

## Left adrenal cyst with calcification: a case report

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### Abstract

*Adrenal cysts are a rare occurrence; nonetheless the incidence has been on the rise with increased use of imaging modalities such as computed tomography (CT) scan. Most cysts are asymptomatic except*

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*those with larger size, mainly detected incidentally; therefore the term "The Adrenal incidentaloma" is used to describe this condition. Biopsy is crucial as it is problematic to portray the nature of the cysts as benign or malignant without it. Here, we present a case of a 72-year old female patient who was admitted to our hospital (The Second Affiliated Hospital of Nanjing Medical University), after complaint of "left lower back pain for more than two months". CT examination revealed a left adrenal gland lesion about 3.4\*2.3 cm in size, with annular calcification at the margin. Adrenal function tests were within normal range and 24h-urinary metanephrines analysis showed no abnormality, thus, ruling out pheochromocytomas. A left adrenal cyst was suspected and left adrenalectomy and resection of the lesion were performed laparoscopically. The pathology showed a simple cyst with cystic wall calcification and ossification. The patient recovered well after the operation without any postoperative complications and received regular imaging follow-up after 6 months, and no mass has been found on either side until now.*

**Keywords:** adrenal cyst, simple cyst, pheochromocytoma, adenoma, laparoscopic adrenalectomy

### **Abbreviations**

CT: computed tomography

MRI: Magnetic resonance imaging

MIBG: 123-Imetaiodobenzylguanidine

FBG: 18-F fluorodeoxyglucose

### **Case report**

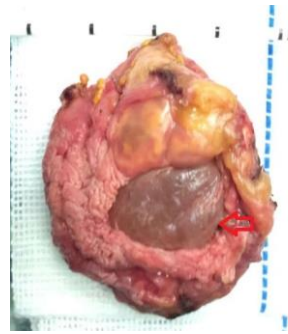
A 72-year old female patient was admitted to our hospital for "left lower back pain for more than two months". She has a history of hypertension, controlled by oral nifedipine. The patient had no other symptoms and also denied any history of tuberculous infection, diabetes or heart disease. The related indexes of adrenal gland: cortisol level, adrenocorticotrophic hormone (ACTH), plasma renin activity, aldosterone level and

angiotensin were all within normal range. There was no obvious abnormality in serum catecholamine and hepatic and renal function tests were unremarkable. Preoperative abdominal computed tomography (CT) demonstrated a left adrenal cystic lesion of about 3.4cm \* 2.3cm in size, with lamellar density shadow and annular calcification at the margin of the lesion (Figure 1). CT abdominal angiography showed circular soft tissue density shadow in the left adrenal area, annular calcification at the margin, about 3.5cm 2.2cm in size and clear demarcation between the mass and peripheral blood vessels.

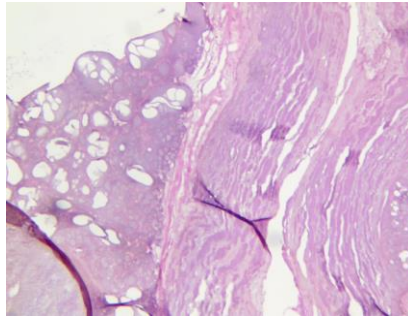
In our differential diagnosis, left adrenal lesion, old tuberculosis and adenoma with calcification were considered. Sputum culture and tuberculin test were negative and there were no obvious surgical contraindications. Laparoscopic left adrenalectomy was performed under general anesthesia on 2017-02-23. The size of the left adrenal gland was about 3.5\*3.2\*1.5cm, containing a smooth-surfaced, powder white-colored cyst of about 2.0cm in diameter, with a wall thickness of 0.5-1.2cm (Figure 2). Incision of the cyst wall revealed a 30ml light yellow and clear liquid. Postoperative pathology (Figure 3) showed: "Left adrenal occupying" simple cyst with cystic wall calcification and ossification. The patient recovered well and was discharged from the hospital without postoperative complications. Subsequent CT examinations revealed no mass in adrenal area on either side.



**Figure 1: Contrast CT, revealing adrenal cystic lesion with annular calcification at the margin (arrow )**



**Figure 2: Excised Adrenal gland specimen containing a smooth-surfaced cyst (arrow)**



**Figure 3 : Pathology analysis demonstrating simple cyst with wall calcification**

## **DISCUSSION**

Adrenal cysts, first described by Greaseless in 1670, are a rare occurrence with estimation from autopsies suggesting an incidence rate of about 0.016%<sup>1,2</sup>. However, with the increasing use and development of imaging modalities such as CT and MRI, the incidence rate of adrenal cyst has also been on the rise. Adrenal cysts mainly occur in people between the ages of 40-60, with a female predominance and a female to male ratio of 3:1.52.

