Case Report

RETRO-PERITONEAL HEMORRHAGE POST CORONARY ANGIOGRAPHY: A CASE REPORT

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ABSTRACT

Background: Retro-peritoneal hemorrhage is an infrequent complication after percutaneous coronary angiography. It occurs when the transfemoral approach is used. Without early diagnosis and prompt treatment, it can lead to fetal consequences.

Case presentation: We report a case of a 44-year-old male who developed retro-peritoneal hemorrhage post coronary angiography and was successfully managed conservatively and was discharged.

Conclusion: Retro-peritoneal hemorrhage should be kept as a differential in patients who show signs of hypovolemic shock after coronary angiography. Non-contrast computed tomography (CT) scan of the abdomen and pelvis should be done for its diagnosis.

INTRODUCTION

Coronary angiography is the benchmark investigation to determine the existence and degree of atherosclerotic coronary artery disease (CAD)[1]. The complications of this test range from short term minor complications to life threatening problems if not treated urgently[2]. Some of the complications of angiography include bleeding, hematoma, vascular damage or contrast related complications[1]. A rare bleeding complication of percutaneous coronary intervention is retro-peritoneal hemorrhage (RPH), which can occur as a result of femoral access or can occur spontaneously[3]. Retro-peritoneal hemorrhage is bleeding into the retro-peritoneal space, either occurring spontaneously or secondary to an injury or illness[4]. The documented incidence for RPH ranges from 0.15-6%[5]. RPH carries a mortality risk of 4 to 12%[6]. We report our experience of successfully managing a patient conservatively after developing retro-peritoneal hemorrhage post coronary angiography.

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CASE PRESENTATION

A 44-year-old male, known hypertensive and smoker presented with the complaint of chest pain for five days which was CCS class III, shortness of breath for the same duration and was classified as NYHA class II, electrocardiography (ECG) of the patient showed anterior wall myocardial infarction (AWMI) (Figure 1).

Figure 1: ECG depicting ST segment elevation in the anterior chest leads.

He was late for thrombolysis, so was managed conservatively and trans-thoracic echocardiography and coronary angiography were planned. The echocardiography showed severe left ventricle systolic dysfunction, 30- 35% ejection fraction (EF) and trace mitral regurgitation (MR) along with AWMI changes. During coronary angiography, the access was initially taken through the right radial artery but was shifted to the right femoral artery due to extreme tortuosity of the right subclavian artery and difficulty in engagement of the coronary arteries.
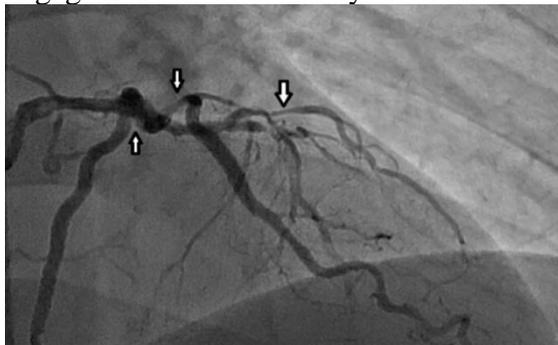

Figure 2: Coronary angiogram showing LMS haziness in distal shaft and bifurcation along with critical ostioproximal and mid-course stenosis of LAD.
LMS: left main stem; LAD: left anterior descending artery.

Moreover, the coronary angiography showed haziness in the distal shaft and bifurcation of the left main stem (LMS) along with stenosis in all three coronary arteries i.e left anterior descending (LAD) (Figure 2, 3), left circumflex (LCX) and

right coronary artery (RCA). The diagnosis of triple vessel coronary artery disease (TVCAD) was made and coronary artery bypass grafting (CABG) was planned after surgical consultation.

Figure 3: Coronary angiogram showing critical mid-course stenosis of LAD.
LAD: left anterior descending artery

The patient was shifted to the coronary care unit (CCU), where within 15 minutes he developed apprehension, profuse sweating and hypotension. Therefore, an initial differential of vasovagal shock, access site hemorrhage or retro-peritoneal hemorrhage was made. As the access site showed no significant sign of hemorrhage, the patient's resuscitation was started on intravenous (IV) fluids; however, as the EF of the patient was low i.e. 30-35%, a central venous catheter (CVC) was passed to check for fluid overload. The pressure of CVC was measured which was 3cm of H2O that favored hypovolemic shock. An urgent computerized tomography (CT) scan of the abdomen and pelvis was advised which revealed a large right sided retroperitoneal hematoma (Figure 4).

Henceforth, the patient was started on blood transfusions. The state of the patient improved significantly after fluid resuscitation and 2 pints of blood transfusion, after which he became vitally stable and was observed for 3 days. The retroperitoneal hemorrhage was successfully managed conservatively and the patient was discharged.
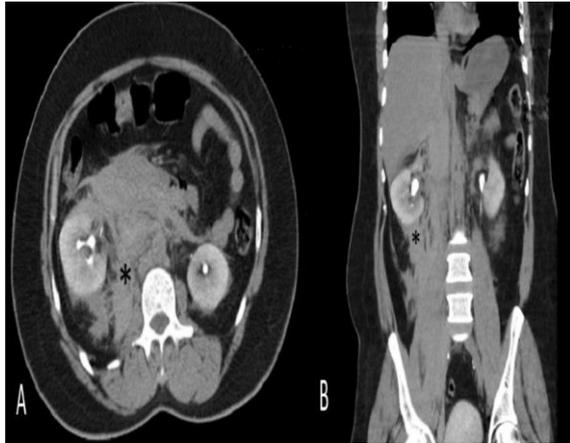
Figure-4: CT scan of the abdomen (A) axial and (B) coronal showing retroperitoneal hematoma in right perinephric, anterior pararenal space and surrounding the right kidney along its anteromedial and posterior aspects, being in contact with right psoas major muscle.
CT: computed tomography

