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Postpartum patient with thrombosis of mechanical prostheses and acquired supravalvular aortic stenosis

Puérpera com trombose de prótese mecânica e estenose supravalvar aórtica adquirida

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Abstract

The blood hypercoagulability proportionate in pregnancy significantly increases the incidence of thrombosis of mechanical valves. Acquired supravalvular aortic stenosis is extremely rare. We report the case of an immediate postpartum patient with aortic mechanical prostheses and stenosis supravalvular aortic acquired, who underwent emergency heart surgery, with severe hemodynamic instability, using adapted surgical technique for correction of supravalvular stenosis with satisfactory clinical and echocardiography results.

Descriptors

Aortic Stenosis, Supravalvular. Heart Valve Prosthesis. Thromboembolism. Pregnancy Complications, Cardiovascular.

Resumo

A hipercoagulabilidade sanguínea proporcionada na gravidez aumenta consideravelmente a incidência de trombose de valvas mecânicas. A estenose supravalvar aórtica adquirida é extremamente rara. Relata-se o caso de uma puérpera imediata, portadora de prótese mecânica aórtica e estenose supravalvar aórtica adquirida, submetida à cirurgia cardíaca de emergência, com instabilidade hemodinâmica grave, por meio de técnica operatória adaptada para a correção da estenose supravalvar aórtica, com evolução clínica e resultados ecocardiográficos pós-operatórios satisfatórios.

Descritores

Estenose Aórtica Supravalvular. Próteses Valvulares Cardíacas. Tromboembolia. Complicações Cardiovasculares na Gravidez.

INTRODUCTION

Pregnancy, among numerous physiological changes, provides a blood hypercoagulable state greatly increasing the incidence of mechanical prostheses thrombosis (MPT), offering rates of 7% to 23% of thromboembolism, thus demonstrating the difficulties in the management of anticoagulation in these patients [1].

Congenital supravalvular aortic stenosis (SAS) is a rare condition usually found in young people with Williams syndrome, which can be found in its localized form (80%) or diffuse (20%), however, its acquired form is extremely rare [2].

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This study was carried out at Federal University of Mato Grosso do Sul, Campo Grande, MS, Brazil.

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Due to the low incidence of women of childbearing age living with mechanical prosthesis in association with acquired supravalvular aortic stenosis, the aim of this report is to demonstrate the case of a postpartum woman who underwent emergency heart surgery due to acute thrombosis of mechanical prostheses in the aortic position with the finding of acquired supravalvular aortic stenosis intraoperatively, not evidenced by echocardiography preoperatively, at the bedside, with an adapted surgical technique with satisfactory immediate results.

CASE REPORT

S.S.A., 26-year-old pregnant woman, GIII PI AI, at gestational age of 36 weeks and 4 days, was admitted to the emergency obstetric care, University Hospital, Faculty of Medicine Dr. Hélio Mandetta, Federal University of Mato Grosso do Sul, at 2:12 a.m. on 5/14/2010, with a history of dyspnea on exertion for 15 days with mucopurulent productive cough and fever, progressing to orthopnea and progressive deterioration associated with serous uncontrollable vomiting and a feeling of impending death.

As background material, five years ago she underwent mechanical double leaflet aortic valve replacement, number 19, in another cardiovascular surgery service because of bacterial endocarditis.

On physical examination the patient was sleepy, Glasgow 13, symmetrical and reactive to light pupils with PA: 120 x 80 mmHg, HR: 130 bpm, RR: 36 bpm, pale ++/4+ and pathological jugular venous distention grade IV. On pulmonary and cardiac auscultation, there was vesicular breath sound diminished with global hemithorax diffuse stertor crackles, loud sounds, rhythm, tachycardia in three stages (B3) with the presence of pansystolic murmur +++/6+ with epicenter in the aortic area. On obstetric examination, there was FCF: 142 bpm, uterine height of 31 cm, absent uterine dynamics, closed cervix and posterior, longitudinal fetal status, back left and cephalic presentation.

The chest radiograph showed bilateral interstitial pattern in bases and middle thirds, plus honeycomb pattern at basis of the right hemithorax. The electrocardiogram showed sinus tachycardia with left ventricular hypertrophy. Blood culture was requested, suggesting infective endocarditis due to history.

Given the above, we administered intravenous furosemide, sublingual isosorbide dinitrate, morphine, antibiotics and full dose of enoxaparin (Ceftriaxone + Azithromycin), directing the patient quickly to the Obstetrical Center for performing of emergency delivery.

