

"Would you rather be skillful or would you rather be lucky?": A challenging case of septal branch perforation successfully sealed with gelfoam embolization

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Septal branch perforation is an uncommon complication during percutaneous coronary intervention (PCI) and is usually seen when navigating septal collateral vessels in retrograde approach of a chronic total occlusion. Unlike epicardial vessel perforation that leaks blood into the pericardial space causing cardiac tamponade, septal perforations trap blood within the muscular walls of the interventricular septum and rapidly expanding hematomas can obstruct right ventricular filling, which leads to obstructive shock or "dry tamponade. Here we report a challenging case of septal branch distal wire perforation in a 71-year-old male, hypertensive, dyslipidemic and an ex-smoker, who came in for staged PCI procedure. Two months prior, he had inferior wall ST segment elevation. Initial coronary angiogram showed a Triple vessel Coronary Artery Disease with Left Main involvement and underwent PCI of Right Coronary Artery (RCA) (culprit lesion). Relook angiography showed a 70-80% stenosis from prox to mid RCA with patent distal RCA stent. The left main (LM) showed 50% distal stenosis and it bifurcates into left anterior descending artery (LAD) and left circumflex artery (LCX). LAD has a tight ostio-proximal stenosis of about 80-90% stenosis and LCx has a 70% proximal stenosis. After wiring LAD with Sion, predilatation was performed with 2.25 mm balloon. After predilatation, contrast staining was noted at the segment of mid LAD. Balloon tamponade was immediately performed. It was a challenge to locate the exact origin of perforation as it was initially thought to be where predilatation of the mid LAD segment was performed. Thus, additional balloon tamponade was performed from prox to mid LAD, but there was still persistent contrast staining after. The exact site of perforation was then located at the first septal branch. However, there were additional challenges met as to- first, difficulty in wiring the first septal branch due to the dissections created from balloon predilatation and second, the site of perforation was very proximal, which may block the blood flow to the remaining segments of the left anterior descending artery during contemplated bail-out strategies. The first septal branch was eventually wired using a dual lumen catheter. Balloon tamponade was repeated with longer inflations but the patient was unable to tolerate. Gelfoam embolization was then contemplated. A microcatheter was inserted to the first septal branch to deliver the gelfoam. Due to anticipated concerns of refluxing into the main epicardial artery during injection of gelfoam, a 3.0 mm balloon was inflated in the proximal LAD to temporary prevent blood flow and to trap the microcatheter in place. Initial gelfoam embolization was attempted using 3 cc of gelfoam solution, but there was still persistence of contrast staining. Balloon tamponade was again attempted to no avail. BP went as low as 90/60 but improved with hydration. A second attempt on gelfoam injection, this time using 5 cc, eventually sealed the perforation. This was followed by successful PCI of LAD using 3.0 x 29 mm DES and DCB and PCI of LCx using 2.5 x 15 mm DCB. Subsequent angiogram showed significant improvement of septal leak and eventually, no more contrast extravasation with TIMI 3 flow. Bedside echo showed minimal pericardial effusion and patient remained stable. In cases of coronary perforation, early recognition, determination of the site of perforation in combination with proper assessment and knowledge of the proper technique for gelfoam embolization will help achieve hemostasis, prevent dry tamponade as well as avoid other possible potential complications such as in this case, avoid gelfoam from leaking into the main epicardial artery.