Bloodless third complex heart operation in a Jehovah’s Witness patient with extremely low preoperative haemoglobin level

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Abstract

We report a successful third complex heart operation without the transfusion of any allogeneic blood or blood products in a female Jehovah’s Witness patient who had pronounced preoperative anaemia with a haemoglobin value of 6.9 mg/dl. The report shows that such a procedure is possible without any transfusion of allogeneic blood or blood products in extreme conditions with a very low pre-operative haemoglobin level.

Keywords: Anaemia • Jehovah’s Witness • Complex heart surgery • Heart valve disease

INTRODUCTION

Cardiac surgery can be performed successfully in Jehovah’s Witness patients, but the risk is considered to be high because of patients’ refusal to receive blood transfusion [1–6]. With the complexity of the surgery, the risk of the procedure also increases, and even more so in female patients [3]. Logically, the presence of anaemia in this situation throws the operability of such a patient into question.

We report a successful third complex cardiac operation without any transfusion of allogeneic blood or blood products in an anaemic female Jehovah’s Witness patient with a preoperative haemoglobin value of 6.9 mg/dl.

CASE REPORT

A 58-year-old female patient with chronic macrocytic anaemia was admitted to our hospital because of dyspnoea at rest, liver enlargement, generalized oedema, pleural effusion and ascites. She experienced sudden onset of progressive dyspnoea with oedema of the legs 1 month before admission. Her medical history included mitral and aortic valve replacement 30 years before, repeated mitral and aortic valve replacement with mechanical valve prostheses and tricuspid valve repair 10 years later, and intestinal resection with subsequent vitamin B12 deficiency. She had chronic atrial fibrillation, pulmonary hypertension (systolic and mean pulmonary artery pressures were 75 and 55 mmHg, respectively) and cardiac cirrhosis. There was no coronary artery disease. Transthoracic echocardiography performed on admission showed a significant paraprosthetic leakage in the region of the posterior mitral leaflet (P-2) with severe mitral regurgitation. The function of the 28-mm Starr–Edwards caged ball mitral valve prosthesis was good. Additionally, echocardiography revealed tricuspid valve regurgitation of grade IV with backflow of the blood into the hepatic veins; left ventricular contractility was normal. Mitral valve endocarditis was excluded with a high probability by clinical, laboratory and echocardiographic data. Computed tomography of the chest demonstrated a severely enlarged right ventricle adhering to the sternum with calcification of both atra. An isolated calcification of about 1 cm × 1.5 cm was found below the sternum invading the wall of the right ventricle (Fig. 1). The patient was treated with low-dose catecholamines, diuretics, digoxin, ferrous glycinate chelate, erythropoietin and vitamins (folic acid, thiamine, riboflavin and nicotinamide). Conservative therapy slightly improved the clinical situation but leg oedema, bilateral pleural effusions (Fig. 2) and ascites remained. The patient was then scheduled for surgery. Preoperative haemoglobin on the day of surgery was 6.9 mg/dl. The patient declined any blood transfusion or blood products for religious reasons.

The third heart procedure was performed through a median sternotomy using a modified surgical strategy. It included use of the cell saver, low priming for the cardiopulmonary bypass circuit and ultrafiltration during cardiopulmonary bypass. Tranexamic acid was used as a standard at our institution for redo surgery. The femoral vessels were dissected and prepared for emergency cannulation, if necessary. Meticulous haemostasis was performed during liberation of the heart from dense adhesions. No local haemostatic agent was applied. Cardiopulmonary bypass was instituted with standard cannulation of the aortic arch and bi-caval venous cannulation. The paraprosthetic leakage was closed with several polypropylene sutures. Next, the tricuspid valve with thickened and restricted movements of the valve leaflets was replaced with a 33-mm mechanical valve. Weaning from cardiopulmonary bypass and completion of the procedure were uneventful, needing only administration of a low dose of norepinephrine. The aortic cross clamp time was 50 min,
the reperfusion time 63 min and the total cardiopulmonary time 125 min. The lowest levels of haemoglobin and haematocrit during cardiopulmonary bypass were 5.7 g/dl and 18%, respectively, with values of 7.0 g/dl and 21%, respectively, at the end of the procedure. The patient was extubated on the first postoperative day. The total postoperative blood loss was 250 ml (it was not re-transfused). The further course was uneventful except for a phase of rectal bleeding because of anal fissure. The lowest haemoglobin and haematocrit values during the postoperative course were 5.2 g/dl and 16%, respectively, on the third postoperative day. The patient was discharged from the hospital on the 22nd postoperative day with a haemoglobin level of 7.5 g/dl and a haematocrit of 22%. Blood and blood products were not given at any time.

**COMMENT**

The report shows that a third complex heart procedure is possible without any transfusion of allogeneic blood or blood products in extreme conditions with a very low preoperative haemoglobin level. Chronic anaemia was caused by chronic vitamin B₁₂ insufficiency as a consequence of previous intestinal resection and was aggravated by the presence of two mechanical heart valves. It worsened acutely because of paravalvular leakage and haemolysis. Despite very low preoperative and intraoperative haemoglobin and haematocrit values, the patient tolerated the surgical procedure and the postoperative course very well. We believe that this was possible because the patient’s preoperative anaemia was already chronic. The bloodless operation included a modified surgical strategy and precise and meticulous haemostasis throughout the procedure. The procedure was undertaken under difficult and urgent circumstances. In an elective situation, surgery could have been deferred until the haemoglobin level was elevated by conservative measures.

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**REFERENCES**


