



Non-surgically treated case of nonfunctioning ruptured adrenal adenoma in a patient on hemodialysis

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Abstract

Objectives Herein, we report a case of rupture of nonfunctional adrenal adenoma treated by nonsurgical supportive management due to high risk for operation.

Method and case A patient with end stage renal disease (ESRD) who was on hemodialysis visited our emergency room and complained of a sudden abdominal pain after a fall. A retroperitoneal hemorrhage with hematoma formation around the adrenal adenoma, which was caused by rupture of the adrenal adenoma, was detected by abdominal computed tomography (CT).

Results Supportive management was performed, with serial CT follow-up instead of surgical adrenalectomy treatment because of high operative risk, due to hemodialysis. After 1 week, the patient's vital signs stabilized and the patient did not further complain about abdominal symptoms. However, supportive embolization was performed and the size of hematoma was more decreased.

Conclusion We report a case of a patient on hemodialysis who experienced a rupture of a nonfunctioning adrenal adenoma, which was caused by low-energy trauma. The patient's conditions improved with nonsurgical supportive management including embolization.

Learning point for clinicians

Physicians should consider both surgical and nonsurgical management for the rupture of adrenal adenomas, depending on the patient situation. Therefore, nonsurgical supportive management such as embolization can be one therapeutic option for treating nonfunctioning adrenal adenoma rupture caused by low-energy trauma in a patient who has risks for operation due to combined comorbidities.

Keywords Adrenal adenoma · Embolization · Hemodialysis · Rupture

Introduction

Nonfunctioning adrenal adenomas are common, with a prevalence of 1–10% according to diagnostic methods [1, 2], but adrenal adenoma rupture is rare. Several cases of adrenal tumor rupture of functioning adenomas, such as

pheochromocytoma and nonfunctioning adrenal carcinoma, have been reported [3–5]. However, the risk of adrenal adenoma rupture increases when a patient has a bleeding tendency or when an adrenal adenoma is prone to rupture, due to huge size or trauma. We report nonfunctioning adrenal adenoma rupture treated by nonsurgical supportive therapy, including embolization in a patient on hemodialysis.

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Case report

A 71-year-old man visited the emergency room of our hospital because of abdominal pain. His symptoms had started about 3 h earlier, after a fall at home. He had a past

history of end state renal disease (ESRD), with hemodialysis for 5 years, which was caused by hypertensive nephropathy. Furthermore, the patient experienced a cerebrovascular accident (CVA) and atrial fibrillation. Therefore, the patient had taken medications of amiodarone and aspirin. However, anticoagulant was not used before due to bleeding risk and he was also aware that he had a non-functioning right adrenal adenoma from 1 year ago, which was 4.2×4.3 cm in size and considered as benign according to 10 HU measurement with washout rate (Fig. 1a). On the day of admission, the vital signs of the patient were as follows. Blood pressure 100/60 mmHg, heart rate 100/min,

body temperature 36.7°C , and respiration rate 24/min. Laboratory findings showed the following: Hb 8.4 mg/dL, Na/K/Cl 140/5.4/98 mmol/L, BUN/Cr 69/4.95 mg/dL. The adrenal function blood test showed normal findings (Table 1), and his past medical record was compatible with nonfunctioning adrenal adenoma. An abdominal computed tomography (CT) scan revealed a 5.5×5.8 cm-sized adrenal mass with active bleeding and a retroperitoneal hemorrhage (Fig. 1b–e). The size of the adrenal adenoma had increased, compared with 1 year before. Hemorrhagic fluid collected around the right adrenal gland. The patient's blood pressure had not worsened after a 2-pack blood transfusion on one

