Received: 2 March 2024 | Revised: 23 April 2024 | Accepted: 27 April 2024

DOI: 10.1002/ccr3.8914

Clinical Case Reports Open Access WILEY

CASE IMAGE

Benign adrenal cyst: A rare type of adrenal incidentaloma

Koichiro Yamamoto | **Kohei Oguni** | **Fumio Otsuka**

Department of General Medicine, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama, Japan

Correspondence
Koichiro Yamamoto, Department of General Medicine, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, 2-5-1 Shikata-cho, Kita-ku, Okayama 700-8558, Japan.
Email: pi291nd8@s.okayama-u.ac.jp

Key Clinical Message

We present a patient with hypertension who developed a rare type of incidentaloma, a benign adrenal cyst. Benign adrenal cysts are typically large; however, most are nonfunctioning and asymptomatic, and they can be managed conservatively.

KEYWORDS

adrenal cyst, adrenal incidentaloma, adrenal tumor, hypertension

1 | CASE

A 67-year-old man was referred for hypertension with an adrenal incidentaloma found by abdominal ultrasonography in an annual health check. The patient had a medical history of perforated duodenal ulcer and dyslipidemia. He did not have obesity (body mass index: 21.6 kg/m^2). Results of physical assessment were unremarkable. As shown in Table 1, laboratory data showed that plasma renin activity (0.7 ng/mL/h), serum aldosterone concentration (25.6 pg/mL), plasma adrenocorticotropin level (21.5 pg/mL), and serum cortisol level (6.7 μg/dL) were normal. Fractionated catecholamines and metanephrines in plasma (adrenaline: 0.05 ng/mL; noradrenaline: 0.49 ng/mL; dopamine: ≤0.01 ng/mL; metanephrine: 46 pg/mL; and normetanephrine: 82 pg/mL) and 24 h urine collection (adrenaline: 10.5 μg/day; noradrenaline: 114.4 μg/day; dopamine: 386.8 μg/day; metanephrine: 0.10 mg/day; and normetanephrine: 0.19 mg/day) were not elevated. Renal and thyroid function tests were also normal (Table 1). Abdominal computed tomography revealed a right adrenal tumor (5 cm) with slight calcification (Figure 1A). Chemical shift magnetic resonance imaging of the right adrenal lesion showed hypointensity on a T1-weighted image and hyperintensity on a T2-weighted image, suggesting an adrenal cyst (Figure 1B). ^{123}I-metaiodobenzylguanidine scintigraphy did not show accumulation in the tumor (Figure 1C). A diagnosis of a nonfunctional benign adrenal cyst was made, and the patient was conservatively managed.

2 | DISCUSSION

Technical advances have increased the incidence of rare types of adrenal incidentaloma, and those with hypertension mandate thorough examination and follow-up. Benign adrenal cysts are rare and account for only about 1%–2% of adrenal incidentaloma cases.[1] Most of them are unilateral, nonfunctioning, and asymptomatic, though they can manifest a mass effect.[1] Differential diagnoses included phaeochromocytoma, adrenal malignant tumor, lymphoma, and metastasis.[1] Adrenal cysts are typically round or oval homogenous lesions with a well-defined border, commonly accompanying pseripheral calcification,[2] as in our case. On the other hand, phaeochromocytoma and adrenal malignant masses that form cystic lesions present heterogeneous appearances.[1] A benign

TABLE 1 Laboratory data.

	Units (normal range)		Units (normal range)
Hematological data		*Endocrine*	
White blood cells	6630 /μL (3300-8600)	PRA	0.7 ng/mL/h (0.3–2.9)
Red blood cells	4.87×10^6/μL (4.35–5.55)	Aldosterone	25.6 pg/mL (4.0–82.1)
Hemoglobin	13.9 g/dL (11.6–14.8)	Adrenocorticotropin	21.5 pg/mL (7.2–63.3)
Platelets	244,000/μL (158,000-348,000)	Cortisol	6.7 μg/dL (7.07–19.6)
Biochemical data		Adrenaline	0.05 μU/mL (0–0.1)
Blood urea nitrogen	14.6 mg/dL (8.0–20.0)	Noradrenaline	0.49 ng/dL (0.1–0.5)
Creatinine	0.88 mg/dL (0.65–1.07)	Dopamine	≤0.01 pg/mL (0.00–0.03)
Sodium	137 mmoL/L (138–145)	Metanephrine	46 pg/mL (0–130)
Potassium	4.0 mmoL/L (3.6–4.8)	Normetanephrine	82 pg/mL (0–506)
Chloride	106 mmoL/L (101–108)	TSH (IFCC)	1.35 mIU/L (0.33–4.05)
AST	17 U/L (13–30)	Free thyroxine	1.13 ng/dL (0.97–1.69)
ALT	14 U/L (10–42)	*24 h urine collection*	
ALP (IFCC)	92 U/L (38–113)	Adrenaline	10.5 μg/day (3.0–41.0)
γ-GTP	19 U/L (13–64)	Noradrenaline	114.4 μg/day (31.0–160.0)
Total bilirubin	0.74 mg/dL (0.40–1.50)	Dopamine	386.8 μg/day (280.0–1100.0)
LDH (IFCC)	168 U/L (124–222)	Metanephrine	0.1 mg/day (0.04–0.18)
C-reactive protein	0.02 mg/dL (<0.15)	Normetanephrine	0.19 mg/day (0.10–0.28)

Abbreviations: ALP, alkaline phosphatase; ALT, alanine aminotransferase; AST, aspartate aminotransferase; γ-GTP, γ-glutamyl transpeptidase; IFCC, International Federation of Clinical Chemistry method; LDH, lactate dehydrogenase; PRA, plasma renin activity; TSH, thyroid-stimulating hormone.

