



Multiple giant calcified aneurysms of three coronary arteries

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To the Editor,

Coronary aneurysms, which are dilations of the coronary arteries (diameter > 1.5 times their reference diameter), are rare (prevalence rate approximately 0.3% to 5.3%) [1]. Although inflammatory disorders (Kawasaki's disease), connective tissue diseases (Marfan's syndrome), infections, and/or trauma are common etiologies [2], atherosclerosis accounts for approximately 50% of cases [3].

We report a case of giant coronary aneurysms of three major coronary arteries (diameter > 4 times the reference diameter or > 8 mm in diameter) [4].

A 39-year-old asymptomatic man without relevant medical or family history and/or risk factors for coronary artery disease presented to our hospital after cardiac computed tomography angiography (CTA) performed during medical checkup revealed a completely occluded thrombotic giant calcified aneurysm in the proximal left anterior descending artery (LAD) (Fig. 1A, long arrow), a thrombotic giant calcified aneurysm in the proximal left circumflex artery (LCX) (Fig. 1B, short arrow), a giant calcified aneurysm with a mixed plaque in the proximal right coronary artery (RCA) (Fig. 1C, long arrowhead), and a giant aneurysm in the mid RCA (Fig. 1C, short arrowhead). Although a baseline electrocardiogram and two-dimensional echocardiography were normal (Fig. 2), single

photon emission computed tomography (Fig. 3A and 3B) documented myocardial ischemia in the LAD territory (Fig. 3C). Following admission, his laboratory data showed: low density lipoprotein 81 mg/dL, high density lipoprotein 38 mg/dL, total cholesterol 134 mg/dL, homocysteine 8.59 μ mol/L, and high sensitivity C-reactive protein 0.02 mg/dL. Fluoroscopy-guided coronary angiography (CAG) showed egg-shaped calcification in each coronary artery aneurysm (Fig. 1D, each arrow in panel D, E, F corresponds to the same arrow in CTA images). CAG revealed chronic complete occlusion and a giant calcified aneurysm in the proximal LAD that was supplied via collaterals from adjacent coronary arteries, a giant aneurysm in the proximal LCX with good distal flow (Fig. 1E), a giant calcified aneurysm in the proximal RCA, and aneurysmal dilatation in the mid RCA (Fig. 1F), and he underwent coronary arterial bypass grafting (CABG).

Approximately 40% to 87% of coronary aneurysms involve the RCA, and three-vessel, or left main coronary artery involvement, and/or giant aneurysms are rare [1]. We reckon ours is the first reported case in an asymptomatic young patient, without risk factors for common etiologies of coronary aneurysms and/or symptoms suggesting coronary artery disease, and rare causes such as Kawasaki's disease should be considered in the

