Biventricular Myocardial Noncompaction

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SUMMARY

The isolated noncompacted ventricular myocardium (NCVM), characterized by excessively prominent trabecular meshwork and deep intertrabecular recesses, is seen in the early period of embryogenesis. Clinical manifestations of NCVM are symptoms associated with depressed left ventricular systolic function, with ventricular arrhythmias, and with systemic embolization. Characteristics on echocardiography have been defined as absent coexisting cardiac abnormalities, non-compacted trabecular endocardium with deep endomyocardial spaces, predominant localisation of the trabeculation to mid-lateral, apical and mid-inferior segments, and a colour Doppler evidence of deep perfused intertrabecular recesses. We describe a case of isolated noncompaction of the left and right ventricular myocardium in a 17-year-old man who presented initially with palpitation and syncope.

Key Words: Myocardial Noncompaction, Echocardiography, Syncope.

INTRODUCTION

The isolated noncompacted ventricular myocardium, characterized by excessively prominent trabecular meshwork and deep intertrabecular recesses, is seen in the early period of embryogenesis. It occurs in the absence of other structural heart diseases and is thought to be due to an arrest of myocardial morphogenesis. This rare disorder is usually seen in the left ventricle. However, to our knowledge there has not been reported isolated noncompaction of the left and right ventricular myocardium. We describe a case of isolated noncompaction of the left and right ventricular myocardium in a 17-year-old man who presented initially with palpitation and syncope.

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CASE REPORT

A 17-year-old man consulted our hospital for palpitation and syncope 2 years ago. Syncope and palpitation have occurred five times over the last 2 years. Physical examination was normal. His pulse rate was 50 bpm and blood pressure 110/80 mm-Hg. Electrocardiography demonstrated sinus bradycardia. Chest X-ray was normal.

Admission transthoracic echocardiography revealed left ventricle with moderately impaired systolic function (Fig. 1). Left ventricular anterior, lateral apical, inferior walls and interventricular septum were hypokinetic. Multiple prominent muscular trabeculations were present in the left ventricle most evident at the apical, anterior septum and the posterolateral wall. Deep intertrabecular spaces were evident on the two-dimensional echo (Fig 2). These findings are pathognomonic for ventricular non-compaction. Also right ventricular free wall mid and apical were hypokinetic. Multiple prominent muscular trabeculations were present in the right ventricle most evident at the apical and the right ventricular mid free wall (Fig 3).

Tilt table test showed a vasovagal syncope. Holter ECG was normal. Electrophysiological study was normal. The patient was started on silazapril and aspirin and was discharged. At present, the patient is being treated medically, as an outpatient, for congestive heart failure. His condition has remained relatively stable over the last year (New York Heart Association class I-II).
DISCUSSION

During normal embryogenesis, the loosely interwoven meshwork of myocardial fibers becomes more compact towards the epicardial surface and condenses to a compact wall. Noncompaction of ventricular myocardium (NCVM), is believed to be the result of an arrest in endocardial morphogenesis. This process resulting in a thickened left ventricular wall with deep intertrabecular recesses (1). Recent studies on genetic linkage analysis has revealed that mutations in the gene G4.5 on the Xq28 chromosomal region are responsible for NCVM and that this disorder is allelic with Barth syndrome (X-linked disorder associated with dilated cardiomyopathy, skeletal myopathy, neutropenia and abnormal mitochondria) (2,3). Clinical manifestations of NCVM are symptoms associated with depressed left ventricular systolic function, with ventricular arrhythmias, and with systemic embolization. The mechanism of ventricular arrhythmia is also unclear, but the similarity of noncompacted left ventricular myocardium to arrhythmogenic right ventricular dysplasia has been pointed out. Left ventricular architecture, as well as decreased contractility, predispose these patients to systemic embolization (4). This rare disorder is usually seen in the left ventricle. However, to our knowledge there has not been reported isolated noncompaction of the left and right ventricular myocardium. Our patient had depressed both left and right ventricular function, and was symptomatic for palpitation and syncope.

Many diagnostic modalities have been evaluated for diagnosis of NCVM. CT and MRI can provide high-resolution imaging of non-compacted myocardium and may indicate a disturbed microcirculation due to fibrosis and thrombus formation (5). Characteristics on echocardiography have been defined as absent coexisting cardiac abnormalities, non-compacted trabecular endocardium with deep endomyocardial spaces, predominant localisation of the trabeculation to mid-lateral, apical and mid-inferior segments, and a colour Doppler evidence of deep perfused intertrabecular recesses (6). As physicians are becoming more aware of this rare disorder, previously missed patients may be diagnosed, and the true prevalence and natural course of NCVM will be better elucidated and understood in the future.

In conclusion, isolated noncompacted myocardium is usually seen in the left ventricle. However, to our knowledge this case is the first report isolated noncompaction of the left and right ventricular myocardium.

REFERENCES


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