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## Post-operative bilateral adrenal haemorrhage: A case report

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## ABSTRACT

**INTRODUCTION:** Bilateral adrenal haemorrhage is a rare, but serious, illness carrying an estimated 15% mortality.<sup>1,2</sup> The majority of cases occur in patients with acute, stressful illness, however the exact mechanism underlying adrenal haemorrhage remains unclear. This medical emergency carries significant diagnostic difficulty<sup>4</sup> with non-specific clinical symptoms and variations in electrolyte abnormalities. Timely treatment is important as it prevents both the acute and long-term sequelae of adrenal failure.

**PRESENTATION OF CASE:** This report describes a medical emergency in a surgical patient following emergency surgery for intra-abdominal sepsis. The patient reported non-specific symptoms of confusion, mild pyrexia and vague abdominal pain during the post-operative phase, with subtle electrolyte abnormalities and a low serum cortisol suggestive of adrenal crisis. Timely medical treatment, with intravenous hydrocortisone and intensive monitoring, and appropriate medical follow-up with addition of long-term fludrocortisone resulted in a satisfactory outcome.

**DISCUSSION:** This report describes a potentially life-threatening complication of intra-abdominal sepsis with adrenal crisis secondary to bilateral adrenal haemorrhage. In particular, this case highlights the diagnostic difficulty in such surgical patients due to vague symptoms and, in this case, the presence of a presentation variant with acute hyponatraemia and normal potassium.

**CONCLUSION:** This case highlights the importance of awareness of both the symptoms and signs and variation in electrolyte profile when assessing surgical patients post-operatively. In addition, this case highlights the benefit of early recognition and initiation of treatment and the importance of follow-up as long-term medical management is often required to prevent further relapse.

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## 1. Introduction

Bilateral adrenal haemorrhage is relatively uncommon with 50% of cases being associated with an acute stressful illness.<sup>1,2</sup> The exact mechanism is unclear but one possible cause is an increase in blood flow coupled with the organ's limited venous drainage.<sup>3</sup> This may be seen when adrenocorticotrophic hormone (ACTH) levels are increased as part of a stress response. Alternatively it could be related to adrenal vein spasm or thrombosis seen in hypercoagulable states such as sepsis. Irrespective of the underlying cause, bilateral adrenal haemorrhage can cause an adrenal crisis and has a mortality rate of 15%.<sup>1–3</sup> The authors describe a post-operative bilateral adrenal haemorrhage, which developed following sepsis secondary to an anastomotic leak.

## 2. Presentation of case

A 67-year-old male who had previously undergone abdominoperineal excision of rectum for a Dukes C

adenocarcinoma presented with generalised abdominal pain, distension, decreased stoma output, and mild nausea. His only other medical history was hypertension managed with amlodipine. On admission, all observations were within normal range and all bloods were normal. Plain AXR demonstrated features consistent with subacute small bowel obstruction and he was managed conservatively with intravenous fluids and nasogastric drainage for 72 h. Due to failure to settle a computed tomography (CT) was performed that demonstrated multiple transition points, a mass of small bowel loops within the pelvis consistent with adhesional obstruction and no sign of recurrence of colorectal cancer (Fig. 1). He underwent laparotomy that confirmed the CT diagnosis, with dense interloop adhesions noted and a mass of small bowel loops within the pelvis. Adhesiolysis was performed and a side-side, stapled small bowel anastomosis performed for the mass of small bowel too densely adhered for safe adhesiolysis.

Initially the patient made a good recovery with a functioning stoma and normal oral intake. On day 3 post-operatively he developed a tachycardia and became pyrexial. Initial assessment suggested a wound infection and empirical antibiotics were commenced. On day 4 he developed mild abdominal pain and his C-reactive protein (CRP) rose to more than 200 (Fig. 2). Clinical assessment at this stage led to CT scanning of the abdomen and

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Fig. 1. Coronal slice – demonstrating small bowel dilatation.



