

Ultrasound quiz: a 29-year-old pregnant lady with left loin pain

超聲波掃描猜謎：一名左腰痛的 29 歲孕婦

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Case

A 29 years old pregnant lady (11 weeks gestational age) complained of sudden onset of left loin pain. Her blood pressure and pulse were stable. She

enjoyed good past health. Urgent ultrasonography (USG) of the left loin was performed and is shown in Figures 1-4.

Questions

1. What are the USG findings?
2. What are the differential diagnoses?
3. What should be the subsequent management?

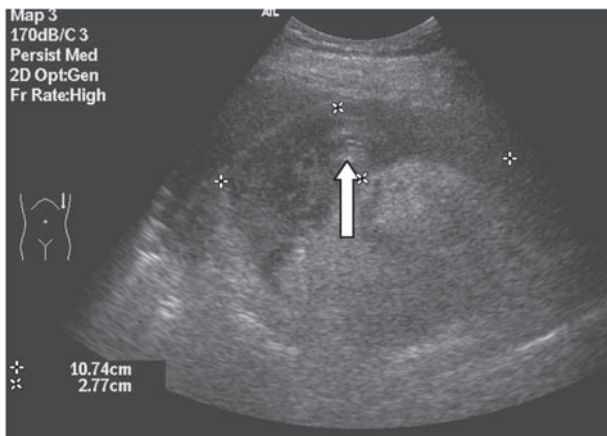


Figure 1.

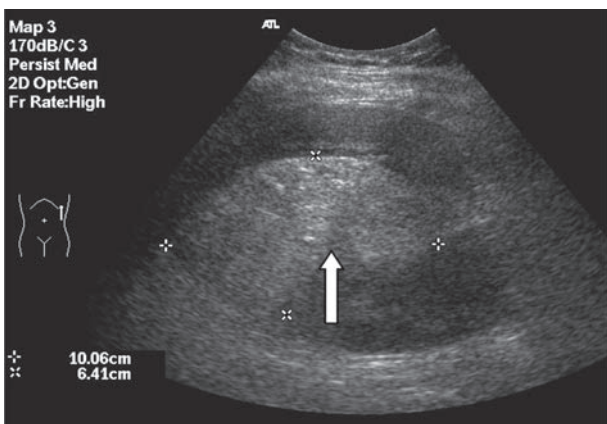


Figure 2.

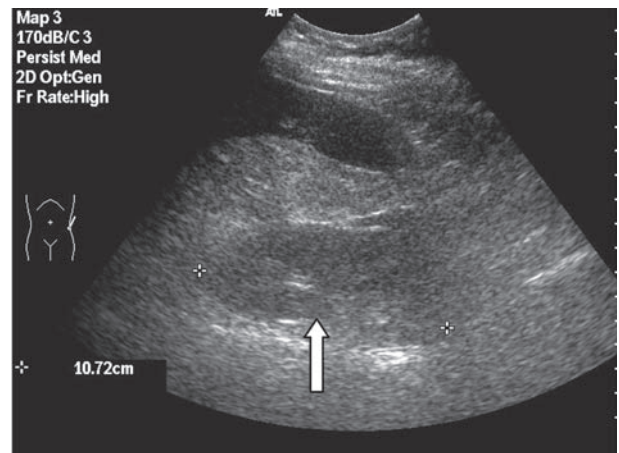


Figure 3.

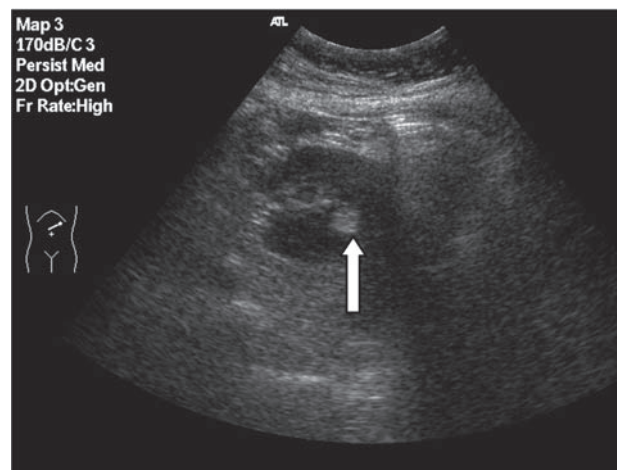


Figure 4.

