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Case Report

Surgery Section

Adrenal Cortical Adenoma Presenting with Haemorrhagic Shock: A Case Report

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ABSTRACT

Spontaneous rupture of an adrenal cortical adenoma is an infrequent cause of retroperitoneal haemorrhage and acute abdomen. This report presents a unique case of a 24-year-old Indian male with sudden-onset left-sided abdominal pain, altered consciousness, hypotension, tachycardia, and abdominal distension. Contrast-enhanced CT angiography revealed a large, ill-defined, necrotic, and haemorrhagic mass measuring 11.3×10.6×13.6 cm in the left suprarenal region, which displaced the kidney inferiorly, and bilateral pleural effusions were noted. Emergency exploratory laparotomy was done, which identified and successfully resected a ruptured adrenal mass, later confirmed histologically as an adrenal cortical adenoma with extensive intratumoral necrosis and haemorrhage. Unlike typical adrenal cortical adenomas, which are small, incidental, and hormonally silent, the present case was a surgical emergency with life-threatening haemorrhage but without endocrine abnormalities. The case highlights the importance of considering adrenal haemorrhage as a differential diagnosis of acute abdomen with shock, even in the absence of trauma or hormonal symptoms.

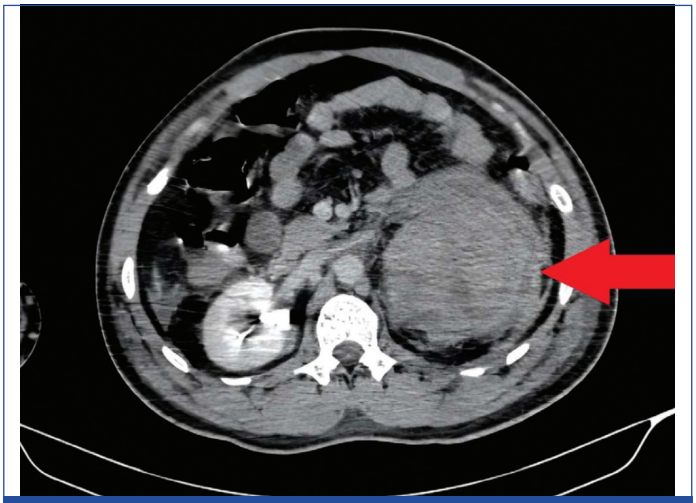
Keywords: Acute abdomen, Emergency surgery, Hypovolaemic shock, Non-traumatic haemorrhage, Suprarenal mass

CASE REPORT

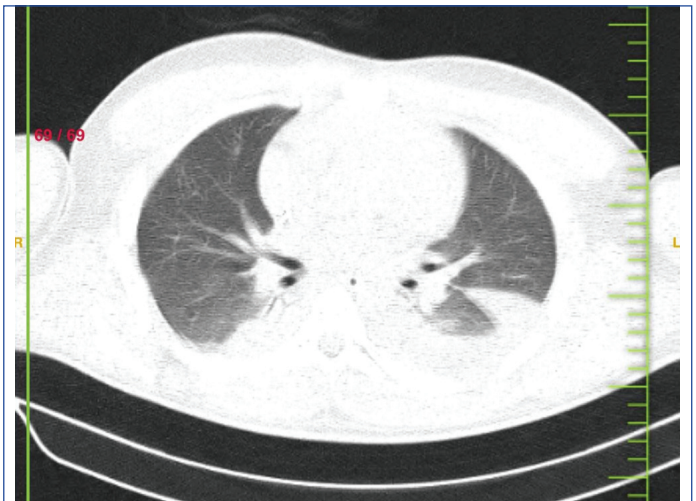
A 24-year-old male from rural India presented to the emergency department of a tertiary care centre with nausea, vomiting, progressing abdominal distension, altered consciousness, and severe left-sided abdominal pain for the last one day, which was sudden in onset and progressive in nature. The patient was drowsy, hypotensive, tachycardic, and febrile. The clinical examination revealed generalised abdominal distension, guarding, and rigidity, with a firm and tender mass palpable in the left lumbar and hypochondriac regions. There was no previous history of trauma, anticoagulant therapy, bleeding disorders, or chronic health conditions. The provisional diagnosis was acute abdomen with features of haemorrhagic shock. The different diagnoses considered were splenic rupture, retroperitoneal haemorrhage, ruptured renal or adrenal mass, aortic dissection, and an aneurysm based on anatomic localisation, haemodynamic instability, and abdominal findings.

