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CASE REPORT

INTERMEDIATE

CLINICAL CASE

From Coronary Artery Ectasia to Giant Coronary Artery Aneurysm

Is it Necessary to Follow-Up?

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ABSTRACT

Here we present a case of an asymptomatic patient with a giant coronary artery aneurysm developed in the context of diffuse coronary artery ectasia. Giant coronary artery aneurysm was complicated by the presence of a large thrombus. The heart team settled for surgical treatment of the lesion. (**Level of Difficulty: Intermediate.**) (J Am Coll Cardiol Case Rep 2022;4:1480–1483) © 2022 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

HISTORY OF PRESENTATION

The patient is an asymptomatic 71-year-old White man with a history of abdominal aortic aneurysm treated with an endoprosthesis and presenting a persistent type II endoleak in clinical and radiological follow-up. A thoracic and abdominal computed tomography (CT) angiography revealed the presence of an unknown perfused cardiac mass. The patient denied any history of chest pain, palpitation, dyspnea, or syncope and clinical examination was unremarkable. Cardiovascular risk factors were smoking, dyslipidemia, and hypertension. Home therapy included a single antihypertensive drug and a low-dose statin. He was then prescribed with low-mass weight heparin at therapeutic dosage.

LEARNING OBJECTIVES

- To be able to make a differential diagnosis of a cardiac mass with multimodality imaging.
- To discuss the different management options for a GCAA.
- To investigate the etiology of a GCAA.
- To investigate the possible development of a coronary ectasia in a CAA.

PAST MEDICAL HISTORY

Past medical history was significant for positive treadmill stress test in 2014. There is a pre-existing proximal right coronary artery (RCA) aneurysm on the 2014 angiogram in the setting of ectasia, in the context of right dominance without obstructive coronary artery disease (Video 1). There were no coronary artery aneurysms (CAAs). The patient did not experience Kawasaki or Takayasu diseases during childhood. Aortography showed an abdominal aortic aneurysm that was subsequently treated with an endoprosthesis.

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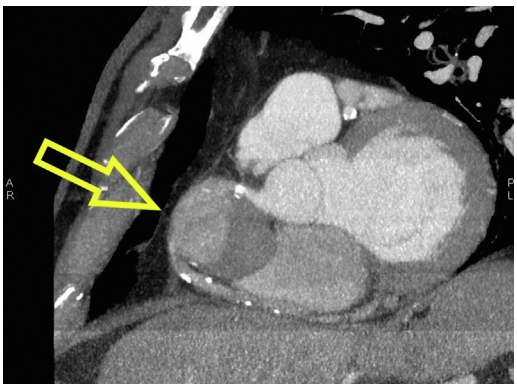
FIGURE 1 Preoperative Computed Tomography Angiography



DIFFERENTIAL DIAGNOSIS

Differential diagnoses included CAA, pseudoaneurysm, dilated coronary sinus, dilated coronary fistula, and pericardial cyst.

INVESTIGATIONS

Subsequent invasive coronary angiography (ICA) demonstrated the presence of a giant coronary artery aneurysm (GCAA) of the RCA. Further investigation was performed with CT-coronary angiography (CT-CA) and echocardiogram. CT-CA better defined anatomical features of the giant right coronary artery aneurysm. It was located in the atrioventricular groove, 7 mm from the right coronary ostium and was 44 × 39 × 40 mm. The aneurysm was only partly perfused because of the presence of an eccentric extensive thrombus with a width of 16 mm (**Figure 1**). The RCA aneurysm was noted to cause compression in both the right atrium and the right ventricle. The left coronary artery was only mildly ecstatic. At transthoracic echocardiogram examination there was no sign of congestion, with a normal inferior vena cava diameter and collapsibility, and the right chambers had normal dimensions, with only a mild reduction in right ventricular longitudinal function, evidence of an abnormal septal motion with a paradoxical movement during ventricular systole compatible with a left bundle branch block, which was confirmed using the electrocardiogram. The GCAA was appreciable as a round mass linked with the RCA and at color Doppler evaluation the aneurysm was perfused (Video 2). An ICA was performed to confirm the echocardiographic finding (Video 3). A CT angiography of intracranial and neck vessels was performed as well, revealing a 3-mm wide focal ectasia of the proximal branch of the middle cerebral artery (M1), and another 3-mm wide focal infundibular ectasia of the posterior communicating cerebral artery. Finally, laboratory workup was unremarkable, with normal metabolic profile and hepatorenal function.

MANAGEMENT

After evaluation by the heart team, although the patient was asymptomatic, medical therapy alone was deemed insufficient because of the already present severe thrombus formation, which conditioned a high risk of distal embolization and acute thrombosis with the consequent acute coronary syndrome. Moreover, the percutaneous coronary intervention was not feasible due to unsuitable anatomy for aneurism exclusion. Therefore, the patient was referred to cardiac surgery for aneurysmectomy.

