Surgical Management of a Giant Right Coronary Aneurysm Presenting As An Inferior ST Elevation Myocardial Infarction

Joshua George Wiesner (jgwiesner2@gmail.com)
Aurora BayCare Medical Center https://orcid.org/0000-0002-5515-9356

Matthew A Schmidt
Aurora BayCare Medical Center

Alexander Roitstein
Aurora BayCare Medical Center

Case report

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Abstract

Background: A coronary artery aneurysm (CAA) is an uncommon finding, which can have several different cardiac presentations including an ischemic event or cardiac mass. If ruptured, a CAA can create a surgical emergency.

Case Presentation: A 79-year-old white male presented for evaluation of weakness. His ECG suggested acute inferior myocardial ischemia. Coronary angiography revealed a totally occluded mid portion of the right coronary artery (RCA) with suggestion of an aneurysmal segment. This was confirmed by computed tomographic imaging. After consideration of all options, the patient elected to underdo surgical intervention. The patient underwent removal of thrombotic material and a single vessel coronary bypass graft to the posterior descending artery. He had an uneventful post-operative course and recovered well.

Conclusions: A CAA can be a surgical emergency. In the following case, additional imaging and time allowed the surgical team to plan for surgical intervention. There is no uniform management for CAA, however, surgical intervention is often the strategy of choice, the specifics of which are dictated by each individual case.

Background

Coronary artery aneurysm (CAA) is an uncommon finding. Incidence varies between 0.3–5.3% (1). CAAs are defined as a coronary dilatation exceeding the diameter of the normal adjacent artery segments or the diameter of the patient's largest coronary artery by 1.5 times (1, 2). The exact mechanism by which CAAs develop is unknown. Known causes include atherosclerosis, connective tissue disorders and drug use (1). Their prevalence in coronary anatomy varies. The right coronary artery is most commonly affected, followed by the left anterior descending and the circumflex artery (1). Presentation is commonly incidental, but can also manifest as an ischemic cardiac event or a cardiac mass (3, 4, 5).

Case Presentation

A 79-year-old white male, with a history of former tobacco, with chronic kidney disease, and hypertension, was evaluated for weakness and diarrhea. ST elevation was noted on his ECG, suggesting acute inferior myocardial ischemia. Coronary angiography demonstrated a completely occluded RCA with an aneurysm in the mid portion of the vessel with collaterals from the left to right, as shown in images 1 and 2.

A transthoracic echocardiogram showed an ejection fraction of 35% with inferior wall hypokinesis. A CT angiogram of the chest showed a large, thrombosed right coronary aneurysm, as detailed in image 3. After a discussion of options, he agreed to surgery given the concern for possible future rupture.

He underwent general anesthesia and midline sternotomy with traditional cardiopulmonary bypass cannulation. Anterograde and retrograde cardioplegia were used. Intraoperative findings showed the aneurysm to be 7.0 cm, as shown in image 4. The aneurysm was linearly incised, and a copious amount

of thrombotic material was extracted as outlined in image 5. There were no perfusing branches found. The patient then underwent single vessel coronary artery bypass with saphenous vein graft to posterior descending artery. The proximal and distal ends were oversewn, as they were tested with anterograde and retrograde cardioplegia. He separated from cardiopulmonary bypass and had an uneventful postoperative course.

Discussion And Conclusions

Giant CAAs are a rare finding with no uniform management offered. A ruptured aneurysm can create a surgical emergency. In the case above, the imaging allowed the surgical team to plan accordingly. Surgical intervention is often the strategy of choice with details dictated by the specifics of each case, including the aneurysm's size, location, and pathophysiology (6, 7).

Abbreviations

CAA
coronary artery aneurysm
RCA
right coronary artery
LAD
left anterior descending artery

Declarations

Ethics approval and consent to participate: not applicable.

Consent for publication: The patient was contacted and agreed to participate in case report. See attached agreement forms.

Availability of data and materials: Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

Competing interests: All authors report that they have no conflicts of interest.

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Author contributions:

JGW reviewed literature, wrote, and organized case report.

MAS performed the coronary angiography in the case, provided images from various imaging studies and aided in editing of the final case report.

AR performed the surgical intervention outlined in case report, provided intraoperative images and aided in the editing of the final case report.

All authors read and approved the final case report.

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