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Case Report

Cystic Lesion of the Adrenal Gland: A Case Report

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Abstract

Background: Cystic lesions in the adrenal glands are infrequent and unusual occurrences, with only a handful of cases documented thus far. These lesions come in various types, exhibiting diverse origins and sharing similar clinical presentations, ranging from benign to potentially malignant cystic growths. Typically, they do not cause symptoms, but in some rare instances, they may lead to abdominal discomfort or a sense of fullness. Due to their rarity, there is ongoing debate surrounding the most effective approach for managing adrenal cysts.

Case Presentation: This case report presents a case of a 36-year-old female who presented with a history of abdominal pain and was incidentally found to have a right adrenal cyst during a CT scan. She exhibited no additional symptoms, such as hypertension, headache, or palpitations. Laparoscopic right adrenalectomy was performed, successfully removing the cystic mass without complications. Preoperative laboratory tests, including endocrine function tests, were unremarkable. Imaging studies, including ultrasound and contrast-enhanced CT, characterized the cyst as a large, well-circumscribed, low-attenuated structure with peripheral calcifications, distinct from the right suprarenal gland. Gross examination revealed a collapsed cyst measuring 7 x 3 cm with a smooth inner wall, and the right adrenal gland measured 4 x 2.5 cm. The histological analysis identified the lesion as an adrenal pseudocyst with a fibrous wall containing focal dystrophic microcalcifications and embedded adrenocortical cells. No endothelial lining, eosinophils, or parasites were present. The patient's postoperative course was uneventful, and she was discharged in stable condition the following day.

Conclusion: This case demonstrates the effective management of a large adrenal pseudocyst through laparoscopic adrenalectomy, resulting in a successful outcome without complications. Comprehensive imaging and histopathological evaluation were crucial in confirming the diagnosis and guiding treatment.

Keywords: Adrenal disorders, Adrenal cyst, Endocrine cancer, Surgery

Introduction

Cystic adrenal lesions are relatively uncommon, with the first reported case dating all the way back to 1670¹. They frequently present with vague radiological and clinical features, which often leads to them being overlooked². Benign adrenal cysts are extremely uncommon findings that are unexpectedly detected during imaging examinations, with a prevalence of approximately 1% among adrenal lesions³. It's worth noting that the actual occurrence of these cysts may be higher, as indicated by several autopsy studies (0.064% to 0.18%) since many of them don't cause any noticeable symptoms³. In the past, adrenal gland cysts have been categorized into different types, such as parasitic cysts, endothelial cysts, epithelial cysts, and pseudocysts⁴. However, there have also been reports of small series of cystic neoplasms in the past⁵. These cystic lesions can have serious clinical consequences when they are linked to malignant neoplasms, but they can also resemble benign lesions⁵. Among surgical series, pseudocysts are the most commonly found cystic lesions, while autopsy series reveal that endothelial cysts make up the majority, reaching up to 45%⁶. The majority of adrenal cysts are undiagnosed and asymptomatic. On the other hand, very large adrenal cysts may

cause mass effect symptoms, which may require surgery to relieve. For asymptomatic cysts, conservative care is therefore usually the best course of action. Nonetheless, more work-up or follow-up is required if there is uncertainty about whether the cyst is benign. It is recommended that the management of an adrenal cyst be addressed during a meeting of the adrenal multidisciplinary team. Management algorithms for adrenal cysts can be quite varied and have sparked controversy due to the overall rarity of these lesions⁷. This case report presents a case of 30 years old female who presented to our clinic with a history of abdominal pain, the patient underwent surgery and completely recovered.

Case Report

A 36-year-old female patient presented to the clinic for a surgical evaluation following a history of abdominal pain. A CT scan of the abdomen, conducted as part of her evaluation, incidentally revealed a right adrenal cyst. The patient reported no accompanying symptoms such as hypertension, headache, or palpitations.

The patient underwent a laboratory workup which was found to be unremarkable, with neither routine laboratory tests nor

endocrine function tests indicating any abnormalities. Specific tests included a urine free cortisol level of 55 nmol/24h with a total urine volume of 2500 ml, and a urine 24-hour metanephrines level of 238 nmol/24h, both within normal ranges. An evening cortisol level was also normal at 282 nmol/L.

Later imaging studies were conducted which supported the diagnosis of an adrenal cyst. An ultrasound of the abdomen revealed a well-defined hypoechoic lesion with internal echoes, measuring 8.2 x 5.1 cm, located at the presumed site of the right suprarenal region. A CT scan with contrast further characterized the lesion as a large, well-circumscribed, low-attenuated cystic structure, with a density of 18-20 HU, measuring 9.8 x 5.7 x 4.7 cm. The cyst had imperceptible walls and peripheral multiple foci of discrete calcifications, with no abnormal enhancement observed post-contrast. Importantly, the right suprarenal gland was identifiable separately from the lesion.

