AMSER Case of the Month August 2024

55 y.o with NASH cirrhosis presents for surveillance liver ultrasound

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Patient Presentation

- HPI: 55 y.o. female with a past medical history of NASH cirrhosis presented for routine HCC surveillance with liver ultrasound. Her last screening ultrasound exam was over 2 years ago due to delay in follow-up.
- Past medical history: NASH cirrhosis, scalp eczema, scalp infection (cellulitis), colonic polyps, T2 DM, GERD, hyperlipidemia, hypothyroidism, PCOS
- Past surgical history: Cholecystectomy
- Allergies: NKDA
- Medications: Amlodipine, Fluticasone, Levothyroxine, Metformin, Metoprolol, budesonide-formoterol, bupropion, oral calcium carbonate, polyethylene glycol, ranitidine, rosuvastatin, semaglutide, Victoza, vitamin D, vitamin E.
- Social Hx: No history of tobacco use. No alcohol use.

Physical exam

- Vitals: BP 145/80 Pulse 85 Temp 36.5 RR 17 SpO2 94%
  - Last menstrual period 8/21/23
- Cardiovascular: Regular rate and rhythm
- Respiratory: Nonlabored breathing, normal breath sounds bilaterally
- Skin: Rash present

Pertinent Labs and Imaging

- CBC, CMP, PT/INR all within normal limits
- Liver ultrasound: Interval development of numerous hepatic lesions since ultrasound exam 2 years prior. Some of these lesions are more conspicuous than others with central hypoechogenicity.

What Imaging Should We Order?

Variant 2: **Chronic liver disease. No prior diagnosis of hepatocellular carcinoma (HCC). Screening and surveillance for HCC.**

Procedure	Appropriateness Category	Relative Radiation Level
US abdomen	Usually Appropriate	O
MRI abdomen without and with IV contrast	Usually Appropriate	O
MRI abdomen without and with hepatobiliary contrast	Usually Appropriate	O
CT abdomen with IV contrast multiphase	May Be Appropriate (Disagreement)	☢☢☢☢
US duplex Doppler abdomen	May Be Appropriate (Disagreement)	O
MRI abdomen without IV contrast	May Be Appropriate	O
CT abdomen without and with IV contrast	Usually Not Appropriate	☢☢☢☢
CT abdomen without IV contrast	Usually Not Appropriate	☢☢☢
MR elastography abdomen	Usually Not Appropriate	O
US abdomen with IV contrast	Usually Not Appropriate	O
US shear wave elastography abdomen	Usually Not Appropriate	O
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	☢☢☢☢

Screening ultrasound was performed. Abdominal MRI w/wo contrast was ordered per the interpreting Radiologist recommendation.

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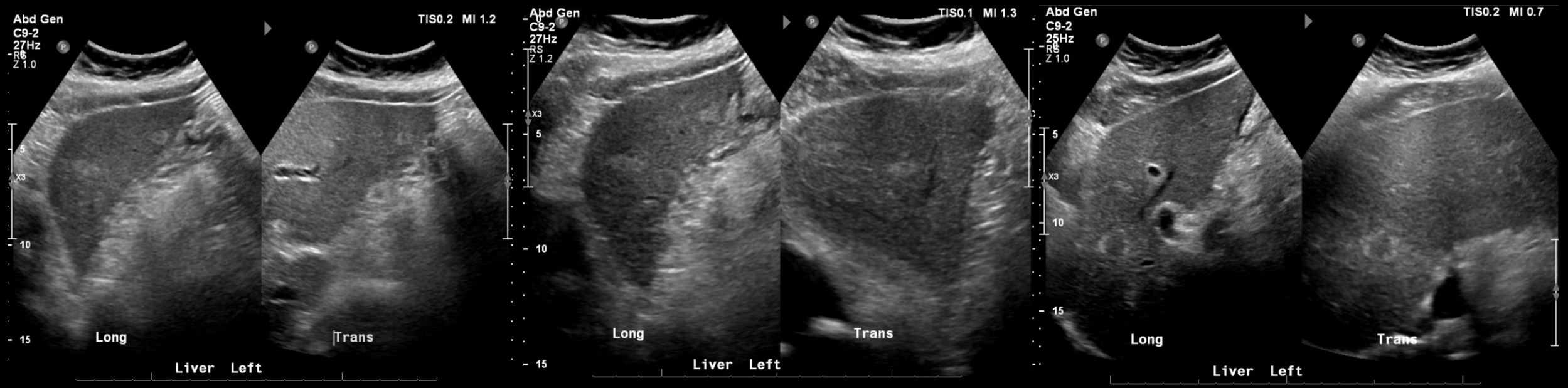
Findings: Abdominal Ultrasound (unlabeled)



