

RETROPERITONEAL HEMORRHAGE

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All the authors contributed significantly to the research that resulted in the submitted manuscript.

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ABSTRACT

Risks of anticoagulation treatment are multiple. Warfarin Sodium when selected for anticoagulation needs to be kept in the target range for that particular condition. INR levels, over or under the target range will be catastrophic in terms of bleeding or thrombosis respectively. Locating site of bleeding, such as retroperitoneal hemorrhage, in a patient with high levels of INR during warfarin treatment, is a challenging problem, in terms of diagnosis as well as treatment. A case of prosthetic mitral valve replacement was diagnosed for retroperitoneal hemorrhage, but fortunately diagnosed relatively early due to its typical presentation.

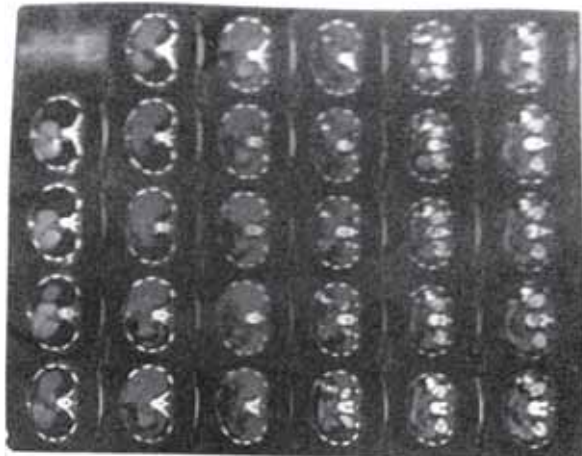
Key Words: Warfarin Sodium, Increased INR, Retroperitoneal Hemorrhage

INTRODUCTION

Warfarin therapy is always associated with risk of hemorrhage and/or thrombosis.¹ Among the bleeding complications, retroperitoneal haemorrhage is difficult to diagnose, as the presentation often mimics the ilio-psoas abscess. Retroperitoneal haemorrhage can be due to variety of causes, including injury to structures in and around peritoneum, rupture of abdominal aortic aneurysm, invasive procedures including surgeries, fibrinolytic therapy and when patient is on anticoagulation therapy for one reason or the other. The haematoma formation after bleeding into the ilio-psoas muscle is often diagnosed when the patient's haemoglobin falls, shows haemodynamic instability and there is a history of anticoagulation treatment or invasive procedure at femoral vessels.

CASE REPORT

A D 24 years of age had mitral wall replacement surgery in 2005. He was on anticoagulation therapy with Vitamin K antagonists (VKA), warfarin sodium, dose of which was adjusted by PT, INR test. Therapeutic range was maintained between INR 2.5-3.5. He was active physically and was managing INR accordingly. He was from interior of Sind and he to travel long distance to see the doctors that's why sometimes couldn't manage to reach hospital on the follow up

Figure 1

date. Same thing caused by delayed follow-up appointment for 10 days. His presenting symptoms were severe pain in right groin and thigh and was unable to extend his right leg and thigh. Presentation was similar as one sees in ilio-psoas abscess. His INR was 7.3. There was high suspicion of retroperitoneal hemorrhage leading to ilio-psoas hematoma. Clinical diagnosis was later confirmed by CT scan. INR was reversed, by fresh frozen plasma (FFP) and intravenous Vitamin K therapy Hemoglobin concentration was found to be 12 g/dl. Patient was closely observed for further bleeding. As the clinical condition of the patient was stable, no ongoing bleeding, as hemoglobin did not fell below 12 g/dl, he was decided to be managed conservatively. He was given ceftriaxone for prophylaxis of infection of the hematoma. His CT scan showed a large hematoma in the iliopsoas of the right side Right psoas measured 38.0 × 55.0 mm in diameter. Iliopsoas hematoma together with psoas muscle, measured 70.0mm × 55.0 mm in diameter. There is displacement of pelvic vessels more medially. The hematoma continues into the upper proximal right thigh. Different areas of decomposition of blood also noted in the hematoma as the areas of low attenuation.

