

Bogusław Kapelak, MD, PhD  
Jerzy Sadowski, Prof. MD, PhD  
Karol Wierzbicki, MD, PhD  
Piotr Wegrzyn, MD  
Piotr Klimeczek, MD  
Krzysztof Bartus, MD  
Krzysztof Wróbel, MD

## **Giant Double Aneurysm (up to 10 cm Diameter) of the Right Coronary Artery: A Case Report**

### **Running Head: Giant Aneurysm of Right Coronary Artery**

**Olbrzymi podwójny tętniak prawej tętnicy wieńcowej – opis przypadku**

Department of Cardiovascular Surgery and Transplantology, Jagiellonian University, John Paul II Hospital, Krakow, Poland

**Słowa kluczowe:**

tętniak  
prawa tętnica wieńcowa  
usunięcie tętniaka

**Key words:**

aneurysm  
right coronary artery  
aneurysmectomy

*Acknowledgments*

*The authors thank Laurie LaRusso, MS, ELS, for writing assistance in the preparation of this manuscript with funding from ATS Medical, Inc. ATS Medical had no involvement with this case report.*

**Corresponding Author:**

**Adres do korespondencji:**

Piotr Wegrzyn, MD  
Department of Cardiovascular Surgery and Transplantology  
Jagiellonian University, John Paul II Hospital  
Prądnicka 80 str. 31-202  
Krakow, Poland  
Phone: 0048 12 614 30 75  
Fax: 0048 12 423 39 00  
e-mail: peter-wegrzyn@o2.pl

**We report on the diagnosis, the course and outcomes of surgical management of a coronary artery aneurysm (CAA).**

*W pracy opisano diagnostykę oraz wynik leczenia operacyjnego pacjenta z olbrzymim, podwójnym tętniakiem prawej tętnicy wieńcowej (CAA).*

### **Introduction**

Saccular coronary artery aneurysms (CAA) are relatively rare findings, occurring in 0.08 to 0.6% of coronary angiograms. As a group CAA (either saccular or fusiform) occur most frequently in the right coronary artery (RCA). Most CAA are of atherosclerotic origin and are asymptomatic, showing up during angiography performed for other reasons. Symptomatic CAA may present as angina, myocardial infarction, or sudden death, particularly when very large. Though not typical, CAA can be a cause of death when thrombosis or rupture occurs, which tends to be of greater concern with giant CAA [1-3].

Ejection fraction (EF) of 40% was documented in the preoperative echocardiography.

The resection procedure was carried out in extracorporeal circulation with general hypothermia 28 degrees C and crystalline cardioplegia administration. Both aneurysms were resected intraoperatively and the RCA was completely closed. Due to total occlusion of the distal segments of the PDA, vessel grafts were not performed.

The perioperative period was complicated by severe low cardiac output with an episode of cardiac arrest a few hours post procedure. During postoperative treatment, the patient required an aggressive pharmacologic regimen (high doses of dobutamine, epinephrine and norepinephrine) and intra-aortic balloon pump (IABP) support for 14 days. The patient was discharged from the hospital 28 days post procedure. On follow-up (after three weeks later), his cardiac disease was classified as New York Heart Association (NYHA) Class II; his EF was 30%.

