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ACUTE ADRENAL INSUFFICIENCY DUE TO BILATERAL ADRENAL HEMORRHAGE

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We report a rare case of bilateral hemorrhage of adrenal glands diagnosed in a 61-year-old female. The case presented with classic clinical findings and typical imaging features.

Key-words: Adrenal gland – hemorrhage.

Adrenal hemorrhage is an uncommon event observed in patients of all ages. It usually occurs as a complication of physiologic stress, trauma, or a coagulopathic state. Although most cases of adrenal hemorrhage have a benign clinical course, bilateral adrenal hemorrhage could result in an Addisonian crisis and is a potentially life threatening disease. Therefore, it is important to promptly recognize adrenal hemorrhage on imaging studies and to realize its clinical implications. The reported case illustrates the typical imaging findings of bilateral adrenal hemorrhage causing adrenal insufficiency.

Case report

A 61-year-old woman was referred to our hospital with fever and acute low abdominal pain. Laboratory tests revealed elevated inflammatory markers. An abdominal CT scan demonstrated perforated sigmoid diverticulitis with a small abscess collection. The patient underwent a Hartmann procedure. She was readmitted two weeks later with fever, abdominal pain, complaints of confusion, nausea, general weakness and anorexia. Laboratory tests showed increased inflammatory markers and hyponatremia. Potassium was normal. A contrast enhanced abdominal CT revealed a wound infection in the laparatomy area, possibly explaining the abdominal pain. On this abdominal CT both adrenal glands appeared significantly increased in size with hazy borders when compared to the preoperative CT (Fig. 1 and 2). The diagnosis of bilateral adrenal hemorrhage with secondary insufficiency of the adrenal glands was proposed and could explain both the hypo - natremia and clinical symptoms of confusion, weakness and anorexia.

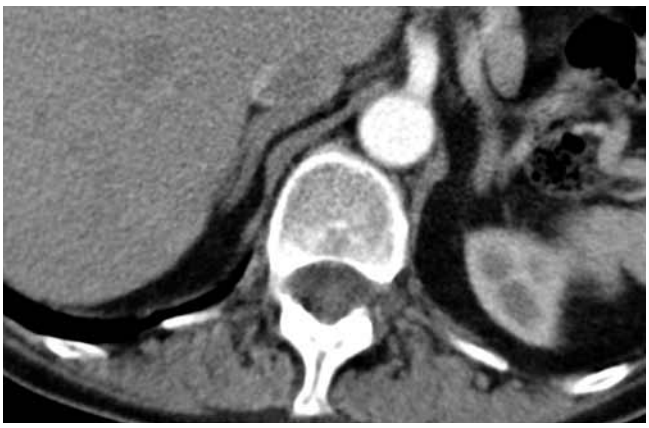

Fig. 1. — Admission (pre-operative) scan: contrast enhanced CT scan showing a normal aspect of both adrenal glands (arrowheads).

Fig. 2. — Follow up scan two weeks postoperative: contrast enhanced CT scan showing bilateral enlarged adrenal glands with less sharp borders compared to Fig. 1.

Hyponatremia was first treated which improved symptoms of confusion. The wound infection was treated surgically. The adrenal failure was proved through a low dose short stimulation test with a synthetic ACTH analog (tetracosactide). The patient was substituted with hydrocortisone and fludrocortisone. The patient was discharged from the hospital five days later. Follow up and treatment of the adrenal insufficiency was performed in the outpa-

