

Bilateral adrenal haemorrhage caused by antiphospholipid antibody syndrome

Published on 09.07.2014

DOI: 10.1594/EURORAD/CASE.11837

ISSN: 1563-4086

Section: Abdominal imaging

Area of Interest: Liver Adrenals Abdomen Thorax Veins
/ Vena cava Spleen

Procedure: Drainage

Procedure: Diagnostic procedure

Imaging Technique: CT

Special Focus: Abscess Infection Haemorrhage
Embolism / Thrombosis Ischaemia / Infarction Case
Type: Clinical Cases

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Patient: 75 years, female

Clinical History:

A 75-year-old female patient underwent a laparoscopic cholecystectomy and developed fever in the following days. No infection focus was found, so a CT of the abdomen was performed. She had a history of systemic lupus erythematosus (SLE) associated with antiphospholipid syndrome (APS) in remission for 20 years. No other signs or symptoms.

Imaging Findings:

Unenhanced CT showed enlargement of the right adrenal gland (its density was about 70HU) while the left adrenal gland was normal. This finding is consistent with acute unilateral adrenal haematoma. In addition, a subcapsular hepatic fluid collection was visible. Both findings did not enhance following contrast administration. The fluid collection was drained with CT guidance, not showing signs of infection, and therefore it will not be explored in this clinical case. Fifteen days later, the CT was repeated to follow up the adrenal lesion seen previously. This time, there was a similar enlargement and higher attenuation of the left adrenal gland, when it was clearly normal two weeks before. Additionally, there were subtraction images in the lumen of the inferior vena cava, left renal vein and a branch of the left pulmonary artery, relating to diffuse venous thrombosis. A splenic infarct was seen.

Discussion:

Adrenal haemorrhage is uncommon and is mostly an incidental finding unless there is a history of trauma. Most of the non-traumatic cases are stress-induced, caused by venous spasm/thrombosis, or haemorrhage of an underlying adrenal tumour (unilateral haemorrhage only). [2-3] Unilateral adrenal haemorrhage is usually asymptomatic while the bilateral one can cause an adrenal crisis. In the latter, patients present with shock, nausea, vomiting, abdominal pain, fever, hypoglycaemia and electrolyte imbalance, requiring exogenous cortisol administration. [3] CT is usually the imaging method of choice when adrenal haemorrhage is suspected, although sonography and MRI may be used. [3] CT usually reveals an enlarged, hyperattenuating mass lesion in the adrenal gland while permitting, at the same time, evaluation of the remaining abdominal organs and vasculature. This hyperattenuating

mass can enhance or not following contrast administration, depending on whether it is an acute or sub-acute haemorrhage. [2-3]

Treatment is determined by the lesion size and symptoms, ranging from conservative management to surgical excision if the haematoma is large and/or symptomatic.

In case of our patient, the first CT revealed an unilateral adrenal haemorrhage, leading the radiologist to propose three possible reasons, ranked in decreasing probability: stress-induced (patient underwent surgery one week before); underlying adrenal tumour (there were no previous examinations that proved that the patient had a normal adrenal gland); and the remote possibility of adrenal injury during the cholecystectomy. Therefore, a follow-up study some weeks later was recommended.

Fifteen days later, the image findings changed considerably. There was now bilateral adrenal haemorrhage as well as signs of diffuse venous thrombosis. A splenic infarct was seen, probably following a splenic venous thrombosis. This led the radiologist to propose coagulopathy as the main reason behind the adrenal haemorrhage, as the possibility of stress-induced haemorrhage and a bleeding tumour diminished substantially. [1-3]

After the CT, blood analyses were performed, confirming a hypercoagulable state and reactivation of the antiphospholipid syndrome. The patient started with anticoagulant therapy and has been asymptomatic ever since. The antiphospholipid syndrome is a syndrome in which the patient develops an increase of antibodies that react against the cell's membrane phospholipids, causing a hypercoagulable state. It can be primary or secondary to SLE. The recommended treatment consists in the use of anticoagulants, such as warfarin. It is a well-known cause for bilateral adrenal haemorrhage. [3]

Follow-up CT two months later revealed slight decrease of the adrenal lesions and less attenuating values, confirming the diagnostic of adrenal haemorrhage in resolution.

