

Ocular melanoma; metastatic to Liver

A study in Radiology Pathology Correlation

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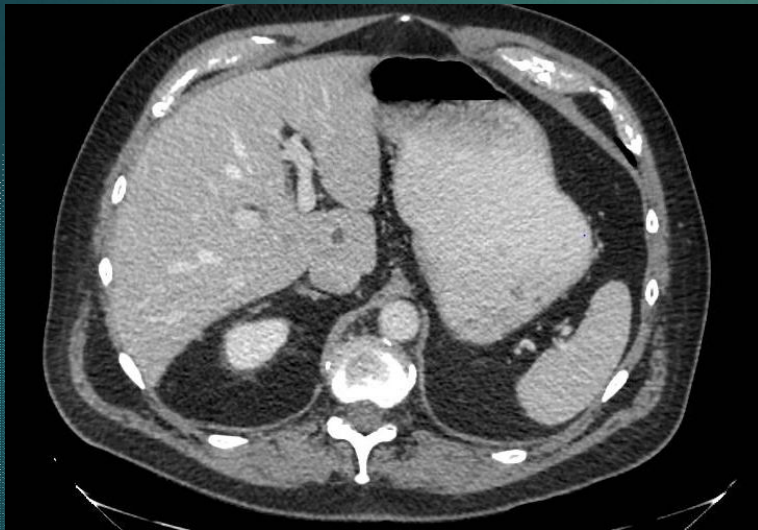
UNIVERSITY OF VIRGINIA SCHOOL OF MEDICINE

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Case Presentation

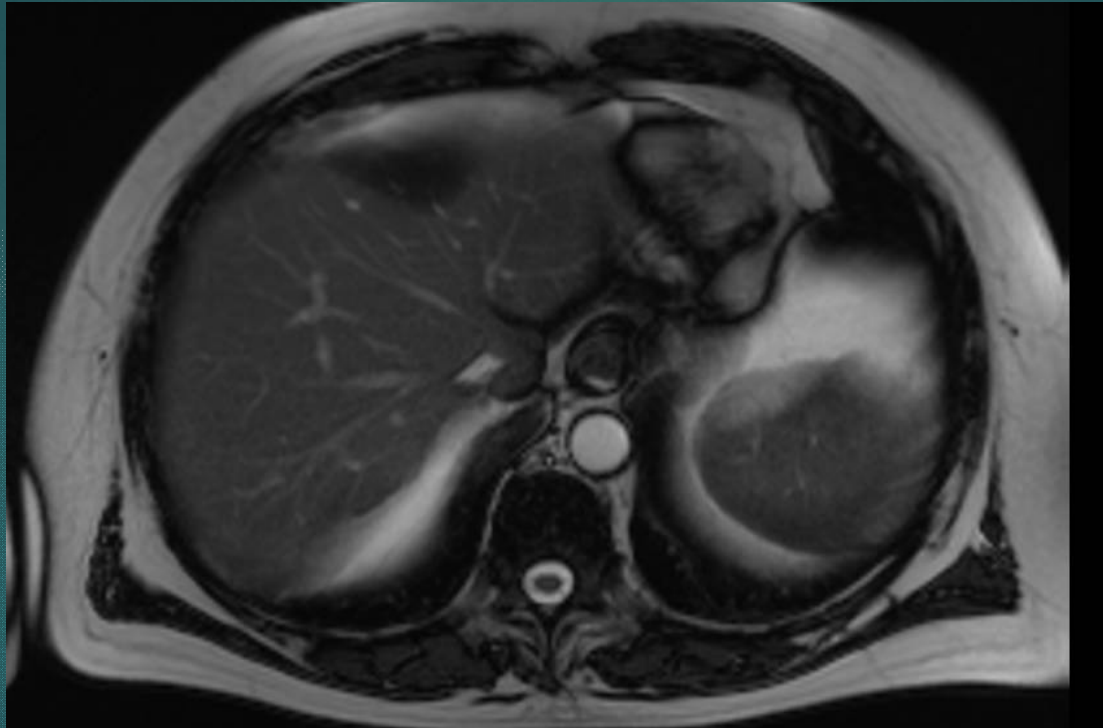
- ▶ Pt was a 73 yo M with PMH of HTN and T2DM who presented to UVA Ophtho with concern for choroidal melanoma
- ▶ - Examination confirmed the diagnosis
- ▶ CT Abdo/Pelvis showed 3 low attenuation lesions in liver concerning for metastasis
- ▶ Pt underwent enucleation of R eye
 - ▶ Path: MALIGNANT UVEAL MELANOMA, EPITHELIOID TYPE, 16 mm x 8 mm mass, noted involvement of sclera, choroid, ciliary body, iris and retina with + extrascleral extension
- ▶ MRI confirmed metastatic involvement of Liver
- ▶ Pt underwent U/S-guided biopsy of Liver lesions

