

Endovascular approach for persistent ductus arteriosus closure in adult patient

Correção endovascular de persistência do conduto arterioso em paciente adulto

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Abstract

The treatment for closure of persistent ductus arteriosus (PDA) in adults is still controversial. The endovascular approach has been shown as an effective alternative to the surgical treatment. We report a case of a 45 year-old patient submitted to endovascular approach for PDA closure.

Descriptors: Ductus arteriosus. Heart Defects, congenital. Ductus arteriosus, patent.

Resumo

O tratamento da Persistência do Canal Arterial (PCA), em adultos, ainda é controverso. A utilização de próteses auto-expansíveis tem-se mostrado como uma alternativa eficaz ao tratamento cirúrgico. Apresentamos um caso de uma paciente de 45 anos submetida ao tratamento endovascular com o uso de stent auto-expansível.

Descritores: Canal arterial. Cardiopatias congênitas. Permeabilidade do canal arterial.

INTRODUCTION

The Persistent Ductus Arteriosus has frequent incidence, especially in premature children, and its correction is simple when performed in childhood [1]. When diagnosed in adulthood, the surgical correction of PDA becomes controversial, when the surgical procedure may be of high-risk due to the characteristics of the channel. The conventional surgical treatment depends on the clinical conditions of the patient, regarding the standard of pulmonary flow and anatomical characteristics of the very own ductus arteriosus. The endovascular treatment of aortic diseases made possible the application of the

technique to congenital heart diseases, among them the PDA which, besides offering the possibility of satisfactory results, exposes the patient to lower transoperative risks, once it is a less invasive procedure. The technique has been reported by authors as being an efficient and safe alternative to the surgical treatment [2,3].

CASEREPORT

Patient, 45 years-old, female, admitted at the Hospital Universitário da UFMS complaining of progressive dyspnea, functional class III – *New York Heart Association* (NYHA). In the physical examination, she presented murmur

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near the left sternal border. In the thoracic X-ray it was observed an increase of the pulmonary artery trunk and increase of pulmonary circulation. The patient was submitted to transesophagefic Doppler echocardiogram that showed the presence of a ductus arteriosus of 5 mm of diameter (Figure 1), discrete overload of the left ventricle and pulmonary hyperflow with gradient of 70 mmHg. In the hemodynamic study, the systolic and diastolic aortic pressures were, respectively, 107 mmHg and 54 mmHg; the systolic and diastolic pulmonary pressures were 20 mmHg and 76 mmHg, respectively; the pulmonary arteriography evidenced dilatation of the pulmonary artery with the pulmonary valve, allowing back-flow of a small contrast volume to the right ventricle.

After approval by the Ethics Committee of the NHU (Núcleo de Hospital Universitário da UFMS) and Term of Agreement signed by the patient, she was submitted to general anesthesia and oral-tracheal intubation, dorsal horizontal position, cardioscopy, pulse oxymetry, non invasive monitoring of blood pressure and vesicle probing.

Local inguinal bilateral antisepsis, dissection and repair

of the right femoral artery. After complete heparinization of the patient it was performed the aortography, finding the PDA by means of radioscopy. Insertion of a self-expansive stent (34 mm in diameter and 9 cm in length – Braile Biomédica, São José do Rio Preto-SP), after marking the exact location of the left subclavian artery and the ductus. Positioning of the prosthesis, in order to occlude the ductus arteriosus, without, nevertheless, occluding the left subclavian artery. Performance of a new aortography observing the absence of aortopulmonary shunt.

There were no interurrences in the postoperative evolution, being the patient extubated in the surgery room and released from hospital in the third day after the procedure. The radiography and computerized tomography of thorax evidenced adequate positioning of the endoprosthesis. After two months of the procedure, the FC evolved to I – NYHA and the transesophagefic echocardiogram showed absence of residual *shunts* and return of the cardiac parameters to normal (Figure 2). The patient started follow-up every six months without the use of any medication.

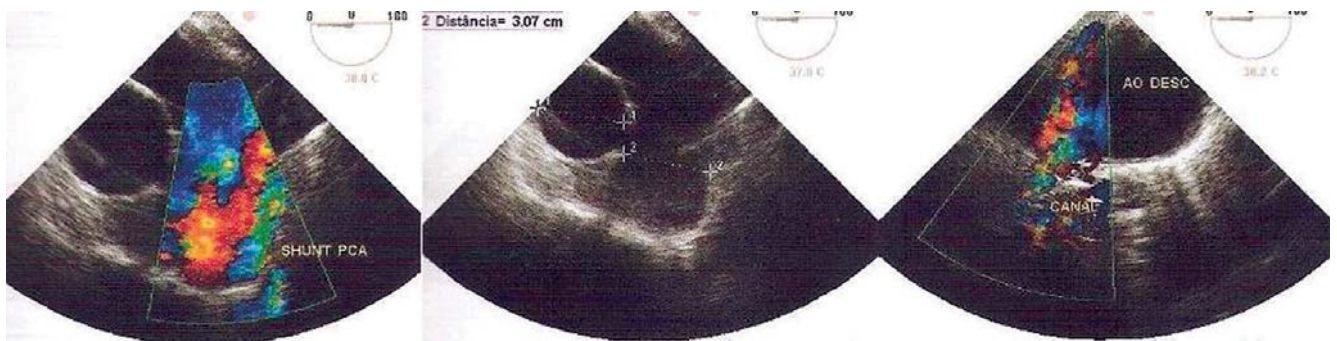


Fig. 1 – Preoperative transesophagefic echocardiography showing the PDA with a directional aorto-pulmonary shunt



Fig. 2 - Postoperative transesophagefic echocardiography showing the absence of aorto-pulmonary shunt after implantation of the self-expansive endoprosthesis

DISCUSSION

The persistence of ductus arteriosus is mostly diagnosed in childhood, being its treatment relatively simple, performing a duct ligation. In adults, the persistence of left-right shunt is associated with pulmonary hypertension and chronic ventricular dysfunction [3].

Maurice et al. describe a predisposition to bacterial endocarditis, being that by the age of 45 years; around 42% of the patients will have already died [4].

Bakir et al. [2] report that due to factors such as fragility and calcification of the aortic wall, besides the presence of possible aneurysms, the surgical treatment in adulthood is of high-risk and controversial.

Due to pulmonary high blood pressure, the risk of surgical occlusion increases even more when using hypothermia, according to Lai et al. [5].

Roques et al. [6] in 2001, reported the first case of endovascular correction of PDA, characterizing a simple and safe technique, proposed for the occlusion of the persistence of a calcified and aneurysmatic ductus arteriosus.

According to the available literature, the use of self-expansive prosthesis for the endovascular treatment of PDA has proven very promising. However, the referrals must be discussed, since the system used to insert the prosthesis requires a minimum size of the artery and the distance between the PDA and the left subclavian artery must be a minimum of 15 mm, in order to assure efficiency and safety to the procedure [3].

In this report, the endovascular treatment for closure of persistent ductus arteriosus in adults proved to be a simple and safe alternative, becoming perhaps a procedure of choice in these types of patients.

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