The condition improved clinically and he was mobilized without much pain. Warfarin sodium re started to prevent thrombosis of the mitral valve prosthesis The straightening of leg took about a month, when he was able to move with support. Paresthesia persisted on the front and medial aspect of the thigh, when he was discharged from the hospital.

DISCUSSION

Retroperitoneal bleeding is a distinctive clinical entity that can present in the absence of specific underlying pathology or trauma.² But it is most commonly seen in association with patients with anticoagulation therapy, bleeding abnormalities and haemodialysis, and might turn out to be

the most serious and potentially lethal complications of anticoagulation therapy.³ The incidence of retroperitoneal haematoma has been reported at 0.6-6.6% of patient undergoing therapeutic anticoagulation.^{1,4,5} Warfarin, unfractionated and low molecular heparin, are all been reported to be the cause.⁶

The pathogenesis of spontaneous retroperitoneal bleeding is not clear. Qanadli et al.⁷ postulated that spontaneous bleeding starts at the microvascular level, and large vessels become disrupted or stretched as the hematoma enlarges. Others have suggested that heparin or anticoagulation induced immune microangiopathy may be responsible, where unrecognized minor trauma in the micro-circulation may lead to haemorrhage.⁸

Other reasons can be iatrogenic, where during percutaneous vascular access causes the rupture of aorta, or puncture of posterior wall of femoral or iliac artery during cannulation. Bleeding occurs is excessive because patients with acute coronary syndrome are likely to receive antiplatelet therapy, either aspirin or clopidogrel and use of heparin for anticoagulation. Moscucci et al.⁹⁻¹¹ found that additional independent predictors of this vascular complication included age of more than 70 years, multiple procedures and hypertension.¹² In 26 patients with retroperitoneal haematoma of 3508 consecutive patients undergoing percutaneous coronary intervention, Farouque et al. found that female gender, low body surface area and higher femoral artery puncture were independent predictors of retroperitoneal haematoma.^{13,14}

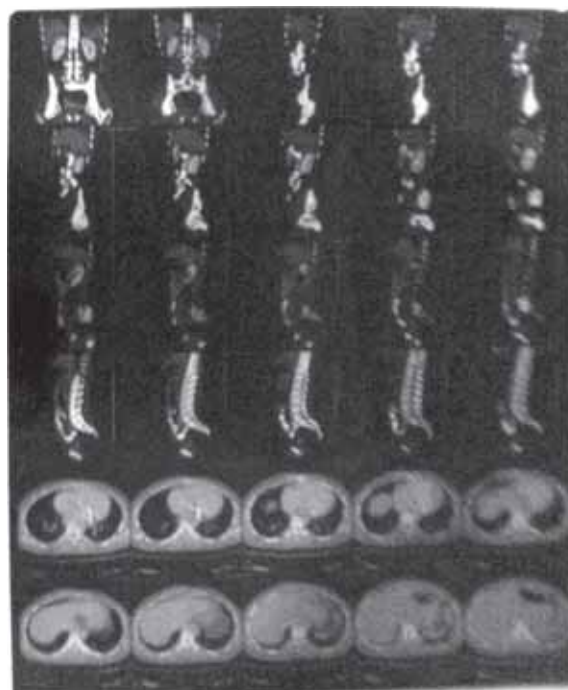
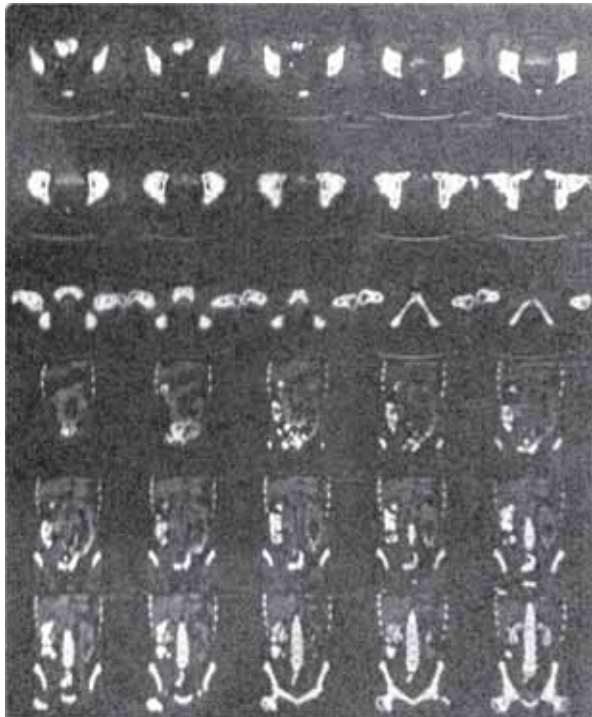
Figure 2

