Traumatic Mesenteric Tear with Right Adrenal Haematoma and Partial Thrombosis of Inferior Vena Cava- A Rare Association

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INTRODUCTION

Post-traumatic isolated mesenteric tear with associated small bowel gangrene is a rare event after blunt abdominal trauma and has been reported previously in literature. [1] Post-traumatic thrombosis of inferior vena cava (IVC) is a very rare event with only isolated case reported in literature. [2] We report a rare case of mesenteric tear with segmental small bowel infarction. There was also right adrenal gland haematoma with associated thrombosis of right adrenal vein, which was extending into inferior vena cava causing its partial thrombosis. Post blunt trauma focal mesenteric tear and segmental small bowel gangrene is a rare event. Posttraumatic right adrenal haematoma is well described in literature while traumatic inferior vena cava (IVC) thrombosis is exceedingly rare. We report a rare case showing association of focal mesenteric tear with segmental small bowel gangrene and associated right adrenal haematoma with adrenal vein haematoma extending into IVC causing its partial thrombosis. To the best of our knowledge, such unusual association has not been reported previously in literature.

PRESENTATION OF CASE

A 45-year-old male patient presented with abdominal pain and inability to pass stools following history of blunt abdominal trauma four days back. There was no other significant complaint. Multi-detector computed tomography (MDCT) was performed on Ingenuity CT scanner (128-slice MDCT, Philips Medical Systems). Non-contrast computed tomography (NCCT) showed hyperdense right adrenal haematoma with associated hyperdense thrombus in right adrenal vein (Figure 1). Contrast enhanced computed tomography (CECT) revealed significant small bowel dilatation with focal segmental mesenteric injury in right lower quadrant with segmental ischaemic and gangrene of a distal ileal loop with focal pneumatosis and fluid in adjacent mesentery. (Figure 2). CECT also confirmed right adrenal vein and partial IVC thrombosis (Figure 3) there were no clinical features of pulmonary embolism or lower limb oedema or phlebitis. Liver function tests were normal. No underlying coagulation disorder was detected. Patient underwent urgent laparotomy, which confirmed focal mesenteric tear and focal gangrene of distal ileal loop (Figure 2c). Resection of gangrenous gut with end-to-end anastomosis was performed. Approximately 300 ml of haemoperitoneum was drained. Because of only small eccentric thrombus, oral anticoagulant treatment was started 5 days after surgery and was continued for 2 weeks. Patient made uneventful post-operative recovery.

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Figure 1. Axial (1a) and Coronal (1b) NCCT Images Showing Hyperdense (55-65HU) Right Adrenal Haematoma (White Arrows). Coronal (1b) Image Showing Hyperdense Acute Thrombus in Right Adrenal Vein (Dotted White Arrow)

Figure 2. Axial (2a) and Coronal (2b) CECT Images Showing Gangrenous Distal Ileal Loop with Lack of Mural Enhancement (White Arrows) and Fluid in Adjacent Mesentery Indicating Focal Mesenteric Tear. Also Seen in Dilated Proximal Small Bowel Loops Measuring up to 4.5 cm in Diameter (Dotted White Arrows). Surgical Images (2c) Showing Mesenteric Tear (Dotted White Arrow) with Gangrenous Ileal Loop (White Arrow)

Figure 3. Axial (3a & 3b) and Coronal (3c) CECT Images Showing Right Adrenal Vein Thrombosis (Dotted White Arrow) Extending into Adjacent Upper Infrahepatic IVC with its Partial Thrombosis (White Arrow)

DISCUSSION

Mesenteric and vascular injuries are much more common after penetrating trauma as compared to blunt trauma.^[3,4] Mesenteric tears can be rarely isolated injuries in blunt abdominal trauma. These may be missed on sonography and initial clinical workup and therefore leading to potential delay in diagnosis which can lead for bowel ischaemic with associated complications like adhesions and sepsis with increased morbidity and mortality. Contrast enhancing multidetector computed tomography (MDCT) allows rapid evaluation of all abdominal solid organs, mesentery and also can depict any associated bowel gangrene. Post traumatic venous thrombosis in abdomen has been reported in portomesenteric veins and in inferior vena cava (IVC).^[2-4] IVC thrombosis secondary to blunt abdominal trauma is

