Unilateral adrenal haemorrhage of idiopathic origin: case report

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Abstract

Introduction
Right unilateral adrenal haemorrhage is a rare disease and might be fatal. The diagnosis is made using imaging findings based on ultrasound and CT scan techniques. This paper reports the case of unilateral adrenal haemorrhage of idiopathic origin.

Case report
Our female patient was 19 years old. She was admitted to the emergency department for strong isolated back pain. The diagnosis was evident using an imaging approach. The findings were suggestive of right adrenal haemorrhage. The patient was hospitalised in the intensive care unit for pain monitoring, and she received strict medical supervision for the first 15 days without any treatment since the adrenal hormone dosage was normal.

Conclusion
Adrenal haemorrhage is an uncommon fatal disease. The idiopathic aetiology still remains to be elucidated. The diagnosis is often incidental during systematic medical. CT scan is the gold standard to confirm the diagnosis.

Introduction
Right unilateral adrenal haemorrhage (AH) is a rare disease and might be fatal1. The diagnosis is made using imaging findings based on ultrasound and CT scan techniques. The diagnosis is evidenced using an imaging approach. The causes identified in the literature are thoraco-abdominal trauma and/or adrenal tumours2. Latrogenic causes and stress may cause major bilateral adrenal haemorrhage1-3. We report unilateral adrenal haemorrhage that manifested with isolated low back pain with a review and discussion of the literature.

Case report
Our female patient was 19 years old without significant pathological history such as trauma or drug intake. She was admitted to the emergency department with a strong isolated back pain. General examination showed a conscious patient with a normal general condition including blood pressure of 120/60 mmHg, normal-coloured conjunctiva, afebrile, and normal respiratory rates. Abdominal examination showed right lumbar pain. Abdominal ultrasound showed right adrenal tumour. Biological assessments including blood cortisol was normal. Abdominal ultrasound (Figure 1) showed the presence of a heterogeneous, echogenic, oval formation measuring 65 mm × 110 mm in the hepato–renal area associated with haemoperitoneum in medium abundance. Abdominal CT scan (Figures 2 and 3) showed a mass with spontaneous hyper-dense aspects in the hepato–renal space corresponding to the adrenal gland. The mass was enhanced peripherally after injection of contrast agent and measured 80 mm × 100 mm diameter with infiltration of the upper pole of the kidney. The presence of haemoperitoneum was noticed. The findings were suggestive of right AH. The patient was hospitalized in the intensive care unit for pain monitoring.

A second CT scan which was performed on the tenth day of hospitalisation showed a decreased AH (Figure 4). The chest CT scan did not show any association of the lesion (Figure 5). The patient received strict medical supervision during 15 days without receiving any treatment since the adrenal hormone dosage was normal.

Discussion
The AH is a very rare pathology. The first case was described in 1863; it has had traumatic origin1. An idiopathic aetiology was never published. The main identified causes in the literature are as follows: direct trauma resulting in a violent compression of the adrenal gland or indirect trauma related to a phenomenon of deceleration4. While the iatrogenic basis are secondary to steroid or corticotropin releasing hormone (ACTH) administration5, it would result in sudden increase of blood flow leading to increased adrenal venous pressure responsible for intraglandular haemorrhage. Adrenal tumours and major stress state such as severe sepsis and, in particular, meningococcemia and prolonged hypotension might originate from AH1-3. Surgical interventions requiring cardiopulmonary bypass, anticoagulation, or coagulopathy (APS, HIT) would also cause AH. However, no aetiology was assessed in the reported case. The right adrenal gland was the most affected4. This might be explained by the anatomical characteristics which are related to the vascularisation of the right adrenal gland; indeed, the right adrenal vein is short and emerges from the lower medial portion of the liver.

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Conclusion
Adrenal haemorrhage is an uncommon fatal disease. The idiopathic aetiology still remains to be elucidated. The diagnosis is often incidental during systematic medical. CT scan is the gold standard to confirm the diagnosis.

