Clinical Case Report

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Spontaneous adrenal hematoma in pregnancy

A case report

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Abstract

Rational: Spontaneous adrenal hematoma in pregnancy is a very rare condition. Herein we present an additional rare case of unilateral spontaneous adrenal hematoma in a pregnant woman, aiming to share this experience and summarize the signal characteristics of simple adrenal hematoma in magnetic resonance imaging (MRI).

Patient concerns: A 28-year old pregnant woman was referred to our hospital with a vague paroxysmal left-side back pain at 17 weeks of gestation.

Diagnosis: MR scan of the abdomen revealed an $8.1 \times 7.7 \times 6.8$ cm round mass in the left adrenal region, which showed a rim of acute hemorrhage signal. Due to the stable condition of the patient and fetus, she was admitted for observation. Repeat MR scan was performed a month later, and it showed a stable mass with marginal subacute bleeding signal.

Interventions: Laparoscope excision of the hematoma was performed.

Outcomes: Simple adrenal hematoma was confirmed by pathological examinations. And the patient was discharged 3 days later with normal renal and adrenal functions.

Lessons: The most important characteristic of adrenal hematoma is the high-signal rim on T1-weighted MR images, and the clinicians should make individualized treatment plan for every patient encountered in the future who might have different clinical conditions.

Abbreviation: MRI = magnetic resonance imaging.

Keywords: adrenal hematoma, laparoscopy, magnetic resonance imaging, pregnancy, spontaneous

1. Introduction

Spontaneous adrenal hematoma in pregnancy is a very rare condition. Until now, the main therapeutic methods are surgical resection and expectant management, which depend on the patient's condition and the situation of the hematoma.[1–3] While the accurate diagnosis and risk assessment of the hematoma may play an important role in this process. In this article, we present a rare case of unilateral spontaneous adrenal hematoma in a pregnant woman, aiming to share this experience and summarize the signal characteristics of simple adrenal hematoma in magnetic resonance imaging (MRI).

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2. Case report

A 28-year-old gravid woman was referred to our hospital with a complaint of vague paroxysmal left-side back pain at 17 weeks of gestation. The medical history was unremarkable, and there was no history of surgery, underlying illness, drugs using, or recent trauma. On physical examination, there was tenderness in the left epigastrium, blood pressure was 112/68 mm Hg and pulse rate of 80/min.

Then abdominal conventional MRI was scheduled and a well-defined round mass of $8.1 \times 7.7 \times 6.8$ cm was found in the left adrenal region with no recognizable left adrenal gland. The mass was heterogeneous with a hyperintense rim and slightly low signal center on the T1-weighted images (Fig. 1A), corresponding with hypointense rim and slightly high signal center on the T2-weighted images (Fig. 1B). Some mild edema was seen in the fat space around the mass, which may indicate a recent enlargement of the mass. Considering the stable condition of the patient and fetus, she was admitted for observation. Then, she was admitted to our hospital to receive further treatment 1 month later. Repeat MRI was performed a month later, and the mass showed a stable volume while the signal was changed. The T1-weighted signal intensity of the mass was the same as the previous images (Fig. 2A), while the hypointense rim on the T2-weighted images has changed to be hyperintense, and the edema around the mass was reduced (Fig. 2B). The imaging diagnosis included adrenal neoplasm with hemorrhage, cystic lesions with hemorrhage, and simple adrenal hematoma. The laboratory findings were as follows: hemoglobin 98 g/L (normal range, 115–150), erythrocyte count 3.26×10^{12}/L (normal range, 3.8–5.1×10^{12}/L), 24 h urine metanephrine 11.47 μg (normal), 24 h urine norepinephrine 47.07 μg (normal range: 16.3–41.5), 24 h

