

# Coronary aneurysm, finding in STEMI

## Aneurisma coronario, hallazgo en SCACEST

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### ABSTRACT

The aneurysms of coronary arteries were described for the first time by Morgagni back in 1761 in a patient with syphilis. It is a rare condition with an approximate incidence rate from 1% and 2% in our specialty. Its main significance, from the clinical point of view, is the possibility of causing infarctions due to thrombosis or spasm, and rupture. Very little is known about its evolution, prognosis, and treatment<sup>1</sup>

This is the case of a patient with ST-segment elevation acute coronary syndrome (STEMI). Revascularization reveals the presence of a giant aneurysm in the left anterior descending coronary artery. The medical literature is reviewed to update the information on this condition

**Keywords:** aneurysm, STEMI, infarction, ectasia.

### RESUMEN

Los aneurismas de las arterias coronarias fueron descritos por primera vez por Morgagni en 1761 en un enfermo de sífilis. Se trata de una patología infrecuente, con una incidencia aproximada de entre el 1 y 2% en nuestro medio. Su principal importancia, desde el punto de vista clínico, es la posibilidad de producir infartos por trombosis o espasmo y ruptura. Se conoce muy poco sobre su evolución, pronóstico y tratamiento<sup>1</sup>.

Se comunica el caso de un paciente que presenta síndrome coronario agudo con elevación del segmento ST (SCACEST) y al revascularizar se observa la presencia de aneurisma gigante en la arteria descendente anterior. Se revisa la literatura con el objetivo de actualizar la información al respecto.

**Palabras clave:** aneurisma, SCACEST, infarto, ectasia.

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### CLINICAL CASE

A 67 year-old male patient with hypertension, type II diabetes, dyslipidemia, medicated (vidagliptin, metformin, atorvastatin, valsartan) was admitted to our hospital with oppressive precordial pain at rest of intensity 8/10 of 4-hour duration. The pain was radiating to the epigastrium and upper limbs and was accompanied by nausea. The cardiac physical examination performed showed no abnormalities. The electrocardiogram (ECG) revealed sinus rhythm, heart rate of 100 bpm, pathological Q-wave in V1-4, and ST-segment supra-elevation in V1-5. The baseline CPK MB levels were high. The patient received nitroglycerin (10 g/min IV infusion), heparin (5000 U through an IV infusion), salicylic acid (250 mg/chewed tablets), clopidogrel (600 mg/orally), and the interventional cardiology unit was tipped off. The cine coronary arteriography performed revealed: patent mid-caliber left main coronary artery (LMCA) without lesions; left anterior descending coronary artery (LAD) occluded in its proximal segment; large caliber, ectatic, dominant, patent left circumflex artery (LCx) without lesions, and hypoplastic and patent right coronary artery (RCA) without lesions (**Figure 1**). An urgent angioplasty was decided. A 3.5 guiding catheter was used (BX<sup>®</sup>) through the left coronary ostium. A 0.014 floppy guidewire (Choice<sup>®</sup>) was crossed and placed distal to the LAD. A 2.5 x 20 mm balloon

(Maverick<sup>®</sup>) was used for predilatation and the vessel was opened. A giant aneurysm was found at the proximal and middle third junction (**Figure 2**). Considering the materials available at the emergency unit it was decided to use a 3.5 x 38 stent (Waltz<sup>®</sup>) (**Figure 3**) that was deployed at 20 atm. The control angiography confirmed the resolution of the lesion with revascularization of the vessel treated, no signs of complications, and final TIMI grade 3 flow (**Figure 4**).

Upon readmission at the coronary unit, the Q-wave in V1-4 was still present, the ST-segment supra-elevation in V1-5 was gone, there were no physical signs of pump failure and precordial pain was gone. The medication prescribed was valsartan 80 mg/day, bisoprolol 10 mg/day, atorvastatin 40 mg/day, aspirin 100 mg/day, and clopidogrel 75 mg/day. It was decided to keep on infusing IV heparin at 18 000 u/kg/day. Also, insulin was administered based on the glycemic levels reported.

The Doppler echocardiography performed 48 hours later revealed normal LV dimensions, a 43 mm left atrium, a 36 mm aortic root, preserved LVEF, and apical segment hypokinesia and thinning consistent with the presence of a basilar-tip aneurysm and grade I diastolic dysfunction. The 17 x 17 mm steady-state hypoechoic imaging were consistent with the presence of an apical thrombus.

The clinical progression of the patient was good, and he was released from the hospital 4 days after admission with the treatment mentioned before. The patient remained on oral anticoagulants with rivaroxaban 20 mg/day. In the serial clinical controls conducted 3, 6, and 9 months after hospital discharge the patient said he was stable without any symptoms associated with his coronary artery disease (no angina, palpitations, dyspnea or syncope). He had not been hospitalized or gone to the ER either with any associated symptoms. He works out daily without any limitations.

