Learning Point for Clinicians

The recognition of myocardial crypts is important to detect patients at high risk of pre-phenotypic hypertrophic cardiomyopathy. Through this presented case, we have illustrated the improved method of a modified two-chamber view across the infero-septum for optimal delineation of the myocardial crypts in both transthoracic echocardiography and cardiac magnetic resonance imaging.

Case report

Myocardial crypts: role of modified two-chamber view

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Introduction

Myocardial crypts are blood-filled invaginations in the left ventricle, involving ≥ 50% of the myocardial thickness with total or near total obliteration during systole.1-3 The accurate identification of the myocardial crypts is important, as the presence of the myocardial crypts has been shown to be a pre-phenotypic marker for hypertrophic cardiomyopathy (HCM).1-4 Modified two-chamber views through the suspected sites of myocardial crypts, such as the infero-septum and right ventricular insertion site, have been suggested for their better delineation, but this concept had not been strongly emphasized.1-3 We present a case where a modified two-chamber view through the infero-septum helped to improve the demonstration of myocardial crypts as compared with standard cardiac views.

Case presentation

A 28-year-old woman without other significant past history presented to our institution for evaluation of recurrent syncope. Physical examination was unremarkable, and her electrocardiogram demonstrated an incomplete right bundle branch block. Transthoracic echocardiography (TTE) revealed normal left ventricular (LV) size and function, however there was mild focal hypokinesis of the right ventricular (RV) apex and mild dilatation of the RV apex, which raised suspicion for arrhythmogenic right ventricular dysplasia. Cardiac magnetic resonance imaging (CMR) was performed for further evaluation, which revealed no major or minor criteria for arrhythmogenic RV dysplasia. However, CMR demonstrated borderline asymmetric septal hypertrophy measuring 14 mm in the mid infero-septum, with subtle findings of blood-filled invaginations in the LV myocardium, which raised the
suspicion for myocardial crypts (Figure 1, Panels A and B). A modified two-chamber view prescribed obliquely through the infero-septum demonstrated the myocardial crypts clearly, which were prominently seen during diastole and less evident during systole (Figure 1, Panels A and C). The other standard cardiac views failed to demonstrate the myocardial crypts. A retrospective review of the TTE also revealed the presence of the myocardial crypts during diastole.

### Discussion

The role of CMR imaging is evolving owing to its inherent excellent spatial resolution and blood–myocardial contrast ratio. An increased prevalence of myocardial crypts have been reported in patients with genotypic-positive but phenotypic-negative HCM (61–81%), as compared with the substantially lower prevalence of myocardial crypts in patients with genotypic-positive and phenotypic positive HCM (4%) and none or few (about 6%) in normal control groups. The role of CMR is gaining recognition owing to its ability to complement TTE in the detection of HCM. Myocardial crypts can be difficult to identify because they can be small in size and located in non-standard views, thus can be easily over-looked. The modified two-chamber view can help us in better delineation of the myocardial crypts.

### Conclusion

In patients suspected of HCM, or if areas of blood-filled invaginations are seen on traditional views, a modified two-chamber view through the suspected areas of the myocardium (especially the infero-septum) may help to optimally delineate myocardial crypts. Care must be taken to detect the presence of myocardial crypts in order to identify patients in high risk of pre-phenotypic HCM.

Conflict of interest: None declared.

### References