Fig. 3. Sagittal slice – demonstrating pelvic collection.

pelvis that revealed a pelvic collection suggestive of anastomotic leak (Fig. 3). He underwent laparotomy and the small bowel anastomosis was taken down and an ileostomy formed. A large bore pelvic drain was left in situ and the patient was transferred to the intensive therapy unit (ITU) for 3 days. He received total parenteral nutrition (TPN) via a central venous catheter, IV fluids and IV antibiotics. Again, he showed signs of improvement with an early warning score of zero, and following the start of an oral diet he returned to the surgical ward.

On the 4th post-operative day he became confused, had a mild pyrexia and vague abdominal pain. Bloods performed that day demonstrated acute hyponatraemia with a plasma sodium of 118 mmol/L (Fig. 4(1)), hypocalcaemia (corrected  $Ca^{2+}$  1.80) and hypermagnesaemia ( $Mg^{2+}$  1.43). Arandom cortisol performed as workup for his hyponatraemia was low at 71. A subsequent short synacthen test demonstrated a blunted response. CT scanning was performed that demonstrated grossly abnormal adrenal glands bilaterally with rounded masses thought to be haematomas (Fig. 5).

At this point adrenocortical insufficiency secondary to bilateral adrenal haemorrhage was diagnosed and he was transferred to the high dependency unit (HDU) for monitoring and ongoing medical management. IV hydrocortisone was administered and he was commenced on a strict fluid balance and cardiac monitoring.

This treatment resulted in a rapid improvement in his electrolyte imbalance (Fig. 4). He made a good recovery and had no further abdominal problems. He was reviewed by the endocrinology team and discharged home on a reducing dose of steroids, with medical and surgical out-patient follow-up, and a steroid card. At follow

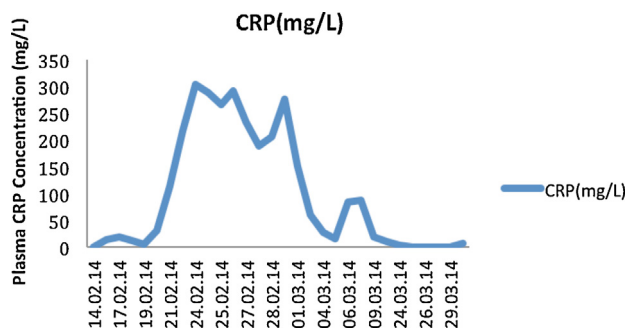


Fig. 2. Line graph demonstrating C-reactive protein course.

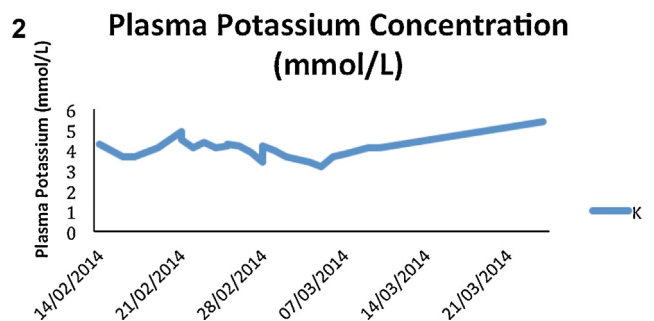
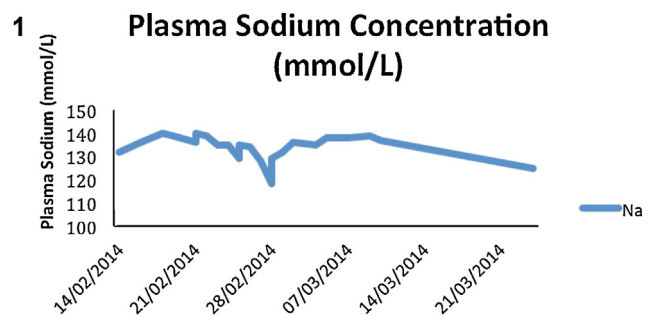


Fig. 4. (1) Line graph demonstrating plasma sodium course. (2) Line graph demonstrating plasma potassium course.

