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## Massive Giant Coronary Artery Aneurysm

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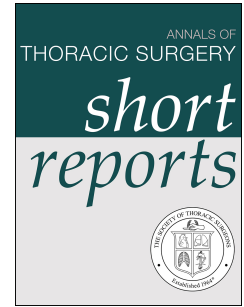
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## **Massive Giant Coronary Artery Aneurysm**

Running head: Giant Coronary Artery Aneurysm

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Patient Consent: Obtained

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**ABSTRACT**

The largest previously documented coronary artery aneurysm (CAA) in literature is recorded to be 5 x 7 cm. With the patient in this case's aneurysm measuring at 11.2 x 9.1 cm, it is significantly larger than what has been previously reported. Due to the lack of statistical data on CAAs, we propose a large-scale study be undertaken to better understand presenting symptoms, size classification, and treatment options for CAAs. Our case seeks to showcase the presentation and treatment of an exceptionally large CAA in order to begin to address the significant deficit in knowledge on this topic.

CAA is defined as a localized irreversible dilation of a coronary artery that is at least 1.5 times larger than the adjacent normal segment. While CAA itself is uncommon, even more rare is the giant CAA, which is at least four times the size of normal adjacent vessel or is greater than 8 mm in diameter (1). At present, there are no large randomized clinical trials that review data regarding diagnosis and treatment of CAAs. Due to this deficit in medical knowledge, workup and treatment must be created in a patient-by-patient case, utilizing multidisciplinary teams consisting of cardiologists, cardiothoracic surgeons, radiologists and internists (2). Literature review detailing clinical presentations, treatments, and outcomes of patients with giant CAAs indicates some of the largest CAAs to be 7 cm by 4 cm; 6 cm by 6 cm; or the largest yet to be 5 by 7 cm (2, 3, 4). Our case presents a patient with a 11.2 cm by 9.1 cm giant CAA, which presented with only mild neck pain and was successfully treated with coronary artery bypass graft (CABG).

This report presents a 76-year-old man with a history of dyslipidemia and emphysema who originally presented to his primary care physician with a 3-day history of left sided neck pain. After workup in the primary care physician's office, including thoracic ultrasound showing what appeared to be a large mass near or on the heart, the patient was sent to the emergency department. On arrival to the emergency department, the patient denied chest pain, dyspnea, and dizziness. Initial workup was all within normal limits (including electrocardiogram, troponins, complete blood count, and comprehensive metabolic panel), with exception of elevated brain natriuretic peptide (BNP) of 167 pg/mL. Further workup included a computed tomography angiography (CTA) chest, which revealed a large mass (estimated in size to be around 9.1 cm x 7.9 cm) in the region of the aortic annulus contiguous with the right atrium (Figure 1). Cardiac catheterization showed a "severe" right coronary artery (RCA) aneurysm (Figure 2). Surgical intervention was deemed necessary, as the risk of aneurysm rupture and subsequent bleeding in such a large aneurysm would be catastrophic.

The following operation is detailed in a stepwise manner in the included Supplemental Video attached to this report. In the operating room, percutaneous femoral-femoral bypass was achieved. Following sternotomy, the pericardium was divided, and the mass was fully visualized compressing the right ventricle and pushing the heart posterolaterally. Intraoperative measurement of the CAA was determined to be 11.2 cm by 9.1 cm (Figure 3). The RCA was tied off proximally and distally to the aneurysm, successfully achieving proximal distal control. The heart was arrested, the CAA excised, and bypass was performed using a left great saphenous vein graft. The patient was successfully weaned from cardiopulmonary bypass and was closed without complication.

The patient's postoperative course was uncomplicated. Follow-up CT showed the heart appeared within normal limits, without an aneurysm. The patient was discharged home on postoperative day nine due to health aid assignment delays. He did not have any medical complications that led to an extended hospital stay. When discharged, the patient was progressing well back to baseline. It has now been three months since his operation, and he is currently in excellent condition. He reports no shortness of breath, chest pain, neck pain, or exertional fatigue.

## COMMENT

This case showcases the presentation, workup, and treatment of a giant CAA, a rare disease process, not well discussed on a large scale in literature. A comprehensive study on CAA in adults could significantly benefit physicians in order to better understand the unique presentations, classifications, and treatment options for this disease process. This case is one of many that could assist in addressing the deficit in knowledge on CAAs in literature.