Differential Diagnosis List: Bilateral adrenal haemorrhage due to diffuse venous thrombosis., Adrenal haemorrhage due to diffuse venous thrombosis, Underlying adrenal tumour, Haemorrhage caused by surgery-induced stress

Final Diagnosis: Bilateral adrenal haemorrhage due to diffuse venous thrombosis.

References:

- Pamela T. Johnson, MD, , Karen M. Horton, MD, and , Elliot K. Fishman, MD (2009) Adrenal Mass Imaging with Multidetector CT: Pathologic Conditions, Pearls, and Pitfalls. RadioGraphics Volume 29, Issue 5 (PMID: [19755599](#))
- Johnson PT, Horton KM, Fishman EK. (2009) Adrenal imaging with MDCT: Nonneoplastic disease. Am J Roentgenol 193(4):1128-35 (PMID: [19770338](#))
- Kawashima A, Sandler CM, Ernst RD, Takahashi N, Roubidoux MA, Goldman SM, Fishman EK, Dunnick NR. (1999) Imaging of nontraumatic hemorrhage of the adrenal gland. RadioGraphics 19(4):949-63. (PMID: [10464802](#))

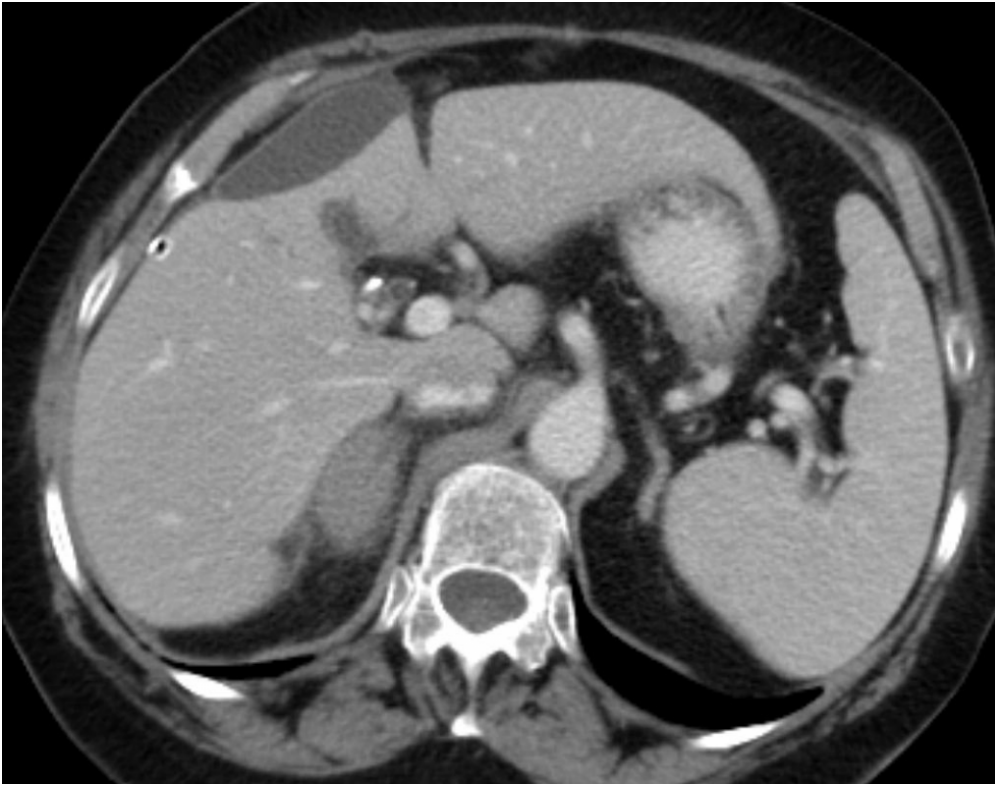
Figure 1

a



Description: Unenhanced CT of the abdomen - 14 days after surgery - Hyperattenuating 4cm mass at the right adrenal site and a subcapsular hepatic fluid collection. No abnormal findings were visible on the left adrenal gland. **Origin:** Medical Imaging Department, University Hospital of Coimbra, Faculty of Medicine of Coimbra