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the gland and joins the inferior vena cava. The left adrenal vein is longer and emerges in the lower edge of the gland and joins the renal vein. Therefore, the post-traumatic hypertension phenomenon generated at the inferior vena cava is intensely transmitted to the right adrenal gland compared to the left adrenal gland. Our patient has had right adrenal haematoma localisation. The clinical symptoms were nonspecific. Hence, a prominent sequential ultrasound and CT scan were indicated. The MRI examination was exceptionally indicated. The diagnosis was mostly confirmed by ultrasound and CT findings. Ultrasound showed an adrenal mass with varying echo texture from a tissular texture to a transonic cystic appearance. Abdominal CT scan demonstrated swollen adrenal glands which were spontaneously hyper-dense without contrast enhancement and with infiltration of the peri–renal fat. The attenuation levels of the haematoma depend on its age. Acute and sub-acute haematomas contain spontaneously hyper-dense areas ranging from 50 HU to 90 HU. The relative low density values observed in the CT scan of our patient is explained by the fact that the examination was performed in the sub-acute stage. Improvement and size of the haematoma decreased in time. Chronic haematoma might organize and form an adrenal pseudo cyst that might calcify after one year.

Acute haemorrhage within less than a week would be visible in the T1-weighted MRI images and would express as glandular enlargement with iso-intense signals compared to the liver. The T2-weighted images allow demonstrating the haemorrhage by hypo-intense aspects provoked by elevated intracellular deoxyhaemoglobin. After a week, the haematoma demonstrates a hyper-signal on T1- and T2-weighted images. This is due to the paramagnetic impact of free methaemoglobin (Fe^3+). This aspect is not specific and might occur in various benign or malignant tumours including melanoma metastases and bilateral haemangiomas. Absence of gadolinium enhancement is an important proof of benign haematoma. In contrast, the sudden onset of adrenal deficiency associated with

![Figure 1: Abdominal ultrasound showing adrenal haemorrhage associated with haemoperitoneum, costal effusion (arrow) associated to haemoperitoneum (1B) (arrow), and adrenal haemorrhage (1C).](image1)

![Figure 2: Right adrenal haemorrhage (left arrow) associated with haemoperitoneum (arrow) before contrast injection.](image2)
Figure 3: Right adrenal haemorrhage (left arrow) complicated with haemoperitoneum (right arrow).

Figure 4: Regression of the adrenal haemorrhage (arrow).

abnormal perinephric fat signal advocate bleeding.

The MRI aspects were not studied in our patient since ultrasound and CT scan provided enough evidence for establishing the diagnosis\(^4\). The literature review did not report any adrenal insufficiency with a unilateral adrenal haematoma. In fact, adrenal deficiency show clinically whenever more than 90% of adrenal tissue is damaged.

A study of 10 post-traumatic bilateral adrenal haematoma cases demonstrated that five patients developed acute adrenal insufficiency\(^5\). Plasma cortisol assessment has to be done in all cases including unilateral haematoma. This ensures suitable function of the non-traumatised adrenal gland. Our patient did not show any adrenal insufficiency due to unilateral infraction. The AH could be associated with multiple lesions already described in the literature such as haemothorax, lung parenchyma contusion, atelectasis, splanchnic injuries, renal lesions, lesions of the spine, and rib fractures. Our case did not show any other lesion aspects; however, a rare haemoperitoneum complication was observed on the CT scan. Clinical follow-up would be achieved by iterative ultrasound and/or CT scans. A gradual decrease of adrenal mass size with appearance of liquefying aspect was demonstrated by decreased echogenicity and CT scan density within four to six weeks. Cicatrisation of unilateral haemorrhage was characterised by the appearance of fibrous lesions without clinical consequences. The evolution might lead to a complete disappearance of adrenal abnormality without squeals. However, a progressive adrenal atrophy might result in chronic adrenal deficiency especially in bilateral AH. Finally, the CT scan follow-up might lead to discard a pre-existing tumour after complete disappearance of the entire mass.

Conclusion

The AH is an uncommon fatal disease. The idiopathic aetiology remains still to be elucidated. The diagnosis is often incidental during systematic medical. CT scan is the gold standard to confirm diagnosis. Medical

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Consent
Written informed consent was obtained from the patient for publication of this case report and the accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Abbreviations list
ACTH, Adrenal Cortico Trophic Hormone; AH, adrenal haemorrhage.

References

Figure 5: A chest CT scan showing no associated lesions.