CASE REPORT

Right coronary artery aneurysm: an unusual cause of chest pain

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SUMMARY

Giant coronary artery aneurysm is an uncommon but well-recognised entity in infants and children with Kawasaki disease. We describe an unusual case of ischaemic cardiomyopathy in an 86-year-old woman owing to giant aneurysm in a dominant right coronary artery discovered with left heart catheterisation and was missed on ECG and nuclear studies. This case highlights the importance of early diagnosis which allows appropriate management. Transcatheter therapy is the main treatment option in this case; however, medical therapy can be used alone with variable results and outcome.

BACKGROUND

Giant coronary artery aneurysm is known as an enlargement of the diameter of one or more coronary artery segment to four times the normal limit. It has been well described in the paediatrics medical literature, especially children with Kawasaki's disease. It is extremely rare in adults with atherosclerosis being the most common aetiology. Left cardiac catheterisation is the standard diagnostic method. Thromboembolic events, compression of adjacent structures or ruptures are possible complications that usually require surgical intervention. In this case, we provide diagnostic, therapeutic and prognostic key features to giant coronary artery aneurysm in an adult patient.

CASE PRESENTATION

A 86-year-old woman with a history of coronary artery disease, hypothyroidism, sick sinus syndrome status post pacemaker placement and hyperlipidemia presented to our hospital with a 4 month history of shortness of breath, chest pain, fatigue and decline in functional capacity. She denied legs swelling, appetite or weight changes. Medications include aspirin, lisinopril, carvedilol, simvastatin and levothyroxine. On examination, vital signs were normal, normal heart sounds and mild crackles in both lung fields with no jugular vein distension. Initial laboratory workup showed normal complete blood count, complete metabolic panel, serum Troponin and thyroid stimulating hormone.

INVESTIGATIONS

ECG showed atrial paced rhythm with no evidence of acute ischaemic changes. Echocardiography was significant for mildly dilated left ventricle and a decline in ejection fraction to 28% (compared to 60% 3 months prior). Pharmacological stress test with nuclear imaging was performed and revealed

large and severe fixed perfusion defect in left circumflex and right coronary artery territories, severe systolic left ventricular dysfunction with no evidence of inducible ischaemia. Left ventricular ejection fraction was 26% with evidence of severe and extensive scar in the territory of the left circumflex artery and right coronary artery with no evidence of hibernation.

TREATMENT, OUTCOME AND FOLLOW-UP

Left heart catheterisation showed a very large and dominant right coronary artery that provides supply to the entire lateral wall with severe aneurysmal dilation involving the entire course to the bifurcation with largest diameter of 1.5 cm (figure 1). It also showed mild aneurysmal dilation in the proximal to mid portion of left anterior descending artery with mild irregularities (figure 2). Giving the patient's age and multiple comorbidities, he was managed medically with anticoagulation, antiplatelets and diuretics and discharged to cardiac rehabilitation centre on clopidogrel and coumadin. Since then, the patient has been doing well with good functional capacity.

DISCUSSION

Coronary artery aneurysm (CAA) is recognised as an enlargement in diameter of one or more coronary artery segment(s) to 1.5 times the diameter of other normal segments. CAA occurs mainly in men and affects only single artery. Although an accurate

Figure 1 Caudal view of left heart catheterisation showing severe dilation of the right coronary artery representing giant aneurysm.

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Figure 2 Mild aneurysmal dilation in the proximal to mid portion of left anterior descending artery with mild irregularities.

definition is not final yet, giant coronary aneurysm (GCAA) is defined when this enlargement is big enough to reach four times the normal diameter. The exact mechanism of aneurysms is not clear, but local vessel wall injury with genetic predisposition is the possible culprit. GCAA is divided into acquired (atherosclerotic and non-atherosclerotic) and congenital according to aetiology. Acquired non-atherosclerotic GCAA is usually seen in vasculitis disorders (Kawasaki disease), connective tissue disorders (systemic lupus erythematosus), infectious disorders (syphilis, Lyme disease and Epstein-Barr virus infection), trauma, drug abuse (cocaine) and iatrogenic cases. Most cases of GCAA affect the right coronary artery close to the right atrium giving the weakness of that area. The size of aneurysm is the main predictor of symptoms and complications⁴ and may lead to blood pooling inside the aneurysm resulting in thrombus formation and distal embolisation. As a result, coronary artery disease (stable or unstable angina, acute myocardial infarction), congestive heart failure or sudden cardiac death may develop. No enough data are available in the literature regarding treatment; the aneurysm size and the presence or absence of

symptoms might be the main decision-making factors. Small and asymptomatic CAA can be treated medically with antiplatelet and anticoagulation medications to prevent thromboembolic complications with no evidence of mortality benefit.^{1–4}

Learning points

- ▶ Giant coronary aneurysm (GCAA) is extremely rare with an incidence rate of less than 0.02% of all coronary artery angiographies and with most cases recognised in infants and children with Kawasaki's disease.
- ▶ Acquired atherosclerotic GCAA is the most common type in adults (accounts for 50% of cases) with most cases occurring in the old age group (60–80).
- ▶ Left heart catheterisation provides an accurate anatomical information of the aneurysm, detects associated anomalies and directly treats the culprit lesion.
- ▶ Giant and symptomatic coronary artery aneurysm is treated with surgical intervention (stent implantation, surgical exclusion using resection or ligation technique). GCAA has 71% 5 years survival.

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Competing interests None.

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