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Guidewire-Induced Distal Perforation of a Protected First Diagonal Branch During Mid-Left Anterior Descending Bifurcation Stenting: A Case Report

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Abstract | **Case Report**

The coronary artery perforation during elective percutaneous coronary intervention is a nightmare for interventional cardiologists and one of the most common complications that lead to cardiac tamponade and is always hard to manage timely and properly [1]. We report the case of a 76-year-old male who developed a paroxysmal supraventricular tachycardia with an accelerating chronic coronary syndrome due to a significant mid-left anterior descending artery [LAD] stenosis involving the first diagonal bifurcation. During provisional stenting of the mid-LAD with protection of the diagonal branch via a jailed guidewire, hemodynamic instability and cardiac tamponade occurred secondary to distal perforation of the first diagonal branch by the protection wire. Pericardiocentesis, transfusion and a covered stent deployed across the mid-LAD, deliberately sacrificing the diagonal branch ostium restored a hemodynamic stability and a satisfying result was achieved.

Keywords: Coronary artery perforation, Percutaneous coronary intervention, Cardiac tamponade, Covered stent, Pericardiocentesis, Jailed guidewire.

INTRODUCTION

Percutaneous coronary artery (PCI) has transformed the management of coronary disease (CAD) and is now the preferred revascularization strategy for the majority of patients with obstructive coronary lesions. Despit advances in equipment, antithrombotic therapy, PCI remain associated with a spectrum of procedural complication, among whiche coronary artery perfuration (CAP) is uncommon but potentially catastrophic.

The clinical impact of perforation depends on its localisation, size and the volume of extravasation which my lead to pericardial effusion, and cardiac tamponade, hemodynamic collapse and death if not recognized and managed promtly.

The provisional stenting strategy with side-branch protection using a jailed guidwire is the most commonly recommended for bifurcation lesion. Although this strategy minimizes the risk of side branch oclusion, it introduces potential risk, including guidwire-induced disection or perforation of side branch, particularly when the branchis chronic total oclusion severe vessel calcification, small or tortuous.

Effective managment of CAP requires immediate recognition, hemodynamic stabilization, reversal of anticoagulation and appropriate intervention strategies to the perfuration type and location. These include prolonged balloon inflation microcoil embolization and covered stent implantation and in rare cases may require an urgent CABG.

CASE REPORT

A76-year-old male patient with paroxysmal supraventricular tachycardia [on anticoagulation following a prior transient ischemic attack] who presented in out-patient clinic complaining of a chest pain with mild exertion class II CCS for 3 months that increased in severity in the last 2 weeks to become class III CCS. The patient was hemodynamically stable with blood pressure of 125/75 mmHg, heart rate of 73 bpm, the electrocardiography showed: The T wave inversion AVL lead and transthoracic echo-cardiography revealed: infero-septal wall hypokinetic motion with normal

ejection fraction. Chest X-ray was normal, the laboratory investigations were showed no abnormalities. Coronary angiography showed mid-left anterior descending artery [mid-LAD] occlusion of about more than 80 % involving the ostial first diagonal bifurcation. During provisional stenting of the mid-LAD with protection of the ostial diagonal branch via a jailed guidewire, during per procedural the patient developed a sudden chest pain, followed by rapid deterioration with hemodynamic instability and cardiac tamponade was detected by TTE sub-costally, contrast extravasation appeared distal of diagonal artery secondary to distal perforation of the first diagonal branch by the protection wire.

Urgent pericardiocentesis restored hemodynamic stability and removal of 680 ml of blood, and the patient received protamine sulphate. After transfusion of two units of packed red blood cells and eight fresh frozen plasma [FFP]. Definitive hemostasis was achieved with a covered stent deployed across the mid-LAD, deliberately sacrificing the diagonal branch ostium. The patient had a dramatic clinical recovery, with preserved left ventricular ejection fraction on follow-up echocardiography.