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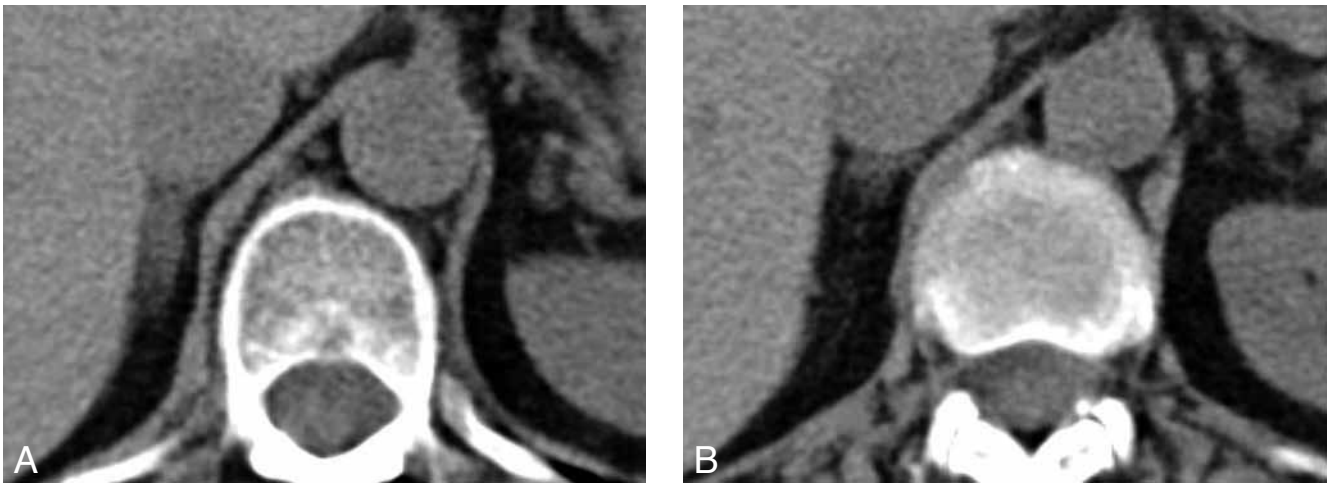

Fig. 3. — Follow up scan three months postoperative: unenhanced CT scan showing a normalized size and attenuation values of both adrenal glands (A = right, B = left).

tient clinic. Three months later the CT scan showed normalization of size and shape of both adrenal glands (Fig. 3a and b). Seven months after the adrenal hemorrhage the patient still needed corticosteroid supplementation.

Discussion

Adrenal hemorrhage can occur as a complication of acute stress, neonatal stress, blunt trauma, sepsis, underlying tumor, coagulopathic state, or idiopathic disease (1). Trauma accounts for 80% of cases of adrenal hemorrhage (2). Recent studies, using advanced imaging modalities, report an incidence of adrenal hemorrhage ranging from 0.8% to 2% in a trauma setting (3).

Symptoms of adrenal hemorrhage are unclear and may include acute abdominal pain, nausea, vomiting, hypotension, hypertension, agitation, mental status change, and low-grade fever. Laboratory tests are often non-specific and rarely show a significant drop in haemoglobin level. Also it may induce hyponatremia and hyperkalemia (4). Since both clinical presentation and laboratory tests are indefinite, adrenal hemorrhage could be easily overlooked. Although most cases carry a benign clinical course, bilateral adrenal hemorrhage may lead to acute adrenal crisis (Addisonian crisis), shock, and death unless it is recognized promptly and treated appropriately. Bilateral hemorrhaqe is particularly associated with anticoagulation therapy or a blood dyscrasia, less commonly it is associated with stress of surgery. The incidence of adrenal insufficiency in case of bilateral adrenal hemorrhage ranges from 16.7% to 50% (5). Hence, early recognition of bilateral hemorrhage by means of abdominal imaging is important.

CT scan, US, or MRI can be utilized to diagnose adrenal hemorrhage (2, 6). CT scan is preferred in all age groups except for neonates where ultrasound may be more beneficial. Findings of adrenal hemorrhage include peri-adrenal fat stranding and thickening of adjacent diaphragmatic crura. Also it is characterized by increased volume of the adrenal gland by a round or oval mass and hyper attenuating foci in the range of +50 to +90 HU (7). Differential diagnoses to be considered include leaking aortic aneurysm, bleeding from retroperitoneal organs, renal vein thrombosis, and abdominal abscess.

Depending on the cause of adrenal hemorrhage, most cases will not require surgical exploration. Non-operative management is recommended in the absence of ongoing bleeding and includes supportive care and evaluation of adrenal function (1). In case of adrenal insufficiency, corticosteroids replacement should be applied. Adrenal hematomas decrease in size and attenuation over time, and often resolve spontaneously (6). Patients with adrenal insufficiency after bilateral adrenal hemorrhage should continue oral steroid replacement on discharge. However, one study with a long-term follow-up of four patients has demonstrated that some patients can recover adrenal function (8).

In conclusion, the clinical presentation of adrenal hemorrhage may be indifferent and laboratory tests are often non-specific. Therefore, the diagnosis could be easily overlooked. On abdominal imaging – mostly CT – findings are quite typical but may be missed because the indication and the radiologist's attention are focused on other organs. Radiologists should be aware of this potentially lethal condition and careful evaluation of the adrenals in each abdominal imaging study is strongly recommended.

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