Figure 3

Clinical Presentation: The presentation may be very dramatic when patient come to the clinic , hopping on one leg and complaining of pain in groin and paraesthesias on the front of the thigh, and unable to extend the hip and knee joints, or it may be vague, where mild tachycardia and relative hypotension is all which is shown. This depends upon the amount of blood loss. Patient may be complaining of pain in the abdomen and lumbar areas or may present as an acute abdomen. Later on patient may become hypotensive and anemia may be evident. Later on this may progress to haemodynamic instability, collapse and a fall in haemoglobin., depending upon the severity of haemorrhage. There may be history of trauma or past medical history of anticoagulation therapy, renal failure or dialysis.

Retroperitoneal haematoma which is near or within the iliopsoas muscle usually presents as femoral neuropathy, which usually begins with severe groin or hip pain or leg weakness. Same picture is reported by Sasson et al. ⁴ The pain radiates to anterior thigh and the lumbar region. Iliopsoas muscle spasm often results in the characteristic flexion and external rotation of the hip and attempt to extend the joint will elicit extreme pain. Later on, pain and parasthesia in the antero-medial thigh and leg is evident. ¹⁵ Due to the stretching of the fascia overlying iliopsoas muscle, femoral nerve compression occurs along the iliopsoas gutter. As the haematoma tracks down in the femoral canal, it compresses the femoral nerve against the tough inguinal ligament. ¹⁵

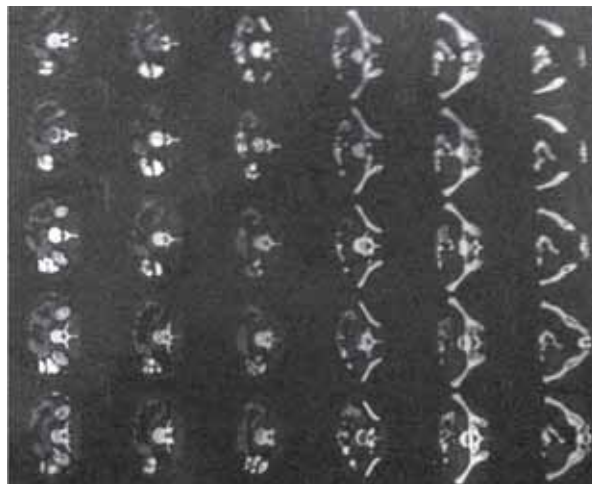
Plain abdomen and pelvic radiograph, and ultrasound scan may give clues to the diagnosis, yet the CT scan is highly sensitive, able to provide useful information of the underlying pathology. Active bleeding can be seen as extravasation of contrast material, seen as a jet and ' layering on the haematocrit level' within the haematoma. ¹⁶ CT angiogram may show the extravasation of the contrast material which may identify the bleeding point.

