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Case Report

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Iatrogenic Coronary Artery and Right Atrial Rupture During Percutaneous Coronary Intervention

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Introduction

Coronary artery perforation is a rare complication of percutaneous coronary intervention (PCI). It can lead to simple dye staining of the pericardium, to pericardial tamponade, or to complete haemodynamic collapse (1). Its incidence has been reported as 0.1- 0.6% of PCI procedures (2). The implantation of covered stents over perforated segments is feasible and associated with a high success rate (3).

Case report

A 85-year-old man chronic smoker with hypertension was referred to our hospital for the treatment of a subacute anterior myocardial infarction. ECG showed ST-segment elevation V1-6 leads. Coronary angiography was performed demonstrating critical stenosis of the proximal and middle portion of the left anterior descending (LAD) coronary artery (Figure-1). The LAD lesions were predilated with a 2.0-20 mm balloon and two stents were implanted in LAD artery (Liberte 3.5x20 mm stent for proximal and sirolimus-eluting stent 2,75x24 mm for middle) (Figure-2). Residual 30% stenosis was obtained in the distally placed stent which was dilated with a 3.5 x 10 mm non-compliant balloon at high pressure. A type 3 perforation of the vessel was detected (Figure-3). A 3.5x19 mm covered stent was implanted immediately to the rupture site. Further injection showed a trivial extravasation of contrast agent.

Transthoracic echocardiography revealed pericardial effusion, a collapsed right ventricle. Later, hemodynamic instability with hypotension and increase of the pericardial effusion occurred. A pericardiocentesis yielded 750 cc of fresh blood with immediate clinical improvement. TTE guided pericardiocentesis was performed immediately and hemodynamic condition was stable and no further treatment was adopted. An hour later patient's condition were deteriorated and taken to the catheterization room. Control angiography showed no evidence of stent restenosis or extravasations from the perforated site (Figure-4). Contrast agent was administered from the sheet in pericardial space and it was detected that the tip of the sheet was inside the right atrium. (Figure-5).

Patient was reconsidered by heart team and surgical withdrawal of the sheet from the

cardiac space was decided. However, control echocardiographic examination showed no change of pericardial effusion and conservative follow up was concluded. The patient was discharged from hospital in good condition four days later.