Adrenal cysts are classified according to pathology. Hodges & Ellis classified adrenal cysts into two main types: true cysts and pseudocysts, based on the presence of endothelial or epithelial cellular lining which is absent in pseudocysts.

These are further divided into subtypes: true cysts comprise of endothelial (lymphatic or vascular) and epithelial cysts<sup>2</sup>, where endothelial cysts are the most common types of adrenal cysts<sup>3,4</sup>. On the other hand, pseudocysts are subdivided into hemorrhagic, neoplastic and parasitic (echinococcal) cysts<sup>2</sup>. Moreover, Terrier and Lscene classified adrenal cysts into five distinct groups, which include: 1) true glandular cysts, 2) cystic adenomas, 3) serous or lymphatic cysts, 4) parasitic cysts and 5) pseudocysts<sup>5</sup>.

Most adrenal cysts are incidental findings as they do not cause any symptoms; however cysts of a diameter greater than 10 cm have been associated with compressive symptoms such as pain, abdominal discomfort or abdominal fullness and palpable mass<sup>4,6,7</sup>. Lack of symptoms may present challenges in diagnosing adrenal cysts therefore imaging modalities such as abdominal ultrasound, CT or MRI play a critical role in preoperative diagnosis of adrenal cysts and accurate differentiation from other adrenal masses. CT is the favored imaging modality in the initial assessment of adrenal masses. On CT, adrenal cysts may be identified as water attenuation lesions, as they have liquid constituents.<sup>8</sup> However, hemorrhage may display increased density inside the cyst. True cysts demonstrate a higher density in contrast with pseudocysts that commonly are low density and at the same time pseudocysts have thicker walls<sup>9</sup>. When a conundrum presents in the differentiation, an MRI may be a necessity, since hemorrhagic cysts may display a higher T1 signal as compared to low T1 signals and higher T2 signals in the case of uncomplicated cyst. Accurate differentiation and diagnosis is of big importance, as about 7% of adrenal cysts are malignant and cysts greater than 5 cm in diameter present with a higher risk of malignancy<sup>1</sup>. Also pheochromocytomas should be considered in patients with adrenal cysts and hypertension.<sup>10</sup> 24h-urinary metanephrines analysis is the most reliable case-detection

method for pheochromocytoma, however in some cases urinary metanephrines and normetanephrine levels can be normal<sup>6,10</sup>. Moreover, morning plasma aldosterone and plasma renin activity ratio is important to rule out aldosterone producing tumors<sup>6</sup>. On imaging pheochromocytomas may present challenges, as they emulate malignant and benign lesions, whereby nuclear medicine might be indicated. <sup>123</sup>I-metaiodobenzylguanidine (MIBG) and <sup>18</sup>F-fluorodeoxyglucose (FBG) imaging have shown higher sensitivity and specificity in the diagnosis of pheochromocytoma<sup>8</sup>. Considering the history of hypertension in our patient, investigations of adrenal functionalities were crucial for the purpose of avoiding misdiagnosis and providing appropriate management; however, nuclear medicine was not necessary as all the results were within normal range.

Since early 1908, even though marsupialisation, incision and drainage were the most commonly used methods in the treatment of adrenal cysts, Doran pressed for total excision of the cyst<sup>11</sup>. Currently, laparoscopic adrenalectomy is the gold standard surgical management of adrenal cysts; be that as it may, alternative methods are also available depending on the case and the surgeon's expertise. Percutaneous aspiration of cyst is one of the alternative surgical management, if malignancy has been ruled out and if the cyst is inactive, nevertheless there is increased probability of fluid accumulation and recurrence if aspiration alone was the management of choice<sup>4,6</sup>. Despite the fact that open surgery could be a possible management option, it should be reserved in the case where preoperative diagnosis was not established, where it can serve as a therapeutic as well as diagnostic measure<sup>12</sup>. Open surgery should also be considered in complicated large cysts greater than 8 cm in diameter and when malignancy is suspected with or without infiltration of adjacent structures<sup>6,12</sup>. In the case where laparoscopic and

open surgery are contraindicated due to the state of the patient, percutaneous treatment with alcohol ablation can be an efficient option in the management of benign uncomplicated adrenal cysts<sup>4</sup>.

## CONCLUSION

Accurate preoperative diagnosis and differentiation of adrenal cysts may present challenges even with the aid of imaging modalities. Adrenal cysts should be considered in the differential diagnosis in patients complaining of abdominal discomfort or lower back pain. More importantly, when associated with hypertension, pheochromocytomas should also be regarded as possible diagnosis unless ruled out.

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