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Case Report

Management of Prosthetic Tricuspid Valve Thrombosis with Streptokinase

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ABSTRACT

Despite improvements in the design of mechanical prosthetic heart valves and regular use of anticoagulation, prosthetic heart valve thrombosis remain the most dreadful complication associated with high mortality. Surgical thrombectomy or valve replacement is used as a conventional therapy. Medical thrombolysis, on the other hand, is a therapy choice. Present case is of a 26-year old female with Ebstein's irregularity who effectively endured tricuspid prosthetic valve thrombolysis using intravenous Streptokinase (SK). The outcome of our patient supports that SK can be an adequate therapeutic option for thrombolysis of tricuspid Prosthetic Valve Thrombosis (PVT) in children and adolescents.

Keywords: Intravenous streptokinase, Prosthetic valve thrombosis, Valve replacement.

How to Cite This Article: *Azizullah, Sadiq N, Farhan MA, Sadiq A, Imtiaz S. Management of Prosthetic Tricuspid Valve Thrombosis with Streptokinase. Pak Armed Forces Med J 2023; 73(SUPPL-3): S593-595. DOI: https://doi.org/10.51253/pafmj.v73iSUPPL-3.10643*

INTRODUCTION

Humans have been using mechanical heart valve prostheses subsequently since 1952.[1] Valve strategy and material advancements obligate significantly reduced mortality and morbidity after valve replacement. Nevertheless, stuck valve is quiet a potentially fatal side effect of artificial heart valves. Lower pressures on the right side of the heart, combined with slower blood flow across the tricuspid valve, are important causes of prosthetic tricuspid valve thrombosis. Furthermore, the possibility is increased in prothrombotic conditions such as the gestation phase or atrial fibrillation. Poor anti-coagulant adherence and suboptimal International Normalised Ratio (INR) remain serious issues in our society. Sharif-Khan et al from the Rawalpindi Institute of Cardiology found that 82.86% of patients had either inadequate INR or poor compliance with oral warfarin medication.[2] Patil *et al*. also showed that 76.40% of the subjects in their study had either inadequate INR or poor adherence to warfarin medication, indicating that this issue is widespread in most developing countries.[3] The average number of prosthetic valve thrombosis has been observed to range between as of 0.1-5.7%.[4] Prosthetic heart valve coagulation develops by means of an 11 year likelihood of (1-2)% in individuals having a bioprosthetic or mechanical heart valve in either the mitral or aortic valve position.[5] However, in the tricuspid position, the incidence of valve thrombosis might increased by 4% for each patient per year.[6] Surgical intervention has been the standard treatment for prosthetic mechanical valve thrombosis, particularly going on left side of the heart chambers, despite the fact that it has a large mortality rate of up to 69%, be contingent on the patient's cardiac functional class.[7] Medical thrombolytic therapy, however, is recommended by the American Heart Association/ American College of Cardiology for thrombosed right-sided prosthetic heart valves with New York Heart Association (NYHA) functional class III-IV symptoms or a substantial clot.[8] Medical thrombolytic therapy is also recommended by the European Society of Cardiology guidelines for tricuspid PVT.[9] Thrombolytic medications, however, are associated with risks of bleeding and embolism, despite the lower complication rates of right-sided PVT. We share a report of tricuspid PVT and evaluate the literature on tricuspid valve thrombolysis with a standard intravenous streptokinase dosage.

CASE REPORT

A 26-year-old lady with Ebstein anomaly had successful Tricuspid Valve Replacement (TVR) through a 30 mm St. Jude motorized prosthetic valve at AFIC/NIHD. Patent foramen ovale (PFO) was left open. Her post-operative echocardiography revealed well placed prosthetic tricuspid valve with no paravalvular leak having mean pressure gradient (MPG) of 4mmHg. Her post-operative recovery was smooth. After complete stabilization, patient was discharged. Her discharge medications included Warfarin 5mg half daily and Co-eziday 50mg half twice daily. Her INR target of 2.5-3.5 was maintained in follow up visits.

