

A rare laminopathy with multisystemic manifestations in a young patient

An unusual heart disease in a young old boy

Corinna Leoni Foglia^a, Marcello Di Valentino^b, Andrea Menafoglio^b

^a Department of Paediatric Cardiology, San Giovanni Hospital, Bellinzona, Switzerland; ^b Department of Cardiology, San Giovanni Hospital, Bellinzona, Switzerland



A 17-year-old boy was referred for a cardiological consultation because of progressive dyspnoea for 1 year. The boy was known to have a learning disability, progerioid features, muscular dystrophy, lipodystrophy, joint contractures, hyperlipidaemia and liver steatosis (fig. 1). There were no known cardiomyopathies or neuromuscular diseases in his family.

The electrocardiogram (ECG) showed left ventricular hypertrophy and Q-waves in the inferolateral leads (fig. 2). Echocardiography revealed left ventricular dilatation and severe systolic dysfunction (ejection fraction 25%) (fig. 3). On cardiac magnetic resonance imaging (MRI), myocardial transmural late gadolinium enhancement in the inferolateral wall was found (fig.



Figure 1: Clinical appearance of the patient: note the progerioid features, the muscular dystrophy, the lipodystrophy and the joint contractures. The picture of the patient is published with his consent and the consent of his parents.

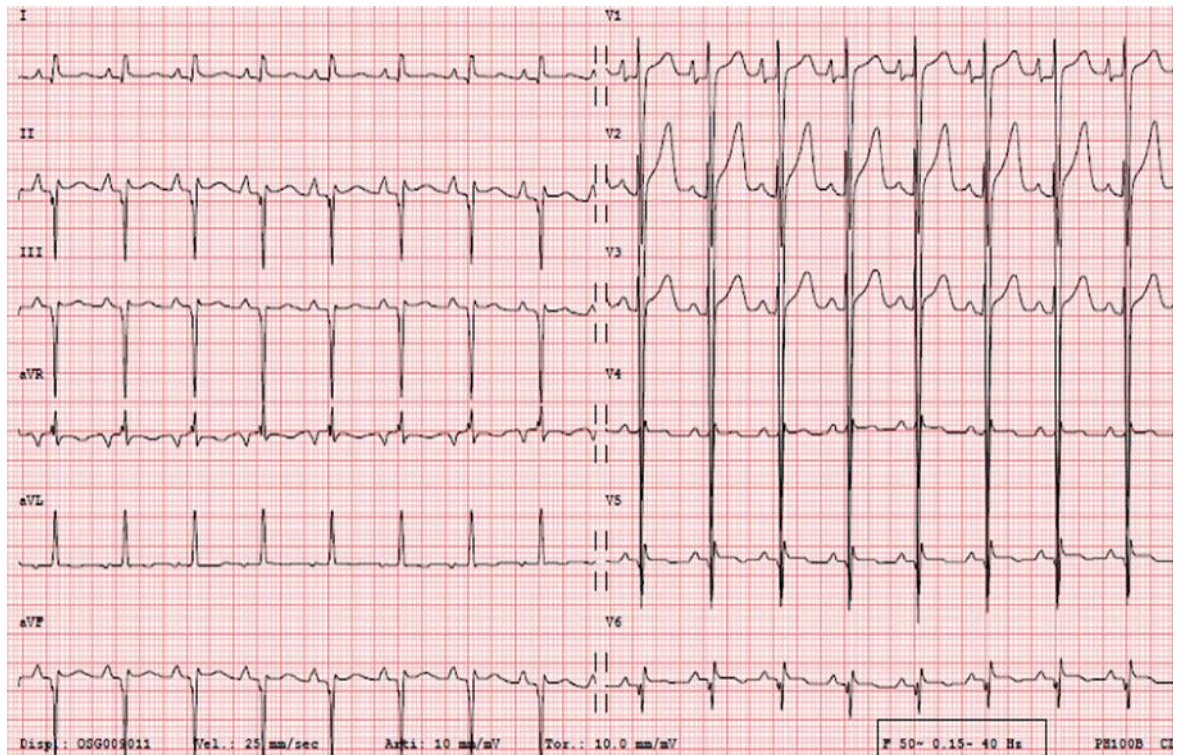


Figure 2: ECG showing sinus rhythm, Q-waves in the inferolateral leads and signs of left ventricular hypertrophy.