Imaging of Liver Lesions



At least 3 subtle low attenuation lesions are appreciated in the liver

Imaging of Liver Lesions

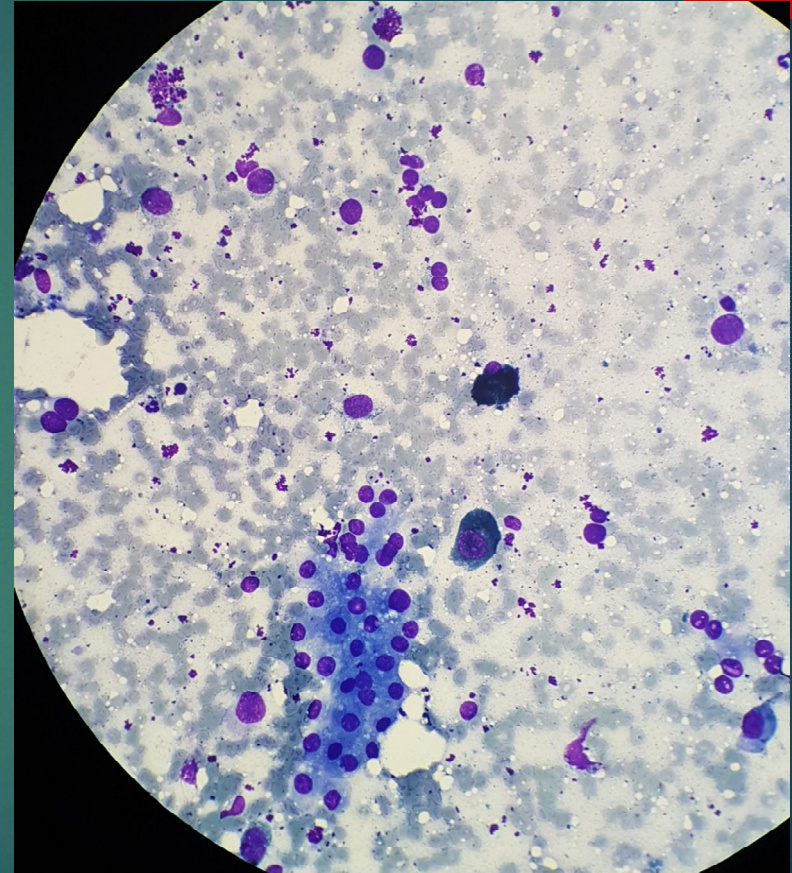
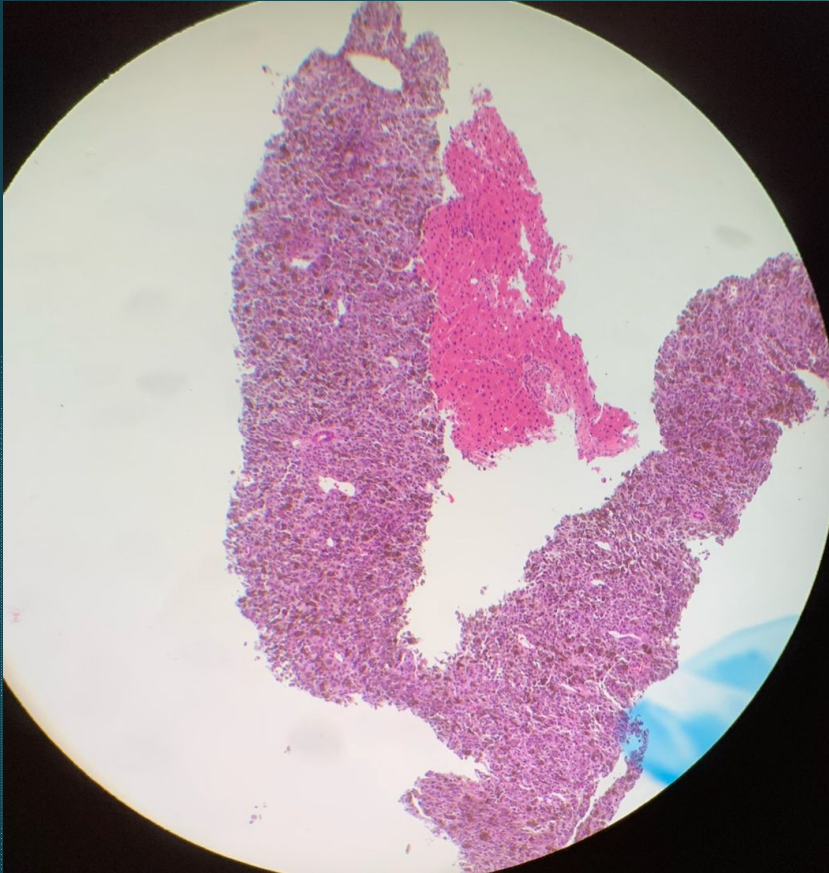


