

Left Ventricular Non-Compaction Revealed by a Sinus Node Dysfunction: Case Report and Literature Review

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ARTICLE INFO	ABSTRACT
Published Online: 24 May 2021	Left-ventricular non-compaction is a myocardial disease of the left ventricle, characterized by excessive trabeculations. The diagnosis relies is based on echocardiography and cardiac magnetic resonance imaging. We report a case of a 23-years-old patient diagnosed for left ventricular non compaction revealed by a sinus node dysfunction. This case underlines the importance of using
Corresponding Author: W. Louizi	multimodality imaging approach to enable a quick diagnosis which can be followed by appropriate treatment.
KEYWORDS: Left ventricular non compaction, Trabeculation, sinus node dysfunction, transthoracic echocardiography, cardiac magnetic resonance imaging.	

INTRODUCTION

Left-ventricular non-compaction (LVNC) is a congenital myocardial disorder characterized by excessive and unusual trabeculations within the mature left ventricle (LV) [1]. The disease can present throughout life with progressive LV systolic dysfunction and may be associated with an increased incidence of thrombo-embolism, ventricular arrhythmia and a heart bloc [2]. Although the diagnosis of LVNC is usually made using echocardiography and magnetic resonance imaging. However, there is no universally accepted definition of LVNC at present [3].

We present a case of twenty-three year-old female patient with LVNC revealed by a sinus node dysfunction.

CASE REPORT

A 23 years old woman, with no medical history. Was admitted to our service for asthenia, and recurrent syncopal attacks that had begun one year before. On examination, the patient had a heart rate of 37 bpm, blood pressure of 110/60 mmHg, respiratory rate of 12 breaths/min, and O₂ saturation of 98% on room air. Heart sounds were distinct with a regular rhythm. There was a grade 2/6 mid-systolic murmur all along the left parasternal border. The chest was clear to auscultation.

The electrocardiogram showed sinus node dysfunction with junctional escape rhythm (Figure1).

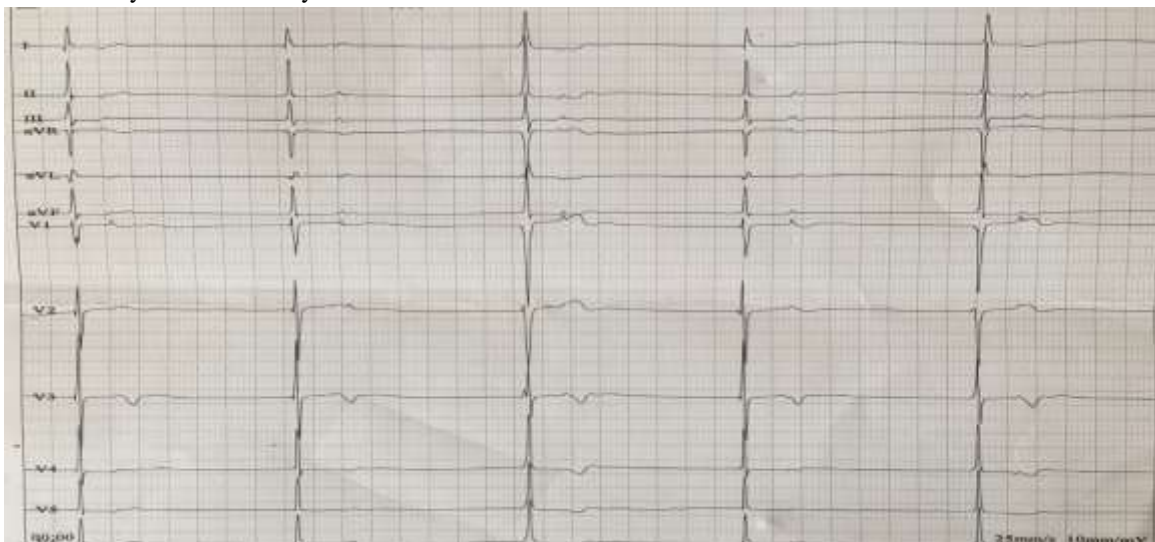


Figure 1: A 12-lead electrocardiogram objecting a sinus node dysfunction with junctional escape rhythm.

