CASE REPORT

Acute Coronary Syndrome Secondary to Hypoplastic Left Main and Left Descending Coronary Arteries

RICARDO LEVIN[MTSAC, 1], MARCELA DEGRANGE[MTSAC, 1], MARZIA LEACCHE[2], JORGE BALAGUER[2], JOHN BYRNE[2]

Received: 20/07/2011
Accepted: 11/08/2011

Address for reprints:
Dr. Ricardo Levin
1809 Patterson st
Nashville. TN. USA
37203
E-mail:
Ricardo.Levin@vanderbilt.edu

SUMMARY

Congenital coronary artery anomalies are a diverse group of congenital disorders and an uncommon cause of acute coronary syndrome. We describe the case of a 48-year old woman with severe hypoplasia of the left main and left anterior descending coronary arteries associated with non-ST-segment elevation acute myocardial infarction. Differential diagnoses and treatment options are evaluated. The patient underwent surgery with favorable outcomes.

Rev Argent Cardiol 2012;80:157-159.

Key words > Acute Coronary Syndrome - Congenital Heart Defects - Tomography

BACKGROUND

Severe hypoplasia of the left main and left coronary artery is an unusual clinical entity included within the group of congenital heart defects of coronary arteries. In the adult patient, the manifestation as an acute coronary event has been rarely documented in medical literature. In this presentation, we describe a case of acute coronary syndrome due to severe hypoplasia of the left main and left anterior descending coronary artery.

CLINICAL CASE

48-year-old female patient with no risk factors for coronary artery disease goes into the emergency department of another institution due to prolonged precordial pain. The ST-segment depression was observed in the electrocardiogram and troponin I elevation (0.8 ng/ml) was detected. The patient goes into intensive care with a diagnosis of myocardial infarction with no ST-segment elevation and a coronary angiogram is performed. (Figure 1)

The patient is referred to our institution for her assessment as a possible surgical candidate. The coronary angiogram causes doubts about a possible anomalous origin of the coronary artery versus an atresia or severe hypoplasia of the left coronary artery. After a joint assessment of cardiology and cardiac surgery, a multislice coronary angiotomography is requested.

In the angiotomography (Figure 2), severe hypoplasia of the left main coronary artery and the proximal portion of the left anterior descending coronary artery is observed. The last one partially increases its caliber in the half portion without observing the birth of the circumflex artery from such vessel. The right coronary artery is developed originating multiple collateral branches towards the left anterior descending coronary artery and the territory of the circumflex artery in which an abnormal vessel originated under the aortic valvular plane is observed.

The discussion as regards therapeutic options led to the fact of performing a cardiac surgery; a bridge with no pump with the use of the internal mammary artery in the third half of the left anterior descending coronary artery was performed. The postoperative evolution was free of events, the patient remained 36 hrs in a critical area, 3 more days in cardiac surgery and the fifth day was discharged. In the monitoring, 3 months after procedure, the patient was asymptomatic and with ideal functional class.

DISCUSSION

Hypoplasia of the coronary arteries is defined as the underdevelopment of one or several epicardial coronary arteries or their main branches with the significant decrease of their lumen diameter or extension. Out of 224 patients, only five with coronary anomalies were identified in a description in 1970 by Ogden and these anomalies were characterized as a

Heart and Vascular Institute - Vanderbilt University Medical Center. Nashville, Tennessee, USA
[MTSAC] Full Member of the Argentine Society of Cardiology
[1] Cardiologists
[2] Cardiovascular surgeons

