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Adrenal Hemorrhage following RTA: Hidden cause of persisting hypotension.

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ABSTRACT

Background

One of the uncommon and usually overlooked complication of a blunt abdominal trauma due to any cause is adrenal hemorrhage. As it is one of the inconsequential and self-limiting complication, it is therefore overlooked on routine examination in the emergency room. Even then it has the potential of developing life threating complications such as severe and persisting hypotension, adrenal insufficiency and crisis. Its rare occurrence preclude any management protocol to be formulated.

Case presentation

Here we present a case of a 44 year old male who was brought to the emergency room with history of RTA. Patient had sustained a fall from bike to the right side. He had sustained injuries to the right upper limb and abdomen which resulted in fracture of both bones of right upper limb and complained of pain in the right side of chest on breathing. On examination he had hypotension with systolic blood pressure of 80 mmhg. He was started on inotropes after Normal saline bolus couldn't raise Blood pressure. Patient had persistent low BP even with inotropes. On CT scan of the abdomen, adrenal hemorrhage was noted. He was treated with Inj hydrocortisone {Steroisds} with which the patient recovered steadily.

Conclusion

With this case we intend to bring to light that an uncommon complication of blunt abdominal trauma, adrenal hemorrhage can be potentially fatal and should be suspected in any patient with symptoms such as persistent hypotension following trauma. Suspicion of the same and actively looking for it can be life saving for the patient.

I. BACKGROUND.

Adrenal gland hemorrhage can be caused by various causes. One of them, not so frequently encountered and therefore missed is hemorrhage following blunt abdominal trauma. Due to the shrouded nature of the injury incidence rates vary from 0.03 to 4.95% [1,2,3]. One reason of it being overlooked might stem from the fact that most of these injuries are self-limiting and might be camouflaged by injuries to surrounding organs. These other injuries might require immediate life saving measures leading to hindrance in its diagnosis.

The frequent self-limiting nature of the injury should in no way undermine the importance of its diagnosis as it can lead to potentially life threatening complications such as hemorrhage , severe hypotension etc. Studies done have shown a steep rise in mortality of patients with adrenal gland hemorrhage (36%) when compared to those without hemorrhage (7.1%) [4]. The treating physician should keep a high index of suspicion for the same in patients with history of blunt abdominal trauma with severe and persistent hypotension with hyponatremia. Usually adrenal gland hemorrhage of isolated nature doesn't require surgery and can be managed by steroid substitution.

Here we present a case of adrenal gland hemorrhage following RTA which presented with severe hypotension and hyponatremia.

II. CASE

A 44 year old male with nil premorbidities was received in emergency triage with history of RTA. The patient had a skid and fall from bike to the right side. He sustained injuries to the right upper limb along with right side of chest and abdomen. On examination patient was conscious, oriented. Blood pressure was found to be low of about 80 mmhg systolic. Other vitals were within normal range. He was given NS bolus of 1LT which failed to raise BP. He was consequently started on inotrope infusion. CXR done was suggestive of right sided pleural effusion. Other radiographs done showed right sided ulna and radial fracture. USG done in emergency failed to show any gross abnormality. Initial laboratory investigations showed raised count of 25100/mcl which was neutrophil predominant (85.8%). His creatinine was slightly high of 1.6 mg/dl with Serum sodium of 135 mmol/lt and potassium of3.6 mmol/lt. His thyroid studies showed him to be hypothyroid with TSH of 10.740 uIU/ml with T44.53 ug/dl. Since the patient

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had sustained injuries to the Contrast enhanced CT was deemed necessary for him. Contract enhanced CT of abdomen was done under high risk as the patient had raised serum creatinine which showed segmental infarctions / intrarenal contusions of the right kidney along with features suggestive of right adrenal hemorrhage and right hemothorax. A random serum cortisol done showed value of 6.46 ugm/dl which was considered inappropriate in presence of hypotension and with right adrenal hemorrhage, therefore the patient was started on Inj hydrocortisone 100mg IV stat f/b 50mg IV q6h. With this treatment the patients BP improved and the serum sodium normalized. As the patient had to be operated for the right radial and ulnar fracture, steroid cover was given preoperatively. Post op, he was changed onto oral Prednislone parenteral steroids were stopped. The patient tolerated the medication well, whist maintaining BP and he was gradually tapered off inotropes. He was discharged on oral steroids and was reviewed after 2 weeks. His blood pressure along with serum electrolytes were with normal range. Oral steroids were tapered. On the next follow up visit, as the serum cortisol and BP were normal, he was deemed to have recovered his glucocorticoid axis and steroids were stopped.

As his TSH values were above normal, he was started on thyroxine supplementation and maintained.