Findings: Abdominal Ultrasound (labeled)

Interval development of numerous hyperechoic hepatic lesions since previous abdominal US, some showing central hypoechogenicity.

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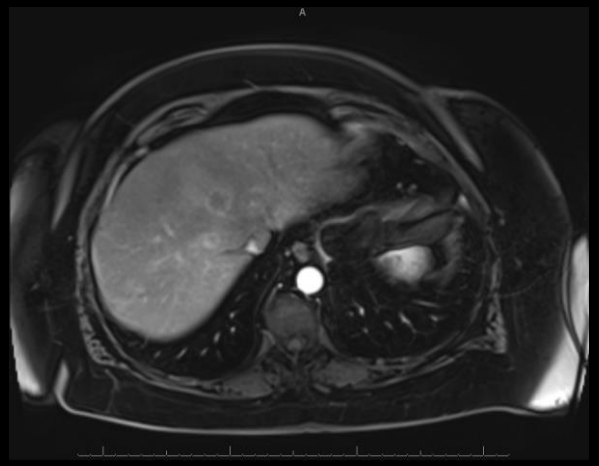
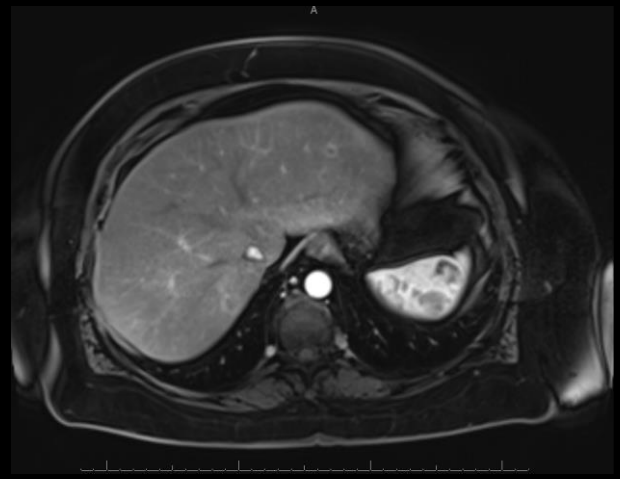
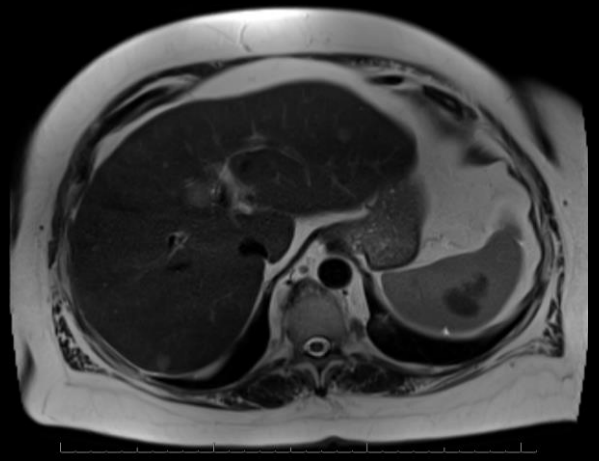
Findings: MRI abdomen (unlabeled)