A gross examination of the surgical specimen, consisting of the right adrenal gland with the cyst, revealed a collapsed cyst measuring 7 x 3 cm with a wall thickness of 2-3 mm. The adrenal gland itself measured 4 x 2.5 cm, and the entire specimen weighed 17 grams. The inner wall of the cyst was smooth, and representative sections were submitted for histological analysis in seven cassettes.

Microscopic examination of the cyst revealed a fibrous wall containing focal dystrophic microcalcifications, with adrenocortical cells embedded in the wall. No endothelial lining was apparent, eosinophils were absent, and there were no convincing signs of parasites within the lumen. These findings were consistent with an adrenal pseudocyst, showing no specific pathological features.

Given the findings, she underwent a laparoscopic right adrenalectomy, during which the cystic mass was completely removed without complications. This surgery was performed without complications. After that, the patient was discharged the following day in stable condition.

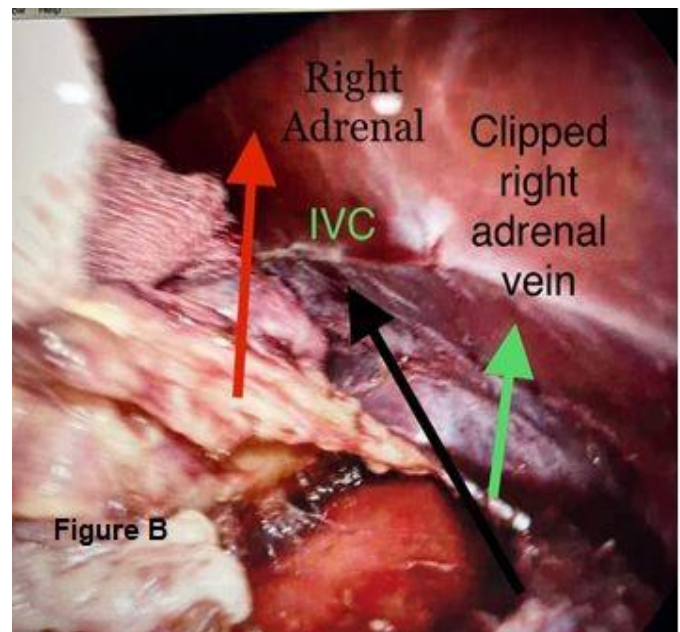
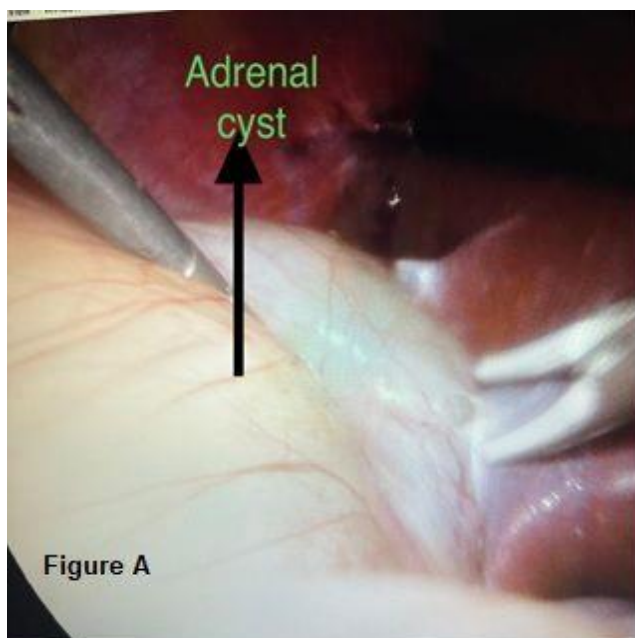