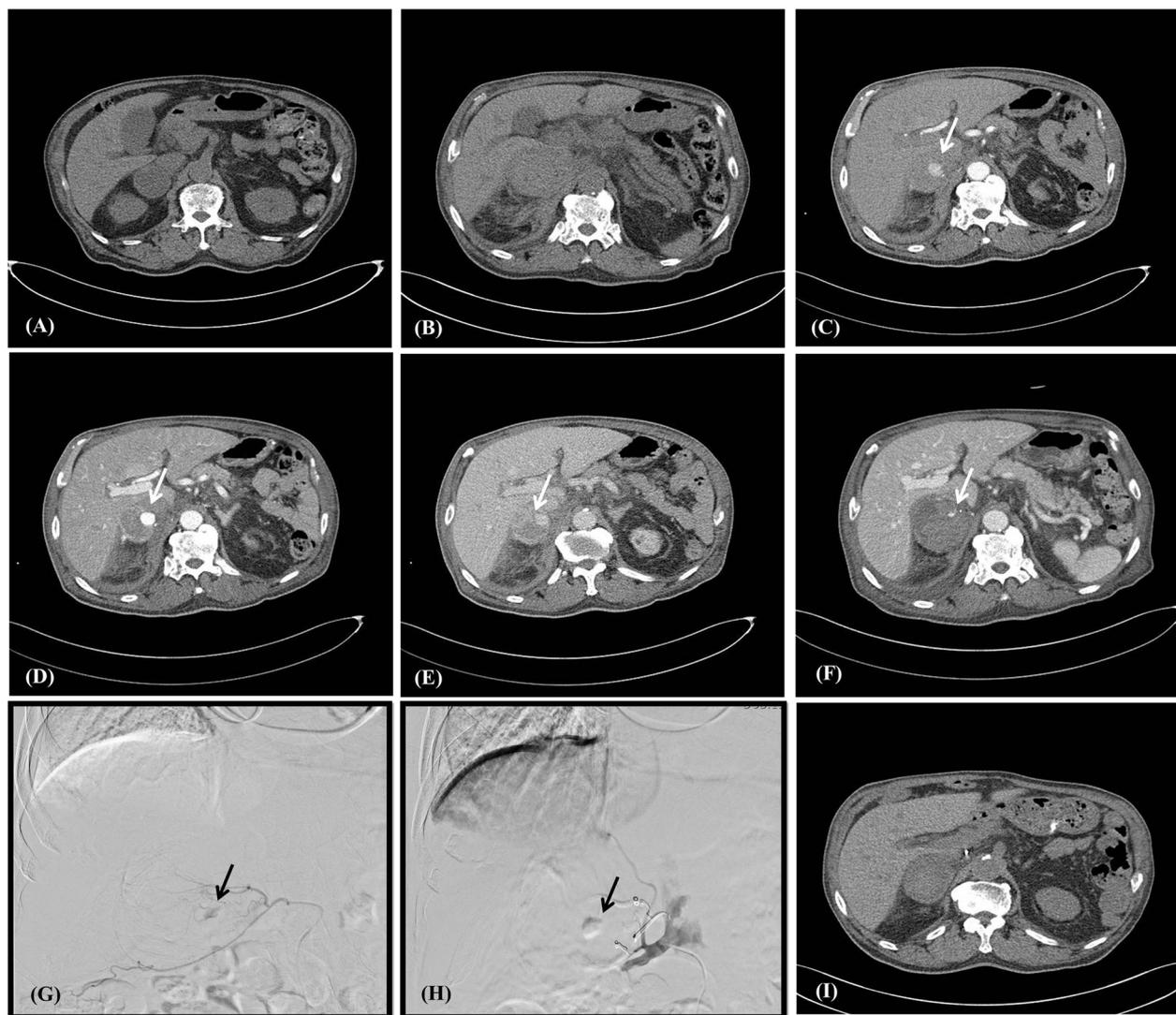


Fig. 1 One year ago, an abdominal CT showed a 4.2×4.3 cm-sized right adrenal adenoma, which was a homogeneous mass with 10 HU (a). On the day of admission, and abdominal CT revealed perihepatic, mesenteric, and retroperitoneal hemorrhages and an increase in the size of the adrenal mass, relative to the CT that was performed 1 year ago. The size of the adrenal adenoma increased from 4.2×4.3 cm to 5.5×5.8 cm which included, with aneurysmal formation with contrast

extravasation in the adrenal mass, as the arrow indicates (b, preenhanced, c, arterial, d, portal, e, delayed phase). After 2 week, the abdominal CT still revealed the presence of an aneurysm, which was likely a bleeding focus of the adrenal adenoma and the increased adenoma with hemorrhage was not more improved after 2 weeks (f). Therefore, embolization was performed (g, h) and follow-up CT after 1 week showed that adenoma size was decreased without hemorrhage (i)