Axial T1 fat sat postcontrast images



Axial T1 fat sat postcontrast images



Axial T2

Axial T1 fat-sat post contrast subtraction image

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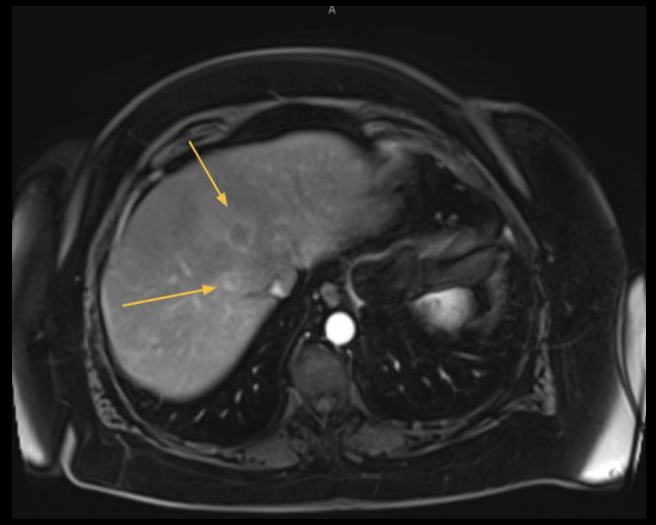
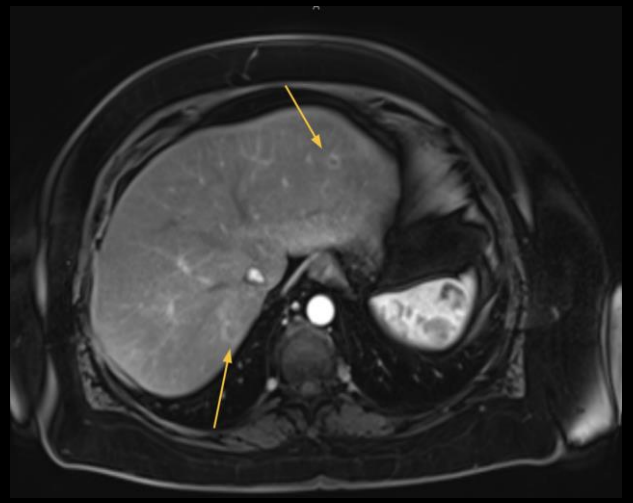
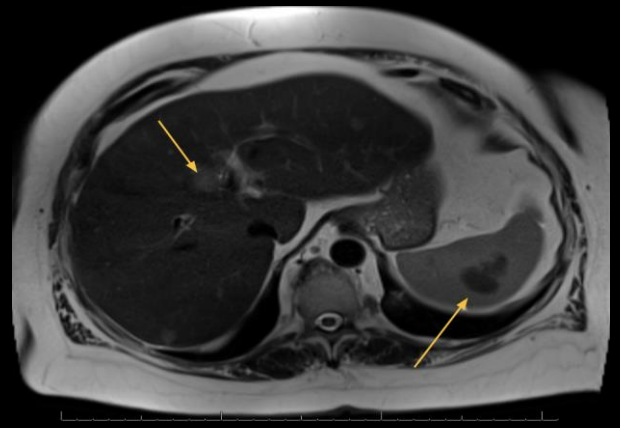
Findings: MRI abdomen (labeled)





Axial T1 fat sat postcontrast images

Numerous rim-enhancing lesions throughout liver.



Axial T2

Axial T1 fat-sat post contrast subtraction image

T2 hyperintense liver lesion in the anterior right hepatic lobe (corresponding to enhancing lesion on prior slide). Indeterminate T2 hypointense splenic lesion with hypoenhancement relative to the normal splenic parenchyma.