DISCUSSION

Retro-peritoneal hemorrhage (RPH) following transfemoral catheterization is a widely acknowledged complication that can lead to substantial hematomas in the groin and retroperitoneal areas. Research suggests that factors that majorly influence the incidence of RPH are female gender, older age, chronic renal functional insufficiency (creatinine > 2mg/dl), low body surface area (below 1.8 m^2) a higher puncture point of the femoral artery and receiving an infusion of Glycoproteins IIb/IIIa inhibitors[7]. Understanding these risk factors can play a crucial role in identifying at-risk populations and improving management strategies.

The present study documented a case of a 44 years old male who suffered from hypovolemic shock as a result of RPH. Several studies have investigated the association between retroperitoneal hematoma after femoral catheterization and various clinicopathological variables like age, gender, hypertension and use of tobacco. Research conducted by Smith et al. analyzed a group of patients and found that males had a higher incidence of retro-peritoneal hematoma (70%) compared to females (30%)[7]. This gender disparity could be attributed to anatomical and physiological differences between males and females. However, another research reported a more balanced distribution of retro-peritoneal hematoma cases between genders[8]. Further research is required to establish a definitive association between gender and retro-peritoneal hematoma after femoral catheterization.

Age has been reported as another significant risk factor for the development of RPH following femoral catheterization. A study demonstrated an increased incidence of retroperitoneal hematoma with advancing age. The study revealed that patients aged 60 years or older were more prone to developing retroperitoneal hematoma as compared to younger individuals. These findings were consistent with Anderson's study, which also highlighted age as a risk factor[10]. Contrary to these findings, in the present case the patient belonged to the 4th decade of his life which is comparatively a younger age group. Nevertheless, vigilance and appropriate management should be exercised, particularly in older patients undergoing femoral catheterization

Hypertension has been identified as another potential contributing factor for RPH. It is documented that hypertension is significantly linked with a greater chance of developing RPH[11]. These results were also supported by another research which emphasized the importance of hypertension management in decreasing the risk of RPH following femoral catheterization[12].

Smoking is recognized as an alterable hazard for various medical complications, involving retro-peritoneal hematoma after femoral catheterization. A case-control study indicated that individuals who smoked had an increased probability of developing retro-peritoneal hematoma in comparison to those who did not smoke[13]. Additionally, Smoking cessation was also co-related with a reduced possibility of retroperitoneal hematoma recurrence in individuals who had previously

experienced it[14]. These results highlight the significance of implementing smoking cessation interventions among individuals who are at risk of RPH after femoral catheterization.

Recent research has reported that the incidence of RPH has radically declined as modern times have adopted a transradial approach rather than a femoral artery for percutaneous coronary intervention (PCI)[7]. Literature also suggests measures like Ultrasound-guided access, adhering to strict aseptic technique and maintaining sterility, the usage of vascular closure devices instead of manual compression after catheterization, pressure dressing and thorough patient assessment (medication history) can play a vital role in the avoidance of hemorrhagic incidences[15].

Treatment approaches for RPH are not supported by randomized trials and are primarily based on limited cohort series or individual case reports. Surgery is suggested only for a few patients, as most of the time these can be managed with blood transfusion and close hemodynamic monitoring. If a patient continues to be unstable despite intensive resuscitation efforts, endovascular techniques, such as transcatheter arterial embolization (TAE) or coil embolization, have demonstrated encouraging results in managing bleeding and minimizing the necessity for surgical intervention, reserving open surgery exclusively for situations where bleeding cannot be effectively managed[12].

In the presented case, the patient was managed conservatively with fluid resuscitation along with a blood transfusion. This management course is in concordance with another study in which 47% of the patients recovered completely with only blood transfusions while only 7% required surgical intervention. Additionally, a study documented three cases of RPH that were adequately managed with intravenous fluid administration and reversal of anticoagulation[16]. Kwok et al., have also reported that blood transfusion can be a successful management modality for RPH management[8]. Meanwhile, another research described two patients managed by balloon tamponade who showed enhanced blood flow whereas another patient with life-threatening RPH has also been satisfactorily treated via balloon occlusion and catheter delivery of thrombin[3].

Prompt recognition of symptoms and suitable management are crucial to optimize patient outcomes. It should be normal practice to suspect hemorrhage whenever a patient develops shock after catheterization and the importance of an early non- contrast computed tomography (CT) scan to rule out any bleeding from the femoral or iliac artery cannot be emphasized enough to decrease the death rate after RPH.

CONCLUSIONS

Retro-peritoneal hemorrhage is an uncommon sequela post coronary angiography. The risk increases in patients with increasing age, female gender, smoking and hypertension. An increased degree of scepticism is required to diagnose retro-peritoneal hemorrhage post coronary angiography. Non-contrast CT scan of the abdomen and pelvis is the best modality to diagnose RPH.

AUTHOR'S CONTRIBUTION

MAA: Case data collection and writing
OF: Conception and data collection
SSK: Case data collection and writing
MA: Primary cardiologist
SFS: Case data collection and writing

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