Figure A and B: Intraoperative view of the Adrenal cyst

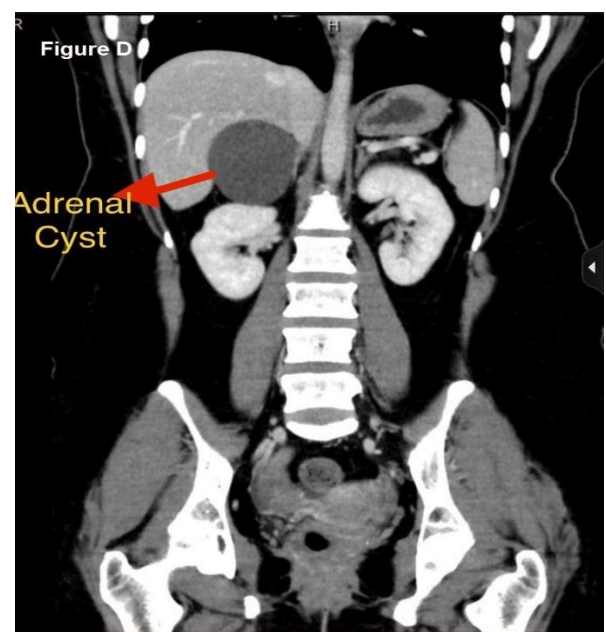
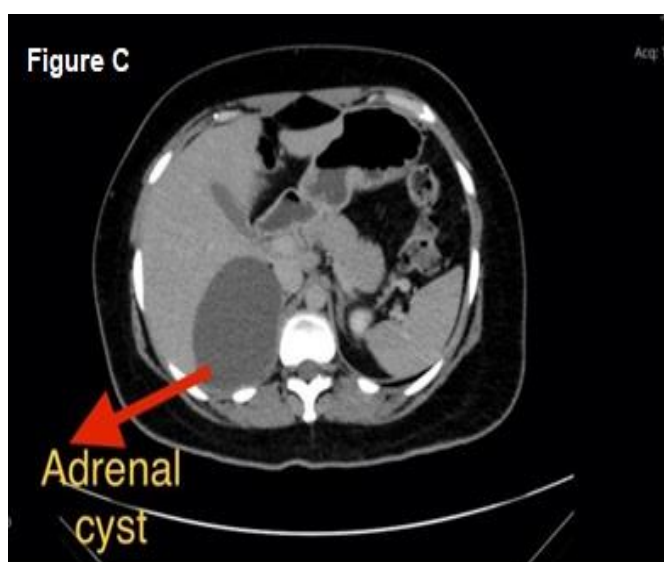


Figure C & D: CT scan showing left adrenal cystic lesion

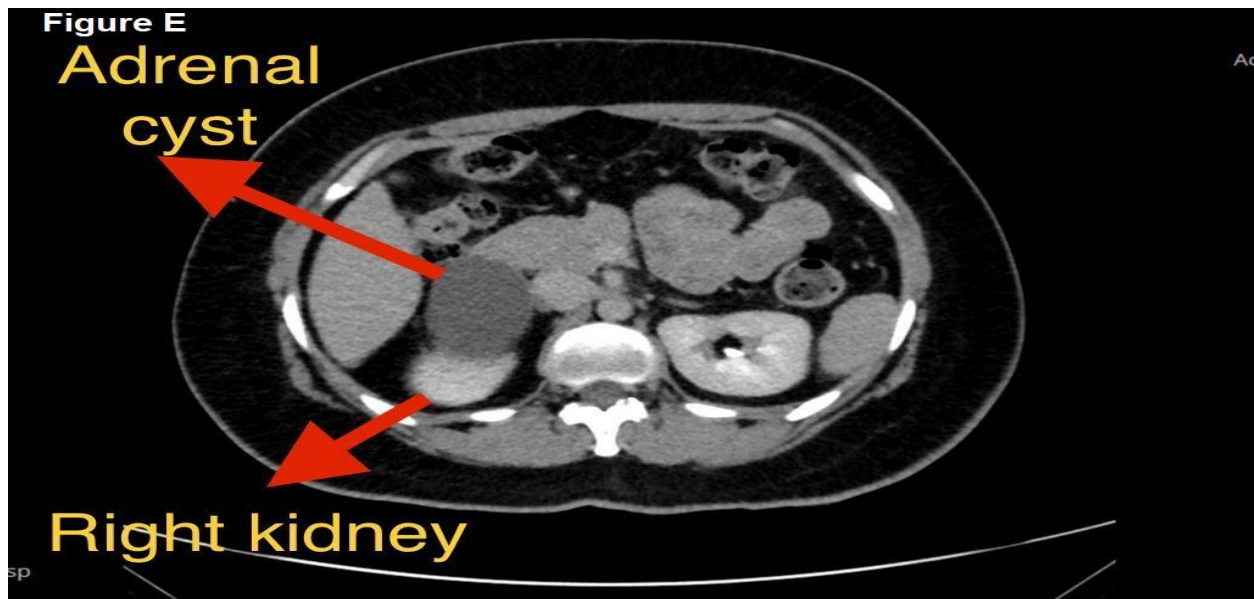


Figure E: CT scan showing left adrenal cystic lesion

The adrenal gland contains a cystic structure with a fibrous wall that includes areas of focal dystrophic microcalcification. There are focal areas where adrenocortical cells are embedded in the wall. No convincing endothelial lining is observed. Eosinophils are not present, and no parasites are detected within the lumen. These findings are consistent with an adrenal pseudocyst with no distinctive features.