exceedingly rare with only about 20 cases reported in the literature, some of them being seen in association with underlying hypercoagulable states.^[2] In some reported cases, IVC thrombosis was associated with retroperitoneal and pericaval haematomas which can cause compression and stasis in IVC leading to thrombus formation.^[5, 6] Some cases have also been reported in association with hepatic or renal lacerations with extension of thrombus from hepatic or renal vein into the IVC.^[7-11] In some cases, where there is no associated solid organ injury or retroperitoneal haematoma, endothelial and shearing injury have been postulated as the cause of venous thrombosis.^[12,9]

In our cases, there was hyperdense right adrenal haematoma with thrombosis of right adrenal vein and this thrombus was seen to extend directly into infrahepatic IVC causing its partial thrombosis. This is another mechanism of IVC thrombosis which has not been reported previously in literature. Post traumatic adrenal haemorrhage is relatively uncommon injury following blunt abdominal trauma which is being identified more frequently due to increasing use of contrast enhanced computed tomography (CECT) in evaluation of trauma patients. Traumatic adrenal haematoma is usually unilateral and more commonly on right side and is usually considered of no consequence. Less commonly, it can be bilateral when it can present with acute adrenal insufficiency.^[12,13] Multiple potential mechanisms are proposed for adrenal haemorrhage. On right side, it could be due to direct compression of adrenal gland between liver and spine. Also adrenal haemorrhage can be secondary to increased intra-adrenal venous pressure due to acute compression of IVC in trauma. Here again, it is more common in right gland, because right adrenal gland drains directly into IVC. Another proposed mechanism of haemorrhage is shearing injury to small intra-adrenal vessels and resultant haemorrhage.

Although, adrenal haematoma is well described in literature, we did not find any previous literature describing associated thrombosis of adrenal vein. It is possibly because of the fact that right adrenal vein has a short course and drains directly into adjacent IVC, therefore its thrombosis has not been looked for in previous studies. In our case resultant right adrenal vein thrombosis was extending into IVC causing its partial thrombosis. The clinical manifestations of IVC thrombosis have been described in the setting of complete thrombosis and include ascites, lower limb oedema/varicosities, features of Budd-Chiari syndrome and pulmonary embolism.^[12,9] In our case, the thrombus was only small, eccentric and non-occlusive, so no specific clinical features of IVC thrombosis were seen. Also, no clinical evidence of pulmonary embolism was seen.

The treatment of IVC thrombosis in setting blunt trauma is seen well described in literature because of rarity of the condition. In case of large thrombus, surgical thrombectomy is recommended especially if it is extending into suprahepatic IVC. It can prevent development progressive hepatic congestion and eventual hepatic failure.^[9] More extensive thrombus, may require IVC reconstruction. Even endovascular thrombectomy and stent-grafting techniques have been described, but their long term management and prognosis is presently clear. IVC filter has also been advocated to prevent pulmonary embolism which can be a potentially fatal complication of IVC thrombosis, especially in those with large

floating thrombi and in those in which lung reserve is already compromised.^[9,14] Medical treatment with anticoagulants can be used in patients with less extensive thrombus and in those in which surgical and endovascular treatment is not feasible.^[9] It may not be possible to start anticoagulant treatment immediately due to associated other major injuries which dominate the clinical picture.^[3] In our case, due to mesenteric tear and segmental small bowel gangrene, immediate surgical intervention was undertaken to resect the gangrenous small bowel with end to end anastomosis. In our case IVC thrombus was very small and eccentric and there were no signs of venous obstruction or pulmonary embolism, so IVC filter was not placed. Patient was given oral anticoagulant for one week. Patient made uneventful recovery.

CONCLUSIONS

IVC thrombosis in setting of blunt trauma is extremely rare. Very rarely, it can be secondary to acute right adrenal haemorrhage and adrenal vein thrombosis. MDCT can help in timely diagnosis and in determining the full extent of thrombus. We recommend that all cases of right adrenal haematoma should be scrutinized for any associated venous thrombosis, as timely diagnosis even of small IVC thrombi is clinically important because of potential for pulmonary embolism.

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