Case Report

Uncovering the Uncommon : An Extremely Rare Adrenal Epithelial Cyst in a Young Female

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Abstract

Background : Adrenal cysts account for less than 0.06% of adrenal lesions and are classified into endothelial cysts, pseudocysts, parasitic cysts and epithelial cyst. The endothelial and pseudocyst variants of adrenal cysts are most common with epithelial subtype contributing to only 9% of all adrenal cysts. Epithelial cysts are defined by the presence of a lining composed of cuboidal to columnar epithelial cells. Although most adrenal cysts are asymptomatic and discovered incidentally, larger lesions may cause flank pain or lead to complications such as hemorrhage or rupture. Due to the overlapping imaging characteristics with other cystic lesions, a definitive diagnosis typically relies on histopathological confirmation.

Key words : Epithelial, Cyst, Adrenal, Female.

Adrenal cysts are uncommon retroperitoneal lesions, first documented by Greselius during an autopsy in 1670[1]. They are typically incidental findings, accounting for only 1%-2% of adrenal incidentalomas[2]. Most adrenal cysts are nonfunctional and asymptomatic; however, larger lesions can present with diverse clinical manifestations, ranging from a palpable mass and abdominal discomfort to gastrointestinal symptoms. Histopathologically, adrenal cysts are classified into four subtypes based on their origin: endothelial cysts, pseudocysts, epithelial cysts, and parasitic cysts[3].

Epithelial cysts, also known as true cysts, are extremely rare and constitute only 9% of all adrenal cysts[4]. Due to the overlapping imaging characteristics among different cystic adrenal lesions, definitive diagnosis relies on histopathological confirmation. Here, we report an exceedingly rare case of an epithelial cyst in the right adrenal gland of a 28-year-old unmarried female, which was initially misdiagnosed radiologically as a pseudocyst.

Case Presentation

A 28-year-old unmarried female presented to the surgical Outpatient Department with complaints of persistent pain in the left side of her abdomen. She also reported a six-month history of decreased appetite. The pain remained unresolved despite medication.On physical examination, her abdomen was soft and non-tender with no signs of distention. She had no dysuria, haematuria, fever, weight loss, or bowel irregularities. Her medical and surgical history was unremarkable. She had normal puberty, a regular menstrual cycle and no signs of hirsutism. Routine blood investigations and renal and hepatic function panels were within normal limits. Computed Tomography (CT) scan of the abdomen and pelvis revealed a large, well-defined, thin-walled, hypodense, non-enhancing cystic lesion measuring 6 cm, located in the left suprarenal region, initially suspected to be a pseudocyst (Fig 1a).

Editor's Comment :

- Adrenal epithelial cysts are rare entities that often mimic other cystic lesions on imaging, especially in young patients.
- Histopathological identification of an epithelial lining is essential for definitive diagnosis and surgical excision offers both diagnostic certainty and excellent clinical outcomes.

The patient subsequently underwent surgical excision, during which an adrenal cyst was identified and removed along with the left adrenal gland. The excised specimen was subjected to histopathological examination.

Gross examination of the specimen revealed an intact unilocular cystic tissue piece measuring 6 × 5.5 cm. The external surface appeared congested, and the cut surface displayed greyish-white areas with mucinous material in some regions (Fig 1b). Microscopic examination demonstrated a cyst lined by flattened to cuboidal to columnar epithelium, with a fibrocollagenous cyst wall devoid of inflammatory reactions or haemorrhage (Figs 1c & 1d). No evidence of endothelial lining, acellular laminated membrane, protoscolices, or malignancy was found in any of the sections examined. These histopathological findings ruled out a pseudocyst, parasitic, and endothelial cyst, confirming the final diagnosis of an epithelial cyst in the adrenal gland.

Discussion

Adrenal cysts are rare retroperitoneal lesions, comprising approximately 4% of all adrenal masses[5]. Their underrecognition is attributed to their nonspecific clinical and radiological presentations. Although typically benign, adrenal cysts possess malignant potential in 7% of cases[6]. Smaller adrenal cysts are frequently asymptomatic and nonfunctional, while larger cysts especially those exceeding 10 cm may cause complications such as infection, haemorrhage, or rupture[7].

