biopsy for pediatric acute heart failure caused by EFE and the comprehensive considerations prior to clinical diagnosis.

Key Words: Endocardial fibroelastosis; Sedation in children; Endomyocardial biopsy; Comprehensive clinical diagnosis

Core Tip: The high-risk medical operation for the clinical diagnosis of pediatric acute heart failure due to endocardial fibroelastosis remains debatable, and the medical management of sedation and biopsy requires a comprehensive assessment of the indications and contraindications in children.

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TO THE EDITOR

With great interest, we read a research report entitled "Pediatric acute heart failure caused by endocardial fibroelastosis mimicking dilated cardiomyopathy: A case report" by Xie *et al*[1], and also we congratulate and commend the authors for their excellent work and unremitting efforts on the comparison between differential diagnosis of endocardial fibroelastosis (EFE) and dilated cardiomyopathy (DCM) in infants and toddlers. However, sedation and endomyocardial biopsy (EMB) in children with EFE during the acute onset phase are worthy of further discussion. In some EFE cases, while performing a cardiac magnetic resonance imaging (MRI) in the acute period is informative seemingly, there are many times when the risks of sedating a child with acute heart failure to obtain an MRI outweigh the benefits of the information gained, such as leading to central inhibitory coma, apnea, hypotension and elusive arrhythmias[2-4]. In addition, the risks of biopsy in an infant with EFE confused with DCM are fairly high, particularly the risk of perforation, bleeding and the exacerbation of hemodynamic derangement and heart failure[5-7]. A latest joint position statement on EMB states that hemodynamically unstable patients with acute heart failure and ventricular dilatation are at relatively high risks of cardiac perforation, pericardial tamponade and malignant arrhythmias, while the development of these risks is strongly related to operator expertise in the subspecialty of cardiac catheterization[8]. In parallel, patients with thin ventricular wall and uncooperative posture have been included as contraindications for EMB[9,10], as illustrated in Figure 1. Despite the increasing maturity and popularity of EMB with advances in medical technology, the majority of myocardial biopsy samples and pathology reports related to EFE are obtained from autopsies and not directly from the children with EFE at the time of onset[11]. As such, for children with acute heart failure who are highly suspected both of EFE and DCM, seeking a high-risk medical test for an absolute clinical diagnosis is not a good alternative, and a meticulous echocardiography is sufficient to diagnose EFE rather than an EMB with trauma[12-15].

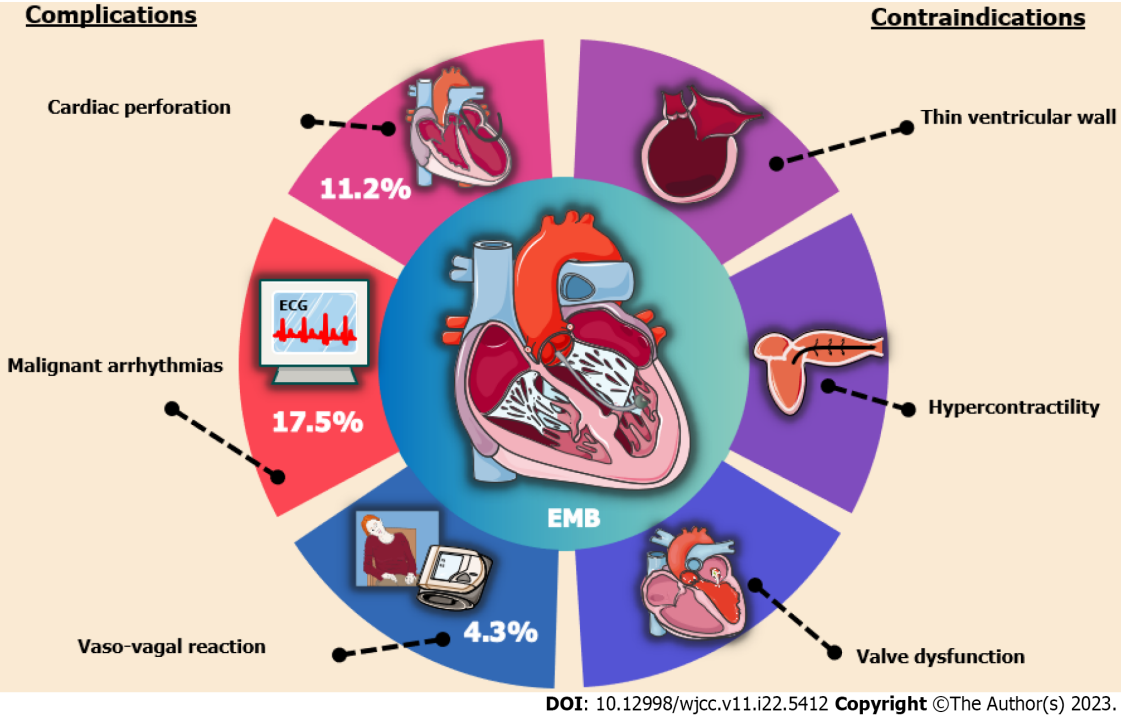

Figure 1 Prominent complications and contraindications of endomyocardial biopsy. EMB: Endomyocardial biopsy.

On top of that, previous EFE studies have been based on the endothelial-mesenchymal transition of the endocardium, but a 2017 genetic lineage tracing study by Zhang *et al*[16] indicated that neonatal endocardial endothelial cells did not make any contribution to fibroblasts in EFE-like tissues; instead, epicardium-derived mesenchymal cells were the major source of EFE fibroblasts, and demonstrated that TGF-β was a potential therapeutic target. Accordingly, there will be growing evidence to support the advantages of genetic lineage tests for the early identification of EFE, whether for the clinical diagnosis or effective treatment of EFE[17-20]. It is worth noting that, while fibrosis is also known to develop in

association with secondary EFE as well as hypertrophic and restrictive cardiomyopathies, the pathophysiological mechanism of primary EFE is certainly distinct from the secondary EFE and traditional intramyocardial fibrosis as they share an incomplete overlapping genetic lineage[21,22]. Hence, improving physicians' adequate appreciation of EFE lesions and sorting out comprehensive information considerations prior to clinical diagnosis will not only beneficial to improve the medical management of the children, but reduce the harm caused by unnecessary high-risk interventions and invasive inspections in children with EFE.

CONCLUSION

In summary, sedation and EMB should be used with caution in the management of pediatric acute heart failure caused by EFE, while EFE with a fuller understanding and a more comprehensive consideration prior to clinical diagnosis will facilitate the subsequent early treatment of the children, also further genetic testing is expected to provide more valuable information for the differential diagnosis of the children, relative to biopsy.

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FOOTNOTES

Author contributions: Se YY compiled literature and data; Xin XX drafted the paper and created Figure 1; Se YY reviewed and revised the final version of the paper.

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