Case Report

Stuck Prosthetic aortic and mitral valves in pregnancy: Thrombolysis with streptokinase

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ABSTRACT

Despite improvements in the design of prosthetic heart valves and the use of anticoagulation, stuck valve due to thrombosis remains the most dreaded complication of mechanical heart valve replacement. Discontinuation of anticoagulation during pregnancy due to fear of congenital anomaly as a result of inadequate counseling remains a great challenge. A course of thrombolytic therapy may be considered as a first-line therapy for prosthetic heart valve thrombosis. The safety of thrombolysis in pregnancy is not known. We describe a multigravida with mitral and aortic valve replacement status presenting with acute prosthetic mitral and aortic valve thrombosis and treated successfully with intravenous streptokinase.

KEYWORDS

Pregnancy, Prosthetic valve, Stuck, Thrombolysis

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INTRODUCTION

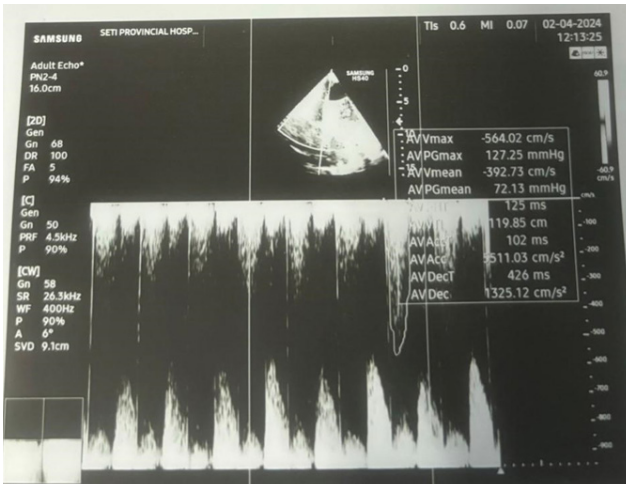
Thrombosis is a complication of prosthetic valves on oral anticoagulants which is associated with significant morbidity and mortality.1 Pregnant patients with mechanical valves are at increased risk of thrombosis. The increased risk is secondary to physiologic changes resulting in a hypercoagulable state beginning in early pregnancy and persisting for at least 6 to 12 weeks after delivery.2 In the absence of anticoagulant therapy, the estimated risk of thromboembolic events for patients with a prosthetic valve in the aortic position is about 12% per year rising to 22% per year for patients with a prosthetic valve in the mitral position.3 A re-operation carries a substantial risk, with mortality rate from 10% to 15% in selected series, which may be 2- or 3-folds higher in critically ill patients.1 So thrombolysis offers a valid alternative to surgery with a high success rate and minimal complications and low mortality.1

CASE REPORT

A 30 years pregnant lady at 35 wks of gestation (G3P2A0) with history of dual valve replacement (St Jude size 21 mm in aortic position and 27 mm in mitral position) and aortoplasty done 2 years back for rheumatic heart disease (severe MR, severe AR with small aortic diameter) presented in cardiology OPD of Seti Provincial Hospital with acute onset dyspnea for 2 days. She was not taking her oral anticoagulant therapy since her pregnancy onset. Patient was conscious, cold and clammy with feeble radial pulse, BP 80/40mmHg, heart rate 110 bpm, SpO2 90% with room air. Precordial examination confirmed the absence of metallic click. Chest examination revealed bilateral basal fine crepitations. Abdominal examination was unremarkable. Lower limbs showed neither edema nor signs of deep vein thrombosis. Urgent echocardiography showed well seated prosthetic aortic valve (AV) and mitral valve (MV) with high peak and mean AV gradients (127 and 72 mmHg, respectively) and MV gradients (17 and 6 mmHg respectively). Additionally, there was moderate intrinsic aortic regurgitation, moderate tricuspid regurgitation with pulmonary artery systolic pressure 46mmHg. Left ventricle ejection fraction was 50-55%. Cinefluoroscopy was not done as there was no cardiac cath lab at our centre. As patient was hemodynamically unstable, she was immediately transferred to intensive care unit (ICU) and thrombolysis started {streptokinase (STK) 2.5 lakhs international units (IU) intravenous (IV) over 1 hour, followed by 1 lakh IU per hour IV infusion for 12 hours}. Repeated echocardiography showed a significant reduction in the peak and mean AV and MV gradients back to baselines. There was significant improvement in her symptoms with stable vitals (BP 110/70mmHg, pulse 82bpm, SpO2 96% in RA). She was started on low molecular weight heparin (LMWH) 40mg subcutaneously (S/C) 12 hrly.

