1013 **Out of the Woods and into the Frying Pan: A Case of Access Site Complication after Successful Percutaneous Coronary Intervention with Stenting of a Chronic Total Occlusion of the Left Anterior Descending Artery**

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Abstract

Vascular access site complication is a dreaded event following cardiac catheterization and coronary intervention. The use of larger diameter devices on top of anticoagulation, make femoral access site prone to complications and it is not limited to ecchymosis, bleeding or hematoma but may even be serious as pseudoaneurysm, retroperitoneal hemorrhage, embolism, thrombosis, infection, dissection, infection, limb ischemia, vessel rupture or perforation. This is a case of a 57 year old female, hypertensive with non-insulin requiring diabetes mellitus who came in for staged coronary intervention for severe 3 vessel coronary artery disease. After successful coronary intervention with stenting of the Left Anterior Descending Artery (LAD), she was noted to be pale looking with hypotension and metabolic acidosis. Peripheral angiogram was performed which showed extravasation of contrast at the right common femoral artery puncture site. Prompt surgical referral followed by inguinal exploration and repair of the femoral artery was performed after percutaneous attempts for hemostasis was unsuccessful. She was subsequently discharged improved and ambulating. Bleeding is the most frequent procedural complication after femoral approach which may lead to blood transfusion and surgical referral in 2.6 to 6.6% of cases [1].

Introduction

Coronary artery disease consistently remains the top cause of mortality in the Philippines. To address this problem the Philippine Health Insurance Corporation expanded the coverage for coronary catheterization and coronary intervention. As the number of invasive coronary procedures increase, we may also see a rise in the corresponding complications as well.

Bleeding is the most common complication following femoral approach to percutaneous coronary procedures and it may present as hematomas, uncontrolled bleeding and retroperitoneal hemorrhage. It should elicit prompt assessment and management if the patient will present with abdominal, back or flank pain, hypotension or a drop in hemoglobin following invasive cardiac procedures.

Case Report

This is a case of a 57 year old female with hypertension and non insulin requiring diabetes mellitus who has been complaining of typical chest pain despite optimal guideline directed medical management. She underwent coronary angiogram a month prior which showed mild disease of the left main coronary artery, a totally occluded left anterior descending artery at the proximal segment, a severely diseased left circumflex artery at the distal segment and a near total occlusion of the mid right coronary artery (Fig 1). She was advised coronary artery bypass surgery but she opted to have percutaneous coronary intervention instead. Pre operative work up was optimal with a transthoracic echocardiogram showing adequate wall motion and contractility with an ejection fraction of 63%.

On the day of the procedure, dual access was planned for simultaneous contrast injection of the left and right coronary circulation. A 7F radial sheath was secured on the right radial artery and an attempt to access the right femoral artery via Seldinger technique was unsuccessful. Direct pressure over the right femoral artery followed by pressure dressing of the right femoral access site was done for hemostasis. The left radial artery was then accessed and a 5F radial sheath

was secured in place. A 5F TIG diagnostic catheter was coursed through the left radial sheath and the right coronary ostium was cannulated. A 7F EBU3.5 guide catheter was coursed through the right radial sheath and the left coronary ostium was cannulated and simultaneous contrast injection was performed (Fig 2). A Gaia Next 3 coronary wire was successfully coursed through the LAD lesion together with a Finecross microcatheter after wire escalation. Serial pre-dilatation was done followed by deploying an Ultimaster Tansei 2.5 x 28mm drug eluting stent (DES) at the mid LAD and another Ultimaster Tansei 2.75 x 24mm DES deployed at the proximal LAD. Final angiographic shots showed Thrombolysis in Myocardial Infarction 3 (TIMI) flow, and a 90% eccentric residual stenosis at the distal segment (Fig 3). The right radial sheath was removed, and a trans-radial band was applied for hemostasis while the left radial sheath was maintained and hooked to arterial pressure monitoring. While at the coronary care unit (CCU), the patient was noted to be awake but sallow looking with a blood pressure of 60/40mmHg. Examination of the right radial and right femoral puncture site did not show active bleeding on the puncture site, no swelling, no ecchymosis. Endotracheal tube was inserted due to metabolic acidosis on arterial blood gas while her complete blood count showed a hemoglobin of 7.2g/dL. A total of 1000cc of isotonic fluid was infused while waiting for 3 units of packed red blood cell to arrive. Norepinephrine and dobutamine drips were started for blood pressure support. Immediate surgical referral was done and the patient was brought back to the catheterization laboratory. A 6F JR4.0 catheter was then inserted over the wire and positioned at the abdominal aorta and angiography of the right common femoral artery showed extravasation of contrast at the right femoral puncture site. An NC Emerge 5.0 x 20mm balloon was positioned at the common femoral artery and serial balloon dilatation was done proximal to the puncture site (Fig 4A) while waiting for the surgeon to arrive. Upon arrival of the surgical attending, the right groin was prepared via aseptic technique and right inguinal incision carried down to the femoral artery was done followed by repair of the femoral artery using Prolene 6.0 (Fig 5). After successful inguinal exploration and repair of the femoral artery, the patient was transferred back to the CCU where her blood pressure recovered, and vasopressors were discontinued. She was weaned off mechanical ventilator and was transferred to regular room the following day where she remained stable and was subsequently discharged after 2 days.