There are multiple T1 hyperintense enhancing lesions scattered mostly in the right lobe consistent with metastasis

U/S-guided biopsy of Liver lesions



Pathology Analysis



Future Directions

- ▶ Genomics studies of the biopsy sample still pending
- ▶ Pt will follow up with local Heme Onc group , starting on the first-line immunotherapy of Ipilimumab and Nivolumab

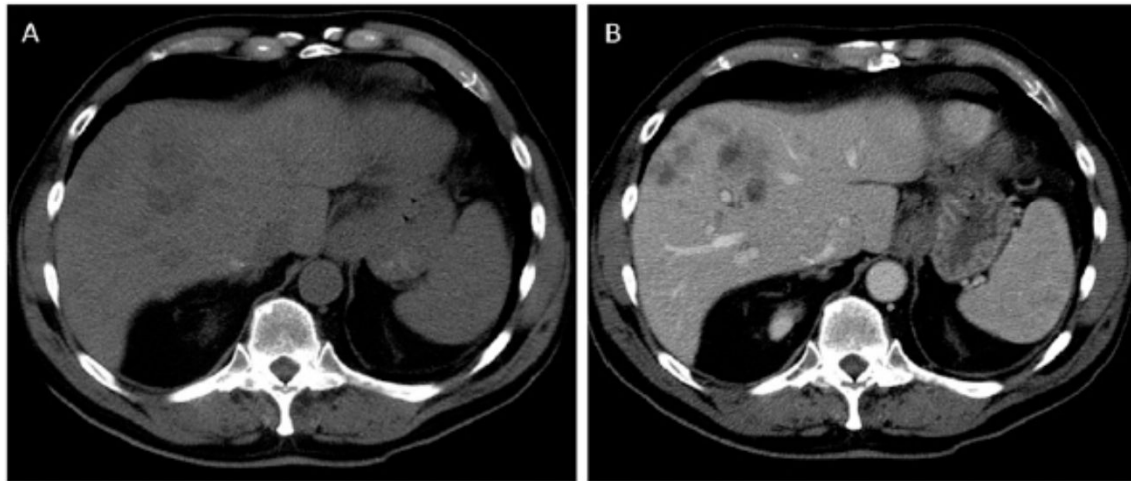
Imaging of Ocular Melanoma Metastasis

- ▶ Most common intraocular malignancy in adults
- ▶ < 1 % have metastatic disease at time of Dx ; many will develop
- ▶ 10- year rate is 34% - identified on avg 3 year after Dx
- ▶ Most frequent site of metastasis is the liver (90%), followed by the lung (30%), bone (23%) and skin (17%)