Subsequently, obstetric scan was done, which showed a single live fetus, 35wks of gestation with adequate AFI. After discussion with obstetrician and anesthesiologist, elective lower segment caserean section (LSCS) was planned after 1 week. Four doses of dexamethasone were given for fetal lung maturity. Patient was discharged on day 4 with LMWH to be continued at home. Patient followed up after 1 week for elective LSCS. The morning dose of LMWH was not given on the day of LSCS. With elective LSCS, she gave birth to a live healthy male baby of weight 2.7 kg. After 12 hrs, LMWH was started. From next day, ecosprin and warfarin tablets were started and continued. LMWH was stopped once INR was >2. She was discharged 5 days after LSCS with INR 2.5 for 2 consecutive days.

a.



b.

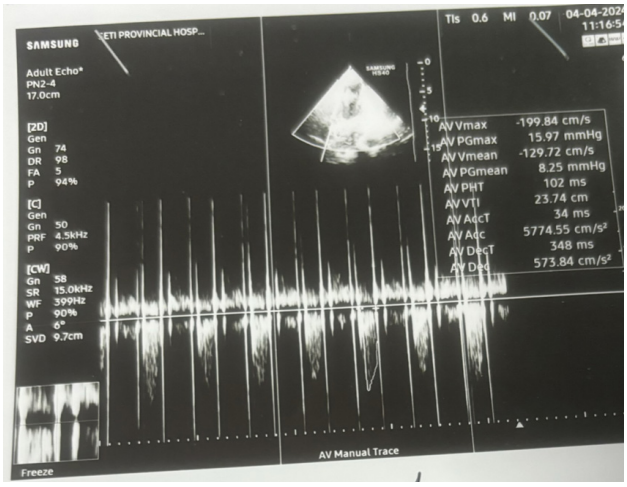
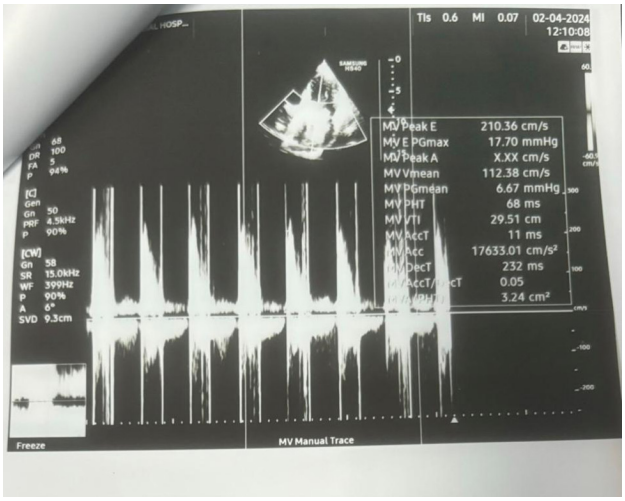


Fig. 1. Echocardiography showed high peak and mean AV gradients (127 and 72 mm Hg, respectively) on the first day of admission (A) and reduced peak and mean AV gradients (15 and 8 mm Hg, respectively) on the 3rd day of admission (B).

c.



d.