Chest radiograph was normal.

Transthoracic echocardiography revealed hyper trabeculation in the left ventricular (LV) myocardium, the intertrabecular recesses communicating with the LV cavity with a noncompacted-compacted myocardium ratio of 2,7 (Figure2).

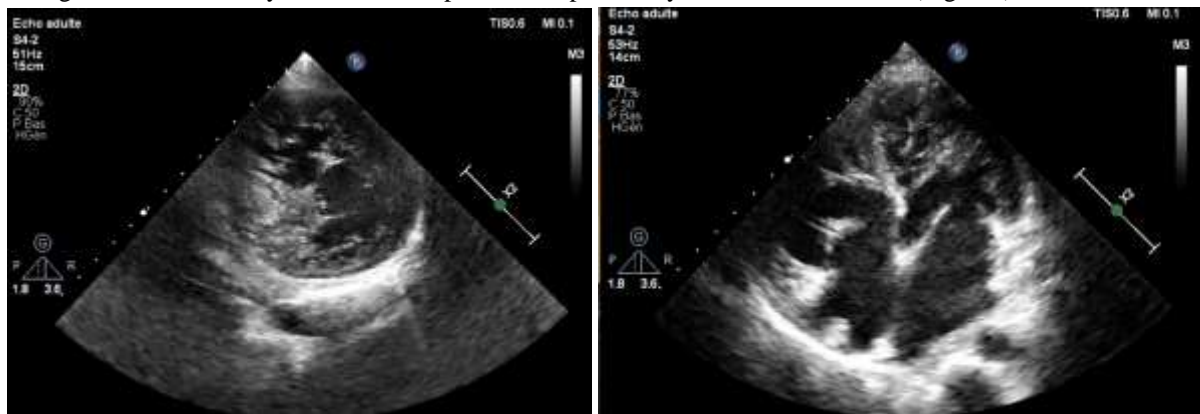


Figure 2: TTE in shot axis et 4-chamber view showing the LV trabeculations.

Cardiac magnetic resonance (CMR) imaging, demonstrated similar findings and confirms the left ventricular non-compaction, there was no ventricular dysfunction (Figure 3).

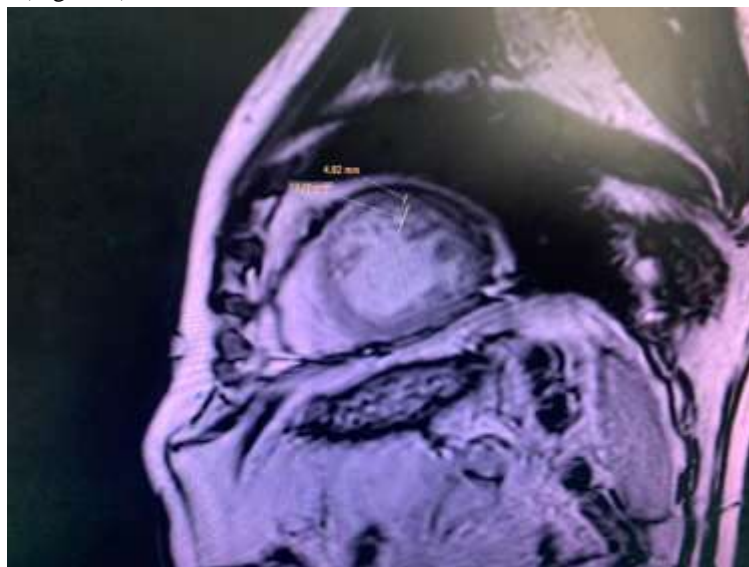


Figure 3: Cardiac MRI in short-axis view showing the left ventricular trabeculations.

This patient had a dual chamber pacemaker implantation in AAI-DDD mode.

The clinical condition of our patient has improved. She is now followed in our department and she is currently asymptomatic.