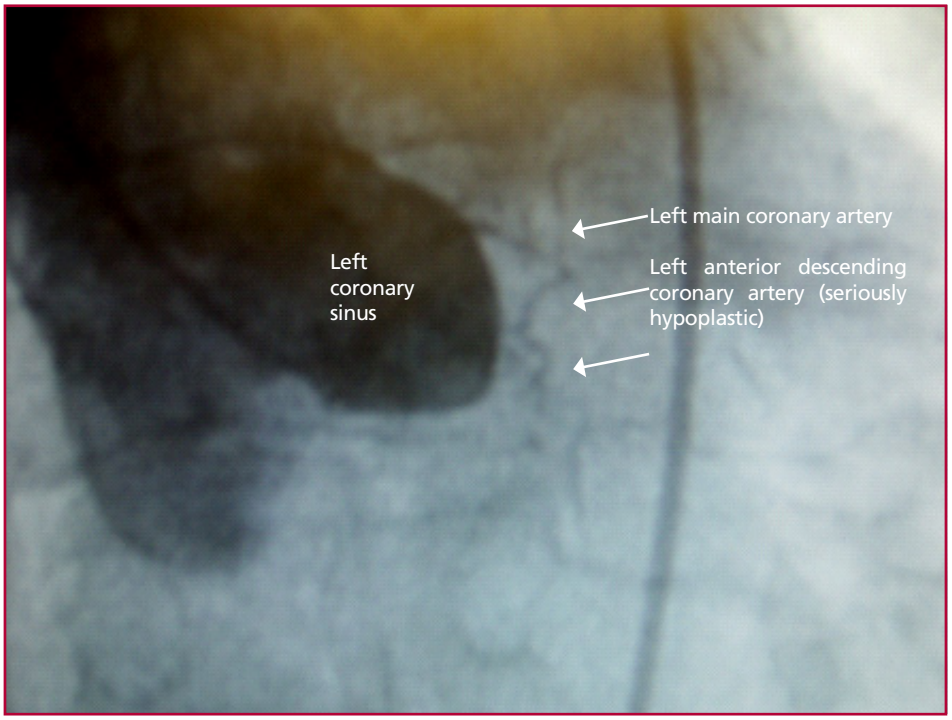

Fig. 1. Angiography

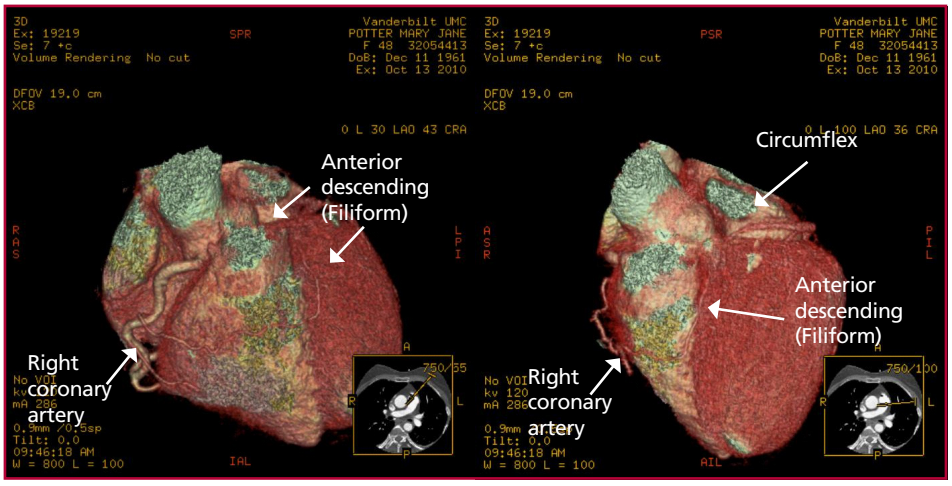

Fig. 2. Coronary angiotomography

minor way of congenital coronary artery anomalies. (1)

Nicol et al. consider this entity as a wide changeable spectrum that includes ways that go from absence of the left main coronary artery up to severe hypoplasia with no need of observing the lack of the coronary ostium in the corresponding sinus. Authors think about the possibility of a major prevalence to the one originally considered, when we associate the development of non-invasive complementary methods, as multislice angiotomography, with an increase in the diagnosis of this entity. (2)