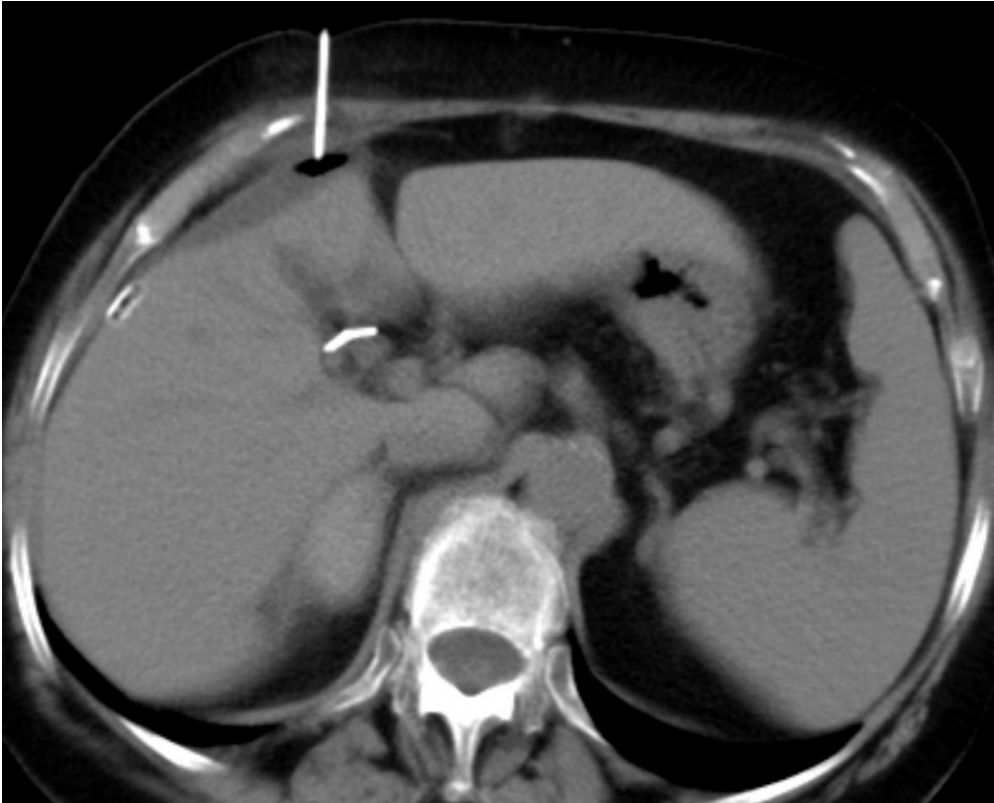
b



Description: Contrast-enhanced CT - portal phase - 14 days after surgery - Both the subcapsular hepatic collection and the right adrenal mass showed no contrast enhancement. **Origin:** Medical Imaging Department, University Hospital of Coimbra, Faculty of Medicine of Coimbra

