SUNTEXT REVIEWS

SunText Review of Case Reports & Images
ISSN: 2766-4589

Open Access
Case Report
Volume 7:4

Giant Adrenal Endothelial Cyst Mimicking a Hepatic Hydatid Cyst: A Case Report and Review of Diagnostic Pitfalls

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Received date: 13 August 2026; **Accepted date:** 22 August 2026; **Published date:** 29 August 2026

Citation: Fellahi W, El Azzaoui I, Bouzroud M, El Kaoui H, Moujahid M, Bouchentouf SM (2026) Giant Adrenal Endothelial Cyst Mimicking a Hepatic Hydatid Cyst: A Case Report and Review of Diagnostic Pitfalls. SunText Rev Case Rep Image 7(4): 188.

DOI: https://doi.org/10.51737/2766-4589.2026.188

Abstract

Background: Adrenal cysts are rare lesions that may pose significant diagnostic challenges, particularly when they are large and located in close proximity to adjacent organs such as the liver and kidney. Endothelial cysts represent one of the most common histological subtypes of true benign adrenal cysts.

Case presentation: We report the case of a 33-year-old female patient presenting with a large right-sided cystic mass measuring 15x10 cm, initially interpreted as a hepatic hydatid cyst as an adrenal origin was not suspected preoperatively. A right adrenalectomy was performed through an open approach, histopathological and immunohistochemical examination demonstrated a benign adrenal endothelial cyst with positive CD34 staining.

Conclusion: Giant adrenal endothelial cysts may mimic hepatic hydatid cysts, particularly in endemic regions, due to the close anatomical relationship between the right adrenal gland, liver, and kidney. This case highlights the limitations of preoperative imaging in determining the exact organ of origin of large retroperitoneal cystic masses and emphasizes the crucial role of histopathological examination in establishing the definitive diagnosis.

Keywords: Retroperitoneal cystic mass; Adrenal cyst; Endothelial cyst; Hydatid cyst; Adrenalectomy; Diagnostic pitfall

Introduction

Adrenal cysts are rare lesions, accounting for 1 to 2% of adrenal incidentalomas detected by imaging. Their detection rate has increased in recent years due to the growing use of imaging techniques, particularly ultrasound and CT scans [1,2]. Histologically, these cystic tumors are classified into four main groups: pseudocysts, endothelial cysts, epithelial cysts, and parasitic cysts. Endothelial cystic tumors are among the most common forms of true benign adrenal cysts and are most often of vascular or lymphatic origin [3]. Most of these lesions are asymptomatic and discovered incidentally. Large lesions may become symptomatic due to mass effect and present significant diagnostic challenges, particularly when the anatomical origin is difficult to determine. For example, large right retroperitoneal cystic masses may mimic liver or kidney lesions or even hydatid cysts, particularly in areas where Echinococcus granulosus is endemic, such as Morocco [4]. Differential diagnosis with an echinococcal cyst is particularly challenging on imaging, given the anatomical proximity of the right adrenal gland to the liver, as well as the sometimes-nonspecific nature of cystic lesions of the adrenal gland. Several cases of adrenal cystic tumors initially considered to be hydatid cysts have been described in the literature, highlighting the limitations of preoperative radiological diagnosis and the crucial role of histopathological examination in establishing a definitive diagnosis [5]. We present the case of a large right adrenal endothelial cyst, discovered intraoperatively and initially misdiagnosed as a hepatic hydatid cyst, with the aim of highlighting the diagnostic pitfalls associated with retroperitoneal cystic masses as well as the difficulties involved in determining their anatomical origin.

Case Presentation

We report the case of a 33-year-old female. No significant past medical history: no contact with dogs, no known personal or family history of liver disease or liver trauma, no history of hypertension, no known endocrine disorders, no history of corticosteroid use and no alcohol abuse. Her medical history dates back 7 years to the incidental discovery of an asymptomatic hepatic cyst during a routine medical checkup. The patient was under clinical and radiological surveillance but was lost to follow-up until the onset, one year ago, of intermittent pain in the right upper quadrant, of moderate intensity, without radiation. Symptoms evolved in a context of preserved general condition and absence of fever. Furthermore, there is no history of gastrointestinal disturbances or vomiting, no clinical cholestasis, and no hydatid vomiting. There are also no signs of hyperandrogenism, no recently diagnosed hypertension or diabetes, no recent weight gain, and no headaches or palpitations.

