

PATENT DUCTUS ARTERIOSUS. IT IS NEVER TOO LATE TO CLOSE IT

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A 70- year- old man with history of diabetes mellitus, hypertension, hyperuricemia and permanent AF was referred to the Cardiology Department because of dyspnea and a previously unknown murmur, being diagnosed at this age of a patent ductus arteriosus (PDA). The echocardiography showed a slightly dilated left ventricle with moderately impaired ejection fraction (EF 40%).

The coronary angiography ruled out coronary disease. A cardiac catheterization and invasive oximetry run was performed, remarking an evident step- up in blood oxygen saturation between main pulmonary artery (blood oxygen saturation of 71.8%) and right ventricular outflow tract (blood oxygen saturation of 54.1%), arterial systemic pressure of 140/70mmHg, systolic pulmonar artery pressure (sPAP) of 44mmHg and an estimated Qp/Qs of 2.3. An interventional procedure was indicated in order to close the defect.

In this procedure, an attempt to cross antegradely through the PDA via right femoral vein with a mammary catheter was unsuccessful. The patient rejected cardiac surgery and missed regular follow-up since then.

Four years later, he presented to the emergency room with decompensated congestive heart failure and was admitted to our department.

On the physical examination, the cardiac auscultation showed a manifest continuous murmur in left subclavicular focus with a reinforced second sound. In the pulmonary auscultation vesicular sounds were decreased with bibasilar rales.

The echocardiography showed a very dilated left ventricle (LV) with severely impaired ejection fraction (EF 30%), a turbulent continuous flow in pulmonary artery with a significant left- to- right shunt (Image 1A), a dilated left atrium and severe mitral regurgitation secondary to LV remodelling with severe pulmonar hypertension (sPAP 61mmHg). The right ventricle (RV) was slightly dilated with preserved EF.

The Qp/Qs measured by echocardiography was 2.4. Due to the significant haemodynamic repercussion of the shunt, a new percutaneous procedure to try to close the PDA was indicated.

The initial angiography proved the presence of a 15 mm- diameter calcified duct between aorta and left pulmonary artery in the usual site for a PDA with evident contrast flow from aorta to left pulmonary artery (Image 1B).

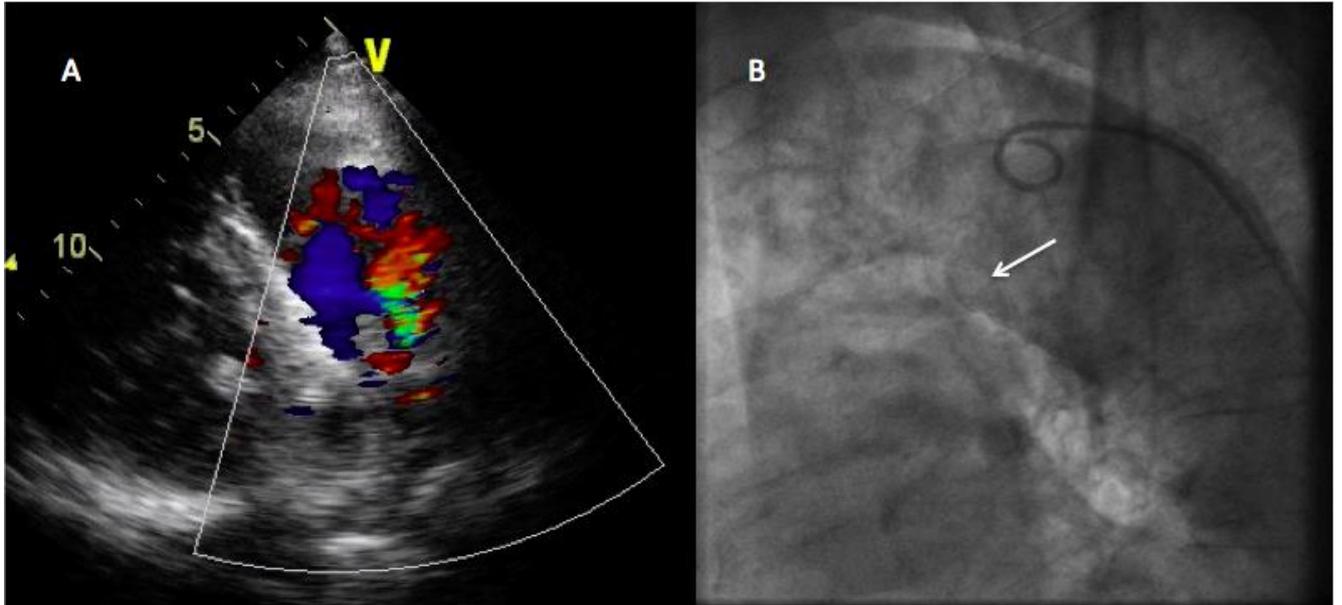


Image 1. A) Echocardiography showing Doppler- color signal corresponding with PDA. B) Angiography with a white arrow pointing the PDA.