Figure 2

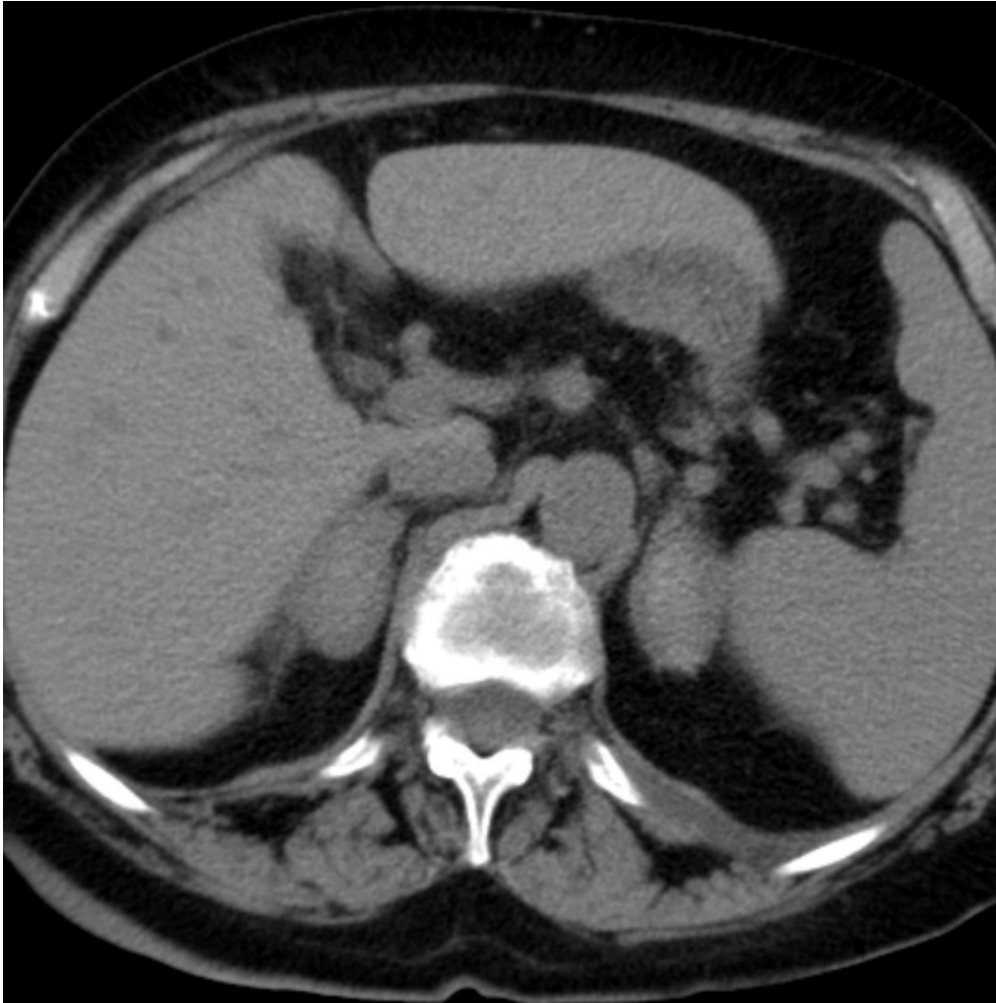
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Description: Drainage of hepatic biloma - There was no sign of infection on the cytologic and analytic studies of the drained fluid. **Origin:** Medical Imaging Department, University Hospital of Coimbra, Faculty of Medicine of Coimbra

