Incidentally Detected Myocardial Cleft: Cardiac Computed Tomography and Magnetic Resonance Imaging Findings

Cemile Ayse Gormeli[1], Julide Yagmur[2], Zeynep Maras Ozdemir[1], Aysegul Sagir Kahraman[1], Bayram Kahraman[1], Ramazan Ozdemir[2]

[1] Department of Radiology, Faculty of Medicine, Inonu University, Malatya, Turkey
[2] Department of Cardiology, Faculty of Medicine, Inonu University, Malatya, Turkey

Abstract
Myocardial clefts are congenital anomalies, usually localized in the basal inferior wall of the left ventricle and mid-apical segments of the interventricular septum. The patients with genetic mutations related to hypertrophic cardiomyopathy showed significant elevation in the incidence of myocardial cleft. Also there is a significant correlation between the myocardial clefts and the carriers of hypertrophic cardiomyopathy gene mutations without clinical signs. Magnetic resonance imaging allows us to diagnose the myocardial clefts of the healthy individuals as well as the patients and closely follow up for clinical hypertrophic cardiomyopathy. Here we present the cardiac computed tomography and magnetic resonance imaging findings of a case with myocardial cleft.

Key Words: Myocardial cleft, magnetic resonance imaging, hypertrophic cardiomyopathy.

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Corresponding Author*:* Cemile Ayşe Görmeli, Department of Radiology, Faculty of Medicine, Inonu University, Malatya, Turkey
E-mail: ayseyazici@yahoo.com

Introduction

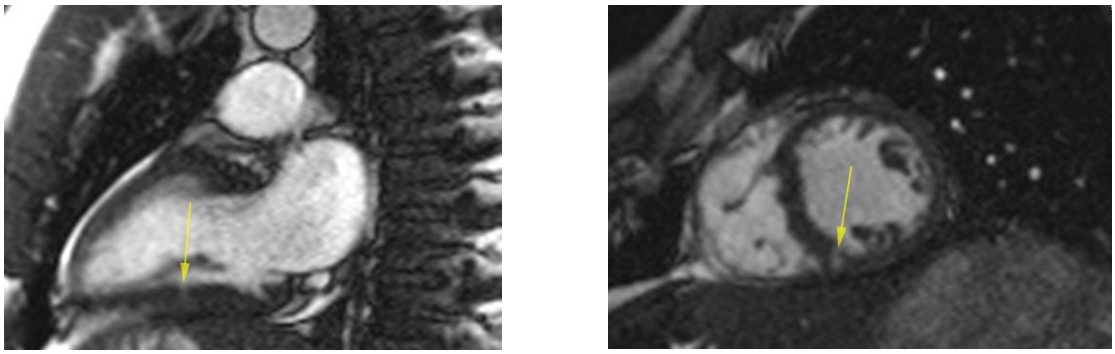
Myocardial clefts are congenital anomalies, usually localized in the basal inferior wall of the left ventricle and mid-apical segments of the interventricular septum. These cardiac zones are also transi-tion region of the myocytes may predispose to developmental disorder related to myocardial fiber disarray [1,2]. Cardiac magnetic resonance imaging (MRI) is a noninvasive imaging method has very good spatial resolution. MRI allows us to diagnose the myocardial clefts of the healthy individuals as well as the patients [3].The clinical studies by cardiac MRI revealed the patients with genetic mutations related to hypertrophic cardiomyopathy (HCM) showed significant elevation in the inci-dence of myocardial cleft. Also these studies showed a significant correlation between the myocar-dial clefts and the carriers of HCM gene mutations without clinical signs [1,4]. Clefts are described as a slit, V- or U- shaped extension of blood signal penetrating the myocardial thickness more than 50%, which seen in diastolic cine frames [2,5]. We aim to provide the cardiac computed tomogra-phy (CT) and MRI findings of a case with myocardial cleft.

Case Report

48-year-old male was admitted to the Cardiology Department of our hospital with atypical chest pain for a week. After the clinical evaluation, coronary CT angiography was recommended and the patient referred to the Radiology Department. CT angiography showed no lesion in the coronary arteries but revealed U-shaped contrast agent extension in the mid-inferior segment of the left ventricular myocardium (Figure 1). A diagnosis of myocardial cleft was presumed. Therefore, cardiac MRI was performed to verify the diagnosis and exclude the possible additional pathologies. In steady-state free precession long-axis cine imaging, a mid-inferior myocardial cleft was observed (Figure 2). There were no signs of wall motion abnormalities in this segment and also after the gadolinium enjection, no myocardial delayed enhancement was observed. The patient was informed about the relation between the myocardial cleft and HCM and discharged with advises about follow up.

a b

Figure 1. Left ventricular vertical long-axis **(a)** and short-axis **(b)** CT angiographic images at end-diastole shows a myocardial cleft in the mid-inferior segment.



a b

Figure 2. Left ventricular vertical long-axis **(a)** and short-axis **(b)** steady-state free precession cardiac magnetic resonance cine images shows the cleft in the mid-inferior segment.

Discussion

The prevalence of HCM is 0.2% in the population and more than 1000 mutations for the proteins of the cardiac sarcomere have been defined [6]. A cardiac MRI study showed that the myocardial cleft was found in approximately 81% of HCM genotype positive and phenotype negative patients [1]. Also, Maron et al revealed that the prevalence of myocardial clefts in genotype positive and phenotype negative HCM patients is more than 60% [4]. These studies encouraged the theories that myocardial clefts might be an early finding of the ventricular hypertrophy in HCM mutation carriers. Clefts might be detected by cardiac MRI easier than the echocardiographic visualisation. For the accurate diagnosis of myocardial clefts, cardiac MRI is the best noninvasive imaging technique [2]. Consequently, myocardial cleft is a valuable imaging finding that will provide closely follow up for clinical HCM.

References

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