To find out the reason for the intra-abdominal bleeding, a Computed Tomography (CT) angiogram of the abdomen and pelvis was performed urgently. CT angiography of the patient revealed a large, mildly enhanced, ill-defined heterogeneous mass measuring approximately 11.3×10×13.6 cm, with a few necrotic areas noted in the left suprarenal region, suggestive of haematoma. The lesion was surrounded by fat strands and was seen displacing the left kidney downwards. Mild ascites and bilateral pleural effusions were also identified [Table/Fig-1]. Additionally, there was no evidence of aortic dissection, aneurysm, or luminal compromise of the abdominal and thoracic vessels, which included the renal, celiac, and mesenteric arteries, and thus ruled out any vascular causes of the bleeding diathesis.

Due to pleural involvement and ongoing respiratory distress, a High-Resolution CT (HRCT) of the thorax was performed. It identified a moderate left-sided pleural effusion (230-260 cc), with fissural extension, and atelectasis of the left lower lobe, and minimal right-sided effusion (40-60 cc) with a segmental collapse of the right lower lobe [Table/Fig-2]. Mediastinal vascular structures and primary bronchi were normal on HRCT. A diagnostic thoracentesis was performed, and pleural fluid cytology revealed a blood-mixed, paucicellular leucocytic effusion without any evidence of malignant cells.

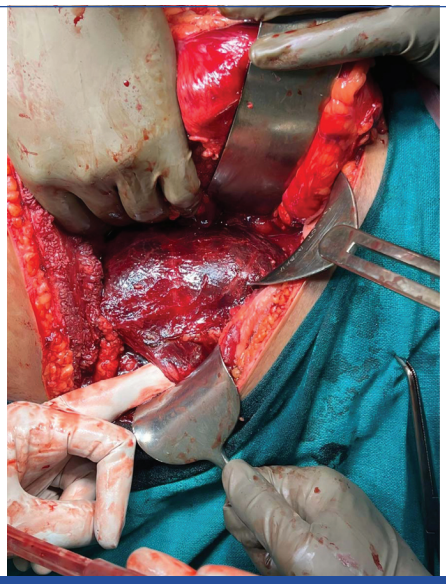


[Table/Fig-1]: Computed Tomography (CT) angiography of abdomen and pelvis revealed a large mildly enhancing ill-defined, heterogeneous mass with few necrotic areas in left suprarenal region, suggestive of adrenal haematoma (red arrow).



[Table/Fig-2]: High-Resolution CT (HRCT) thorax showing pleural effusion with fissural extension, and atelectasis of the left lower lobe, and minimal effusion with a segmental collapse of the right lower lobe.

After stabilising the patient's haemodynamic status, an emergency exploratory laparotomy was performed to treat the retroperitoneal haemorrhage and resect the identified adrenal mass. A left subcostal incision was performed under general anaesthesia to gain adequate access to the retroperitoneum and the left upper quadrant of the abdomen. Upon entering the abdominal cavity, a large amount of clotted and fresh blood (approximately 1.5 litres) was evacuated from the retroperitoneum, which was done to facilitate proper visualisation. The left adrenal gland was identified as the source of the haemorrhagic mass [Table/Fig-3].