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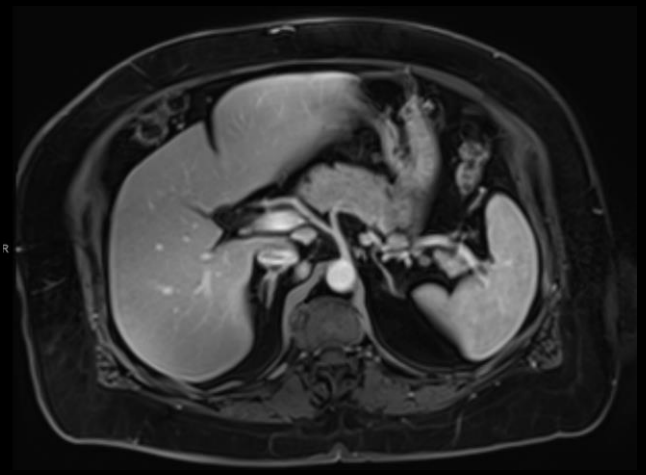
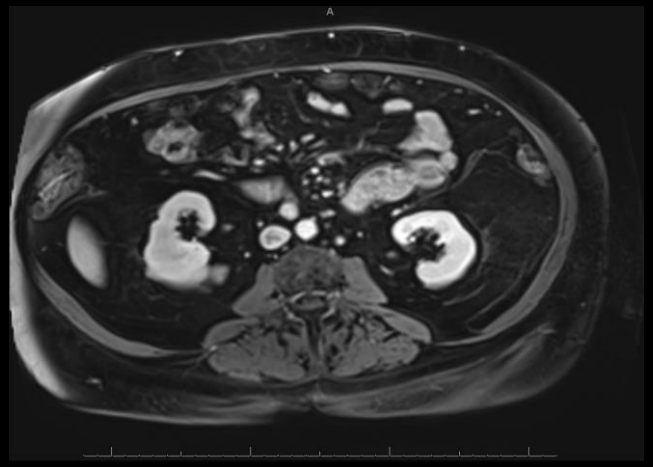
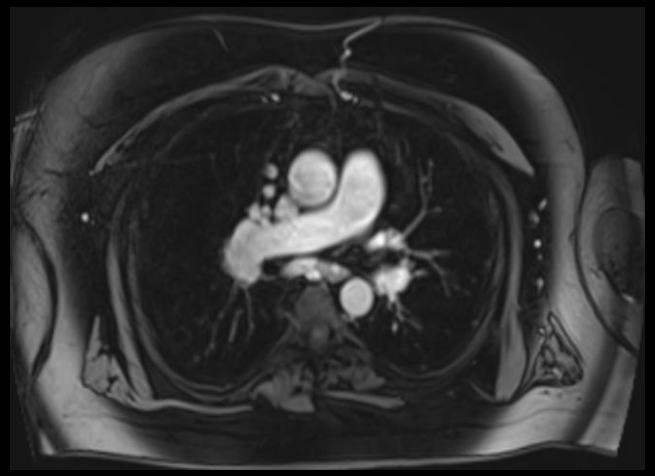
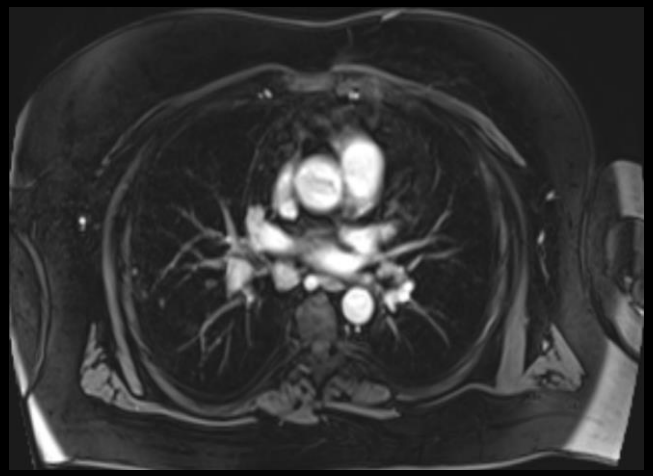
Findings: MRI abdomen (unlabeled)





