A 15-cm aneurysm of the right coronary artery presenting as a pericardial cyst

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Abstract

We report an unusual case of a giant right coronary artery aneurysm, measuring 15 cm in diameter, in a 76-year old woman. The aneurysm was initially identified when the patient was investigated for signs of congestive cardiac failure with a computed tomography scan of her thorax; at this stage, the lesion was misdiagnosed as a large pericardial cyst. The aneurysm was successfully excised at surgery and her heavily diseased right coronary artery was secured with a saphenous vein graft.

Keywords: Right coronary artery aneurysm • Giant aneurysm • Pericardial cyst

INTRODUCTION

Large aneurysms of coronary arteries are an uncommon occurrence. They are mainly caused by atherosclerotic changes, although it can also arise due to infective, inflammatory or connective tissue disorders. First described by Morgagni in 1761 [1], a coronary artery aneurysm is defined as the dilation of the normal coronary diameter to 1.5 times the size of a normal adjacent coronary artery segment. We discuss the presentation and treatment of a patient with a 15-cm right coronary artery aneurysm, which we believe is the largest reported coronary aneurysm to date.

CASE REPORT

A 76-year old woman suffering from dilated cardiomyopathy and paroxysmal atrial flutter for over 15 years was referred by her primary-care physician for investigation of symptoms of shortness of breath, orthopnoea and ankle oedema. She was diagnosed with heart failure and commenced on appropriate medications providing good symptomatic relief. An echocardiogram performed at this time identified a moderate reduction in left ventricle function but also noted a large cystic lesion outside of the heart adjacent to her right atrium. She underwent a computed tomography (CT) scan of her thorax which showed a large pericardial cyst (Fig. 1).

As the lesion was deemed a pericardial cyst, the patient was admitted to thoracic surgery for excision via median sternotomy. During the procedure, the lesion was found to be intrapericardial, the misdiagnosis was recognized early and she was transferred directly to cardiac surgical theatres, while still intubated, for formal excision of the aneurysm.

A saccular aneurysm of 15 cm in diameter was found to be arising from the right coronary artery, extending to the crux. The right atrium was significantly compressed by the aneurysm which lay in the atrioventricular groove. The left and right ventricles were both compressed on transoesophageal echocardiogram. Due to difficult anatomy, cardiopulmonary bypass was established via right femoral inflow and right femoral venous cannulations, as the heart was still ejecting a Pacifio cannula was used to drain the superior vena cava directly. The patient was cooled to 25°C and the aorta cross-clamped, the heart was arrested using cold cardioplegia via the aortic root. The aneurysmal sac was then partially resected and laid open to occlude any feeding vessels (Fig. 2).

The aneurysm appeared to have dissected as two distinct lumens were identified. Following the closure of the aneurysm, the posterior descending artery was grafted with a saphenous vein graft. The patient was rewarmed and was paced off cardiopulmonary bypass. The patient made a full recovery and was discharged on day 14. Post-operative histological examination showed widespread myxoid degeneration in the artery wall.

DISCUSSION

The coronary artery surgery study registry found an angiographic incidence of Right Coronary Artery at 4.9% in a large population group of 20 087 patients, [2] although a much lower incidence has been recorded by Daoud et al. [3] at 1.4% in a large autopsy series. As described in this case, the right coronary artery is the most commonly involved vessel [2]. Coronary artery aneurysms rarely rupture but when they do the results can be catastrophic [4].

There are a vast range of causes of coronary aneurysms; in the described case, there was significant myxoid degeneration; however, the majority of cases described are secondary to atherosclerotic lesions. Other causes include infective (e.g. Syphilis), autoimmune (e.g. Kawasaki’s disease), connective tissue disorders (e.g. Ehlers-Danlos syndrome), inflammatory (e.g. Takayasu’s
arteritis), blunt trauma to the chest and iatrogenic injuries (e.g. coronary artery stents) [5].

Since the events of this case, a paper reviewing the imaging modalities of pericardial pathology was published in 2010. It suggests using contrast-enhanced CT, as opposed to plain CT, in the workup of pericardial cysts. At time, imaging with CT and two-dimensional echocardiography did not raise the possibility of an aneurysm as a potential diagnosis. In hindsight, the use of intravenous contrast enhancement, or coronary artery angiogram, would most likely have prevented this misdiagnosis. Although the diagnostic test of choice for coronary artery aneurysms is angiography, this more invasive study was not indicated at this time [6].

Due to the infrequency of cases, no randomized control trials have been carried out looking at the management of giant coronary artery aneurysms. For aneurysms, measuring <20 mm anticoagulation has been the mainstay treatment [7]. Another treatment modality described in the management of ‘non-giant’ coronary artery aneurysms is the use of percutaneous coronary stents [8, 9]. Surgical intervention is the mainstay treatment for giant coronary artery aneurysms.

Although several cases of coronary artery aneurysms have been described previously in literature, this case is interesting due to its false presentation as a pericardial cyst and due to its immense size.

**Conflict of interest:** none declared.

**REFERENCES**