

# Heart valve replacement during pregnancy

## *Cirurgia de troca valvar em gestante*

Claúdio Ribeiro da CUNHA<sup>1</sup>, Paulo Cesar SANTOS<sup>2</sup>, Carolina Pastorin CASTINEIRA<sup>3</sup>, Flávia Souza Fernandes PEREIRA<sup>3</sup>

RBCCV 44205-935

### *Abstract*

We describe a woman with gestational age of 20 weeks, who was submitted to a complex procedure. She underwent replacement of the biological mitral and aortic valve, both by biological prosthesis, valvuloplasty of the tricuspid valve, as well as thrombectomy of the left atrium. Extracorporeal circulation (ECC) was used during 105 minutes. The patient was discharged from hospital in good health conditions and the newborn remained in the Neonatal Intensive Care Unit (NICU) in a stable state. This is a complex procedure with a high maternal and fetal mortality. Therefore, this is an important case regarding valve abnormalities treatment during pregnancy.

**Descriptors:** Cardiac surgical procedures. Pregnancy. Heart valve prosthesis. Mitral valve, surgery. Aortic valve, surgery.

### *Resumo*

Trata-se de uma gestante de 20 semanas submetida à troca de prótese de valva atrioventricular esquerda e troca da valva da aorta, ambas por prótese biológica, valvuloplastia de tricúspide e trombectomia de átrio esquerdo. O tempo de circulação extracorpórea foi de 105 minutos. A paciente recebeu alta do hospital em boas condições gerais e o recém-nascido permanece estável em Unidade de Terapia Intensiva. Por ser um procedimento de considerável complexidade e de alta mortalidade materna e fetal, este caso é de importante relevância no tratamento das doenças valvares durante o período gestacional, bem como a condução nos períodos intra e pós-operatório.

**Descritores:** Procedimentos cirúrgicos cardíacos. Gravidez. Próteses valvulares cardíacas. Valva mitral, cirurgia. Valva aórtica, cirurgia.

1. Specialist Member of the Brazilian Society of Cardiovascular Surgery; Head Surgeon at Universidade Federal de Uberlândia.
2. Health Science Ph.D. - EPM; Physician-Cardiovascular Surgeon.
3. Undergraduate medical student - Universidade Federal de Uberlândia.

This study was carried out at Universidade Federal de Uberlândia, Uberlândia, MG, Brazil.

Correspondence address:

Paulo César Santos. Av. Engenheiro Diniz, 1178. Uberlândia, MG. CEP: 38400-902.

E-mail address: paulocir@hotmail.com

Article received in 27 Jun 2007

Article accepted in 26 Jul 2007

## INTRODUCTION

In the early 1950s, the first heart surgery reports performed during pregnancy appeared in Brazil. It was observed then that maternal mortality was not as high as that verified in non pregnant women undergoing the same type of surgical procedure [1].

Although maternal mortality is low, the same is not true about fetal mortality, which has arose after the introduction of cardiopulmonary bypass (CPB) as a consequence of premature obstetric labor and intraoperative fetal death due to hypoxia [1,2]. On account of the improvement of knowledge about CPB technique and its fetal repercussions, several strategies have been described aiming at reducing fetal morbid-mortality rate [1,2].

The aim of this study is to evaluate fetal and maternal outcomes of a pregnant woman undergoing a complex heart surgery procedure.

## CASE REPORT

We report a case of a 31-year-old woman, at 20 weeks of gestation, who underwent mitral valve replacement by biological prosthesis seven years ago. An echocardiogram showed a mitral prosthesis dysfunction of a stenosis type with a mitral valve area [MVA] = 1.0 cm<sup>2</sup>, moderate to severe aortic insufficiency, and mitral regurgitation. In addition, there was a presence of left atrial thrombus and a New York Heart Association (NYHA) functional class IV heart failure with frequent episodes of pulmonary edema. Considering this, a surgical procedure to replace both the biological mitral valve prosthesis and the aortic valve by biological prosthesis was performed. Mitral valvuloplasty and a left atrial thrombectomy were recommended. CPB was performed in the usual fashion, with modified ultrafiltration and myocardial protection through both antegrade and retrograde routes, besides moderate systemic hypothermia at 35°C.

