

Case 2

A 70 year-old-female with a false eye complained of right upper quadrant pain. She underwent an US of her upper abdomen (Image 1). An MDCT was then performed (Image 2); this was followed by an MRI of which the axial T1 fat sat and T1 MR sequences are shown (Images 3a and b).

Questions

1. What are the findings on US?
2. What does the MDCT show?
3. What do the unenhanced T1 fat sat and T1 MR sequences show, and what is their significance?
4. What is the likely diagnosis?
5. What further sequences would you perform to clarify appearances?

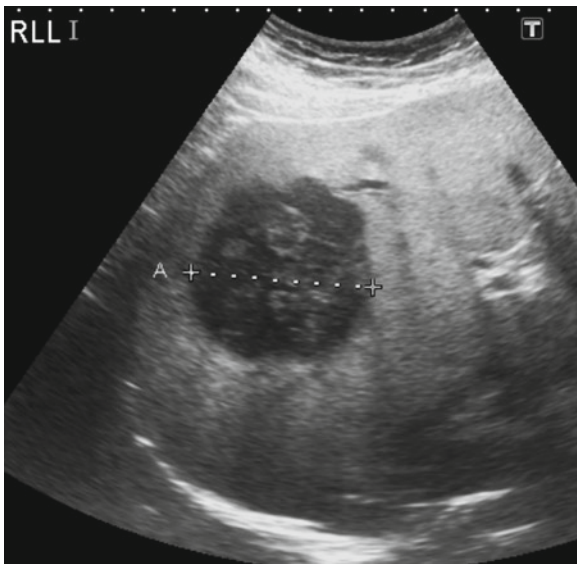


Image 1



Image 2

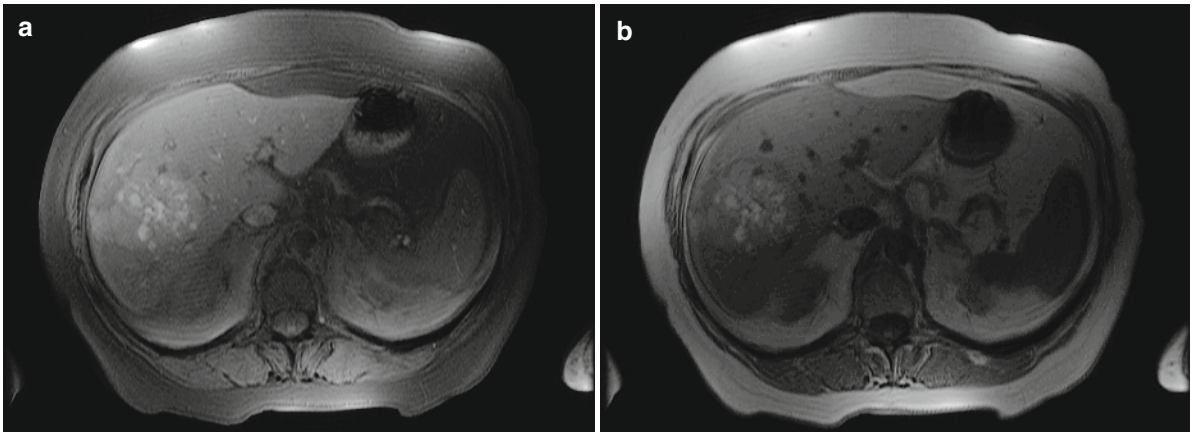


Image 3

Answers

1. The US shows a solitary 5.8 cm solid soft tissue mass within the right lobe of the liver highly suspicious for a metastasis or primary hepatoma (Image 4).
2. The CT confirms a subtle mass within the right lobe of the liver causing distortion of the adjacent vessels (Image 5).