The patient presented with only neck pain, a very mild symptom that could easily have been overlooked by a less thorough primary care physician. Without proper clinical suspicion and workup, this patient could have potentially faced an aneurysm rupture, which almost certainly would have resulted in his death. Treating CAAs of this size is easily done with excision of aneurysm and CABG while on

percutaneous bypass. It would be our recommendation that this management is how most giant CAA are treated in the future, due to the ease of the procedure and excellent patient outcome.

*Acknowledgments*

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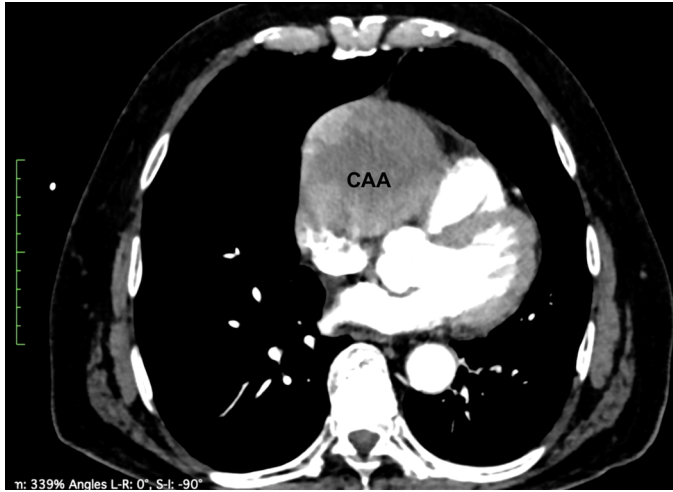


## **FIGURE LEGENDS**

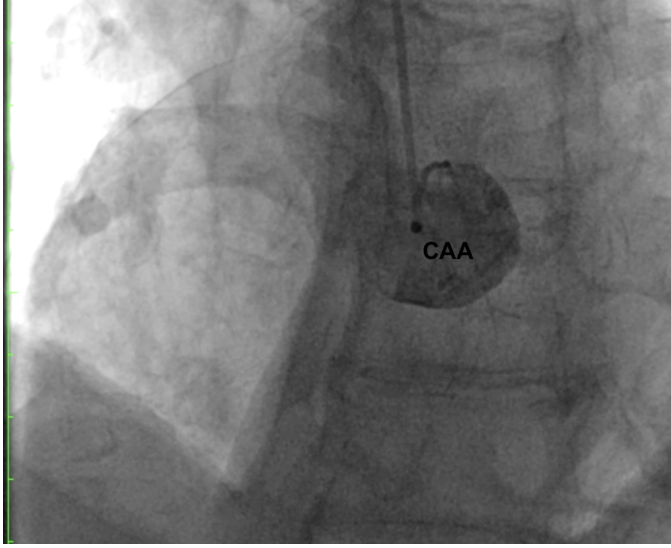
Figure 1: CTA scan of the chest showing the giant CAA, labeled as “CAA”.

Figure 2: Cardiac catheterization indicating filling of the giant CAA, seen in the center of the image, labeled as “CAA”.

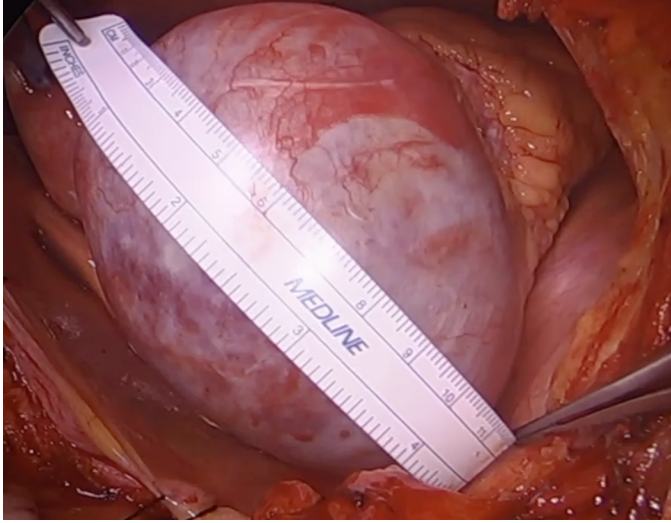
Figure 3: Intraoperative image indicating the size of the giant CAA prior to resection and CABG.



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**Declaration of interests**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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