The entity may be congenital, as in our case, or acquired, secondary to atherosclerotic occlusion which has similar angiographic characteristics. A third of patients with congenital forms present associate anomalies as septal defects or anomalies of great vessels which are absent in our patient. (2)

The more frequent manifestation of this entity is sudden death, especially in young patients and in sporty people, while the acute myocardial infarction is an infrequent manifestation. (3-5)

The relationship between coronary hypoplasia and myocardial ischemia was clearly shown by Amabile et al. They detected ischemia in the territory irrigated by a hypoplastic anterior descending coronary artery in a study of coronary perfusion in an 11-year-old patient with a non-Q wave myocardial infarction of the anterior face; and Sim et al. detected the same in a 20-year-old patient with a previous myocardial infarction and a hypoplastic anterior descending coronary artery. (6, 7)

Differential diagnosis

The main differential diagnosis should be performed with a single coronary artery; this one may be differentiated by its type of coronary flow. In such entity, the flow is anterograde or centrifugal, while in severe hypoplasia; on the contrary, the flow is centripetal.

Treatment

Surgery is the treatment in adult patients due to the long durability of the internal mammary artery and due to its adaptability, so that the caliber of the left coronary artery is not an obstacle for the surgery. In fact, Musiani et al. have observed the growth in size of the left coronary system, after bypass, with the reduction of the diameter and the disappearance of collateral circulation from the right coronary artery. All this was shown in control angiographies. Over the base of such concept, we performed a coronary revascularization in our patient with the use of the internal mammary artery. Such behavior was supported by a favorable initial evolution. (8, 9)

RESUMEN

Síndrome coronario agudo secundario a hipoplasia grave del tronco y de la arteria descendente anterior

Las anomalías coronarias congénitas representan una rara entidad que infrecuentemente resulta la etiología subyacente de un síndrome coronario agudo. En esta presentación se describe el caso de una paciente de 48 años portadora de una hipoplasia grave del tronco y de la arteria descendente anterior asociada con un infarto agudo de miocardio sin elevación del segmento ST y se evalúan sus diagnósticos diferenciales, así como la decisión terapéutica. La paciente fue intervenida quirúrgicamente, con una evolución inicial favorable.

Palabras clave > Síndrome coronario agudo - Anomalías congénitas - Tomografía

BIBLIOGRAPHY

1. Ogden JA. Congenital anomalies of the coronary arteries. Am J Cardiol 1970;25:474-9.

2. Nicol ED, Lyne J, Rubens MB, Padley SP, Yen Ho S. Left main coronary atresia: A more commonly identified after the advent of 64-slice CT coronary angiography? J Nucl Cardiol 2007;14:715-8.

3. Fraisse A, Quilici J, Canavi I, Savin B, Aubert F, Bory M. Images in cardiovascular medicine. Myocardial infarction in children with hypoplastic coronary arteries. Circulation 2000;101:1219-22.

4. Zugibe FT, Zugibe FT Jr, Costello JT, Breithaupt MK. Hypoplastic coronary artery disease in the spectrum of sudden unexpected death in young and middle age adults. Am J Forensic Med Pathol 1993;14:276-83.

5. Roberts WC, Glick BN. Congenital hipoplasia of both right and left circumflex coronary arteries. Am J Cardiol 1992;70:121-3.

6. Amabile N, Fraisse A, Quilici J. Hypoplastic coronary artery disease: report of one case. Heart 2005;91:12.

7. Sim DS, Jeong MH, Choi S, Yoon NS, Yoon HJ, Moon JY, et al. Myocardial infarction in a young man due to a hypoplastic coronary artery. Korean Circ J 2009;39:163-7.

8. Musiani A, Micalizzi E, De Gasperis C. Surgical revascularization for left main coronary artery atresia. Ann Thorac Surg 1995;60:229-31.

9. Musiani A, Cernigliaro C, Sansa M, Maselli D, De Gasparis C. Left main coronary artery atresia: literature review and therapeutical considerations. Eur J Cardiothorac Surg 1997;11:505-14.