



## ISOLATED ADRENAL GLAND RUPTURE: A CASE OF BLUNT TRAUMA

## Surgery

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## ABSTRACT

**Background:-** Adrenal gland rupture is a very rare condition seen in 0.43% after blunt trauma cases. We discuss the case of a 14 year old boy who came with a blunt abdominal trauma with liver laceration and incidental finding of adrenal gland rupture who was successfully treated with explorative laparotomy and resuscitation. **Case presentation:-** Patient came with an alleged history of fall from terrace because of by losing balance, resulting in fall with sustained injury and pain in abdomen since the fall. Multiple episodes of vomiting was also present. USG was done which showed space occupying lesion in lumbar region (not confirmative). CECT was done which showed adrenal hematoma. As the patient was collapsing and in critical state explorative laparotomy was done to stabilise the patient. His vitals were monitored throughout the hospital stay. Numerous lab test were done to assess the patient. Blood transfusions were also done. Patient was discharged in hemodynamically stable state. **Conclusion:-** Patient was treated successfully with explorative laparotomy which was lifesaving and a needed approach.

## KEYWORDS

Explorative laprotomy, Liver lacerations, Adrenal gland rupture

## INTRODUCTION

Adrenal rupture is a rare condition characterized by bleeding in the suprarenal glands. The hematoma can be unilateral or bilateral, and the clinical presentation can vary from abdominal pain to cardiovascular collapse. There are many etiologies which may contribute to this condition. Most important causes include blunt abdominal trauma, septicaemia, coagulopathies, anti-coagulant use, pregnancy, stress, antiphospholipid syndrome, and essential thrombocytosis.[1] As the clinical presentations are diverse and non-specific the diagnosis is very challenging. The signs and symptoms depend on the size and extent of haemorrhage. Imaging and biochemical evaluation are the mainstay of diagnosis.

The adrenal glands play a vital role in the body's fight or flight response. They generate stress hormones that activate physiological adaptations that are necessary to counteract changes in the external environment. The adrenal glands also secrete several essential hormones that play a significant role in regulating the body's immune system, body metabolism, and salt and water balance. The paired adrenal glands are triangular-shaped organs that measure approximately 5 cm by 2 cm, are located on the superior aspect of each kidney, and weigh 4 to 5 grams each.[2]

## Etiology:-

The etiology of adrenal haemorrhage can be classified as

1. Primary or idiopathic
2. Secondary causes which include abdominal trauma, infections, septicaemia, surgery. Acute stress, neonatal stress an also contribute to the cause. Physiological condition like pregnancy can be a factor. Use of anticoagulant an be another cause. Autoimmune disease like SLE and antiphospholipid syndrome are rare causes.

Adrenal gland hyperplasia and increased vascularity can be a result of any stressful condition in the body. These conditions along with rich arterial supply and strict venous drainage can lead to haemorrhage.[3-6]

## Case Presentation

A 14 year old male patient who is a student had a alleged history of fall from height from terrace in a attempt to pluck branches from neem tree followed by losing balance resulting in fall, sustained injury and pain in abdomen since then associated with 6-7 episodes of vomiting. Retrograde amnesia was also present. Primary treatment was done at a small hospital and referred to our hospital for further management.

## Lab Investigations-

## Usg report-

suggested of large echoic space occupying lesion of size 10.4cm x 6.05cm x 6.98cm of approximate volume 250ml was seen in right lumbar region - ?hematoma? Laceration in right lobe of liver or supra renal region. Patient was kept nil per oral and CECT was done to confirm diagnosis.

## CECT report-

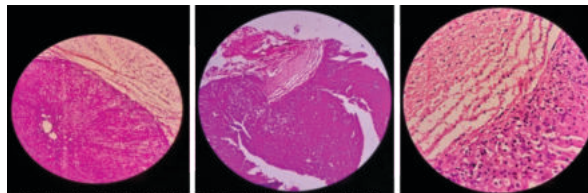
1. Large right adrenal hematoma causing displacement of right kidney.
2. Marked right perinephric hematoma.
3. Moderate hemoperitoneum
4. Large perisplenic hematoma at splenic hilum
5. Mild right hemothorax.