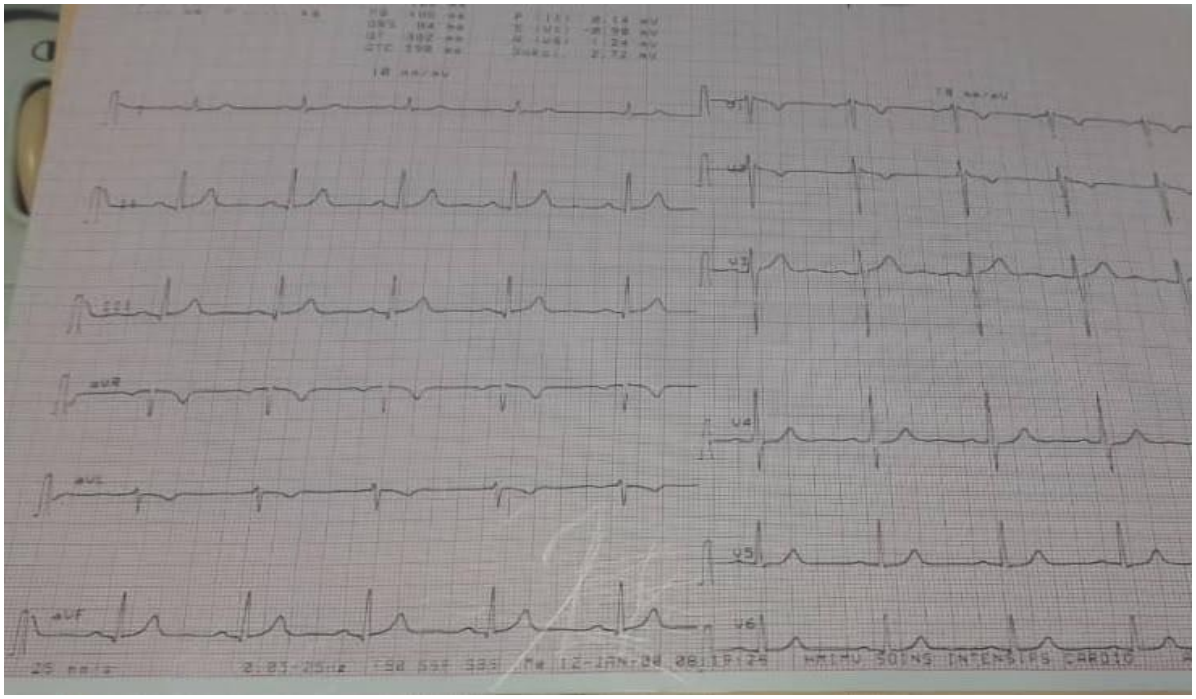
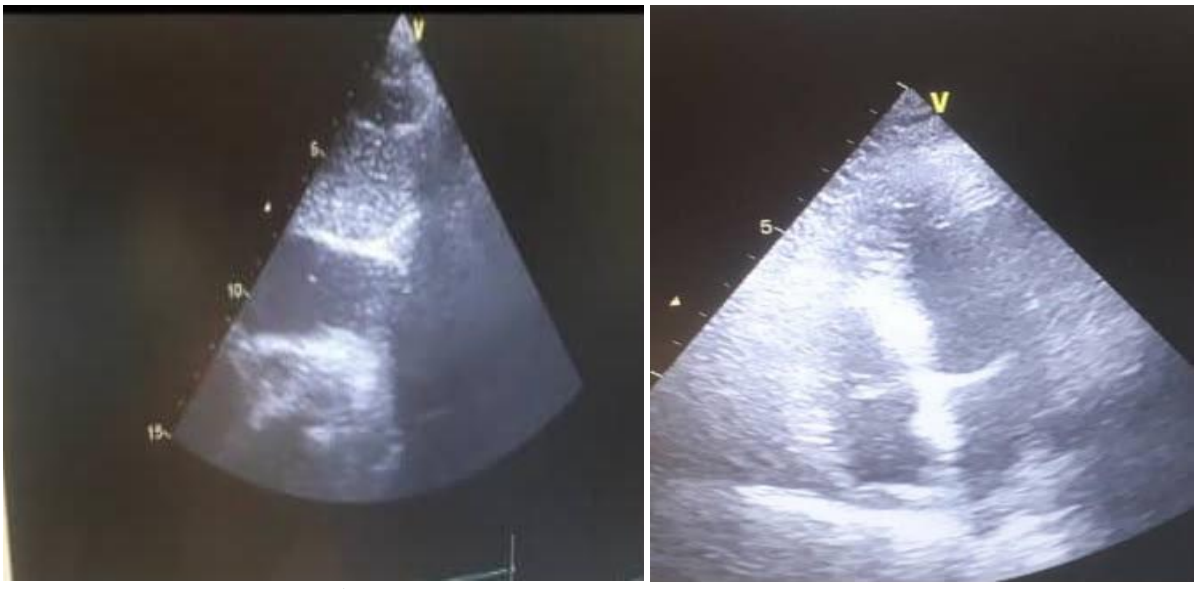


Fig. 1



A **B**

Fig [2 A and B]: subcostal view of echocardiography showing the tamponade and post pericardiocentasis apical 4 cavity emptying the tamponade