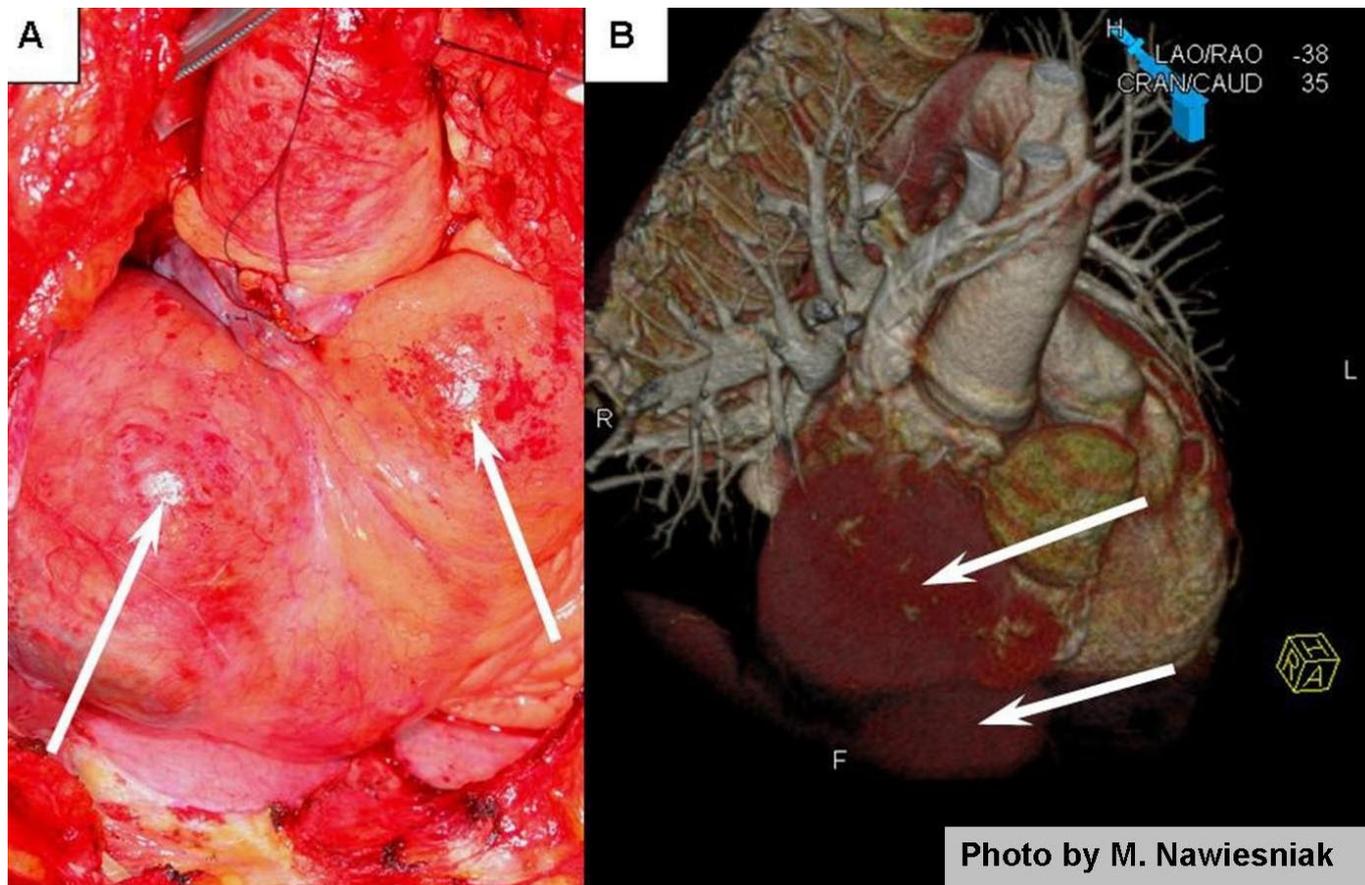
### **Case Report**

[Patient consent to publication of his case]

A 73-year-old man was admitted to the hospital after two saccular coronary aneurysms (10 x 7 cm and 4.3 x 4.2 cm) of the RCA were diagnosed on multi-slice computed tomography (CT). The patient's medical history includes long-term hypertension, abdominal aortic aneurysm after heart infarct in 2007, and VDD pacemaker implantation in 2005. The aneurysms were initially identified on angiography in 1998. The patient presented intermittently with signs of angina pectoris and weakness for about 10 years. Repeat angiography in 2007 revealed the LAD and circumflex were without critical stenosis. The RCA was closed distally with presence of the two saccular, atherosclerotic aneurysms affecting long stretches of the RCA and posterior descending artery (PDA) (see Figure 1). Collateral circulation was well developed.

### **Comment**

CAA may be managed medically with antiplatelet/antithrombotic therapy, percutaneously with special stent placement, or surgically with either aneurysm ligation and distal bypass, isolated CABG, aneurysm plication, saphenous vein patch repair, or aneurysmectomy (resection) [1]. At present, the majority of published research is on surgical repair, with medical management supported by anecdotal evidence, and PTFE stenting being a newer treatment option that appears to be more suited to CAA < 10 mm in diameter [2].



**Figure 1**  
**(A) Huge aneurysms of RCA as shown on angio CT. (B) Intraoperative view. (arrows indicate aneurysms).**

Selection of treatment is based on etiology, associated symptoms, severity of existing CAD, and complications caused by the aneurysm, which may include slow flow within the aneurysm leading to thrombus formation with vessel occlusion, thromboembolism, and myocardial infarction. Other potential complications include formation of AV fistula, vasospasm, and, rarely, acute rupture requiring prompt surgical intervention [1,2,4,5]. Indeed, research to date shows that most CAA do not rupture and underlying CAD, rather than the CAA, appears to be the causative factor leading to MI in patients with CAA [1]. In cases of giant CAA, however, published literature indicates that surgical repair is the treatment of

choice, most often surgical resection with CABG or coronary artery reconstruction [2,3].

In our case, surgical resection was successfully performed on two CAA associated with distal closure of the RCA, though CABG was not performed due to total occlusion of the distal segments of the PDA. Our patient recovered from surgery and was discharged in good condition, though the peri- and postoperative periods were fraught with cardiac complications requiring aggressive pharmacologic and mechanical intervention.

With the increasing availability and utilization of high-resolution CT and MRI scan, diagnosis of CAA will no doubt

become more frequent and evidence-based management strategies for the various types of CAA will be needed.

#### References

1. **Chrissoheris MP, Donohue TJ, Young RS, Ghantous A.** Coronary artery aneurysms. *Cardiol Rev* 2008; 16: 116-123.
2. **Cohen P, O'Gara PT.** Coronary artery aneurysms: a review of the natural history, pathophysiology, and management. *Cardiol Rev* 2008; 16: 301-304.
3. **Ramos SG, Mata KM, Martins CC, Martins AP, Rossi MA.** Giant right coronary artery aneurysm presenting as a paracardiac mass. *Cardiovasc Pathol* 2008;17: 329-333.
4. **Celebi H, Duran C, Catakoglu AB, Gulbaran M, Demiroglu C, Aytakin V.** Thrombosed giant right coronary artery aneurysm. *Anadolu Kardiyol Derg* 2007; 7: 350-351.
5. **Ozler A, Tarhan IA, Kehlibar T et al.** Resection of a right coronary artery aneurysm with fistula to the coronary sinus. *Ann Thorac Surg.* 2008; 85: 649-651.