In this case, the patient's adrenal cyst measured only 6 cm, yet she experienced recurrent left flank pain for one year, which is uncommon for cysts of this size to be symptomatic.

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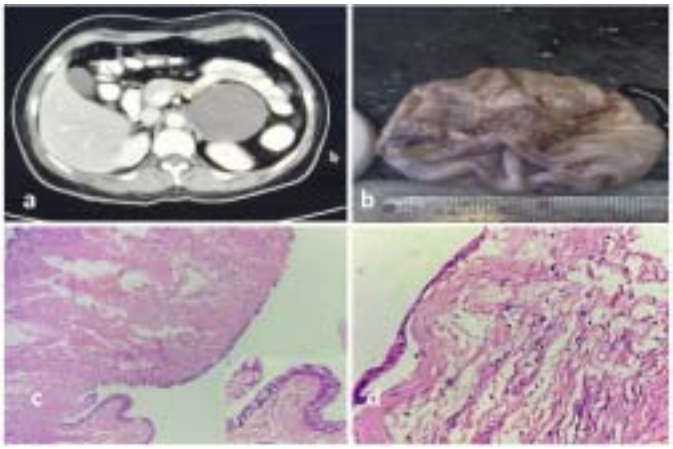

Fig 1 — (a) CT Abdomen and Pelvis: Well-defined thin walled hypodense, non-enhancing cystic lesion, (b) Gross: Unilocular cyst wall, (c) & (d) Microscopy: Cyst lined by flattened to cuboidal to columnar epithelium with fibrocollagenous wall (Hematoxylin and Eosin x400).

Adrenal cysts can develop at any age; however, they are most frequently diagnosed in individuals between their third and sixth decades of life, with a slight female predominance[8]. Reports of adrenal cysts in younger individuals are rare, making this early presentation in a 28-year-old particularly noteworthy and contributing to the initial misdiagnosis[9].

Histopathologically, adrenal cysts are categorized into four types : Endothelial cysts (45%) – Derived from lymphatic or vascular origins; usually small (0.1–1.5 cm in diameter). Pseudocysts (39%) – Lined by fibrous tissue and lacking epithelial or endothelial lining. Epithelial cysts (9%) – True cysts lined by cuboidal to flattened epithelium; includes congenital glandular (retention) cysts, cystic adenomas, and mesothelial cysts. Parasitic cysts (7%) – Rarely isolated to the adrenal gland, often associated with Echinococcus infection.

Ultrasound and CT imaging are effective in detecting adrenal cystic lesions but may not accurately differentiate among the subtypes (endothelial, pseudocyst, epithelial, and parasitic). In this case, the imaging suggested a benign cyst, yet it lacked specificity for definitive classification.

Given the rarity of adrenal cysts and the uncertainty of pre-operative diagnosis, no universal management protocol exists. However, surgical resection is recommended in the following scenarios:

- Symptomatic cysts, irrespective of size.
- Cysts larger than 5 cm.
- Cases with suspected malignancy.

Laparoscopic resection is the preferred approach for adrenal cyst excision, offering minimally invasive, effective removal while preserving adrenal function. In contrast, asymptomatic and benign cysts can often be managed conservatively with imaging follow-up.

Histopathological examination remains the gold standard for diagnosis, particularly when imaging findings are inconclusive.

Conclusion

This case underscores the diagnostic challenges associated with epithelial cysts of the adrenal gland. While imaging modalities effectively detect adrenal cysts, they often lack specificity for definitive classification. Histopathological confirmation, characterized by an epithelial lining, remains essential for an accurate diagnosis.

Surgical resection, particularly laparoscopic adrenal cyst excision, is a safe and effective treatment strategy that facilitates complete cyst removal while preserving adrenal gland function. Given the rarity of adrenal epithelial cysts, increased awareness and multidisciplinary evaluation are vital to managing such cases effectively, preventing complications and ensuring optimal patient outcomes.

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Data Availability Statement : All data generated or analyzed during this study are included in this article and its supplementary material files. Further enquiries can be directed to the corresponding author.

Consent : A written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images.

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