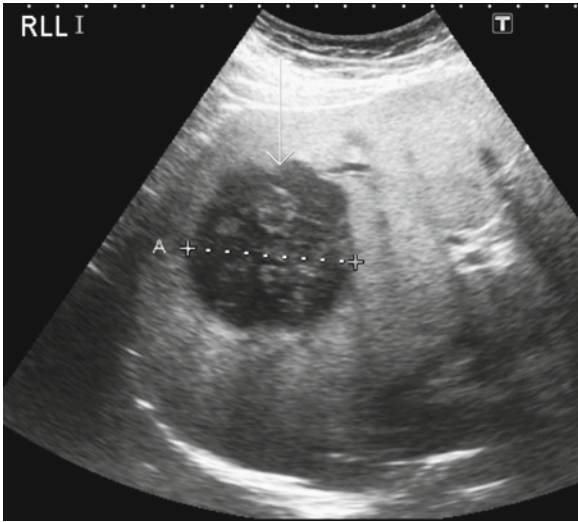


Image 4

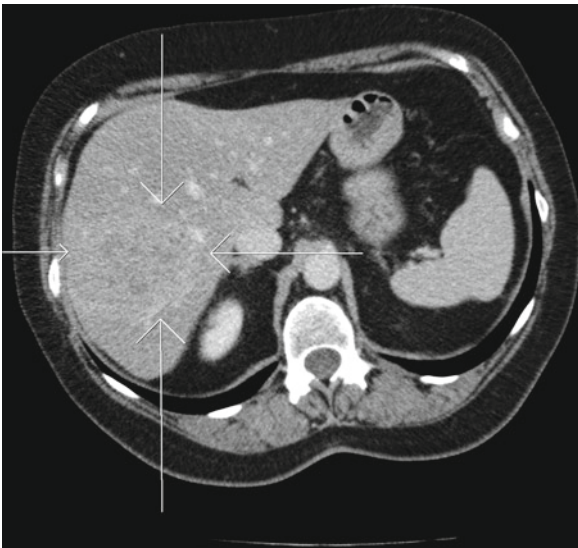


Image 5

3. MRI (often more sensitive than USS) confirms a 6.8 cm mass that is mixed but predominantly high signal on T1 fat sat imaging (Image 6a) and again mixed signal on T1 with focal areas of high signal within it (Image 6b). The areas of high signal on unenhanced T1 fat sat and T1 imaging indicate either haemorrhage or melanin.
4. The patient had a false eye which would fit with a history of choroidal melanoma, and this is therefore most likely to represent a solitary melanoma metastasis.
5. Dynamic post-gadolinium fat sat T1 scans.

Dynamic post-gadolinium fat sat T1 scans (Images 7a–d) were performed and confirmed arterial enhancement (Image 7a) of the lesion above with wash out of enhancement on portal phase imaging (Image 7b) typical for highly vascular melanoma metastases. Further metastases are revealed only on the

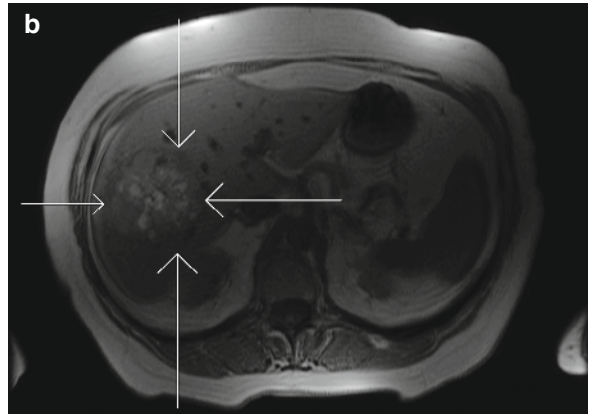
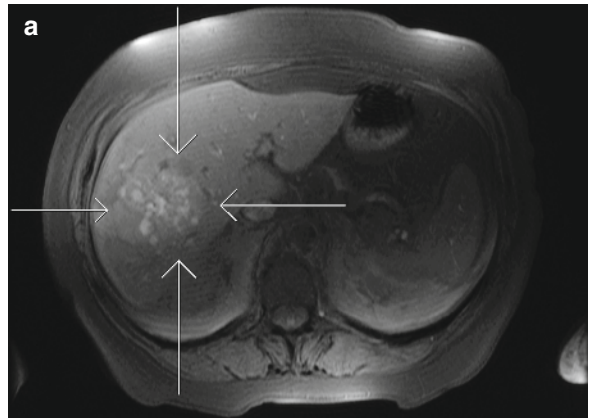


