TOOLS TECHNIQUES

Tools & Techniques - Clinical: Management of coronary perforation

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In this chapter of Tools and Techniques Clinical, management of coronary perforation in the cardiac catheter laboratory is discussed. The following is a summarised overview of this technique. The complete, unabridged version with images is available online at: http://www.pcronline.com/eurointervention/76th_issue/111.

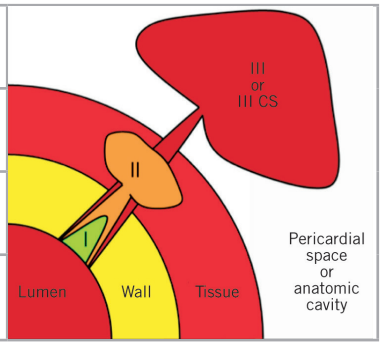
Background

Coronary perforation is a rare (pooled incidence: 0.43%, 95% confidence interval: 0.35-0.52%)[1] but serious complication of percutaneous coronary intervention (PCI) that is associated with significant morbidity and mortality **(Figure 1)**. Clinical and procedural predictors of coronary perforation are well described **(Table 1)**.

Table 1. Predictors of perforation.

Clinical	Procedural
Complex lesions	Atheroablative devices
Age	Cutting balloons
Female gender	Hydrophilic guidewire
Chronic total occlusion	Stiff guidewire
Presence of coronary calcification	Use of IVUS
Hypertension	Oversized device
Acute coronary syndrome	Femoral approach
Heart failure	

Type I	Extraluminal crater without extravasation
Type II	Pericardial or myocardial blush without contrast jet extravasation
Type III	Extravasation through frank (>1 mm) perforation
*Type III cavity spilling (CS)	Perforation into an anatomic cavity, chamber, coronary sinus, etc.



*Sometimes referred to as Type IV

Figure 1. *Ellis classification of perforations[2].*

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Management

Management is dependent upon the Ellis classification. The primary aim is to seal the perforation and prevent cardiac tamponade.

Table 2. Glycoprotein IIb/IIIa inhibitors; plasma half-life and reversal.

Glycoprotein IIb/IIIa inhibitor	Plasma half-life (minutes)	Reversal
Abiciximab (ReoPro®)	20-30	Platelet transfusion
Eptifibatide (Integrilin®)	150	Await elimination
Tirofiban (Aggrastat®)	84-108	Await elimination

Haemodynamic compromise should be treated with resuscitation; evidence of cardiac tamponade should be sought. If tamponade is confirmed, pericardiocentesis should be performed, preferably guided by transthoracic echocardiography. European Society of Cardiology guidelines describe signs, symptoms and management of cardiac tamponade[4]. Glycoprotein IIb/IIIa inhibitors should be discontinued on recognition of coronary perforation because their use may be associated with increased risk of major adverse cardiac events (MACE) and greater difficulty in achieving haemostasis[5]. Intravenous heparin can be reversed with intravenous protamine sulphate (1 mg of intravenous protamine sulphate neutralises 80-100 units of heparin [max. dose 50 mg]).

Conflict of interest statement

The authors have no conflicts of interest to declare.

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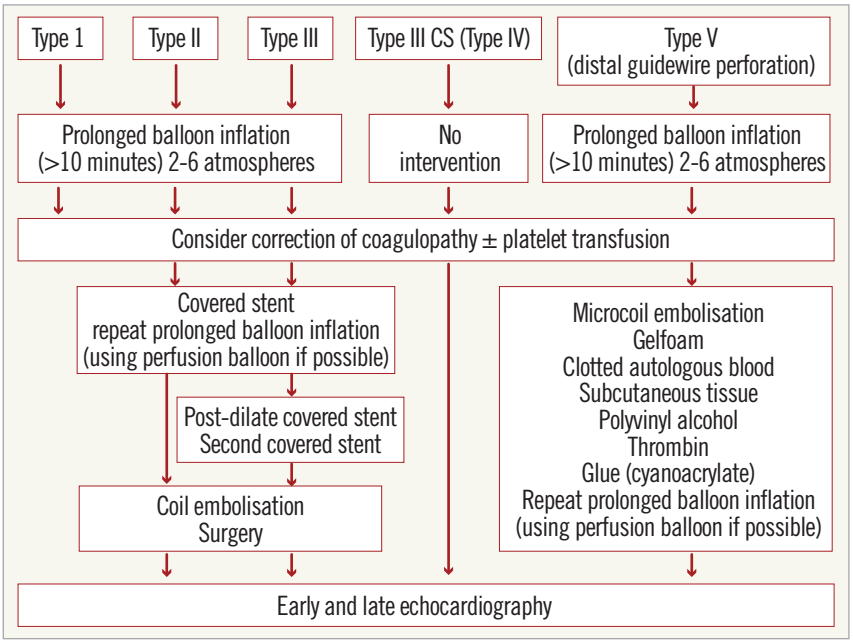

Figure 2. *Algorithmic management of coronary perforation*[3].