

Redo Mitral Valve Replacement using a St. Jude Medical Mechanical Prosthesis in a Patient with Thrombosed Mitral Prosthesis: A Video Presentation

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Abstract

Keywords

- ▶ redo mitral valve replacement
- ▶ St. Jude medical mechanical prosthesis
- ▶ thrombosed mitral prosthesis

We performed explantation of a chronically thrombosed St. Jude Medical mechanical mitral prosthesis with failed thrombolysis and re-replacement of the mitral valve using another St. Jude Medical mechanical mitral prosthesis. The technical details of explantation and re-implantation without causing injury to the cardiac chambers, great vessels, and atrioventricular groove and the importance of elective femoro-femoral bypass prior to sternotomy has been described.

Introduction

Despite usage of carbon pyrolite and central flow design of St. Jude medical Mechanical Prosthetic Valve, thromboembolism and anticoagulant induced hemorrhage after surgery continue to account for 75% of all valve-related complications.^{1–5}

Thrombolysis of thrombosed St. Jude mechanical valves is safe and the preferred first choice of treatment in the absence of other contraindications for anticoagulation.^{4–7} Cinefluoroscopy is the preferred method for diagnosis and follow-up of St. Jude thrombosis in our institution. Doppler echocardiography and cinefluoroscopy play complimentary roles in assessing prosthetic valve function during thrombolytic therapy.^{8–11}

Patients who do not respond within 48 to 72 hours should be referred for surgery because these patients may have tissue ingrowth, obstructing the prosthetic valve (Panus formation) and usually do not respond to continued thrombolytic treatment. Explantation of the prosthetic valves during redo surgical procedures present formidable surgical challenges in many instances.

We present herein a 45-year-old male patient diagnosed to have a chronic thrombosed St. Jude Medical mitral valve prosthesis, with failed thrombolysis, who underwent explantation

of the thrombosed mitral prosthesis and re-replacement of the mitral valve using another St. Jude Medical mechanical prosthesis. The technical details of explantation and re-replacement procedure without causing injury to the cardiac chambers, great vessels, and atrioventricular groove have been discussed in detail. Postoperative recovery was uneventful.

Surgical Techniques

Elective right femoral arteriovenous cannulation is done using long femoral arterial and venous cannulae (Edwards Lifesciences LLC, One Edwards Way, Irvine, CA, USA) following systemic heparinization.

Under cardiopulmonary bypass, secondary median sternotomy is performed with the heart decompressed on bypass. The pericardium overlying the aorta, right ventricular outflow tract, and superior vena cava is dissected.

An 18-Fr sump suction vent is placed over the main pulmonary artery for further decompression of the heart to facilitate dissection. The superior caval vein is dissected and cannulated directly using an angled metal tipped venous cannula and drained directly into the oxygenator. The intrapericardial inferior caval vein is dissected and looped for later occlusion.

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The right pleural cavity is widely opened. Due to dense adhesions overlying the right and left atrium, the pericardium overlying the body of the right atrium is not dissected. The patient has been planned for transeptal approach of mitral re-replacement.

The aorta is cross-clamped using an atraumatic aortic vascular clamp. Myocardial protection is achieved by integrated myocardial protection and topical cardiac cooling using ice cold saline.

After snugging the inferior caval vein, the pericardium overlying the right atrium is directly incised in between stay sutures. The interatrial septum is incised and opened in between stay sutures.

Two stay sutures of 2–0 Ethibond (Johnson and Johnson Ltd., Ethicon, LLC, San Lorenzo, USA) are placed over the prosthetic mitral annulus to facilitate later explantation of the mitral prosthesis.

An incision is made on the mitral prosthetic ring using a No.11 scalpel blade. The prosthetic valve is detached from the anterior atrioventricular groove by a combined sharp and blunt dissection.

A small right angle forceps is insinuated within the opening to facilitate explantation of the mitral prosthesis. The prosthetic valve is explanted by incising the prosthetic fibrous capsule on both atrial and ventricular surfaces. Extreme precautions are taken not to cause type I atrioventricular groove rupture. Precautions are also taken not to dislodge the thrombus contained within the prosthetic mitral valve.

The posterior chordal apparatus is retained. The ventricular cavity is irrigated using cold normal saline.

Re-replacement of the mitral valve is done using a 29 mm St. Jude Mechanical prosthesis (St. Jude Medical; St. Jude Medical; St. Paul, MN, United States) and interrupted 2–0 Ethibond mattress suture.

The interatrial septum is reconstructed using a Dacron polyester patch (Bard Savage filamentous knitted polyester fabric, Bard Peripheral Vascular Inc., Tempe, AZ, United States). The right atrium is closed in two layers using 2–0 polypropylene suture. The cardiac chambers are covered using a patch of bovine pericardium (►Video. 1).

Video 1

Video 1 Redo mitral valve replacement using a St. Jude medical mechanical prosthesis in a patient with thrombosed mitral prosthesis. Online content including video sequences available at: <https://www.thieme-connect.com/products/ejournals/html/10.1055/s-0040-1709272>.

Conclusions

Elective institution of cardiopulmonary bypass through femoro–femoral arteriovenous cannulation prior to sternotomy prevents accidental injury to the cardiac chambers and

great vessels during sternal entry. Pulmonary artery venting and cannulation of the superior vena cava further facilitates dissection of the cardiac chambers without causing injury. Placement of two stay sutures on the prosthetic annulus and intracapsular dissection greatly facilitates explantation without causing rupture of the atrioventricular groove.

Declaration of Conflicting Interests

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