The patient also had hemothorax for which an ICD was inserted and fluid drained. It was kept in situ till the drain stooped after which it was removed.

III. DISCUSSION

Adrenal gland hemorrhage is one of the rare entities encountered in emergency settings. As the entity is more often than not self-limiting it is frequently missed. Traumatic causes of the same are more commonly encountered though non traumatic ones shouldn't be ignored.

Some of the non-traumatic causes of adrenal hemorrhage are

Stress:

Any stressor such as surgery, hypotension or a fulminant infection cause adrenal hemorrhage [5]. Patients on anticoagulation prior to surgery have increased chances of bleeding. Adrenal hemorrhage has been frequently been associated with infection with meningococcus (Waterhouse-Friderichsen syndrome) though infection with other gram negative bacteria have the potential of causing similar bleed. Other stressors like pregnancy and Cardiovascular diseases are also implicated. There have been reports of adrenal bleed with use of adrenocorticotrophic hormone and steroids [6,7].

Hemorrhagic Diathesis or Coagulopathy:

Adrenal gland hemorrhage is seen frequently in patients on anticoagulant therapy. Though the primary pathology is believed to be thrombosis of the adrenal vein and bleed after the anti-coagulation is started [8,9,10]. Most bleed seen in these patients is within 3 weeks of initiation of treatment [11].

Neonatal Stress:

One of the most common causes of adrenal gland mass in neonates is adrenal gland hemorrhage can be due to a multitude of factors including complicated labor or delivery, perinatal asphyxia, hypoxia, sepsis or bleeding disorders [12].The hemorrhage, like in adults in most commonly seen on the right most probably due to compression of the gland between the liver and kidney. Cases of bleed have been reported in 4% of cases after extracorporeal membrane oxygenation for respiratory distress [13].

Adrenal tumors:

An adrenal cyst or neoplasm like Myelolipomas, hemangiomas, pheochromocytomas can sometimes give rise to adrenal gland hemorrhage and should always be suspected when no other risk factors for bleed are found. The fourth most common cause of retroperitoneal bleed is found to be primary adrenal cyst or tumor [14]. Contrast enhanced CT can be of value in distinguishing a non-traumatic hemorrhage from a neoplastic lesion complicated by hemorrhage. A definitive diagnosis can only be given by a biopsy or surgery.Myelipoma and pheochromocytoma are the most common cause of bleed among benign conditions [15].

The traumatic causes of adrenal hemorrhage was usually RTA or a blunt abdominal trauma. Most commonly adrenal hemorrhage is associated with multiple rib fractures, hemothorax, injuries to liver or spleen and vertebral fractures.

Patients are usually asymptomatic or might rarely present with diffuse abdomimal or loin pain. Patient in adrenal insufficiency usually presents with severe hypotension, hypothermia and rarely altered mental status. Patients might frequently be in sepsis with a broad workup done for the same. Laboratory features include hyponatremia, hyperkalemia and acidosis. Hypoglycemia and rarely hypercalcemia can also be found. The baseline cortisol level in normal individuals is 9-25 ug/dl. Cortisol level of <18 ug/dl in a stressed

individual is considered as an inappropriate response and indicate adrenal insufficiency. It is supported by absence of cortisol response after ACTH administration (250 mg of synthetic corticotrophin)

The diagnosis of Adrenal hemorrhage is usually made by CT scan. Ct scan shows a rounded or oval hematoma mass, ill-defined adrenal margins, strand-like infiltration of adjacent fat, and appearance of a thickened diaphragmatic crus [16]. The findings are similar following both traumatic/non traumatic causes.

Adrenal hemorrhage usually is self-limiting and may not warrant any intervention. Corticosteroid replacement has been deemed as the standard treatment for adrenal insufficiency [17]. Management should be started with inj hydrocortisone as it provides both mineralocorticoid and glucocorticoid cover. Blood samples for Cortisol and ACTH levels should be sent but treatment initiation need not be delayed. An initial dose of 100-200 mg followed by 200 mg in divided doses can be given. The dose should be gradually tapered with the clinical status of the patient. If the diagnosis is not confirmed then dexamethasone 10 mg intravenously can be given as it does not alter the cortisol assay after ACTH administration.

The patient should be followed up after discharge with cortisol and serum electrolytes. Steroids can be tapered and stopped according to the clinical response of the patient. Some patients might require lifelong steroid supplementation.

IV. CONCLUSION.

Adrenal hemorrhage is one of the neglected complications of blunt abdominal trauma. A high index of suspicion is required in a patient presenting with trauma with persisting hypotension and hyponatremia. Findings in CT abdomen done in most of these patients might be overlooked due to concomitant more life threatening injuries. Steroid supplementation should be initiated early and tapered according to clinical response.

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