

# Entrapment of Guide Wire – A Preventable Complication of Balloon Mitral Valvotomy

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## Abstract

Balloon mitral valvotomy (BMV) is a safe procedure in experienced hands. We report a case, wherein the tip of 0.025" stainless steel coiled guide wire was entrapped between the BMV balloon catheter and the balloon stretching tube during stretching of the balloon. This resulted in looping of the guide wire and any forceful withdrawal could result in its fracture. The mechanism of this complication and the steps to prevent it are discussed.

**Keywords:** Mitral stenosis; Mitral valvuloplasty; Complication

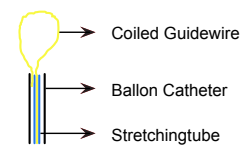
Balloon mitral valvotomy (BMV) is a safe procedure in experienced hands. Though several peri procedural complications had been described [1,2], we describe a preventable complication of BMV.

A 43-years-old female presented with symptomatic severe mitral stenosis with valve orifice area of 0.8 cm<sup>2</sup>. As the valve morphology was suitable, she was taken for BMV. BMV was done by the standard technique described by Inoue et al [3]. We used the Accura balloon catheter (Vascular Concepts, Essex, UK), which has comparable efficacy to the Inoue balloon catheter (Toray Industries, Japan) [4]. After obtaining femoral venous access and anti coagulating the patient, transseptal puncture was done in the 90° lateral view with Brokenbrough needle. Immediately after septal puncture, the patient developed pericardial effusion with tamponade. Pericardiocentesis was done through the subxiphoid approach and a pig tail catheter was left insitu. A puncture site which was above the plane of fossa ovalis with inadvertent puncture of left atrial (LA) roof could have caused the pericardial tamponade. After pericardiocentesis, the Mullins sheath along with the Brokenbrough needle was withdrawn and repunctures of septum was done at the level of fossa ovalis. Subsequently BMV was completed successfully with a valve orifice area of 1.9 cm<sup>2</sup>. To slenderize the balloon in LA, the 0.025" coiled BMV guide wire was introduced into the central lumen of the balloon catheter along with the straightening tube. As the straightening tube was advanced an initial resistance was noted but subsequently it went smoothly. When fluoroscopy was done to lock the distal hub of the catheter, we noticed that the guide wire had got entrapped and formed a closed loop, resembling a snare unit (Figure 1). While introducing into balloon catheter lumen, the tip of the guide wire got entrapped between the lumen of balloon catheter and the straightening tube (Figure 2). Once the entrapment occurred, the first thing we tried was withdrawing the slenderizing tube. But even with force the slenderizing tube could not be withdrawn as the

slenderizing tube was jammed within the lumen of balloon catheter due to friction caused by guide wire entrapment. If the guide wire was advanced further into balloon catheter, the loop kept increasing. When we tried to pull out the guide wire or the straightening tube resistance was encountered. Further forceful withdrawal could potentially fracture the guide wire [5]. Hence no further attempt to withdraw the guide wire was made. As the balloon was already slenderized we decided to pull the entire balloon catheter outside. Withdrawing the balloon catheter in such a manner; can remotely result in injury to the interatrial septum and femoral vein. The balloon catheter was gently pulled out without manipulating the guide wire (Figure 3). There was no obvious injury to the septum on echocardiography.

When pericardial effusion occurs following septal puncture, the high LA pressure decreases the chance of spontaneous closure of rent in LA wall. It has been the authors experience that if BMV is completed in the same setting, the LA pressure decreases and the rent usually seals of spontaneously. If there is persistent collection following completion of BMV then we resort to reversal of anticoagulation.

Fluoroscopy should be done compulsorily, while introducing the



**Figure 2:** Line diagram illustrating the entrapment of coiled BMV guidewire. The tip of the coiled guidewire can be seen to be stuck between the balloon catheter and straightening tube.



**Figure 1:** The loop formed by the entrapped 0.025" BMV guidewire can be seen. The balloon catheter resembles a snare unit. The pigtail catheter in pericardium can also be seen.

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**Figure 3:** Cine film demonstrating the withdrawal of the balloon catheter along with the looped guidewire from the femoral vein.

coiled guide wire into the balloon catheter. This complication can also be prevented by introducing an adequate length of the guide wire into the balloon catheter lumen before advancing the straightening tube. If any resistance is encountered while introducing the balloon stretching tube, further advancement should be avoided and fluoroscopy should be done to assess the cause of resistance. If the guide wire tip is struck, then the guide wire along with the straightening tube should be withdrawn. These simple steps will prevent guide wire entrapment and looping.

## Conclusion

Looping of BMV guide wire occurs due to entrapment of tip of

the guide wire between balloon catheter and balloon stretching tube. Withdrawing the balloon catheter along with the looped guide wire or forceful withdrawal of the entrapped guide wire may result in serious complications. Mandatory fluoroscopy and advancing the guide wire adequately before introducing the balloon stretching tube virtually prevents entrapment and looping of guide wire.

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