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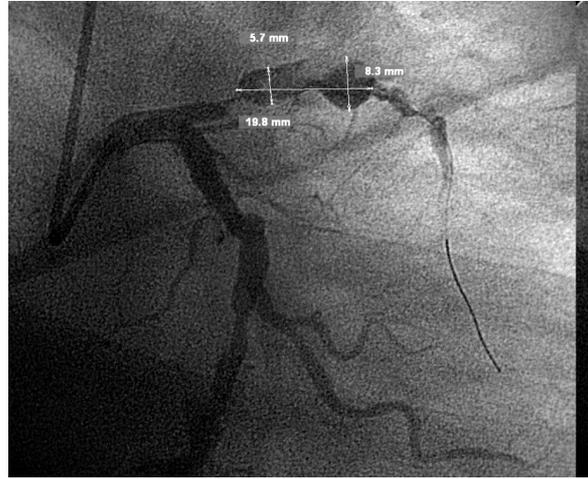
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**Figure 1.** The cine coronary arteriography performed revealed: patent, mid-caliber left main coronary artery (LMCA) without any lesions; left anterior descending coronary artery (LAD) occluded in its proximal segment; large caliber, ectatic, dominant, patent left circumflex artery (LCx) without lesions, and hypoplastic and patent right coronary artery (RCA) without lesions.



**Figure 2.** An urgent angioplasty was decided. A 3.5 guiding catheter was used (BX<sup>®</sup>) through the left coronary ostium. A 0.014 in floppy guidewire (Choice<sup>®</sup>) was crossed and placed distal to the LAD. A 2.5 x 20 mm balloon (Maverick<sup>®</sup>) was used for predilatation and the vessel was opened. A giant aneurysm was found at the proximal and middle third junction.



**Figure 3.** 3.5 x 38 stent (Waltz<sup>®</sup>) deployed at the lesion site at 20 atm.



**Figure 4.** Control angiography. Resolution of the lesion with revascularization of the vessel treated, no complications and final TIMI grade 3 flow.

## DISCUSSION

Coronary aneurysms are defined as dilatations located inside a blood vessel that exceed surrounding segments by 1.5 times. Atherosclerosis is the disease most commonly associated with it, although congenital aneurysms have been reported too. Aneurysms associated with the Kawasaki disease, connective tissue, infectious diseases or due to endovascular procedures have been described as well. It is more prevalent in males in a 4:1 ratio and it occurs more often, in descending order, in the RCA, LCx, and LAD.<sup>2</sup> In our patient the lesion was located at the left anterior descending coronary artery, which is somehow uncommon.

It has been diagnosed more often thanks to the coronary angiography, the use of non-invasive diagnostic imaging modalities like the ultrasound scan, CT scan, magnetic resonance imaging, and lung scans.<sup>3</sup>

Atherosclerotic damage may be the underlying reason to end up developing coronary aneurysms through the activation of several mechanisms: initially the formation of atheromatous plaque with damage to the intima and internal elastic lamina with lipid, collagen and cell (macrophages,

lymphocytes T, etc.) deposits and smooth muscle cell proliferation. Apparently, this early lesion ends up damaging the media and adventitial layers with the corresponding remodeling and neof ormation of vasa vasorum in the atheromatous plaque.<sup>4</sup>

We believe that this could be the etiology of the case presented here. It would also explain the diffuse ectasia seen in other main epicardial coronary arteries. Several other major complications have been reported over the course of the disease including thrombosis and distal embolization, ischemia or myocardial infarction, dissection, vasospasm, calcification, fistulization and rarely rupture.

The therapeutic options are surgical, percutaneous or medical treatment.

Treatment should be individualized and based on the size, location, presence of aneurysmal complications and the patient's clinical course. The limited number of cases reported in the medical literature makes the therapeutic decision-making process more difficult.<sup>5</sup>

In symptomatic patients with significant coronary stenoses associated with the aneurysm, surgery could be the best option through aneurysm ligation and bypass. However, some

cases reported in the medical literature show the feasibility, safety, and efficacy of PTFE-covered stents in the management of aneurysms.

In asymptomatic patients some groups recommend conservative treatment by accurately controlling risk factors and antiplatelet therapy by combining oral anticoagulation.

For the management of coronary aneurysm with infarction due to thrombosis—as in the case presented here—endovascular revascularization therapy with conventional

stents or PTFE-covered stent grafts is recommended. They can effectively seal the aneurysm. However, there is a higher rate of subacute thrombosis between the first and the second month, which may be due to very late PTFE-covered stent endothelialization.<sup>6</sup> In the case presented here a conventional stent was used to successfully revascularize the vessel which added to the usual anti-ischemic/antiplatelet therapy plus oral anticoagulation course led to an excellent clinical progression.

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