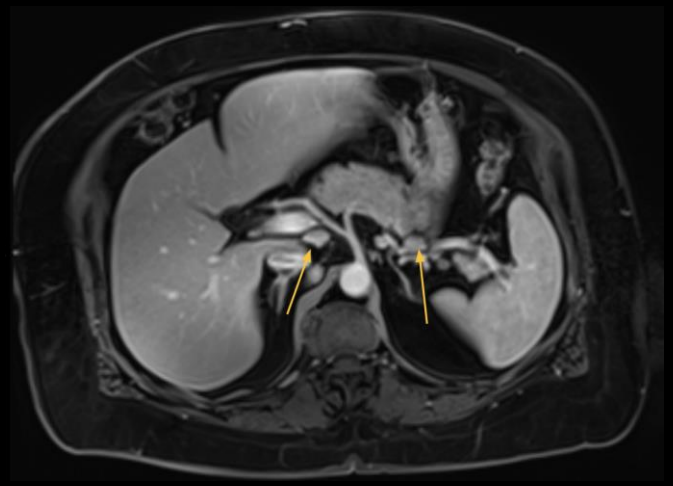
Axial T1 fat sat postcontrast images

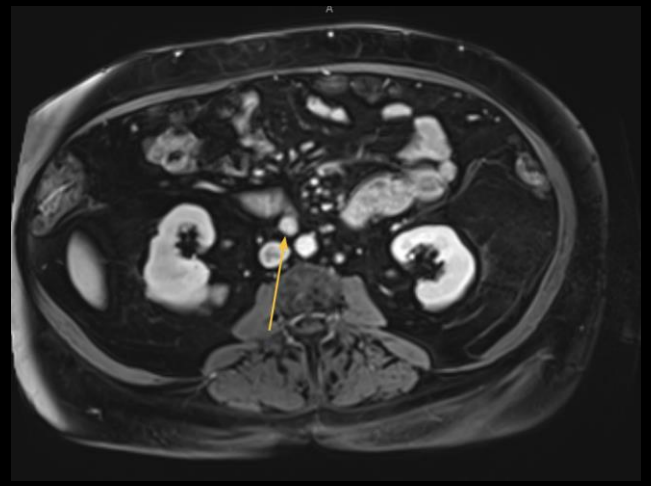




Axial T1 fat-sat post contrast subtraction images

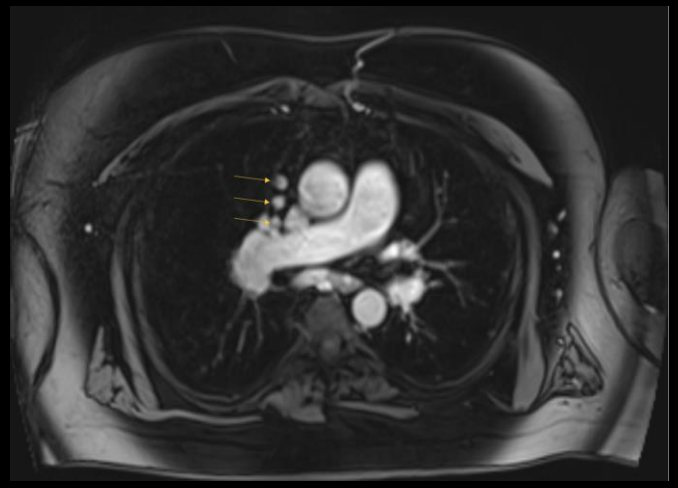
Findings: MRI abdomen (labeled)

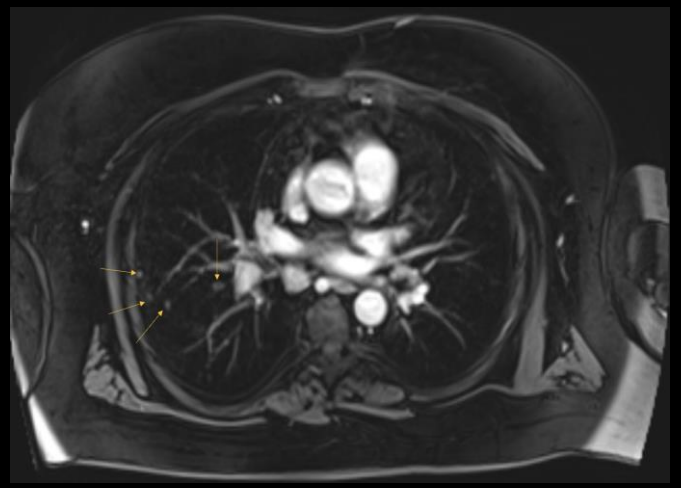




Axial T1 fat sat postcontrast images

Enlarged and prominent abdominal lymph nodes.