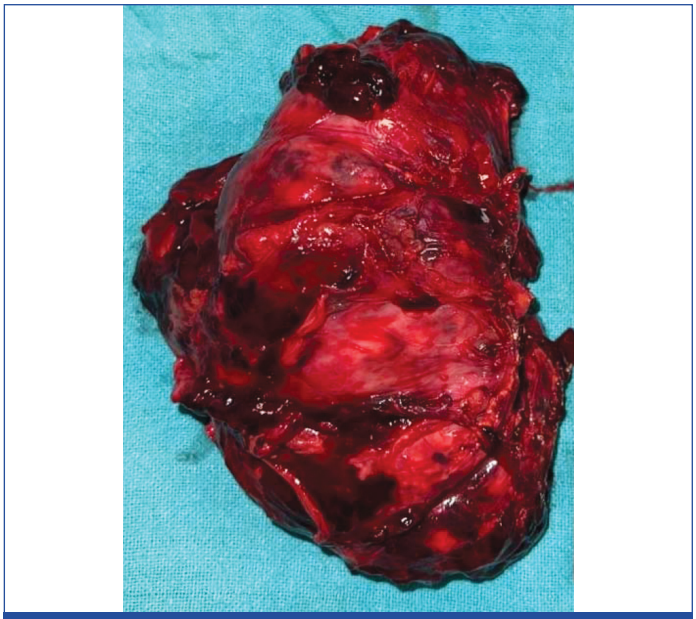


[Table/Fig-3]: Exploratory laparotomy for excision of ruptured left adrenal tumour.

The tumour was noted to be large, friable, and haemorrhagic, but there was no local invasion to surrounding structures. The excision of the mass and adrenal gland was performed correctly, preserving the surrounding vital structures, including the pancreas, left kidney, spleen, and major vessels. Both the adrenal vein and small arterial branches to the adrenal gland were successfully ligated to achieve vascular control. The adrenal mass was then removed along with the gland, ensuring that all necrotic and haemorrhagic tissue was correctly removed, haemostasis was achieved, and the retroperitoneal cavity was thoroughly irrigated. A drain was placed at the operative site to monitor any possible bleeding. The abdominal wall was closed in layers in a standard fashion. Both the excised specimens were sent for histopathological examination to confirm the diagnosis and to determine the characteristics of the tumour.

The histopathological examination was conducted on two specimens. The first container was labelled as an excised adrenal tumour with numerous friable blood clots and a larger soft mass of 10×9×6 cm. The excised specimen of adrenal tumor is shown in [Table/Fig-4].

Cut-section revealed a capsulated mass with a fleshy, variegated surface. The microscopic examination revealed features which were suggestive of an adrenal cortical adenoma with extensive tumour necrosis and intratumoral haemorrhage. The second container, labelled as the left adrenal gland, contained two irregular fibrofatty tissue fragments (aggregating 3×2×2 cm), showing unremarkable adrenal cortex morphology with extensive haemorrhage and infarct necrosis. The patient was monitored continuously in the SICU after the surgical procedure. The patient received mechanical ventilation with two units of blood. Pulmonology consultation of the patient was done due to persistent left pleural effusion and difficulty in weaning from ventilation. The patient underwent pigtail catheter placement into the left pleural cavity after ultrasound-guided thoracentesis of haemorrhagic fluid. The patient had positive chest X-rays with adequate drainage, and he was gradually weaned from ventilatory support, and successfully extubated. There were no postoperative



[Table/Fig-4]: The excised specimen of adrenal tumour.

complications with infection, respiratory distress, or haemodynamic instability. The abdominal drain was then removed on postoperative day five after having a minimal output. The surgical wound healed well without infection, and the sutures were removed on day 10, revealing a healthy scar.

The patient was discharged in a stable condition, receiving medications that included analgesics, antibiotics, vitamin supplementation, and gastric protection. During follow-ups at two weeks and one month, the patient remained asymptomatic, and respiratory and abdominal examinations were normal. Results of imaging during follow-ups showed resolving pleural effusions with no recurrence of adrenal pathology. The patient was advised to undergo further periodic endocrine follow-ups and serial imaging for possible future adrenal abnormalities.

DISCUSSION

Spontaneous rupture of adrenal cortical adenoma is an extremely rare condition, which presents mainly as retroperitoneal haemorrhage leading to acute abdomen with haemorrhagic shock [1]. Mostly, it involves adrenal masses such as pheochromocytomas or adrenocortical carcinomas, while ruptured benign cortical adenomas remain exceptionally uncommon [2,3]. Adrenal cortical adenomas are typically incidental, non-functional, and small lesions below 2 cm, massive rupture is rare due to their typical vascular structure [4]. When rupture occurs, it often manifests as sudden onset abdominal or flank region pain, rapid haemodynamic deterioration, and anaemic features which mimic ruptured ectopic pregnancy and visceral aneurysm [5].