The intraoperatory findings confirmed the imaging showing a GCAA (**Figure 2**), and the patient underwent elective aneurysm resection with the sparing of the right coronary artery ostium and subsequent interposition of a reversed saphenous vein graft with end-to-end anastomosis. An interposition vein graft technique was preferred instead of a coronary artery bypass to preserve coronary artery ostium for further angiography examination,[1,2] given the diffuse coronary artery disease (**Figure 3**).

DISCUSSION

CAAs were first described by Morgagni in 1761,[3,4] and since then many clinical cases have been reported, bringing a deeper understanding of this clinical entity. CAAs are a rare pathology, with an incidence of 0.2%-4.9% in the general population.[1] CAAs are defined as an irreversible dilation of 1.5 times more than the diameter of a healthy adjacent coronary artery considered as a reference point.[1,3] When a CAA exceeds the referent vessel dimension of >8 mm in diameter, this condition is called GCAA.[3] GCAAs are an even rarer condition, with an incidence of 0.02% in the general population.[1] However, there is no consensus on the GCAA definition and the etiology remains mysterious.[3] The prevalent etiology among adults is atherosclerosis, which might reduce wall resistance to intraluminal pressure causing arterial dilation.[4] Other frequent causes of CAA are congenital forms and those associated

ABBREVIATIONS AND ACRONYMS

CAA = coronary artery aneurysm

CAE = coronary artery ectasia

CT = computed tomography

CT-CA = computed tomography coronary angiography

GCAA = giant coronary artery aneurysm

ICA = invasive coronary angiography

RCA = right coronary artery

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FIGURE 2 Intraoperative Finding of the Giant Coronary Artery Aneurysm

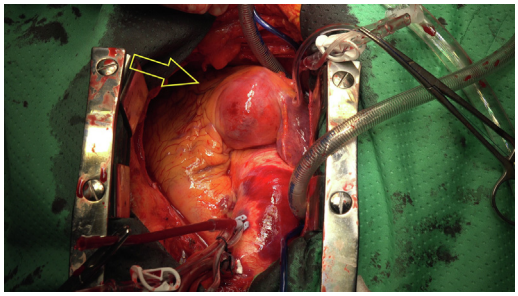
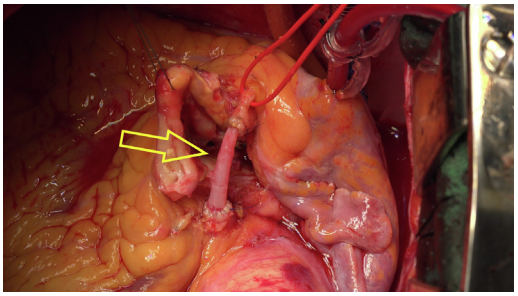


FIGURE 3 Intraoperative View of the Saphenous Vein Graft Interposed Between the Right Coronary Artery Ends



with vasculitis.[4] In this case, a giant right coronary artery aneurysm developed in the context of diffuse coronary artery ectasia (CAE), suggesting this to be a predisposing condition sharing a common pathophysiological pathway with CAAs and the usefulness of a serial follow-up in patients with CAE.[5] In addition, our patient presented with multiple vascular ectasias involving coronary arteries, intracranial vessels, and abdominal aorta suggesting a form of vasculitis.[6] For this reason, we referred him for a rheumatologic consult.

Our patient already presented with a large thrombus complicating GCAA, posing the question of how to treat asymptomatic patients with incidental finding of GCAA with ongoing complication amenable to fatal evolution. Due to the high risk of distal embolization and diffused coronary calcification, we decided on surgical intervention with the interposition of a reversed saphenous vein graft instead of a coronary artery bypass grafting technique, to preserve the coronary ostium for future ICA evaluations.[2,7]

Finally, there is no consensus on how to perform follow-up of asymptomatic patients at risk of developing a CAA. CT-CA could be a valuable strategy both for diagnosis and follow-up, because it is rapid, noninvasive, and brings high anatomical definition.[3]

FOLLOW-UP

The patient had an uneventful postoperatory recovery. ICA was performed before discharge, showing a similar size-match between the interposed saphenous vein graft and the native right coronary artery (Video 4). The patient is currently doing well, and the heart team decided for yearly follow up with CT-CA.

CONCLUSIONS

GCAAs may share common pathophysiological pathways with CAE and represent a dangerous evolution of it. Regular follow-up of patients with CAE based on anatomical examinations, such as ICA or CT-CA, may be useful to detect asymptomatic patients with new-onset GCAAs who may benefit from prompt treatment.

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KEY WORDS coronary artery aneurysm, coronary artery disease, coronary artery ectasia, giant coronary artery aneurysm, vascular disease

APPENDIX For supplemental videos, please see the online version of this paper.