



RETROPERITONEAL HEMATOMA: A LIFE-THREATENING COMPLICATION REQUIRING PROMPT INTERVENTION

Cardiology

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ABSTRACT

Vascular access complications during coronary angiography, though rare, can be life-threatening and require rapid intervention. We report the case of a 43-year-old male with Non- ST elevation myocardial infarction (NSTEMI) who developed hypotension during diagnostic coronary angiography via the femoral route. Imaging revealed active bleeding from the right external iliac artery and retroperitoneal hematoma. The patient was successfully treated with balloon occlusion followed by covered stent placement. A month later, he underwent successful percutaneous coronary intervention (PCI) for a calcific right coronary artery(RCA) lesion, in view of persistent angina.

KEYWORDS

Retroperitoneal Hematoma, Femoral Access Complication, Coronary Angiography, Covered Stent, Endovascular Management

1. INTRODUCTION

Catastrophic cardiovascular bleeding pathologies remain one of the most fatal and sudden medical emergencies. Conditions such as aortic rupture, aneurysmal dissection, or massive intrathoracic hemorrhage often lead to instantaneous collapse and death, with diagnosis frequently established only at autopsy.¹ These events underscore the devastating impact of vascular catastrophes on survival and highlight the challenges clinicians face in identifying and managing such conditions in time. Femoral access-related bleeding is an infrequent but potentially fatal complication of coronary angiography. Retroperitoneal hematoma is another life threatening complication which can cause rapid hemodynamic deterioration and is often difficult to detect without high clinical suspicion. The overall incidence of retroperitoneal hematoma is difficult to ascertain as the label comprises such a heterogeneous group of injuries. Traumatic retroperitoneal hematomas result from 67% to 80% of blunt injuries versus 20% to 33% of penetrating trauma. One retrospective series identified retroperitoneal hematoma in 12% of a population of stable patients with documented abdominal trauma.² We present a case where early detection and intervention prevented a fatal outcome.

2. Case Presentation

A 43-year-old hypertensive and diabetic man presented with exertional chest discomfort persisting for one week. He had a past history of posterior circulation stroke. He was on single antiplatelet and statin therapy for the same. On examination, his vitals were stable, and systemic examination was unremarkable.

ECG showed sinus rhythm with ST depressions in the lateral leads, as shown in Figure 1. Echocardiography revealed normal LV function (EF 68%). Troponin was mildly elevated (0.080 ng/mL) [Reference Range – upto 0.020ng/ml].Coronary angiography via the femoral route [puncture site being 2 cm below the inguinal ligament] under fluoroscopic guidance with a 7 French sheath. Right radial pulse was absent, hence femoral route was preferred, considering the present scenario of acute coronary syndrome. 5000 IU of Heparin was given via femoral sheath. Angiography revealed double vessel disease: 95% tubular stenosis in distal RCA, being the culprit lesion(as shown in Figure 2). Shortly after the contrast injection, the patient developed acute right iliac pain accompanied by hypotension with a systolic blood pressure of 70 mm Hg which was 150 mm Hg during the beginning of the procedure. Intravenous fluids were given as a bolus, and patient was also started on inotropic support immediately. Contrast angiography via the femoral sheath demonstrated external iliac artery ooze and a positive bladder sign, as shown in Figure 4. Contrast-enhanced CT confirmed a retroperitoneal hematoma [6.7x8.4x10.8cm]with active bleeding from the right external iliac artery, as shown in Figure 3.