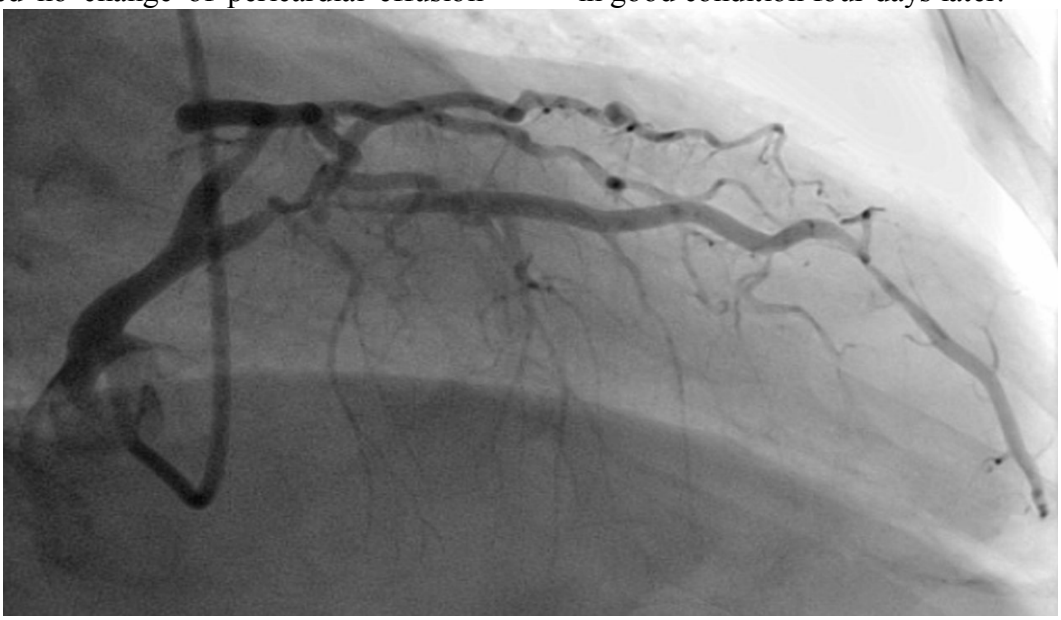


Figure-1: Right anterior oblique cranial view showing the proximal and middle portion of LAD lesions. LAD: left anterior descending

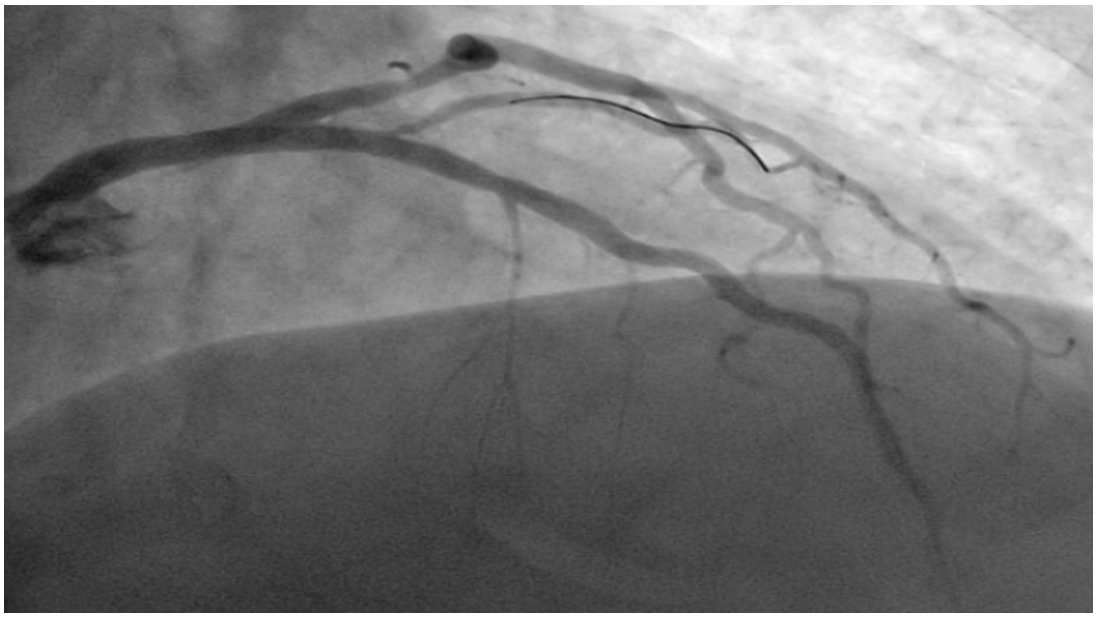


Figure-2: Shows view of left anterior descending artery after implantation of stents and residual stenotic segment.