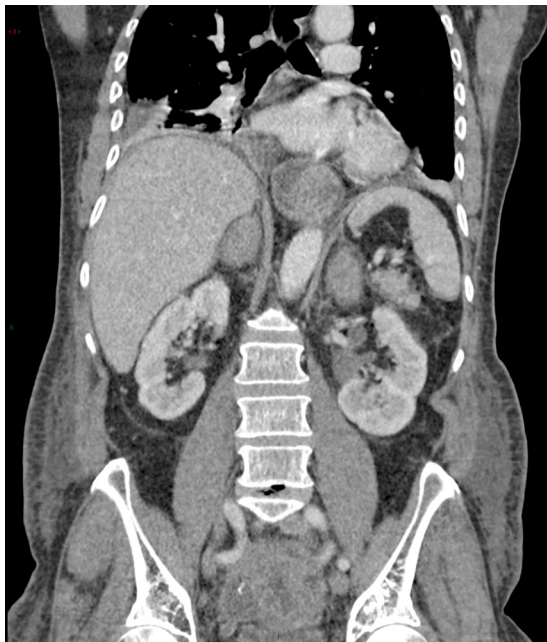


Fig. 5. Post haemorrhage coronal image.

up he remained hypotensive, therefore mineralocorticoid replacement was commenced with 100 µg of fludrocortisone.

### 3. Discussion

Current literature reports that that bilateral adrenal haemorrhage is more common in hospitalised patients, and in surgical patients may occur during the first or second week post-operatively.<sup>3</sup> Common pre-disposing factors include sepsis and heparin induced thrombocytopenia. In this case the most likely cause was post-operative stress in conjunction with sepsis. Presentation is often non-specific and the diagnosis is frequently only noted at autopsy. Clinical presentation can include abdominal pain, nausea and vomiting, fever, fatigue and hypotension.<sup>4</sup> However, in cases such as that reported here, all of these symptoms could be accounted for by intra-abdominal sepsis. Thus adrenal insufficiency in the acute setting presents a significant diagnostic challenge. Further, the electrolyte profile of adrenal insufficiency remains unclear and controversial, literature reports that associated electrolyte disturbances include hyponatraemia, hyperkalemia, hypoglycaemia, hypocalcaemia and hypermagnesia. In this case there was an acute drop in serum sodium 4 days after the second laparotomy, preceded by an elevated CRP. However, interestingly, the blood results do not demonstrate a rise in potassium, illustrating that not all patients will have complete electrolyte derangement (Fig. 4(2)). Adrenal insufficiency should therefore be considered even in the presence of normal or only mildly abnormal potassium.

Due to timely recognition of adrenal insufficiency and early instigation of treatment there was rapid correction of the

electrolyte imbalance and the patient remained stable on a reduced steroid dose. A further brief admission with hypotension suggested the need for mineralocorticoid replacement alongside the glucocorticoid replacement. However, this was not commenced during admission but at medical follow-up thus highlighting the importance of both medical and surgical follow-up of such patients. Literature in conjunction with the experience of the consultant endocrinologist overseeing the patient's care, predicted that there was likely to be long-term residual adrenal insufficiency and ongoing treatment would be required.<sup>1</sup>

### 4. Conclusion

This case describes an adrenal crisis due to bilateral adrenal haemorrhage following intra-abdominal sepsis as a result of an anastomotic leak. The patient had a sudden drop in sodium levels but non-specific symptoms and no changes in his potassium level, demonstrating the high level of suspicion needed in order to diagnose this rare but serious condition. Immediate initiation of the correct treatment and frequent monitoring can lead to a quick recovery and timely discharge from hospital. However, failure to appreciate the need for mineralocorticoid replacement to prevent hypotension led to a further potentially avoidable admission thus stressing the importance of endocrinology input and follow-up for such patients.

### Conflict of interest

The authors declare they have no conflicts of interest.

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### Ethical approval

This is not a research study.

### Author contributions

R.E. McNicol involved in data collection drafting of report.

A. Bradley, J. Griffin and C.A. Eriksen involved in drafting of report.

G. Duncan involved in acquisition of images, editing images and drafting manuscript.

G.J.K. Guthrie involved in concept, design and drafting of report.

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