A 20-year-old soccer player died suddenly while watching a game with friends at home. At annual preparticipation screening, ECG was normal with consequent sport eligibility (Figure 1A). History for juvenile sudden death and hypertrophic cardiomyopathy was reported on the mother’s side of the family. Postmortem examination of the heart showed normal dimensions (weight, 347 g; wall thicknesses of left ventricle [LV] and septum 13 mm and right ventricle [RV], 3 mm), in the absence of aneurysms or chamber dilatation; a subepicardial scar-like grey rim was evident in the anterolateral and posterior LV free wall and in the septum (Figure 1B). Coronary arteries had a normal origin and course, with patent lumen. Histological examination revealed extensive subepicardial and intramural fibrous replacement with scarce fatty tissue infiltration, involving the entire LV circumference and the septum (Figure 1C). Right ventricular involvement was only focally detected, in the anterior wall. The features were in keeping with either chronic myocarditis or left-dominant arrhythmogenic cardiomyopathy (AC).

At postmortem, molecular pathology investigation by polymerase chain reaction ruled out the presence of viral genomes in the myocardium. Genetic testing of all AC-related genes was performed on DNA isolated from frozen tissue sample. A heterozygous nonsense mutation of desmoplakin (DSP) at position c.448C>T in exon 4, resulting in a premature stop codon and truncation (Arg150X) at the N-terminal domain of the protein, was detected in the proband (Figure 1B). A heterozygous nonsense mutation of desmoplakin (DSP) at position c.448C>T in exon 4, resulting in a premature stop codon and truncation (Arg150X) at the N-terminal domain of the protein, was detected in the proband (Figure 1B).

From the Department of Cardiac, Thoracic, and Vascular Sciences, University of Padua, Padua, Italy (K.P., I.R., E.L., E.C., B.B., M.P.M., C.B.); Department of Radiology, Oncology, and Pathology, La Sapienza University, Rome, Italy (M.M., G.d.A.); and Radiology, Azienda Ospedaliera, Padua, Italy (B.G.).

The online-only Data Supplement is available with this article at http://circ.ahajournals.org/lookup/suppl/doi:10.1161/CIRCULATIONAHA.114.012515/-/DC1.

Correspondence to Cristina Basso, MD, Cardiovascular Pathology, Department of Cardiac, Thoracic, and Vascular Sciences, University of Padua, Via Gabelli 61 35121 Padua, Italy. E-mail cristina.basso@unipd.it

Cristina Basso, MD, PhD

Correspondence to Cristina Basso, MD, Cardiovascular Pathology, Department of Cardiac, Thoracic, and Vascular Sciences, University of Padua, Via Gabelli 61 35121 Padua, Italy. E-mail cristina.basso@unipd.it

Cristina Basso, MD, PhD

© 2014 American Heart Association, Inc.

Circulation is available at http://circ.ahajournals.org

DOI: 10.1161/CIRCULATIONAHA.114.012515

e180
These data further highlight the limitations of 2010 TFC criteria for LV AC and the fundamental role of CE-CMR in achieving the correct diagnosis in gene mutation carriers.

Sources of Funding
This work was supported by the Registry of Cardio-Cerebrovascular Pathology and Ricerca Sanitaria Finalizzata CUPF11J12000150002, Veneto Region, Venice, Italy; and Research Grant TRANSAC, Padua, Italy.

Disclosures
None.

References
Figure 3. The 54-year-old asymptomatic father, carrier of the DSP c.448C>T mutation. A, Basal 12-lead ECG showed low-voltage QRS and 1 PVC with LBBB morphology. B through E, Cardiac magnetic resonance. On the cine images diastolic frame (B) and systolic frame (C), no LV cine abnormalities were found; on the contrary, a focal bulging on anterolateral apical region of RV was found (C, white arrow), not fulfilling the current task force criteria for AC, because it was not associated with RV dilatation or dysfunction (end-diastolic volume 62 mL/mq, ejection fraction 59%). On postcontrast sequences (D through E), late gadolinium enhancement with a midepicardial stria was found in the inferior LV wall. DSP indicates desmoplakin; LBBB, left bundle branch block; LV, left ventricle; RV, right ventricle; and PVC, premature ventricular complex.

Figure 4. The 19-year-old sister with a history of ventricular arrhythmias, carrier of the DSP c.448C>T mutation. A, Basal 12-lead ECG showed low-voltage QRS and inverted T wave V1, incomplete right bundle branch block, and nonpathological Q wave in inferior leads. B through E, Cardiac magnetic resonance. On the cine images diastolic frame (B) and systolic frame (C), no LV cine abnormalities were found; on the contrary, a focal bulging on RV anterolateral region was visible (C, white arrows), not fulfilling the current task force criteria for AC because it was not associated with chamber dilatation or dysfunction (end-diastolic volume, 72 mL/mq; ejection fraction, 65%). On postcontrast sequences (D and E) late gadolinium enhancement with a mid-stria was identified, almost circumferentially, in the inferior and anterior LV walls and septum. DSP indicates desmoplakin; LV, left ventricle; and RV, right ventricle.
Nonischemic Left Ventricular Scar: Sporadic or Familial? Screen the Genes, Scan the Mutation Carriers

Kalliopi Pilichou, Massimiliano Mancini, Ilaria Rigato, Elisabetta Lazzarini, Benedetta Giorgi, Elisa Carturan, Barbara Bauce, Giulia d'Amati, Martina Perazzolo Marra and Cristina Basso

Circulation. 2014;130:e180-e182
doi: 10.1161/CIRCULATIONAHA.114.012515

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/130/21/e180

Data Supplement (unedited) at:
http://circ.ahajournals.org/content/suppl/2014/11/17/130.21.e180.DC1

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Circulation can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Circulation is online at:
http://circ.ahajournals.org//subscriptions/