The present case describes a 24-year-old male with haemorrhagic shock due to rupture of adrenal mass. In contrast, the case described by Wang SR et al., involved a 77-year-old African American woman who presented with asymptomatic hypertension and an incidentally discovered adrenal mass. Biochemical tests suggested a tumour with active hormones showing elevated androstenedione. Despite having an intraoperative suspicion of malignancy because of focal renal invasion, histopathology confirmed it as a benign adrenal cortical adenoma with renal-adrenal fusion rather than proper invasion. The course was elective, robotic-assisted, and uneventful [6].

A case of a 14-year-old Indian girl reported by Lallawmzuali C et al., presented with symptoms of uncontrolled hypertension and hypokalaemia, consistent with hyperaldosteronism, and imaging revealed a well-circumscribed adrenal lesion. Histopathology showed a collision tumor comprising an adrenal cortical adenoma

Feature	Present case (24-year-old Indian male)	Wang SR et al., (77-year-old African American woman) [6]	Lallawmzuali C et al. (14-year-old Indian girl) [7]	Boro H et al., (2.5-year-old Indian boy) [8]
Presentation	Acute abdomen, altered sensorium, hypotension, haemorrhagic shock	Asymptomatic; incidentally detected mass	Hypertension, hypokalemia, palpitations	Rapid weight gain, virilisation, aggressive behaviour
Clinical course	Emergency; life-threatening haemorrhage	Elective and stable	Elective and stable	Elective, paediatric endocrine case
Haemodynamics at presentation	Unstable (shock, tachycardia)	Stable	Stable	Stable
Hormonal activity	Hormonally silent	Androgen secreting (elevated androstenedione)	Hyperaldosteronism (aldosterone-secreting)	Cushing's syndrome + androgens (ACTH-independent)
Mass characteristics (imaging)	11.3×10.6×13.6 cm, haemorrhagic, necrotic, displacing kidney	~6 cm, no haemorrhage, renal-adrenal fusion	Well-circumscribed lesion	3.9 cm, well-circumscribed, no necrosis
Diagnosis (Histopathology)	Adrenal cortical adenoma with necrosis and haemorrhage	Adrenal cortical adenoma with renal-adrenal fusion	Collision tumor: adrenal cortical adenoma + ganglioneuroma	Adrenal cortical adenoma
Surgical Approach	Emergency open exploratory laparotomy	Elective robotic adrenalectomy	Elective open/laparoscopic adrenalectomy	Elective adrenalectomy
Complications	Pleural effusion, respiratory distress, managed with pigtail drainage	None reported	None reported	None reported
Postoperative Outcome	Recovered well; asymptomatic at follow-up	Uneventful recovery	Complete clinical recovery	Clinical and hormonal normalisation

[Table/Fig-5]: Adrenal mass presentations and management across different cases.

and a ganglioneuroma, which were immunohistochemically different but also co-existing in close proximity. The diagnosis of adenoma was confirmed with Melan-A and inhibin marker. Postsurgical resection of these tumours led to complete clinical recovery, and the case was managed electively without acute complications [7]. Unlike the given, present case was a surgical emergency with life-threatening haemorrhage, yet both patients had favourable outcomes after surgical intervention.

The case reported by Boro H et al., involves a 2.5-year-old Indian male child presenting with rapid weight gain, central obesity, virilisation, aggressive behaviour, and signs of ACTH-independent Cushing's syndrome with pseudo-precocious puberty [8]. Hormonal investigations confirmed elevated cortisol, testosterone, and adrenal androgen levels with suppressed ACTH and gonadotropin hormones. Surgical resection was done, and histology later confirmed the diagnosis of adrenal cortical adenoma with low proliferative index and no malignant features [8]. Although the present case also involved an adrenal cortical adenoma, the paediatric case was a hormonally active, endocrinopathy-involved case [8]. In contrast, the present case was hormonally silent but clinically dramatic due to acute haemorrhagic rupture. Adrenal mass presentations and management across different cases is described in [Table/Fig-5].

CONCLUSION(S)

This case describes a rare but life-threatening condition of a spontaneous haemorrhagic rupture of an adrenal cortical adenoma. This non-functional adrenal mass led to retroperitoneal haemorrhage with haemorrhagic shock, which required emergency surgical intervention. Timely diagnosis with CT angiography, haemodynamic stabilisation, and adrenalectomy resulted in a favourable outcome. This case highlights the importance of consideration of adrenal pathology in patients having an acute abdomen with shock.

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