Image 6

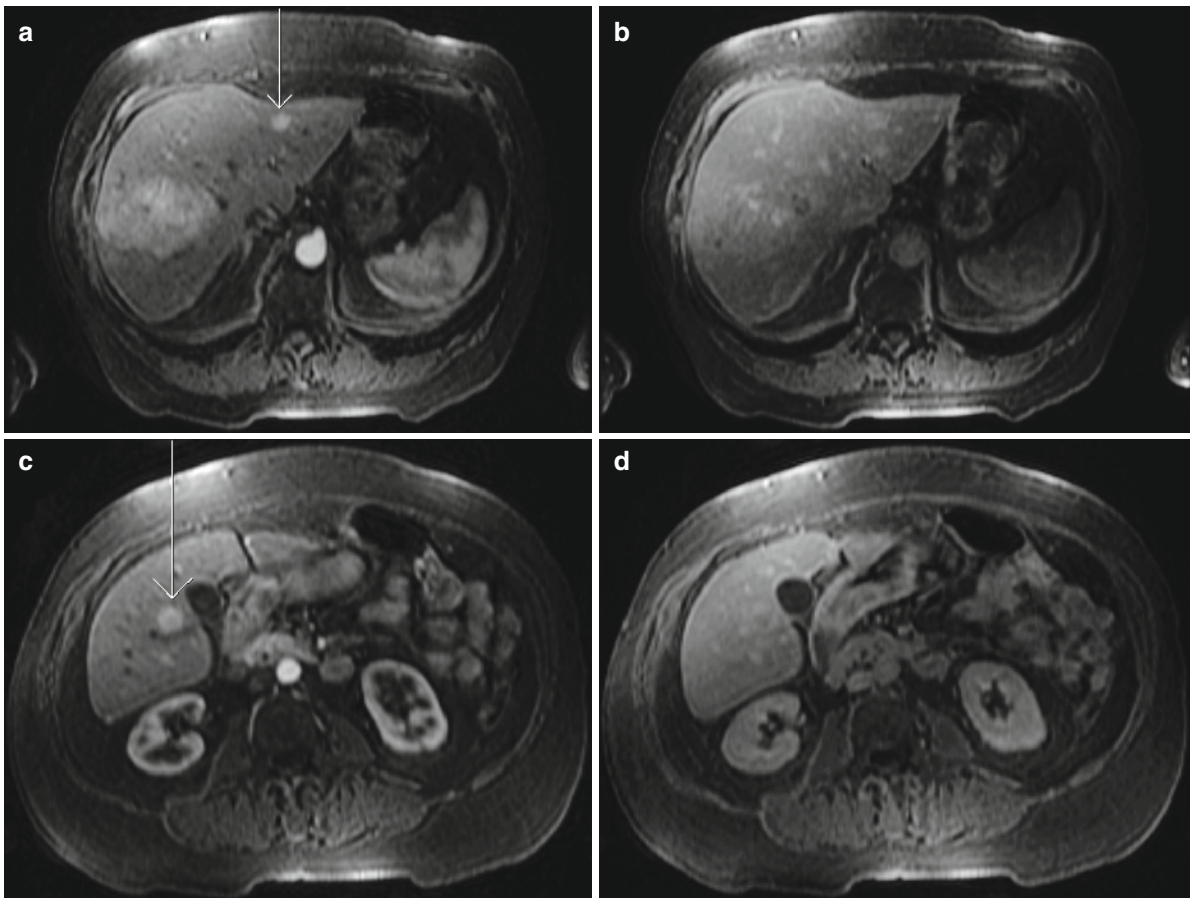


Image 7

post-contrast scan within the left lobe in segments II (arrow Image 7a) and V (arrow Image 7c) again showing portal phase wash out of enhancement (Images 7b and d).

High signal lesions on T1 imaging include fat, recent haemorrhage, melanin and gadolinium. Highly vascular lesions include hepatomas, neuroendocrine metastases such as carcinoid and renal cell carcinoma metastases. Most other metastases have a portal venous enhancement pattern. Note the significantly increased signal on pre-contrast fat sat T1 imaging which represent areas of melanin.

Choroidal melanoma has a propensity for late hepatic metastases, delays of 10–15 years are not uncommon. This is a different disease pattern to non-choroidal melanoma where spread is most commonly to subcutaneous tissues, lungs and distant lymph nodes. In one series [1] of 25 patients, 15 developed hepatic metastases as the sole initial manifestation of metastatic disease with a median time interval after original enucleation of 43 months and a survival on onset of spread was 7 months.

Key Points

- Choroidal melanoma can metastasize late to the liver.
- Melanin has paramagnetic properties seen as high signal (bright) on T1 and T1 fat sat imaging.
- Differential diagnosis for high signal lesions on T1 imaging are fat, haemorrhage, melanin and gadolinium (on post-contrast scans).
- Other highly vascular lesions include hepatomas, metastases from neuroendocrine tumours such as carcinoid and also renal cell carcinoma metastases.
- MR, particularly with post-gadolinium dynamic scans, greatly increases the sensitivity of hepatic imaging.

Reference

1. Einhorn LH (1974) Metastatic patterns of choroidal melanoma. *Cancer* 34: 1001-1004



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