On physical examination

Patient is hemodynamically stable: BP=130/80, HR=73, SpO2=100%, temperature 36.5°C, No facial or trunk obesity.
Skin findings: no jaundice, no hyperpigmentation, no hirsutism, and no stretch marks.
Abdominal findings: no abnormalities on inspection (no signs of PHT), no palpable abdominal mass, tenderness on palpation of the right hypochondrium, hepatomegaly with a liver margin at 17 cm, no splenomegaly.
Bilateral negative lumbar tenderness is also noted. The remainder of the physical examination was unremarkable. The contrast-enhanced abdominal CT scan reveals a cystic mass located between the liver and the kidney, with a thin wall and fluid-filled contents, measuring 115 x 117 x 158 mm (Figure 1); there is no calcification or septation within it. This mass causes scalloping of the right hepatic lobe and displaces the right kidney downward (Figure 2). The right kidney measures 101 x 56 mm, is slightly ptotic, and secretes within physiological limits, with a normal cortical index, no calculi, and no dilation of the upper urinary tract. The left kidney shows no abnormalities. Liver of normal size, with regular contours and homogeneous density, without focal abnormalities or suspicious pathological contrast uptake; no dilation of the intrahepatic bile ducts (IHBDs) or the portal vein (PV). Good patency of the inferior vena cava (IVC), the suprahepatic veins, and the portal branches.
Note that the adrenal glands are of normal size and density.
No ADP or abdominal-pelvic effusion.
Preoperative laboratory findings were within normal ranges.
Echinococcal serology: <1/80 (i.e., a non-significant reaction, likely indicating the absence of hydatid disease).
Hormone panel not performed because an adrenal origin was not suspected preoperatively. At the preoperative evaluation, the patient was hemodynamically stable, with no respiratory or cardiac symptoms, and her ECG and chest X-ray were unremarkable.

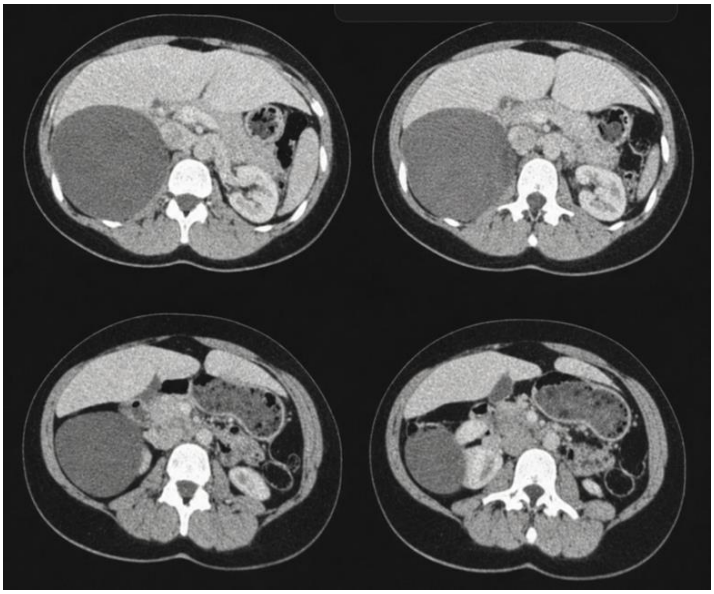

Figure 1: *Axial CT scan of the TAP c+, showing a cystic mass located between the liver and the kidney, with thin walls and fluid-filled contents, measuring 115 x 117 x 158 mm with no calcifications or internal septa. (Department of Visceral Surgery '1', HMIMV, Rabat, MOROCCO)*

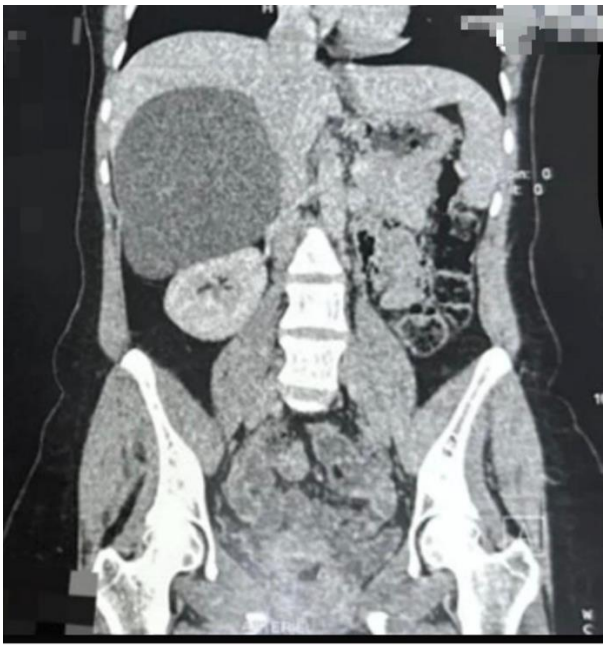

Figure 2: *Frontal CT scan from the TAP c+ CT, showing a cystic mass exerting a mass effect on the liver without invasion or irregular enhancement, with displacement of the slightly ptotic right kidney downward; the adrenal glands are of normal size and density. (Department of Visceral Surgery '1', HMIMV, Rabat, MOROCCO)*