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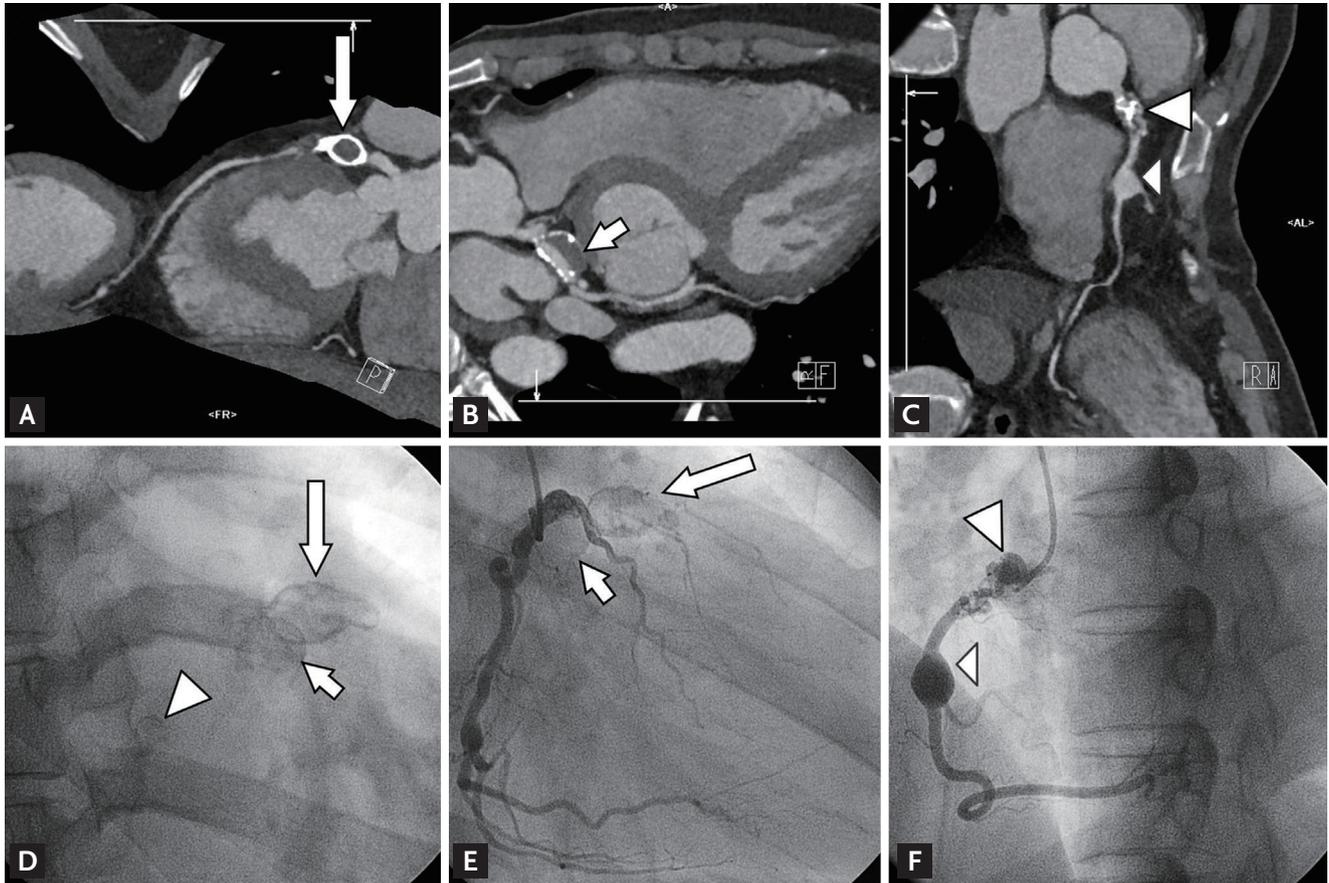


Figure 1. Computed tomography angiography (CTA) imaging and coronary angiography of the three coronary arteries. (A) The left anterior descending artery (LAD) showing a completely occluded thrombotic aneurysmal dilatation in the proximal LAD (long arrow). (B) The left circumflex artery (LCX) showing a thrombotic giant aneurysm in the proximal LCX (short arrow). (C) The right coronary artery (RCA) showing two aneurysms in the proximal (long arrowhead) and mid RCA (short arrowhead). (D) Fluoroscopy showing egg-shaped calcification in each of the three coronary artery aneurysms (each arrow in panel D, E, F corresponds to the same arrow in CTA images). (E) Coronary angiogram revealing a chronic complete occlusion with giant calcified aneurysm in the proximal LAD, a giant aneurysm in the proximal LCX with good distal flow. (F) A giant calcified aneurysm in the proximal RCA, and an aneurysmal dilatation in the mid RCA.

differential diagnosis.

Coronary aneurysms require treatment only when complicated by myocardial ischemia, rupture, or thromboembolism. Use of low-dose aspirin and/or inhibitors of adenosine diphosphate-induced platelet aggregation or anticoagulants for larger aneurysms is the usual treatment. Long-term outcomes of medical management alone are not consistently favorable and surgical treatment (aneurysmal ligation/plication, CABG) is preferred. Percutaneous stent deployment and coil embolization could be useful [1]. We performed CABG due to multiple proximally located large-sized aneurysms in a young patient. No consensus exists regarding treatment of multiple giant coronary aneurysms in adults. Mechanisms underlying their formation including a molec-

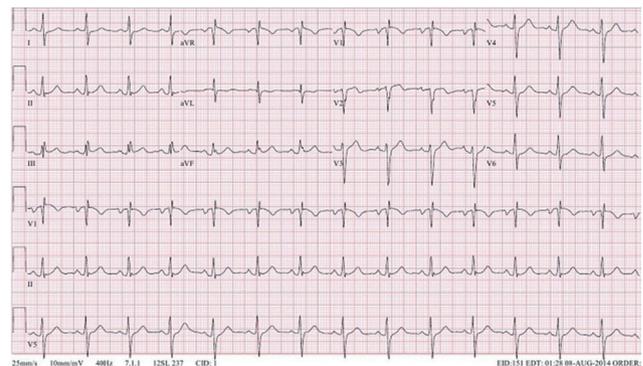


Figure 2. Baseline electrocardiogram.

ular basis (a possible role of matrix metalloproteinases [MMPs]) are being investigated. Lamblin et al. [5] report