At 15h on the same day, the obstetrics and gynecology teams chose for performing cesarean delivery and tubal ligation under spinal anesthesia. In the immediate postoperative period, the patient progressed with shock, acute pulmonary edema and anasarca, necessitating intubation, mechanical ventilation, sedation and vasoactive drugs (norepinephrine and dobutamine), being referred to the intensive care unit.

We performed emergency echocardiogram, which showed stenosis of the aortic valve prosthesis with signs of severe mechanical thrombosis (peak gradient of 126 mmHg and mean 75 mmHg). In severe hemodynamic instability and norepinephrine at higher doses, the patient was referred to the operating room.

Standard median transsternal thoracotomy, dissection of abundant adhesions, opening of the pericardial sac and viewing of constriction in the ascending aorta (supra-aortic stenosis) were performed (Figure 1). After heparinization (4 mg/kg), it was established cardiopulmonary bypass (CPB), cooling up to 27°C, aortic clamping and infusion of cold antegrade St. Thomas cardioplegia in aortic root (2x). It was proceeded to the aortic opening and visualization of multiple sub-prosthetics thrombi and subsequent thrombectomy followed by reconstruction of the ascending aorta with enlargement of the proximal aorta with longitudinal incision of approximately 3 cm toward the aortic valve annulus corresponding to the non-coronary leaflet and posterior suture using pericardium in a triangular area of 4 cm^2 using 4-0 polypropylene. Sequentially, it was performed 4-0 polypropylene aortorrhaphy involving the bovine pericardial patch (Figure 2).

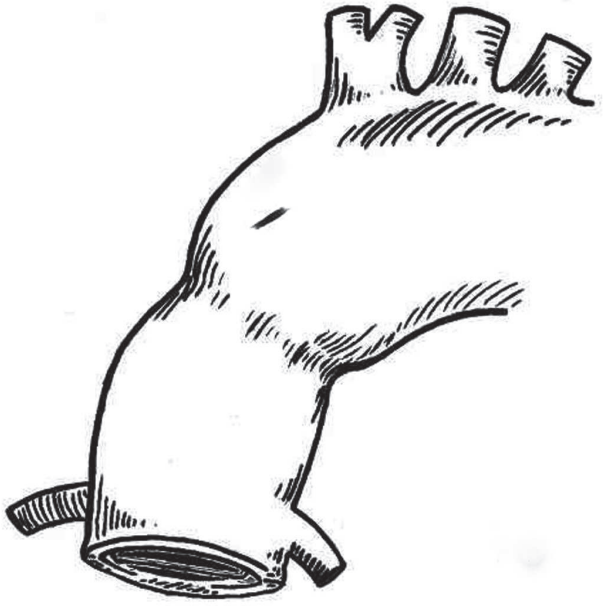

Fig. 1 – Illustration of acquired supra-aortic stenosis

Fig. 2 – Illustration of correction of acquired supra-aortic stenosis with a patch of bovine pericardium.

It was established the overall warming, hemodynamic stabilization, unclamping with return of spontaneous beats, the cessation of CPB (55 minutes), volume replacement up to the limit of static prime, cannulas removal, heparin with protamine reversal (1:1), insertion of temporary epicardial pacemaker electrode, draining of the mediastinal cavity, and finally, synthesis by plans.

In the immediate postoperative period, the patient had significant clinical improvement without the use of vasoactive drugs and early weaning from mechanical ventilation.

Echocardiographic parameters postoperatively (Figure 3) showed an ejection fraction of 48%, mild systolic dysfunction, aortic mechanical prosthesis with minimal regurgitation and mild stenosis, the LV-Ao gradient up to 47 mmHg and 29.5 mmHg on average, minimum supravalvular stenosis and maximum systolic gradient in the ascending aorta estimated at 24 mmHg.

The patient remained stable in a ward, nursing and with no major complaints with drugs for heart failure, antibiotics and anticoagulation. On 25/6/2010, she was discharged from hospital in excellent condition with warfarin, carvedilol and captopril. She was oriented for outpatient clinic for clinical evaluation and prothrombin time.

This case report was approved by the Ethics Committee of the Federal University of Mato Grosso do Sul (Protocol number 1857).

