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Emergency mitral valve replacement in the setting of severe pulmonary hypertension and acute cardiovascular decompensation after evacuation of twins at fifteen weeks' gestation

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A case of critical mitral stenosis with severe pulmonary hypertension in a twin pregnancy is presented. On therapeutic evacuation at 15 weeks' gestation the patient became critically unstable, necessitating emergency open heart surgery with mitral valve replacement. (Am J Obstet Gynecol 1998;179:270-2.)

Key words: Mitral stenosis, pulmonary hypertension, cardiac surgery

Cardiac disease complicates 1% to 4% of all pregnancies in the United States, with rheumatic heart disease being the most common etiology. Mitral stenosis is the rheumatic valvular disease most frequently associated with maternal death. Patients in whom mitral stenosis has led to the development of secondary pulmonary hypertension are advised to avoid pregnancy because they are especially vulnerable to decreases in right heart preload, which may be rapidly fatal.¹ We present a patient with severe pulmonary hypertension who underwent an early second-trimester abortion and in whom acute pulmonary edema developed with near cardiovascular collapse.

Case report

In July 1997 a 32-year-old Hispanic woman, gravida 3, para 2, with a history of rheumatic fever was seen at 15 weeks' gestation with increasing dyspnea. Physical examination was notable for a blood pressure of 114/75 mm Hg, a pulse of 103 beats/min, oxygen saturation of 97%, jugular venous distention, clear lung fields, and a pansystolic murmur. An electrocardiogram revealed sinus tachycardia with left atrial enlargement. The echocardiogram

demonstrated a heavily calcified mitral valve, severe mitral stenosis with a valve area of 0.7 to 0.8 cm², and moderate tricuspid regurgitation. On cardiac catheterization pulmonary arterial pressures were noted to be 90 to 110/60 to 70 mm Hg, with the cardiac output ranging from 3 to 4.8 L/min. Ultrasonography demonstrated twin gestations consistent with the patient's menstrual dates.

Cardiology consultation was obtained and the patient was advised to undergo therapeutic abortion with antimicrobial prophylaxis. Inhalational nitric oxide was obtained after Food and Drug Administration approval with the goal of lowering pulmonary arterial pressures during surgery. Arrangements were made to operate in the cardiothoracic surgical suite with the cardiovascular surgeons on standby.

The evacuation was performed under ultrasonographic guidance at 15 weeks 4 days with use of epidural analgesia with an estimated blood loss of 200 mL. Immediately postoperatively, the patient became critically unstable with a fall in cardiac output and oxygen desaturations (70% to 80%). There was no evidence of uterine hemorrhage or atony. Persistent tachycardia ensued that was unresponsive to β -blockers and that led to refractory hypotension and pulmonary edema. Ultimately, intravenous epinephrine and dobutamine was required to maintain systemic pressures and cardiac output. The patient remained very unstable and the decision was made to proceed with thoracotomy, cardiopulmonary bypass, and emergency mitral valve replacement.

A 29 mm St Jude's valve was placed and the patient was off bypass on transfer to the intensive care unit. Her pulmonary arterial pressures diminished (50 to 60/30 to 40 mm Hg) and the tachycardia resolved. She was extubated on the first postoperative day and discharged home receiving anticoagulation on the fifth postoperative day.