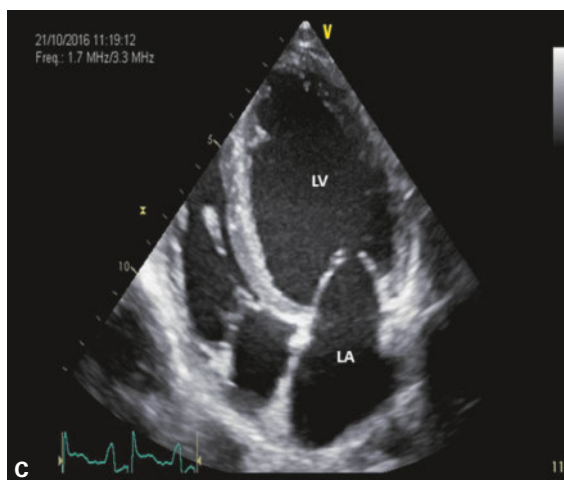


Figure 3: Echocardiography four chamber view showing left ventricular (LV) dilatation. LA: left atrium

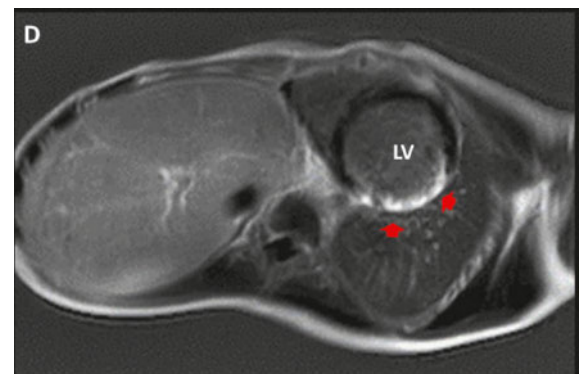


Figure 4: Cardiac magnetic resonance imaging with myocardial transmural late gadolinium enhancement in the inferolateral wall (red arrowheads).

4). Coronary angiography showed normal coronary arteries (fig. 5). A 24-hour Holter ECG showed about 1000 isolated polymorphic ventricular premature beats. Treatment with a beta-blocker, angiotensin converting-enzyme (ACE) inhibitor and spironolactone was started with symptomatic improvement. Furthermore, we are considering implantable cardioverter-defibrillator (ICD) implantation as primary prevention for sudden cardiac death.

A genetic test showed a very rare lamin gene mutation: LMNA:NM_005572:exon1:c.C29T:p.T10I.

This rare laminopathy is probably responsible for the whole clinical picture of this young patient.

The lamin gene codes for lamin A/C, which is a structural protein of the nuclear envelope. Laminopathies cause a wide variety of diseases involving skeletal muscles, adipose tissue, peripheral nerves, premature aging and cardiac involvement, including left ventricular dysfunction, atrioventricular block, and atrial and ventricular arrhythmias. The clinical manifestations could involve one or more systems. It has been estimated that LMNA mutations cause up to 10% of famil-



Figure 5: Coronary angiography showing normal coronary arteries.

ial dilated cardiomyopathies. The cardiac involvement is progressive, with poor prognosis [1–3].

Typically, in the LMNA cardiomyopathy, a midventricular septal fibrosis is described on cardiac MRI. In our patient, despite normal coronary arteries, an inferolateral transmural scar was documented, similar to the pattern described in Duchenne and Becker muscular dystrophy [4].

In a young patient with dilated cardiomyopathy, particularly if multisystemic manifestations are present, it is important to suspect a laminopathy, because of the poor prognosis of this disease. In the presence of clinical manifestations that raise suspicion of a laminopathy, a cardiological assessment should be considered.

Disclosure statement

No financial support and no other potential conflict of interest relevant to this article was reported.

References

- 1 Charron P, Arbustini E, Bonne G. What should the cardiologist know about lamin disease. *Arrhythm Electrophysiol Rev.* 2012;1:22–8.
- 2 Kumar S, Baldinger S, Grandjbakhch E, Maury P, Sellal JM, Androulakis AF, et al. Long-term arrhythmic and nonarrhythmic outcomes of Lamin A/C mutation carriers. *J Am Coll Cardiol.* 2016;68:229–307.
- 3 van Rijsingen IA, Arbustini E, Elliot P, Mogensen J, Hermans-van Ast JF, van der Kooij AJ, et al. Risk factors for malignant ventricular arrhythmias in Lamin A/C mutation carriers. *J Am Coll Cardiol.* 2012;59:493–500.
- 4 Holmström M, Kivistö S, Heliö T, Jurkko R, Kaartinen M, Antila M, et al. Late gadolinium enhanced cardiovascular magnetic resonance of lamin A/C gene mutation related dilated cardiomyopathy. *J Cardiovasc Magn Reson.* 2011;13:30.

Correspondence:
Corinna Francesca Pia
Leoni Foglia, MD
Department of Pediatric
Cardiology
San Giovanni Hospital
CH-6500 Bellinzona
corinna.leoni-foglia[at]
eoc.ch