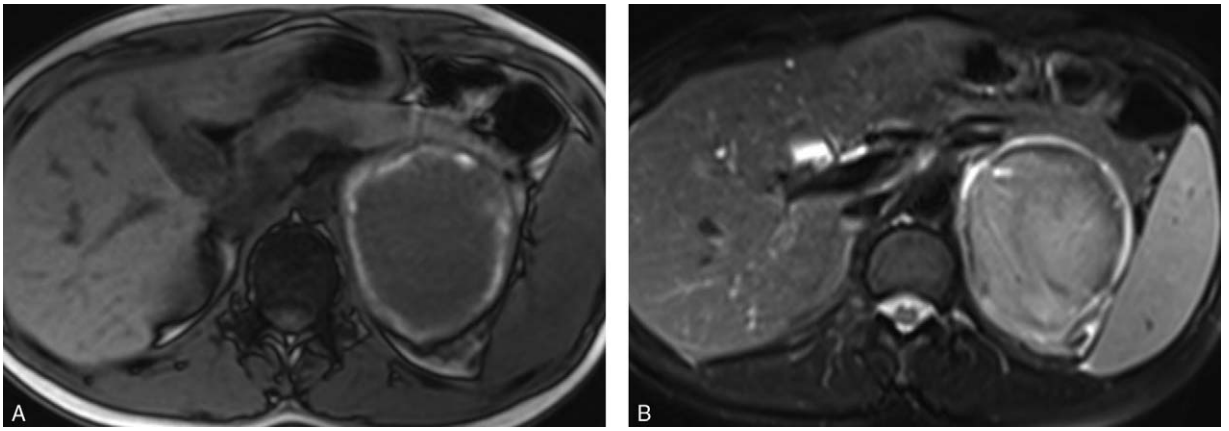

Figure 1. Unenhanced MR images at the 17 weeks of pregnancy. A, Axial T1-weighted image shows heterogeneous signal with a high-signal-intensity rim and slightly low-signal-intensity center. B, Axial fat-saturated T2-weighted image shows hypointense rim and slightly high signal center, and some mild edema in the fat space around the mass. MR = magnetic resonance.

urine dopamine 388.21 μg (normal range: 107.2–246.6), blood adrenaline 77 ng/L (normal), blood norepinephrine 448 ng/L (normal range: 174–357), blood plasma total cortisol 106.4 nmol/L (normal), and 24-hour urinary free cortisol 205.7 μg (normal range: 20.26–127.55).

Following multidisciplinary discussion, the patient was scheduled a left adrenal laparoscopic surgery. A well-circumscribed round cystic mass about 8 cm in diameter was found in the left adrenal region, adhering to the surrounding tissue without infiltrating adjacent organs (Fig. 3). The sample was dark red and brown discoloration with a lot of blood clot and hemorrhagic debris, the simple hematoma was diagnosed under histopathological examination. The patient was discharged 3 days later with normal renal and adrenal functions.

3. Discussion

Spontaneous adrenal hematoma is an uncommon condition in pregnancy, and its etiology is mostly thought to be adrenal vascular rupture and central venous thrombosis. The high-risk factors of increased arterial blood supply to adrenal gland with limited venous drainage, physiological adrenal cortex hyperplasia, and hypercoagulative status during pregnancy may cause hemorrhage when there are no related factors in inducing bleeding such as recent surgery, coagulopathy, trauma, or underlying adrenal mass.[1–3]

Adrenal simple hematoma has its own characteristics owing to pseudocapsule formation and repeated hemorrhage. Compared with the focal hemorrhage signal in tumor-related adrenal hemorrhage,[2,4,5] adrenal simple hematoma is filled with hemorrhage signal in different stages and lack of signal of tumor tissue. The most important characteristic is the high-signal-intensity rim on T1-weighted images, which will last from acute to subacute stage and is certified by signal intensity change from hypointensity to hyperintensity on T2-weighted images as a result of intracellular deoxyhemoglobin changed to be iron-free hemoglobin fragment.[2,4–6] The mass is filled with inhomogeneous low signal on T2-weighted images, which is consistent with recurrent bleeding as seen on the sample and different from the signal of tumor-related tissue and the layering tendency of cystic lesions with hemorrhage.[2,7] The above MR characteristics are possibly because the hemorrhage originated from the capsule