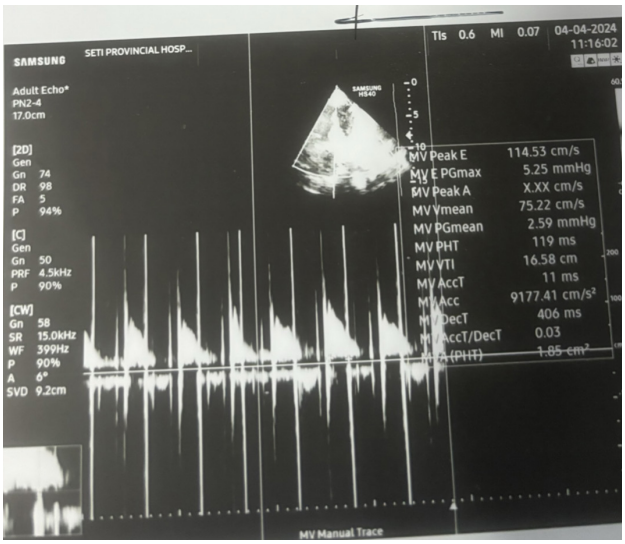


Fig. 2. Echocardiography showed high peak and mean MV gradients (17 and 6 mm Hg, respectively) on the first day of admission (C) and reduced peak and mean MV gradients (5 and 2 mm Hg, respectively) on the 3rd day of admission (D).

DISCUSSION

In 1971, Luluaga et al.4 were the first to report thrombolytic therapy with STK in stuck tricuspid valve. Three years later, Baille et al.5 reported the use of thrombolysis in a stuck left-sided (aortic) valve. Nowadays, there are more than 200 reported cases of thrombolysis of stuck left-sided valves, with an overall 82% initial success rate, 12% thromboembolism, 5% to 10% stroke, 6% death, 5% major bleeding and 11% recurrence rate.6 The valve models involved in approximately half of the cases are older ones (caged ball or single leaflet). Information regarding bileaflet valves, which are currently the preferred mechanical prosthetic valve models, is limited. Moreover, bileaflet valves are of special interest because their delicate mechanism may lead more easily to leaflet immobilization, even with a relatively small clot. On the other hand, if the offending clot is minor, thrombolysis may be easier and safer. In 2000, Gupta et al.7 reported a series of 110 patients with thrombosis of the mitral (96 patients) and aortic (14 patients) prosthesis undergoing thrombolysis, 108 of whom received STK, and 2 received urokinase (UK). The infusion dosage of STK was a bolus of 250,000 IU in 30 minutes, followed by 100,000 IU/h. Doppler echocardiography was used to monitor the time of infusion of the thrombolytic agent and to assess its efficacy. The criteria for interrupting infusion were as follows: hemodynamic improvement, assessed on echocardiography; occurrence of major bleedings or hemorrhagic stroke; and infusion time of 72 hours. Complete hemodynamic improvement was observed in 81.8% of the patients, partial improvement in 10%, and treatment failure in 8.2%. An embolic event occurred in 19.1% of the patients during treatment.

STK and UK have been the most commonly used fibrinolytic agents. The results of a randomized controlled trial provided no evidence for a benefit of an accelerated fibrinolytic infusion compared with a conventional infusion for patients with left-sided PVT. The use of recombinant tissue-type plasminogen activator (rt-PA) has also been reported in doses used in the treatment of pulmonary embolism, but it is more costly, and no advantage of rt-PA for valve thrombosis has been demonstrated over STK or UK.8 At the end of thrombolytic therapy, treatment with heparin by continuous infusion or LMWH by S/C injection is recommended to prevent recurrent thrombosis. Conversion to oral anticoagulant treatment is performed in the usual manner, by starting warfarin simultaneously with heparin.9 Anticoagulation is targeted to an INR of 2.5 to 3.5 according to the standard recommendations10 and the addition of aspirin (81 to 100 mg daily) is strongly recommended.11

Pregnancy is generally considered a relative contraindication. However, when there is great danger to the patient, the advantages and disadvantages of fibrinolysis should be considered. There have been at least four reported cases, in which fibrinolysis was successfully used during pregnancy, with no harm to the fetus.12,13

CONCLUSION

Left-sided prosthetic valve thrombosis with stuck valve is potentially a life-threatening medical emergency. Since, pregnancy is a prothrombotic state more strict control of anticoagulation therapy and frequent monitoring is necessary for those patients who have used a mechanical valve. Proper counseling regarding the adherence to anticoagulant therapy is of outmost importance to prevent such dreadful condition. Thrombolytic therapy with streptokinase can be a safe alternative to surgery even during pregnancy.

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