Surgical treatment of a pulmonary artery aneurysm

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Abstract

We would like to report a rare case of post-stenotic aneurysm of the pulmonary trunk and its left branch in a 51-year-old man. His cardiac disease, which was first diagnosed at the age of 4, was left untreated because of absence of symptoms and normal physical development. A CT scan, recently performed because of decrease in exercise tolerance and worsening dyspnea, showed a pulmonary artery aneurysm (52 mm × 79 mm). The echocardiography revealed a severe pulmonary commissural stenosis. Through a surgical approach the pulmonary trunk and its left branch were excised and reconstructed using a 30 mm Dacron graft; the right pulmonary branch was then reimplanted on the right side of the tube. The patient’s postoperative course was uneventful. He was discharged on the seventh postoperative day and there were no adverse events or complications at 1- and 3-month follow-up.

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1. Introduction

Pulmonary artery aneurysm is a rare condition that may be idiopathic or the result of several pathologies, such as congenital cardiac anomalies associated with pulmonary hypertension, pulmonary valve stenosis, Behcet’s disease and generalized vasculitis, infections and trauma [1,2]. Its natural history is still not well understood and there are no clear guidelines about its optimal management. We believe that surgical approach should be recommended because of the risk of dilatation and eventual rupture of the thin arterial wall.

2. Case report

We would like to report a case of post-stenotic aneurysm of the pulmonary trunk and its left branch in a 51-year-old man. The initial diagnosis of pulmonary valve stenosis was made when the patient was 4-year-old, following the discovery of a right parasternal holosystolic murmur. His life continued normally, with regular physical development, without symptoms and following periodical medical examinations. Recently, the patient was referred to our department because of worsening dyspnea and decrease in exercise tolerance; therefore a CT scan (Fig. 1A) was performed, showing an aneurysm of the pulmonary trunk and of its left branch (52 mm × 79 mm), a right pulmonary artery with normal dimensions and a dilatation of the right ventricle, without ventricular septal defect or pulmonary veins anomalies. Transthoracic echocardiography confirmed the dilatation of the pulmonary artery and revealed an associated severe commissural stenosis of the pulmonary valve (mean gradient 30 mmHg), with a satisfactory left ventricle function (EF 68%).

Surgery was performed through median sternotomy (Fig. 1B) and under normothermic cardiopulmonary bypass (CPB). A limited right atriotomy along the atrio-ventricular groove was performed in order to deliver retrograde cardioplegia through the coronary sinus; at the same time a patent foramen ovale was discovered and sutured with a 5-0 Prolene® running suture. After opening the pulmonary artery on its anterior face the pulmonary valve appeared stenosed, with a severe symphysis of the three commissures. A triple commissurotomy was carried out and the valve was then tested with a 25 mm diameter Hegar probe. The pulmonary trunk was then resected a few millimetres above the commissures and a 30 mm Dacron® tube was implanted with a 5-0 Prolene® running suture. The left pulmonary branch was finally reimplemented on the right lateral face of the Dacron tube with a termino-lateral 5-0 Prolene® running suture (Fig. 2A and B). The CPB and aortic cross-clamping times were

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101 and 79 min, respectively. The patient was weaned from CPB without inotropic support. The postoperative course was completely uneventful and the patient was extubated on the first post-operative day. The ICU stay was 2 days, the patient was discharged on the seventh postoperative day and there were no adverse events or complications at 1- and 3- month follow-up.

3. Discussion

Pulmonary artery aneurysm is a rare pathological condition, the management of which is not clearly established [1—5]. The most common symptoms are general weakness, dyspnea on exertion, cough and sometimes haemoptysis. Patients are often referred, especially when they are asymptomatic, for vascular dilatation seen on chest X-ray and the ultimate diagnosis may be made with transthoracic echocardiography, pulmonary angiography, magnetic resonance imaging or computerised tomography. A conservative treatment for this type of lesion may be advocated when the
patient has no symptoms and there are no associated congenital lesions, right ventricular dysfunction, significant pulmonary arterial hypertension or left to right shunt [5]. In the other cases, we believe that early surgical repair should be the treatment of choice because of the high risk of vessel dilatation and possible rupture, which may lead to death. Through the present case, we report a successful example of surgical repair in a post-stenotic form. In spite of the technical difficulties, especially due to the distal suture of the tube on a very thin vascular wall and in a poorly accessible area of the left pulmonary artery (a few millimetres upstream the origin of the lobar branches), the operation was satisfactory and the postoperative course of the patient was uneventful. Therefore, we can assert that our technically careful surgical approach, although not free from risks, allows long-term survival. The critical size of a pulmonary aneurysm associated with a high risk of rupture remains unknown, but in our opinion, even if the patient is asymptomatic, replacement of the whole dilated pulmonary artery is recommended, especially when congenital malformation of the valve and intrinsic arterial wall weakness lead to vessel wall remodelling.

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References