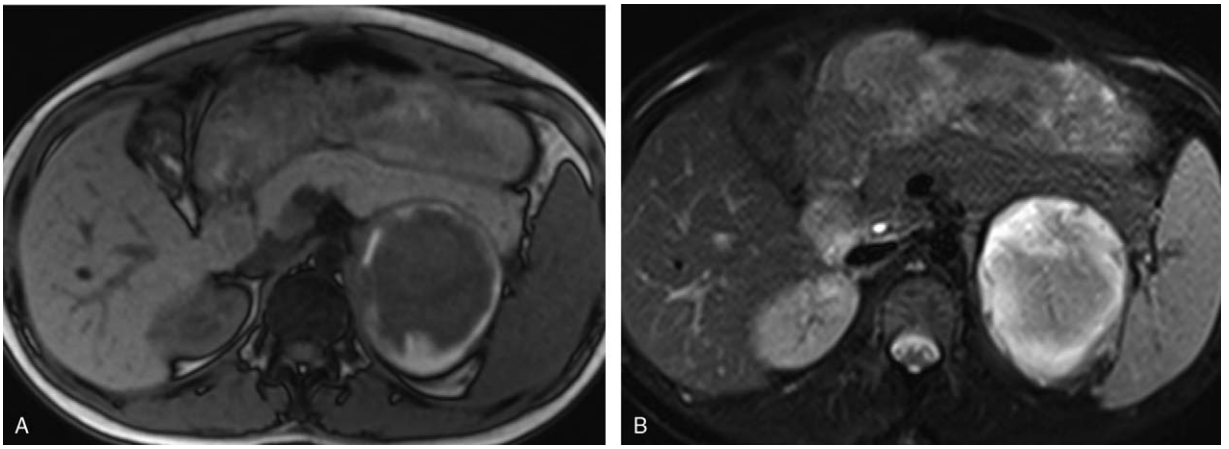

Figure 2. Repeat MR images at the 21 weeks of pregnancy. A, Axial T1-weighted image shows stable volume and signal as before. B, Axial T2-weighted image shows peripheral hyperintensity, and the edema around the mass was reduced. MR = magnetic resonance.

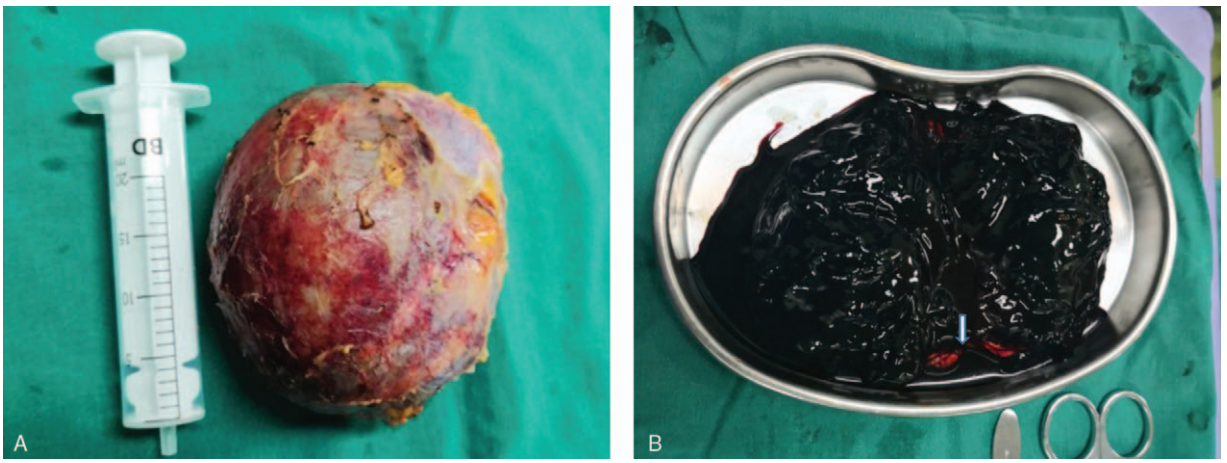

Figure 3. Photographs of gross specimen show old hemorrhage along with a little fresh hemorrhage (*white arrowhead*).

tissue, while the central area is old hemorrhage. And this sign is hardly demonstrated in other adrenal lesions. In our experience, the method of conventional MR scanning has an important role in the accurate diagnosis of adrenal hematoma.

When suspected of adrenal hemorrhage, it is important to investigate whether it will lead to life-threatening abnormalities such as hemorrhagic shock and insufficiency of adrenocortical function. Surgical, conservative, and interventional treatments are the main management of spontaneous adrenal hemorrhage in pregnancy, which depends upon the week of gestation, amount of bleeding, imaging findings, adrenal function, and so on.[6–9] It is difficult to form a systematic evaluation system for this condition because lack of high evidence studies. Keizer et al[6] put forward if the bleeding is less severe and the patient is hemodynamically stable, conservative management can be appropriate during pregnancy, since their patients achieved good therapeutic effects by just surveillance.[8,9] While Anagnostopoulos and Sharma[1] reported another case of retroperitoneal hematoma secondary to right adrenal hemorrhage and managed by laparotomy drainage and packing of the retroperitoneal hematoma. The laparoscopic approach performed in this case is based on the unconfirmed diagnosis, risk of rehemorrhagia, and relieving of anxiety.

In conclusion, we provide a rare case of nontraumatic adrenal hematoma in a pregnant woman. First, we demonstrated that the most important characteristic of adrenal hematoma is the high-signal rim on T1-weighted MR images accompanied by changing T2 signal, which has not been reported in the literature. The clinicians should make individualized treatment plan for every patient encountered in the future who might have different clinical conditions, such as whether there is insufficiency of adrenocortical function or blood *volume*.

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Author contributions

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Methodology: Yu-Chun Zhu, Rong-Bo Liu.
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