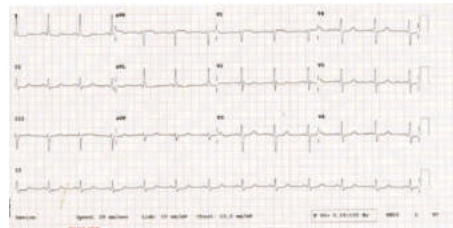


Figure 1 : ECG at Presentation

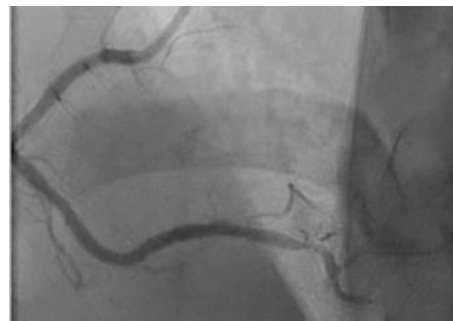


Figure 2 : RCA Stenosis Culprit Lesion



Figure 3 : Retroperitoneal Hematoma with External Iliac Artery Active Bleeding

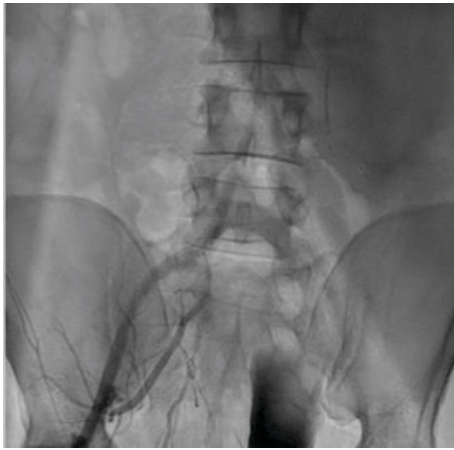


Figure 4 : Right External Iliac Artery Ooze with Positive 'Bladder Sign'

Emergency management included balloon occlusion of the external iliac artery, till the covered stent was prepared. Finally, placement of a 10x37 mm covered stent (Bentley), as shown in Figure 5 was done. As the patient was hemodynamically unstable with active bleeding as confirmed angiographically and on CT, covered stent was placed for prompt intervention. Surgical risk of repair was higher in this case. Hypotension resolved, and no further bleeding was observed on check angiography (Figure 6). In the clinical context of acute coronary syndrome, and as there was no active bleeding noted after covered stent was put, dual antiplatelet was continued. In this scenario of a massive bleeding with hemodynamic compromise, reversal of Heparin with protamine sulphate could also have been done, however since 5000 IU of Heparin was given for angiography, and the complication was managed well in time with immediate intervention, hence protamine sulphate was not given. He was monitored in the intensive care unit for 4 days and discharged.

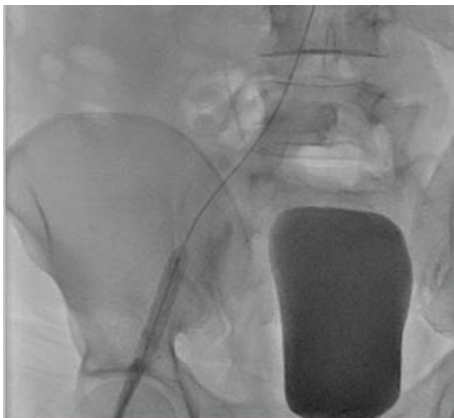


Figure 5 : Right External Iliac Artery Stent



Figure 6 : Post Stent Flow in External Iliac Artery

3. Outcome and Follow up

One month later, the patient was readmitted for recurrent angina.

Percutaneous coronary intervention of the calcific RCA-PDA (posterior descending artery) lesion was performed under IVUS guidance, as shown in Figure 7 and Figure 8. TIMI 3 flow was achieved (Figure 9). We planned to do a staged percutaneous intervention to avoid any life-threatening complication and worsening of the retroperitoneal hematoma. Patient was continued on medical management for 1 month and staged PCI to RCA was done. The patient was monitored post-procedure for 48 hours and subsequently discharged in stable condition.

Patient also followed-up after 1 month and he was stable with no active complaints.

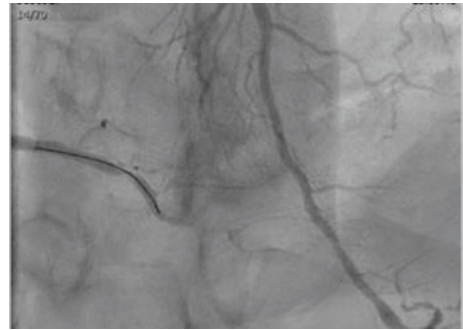


Figure 7 : Right Coronary Artery Lesion Crossed with Fielder XT and Caravel with Simultaneous Injection