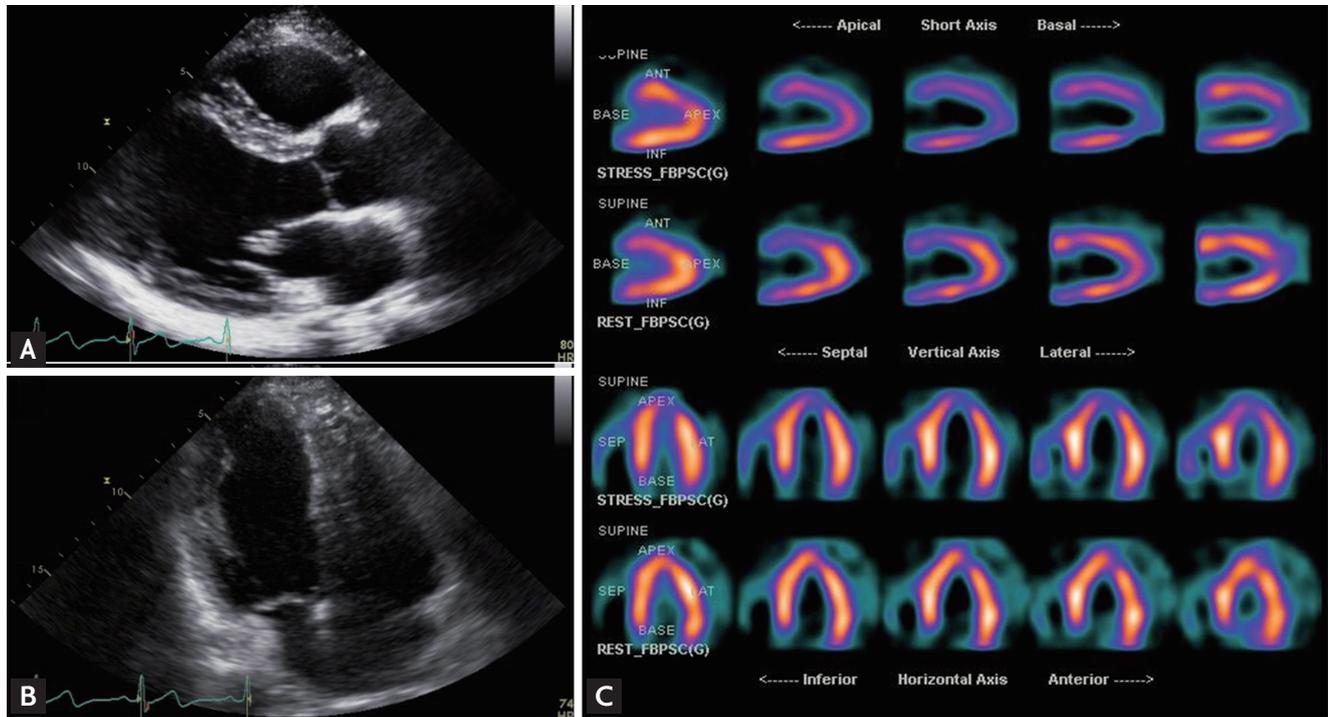


Figure 3. Two-dimensional echocardiogram shows no abnormality (A, B) and single photon emission computed tomography (C: stress images above and resting images below) shows myocardial ischemia in the left anterior descending artery territory.

that the 5A/5A genotype of MMP-3 was significantly more frequent in patients with coronary aneurysms than in controls. Large-scale clinical studies are required to establish common treatment guidelines for this disease.

Keywords: Aneurysm; Coronary disease

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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REFERENCES

1. Cohen P, O'Gara PT. Coronary artery aneurysms: a review of the natural history, pathophysiology, and management. *Cardiol Rev* 2008;16:301-304.
2. Li D, Wu Q, Sun L, et al. Surgical treatment of giant coronary artery aneurysm. *J Thorac Cardiovasc Surg* 2005;130:817-821.
3. Syed M, Lesch M. Coronary artery aneurysm: a review. *Prog Cardiovasc Dis* 1997;40:77-84.
4. Eshtehardi P, Cook S, Moarof I, Triller HJ, Windecker S. Giant coronary artery aneurysm: imaging findings before and after treatment with a polytetrafluoroethylene-covered stent. *Circ Cardiovasc Interv* 2008;1:85-86.
5. Lamblin N, Bauters C, Hermant X, Lablanche JM, Helbecque N, Amouyel P. Polymorphisms in the promoter regions of MMP-2, MMP-3, MMP-9 and MMP-12 genes as determinants of aneurysmal coronary artery disease. *J Am Coll Cardiol* 2002;40:43-48.