Table 1 Results of vital sign, hemoglobin, and adrenal function tests

	1 year ago	Admission day	Day 2	1 week	Reference range
Blood pressure	140/90 mmHg	100/60	120/80	130/85	
Heart rate	78/min	100/min	88/min	80/min	
Hemoglobin	10.6 mg/dL	8.4 mg/dL	9.8 mg/dL	10.5 mg/dL	
ACTH (pg/mL)	36	54	Not checked	Not checked	
Basal morning cortisol (µg/dL)	12.1	15.6	Not checked	Not checked	3–23
Cortisol after 1 mg dexamethasone suppression	0.5	Not checked	Not checked	Not checked	
Plasma renin activity	1.72	1.8	Not checked	Not checked	0.15–2.33
Plasma aldosterone (ng/dL)	3	5	Not checked	Not checked	1–16
Plasma metanephrine (nmol/L)	0.18	0.2	Not checked	Not checked	0–0.5
Urinary VMA (mg/day)	2.2	Not checked	Not checked	Not checked	0–8
Urinary metanephrine (mg/day)	0.2	Not checked	Not checked	Not checked	0–0.8
Urinary 17-ketosteroid (mg/day)	6	Not checked	Not checked	Not checked	6–15

ACTH adrenocorticotropic hormone, *VMA* vanillylmandalic acid

day, and he received hemodialysis according to his dialysis schedule. Therefore, supportive therapy and close monitoring continued, and a follow-up CT was performed, instead of an emergent operation including laparoscopic adrenalectomy or embolization after discussion in our multidisciplinary team. On next day, his follow-up CT showed that the retroperitoneal hemorrhage did not increase and the patient's abdominal pain was not aggravated. After 1 week, his vital signs stabilized and Hb was maintained at 10.5 mg/dL, which was similar to the level observed before the event. In addition, the retroperitoneal hemorrhage from the ruptured adenoma did not increase on follow-up CT and the patient did not complain of any more abdominal pain. Therefore, he was discharged with a planned follow-up CT on his next visit, after 2 weeks. However, follow-up CT scan showed that the size of adenoma was more increased and aneurysmal formation was still observed (Fig. 1f), After confirming extravasation with right adrenal arteriography, two main feeders originated from right adrenal artery were devascularized by embolization (Fig. 1g, h). After that, adenoma size with hematoma was decreased in follow-up CT after 1 week (Fig. 1i).

Discussion

Spontaneous hemorrhages or ruptures of adrenal masses by low-energy traumas are rare. Several cases of spontaneous ruptures have been associated with functioning tumors, such as pheochromocytoma and carcinoma, including adrenal cortical carcinomas that should be treated by surgical management [4, 6]. In cases of nonfunctioning adrenal adenomas, spontaneous ruptures have also been reported; however, these conditions required surgical treatments such

as adrenalectomy, as functioning adenomas or carcinomas were treated by surgery.

Previously reported cases have suggested that spontaneous rupture of an adrenal adenoma that presents with acute abdominal pain should be treated by an emergent adrenalectomy, based on early suspicion. The patient that we treated was aware that he had a large adrenal adenoma on his right adrenal gland prior to the rupture.

The patient was diagnosed with a large-sized adrenal adenoma 1 year ago, but the adenoma was nonfunctioning and benign, at that time. Moreover, he had experienced ESRD, which was being treated with hemodialysis, CVA, and atrial fibrillation. Therefore, elective or emergent surgery should be decided upon prudently, when a patient is undergoing hemodialysis. We decided that that the retroperitoneal hemorrhage and ruptured adrenal adenoma should be followed-up, instead of removed. The patient's vital signs were stable, and his anemia and abdominal pain did not aggravate as time passed after transfusion and supportive management, which included Vitamin K and tranexamic acid to prevent additional blood loss. In addition to these findings and patient symptoms, the follow-up CT did not show increased hemorrhaging, compared with the day before. Therefore, we decided upon observation and nonsurgical management. Moreover, in the event of a spontaneous rupture, operation should be considered due to possibility of recurrence, but in this case, a low-energy trauma caused the rupture. Therefore, the chance of recurrence was considered to be low after this event was resolved.

Conclusively, this case emphasizes that large-sized nonfunctioning adrenal adenoma can be ruptured by low-energy trauma as well as spontaneous rupture according to the patient's medical condition. In this situation, rather than

performing an emergent adrenalectomy, nonsurgical conservative management including embolization can be chosen with close CT follow-up monitoring. This is the first patient on hemodialysis, with a nonfunctioning adrenal adenoma rupture due to low-energy trauma, who was successfully treated with nonsurgical supportive management with embolization. In the future, advantages and disadvantages among diverse therapeutic approaches for adrenal adenoma rupture need to be compared after accumulation of a lot of experiences.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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