## On Examination -

Patient was afebrile, BP- 80/50 mm of Hg, Pulse - 140/min, RR- 25/min, SpO2- 92%. No signs of pallor, clubbing, icterus, cyanosis, edema was seen. Patient was in a state of shock.

## Lab Reports-

- Haemoglobin was 4.5gm/dl with PTINR-1.75.
- Liver function tests revealed SGOT- 145u/l, SGPT-117 u/l, Total Protein- 4.5, Albumin- 2.5
- Renal function tests showed Urea-39, creatinine- 1.2mg/dl, Calcium- 7.1 mmol/l, Sodium- 125.62mmol/l, Potassium- 6.11mmol/l



**Figure 1:** H&E Slides showing adrenal gland with presence of hematoma



**Figure 2:** Cut section of adrenal gland with hematoma

### Operational procedure-

Emergency explorative laparotomy was performed immediately under general anaesthesia. Right adrenalectomy with removal of large size hematoma around ruptured adrenal gland and peritoneal toileting was done. It started by exploration of retroperitoneal area, inferior vena cava was identified, supra renal pedicle was divided. Evacuation of hematoma and remnant of supra renal gland was removed. There was minimal hemoperitoneum with haemorrhage of approx. 2 litres at retro peritoneal area due to rupture of adrenal gland. Drain was placed and hematemesis was achieved. Massive haemorrhage approximately 2 litres with large size hematoma in right retroperitoneal area and supra renal was 10cm x 10cm. There was traumatic rupture of right supra renal gland.

After the procedure, central line was inserted in right internal jugular vein because of huge blood loss. 4 units of fresh frozen plasma, 3 units of packed red blood cell, 4 units of platelets were transfused to stabilize the patient and achieve blood volume.

Patient was kept in ICU during blood transfusions and after stabilization was shifted to ward. Patient was then discharged from the hospital in hemodynamically stable condition.

### DISCUSSION

We reported here a rare case of isolated unilateral adrenal injury with haemorrhage from blunt trauma. The presence of adrenal neoplasm presenting as possible adrenal haemorrhage is described [7-9]. The need to follow-up and to rule out an underlying adrenal neoplasm should be considered, due to possible haemorrhage into a pre-existing adrenal mass. The adrenal gland is a highly vascularized organ, so the sudden onset of deceleration forces may cause shearing of small vessels, which result in acute or delayed haemorrhage [10,11]. The correlation between history of fall and serious presentation of the child was not clear. There is no literature that discusses isolated adrenal gland injury in cases of blunt trauma. In the case discussed, the child must have had some pathology of adrenal gland which was not diagnosed earlier. The blunt trauma caused the adrenal gland to get ruptured which was the reason for the child to have such a serious crashing presentation. Some authors proposed that ultrasonography can provide information about a retroperitoneal hematoma, and even detail the adrenal gland haemorrhage. [12,13] CT seems to be the tool of choice, as it can provide quick and extensive information about adjacent organs, including the liver, kidneys, spleen, lungs, and skeletal injuries. [14] Bilateral adrenal gland injuries or haemorrhage can lead to serious adrenal insufficiency or an adrenal crisis, which is often overlooked as a reason for a patient's deterioration [15].

### CONCLUSION

This case presentation shows isolated adrenal gland rupture resulting from blunt trauma to abdomen. Presently there are no guidelines for monitoring isolated adrenal haemorrhage. It is important to recognise adrenal injury in trauma cases as this leads to massive haemorrhage. There can be a pre-existing pathology in adrenal gland which can rupture or direct impact of trauma at an angle that causes its rupture. In either of the case it should be identified early and managed conservatively if possible or go for explorative laparotomy as per situation and patient condition.

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### Author's Contributions

The document's concept was developed by SV, who also worked on its writing and drafting. The editing was aided by OP. The manuscript was read and modified by SV and RD. The manuscript was edited and examined by RD. SV contributed to the editing, and evaluation of the manuscript as well as the literature review. The final manuscript was read and approved by all writers.

### Conflict Of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

### Consent For Publication

Written informed consent was obtained from the patient for the publication of this case report.

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