Magnetic resonance imaging (MRI) is very sensitive for detection of retroperitoneal structures and is helpful in patient presents with femoral neuropathy as a consequence of retroperitoneal bleed. MRI helps to rule out nerve root compression or spinal problems. ¹⁵

Haemodynamically unstable patients, need urgent digital subtraction angiography with a view to selective embolism or placement of a stent graft. The transfemoral route from the contralateral artery is usually used for access.

The treatment is preferably conservative. There are reports which suggest that early diagnosis of retroperitoneal haematoma following relatively minor trauma respond well to conservative management. ¹⁷⁻¹⁹ All patients with retroperitoneal hemorrhage should be managed in ICU under monitoring for blood pressure, blood loss and pain management. Bolus of normal saline or Ringer Lactate solution and / or whole blood transfusion may be required. Fluid resuscitation, blood transfusion and normalization of coagulation factors may be required. When the retroperitoneal bleed occurs in patients taking warfarin sodium, treatment is replacement of all the deficient factors, which occurs due to warfarin therapy. All factors can be replaced by using prothrombin complex concentrate as well as intravenous Vitamin K.

There is no definite criteria set to guide about the endovascular/surgical intervention. If the patient is haemodynamically stable with no evidence of continuous

Figure 4

blood loss, he should be preferred for conservative management.

Endovascular treatment:

In the continuous bleeding state in retroperitoneal hemorrhage, alternative to open surgery is the selective intra-arterial embolisation or stent-grafts to stop the bleeding.²⁰ The embolic agent should be placed both proximally and distally to the bleeding site to prevent bleeding as there is a rich network of collateral vessels. The bleeding after embolisation may stop completely, but patient may develop abdominal compartment syndrome requiring surgical or radiological decompression procedures.²⁰

Open surgery in retroperitoneal hemorrhage:

Open surgery is indicated if the patient remain unstable despite adequate fluid and blood replacement, or if interventional radiology is not successful or unavailable. The primary aim of surgery is to control all bleeding points and to remove the large haematoma. The retroperitoneum may need to be packed and re-explored after 24 to 48 hours.²¹

If the retroperitoneal haematoma causes the compartment syndrome in the abdomen, then to release the intra-abdominal pressure, image-guided drainage of haematoma may be done as an alternative to open surgery. If untreated, patient may develop signs of increased intra-abdominal pressure with respiratory, cardiovascular and renal impairment.

Arteries involved in retroperitoneal haematoma can be judged from location of haematoma:

- 1) Upper abdominal midline supra-mesocolic retroperitoneal haematoma is associated with bleeding from the supra-renal aorta, celiac axis or the superior mesenteric artery.²²⁻²³
- 2) The mid-abdominal midline infra-mesocolic retroperitoneal haematoma is associated with proximal renal artery, infra-renal aorta or caval injury.
- 3) A peri-nephric haematoma is associated with renal artery rupture. A midline haematoma is mostly associated with pelvic fracture, bladder injury or iliac vessel injury.
- 4) A right lateral retroperitoneal haematoma suggests a high infra-renal or retrohepatic cava injury, which is associated with hepatic injury and high mortality.²⁴

CONCLUSION

Retroperitoneal haematoma should be suspected if the patient presents with symptoms pointing towards the condition and/or when patient is on anticoagulant therapy, renal dialysis and those patients who has had an invasive procedure via the femoral artery or vein. CT angiogram

should be done as soon as possible, but if not available, ultrasound and plain X-ray film can be helpful.

Correction of underlying coagulopathy and resuscitation with fluid and blood products is essential. High quality CT scan is mandatory to ascertain the type, site and extent of haematoma.

Emergency angiography with a view to embolise or stent-graft the bleeding vessel(s) is indicated if the CT examination shows active extravasation of contrast. Surgery can be done in very selected cases, but removal of the haematoma may increase bleeding by removing the tamponade effect, and packing with large gauze in abdomen may be the only option, if no definite point of bleeding but only the general ooze is seen per operatively. Abdominal compartment syndrome may require decompression laprostomy.

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