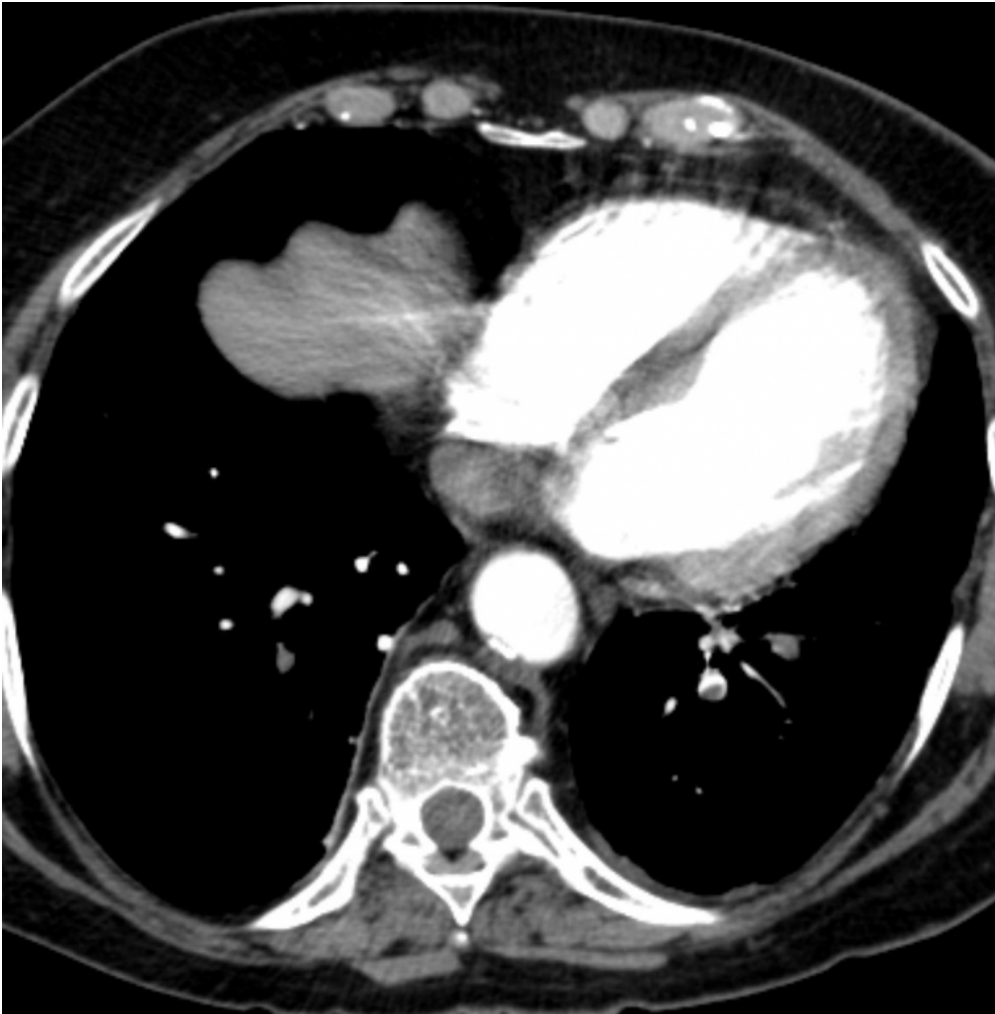
Figure 3

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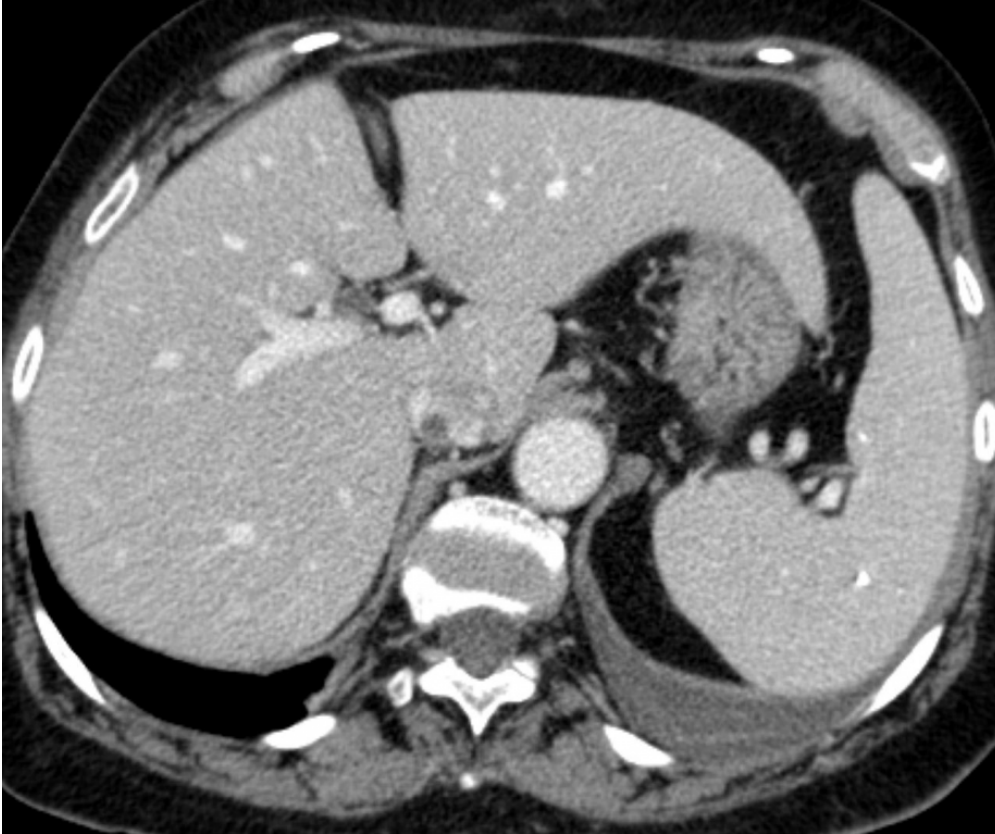
Description: Unenhanced CT fifteen days after the first CT - hyperattenuating mass on the left adrenal, compatible with haemorrhage. The right adrenal is now slightly less hyperdense than before. The previous biloma resolved completely. **Origin:** Medical Imaging Department, University Hospital of Coimbra, Faculty of Medicine of Coimbra