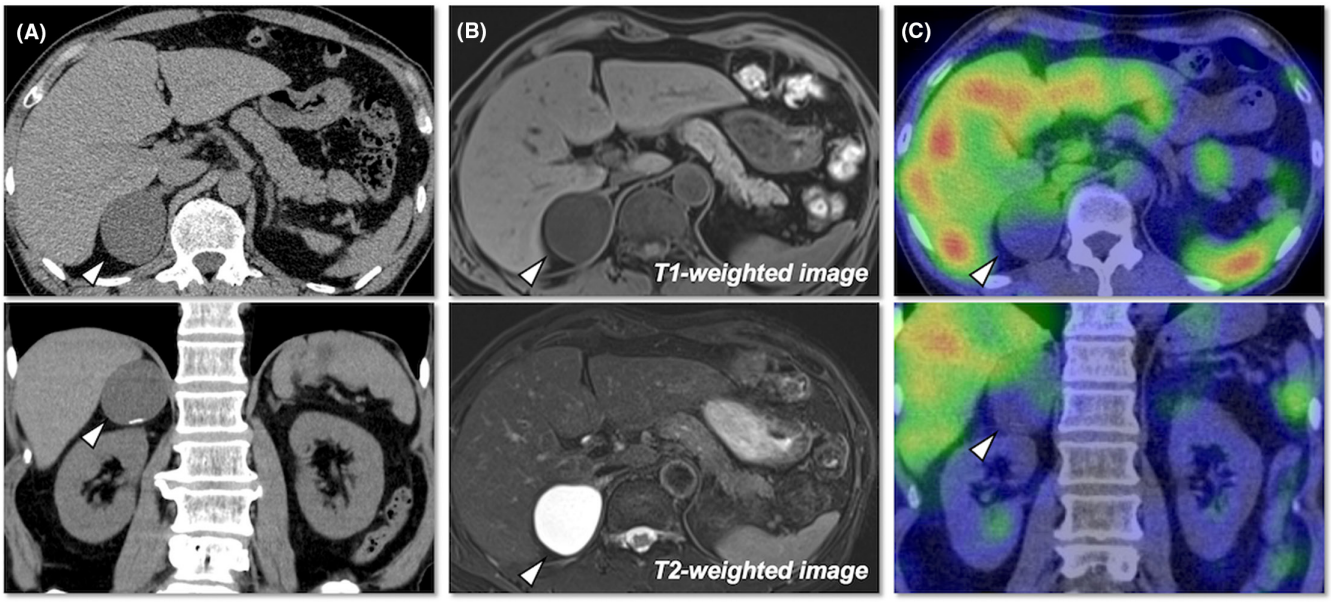

FIGURE 1 (A) Computed tomography revealed a right adrenal tumor with slight calcification (arrowheads). (B) Chemical shift magnetic resonance imaging in the adrenal lesion showed hypointensity on T1- and hyperintensity on T2-weighted sequences (arrowheads). (C) ^{123}I-metaiodobenzylguanidine scintigraphy did not show accumulation in the right adrenal tumor (arrowheads).

adrenal cyst shows no contrast enhancement except at the rim, which is sometimes enhanced, whereas solid components of phaeochromocytoma and adrenal malignant tumors typically show contrast enhancement.[1] Benign adrenal cysts are large (median size: 4.8 cm)[3]; however, they are known to be stable over time, and those without symptoms can be managed conservatively.[1,2] Adrenal cysts may cause hypertension due to renal artery compression.

Our patient has repeatedly shown elevated office-based blood pressures (>130 mmHg systolic and >80 mmHg diastolic); however, self-measured blood pressures at home have been normal, suggesting white coat hypertension. In the present case, the adrenal cyst had not grown over the past 20 months. Nevertheless, considering the possibility that enlargement of the adrenal cyst may compress the renal artery, leading to secondary hypertension, a careful follow-up on the size of the adrenal cyst would be needed.

AUTHOR CONTRIBUTIONS

Koichiro Yamamoto: Conceptualization; investigation; writing – original draft. **Kohei Oguni:** Investigation; supervision; writing – review and editing. **Fumio Otsuka:** Conceptualization; supervision; writing – review and editing.

ACKNOWLEDGMENTS

None.

FUNDING INFORMATION

None.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data sharing not applicable—no new data generated.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

ORCID

Koichiro Yamamoto https://orcid.org/0000-0001-9571-1646
Kohei Oguni https://orcid.org/0009-0006-9020-6118
Fumio Otsuka https://orcid.org/0000-0001-7014-9095

REFERENCES

1. Calissendorff J, Juhlin CC, Sundin A, Bancos I, Falhammar H. Adrenal cysts: an emerging condition. *Nat Rev Endocrinol*. 2023;19:398-406.
2. Dogra P, Sundin A, Juhlin CC, Calissendorff J, Falhammar H, Bancos I. Rare benign adrenal lesions. *Eur J Endocrinol*. 2023;188:407-420.
3. Dogra P, Rivera M, McKenzie TJ, et al. Clinical course and imaging characteristics of benign adrenal cysts: a single-center study of 92 patients. *Eur J Endocrinol*. 2022;187:429-437.

How to cite this article: Yamamoto K, Oguni K, Otsuka F. Benign adrenal cyst: A rare type of adrenal incidentaloma. *Clin Case Rep*. 2024;12:e8914. doi:10.1002/ccr3.8914