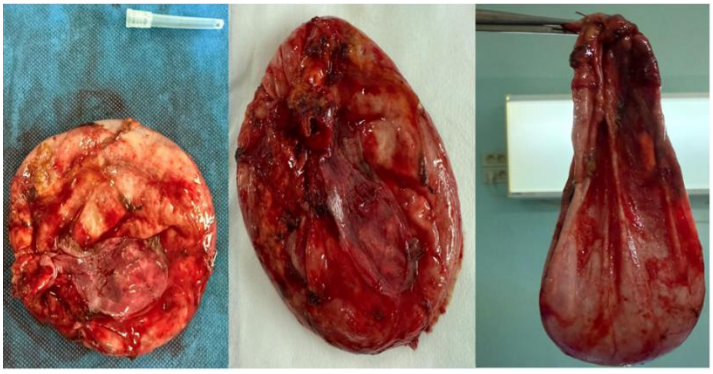

Figure 3: *Surgical specimen of the adrenal cystic tumor measuring approximately 12 cm, containing fluid.*

(Department of Visceral Surgery '1', HMIMV, Rabat, MOROCCO)

During surgery, the patient underwent right adrenalectomy through a right subcostal approach. Surgical exploration revealed a large mass involving the right adrenal gland measuring 10x15 cm. After careful adhesiolysis, the right adrenal mass was opened and its contents aspirated (chyleous fluid was present). The right adrenal vein was then ligated and transected, and the right adrenal arterial branches were ligated and transected. Right adrenalectomy was subsequently completed while preserving the renal polar arterial branches. The specimen was sent to the pathology department for histological examination (Figure 3). The postoperative course was uneventful, with no diarrhea, vomiting, or lower back pain in the immediate postoperative period, and bowel movements resumed on day 3.

Postoperative hormonal assessment revealed no evidence of subclinical hormone secretion, with 24-hour urinary fractionated metanephrines, morning serum cortisol level, serum electrolytes (particularly potassium levels) and DHEA-S levels all within normal ranges. The patient was discharged on day 3 following a favorable clinical and laboratory course. Histological examination of the surgical specimen revealed a morphological appearance and immunohistochemical profile consistent with an adrenal endothelial cyst, with no histological signs of malignancy. This is a cystic mass with a slightly thickened wall on sectioning, measuring 11.5 x 8.5 x 4 cm. There were no exophytic or endophytic growths, and a few yellowish deposits were present. Under the microscope, the cystic wall was lined by an endothelial layer composed of regular, flattened cells. The cyst wall was supported by fibrous stroma containing congested vessels and scattered lymphocytes. Immunohistochemical staining with anti-CD34 antibody is positive, marking the endothelial layer. It is noteworthy that no signs of clinical or radiological recurrence have been observed after 9 months of follow-up.

Discussion

Adrenal cysts are rare lesions, with an estimated incidence of approximately 0.06% in the general population. Most often asymptomatic, they are generally discovered incidentally during imaging studies or autopsies, in the absence of specific symptoms. Their histological presentation is heterogeneous, ranging from simple benign cysts to malignant cystic lesions. Endothelial cysts are among the most frequently encountered subtypes in autopsy series. Despite advances in modern imaging techniques, distinguishing between benign and malignant adrenal lesions remains difficult in some cases, making preoperative diagnosis and therapeutic strategy particularly complex [6]. The preoperative diagnosis of these adrenal cystic masses remains particularly difficult, especially in large cases [1]. Giant cysts can alter their usual anatomical relationships and exert significant compressive effects on neighboring organs, thereby complicating the precise determination of their anatomical origin [7]. In our case, the large right cystic mass displaced the kidney downward and caused a scalloping effect on the liver, initially leading us to suspect a hepatic cyst, or even a hydatid cyst given the Moroccan context of echinococcal endemicity. In radiology, distinguishing between an adrenal cyst and a hepatic cyst can be particularly challenging in the right hepatorenal space. The anatomical proximity of the right adrenal gland, the liver, and the upper pole of the kidney is a common cause of mislocalization, especially when the mass is large [5,7]. Failure to clearly identify the native adrenal gland on preoperative imaging should raise suspicion for an adrenal origin in any large right retroperitoneal cystic lesion, even when hepatic hydatid disease is initially suspected.