CT

- ▶ **Pros:** available, cheap, consistent quality
- ▶ **Cons:** radiation – insensitive to smaller Liver lesions

Figure 1. (a) Non-contrast CT abdomen demonstrating the ill-defined lesions in the right lobe of the liver. (b) Contrast-enhanced CT in the same patient. The lesions are better evaluated on the post-contrast images.



Picture from ref 3

CT features: nonspecific ; hypervascular lesions ; hypodense and contrast-enhancing ;

PET - CT

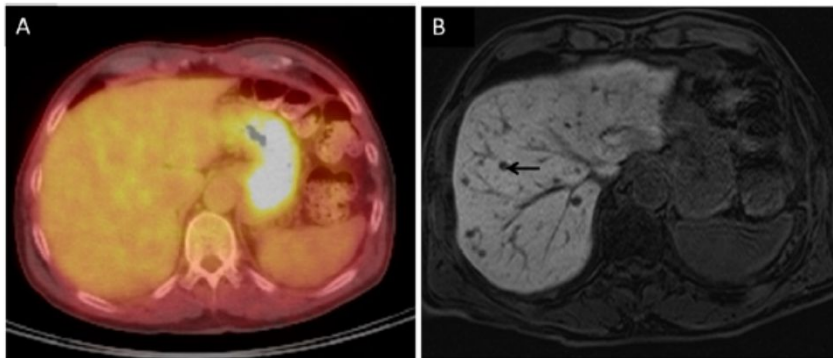
- ▶ **Pros:** FDG-avid lesions; can see LNs and bone and lung mets
- ▶ **Cons:** radiation – insensitive to smaller lesions (normal uptake – respiratory motion artifacts)

Figure 4. Coronal fused positron emission tomography CT image demonstrating a hypermetabolic lesion within the liver (arrow) consistent with metastasis.



Both pictures from ref. 3

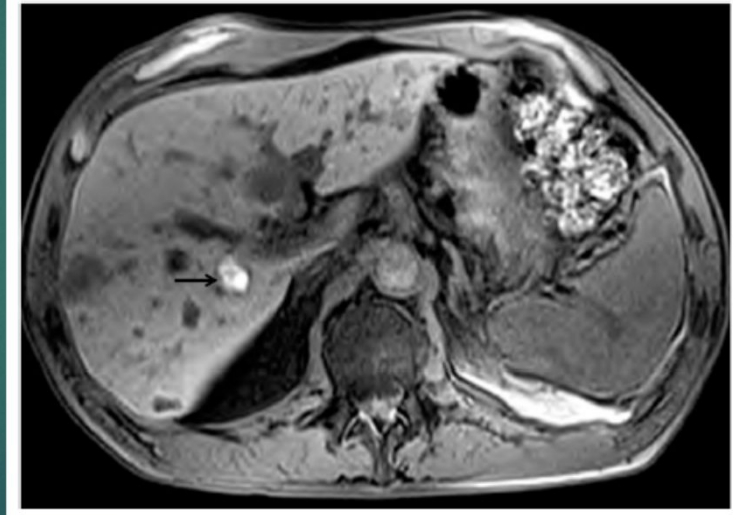
Figure 5. (a) Fused positron emission tomography CT images through the liver showing no focal fludeoxyglucose uptake to suggest metastasis. (b) T_1 weighted hepatobiliary-phase post-contrast image performed on the same day demonstrating multiple, tiny, rounded hypointense lesions consistent with metastases. An arrow points to one of these lesions.



