

Case Report

Extra cardiac perforation following failed percutaneous transvenous mitral commissurotomy

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ABSTRACT

Percutaneous transvenous mitral commissurotomy (PTMC) is the procedure of choice for select patients with mitral valve disease who have favorable valve architecture and meet the requirements for balloon valve dilatation. Complications following PTMC are rare (<3%). A 56-year-old woman with rheumatic valvular heart disease, severe mitral stenosis and moderate mitral regurgitation in atrial fibrillation underwent elective PTMC. She developed an extra-cardiac perforation during PTMC because of abnormal catheter course, and underwent emergency mitral valve replacement with extra-cardiac perforation repair. Catheter-related complications following PTMC are rare but not unheard of. Prompt management of immediate complications result in favorable outcomes.

Keywords: Rheumatic valvular heart disease, Severe mitral stenosis, Percutaneous transvenous mitral commissurotomy, Mitral valve replacement, Case report

INTRODUCTION

Percutaneous transvenous mitral commissurotomy (PTMC) is a non-invasive procedure performed as standard therapy in patients with severe mitral stenosis, fulfilling the criteria for balloon dilatation with favorable valve architecture.¹ The concept was introduced in 1982 by Dr. Kanji Inoue.² The procedure involves the insertion of Inoue-Balloon catheter through the femoral vein into the right atrium. A Brockenbrough needle is used to penetrate the interatrial septum, after which an Inoue balloon is inserted transeptally into the left atrium and positioned against the mitral valve. The balloon is inflated to lower the gradient across the mitral valve. Once the dilatation is complete, the balloon is withdrawn from the left atrium, the valve is evaluated for increase in valve area, and degree of mitral regurgitation. Literature evidence suggests long-term favorable outcomes when used in young patients with increased valve area prior to intervention.³ The mortality rate associated with surgery

is 4.7%, while that of PTMC is 1%.⁴ Complications requiring emergency surgery include acute, severe mitral regurgitation following mitral valve apparatus disruption and cardiac tamponade induced by the perforation of cardiac chamber.⁵ We present the case of an emergency mitral valve replacement with extra-cardiac perforation repair after a failed PTMC in which the guide wire and sheath traversed an aberrant path and perforated the ascending aorta.

CASE REPORT

A 56-year-old diabetic and hypertensive woman with known history of rheumatic valvular heart disease presented to our hospital with shortness of breath on exertion, and palpitation. Physical examination was unremarkable. An echocardiogram indicated significant mitral stenosis, moderate mitral regurgitation, and calcification of the posterior mitral valve leaflet, in atrial fibrillation and the left ventricular function was normal.

Wilkin's score was 8. A diagnosis of rheumatic heart disease, with severe mitral stenosis and moderate mitral regurgitation was given. She was scheduled to undergo PTMC. The Mullin's sheath with guidewire was introduced through the right femoral vein. Fluoroscopy revealed an aberrant catheter path. Injection of contrast revealed the presence of the sheath's tip in the ascending aorta. The procedure was promptly stopped, Mullin's sheath and guidewire were left in place, and she was immediately shifted for emergency surgery. In the operating theatre, her chest was opened and a pericardiotomy was performed. The sheath had entered the great curvature of the ascending aorta after puncturing the roof of the right atrium. The patient was heparinized, and cardiopulmonary bypass was instituted using aortic and bi-caval cannulation. A purse string suture was placed on the aorta around the entry point of the sheath. Under direct vision, the sheath and guidewire were slowly withdrawn. Hemostasis was achieved. Mitral valve replacement was performed using 25 mm St Jude Medical master series mechanical heart valve through left atrial approach. Patient was decannulated. Her post-operative course in the hospital was uneventful. The patient was discharged on the seventh post-operative day. The patient was doing well at the 2-week postoperative review.

DISCUSSION

The key mechanism of successful PTMC is a commissure fracture. The Inoue-balloon approach is simpler to perform and has a lower complication rate than the double balloon technique.⁶ The size of the balloon used is dependent on patient's height, body surface area and maximal size of the inter commissural distance.⁷ Acute adverse events related to the procedure commonly occur during the procedure.⁸ The penetration of the Brockenbrough needle into the ascending aorta and the post-atrium pericardial space is considered as a major complication of Brockenbrough puncture.⁹ Emergency surgery is required to manage the situation.⁴ A similar report was presented by Park in 2008.¹⁰ Our patient was managed with emergency mitral valve replacement, repair of the ascending aorta, and the right atrium.

CONCLUSION

Acute complications following PTMC are rare, but not unheard of. Prompt action is must to salvage the situation.

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