Bronchial obstruction secondary to aneurysm of a persistent ductus arteriosus

Abstract
A 4-month-old infant presented with aneurysm of patent ductus arteriosus (PDA) which was causing obstruction of the left main bronchus. The patient had elevated pulmonary vascular resistance (PVR) at 6.1 mmHg. The aneurysm was resected on cardiopulmonary bypass. The patient required phenoxybenzamine and prostacycline after the operation for elevated PVR. Postoperative progress was prolonged but 12 months after surgery the patient is well, growing normally without any respiratory symptoms. [Eur J Cardio-thorac Surg (1996) 10: 146-147]

Key words: Ductus arteriosus - Aneurysm - Bronchial obstruction

Case report
A 4-month-old infant presented with a history of recurrent respiratory tract infections and failure to thrive. Diagnosis of left main bronchus obstruction by aneurysmal dilatation of patent ductus arteriosus (PDA) was made. Physical examination demonstrated a loud second heart sound and a loud "machinery" murmur. There were no signs of congestive failure. She underwent routine laboratory investigations and a chest X-ray, which demonstrated prominent vascular markings and obstruction of the left main bronchus. Echocardiography demonstrated evidence of aneurysmal dilatation of a PDA, with left to right flow. Angiography confirmed the diagnosis of a large aneurysm of the PDA (Fig. 2) with a left to right shunt. The main pulmonary artery was also dilated. Pulmonary artery pressure was elevated at 77/43 mmHg with an oxygen (O2) saturation of 71%, and systemic pressure was 85/43 mmHg. The calculated Qp/Qs was 2.7:1.0 and the pulmonary vascular resistance (PVR) was elevated at 61.1 Wood units.

Operative repair was performed on 13th December, 1993. Through a median sternotomy, the aorta and right atrium were cannulated and cardiopulmonary bypass established. Prior to initiating bypass the patient was given phenoxybenzamine. The patient’s core temperature was cooled down to 28°C and the PDA was dissected. The aneurysm was approximately 3 cm in diameter and was compressing the left main bronchus. Operative repair was performed by placing vascular clamps on the aortic and pulmonary sides of the aneurysm, partially dividing the aneurysm and oversewing the divided ends with 6/0 Prolene prior to further dividing and oversewing the remaining aneurysm. On completion of the procedure, the great vessels were freed from the surrounding tissues, thus totally relieving the obstruction on the left main bronchus.

Histology of the aneurysm demonstrated normal elastic artery with no evidence of cystic medial necrosis, or dissection. At the completion of the operation, the right ventricular pressure remained elevated at 65/32 mmHg compared with systemic pressures of 72/40 mmHg. The patient was started on a prostacycline infusion for pulmonary vasodilation. After rewarming and decannulation, pulmonary artery and left atrial lines were placed. Routine chest closure was performed and the patient returned to the intensive therapy unit (ITU).

Postoperatively, the pulmonary artery pressures remained elevated at 60/40 mmHg, 20 mmHg below systemic pressures despite maximal therapy with prostacycline and phenoxybenzamine. Nitric oxide (5 parts per million) was initiated but was not effective. After 48 h, pulmonary artery pressures gradually diminished but remained elevated at 45/20 mmHg by the 12th postoperative day. The pulmonary artery catheter was removed and the patient weaned off the ventilator on the 13th postoperative day. Prostacycline was weaned following extubation. Her postoperative course was further complicated by pneumonia for which she was treated with antibiotics and chest physiotherapy. Thereafter, she was discharged home from hospital on the 33rd postoperative day.

Discussion
Aneurysm of the ductus arteriosus was first described by Martin in 1827 [8]. In the literature, ductal aneurysms have been described mainly in neonates [2-4, 6, 7, 10, 11] although older cases have also been cited [5, 9]. In neonates,
aneurysms are often closed at the pulmonary artery end but maintain patency at their aortic communication [3, 4]. Furthermore, the aneurysms often regress spontaneously. The latter phenomenon has been noted to occur prenatally in utero [7]. Ductus arteriosus aneurysms have a high incidence of rupture, infection, embolism and pulmonary hypertension [3]. Alternatively, the anomaly may present as an unusual mediastinal mass on chest X-ray or computed tomography (CT) examination [6, 10]. In neonates this should not be confused with the so-called “ductus bump” – a transient dilation of the ductus seen infrequently at the time of birth [1]. Successful surgical repair of ductal aneurysms has also been described in adult patients [5, 9] as have mortalities from rupture [2]. This case is reported to highlight obstruction of the left upper lobe bronchus with subsequent bronchomalacia as a complication of a ductal aneurysm. The presence of bronchomalacia along with intractable pulmonary hypertension subsequently led to a protracted ventilator-dependent course postoperatively.

References