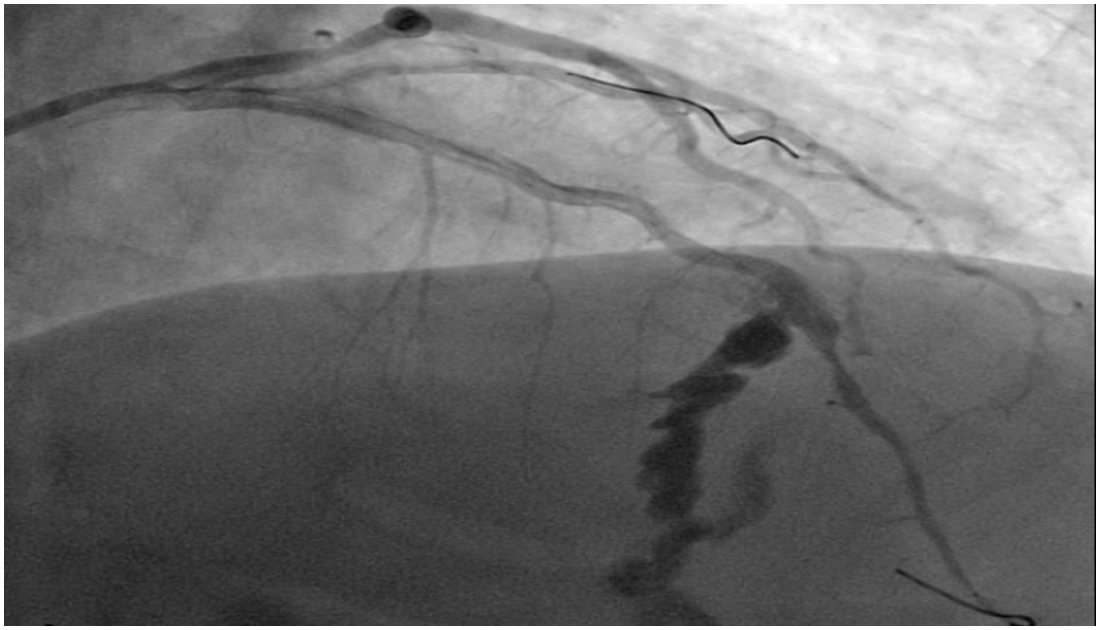


Figure-3: Post-dilation of residual stenosis with high pressure balloon and after post-dilation in mid segment of LAD. Strut rupture and coronary perforation is clearly seen and active bleeding is demonstrated by extravasation of material.

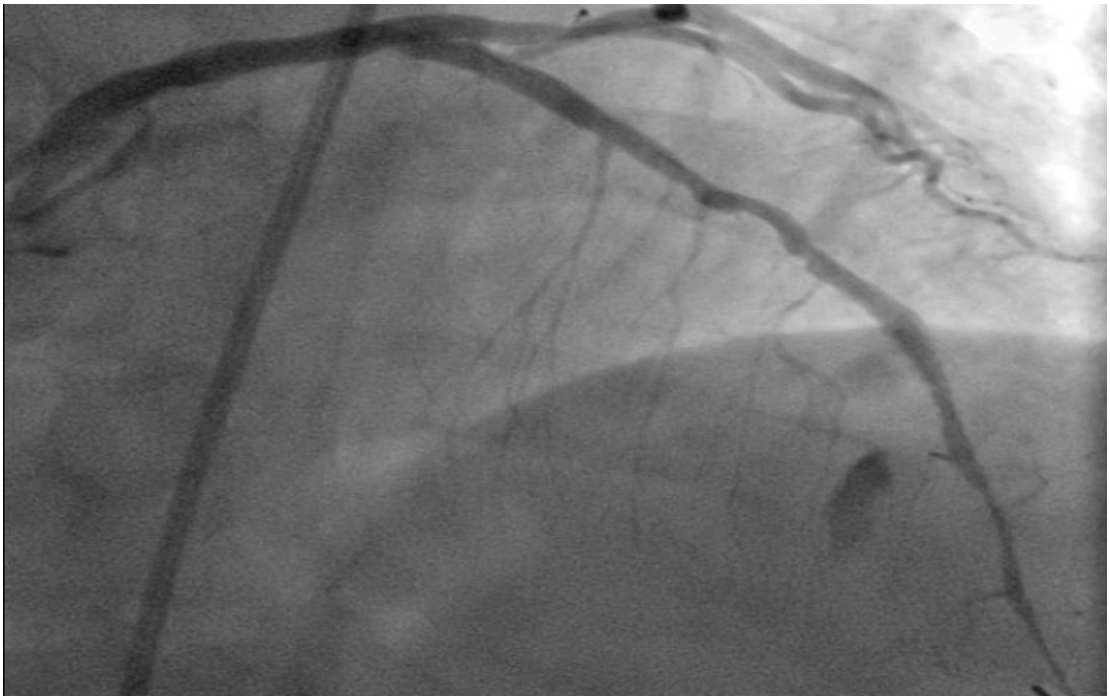


Figure-4: Shows appearance of left anterior descending artery in control angiography performed one hour later. Sealing of perforation with covered stent.