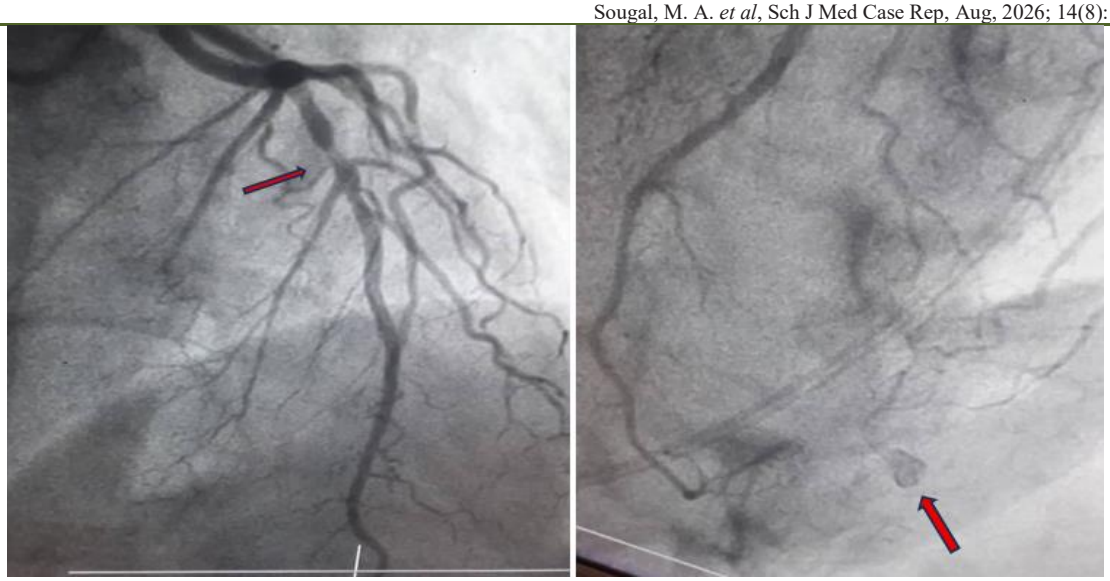


Fig. 3: Let the arrow showing the lesion and extravasation

DISCUSSION

Percutaneous coronary intervention [PCI] is the gold standard management for coronary artery disease [CAD] [2]. Coronary artery perforation [CAP] is a rare and life-threatening complication of PCI, with an incidence of 0.1% to 0.6% and mortality ranging from 8% to 15%. The coronary artery perforations are classified into five types as type I to type V. The type I and II perforations can be managed conservatively with hemodynamic monitoring and close observation [3]. While type III, IV and type V perforations can lead to a serious hemodynamic collapse as it is associated with high rates of cardiac tam ponade. Type III distal perforation needs an urgent coronary artery bypass grafting [CABG] [surgery] or with covered stents to achieve a rapid hemodynamic restoration while type V are usually treated with embolization [4].

Treatment modalities include pericardiocentesis of cardiac tamponade and hemodynamic correction, reversal of heparin anticoagulant, antiglycoprotein IIb/IIIa inhibitors [protamine sulfate], prolonged balloon inflation, microcoil embolization and covered stent implantation and in rare cases may require an urgent CABG [5]. The primary goal of using a covered stent is to create a barrier impermeable to blood leakage effectively [6].

It was observed that covered stents are associated with a higher risk of stent restenosis and thrombosis, leading to suboptimal long-term outcomes [7].

Therefore, in this case, the decision was made by cardio-surgery team to implant a covered stent and sacrificing the primary diagonal artery, and positive results were obtained. This strategy was chosen because there were not available microcoil embolization at the center where the procedure was performed and to prevent the further catastrophic hemodynamic instability and to minimize or avoid the open-heart surgery.

Coronary artery perforation, is a rare, can lead in catastrophic complications, That required effective treatment and immediate hemodynamic stabilization and interventional strategies according on perforation type and there location.

REFERANCES

1. Ellis SG, Ajluni S, Arnold AZ, Popma JJ, Bittl JA, Eigler NL, *et al.,* Increased coronary perforation in the new device era. Incidence, classification, management, and outcome.
2. Braunwald's Heart Disease. Elsevier; 2022.
3. Al-Lamee R, Ielasi A, Latib A, Godino C, Ferraro M, Mussardo M, *et al.,* Incidence, predictors, management, immediate and long-term outcomes following grade III coronary perforation.
4. Megaly M, Xenogiannis I, Brilakis ES. Coronary artery perforation during percutaneous coronary intervention: incidence, risk factors, classification, management, and outcomes.
5. Azzalini L, Poletti E, Ayoub M, Ojeda S, Bellini B, Gasparini GL, *et al.,* Coronary artery perforation during chronic total occlusion percutaneous coronary intervention: epidemiology, mechanisms, management, and outcomes.
6. Al-Lamee R, Ielasi A, Latib A, Godino C, Ferraro M, Mussardo M, *et al.,* Incidence, predictors, management, immediate and long-term outcomes following grade III coronary perforation.
7. Brilakis ES, Mashayekhi K, Tsuchikane E, *et al.,* Guiding principles for chronic total occlusion percutaneous coronary intervention. Circulation. 2019; 140[5]: 420-433. Doi:10.1161/CIRCULATIONAHA.119.039797.