A Radifocus 0.035", 260 cm. Terumo® guidewire was used via right femoral artery, reaching retrogradely the left pulmonary artery through the PDA and finally creating an arteriovenous loop through right femoral vein. A 14- 16mm Amplatzer Duct Occluder I®, the biggest device available, was successfully placed through right femoral vein, achieving almost a complete closure of the duct (Image 2A).

The patient was discharged from hospital in a good clinical situation without complications, under treatment with warfarin, furosemide, ramipril, eplerenone and allopurinol.

Six months later, the patient had experienced a substantial improvement of his functional grade, currently II/IV. The correct position of the device was checked with a cardiac computed tomography (CT) (Image 2B). The echocardiography showed a slightly dilated LV with almost normal EF (50%), a mild mitral regurgitation with normal pulmonary pressure (sPAP 37mmHg).

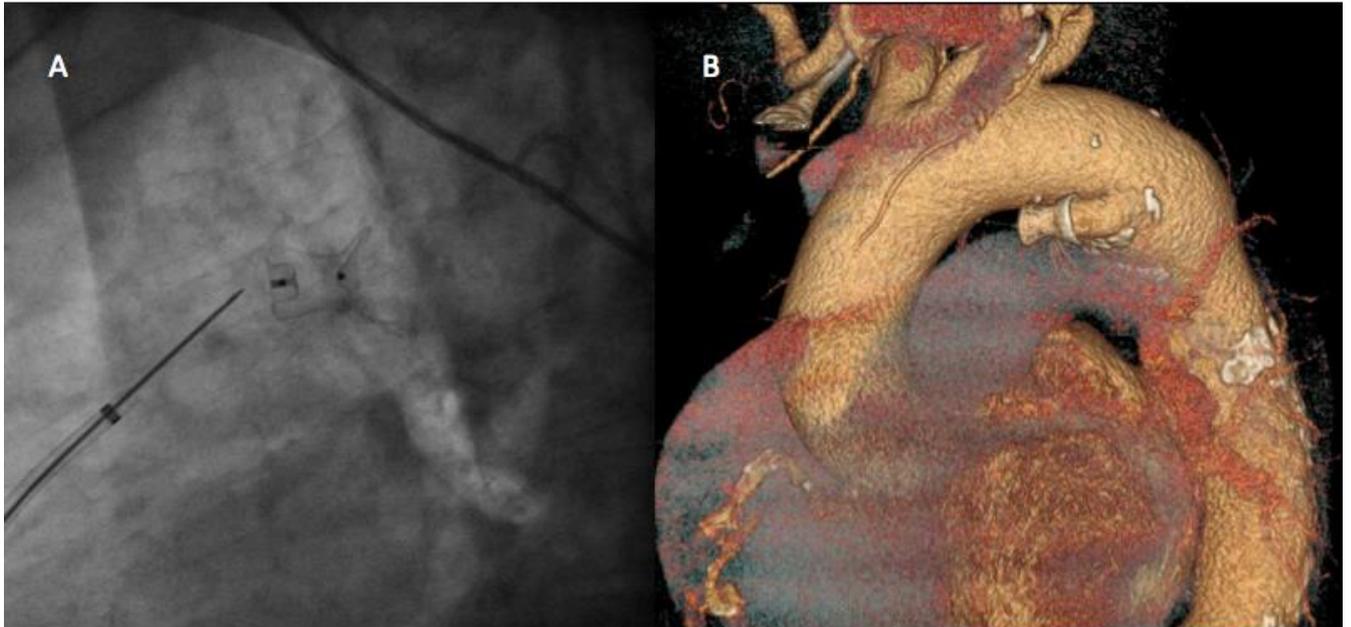


Image 2. A) Final angiography showing the closure device placed successfully in PDA. B) Cardiac CT six months later, with a right position of the device.

This case highlights the importance of haemodynamic and clinical repercussion of an uncorrected significant left- to- right shunt for a long time.

Our patient surprisingly reached the age of 70 years- old without being diagnosed of PDA, with an important left- to- right shunt and acceptable clinical situation. Despite the volume overload in the LV for such a long time, a severely impaired EF and secondary persistent pulmonary hypertension, this case proves that this condition may be reversible if treated properly, even if the treatment is performed late in time.

In this case, we can appreciate a significant clinical and haemodynamic improvement after the shunt correction despite the patient's age, with an improvement of his functional grade and echocardiography parameters, such as an almost complete normalization of LV function, secondary mitral regurgitation and pulmonary hypertension.

In conclusion, PDA closure should always be taken into account when there is severe haemodynamic compromise, regardless of the patient's age and time of the diagnosis.