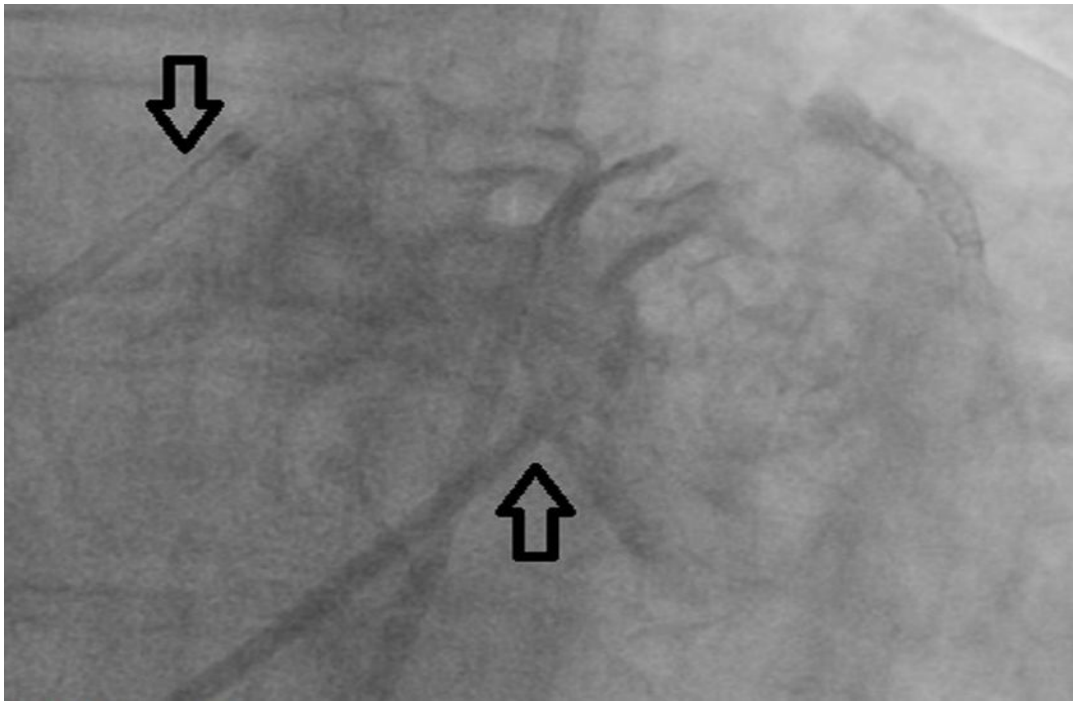


Figure-5: TTE guided pericardiocentesis was performed immediately. But when contrast agent given from sheet in pericardial space it had seen in right heart chambers (below arrow). Guiding catheter is seen (above arrow).

Discussion

Coronary perforation is a rare but serious complication of PTCA and requiring immediate treatment. Post-dilation of stent should be made consciously in these patients since there is a high risk of coronary perforation. Even a stent with a high radial force such as a sirolimus-eluting stent can cause a perforation via rupture of struts after poststent-dilatation, and this can be life-threatening. Presence of calcification on the arterial wall and use of a high balloon-to-artery ratio were important predisposing risks as both were present in our patient.

This case is a good example of survival from coronary artery perforation which should always be maintained with great caution and faster evaluation.

References

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