Length of CPB was 105 minutes. Patient remained in ICU over 4 days and was discharged within 20 days. ICU fetal outcome was satisfactory. At 29 weeks and 6 days of gestation, the patient was admitted after a gestational diabetes diagnosis was made. Fetal distress was also noted. The patient underwent an uneventfully C-section with 30 weeks and 5 days of gestation. A live born baby, Small for his/her Gestational Age, the 1-minute and 5-minute APGAR score were 5 and 8, respectively, birth weight of 1150 g, and presenting perinatal asphyxia was born. Patient was discharged in good health conditions and the baby remains stable under ventilatory support in a neonatal ICU.

## DISCUSSION

The incidence of heart disease in pregnant women varies

from 1 to 4% and the most common cause is rheumatic mitral disease [3], a substrate of the valvular heart disease described in the current report. The treatment of choice is the conservative one and when patients are refractory to it, the option is surgical intervention, which has similar indications to those observed in non pregnant women.

Women with valvular heart disease during pregnancy present with increased pathological events, such as congestive heart failure, arrhythmias, and the need of initiating or increasing of cardiac medications doses. Moreover, an increase in hospitalization rates occurs during pregnancy [4]. In this case, there has been refractivity to clinical therapy with several episodes of acute pulmonary edema. Being the mother's life at risk an early surgical therapy was recommended with an increase risk to the fetus's life. Repair or replacement of the valve during pregnancy may be indicated in selected patients who remain symptomatic in spite of adequate medical therapy [5].

Some gestational characteristic factors such as relative hypovolemia, increase of both maternal heart rate and cardiac output, and anemia can cause cardiocirculatory unbalance and decompensation in pregnant women with valve heart disease, thereby requiring interventional or surgical therapy [1,3].

In the current case report, it was chosen the surgical therapy with double replacement, because the patient was found to have a high-risk pregnancy, once she was in the New York Heart Association (NYHA) functional class IV and presenting valvular lesions, such as mitral bioprosthesis stenosis and acute pulmonary edema. This strengthens the gestational participation of the abovementioned phenomena and the increase of risk for maternal mortality as gestation progresses, thereby requiring surgical therapy.

Although maternal mortality is low, general anesthesia, thoracotomy, and CPB are risk factors for fetal mortality [2]. Moreover, maternal welfare and gestational aspects, such as maternal age, New York Heart Association (NYHA) functional class, kind of surgery (emergency, elective, planned, reoperation), kind of gestation (multiple, with or without abortion, primipara), and gestational age were considered as contributing risk factors for fetal morbid-mortality [3].

In this case, it was performed a double valve replacement (mitral and aortic valve replacement), which increases the length of cardiopulmonary bypass as well as the fetal mortality. In the present case report, there was no fetal distress during CPB and the fetus was monitored through ultrasound. In addition, there was no immediate postoperative distress, which led to an uneventfully progression of pregnancy; however, there has occurred a diabetes decompensation in this patient, which led to a

premature delivery only one month after the surgical procedure.

Asphyxia of unknown cause has occurred during delivery. Thus, the baby needed to remain at the neonatal ICU under ventilatory support in a progressive recovery, once the baby was preterm infant and undersized for his/her gestational age.

#### ACKNOWLEDGEMENT

To all physicians who spares no pains for the patients' well-being.

#### REFERENCES

1. Pomerantzeff PM, Benício A, Brandão CM, Ávila WS, Bueno PC, Grinberg M, et al. Cirurgia valvar em gestantes. Experiência em oito casos. *Arq Bras Cardiol.* 1998;70(6):403-8.
2. Tehrani H, Masroor S, Lombardi P, Rosenkranz E, Salerno T. Beating heart aortic valve replacement in a pregnant patient. *J Card Surg.* 2004;19(1):57-8.
3. Arnoni RT, Arnoni AS, Bonini RC, Almeida AF, Neto CA, Dinkhuysen JJ, et al. Risk factors associated with cardiac surgery during pregnancy. *Ann Thorac Surg.* 2003;76(5):1605-8.
4. Hameed A, Karaalp IS, Tummala PP, Wani OR, Canetti M, Akhter MW, et al. The effect of valvular heart disease on maternal and fetal outcome of pregnancy. *J Am Coll Cardiol.* 2001;37(3):893-9.
5. Elkayam U, Bitar F. Valvular heart disease and pregnancy part I: native valves. *J Am Coll Cardiol.* 2005;46(2):223-30.