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RUPTURE OF SINUS OF VALSALVA ANEURYSM: CASE REPORT
A. G. B. Amoah, MBChB (UG), MRCP (E), PHD (SURREY), Department of Medicine and Therapeutics University of Ghana Medical School P.O. Box 4236, Accra. Ghana, National Cardiothoracic Centre, P.O. Box 77, Korle Bu. Accra. Ghana, K. Frimpong-Boateng, MBChB (UG) MD (Hanover), National Cardiothoracic Centre, P.O. Box 77, Korle Bu. Accra. Ghana and H. Baddoo MBChB(UG), FRCS, FRCA, Department of Anaesthesia, University of Ghana Medical School, P.O. Box 4236, Accra, Ghana.

Request for reprints to: A. G. B. Amoah, National Cardiothoracic Centre, Korle Bu Teaching Hospital, P. O. Box 77, Korle Bu, Accra, Ghana

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SUMMARY

Sinus of Valsalva aneurysms are uncommon. Aortic sinus aneurysm may be complicated by endocarditis or rupture. A 26 year old native Ghanaian presented with dyspnoea, raised jugular venous pressure (JVP), tender hepatomegaly, peripheral oedema, a thrill and a continuous murmur at the upper left sternal edge. Two-dimensional doppler echocardiography with colour flow mapping revealed a large aneurysm of the right sinus of Valsalva (4cm diameter) that abutted the right ventricular out-flow tract with distortion of the pulmonary valve. Colour flow revealed left to right shunting of blood from the aortic root into the right atrium. A year later he presented with a febrile illness, weight loss, night sweats and was diagnosed as having culture negative infective endocarditis. Following a course of antibiotics, he underwent successful cardiopulmonary bypass surgery with repair of the ruptured aneurysm of the right sinus of Valsalva.

INTRODUCTION

Sinus of Valsalva aneurysms are uncommon cardiac anomalies that may be congenital or acquired[1]. The congenital form is more common with an incidence of 0.1 to 3.5% of all congenital heart defects. Acquired aneurysms may be secondary to endocarditis, syphilis, trauma, Marfan's syndrome and senile dilatation[1]. The defect is typically single and starts as a blind pouch from a localised site in one of the aortic sinuses but rarely multiple sinuses may be affected(2). The usual sites of the defects are the right coronary and noncoronary sinuses, aneurysms of the left coronary sinus being relatively rare(3,4). Two dimensional echocardiography with colour flow provides an accurate non-invasive means of demonstrating the aneurysm and the left to right shunting following rupture(4-6). We present a case of ruptured congenital aortic sinus aneurysm which was diagnosed using two-dimensional echocardiography with doppler and colour flow. Our subject underwent successful cardiopulmonary bypass surgery with repair of the aneurysm.

CASE REPORT

A 26 year old native Ghanaian presented with dyspnoea and was found to be in right heart failure with raised JVP, tender hepatomegaly and peripheral oedema. At that time he was noted to have a thrill and a machinery murmur at the upper left sternal edge. Two-dimensional doppler echocardiography with colour flow mapping revealed a markedly dilated right atrium, normal cardiac valves, intact interatrial and interventricular septa and a moderate pericardial effusion. A large aneurysm of the right sinus of Valsalva (4cm diameter) was seen abutting the right ventricular out-flow tract (RVOT) with distortion of the pulmonary valve. The RVOT pressure gradient was 17 mm Hg. Colour flow revealed left to right shunting of blood from the aortic root into the right atrium. A diagnosis of rupture of a congenital aneurysm of the right sinus of Valsalva into the right atrium was made and the patient was managed conservatively with frusemide, spironolactone and digoxin and the cardiac failure resolved. Open heart surgery was discussed with the patient and his relatives. There was however some reluctance and delay for surgery.

A year later, he presented with a febrile illness, weight loss, night sweats and was found to have a tinge of jaundice, hepatomegaly and evidence of right heart failure. The spleen was not palpable. His blood pressure was normal. The fever had not responded to oral antibiotics prescribed by his local doctor. Blood film for malaria parasites was negative. The haemoglobin was 8.7 g/dl; ESR 95 mm/hr; wbc 12.1 x 109/l (N 78%; L 22%); Serum creatinine 240 mol/l; except for pyuria, urine microscopy was normal. Three sets of blood cultures did not grow any bacteria. A diagnosis of culture negative infective endocarditis was made and he received a six week-course of high doses intravenous penicillin, cloxacillin and reduced dose of intravenous gentamicin in view of the high serum creatinine. Four weeks into his antibiotic course, surgery was performed using cardiopulmonary bypass, moderate systemic hypothermia and cardioplegic cardiac arrest. At surgery, an aneurysm was found involving the right sinus of Valsalva. No infection was evident. After opening the root of the aorta the aortic valve ring, the leaflets and commissures were found to be normal. About 4mm to the right of the right coronary ostium, a 3mm aperture opened into a 5 cm aneurysm sac, which had ruptured into the right atrium. The opening in the right aortic sinus was closed with interrupted 4/0 ethibond suture, protected with teflon pledgets. The aneurysm and the right atrium were opened and the

communication between the two closed with 4/0 prolene running sutures. The sac of the aneurysm was plicated with 3/0 prolene continuous sutures. Subsequently the right atrium was closed. The post-operative course was uneventful and the patient was discharged home after two weeks. On review a year later, he was well.

DISCUSSION

Until they rupture, sinus of Valsalva aneurysms are usually asymptomatic. Rupture of an aortic sinus aneurysm may be associated with chest pain, difficulty in breathing, heart failure and rarely acute renal failure(7). In this regard, our patient had a typical presentation with dyspnoea, right heart failure and evidence of renal impairment. He did not however experience chest pain. He was male and less than 30 years old when he developed rupture of his aortic sinus aneurysm. In the 38 subjects with ruptured aortic sinus aneurysms reported by Islam *et al*(8), there was a preponderance of males, the mean age was 25.8 years and the predominant symptom was dyspnoea. Right aortic sinus aneurysm commonly ruptures into a ventricular chamber and less so into the right atrium(3,8). In the present case, the right sinus of Valsalva aneurysm ruptured into the right atrium. As illustrated by the present case, sinus of Valsalva aneurysm may rarely cause right ventricular outflow obstruction(12). The aortic sinus aneurysm in our patient at echocardiography was seen abutting the right ventricular outflow tract with distortion of the pulmonary valve. The RVOT gradient in the present case was however not significant. It is estimated that 26-50% of subjects with right sinus of Valsalva aneurysm may have an associated ventricular septal defect(8,9). The case presented had no ventricular septal defect either at echocardiography or at surgery. Usually the thrill and the associated continuous murmur of ruptured sinus of Valsalva aneurysm are said to be maximal at the lower left sternal edge(9). In the case presented, the machinery murmur was maximal at the upper left sternal edge simulating patent ductus arteriosus (PDA). However, on echocardiographic evaluation and at surgery no PDA was found. In addition to rupture, aortic sinus aneurysms may become thrombosed(10), be associated with systemic embolic phenomena(11,12), dissect into the interventricular septum, produce heart block(4), or be complicated by endocarditis(13). In the present case, blood cultures were negative despite the clinical diagnosis of infective endocarditis. The negative blood cultures may conceivably have been due to the antibiotic course prior to presentation. On account of the natural history(4,8,11-13), surgical correction is recommended for aortic sinus aneurysms(8,14). In the case presented, surgical repair was curative with absence of blood shunting from the aorta to right atrium on post-operative colour doppler echocardiography.

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