DISCUSSION

Left ventricular non compaction is a rare congenital disorder. The prevalence occurs in infants (0.81 per 100,000 infants/year), children (0.12 cases per 100,000 children/year) [4], and adults (prevalence 0.014%) [5]. It can be isolated myocardial or associated with other cardiopathies [6].

The clinical presentation of LVNC is highly variable. It may be asymptomatic, or causes severe disorders like heart failure, thromboembolic events, conduction disorders and/or arrhythmias which represent the most common reason of sudden cardiac death. The diagnosis of LVNC relies is based on echocardiography and cardiac magnetic resonance

imaging (CMR) data [7]. There is 3 echocardiographic diagnostic criteria: the ratio of compact layer to total thickness of the LV less than 0.5 measured at end diastole from the parasternal short axis view or the apical views; a 2-layer structure of the LV, a ratio of the thickness of the noncompacted layer to the thickness of the compacted layer (T/C) with a ratio >2 at end-diastole being in the parasternal short axis view; absence of other coexisting cardiac structural abnormalities [8]. Cardiac MRI is also used in the diagnosis in complementarity to the echocardiography. With this technic, the diagnostic is also based on the T/C ratio, with a ratio >2.3 at end-diastole[9].

In the electrocardiogram, the most seen abnormalities are: T wave inversion, ST segment abnormalities, left atrial enlargement, left axis deviation, QTc prolongation, preexcitation, or conduction abnormalities.

The management should be appropriate according disorders.

In our case, sinus node dysfunction, is the first anomaly that revealed LVNC, ventricular arrhythmia was not detected, we implanted a dual pacemaker without cardioverter properties.

CONCLUSION

Sinus node dysfunction might be the first cardiac abnormality revealing a LVNC, the diagnosis is based on echocardiographic et cardiac MRI data, and the treatment may require electrical stimulation.

REFERENCES

1. R.T. Grant, An unusual anomaly of the coronary vessels in the malformed heart of child, *Heart* 13 (1926) 273-283.
2. Ergul Y, Nisli K, Varkal MA et al. Electrocardiographic Findings at Initial Diagnosis in Children with Isolated Left Ventricular Noncompaction. *Ann Noninvasive Electrocardiol* 2011; 16(2):184–191.
3. Jenni R, Oechslin E, Schneider J, Attenhofer Jost C, Kaufmann PA. Echocardiographic and pathoanatomical characteristics of isolated left ventricular non-compaction: a step towards classification as a distinct cardiomyopathy. *Heart* 2001; 86:666–671.
4. Riserbo CA, Riley PR. Formation of the ventricles. *ScientificWorldJournal* 2006; 6:1863-80.
5. Oechslin EN, Attenhofer Jost CH, Rojas JR, et al. Long-term follow-up of 34 adults with isolated left ventricular noncompaction: a distinct cardiomyopathy with poor prognosis. *J Am Coll Cardiol* 2000; 36:493–500.
6. Stahli BE, Gebhard C, Biaggi P, et al. Left ventricular non-compaction: prevalence in congenital heart disease. *Int J Cardiol* 2013; 167:2477–81.
7. T.K. Chin, J.K. Perloff, R.G. Williams, K. Jue, R. Mohrmann, Isolated noncompaction of left ventricular myocardium. A study of eight cases, *Circulation* 82 (1990) 507–513.
8. Chin TK, Perloff JK, Williams RG, et al: Isolated noncompaction of left ventricular myocardium. A study of eight cases. *Circulation* 1990; 82:507-513.
9. S.E. Petersen, J.B. Selvanayagam, F. Wiesmann, et al., Left ventricular non-compaction: insights from cardiovascular magnetic resonance imaging, *J. Am. Coll. Cardiol.* 46 (2005) 101–105.
10. Epstein A, DiMarco J, Ellenbogen K, et al: ACC/AHA/HRS 2008 guidelines for device-based therapy of cardiac rhythm abnormalities. *J Am Coll Cardiol* 2008; 51:1-62.