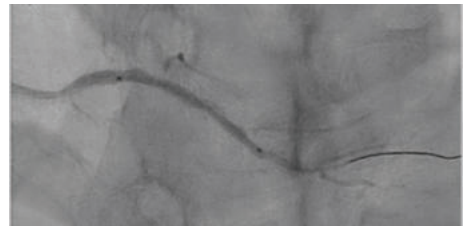


Figure 8 : Right Coronary Artery Stent Placement

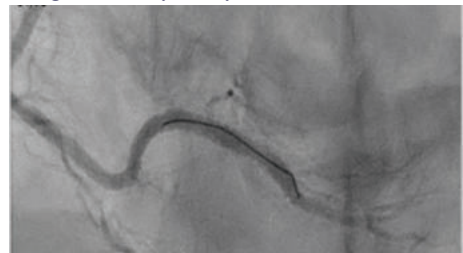


Figure 9 : Post Stent Flow In Right Coronary Artery

4. DISCUSSION

Retroperitoneal hematoma is a serious but often overlooked complication of femoral access. Risk factors include female sex, obesity, high femoral puncture and anticoagulation. Early signs such as flank pain or hypotension should prompt immediate imaging. In our case, rapid endovascular intervention with balloon tamponade and covered stenting stabilized the patient. The early diagnosis of retroperitoneal hematoma is elusive due to its concealed nature. Typically, the diagnosis is made only after significant blood loss has occurred, as in our case, where the patient presented with hypotension. The evidence of bladder sign in our patient also helped us in diagnosing this complication early. Bladder sign is a radiographic evidence of compressed or indented contrast filled urinary bladder on fluoroscopy indicating external compression from a retroperitoneal hematoma. It is a highly specific sign and an early marker of retroperitoneal hematoma, allowing its prompt detection and management.

Retroperitoneal hematomas tend to be associated with high femoral artery punctures. This is because punctures and sheath insertion above the inguinal ligament into the external iliac artery may predispose uncontrolled bleeding because of the difficulty in achieving compression of this vessel. However, low femoral artery punctures do not eliminate the risk of retroperitoneal bleed. The insertion of the sheath in the common femoral artery well below the inguinal ligament can still lead to spread of bleeding from the puncture site along well-

defined anatomic fascial planes to cause bleeding into the retroperitoneum.³ Meticulous attention to puncture technique with fluoroscopic guidance may minimize the occurrence of retroperitoneal hematoma.²

Similar to the abrupt intra-abdominal hemorrhage described in recent literature⁴, our case of retroperitoneal hematoma during coronary angiography highlights a particularly fatal presentation that underscores the need for prompt recognition and timely management. The decision to defer PCI of the RCA lesion was driven by patient instability. A staged approach allowed for optimized revascularization without further vascular risk. Importantly, management included avoiding more potent antiplatelet loading and reversing heparin effect to reduce bleeding risk.

The complication described in this case report can be prevented by utilizing a meticulous and methodical approach for femoral punctures with ultrasound or fluoroscopic guidance.

Surgical modality of repair in an emergency situation is preferred if the patient is relatively hemodynamically stable and fit for an open surgical repair. It is sometimes also preferred when the covered stents are not available immediately. However, as such patients are usually on dual antiplatelet therapy, bleeding risk during surgical repair is high. Opening the retroperitoneal space to explore associated vascular injury may end in exanguination of this hematoma, visceral injury and in-stability of the patient general condition, so management of such injuries remains challenge to surgical trauma team.⁵

On the other hand, conservative management for a retroperitoneal hematoma is preferred in some situations where the patient is hemodynamically stable with no further deterioration and there is no evidence of active bleeding, as confirmed by CT.

Transcatheter embolotherapy also remains an option in such cases and it appears to be a life-saving, safe and effective treatment for retroperitoneal bleedings that may be carried out in emergency situations in haemodynamically unstable patients.⁶

To summarize, there is a lack of level I evidence for the best management plans for retroperitoneal hematoma, and evidence is based on small cohort series or isolated case reports. Conservative management should only be reserved for patients who are stable. Interventional radiology with intra-arterial embolisation or stent-grafting is the treatment of choice. Open surgery is now rarely required.⁷

7. CONCLUSION

This case report emphasizes on the fact that there should be a high index of suspicion in any patient undergoing percutaneous intervention via femoral access who has sudden onset of flank or abdominal pain with hypotension, as this mandates immediate evaluation and treatment, which could be indeed life-saving. Prompt recognition and treatment of retroperitoneal hematoma due to vascular injury are essential in preventing mortality. Endovascular techniques, including balloon occlusion and covered stents, provide effective, life-saving management. This case emphasizes the value of clinical vigilance and a staged PCI strategy in case of unforeseen complications.

Ethics Statement

The authors have nothing to report.

Consent

Informed written consent was obtained from the patient, according to the COPE guidelines.

Conflicts of Interest

The authors declare that they have no conflicts of interest

Acknowledgments

We would like to express our sincere gratitude to the patient for his cooperation and consent in sharing his medical history and allowing us to report this case.

Author's Contribution

Dr. Vasavdatta Sharma has conceptualized this case, curated the data and assisted during performing the abovementioned procedure. She has also drafted the manuscript and reviewed it. Dr. Tom Devasia has performed the procedure as the primary operator and supervised the work. Dr. Monika Jawanjal has devised the methodology for writing this manuscript.

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