Axial T1 fat-sat post contrast subtraction images

Pleural and pulmonary nodules along with mediastinal/hilar lymphadenopathy at lung bases prompted chest CT.

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What Imaging Should We Order?

Variant 4: **Adult greater than or equal to 35 years of age. Incidentally detected indeterminate pulmonary nodule on incomplete thoracic CT (eg, CT abdomen, neck, spine, etc). Next imaging study.**

Procedure	Appropriateness Category	Relative Radiation Level
CT chest without IV contrast	Usually Appropriate	☢☢☢
Radiography chest	Usually Not Appropriate	☢
Image-guided transthoracic needle biopsy	Usually Not Appropriate	Varies
MRI chest without and with IV contrast	Usually Not Appropriate	O
MRI chest without IV contrast	Usually Not Appropriate	O
CT chest with IV contrast	Usually Not Appropriate	☢☢☢
CT chest without and with IV contrast	Usually Not Appropriate	☢☢☢
FDG-PET/CT whole body	Usually Not Appropriate	☢☢☢☢

Pleural and pulmonary nodules detected along with mediastinal/hilar lymphadenopathy at lung bases prompted Chest CT.

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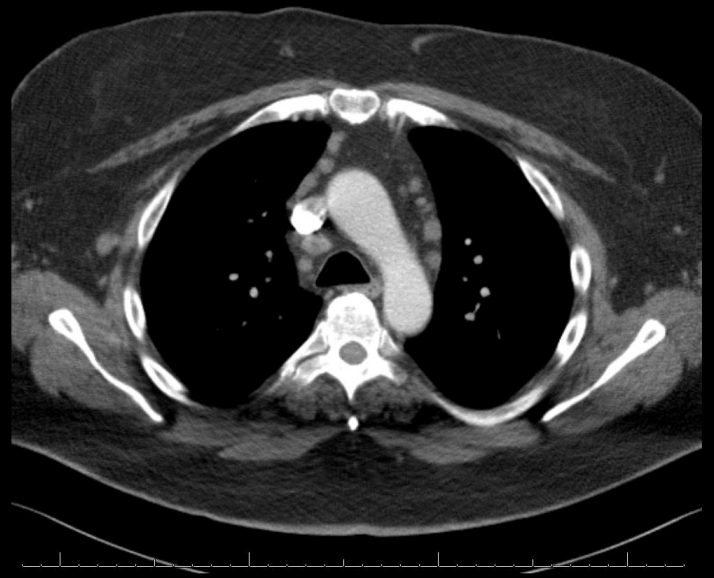
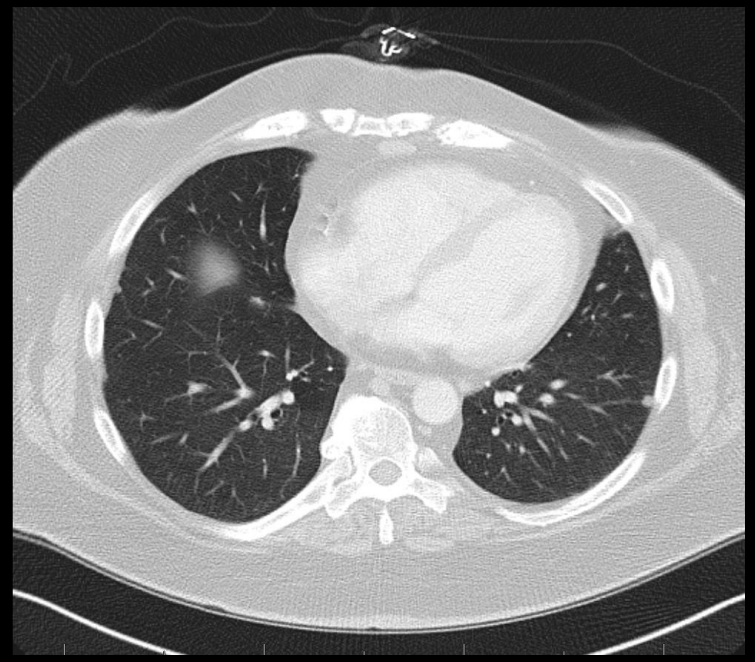
Findings: Chest CT (unlabeled)