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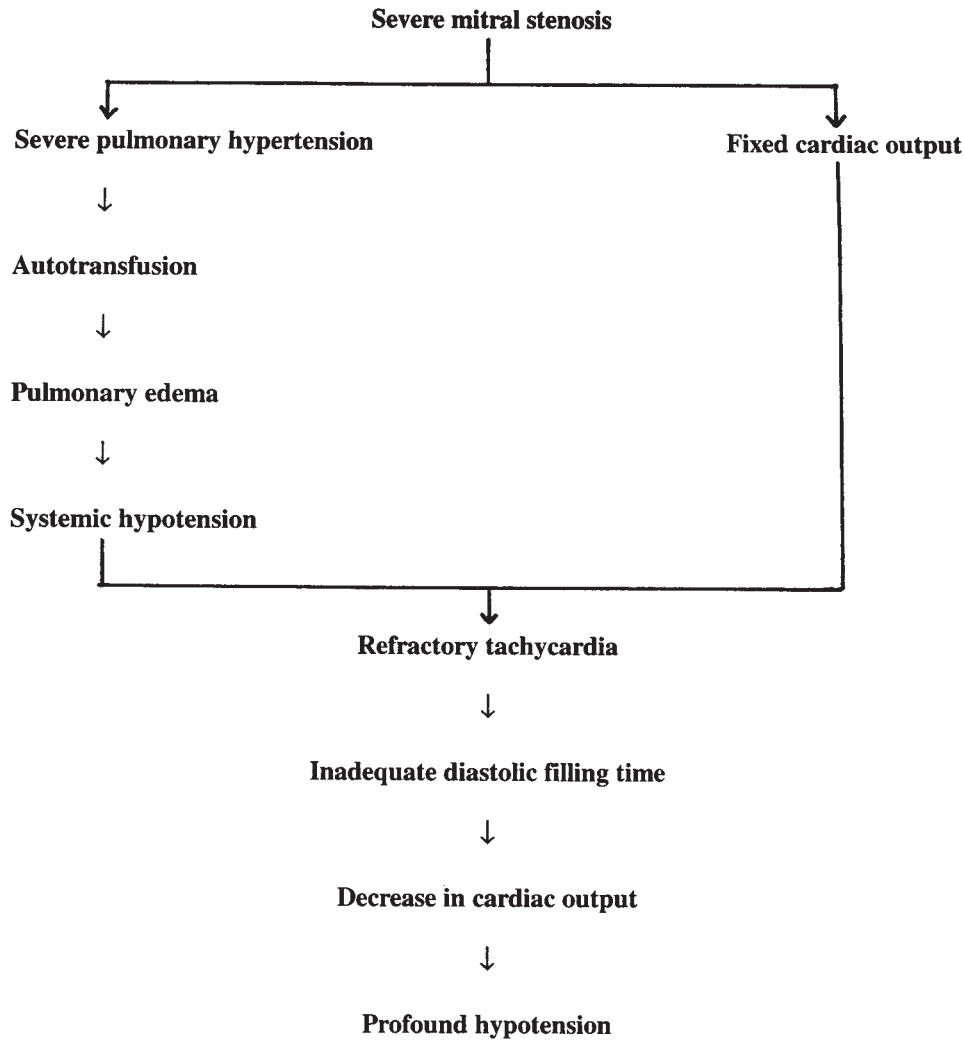


Fig 1. Hemodynamic consequences of autotransfusion after therapeutic evacuation of twin gestations at 15 weeks 4 days.

Comment

Although many patients with severe mitral stenosis have a worsening of symptoms after 20 weeks' gestation when increases in intravascular volume begin to plateau, our patient's increased dyspnea at 15 weeks' gestation may have been the result of the hemodynamic challenge imposed by twin gestation. A large volume of autotransfusion may not be anticipated in the early second trimester. It is conceivable, however, that multiple gestations predispose to larger volume shifts when the uterus and placenta are removed from the circuit after evacuation. Our patient had a fixed cardiac output resulting from severe mitral stenosis that was complicated by severe pulmonary hypertension. She was unable to maintain systemic arterial pressure once autotransfusion led to florid pulmonary edema (Fig 1).

Percutaneous balloon valvuloplasty was entertained as an alternative to therapeutic abortion. Because of the severity of pulmonary hypertension and extensive valvular calcifications and regurgitation demonstrable by echocardiography, the cardiologists did not recommend valvuloplasty. Although there are successful reports of valvuloplasty in pregnancy for severe mitral stenosis, none have been performed on patients with severe pulmonary hypertension. Glantz et al² described a successful valvuloplasty in a patient with severe mitral stenosis at 29 weeks' gestation who had a pulmonary artery pressure of 70/41 mm Hg.

Women with pulmonary hypertension should be advised to avoid pregnancy. If pregnancy occurs in spite of counseling or if such patients are seen during pregnancy, a consideration should be made for balloon valvuloplasty in an attempt to diminish pulmonary pressures by reliev-

ing mitral stenosis. For patients who are not candidates for valvuloplasty, mitral valve replacement or therapeutic abortion should be considered. However, the cardiovascular changes that occur during pregnancy must be respected regardless of gestational age. We advise close coordination with a cardiothoracic surgical team should hemodynamic instability evolve that is refractory to medical management.

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