Several cases reported in the literature describe adrenal cysts initially diagnosed as hepatic hydatid cysts, cystic renal lesions, or retroperitoneal masses of undetermined origin. Cross-sectional imaging modalities such as CT and MRI allow characterization of more than 80% of incidental adrenal lesions, thereby reducing the need for further diagnostic investigations [8]. Abdominal CT is the reference imaging modality for the evaluation of adrenal cystic masses. Benign lesions typically appear as homogeneous, thin-walled collections without parietal enhancement or intracystic vegetations. However, these radiological features are nonspecific and may be observed in other abdominal cystic conditions. In some cases, MRI can provide a more detailed characterization of tissue and better define the anatomical origin of large retroperitoneal masses through a more precise analysis of anatomical relationships [1]. Nevertheless, even the most advanced imaging modalities may prove limited when lesions reach very large sizes. Other diagnostic tests include meta-iodobenzylguanidine (MIBG) scintigraphy and 2-fluoro-2-deoxy-D-glucose (FDG) positron emission tomography (PET). These tests provide functional and metabolic information; however, their use remains limited in the evaluation of typical benign adrenal cysts and does not always allow for the determination of the

anatomical origin of large retroperitoneal cystic masses [7]. In our case, the absence of septa, calcifications, or a solid component on abdominal CT made the diagnosis of an advanced hydatid cyst less likely, despite the initial diagnostic direction.

MRI was not performed because CT findings initially strongly favored the diagnosis of a hepatic hydatid cyst and surgical management was already indicated given the lesion size and diagnostic uncertainty. MIBG scintigraphy and FDG-PET were not performed due to the absence of clinical or radiological findings suggestive of a functional or malignant lesion. Echinococcal serology serves as a supplementary diagnostic tool with significant limitations, particularly in cases of inactive or atypical cystic forms. A negative serological result does not definitively rule out echinococcosis, while certain non-parasitic cystic lesions can lead to false-positive results, especially in endemic areas [9]. This diagnostic uncertainty explains why several cases of adrenal cysts are identified only intraoperatively or confirmed retrospectively by histology, as in the case reported here. A definitive diagnosis relies on histopathology. Histologically, endothelial cysts have a wall lined with regular, flattened cells expressing endothelial markers such as CD31, CD34, podoplanin, FLI1, and factor VIII, thereby confirming their endothelial nature and vascular or lymphatic origin [6,10]. In our case, CD34 positivity, along with the absence of cellular atypia, confirmed the diagnosis of a benign adrenal endothelial cyst. The optimal management of adrenal cysts remains controversial due to their low incidence and the lack of standardized recommendations. Surgical treatment, whether open or minimally invasive, generally depends on the surgeon's preference and expertise, as well as the characteristics of the lesion. Surgery is usually indicated for functional cysts associated with abnormal endocrine activity, symptomatic cysts, cysts suspected of being malignant or potentially malignant, as well as asymptomatic and large lesions measuring more than 5 cm or in cases where follow-up is uncertain. Conversely, a conservative approach may be recommended for patients with simple, asymptomatic, and uncomplicated cysts measuring less than 5 cm [6,11].

In our case, the large size of the mass exceeding 10 cm and the diagnostic uncertainty warranted surgical exploration with right adrenalectomy. It is also important to note that endocrinological evaluation plays a key role in the assessment of cystic adrenal masses, with the aim of ruling out a functional lesion, namely a pheochromocytoma, hypercortisolism, or hyperaldosteronism. Indeed, certain cystic adrenal lesions may be associated with hormonal hypersecretion even in the absence of suggestive clinical signs [1,12]. However, in our patient, an adrenal origin of the mass was not suspected preoperatively given its apparent location within the liver and the clinical presentation suggestive of a hydatid cyst. Furthermore, the absence of clinical signs suggestive of a functional adrenal tumor made an underlying endocrine disorder unlikely, which explains the lack of preoperative hormonal testing. The main limitation of this report is the absence of preoperative MRI and endocrine evaluation, mainly related to the initial radiological suspicion of a hepatic hydatid cyst rather than an adrenal lesion. Nevertheless, this diagnostic pitfall itself reflects the complexity of determining the exact anatomical origin of large right retroperitoneal cystic masses. This case highlights the diagnostic challenges posed by large right retroperitoneal cystic tumors and underscores the importance of including adrenal cysts in the differential diagnosis of atypical hepatic cysts, particularly in areas where hydatid disease is endemic.

Ethical Approval

Not required for case reports.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Conflict of Interest

The authors declare no conflict of interest.

Funding

No funding was received for this study.

Author Contributions

All authors contributed to the conception of the study, data collection, manuscript drafting, and final approval of the submitted version.

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