Axial CT through the upper chest

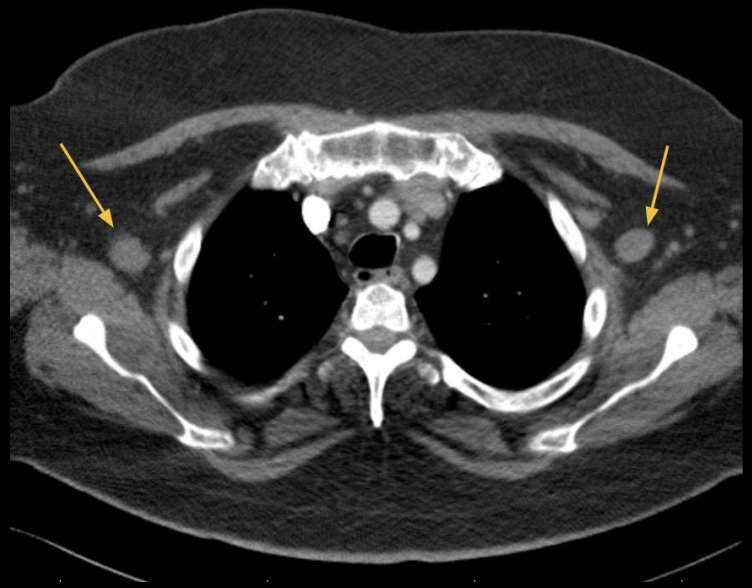


Axial CT through the aortic arch

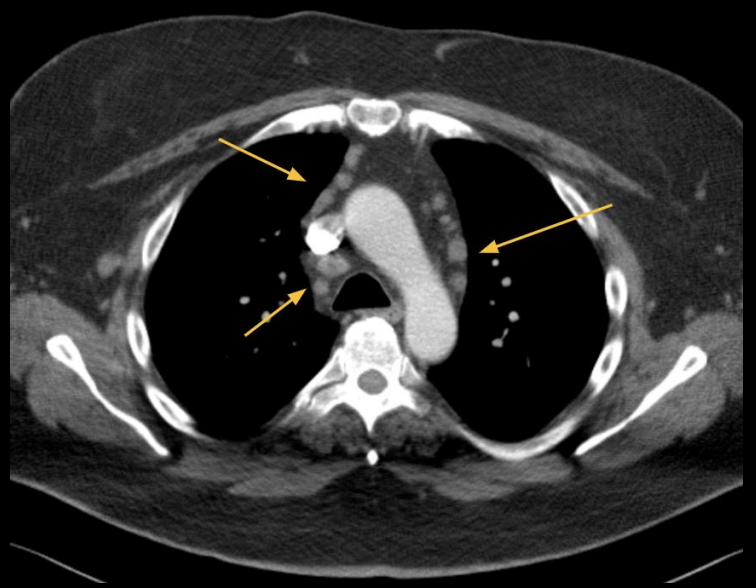


Axial CT through mid lungs

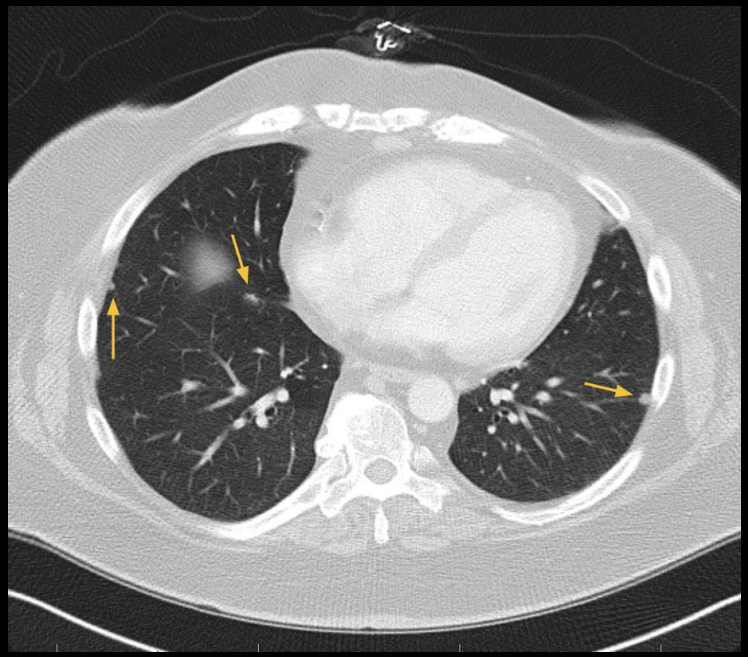
Findings: Chest CT (labeled)



Axial CT through the upper chest



Axial CT through the aortic arch



Axial CT through mid lungs

Multiple enlarged axillary, hilar, and mediastinal lymph nodes (left and middle images).
Multiple bilateral sub-6mm solid pulmonary nodules in perilymphatic distribution (for example subpleural and along the bronchovascular bundles).
Hilar lymphadenopathy and bilateral pulmonary nodules is suggestive of an immune reaction.

Findings: Liver Biopsy

- US Guided Liver Biopsy of LEFT hepatic lobe mass (9/1/23):
  - Path report of FNA/core biopsy revealed **non-necrotizing granulomas**, **associated giant cells**, and extensive bridging fibrosis on background background portal inflammation and macrovesicular steatosis.
  - Non-necrotizing granulomas and giant cells are a hallmark of sarcoidosis.

Final Dx:
Sarcoidosis

Sarcoidosis

Background

- Sarcoidosis is an immune mediated granulomatous disease with an unknown cause. The systemic inflammatory disease is characterized by TH1 CD4+ mediated non-caseating granulomas and most commonly affect the lungs, skin, and eyes.[7]