MRI – part 1

- ▶ **Pros:** more specific – equally sensitive as CT
- ▶ **Imaging features:** melanin bright on unenhanced T1 however predominance of T1 hypointense metastatic lesions

Figure 6. T_1 weighted pre-contrast image showing multiple metastatic lesions, very few of which are T_1 bright. The T_1 bright lesion as indicated by an arrow is in the right lobe. Most melanoma metastases are not bright on T_1 weighted sequences.



Picture from ref. 3

MRI – part 1

▶ Other features of MRI imaging of ocular melanoma liver metastasis

- ▶ Hepatocyte-avid agents cause small lesions to stand out in delayed hepatobiliary phase
- ▶ Diffusion-weighted sequences are sensitive for melanoma mets ; useful in severe kidney disease

Figure 7. (a) Pre-contrast T_1 MRI fat-suppressed image demonstrating multiple hypodense lesions concerning metastases in a patient with uveal melanoma. (b) Post-contrast T_1 MRI hepatobiliary-phase image demonstrating several more lesions in addition to the previously seen lesions. One of the smaller lesions, seen only on the hepatobiliary phase, is indicated by an arrow.

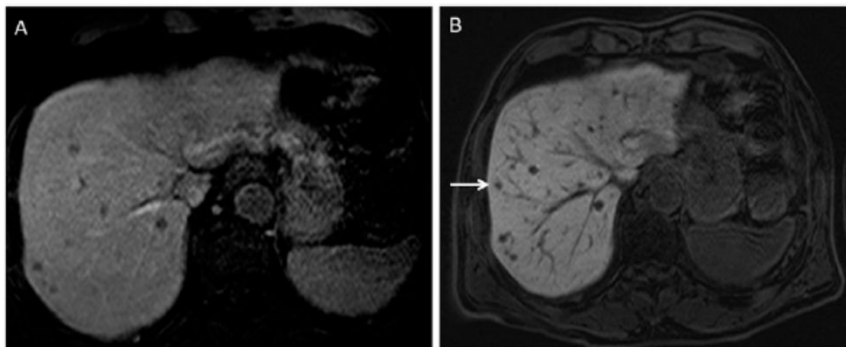
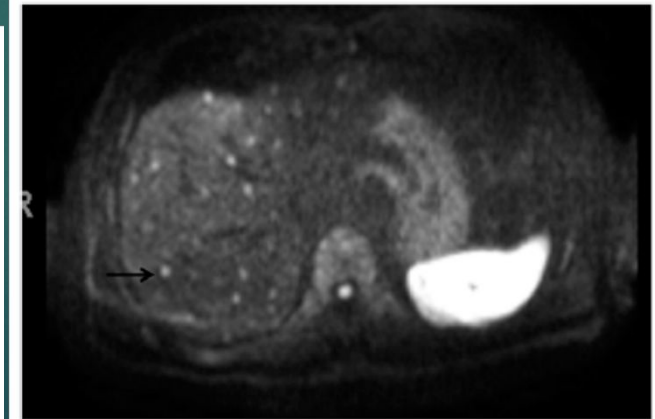


Figure 8. Diffusion-weighted sequence of the same patient in Figure 5 showing the multiple tiny metastatic lesions (one of which is indicated by an arrow) not visualized on positron emission tomography CT.



Both pictures from ref. 3

References

- 1- Chapter 5 (Pathology of the liver, biliary system, and the exocrine pancreas) of the book: Atlas of Anatomic Pathology with Imaging A Correlative Diagnostic Companion
- 2- Carvajal RD, Schwartz GK, Tezel T, Marr B, Francis JH, Nathan PD. Metastatic disease from uveal melanoma: treatment options and future prospects. Br J Ophthalmol. 2017 Jan;101(1):38-44.
- 3- Balasubramanya R, Selvarajan SK, Cox M, Joshi G, Deshmukh S, Mitchell DG, O'Kane P. Imaging of ocular melanoma metastasis. Br J Radiol. 2016 Sep;89(1065):20160092