Discussion

There are numerous possible vascular complications one might encounter when performing cardiac catheterization and cardiac intervention. It is not limited to minor complications like ecchymosis, minor bleeding and non expanding hematoma but it may be as serious and life threating that would require blood transfusion and surgical repair.

The incidence of femoral access site complication may vary and is dependent on multiple factors like the size of the devices used and the degree of anticoagulation. It may be as high as 17% [2] and is usually more frequent during interventional cardiovascular procedures. Major bleeding after interventional cardiovascular procedures range from 2 to 6% [3] and would usually require blood transfusion and surgical repair due to access site complications.

There are patient related factors and procedure related factors that needs to be considered in order to reduce vascular access site complications during cardiac catheterization procedures. Prolonged and high dose anticoagulation and use of thrombolytic agents, use of GP IIb/IIIa inhibitors, larger arterial sheath with adjacent venous sheath, prolonged indwelling sheath and prolonged procedure time, same arterial access site from previous catheterization and repeat PCI on the same access site location are among the procedural factors associated with vascular access site complications [4, 5, 1, 6]. It is wise to take note that there were fewer vascular access site complication when using a 6F guide catheters in patients undergoing elective PCI as compared to 7F or 8F guide catheters [5]. Some patient related factors that were

associated with vascular access site complications were elevated creatinine or renal failure, low platelets, low body mass index as well as obese patients, female gender and older age patients, and patient with peripheral vascular disease [1, 4, 5].

Over years of performing numerous cardiac catheterization and coronary intervention, there have been numerous approaches to reduce vascular access site complications from use of fluoroscopy to locate the femoral head to ultrasound guidance to quickly identify the femoral artery and reduced multiple attempts and time to access. Radial access has been shown to significantly reduce vascular complication most specifically bleeding with concomitant increase in patient comfort and reduced hospital cost [7, 8]. Arterial closure devices on the other hand improve patient comfort and earlier ambulation, reduce hospital cost by reducing complications and promote early discharge but some complications that arise from manual compression are similar to and may also arise from arterial closure devices ie. bleeding from incomplete closure or bleeding from posterior wall puncture.

Once vascular site complication is suspected, prompt and rapid response should be initiated due to the risk of developing hypotension and shock. Manual pressure should be applied on the puncture site and anticoagulation should immediately be stopped or reversed. If hypotension develops, fluid resuscitation and blood replacement should be started as soon as possible. Balloon tamponade should be performed if manual compression is unsuccessful after localization by angiography, like what was done in this patient. Other endovascular methods should be considered like stent grafting, embolization using coils, polyethelyne glycol plug, and fat embolization if primary balloon tamponade fails whichever is available in your institution. Surgical intervention is indicated especially in hemodynamically unstable patients not responding to earlier interventions mentioned.

Conclusion

Interventional cardiologist face a significant challenge when they encounter femoral access site complications. Despite the preference of using the radial artery for cardiac intervention, one should still be knowledgeable and sufficiently equipped to face complications arising from accessing the femoral artery.

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