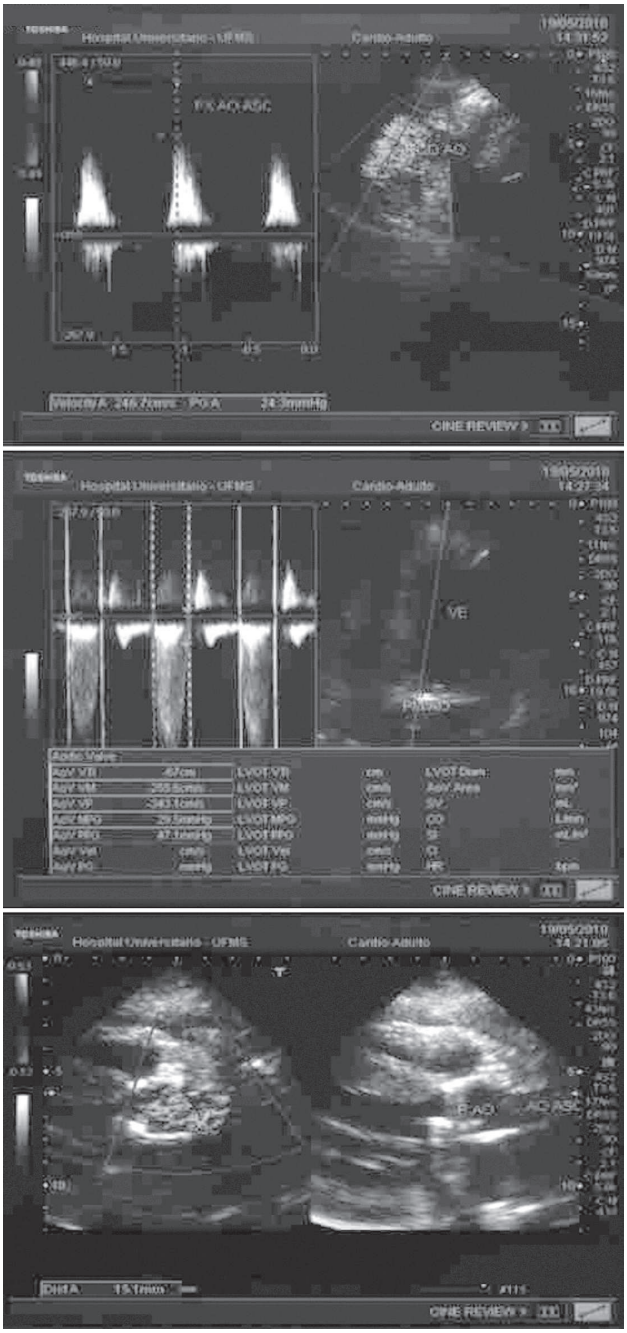

Fig. 3 – Postoperative echocardiogram

DISCUSSION

Because of the hypercoagulable state that is imposed during pregnancy, as well as the thrombogenic potential of mechanical valves, anticoagulation is imperative throughout the pregnancy. The coumarins are extremely effective and

can be used up to 35-36 weeks, which, because of the risks of prematurity and fetal bleeding, should be replaced by heparin in the first 12 weeks and the last four, although it safer for the fetus, increases the risk of maternal thrombosis, compared with inhibitors of K vitamin [2].

The patient was using coumarin, but was not adequately anticoagulated, which was proven by tests on admission (INR = 1.10), far from the standards recommended, INR between 2.5 and 3.52. She didn't use heparin in the hospital at this stage of pregnancy, which probably caused the formation of thrombi in the mechanical aortic prosthesis. This fact, coupled with the physiological increase in blood volume and cardiac work during pregnancy, as well as the increased preload provided by the decompression of the vena cava by the uterus when withdrawing the fetus, precipitated cardiac decompensation, which was manifested by circulatory collapse and acute pulmonary edema.

The supra-aortic stenosis, a disease included in so-called obstructive lesions of the left ventricle is a rare condition, especially when it addresses its acquired form, with the most common causes of aortitis, aneurysmal constrictions [3] and also prior aortic surgeries [4,5].

For surgical correction of supra-aortic stenosis is usually use four techniques: enlargement using patch within simple non-coronary Valsalva technique, McGoon et al. [6]; enlargement using bifurcated Y-shaped patch in the sinuses of Valsalva in non-coronary and right coronary, Doty technique [7,8]; enlargement of three sinuses of Valsalva using patches, Brom & Khonsari technique [9] and aortoplasty with enlargement of the three sinuses of distal aorta without the use of prosthetic material, technique by Sousa et al. [10.11].

All techniques with postoperative results very satisfactory.

The supra-aortic stenosis in our case was possibly a result of previous implantation of mechanical aortic prosthesis, leading to a localized constriction, which was approached differently from traditional models established [60-10]. The use of operative strategy described above provided good hemodynamic results, and satisfactory postoperative ans surgical evolution.

Considering the seriousness of this case: immediate postpartum with aortic mechanical prostheses and acquired supravalvular aortic stenosis undergone emergency heart surgery, with severe hemodynamic instability and an adapted surgical technique, presents a satisfactory clinical and postoperative echocardiographic results.

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