

A case of multiple giant right coronary artery aneurysms

Kazimierz Radwan^{1, 2}, Ewa Peszek-Przybyła³, Paweł Buszman^{1, 3}, Maciej Sosnowski^{2, 3}

¹Coronary Care Unit, Silesian Medical Centre, Katowice, Poland

²Unit of Noninvasive Cardiovascular Diagnostics, Silesian Medical Centre, Katowice, Poland

³3rd Chair and Division of Cardiology, Medical University of Silesia, Katowice, Poland

Abstract

Coronary artery aneurysm is a rare congenital or acquired anomaly. The commonest location of coronary artery aneurysms is the right coronary artery and they are found slightly more often in males. We report an unusual case of multiple and extremely large aneurysms, therefore potentially at risk of rupture or thrombosis. (Cardiol J 2011; 18, 4: 434–436)

Key words: right coronary artery, coronary artery aneurysms, multiple aneurysms, multirow detector computed tomography

Introduction

Coronary artery aneurysm is a rare congenital or acquired anomaly (Kawasaki disease or atherosclerosis). The commonest location of coronary artery aneurysms is the right coronary artery (RCA) and they are found slightly more often in males. The aneurysms could be single or multiple, may produce symptoms or may be asymptomatic even though hazardous; they can cause sudden cardiac death, thrombus formation in aneurysm lumen, aneurysm rupture with vessel obstruction or embolization, or even fistula formation [1, 2].

Case description

A 73-year-old male, a smoker with a history of hypertension, hyperlipidemia, gout and chronic stable angina pectoris, after implantation of DDD type pacemaker and diagnosed multiple aneurysms (coronary arteries, abdominal aorta, iliac arteries), presented with girdle chest pain radiating to right upper arm (angina status CCS class II). The patient had no history of injury, connective tissue disease, rheumatic fever nor any family history of such.

Laboratory exams performed on admission to the hospital showed no abnormalities. A 12-lead electrocardiogram (ECG) showed neutral axis, rate 78 BPM, DDD stimulation.

Transthoracic echocardiography revealed ejection fraction of 45%, enlargement of left atrium (43 mm, area 22 cm²) and right ventricle (28 mm), mitral and tricuspid insufficiency (grade I) and presence of electrode in right ventricle. Coronary angiograms revealed 'cloudy' areas with blurred borders, which suggested the presence of RCA aneurysms (Fig. 1).

Multi-slice computed tomography (64-detector row MSCT) performed using Toshiba Aquilion 64, showed Calcium score of 7,049 Agatston units, intramural calcifications within RCA and three visible RCA aneurysms: proximal (diameter 40 mm), medial (32 mm) and last one (82 mm) compressing the right atrium, right ventricle, superior and inferior vena cava. The aneurysms were lined with mural thrombi (Fig. 2–4). Left main artery width was 10 mm with calcifications resulting in diameter stenosis about 30%. Left anterior descending artery was dilated up to 14 mm in segment 7, other segments presented massive calcifications and multilevel stenoses up to 60%. Circumflex artery

Address for correspondence: Kazimierz Radwan, 3rd Coronary Care Unit, Silesian Medical Centre, ul. Ziołowa 47, 40–635 Katowice, Poland, tel/fax: +48 32 252 72 12, e-mail: kradwan@neostrada.pl

Received: 23.07.2009

Accepted: 14.02.2010

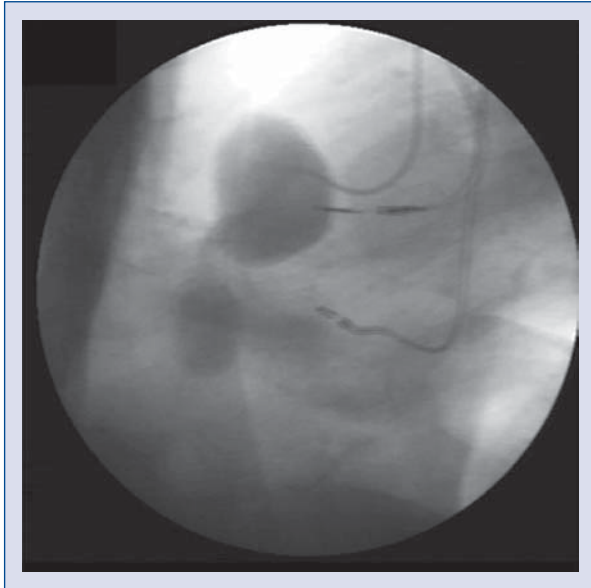


Figure 1. Invasive coronary angiography of right coronary artery demonstrating two aneurysms; the third, giant, one is not visible.

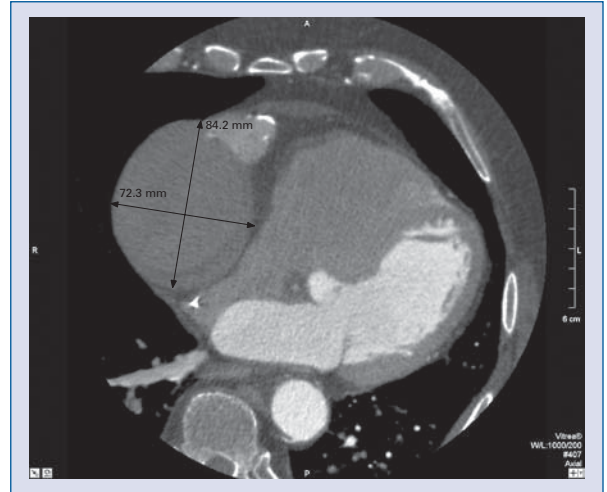


Figure 3. Axial-section computed tomography — right coronary artery aneurysm (dimensions 72.3 × 84.2 mm) with intramural thrombi.