Epidemiology

- Black women are 3x more likely to be diagnosed than white women, have a more severe disease course, and have poor mortality.[1]
- Sarcoidosis is rare with around 27,000 new cases per year and less than 200,000 cases at any given moment in the US.[1]

Risk Factors

- More common in women than men
- African or Scandinavian descent
- Family history / genetics

Sarcoidosis

Clinical Presentation

- **General:** Fever, fatigue, night sweats, unexplained weight loss
- **Pulmonary**: Cough, dyspnea, wheezing
    - CXR: Hilary lymphadenopathy, pulmonary reticular nodules/infiltrates
- **Skin:** Erythema Nodosum
    - Can also be plaques, maculopapules, subcutaneous nodules
- **Eyes:** Uveitis, vision changes
- **MSK:** Joint pain, muscle aches
- **Labs:** Hypercalcemia, High ACE Levels (in pulmonary disease)
- **Can involve any body system**

Sarcoidosis

Diagnosis:

- Diagnosis of exclusion
- Helpful Tests: Chest CT, CXR, Eye Exam, Biopsy
  - Pulmonary Involvement: PFT, Endobronchial US guided transbronchial FNA
  - Cardiac/CNS Involvement: ECG, MRI,

Management:

- Corticosteroids: Prednisone, Cortisone
  - However long term use has numerous side effects.
- Immunosuppressants: Methotrexate, Azathioprine, Mycophenolate

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