Discussion

In postmortem studies, the incidence of adrenal lesions has been reported from 0.064 to 0.18%, indicating their continued rarity⁷. Because imaging techniques have become more advanced and widely used in recent decades, there appears to be an increase in this incidence^{7, 8}. These uncommon lesions often appear in the sixth or third decades of life, and are unilateral, benign, and nonfunctional⁸. The literature reports a male- to- female ratio of 1:3⁹. They are typically found unexpectedly and are asymptomatic. However, our patient had abdominal pain, and was 36 years old, when she presented with the adrenal cyst. Ruptures or hemorrhages may cause a big mass lesion and pain in about 39% of the cases⁵. Adrenal cysts may very rarely (9% of instances) be linked to hypertension, most likely as a result of renal medulla or adrenal artery compression¹⁰. No history of hypertension was noted in our case.

According to Terrier and Lecene in 1906, the original categories of adrenal cysts were parasitic, congenital retention, cystic adenomas, endothelial, and hemorrhagic¹¹. In the end, numerous other classes were developed. While in 1966, based on histological incidence and types, Foster divided adrenal cysts into four categories in 1966: endothelial cysts (45%), pseudocysts (39%), epithelial cysts (9%), and parasite cysts (7%). As of right now, this classification is still the most widely used¹². It's still unclear where the formation originated. Research discovered that Pseudocysts are believed to originate from endothelial cysts that experience recurrent fibrosis and hemorrhaging, whereas endothelial cysts are assumed to form from thrombosed and dilated arteries with organization¹³. Simple cysts are another name for endothelial cysts¹⁴. With an incidence of 45%, they are the most frequent adrenal cysts in autopsy series, yet they only make up 2% to 24% of lesions that are clinically symptomatic⁶. They fall into two categories: lymphangiomatous and angiomatous⁶. According to research,

they can also appear in young people since they are thought to have originated from pre-existing vascular hamartomas¹⁵, in a recent study conducted by Koperski et al, three general categories of cystic lymphangiomatous malformations were identified¹⁶: lymphangiomatous cysts, unicystic, and multicystic with papillary endothelial growth. Pseudocysts account for 39% of all adrenal cysts, making them the most common type across research². Hemorrhage within the adrenal gland, resulting from trauma, cancer, surgery, childbirth, and stress is the most prevalent cause of adrenal pseudocysts. Their long-standing association with cancer has been established; their estimated incidence is around 7%. Adrenocortical carcinoma is the most prevalent malignancy associated with adrenal pseudo cysts⁹.

Due to their uncommon occurrence, there is still debate regarding the best ways to treat adrenal cysts. Whether to do a minimally invasive or open surgical procedure depends on the surgeon's experience, preferences, and characteristics of the tumor². Surgery is typically recommended for patients with uncertain follow-up, symptomatic cysts of any size, asymptomatic cysts larger than 5 cm, potentially malignant cysts, and functional cysts⁶. Because our patient had pain and lesion was 7 cm, laparoscopic adrenalectomy was performed to remove it. Open or laparoscopic adrenalectomy is a better surgical technique for lesions larger than 8 cm because these lesions can have dense adhesions with surrounding structures¹⁷. Although the exact cause of this is unknown, it might be because of cystic fluid that seeps through the capsule and forms adhesions with nearby tissues¹⁷. It's also critical to remember that if laparoscopic surgery is planned, we should be ready for challenging dissection and have an open surgical backup plan in case it becomes necessary. The planes of dissection are more complicated if the patient has a history of pigtail insertions or aspirations.

If the cyst is less than 5 cm in size and is not symptomatic, conservative therapy is appropriate³. Even if these patients recover well and have an uncomplicated postoperative period, repeat CT scans should be performed every six months for a minimum of 18 months¹⁸. For patients who are not surgical candidates, aspiration of the cyst may be a viable option instead of surgery¹⁹. In addition to surgery, decortication and marsupialization have also been considered as alternatives for treating big cysts, particularly those that are attached to many

organs and may be challenging to remove¹⁹. Although absolute alcohol-based sclerosing therapy has also been reported, it is linked to a 30% to 50% high recurrence rate²⁰.

Conclusion

Adrenal cysts are an uncommon group of benign lesions that are typically asymptomatic. However, the diagnosis and management of these conditions can be problematic due to their diverse appearance and the difficulty in identifying the pathological subtype using conventional imaging techniques. Surgical intervention is advised for any lesion that is potentially malignant, functional, or larger than 5 cm, while other cases can be adequately managed through conservative therapy. Despite the difficulty of detecting cancer through imaging, the mortality and morbidity associated with these lesions have substantially decreased as a result of improvements in surgical techniques and minimally invasive procedures.

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