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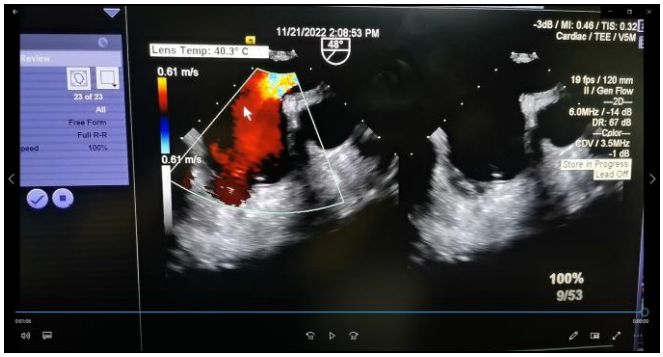

Figure-1: Transesophageal Echocardiogram (TEE) image color doppler showing right to left shunt through Patent Foramen Ovale (PFO) before Streptokinase (SK) injection.

Figure-2: Transesophageal Echocardiogram (TEE) image showing stuck prosthetic tricuspid valve before Streptokinase (SK) injection.

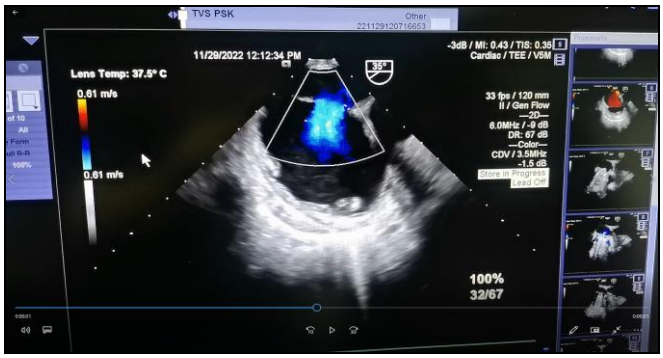

Figure-3: Transesophageal Echocardiogram (TEE) image showing shunting from left to right through Patent Foramen Ovale (PFO) after successful Streptokinase (SK) treatment.

One month later, patient presented with complaints of cyanosis, shortness of breath and dyspnea. On examination, she had tachycardia, tachypnea and SPO_2 of 42%. Her 2D echocardiography revealed limited mobility of tricuspid valve disc and right ventricular dysfunction. Additionally, her Transesophageal Echocardiogram (TEE) showed large paravalvular leak, restriction of lateral disc movement and tricuspid MPG of 10mmHg.

Figure-4: Transesophageal Echocardiogram (TEE) image shows both prosthetic tricuspid valve disc open after successful Streptokinase (SK) treatment.

There was shunting of blood from right to left through PFO. Moreover, her fluoroscopic examination confirmed stuck valve. Therefore, urgent referral to cardiac surgeon was decided. However, after detailed discussion between cardiac surgeon, paeds interventional cardiologist and intensive care specialist resulted to adopt empiric thrombolytic therapy for automatic tricuspid valve occlusion. Unfortunately if it fails, surgery or prolonged medical monitoring would be recommended.

On 25th of November 2022, after high risk consent, patient had been started with a 30-min loading dose of intravenous Streptokinase 250,000 U, followed by 100,000 U/h for 24 hours. During this period, strict monitoring was carried out including PT, APTT, INR, platelet count and vital record. Her 2D echocardiography, Transesophageal Echocardiography (TEE) and fluoroscopy at 24 hours showed normal disc movements and a mean MPG of 4.5mmHg. In addition, there was left to right shunt at PFO level. Intravenous Heparin infusion was started after termination of thrombolysis. After stabilization concomitantly, Warfarin 5mg was administered to achieve target INR 2.5-3.5. After achieving two therapeutic INR levels 24 hours apart, heparin was discontinued. In addition, that woman was on the go on Aspirin 75mg everyday. Her repeated echocardiogram at one, two, and three months after discharge indicated a typical operational prosthetic tricuspid valve through a mean tricuspid valve gradient of 3.0mmHg.

CONCLUSION

Medical thrombolysis is an appropriate treatment option that may avoid the need for redo surgery, particularly if a recent precipitant can be identified especially in developing countries like Pakistan where the immediate surgical options are remote. This management offers a harmless and low risk thrombolytic therapeutic preference to

conventional surgical intervention or continuous comment for tricuspid PVT.

ACKNOWLEDGEMENT

I am really grateful to my supervisor for his guidance and support that greatly assisted this research. I also want to share my gratitude for Comdt Exec Dir AFIC/NIHD & R&D Department for their support and contribution in completion of the research work.

Conflict of Interest: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript:

A, & NS: Manuscript writing, formatting of content, study concept, approval of the final version to be published.

MAF, & AS: Manuscript writing, formatting of content, study concept , approval of the final version to be published.

SI: Manuscript writing, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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