Management and Outcomes of Coronary Artery Perforation During Percutaneous Coronary Intervention - Seven years of institutional experience

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Background: Coronary perforation (CP) is a rare, sometimes lethal complication of percutaneous coronary intervention (PCI). We sought to define the incidence and outcome of CP in our institution given the advance in interventional techniques and devices.
Objectives: We analyzed a cohort of patients who had CP during PCI at our hospital over a 7-year period to examine incidence, management and outcomes.
Methods: All patients who had a CP as a complication of PCI between 1/01 – 12/07 were identified retrospectively from our computerized database. Demographic, clinical and procedural data and outcome variables were obtained. CPs were classified by an interventional cardiologist according to an accepted grading score. Type I perforations were defined by the development of an extraluminal crater without extravasation, type II by a pericardial or myocardial blush without contrast jet extravasation and type III by extravasation through a frank (1 mm) perforation or cavity spilling into an anatomic cavity chamber.
Results: 49 cases (Age 67.7±11.7 years) with CP (14.3%, 53% and 32.7% for grade I, II, III respectively) were identified among 8345 interventions performed during the study period (0.59%). The indications for PCI were STEMI, UA/NSTEMI or stable CAD (8.2%, 71.4%, 20.4% respectively). Perforated vessels were LAD (24.5%), LCX (24.5 %), RCA (43%), and SVG's (8%). Vessels were perforated by wires (49 %), balloons (28.6%) and stents (22.4%). Associated lesion characteristics were chronic total occlusion (53%), calcified lesions (40.8%), bifurcation lesion (34.7%), small diameter (≤2.5mm) (34.7%) and in-stent restenosis (4%). Three patients (6%) died in hospital, 9 (18.4%) had tamponade, 8 of whom (16.3%) required urgent pericardiocentesis and 3 (6%) required urgent surgery. Eleven patients (22.4%) were managed percutaneously with covered stents or balloon inflation. All severe complications occurred with grade III perforations (death 3/16; 19%, tamponade 9/16; 56%) but 31% (5/16) of grade III cases did not require any intervention. Most cases with grade I and II were followed conservatively.
Conclusions: Most patients with grade I and II perforations can be managed conservatively while patients with grade III perforations usually require a more aggressive approach. A sizeable minority of patients with grade III perforations can be managed without any intervention.