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Answers

1. An echogenic left retroperitoneal mass (arrow in Figure 2) with an adjacent hypoechoic rim, displaces the left kidney (arrow in Figure 3) anteromedially. With the given history of abrupt onset of abdominal pain, pathology of vascular origin and haematoma have to be considered. Rupture of renal mass, particularly angiomyolipoma with adjacent haematoma (arrow in Figure 1), is suspected. A 1 cm echogenic lesion (arrow in Figure 4) noted in the lower pole of the left kidney, could be a small angiomyolipoma. The collecting system is not dilated.
2. Differential diagnoses include abscess versus renal tumour complicated by haemorrhage. Haemorrhage from angiomyolipoma is likely as the patient has acute onset of pain and pregnancy is one of the risk factors for haemorrhage from angiomyolipoma.
3. Further investigation with MRI for confirmation of the nature of the mass is useful especially for the identification of any fat content inside. MRI has no risk of radiation to her foetus while the radiation dose from CT is high for her foetus. In addition, any other associated complication of haemorrhage can also be demonstrated by MRI.

Discussion

MRI and CT have both been performed for this patient and both showed large fat containing masses in both kidneys. They were compatible with angiomyolipoma with haemorrhage on the left side. CT was performed after the patient made the decision of termination of her pregnancy.

Figures 5 and 6 are the T1W images of the left renal mass with fat saturation in Figure 6. Figures 7 and 8 are T2W images of the left renal mass with fat saturation in Figure 8.

Angiomyolipomas occur as isolated, sporadic entities in 80% of cases and most commonly manifest in middle-aged women. The other 20% of angiomyolipomas develop in association with tuberous sclerosis.¹

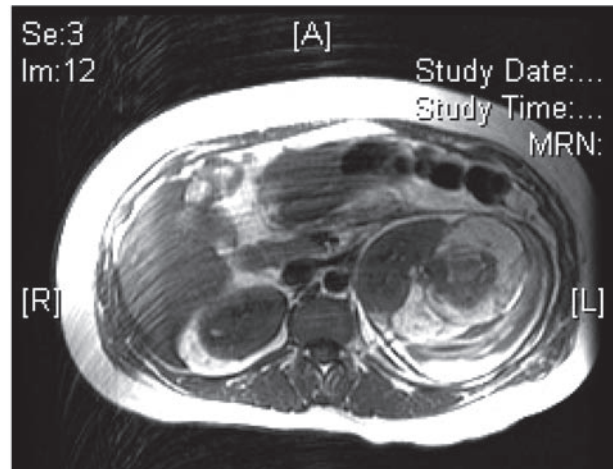


Figure 5. T1W image of the left renal mass.

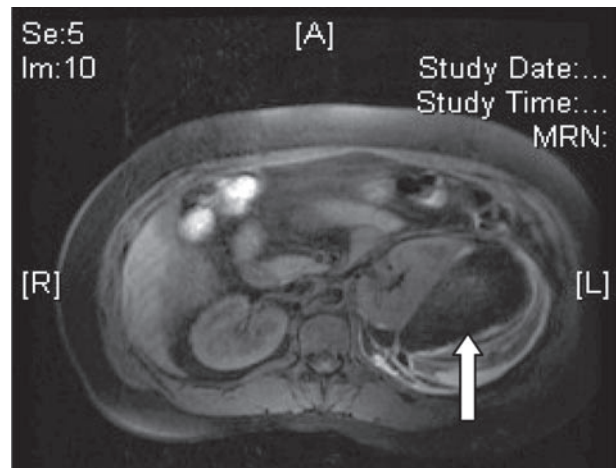


Figure 6. T1W image with fat saturation sequence showing the fat containing left renal mass (arrow). The adjacent thick rim of T1W hyperintense signal is haematoma.

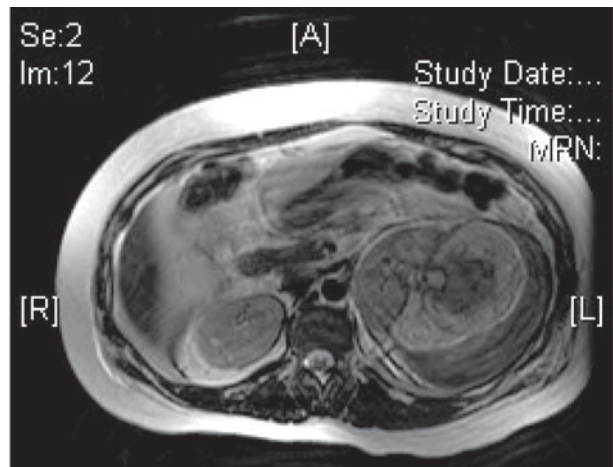


Figure 7. T2W image of the left renal mass.