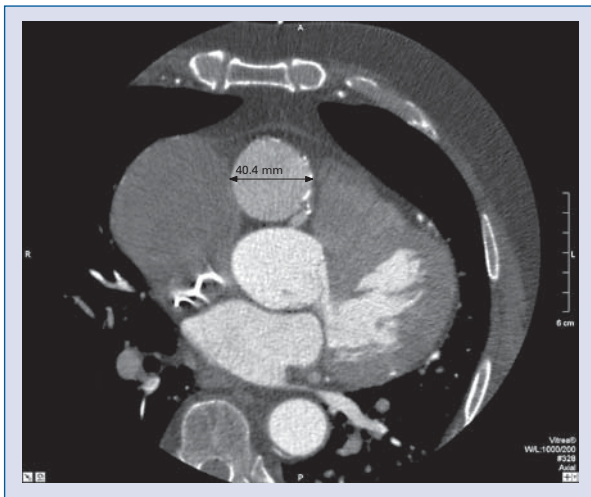


Figure 2. Axial-section computed tomography demonstrating right coronary artery origin with proximal aneurysm (diameter 40.4 mm). A second moderate aneurysm is visible.

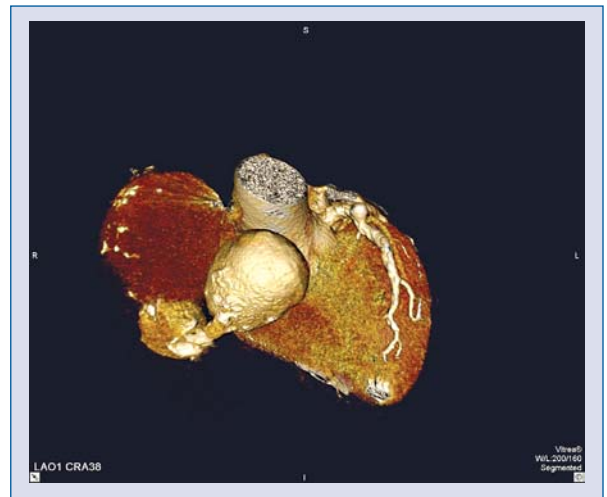


Figure 4. Three-dimensional heart reconstruction: clearly visible are two right coronary artery aneurysms, the third giant aneurysm is less contrasted.

was narrow, with insignificant stenoses. Marginal branch artery diameter was 5 mm with multiple mixed plaques causing stenoses up to 40%.

The patient was successfully operated upon using standard anesthetic techniques, through a median sternotomy, with standard cardiopulmonary bypass and 28°C systemic hypothermia with

cardioplegia. The right coronary artery aneurysms were excised and RCA was underpinned. In the course of post-operative treatment, the patient required administration of catecholamines and intra-aortic balloon pump. This procedure could be performed because of the exact visualization of the aneurysms in computed tomography.

Discussion

Small atherosclerotic coronary artery aneurysms are a relatively frequent finding at angiography. We report an unusual case of multiple, and extremely large, aneurysms, therefore potentially at risk of rupture or thrombosis. Only such aneurysms are an indication for surgery. In older patients, such aneurysms are usually caused by atherosclerosis, but they may be a consequence of coronary artery intervention, inflammation (systemic lupus erythematosus, polyarteritis nodosa, Takayasu's arteritis, Marfan's syndrome, Ehlers-Danlos syndrome, Lyme borreliosis, syphilis) or congenital fistula. In Asia, such aneurysms are mostly caused by Kawasaki disease [2–4].

Our patient had definitely generalized atheromatous disease in his coronary arteries, suggesting that his aneurysms had an atheromatous cause (there was no history to suggest Kawasaki disease or other inflammatory diseases).

Invasive imaging with coronary angiography suggested the diagnosis, but was not diagnostic. The diagnostic test was the MSCT revealing the accurate anatomy, size and position of aneurysms, which was helpful during defining the range of surgical procedure.

The best management strategy for coronary artery aneurysms has not been established. It is recommended that patients be managed individually according to the location of the aneurysm and the clinical context [1–4].

We preferred the surgical option, since the patient was symptomatic and there were multiple and giant aneurysms. With such aneurysms,

there is a risk of rupture or myocardial ischemia due to mural thrombi and the possibility of distal embolization.

Several cases of coronary artery aneurysm have been described. Our case is rare and interesting because of its multiplicity and extremely large size. MSCT coronary angiograms should be considered as a basic diagnostic tool in cases of coronary artery aneurysm.

Conclusions

MSCT coronary angiography represents an ideal, non-invasive imaging modality for the diagnosis of coronary arteries malformations, complementing invasive coronary imaging. Its use in the management algorithm should be considered.

Acknowledgements

The authors do not report any conflict of interest regarding this work.

References

1. Everett M, Holper E, Lang R. Giant coronary aneurysm. *Am J Geriatr Cardiol*, 2006; 15: 394–395.
2. Luz A, Silveira J, Carvahlo H, Gomes L. Right coronary artery aneurysm. *Intern J Cardiol*, 2006; 114: e122–e123.
3. Banerjee P, Houghton T, Walters M, Kaye GC. Giant right coronary artery aneurysm presenting as a mediastinal mass. *Heart*, 2004; 90: e50.
4. Manghat NE, Morgan-Hughes GJ, Cox ID, Roobottom CA. Giant coronary artery aneurysm secondary to Kawasaki disease: Diagnosis in an adult by multi-detector row CT coronary angiography. *Br J Radiol*, 2006; 79: e133–e136.