Catecholamine-Induced Myocarditis in Pheochromocytoma

Valeria de Miguel, MD; Aníbal Arias, MD; Andrea Paissan, MD; Diego Pérez de Arenaza, MD; Marcelo Pietrani, MD; Alberto Jurado, MD; Ana Jaén, MD; Patricia Fainstein Day, MD

A 25-year-old man arrived at the emergency room of his community hospital complaining of abdominal pain, headaches, and palpitations that had appeared suddenly while he was playing soccer. He had no history of hypertension. An abdominal ultrasound revealed a tumor located in the right adrenal gland.

He was subsequently transferred to our hospital for further evaluation. On admission, he presented acute pulmonary edema with severe hypertension (blood pressure, 220/120 mm Hg). He was admitted to the coronary care unit. Intravenous vasodilators and loop diuretics were administered, with rapid recovery of clinical status.

ECG showed sinus rhythm, a heart rate of 80 bpm, and T-wave inversion in the DI, DII, and AVL leads. Transthoracic echocardiography revealed left ventricular hypertrophy and diffuse intramyocardial edema with focal midwall late gadolinium enhancement. LGE is a technique that enables identification of myocardial edema on T2-weighted images and focal midwall LGE (Figure 2A through 2F and Movie II in the online-only Data Supplement). Catecholamine-induced myocarditis is an infrequent clinical manifestation seen in patients with pheochromocytoma.

Catecholamine and their oxidation products may have a toxic effect on the myocardium. Long-term elevation of catecholamines leads to downregulation of β-adrenergic receptors, thereby inducing suboptimal function of myofibers and decreasing the number of contracting units. Contraction band necrosis, neutrophil infiltration, and fibrosis are histological changes that are generally observed.1–3 Cardiac magnetic resonance is a noninvasive technique that enables to assess acute myocarditis. It combines T2- and T1-weighted imaging after contrast highlighting the presence of myocardial inflammation and edema. LGE is a technique that enables identification of myocardial cell injury and focal fibrosis.4

The typical pattern in the acute phase of myocarditis induced by pheochromocytoma consists of the presence of diffuse myocardial edema on T2-weighted images and focal midwall LGE. This case shows evidence of acute catecholamine myocarditis with resolution of myocardial edema after adrenalectomy.

Disclosures

None.

References

From the Endocrinology (V.d.M., A.P., P.F.D.), Cardiology (A.A., D.P.d.A.), Radiology (M.P.), Urology (A.Jurado), and Pathology (A. Jaén) Units, Hospital Italiano de Buenos Aires, Buenos Aires, Argentina.

The online-only Data Supplement is available with this article at http://circ.ahajournals.org/lookup/suppl/doi:10.1161/CIRCULATIONAHA.113.002762/-/DC1.

Correspondence to Valeria de Miguel, MD, Hospital Italiano de Buenos Aires, Endocrinology Unit, Perón 4190, CP: 1180, Buenos Aires, Argentina.

E-mail valeria.demiguel@hospitalitaliano.org.ar (Circulation. 2014;129:1348–1349.)

© 2014 American Heart Association, Inc.

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

DOI: 10.1161/CIRCULATIONAHA.113.002762
Figure 1. Abdomen computed tomographic scan: 47.5×36.7-mm heterogeneous right adrenal mass.

Figure 2. A through C, Cardiac magnetic resonance (CMR) on presentation. Increased left ventricular wall thickness (A), diffuse myocardial edema on T2-weighted images (B), and focal midwall late gadolinium enhancement (LGE) in the inferior medial segment (C). D through F, CMR on recovery. Normal left ventricular wall thickness (D), absence of myocardial edema on T2-weighted images (E), and persistence of focal midwall LGE in the inferior medial segment (F).

Figure 3. A, Tumor (T) and normal adrenal gland (N). B, Tumor cells nests.
Catecholamine-Induced Myocarditis in Pheochromocytoma
Valeria de Miguel, Aníbal Arias, Andrea Paissan, Diego Pérez de Arenaza, Marcelo Pietrani, Alberto Jurado, Ana Jaén and Patricia Fainstein Day

Circulation. 2014;129:1348-1349
doi: 10.1161/CIRCULATIONAHA.113.002762
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2014 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539

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/129/12/1348

Data Supplement (unedited) at:
http://circ.ahajournals.org/content/suppl/2014/05/02/129.12.1348.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/
Movie Legend

Movie 1. Cardiovascular magnetic resonance shows increase left ventricular wall thickness, diffuse myocardial edema on T2-weighted images, and focal mid-wall late gadolinium enhancement in the inferior medial segment. Best viewed with Windows Media Player.

Movie 2. Cardiovascular magnetic resonance shows normal left ventricular wall thickness, absence of myocardial edema on T2-weighted images, and persistence of focal mid-wall late gadolinium enhancement in the inferior medial segment. Best viewed with Windows Media Player.