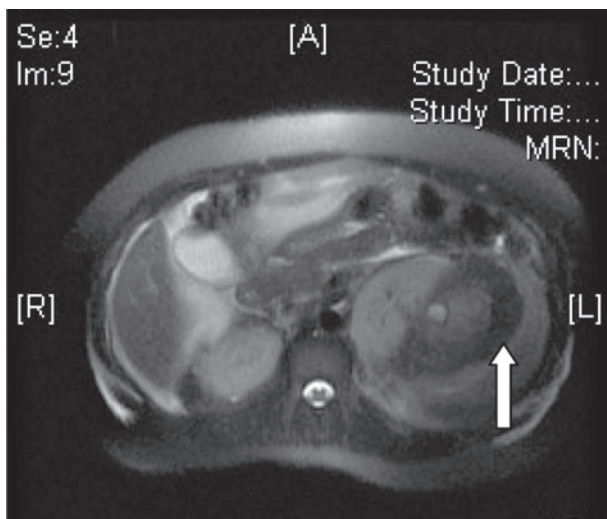


Figure 8. T2W image with fat saturation sequence showing a hypointense left renal mass (arrow) indicating its fat content.

Most angiomyolipomas are clinically silent, but haemorrhage may cause symptoms of fever, flank pain, haematuria, or rapid enlargement (especially during pregnancy).² Tumour size of 4 cm or larger has been used as a predictor of impending rupture.³

Angiomyolipomas that occur in association with tuberous sclerosis manifest at a younger age (31.5 years vs. 53.6 years, $P < 0.05$), are likely to be larger and bilateral, and are prone to grow and may need surgical treatment.¹

L'Hostis et al observed the presence of both progesterone and oestrogen receptors in angiomyolipomas and found that progesterone and oestrogen immunoreactive angiomyolipomas were predominantly found in women and in patients with tuberous sclerosis.⁴ These findings may further explain the more aggressive nature of the disease process in patients with tuberous sclerosis, the hormonal potentiation of tumour growth and haemorrhage in conditions such as pregnancy, and the overwhelming female predominance in the sporadic form of angiomyolipoma without tuberous sclerosis.¹

For our patient, before performing CT (Figures 9 and 10), she had already agreed for termination of pregnancy and she subsequently had urgent embolization of the left angiomyolipoma due to the complication of haemorrhage. Resection of the bilateral angiomyolipoma is pending. So far, no other evidence of tuberous sclerosis is seen in this patient.

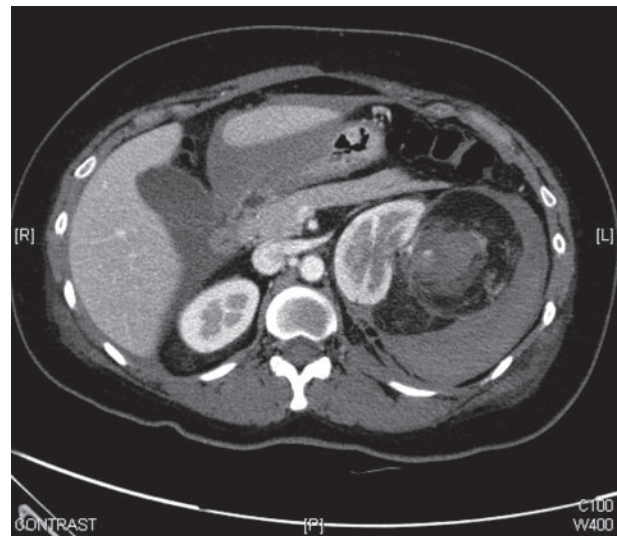


Figure 9. Post contrast CT abdomen showing a fat containing lesion in the left kidney with haemorrhage compatible with angiomyolipoma (7 cm x 8 cm x 10 cm).



Figure 10. Post contrast CT abdomen showing right renal angiomyolipoma (6 cm x 6 cm x 8 cm).

References

1. Logue LG, Acker RE, Sienko AE. Best cases from the AFIP: angiomyolipomas in tuberous sclerosis. *Radiographics* 2003;23(1):241-6.
2. Clark RE, Palubinskas AJ. The angiographic spectrum of renal hamartoma. *Am J Roentgenol* 1972;114(4):715-21.
3. Yamakado K, Tanaka N, Nakagawa T, Kobayashi S, Yanagawa M, Takeda K. Renal angiomyolipoma: relationships between tumor size, aneurysm formation, and rupture. *Radiology* 2002;225(1):78-82.
4. L'Hostis H, Deminiere C, Ferriere JM, Coindre JM. Renal angiomyolipoma: a clinicopathologic, immunohistochemical, and follow-up study of 46 cases. *Am J Surg Pathol* 1999;23(9):1011-20.