



Case report

Postoperative bilateral adrenal hemorrhage: correlation between clinical and radiological signs

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Abstract The case of a patient who developed progressive hemodynamic instability during the late postoperative period following oncologic abdominal surgery is presented. Suspecting the onset of intraabdominal infection, we ordered a computed tomographic scan of the area, on which bilateral adrenal hemorrhage was observed. Adrenal function tests confirmed the presence of adrenal insufficiency.

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1. Introduction

Severe sepsis or septic shock, the second most common cause of death in the noncoronary intensive care unit (ICU), is a condition derived from a systemic inflammatory response initiated as a defense against infection of any origin. This response involves a complex array of proinflammatory, antiinflammatory, humoral, and cellular elements, which, to a greater or lesser extent, trigger the development of organ dysfunction. The literature provides increasing evidence that one of the organs affected in this case is the adrenal gland [1]. The contribution of adrenal dysfunction to the occurrence of clinical sepsis is an issue that still requires further investigation, but study in recent

years has shown that early diagnosis and treatment of this complication reduces mortality [2].

2. Case report

A 63-year-old man who underwent right hemicolectomy 14 days earlier, was admitted to the postoperative care unit (PCU) 7 days after reintervention. His main symptoms at admission were disorientation, difficulty in breathing, mild tachycardia, and fever. Treatment was begun with sedation, mechanical ventilation, two units of packed red blood cells, antithrombotic prophylaxis, and empirical antibiotic therapy with imipenem, which was later adjusted in accordance with microbiological results. Initial doses of dopamine as a diuretic was increased to inotropic amounts due to progressive hemodynamic deterioration, and noradrenaline infusion was added.

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Laboratory tests at the time of admission showed leukocytosis ($30 \times 10^3/\mu\text{L}$) with neutrophilia (86.6%) and immature cells (15%), lymphopenia (6%) and mild eosinophilia (3.4%), moderate anemia with hemoglobin 8 g/dL, hematocrit 24.7%, and a red blood cell count of $2.73 \times 10^6/\mu\text{L}$, normal platelet count ($412 \times 10^3/\mu\text{L}$), and normal coagulation tests (prothrombin time 13.9 sec, prothrombin activity 86.6%, international normalized ratio [INR] 1.1, cephalin clotting time 37.3 sec), except for an increase in fibrinogen (938 mg/dL). In the microbiological tests performed at admission, multidrug-sensitive *Proteus mirabilis* was isolated in the postintubation bronchial aspirate, and *Pseudomonas aeruginosa* and *Enterococcus faecium* – both of which were resistant to standard antibiotics – from the surgical wound.

Computed tomography (CT) performed during the early postoperative stay showed an accumulation of fluid between the bowel loops corresponding to a perianastomotic collection (Fig. 1). Suspecting that these collections were going to increase, we ordered a second scan to enable the drainage of some of them. The scan showed swelling of both adrenal glands and active bleeding in the right gland (Fig. 2). These images had not appeared in the previous CT scan performed 4 days earlier. Diagnostic tests for adrenal insufficiency were performed and the suspected diagnosis was confirmed; the baseline cortisol level was 10.4 $\mu\text{g/dL}$ and there was a limited cortisol response (12.1 $\mu\text{g/dL}$) after 60 minutes of stimulation with 250 μg of adrenocorticotropic hormone (ACTH). Continuous intravenous infusion of 200 mg of hydrocortisone per day was initiated, making it possible to reduce the inotropic support, which was discontinued 24 hours later. Extubation of the patient's trachea was



Fig. 1 Computed tomography (CT) performed during the early postoperative stay, showing an accumulation of fluid between the bowel loops (arrows) corresponding to a perianastomotic collection.



Fig. 2 Second computed tomographic scan, taken 4 days after the first, showing swelling of both adrenal glands (arrows) and active bleeding in the right gland (Fig. 2).

delayed for 4 days because he developed pneumonic consolidation in the left hemithorax. He was discharged from the PCU 12 days later and treatment with hydrocortisone was continued in the ward. One month later, despite the persistence of lesions suggestive of adrenal hematomas in radiological images, tests showed that the status of the adrenal glands had improved. The corticosteroid therapy was discontinued and the patient was released from the hospital.

3. Discussion

A case of adrenal insufficiency occurring in the late postoperative period is presented [3-5]. In the majority of cases, it presents with the characteristic hemodynamic signs of shock, including increased cardiac output associated with extremely low systemic resistances and hypotension. High doses of exogenous catecholamines are required and the response to fluid resuscitation is poor. It is accompanied by changes in mental status that can range from weakness and lethargy to delirium, agitation, or even coma, and gastrointestinal disorders, which include abdominal pain (in the case of thrombosis or adrenal hemorrhage), anorexia, nausea, vomiting, and diarrhea. The patient presented with a classic state of hypotension requiring inotropic support.

Although the incidence of adrenal insufficiency of any etiology in the general population is low (<0.01%) [4], the prevalence is higher in critically ill patients. According to different reports, incidence ranges between 0% and 77%,

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