Wire Induced Coronary Perforation Finally Terminating into Contained Myocardial Rupture – A Case Report

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Abstract
We herein describe a case of coronary microleak secondary to possible wire tip induced injury during percutaneous coronary intervention (PCI) successfully closed with intra arterial glue but secondarily ending in a contained myocardial rupture with continued and repeated leak leading to fresh repeated cardiac tamponade, an observation not so commonly noted. The surgical findings confirming the contained myocardial rupture and its final salvage are described.

Keywords: Myocardial Rupture; Coronary Microleak; Cardiac Tamponade

Learning Objective
The case gives an insight into the complication of coronary leaks post PCI which though rare, are not uncommon, and we feel should be a very important learning lesson for all readers involved in interventional procedures.

Introduction
Coronary leaks post percutaneous interventions are not uncommon with wire tip induced perforation being one of the commonest. These are also the commonest cause for an overlooked perforation during the procedure, the leak being slow, and patient presenting with pericardial effusion and tamponade only in the post procedure period once he/she is shifted to the ward. Nearly half of these are self terminating with medical management and the other half require a closure of the leaking twig using micro coils, thrombus, fat particles, glue or otherwise [1-9]. Interventional management is usually successful except in rare cases. Our case was unusual in the sense that successful closures of the microleak producing vessel led to a possible myocardial infarction and rupture with continued leak from the territory and repeated cardiac tamponade finally needing surgical closure of the contained myocardial rupture.

Case Report
GS was a 60 yr old lady who was taken for routine percutaneous coronary intervention (PCI) in a triple vessel disease setting. During PCI of the obtuse marginal, the last vessel being handled, there was a contrast stain noted at end of the procedure in the region subtended by the obtuse marginal territory (Figure 1). Simultaneously there was a small amount of pericardial effusion detected with normal hemodynamics but in the next half an hour the same progressed to cardiac tamponade with systemic hypotension (BP < 90mmHg systolic). In view of the hypotension an immediate pericardiocentesis was done which brought the blood pressure to normal and closure of the distal obtuse marginal was obtained using intra arterial glue injection. The technique for glue injection has been described earlier in detail [8-9]. There was instantaneous closure of the vessel and no further leak could be detected on the coronary angiographic shoot (Figure 2). The patient was shifted back to the ward with pericardial drain indwelling. However within next 30 min there was repeat collection and recurrence of cardiac tamponade needing further drainage of about 250 ml through the indwelling pericardial drain which was auto transfused. Heparin reversal was done using injection protamine. Patient was brought back to cathlab to look for a missed bleeder on the angiogram but none was found. As a last resort pericardial injections of 2-3 vials

Figure 1: Left coronary angiogram in anteroposterior caudal view (1a), and left anterior oblique view (1b) showing leak from the distal obtuse marginal with stain.
of cyanoacrylate glue mixed with lipoidol were done to stick the two pericardial surfaces after having drawn all blood from the space so as to contain any microleak which was not detectable on the angiogram, a technique also described by us earlier [10]. This effort, however, also did not help in the control of the situation in this case and repeated pericardial collection continued with pericardial drainage being needed almost every hour from the self retaining pericardial drain for next 8-10 hrs and the aspirate was auto transfused through a venous line.

Realising that the leak would not stop and recollection was occurring repeatedly and that too at a rather rapid pace needing drainage almost every 30 min to an hour and the source being somewhat unexplained it was decided to send the patient for an exploratory surgery and ligation of the bleeding vessel under direct vision.

On surgery however the moment pericardium was opened it was found that the space was full of blood with minor adhesions noted secondary to the glue injection in the pericardial space. Further, on looking towards the obtuse marginal territory, to our surprise it was observed that there was a pulsatile spurt from not any vessel but from the myocardium in the lateral area with bleed during systole and stoppage during diastole and the entire area was infarcted, aneurysmal and bulging. The adhesions developed secondary to the pericardially injected glue partly tamponading a contained myocardial rupture (Figure 3; Video 1). This rupture was then repaired by plagetted sutures and situation could be finally salvaged. Patient needed transfusions of several units of packed RBC, fresh frozen plasma and platelets post operation and could be finally reinstituted antiplatelet therapy on the 3rd day, once the surgical drains were removed. A final discharge home was made on 7th day. There was no ischemic coronary event as such inspite of the antiplatelet stoppage and the recent five drug eluting stents in place in a triple vessel PCI setting.

Discussion

Our case describes a not so unusual PCI complication i.e coronary microleak secondary to a wire tip induced perforation which is well known and leads to pericardial collection and tamponade needing pericardial drainage. Attempts to closure of the bleeding vessel can be made using prolonged balloon inflation alone or embolization of microcoils, thrombus, fat particles, or intra arterial glue as described by earlier [1-9].

The unusual part of this case was the continued leak and that too at a rather rapid pace, post therapeutic closure of the leaking vessel without any remaining evidence of continued leak left on the angiogram. The cause of this continuing leak being somewhat perplexing and unexplained was the main reason for delay in surgical decision because one could not just push a patient with five recently implanted stents to surgical exploration without knowing the finding to be expected on surgery and the possible repair contemplated. Hence all efforts were made to bridge the gap using heparin reversal and an indwelling pericardial drain with tapping every time when the systolic pressure fell below 90 mmHg and auto transfusion of the aspirate in the hope that the leak could self heal itself. However when the collection never showed an indication of stopping it was only as a last resort that the patient was taken for exploratory surgery and the surgical findings were also somewhat surprising.

The case gives us an insight into the fact that in situations where the distal vessel is closed as a part of treatment strategy to seal the leaking micro hole the ensuing infarct in the territory subtended by...
the vessel could also lead to a myocardial rupture with a so called new source of leakage. We strongly believe this as the possibility in our case and was the unusual part. The patient could sustain during this intervening period partly because the pericardial glue injection which helped in tamponading the rupture site making the rupture contained rather than free. However the rupture was still big enough to continue to spurt from the sides of the contained zone and was the cause for repeated rapid collection. Finally surgery helped us salvage the patient.

Also at that stage, may be, had we done a LV angiogram in a LAO view profiling the obtuse marginal surface we might have been able to pin point the leaking site from the ventricle which we learnt as a hind sight. But because LV angio is not routine during coronary intervention the same was not done.

References


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