Bilateral adrenal haemorrhage in a critically ill patient

Christian M Girgis, Louise Cole and Bernard L Champion

ABSTRACT

Although rare, bilateral adrenal haemorrhage remains a life-threatening complication of severe infection and prolonged critical illness. A 67-year-old woman developed acute adrenal haemorrhage in the context of severe systemic infection due to diverticulitis and pericolic abscess. The prompt recognition and management of this condition was an important component of her eventual recovery.

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Clinical record

A 67-year-old woman presented to the emergency department with a 3-week history of lower abdominal pain and fever. Following an abdominal computed tomography (CT) scan, she was diagnosed with diverticulitis and a pericolic abscess, for which she underwent surgical resection of the inflamed bowel, abscess drainage and formation of a colostomy. Thereafter, she was transferred to the intensive care unit, where she received inotropic and ventilatory support over 2 days for the treatment of severe septic shock (Acute Physiology and Chronic Health Evaluation [APACHE] II and Sequential Organ Failure Assessment [SOFA] scores, 24 and 7, respectively).

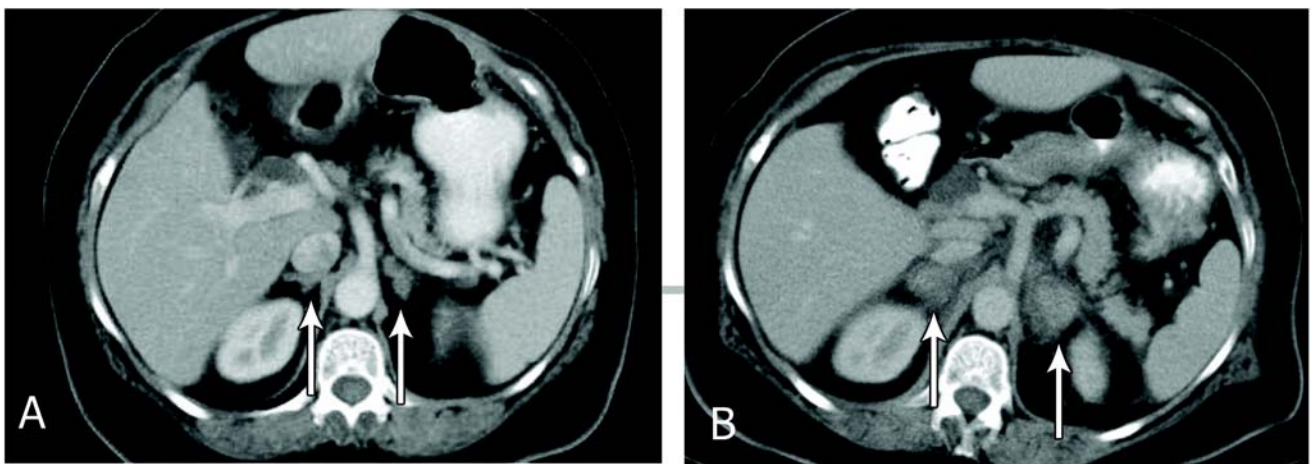
One day after extubation and cessation of inotropic agents, she became acutely ill with hypotension (blood pressure, 90/60 mmHg), delirium, hyponatraemia and hyperkalaemia (sodium [Na^+], 130 mmol/L, reference range [RR], 135–145 mmol/L; potassium [K^+], 5.4 mmol/L, RR, 3.5–5.0 mmol/L). Adrenal insufficiency was demonstrated by a low baseline morning serum cortisol level (70 nmol/L, RR, > 350 nmol/L) and an inadequate response following cosyntropin administration at a dose of 250 μg (rise from baseline < 200 nmol/L). A CT scan showed bilateral gross adrenal enlargement (Figure 1), confirming a diagnosis of bilateral adrenal haemorrhage in the context of critical illness. Glucocorticoid replacement led to normalisation of her blood pressure, cognition and electrolytes (Na^+, 136 mmol/L; K^+, 4.1 mmol/L).

The patient made a complete recovery from her critical illness, but her adrenal insufficiency persisted as demonstrated by a significantly low baseline cortisol level (90 nmol/L) 1 month after the initial diagnosis and persistent changes to suggest adrenal haemorrhage on magnetic resonance imaging (Figure 2). At follow-up 4 months after discharge, she continued to require full glucocorticoid replacement, had commenced mineralocorticoids and continued to display very low early morning cortical measurements.

Discussion

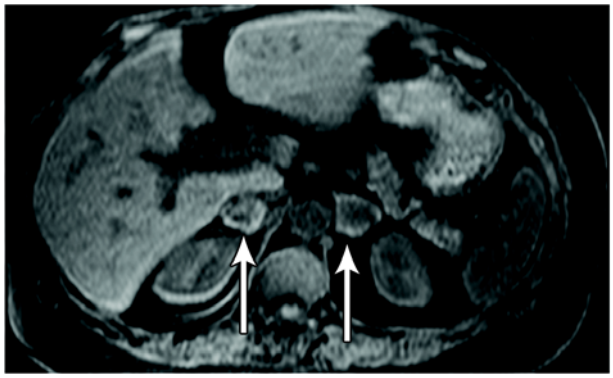
Bilateral adrenal haemorrhage has become a rare consequence of severe infection due to the prompt institution of antibiotic therapy and intensive care support in such patients. It is classically associated with meningococcae-

Figure 1. Computed tomography scan showing the patient's adrenal glands before and after development of bilateral enlargement due to haemorrhage



Adrenal glands identified by arrows. Normal adrenal glands **(A)** *several days before the development of bilaterally enlarged adrenal glands* **(B)** *with surrounding fat stranding; this coincided with clinical and biochemical features of adrenal insufficiency.*

Figure 2. Magnetic resonance image performed 1 month after the initial diagnosis of bilateral adrenal haemorrhage



This shows persistently enlarged adrenal glands (arrows) with predominant central T1-hypointensity, consistent with previous haemorrhage.

mia,[1] but may also occur among patients with infections due to *Pseudomonas*,[2] gram-negative organisms[3] and streptococcal organisms.[4] Patients generally require lifelong adrenal replacement therapy, although there are reports of spontaneous recovery, even years after the original injury.[5]

Its pathophysiology is poorly understood, but is thought to be due to impaired coagulation and acute changes in adrenal venous pressure leading to haemorrhage.[6]

Our patient displayed particular risk factors for this condition, including persistent, gram-negative systemic infection and the postsurgical state.[7] Bilateral adrenal haemorrhage remains an important condition to recognise among critically ill patients, as prompt diagnosis and treatment with glucocorticoid replacement are life-saving.

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