

# Coronary Perforation with Emergence of Cardiac Tamponade During Coronary Intervention - A Cath Lab Nightmare

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## ABSTRACT

Coronary perforation is an uncommon complication of percutaneous coronary intervention (PCI), that, in extreme cases, might result in cardiac tamponade. Here, we describe a case of coronary artery perforation in a 55-year-old female, presented with recent inferior wall myocardial infarction (IWMI). Coronary angiogram represented right coronary artery (RCA) lesion which was planned to manage with PCI. During PCI, coronary perforation emerged in RCA, leading to cardiac tamponade. Hence an immediate pericardiocentesis was performed and coronary perforation was tackled successfully using a covered stent.

**Keywords:** Coronary perforation, percutaneous coronary intervention (PCI), cardiac tamponade, cath lab nightmare

## INTRODUCTION

Coronary perforation is an undesirable and rare complication of coronary intervention that might result cardiac tamponade or acute myocardial infarction.[1] The incidence of coronary perforation as a complication of PCI ranges from 0.29-0.71%, and the use of debulking devices were reported to be responsible for this complication.[2,3] Perforation occurs when a dissection or an intimal tear entirely penetrates the arterial wall leading to either vessel puncture or, in more critical cases, a vessel rupture. Also, coronary perforation is associated with high mortality rates ranging from 7-15.2%.[4] Use of covered stents may provide a valuable rescue option for this life-threatening complication. Besides, an immediate surgical intervention may be

beneficial when coronary perforations are complicated by cardiac tamponade.[5] However, here in the present case, we have successfully managed a case of PCI induced cardiac perforation complicate by cardiac tamponade with pericardiocentesis using a covered stent.

### CASE DESCRIPTION

A 55-year-old female was presented with a recent inferior wall myocardial infraction (IWMI) at our tertiary care centre. On evaluation, coronary angiogram revealed critical right coronary artery (RCA) lesion, thus primary PCI was considered for management. During guide wire manipulation and balloon angioplasty, a perforation was formed in RCA (Figure 1) which was further complicated with hemopericardium and cardiac tamponade. Besides, there was a sudden fall of blood pressure to 40 mm Hg. Therefore, an immediate continuous pericardiocentesis was performed with a pig tail catheter in the pericardial cavity. Later, the perforation of RCA was sealed successfully with the deployment of a covered stent (Figure 2 and Figure 3). The patient was haemodynamically stable with no further pericardial leak.



Figure 1: Perforation with extravagation of dye



Figure 2: Implanted covered stent for coronary perforation



Figure 3: Sealed perforation with stent deployment (Final angiogram)

### DISCUSSION

Coronary artery perforation is an occasional complication that may result in cardiac tamponade during percutaneous treatment, and coronary perforation has been evidenced by the sudden emergence of its clinical picture. The common etiological factors involved in this complication includes advanced age, heart failure, non-ST elevation myocardial infarction and renal insufficiency. Moreover, angiographically type B and C lesions, use of hydrophilic stiff guide wire, oversize balloon or stent, cutting balloon, the use of atherectomy devices and post-dilatation with high pressure has also been reported as the significant risk factors of coronary perforation.[5] Coronary perforations are classified into three types: Type-I includes extraluminal crater without extravasation, Type-II involves pericardial or myocardial blushing and Type-III contains perforation  $\geq 1$  mm diameter with contrast streaming and cavity spilling.[4] The immediate recommended therapy for coronary perforation is prolonged balloon inflation proximal to the perforation site in parallel with reverse-heparin anticoagulation. Following failure of this therapy and continuous bleeding, treatment with a covered stent is recommended for intraluminal sealing of the perforation.[4] Urgent pericardiocentesis or drainage of excess fluid is indicated for each patient with established diagnosis of cardiac tamponade.[6] In the present case, hemopericardium and cardiac tamponade

were emerged in the patient during intervention. Therefore, pericardiocentesis was performed immediately to treat cardiac tamponade.[5,7]. Further management was done depending on the perforation type, for instance, large vessel perforations are usually treated with a covered stent whereas distal vessel perforation with distal embolization or coils.[3] In the present case, covered stent was used to seal the perforation. The main objective of a covered stent is to seal the perforation with a layer impermeable to blood. Both large and distal vessel perforations are associated with adverse clinical outcomes, underlining the importance of prevention, early diagnosis and treatment. Krishnegowda C et al., in their study have reported the incidence, management and outcomes of coronary artery perforation during percutaneous coronary intervention where, cardiac tamponade was successfully managed by pericardiocentesis, and covered stent has been demonstrated for the event of a high-grade perforation.[8]

## CONCLUSION

Coronary perforation is a life-threatening complication of percutaneous coronary intervention. Our report in real life patient demonstrates that covered stents are highly deliverable in challenging coronary anatomical conditions and thus may be useful for emergency treatment of coronary perforation.

**Conflict of Interest:** None

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