b



Description: CECT fifteen days after the first CT - small thrombus is seen as a filling defect in a branch of the left pulmonary artery - pulmonary embolism. **Origin:** Medical Imaging Department, University Hospital of Coimbra, Faculty of Medicine of Coimbra

c



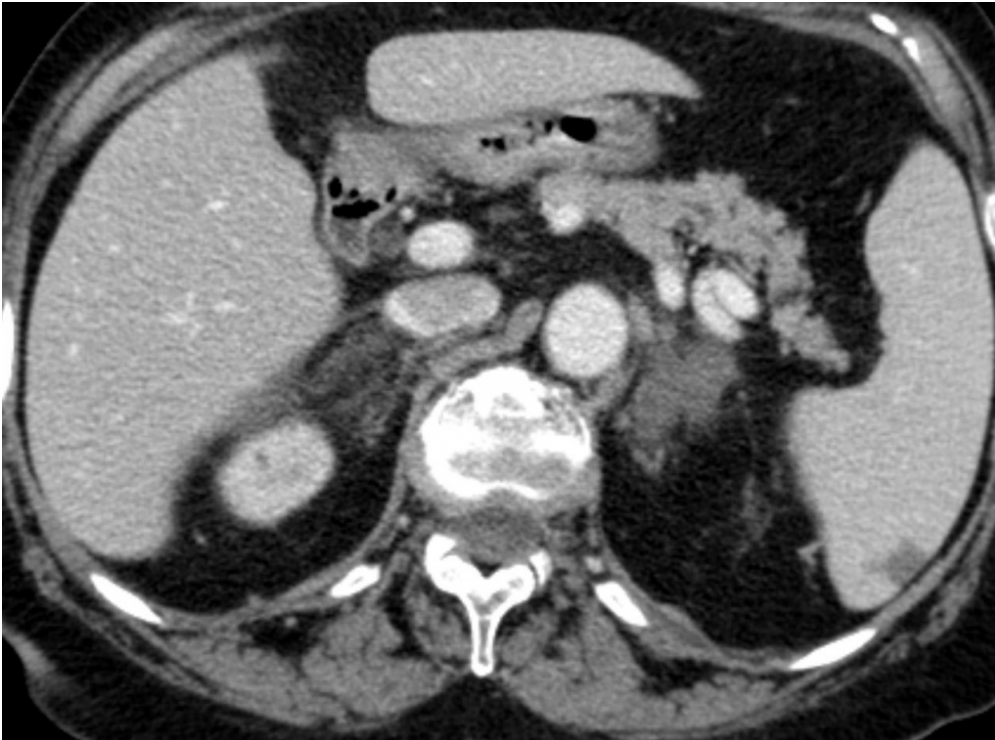
Description: CECT fifteen days after the first CT - partial filling defect in the inferior vena cava. **Origin:** Medical Imaging Department, University Hospital of Coimbra, Faculty of Medicine of Coimbra

d



Description: CECT fifteen days after the first CT - The two adrenals didn't enhance following contrast administration, keeping the same density (around 60-70HU). **Origin:** Medical Imaging Department, University Hospital of Coimbra, Faculty of Medicine of Coimbra

e



Description: CECT fifteen days after the first CT - non-enhancing wedge-shaped hypodense image in the spleen, related to a small splenic infarct. **Origin:** Medical Imaging Department, University Hospital of Coimbra, Faculty of Medicine of Coimbra

f



Description: CECT fifteen days after the first CT - a hypodense image is seen in the lumen of the left renal vein. **Origin:** Medical Imaging Department, University Hospital of Coimbra, Faculty of Medicine of Coimbra