# 58M with chronic liver disease, SOB, hypoxia

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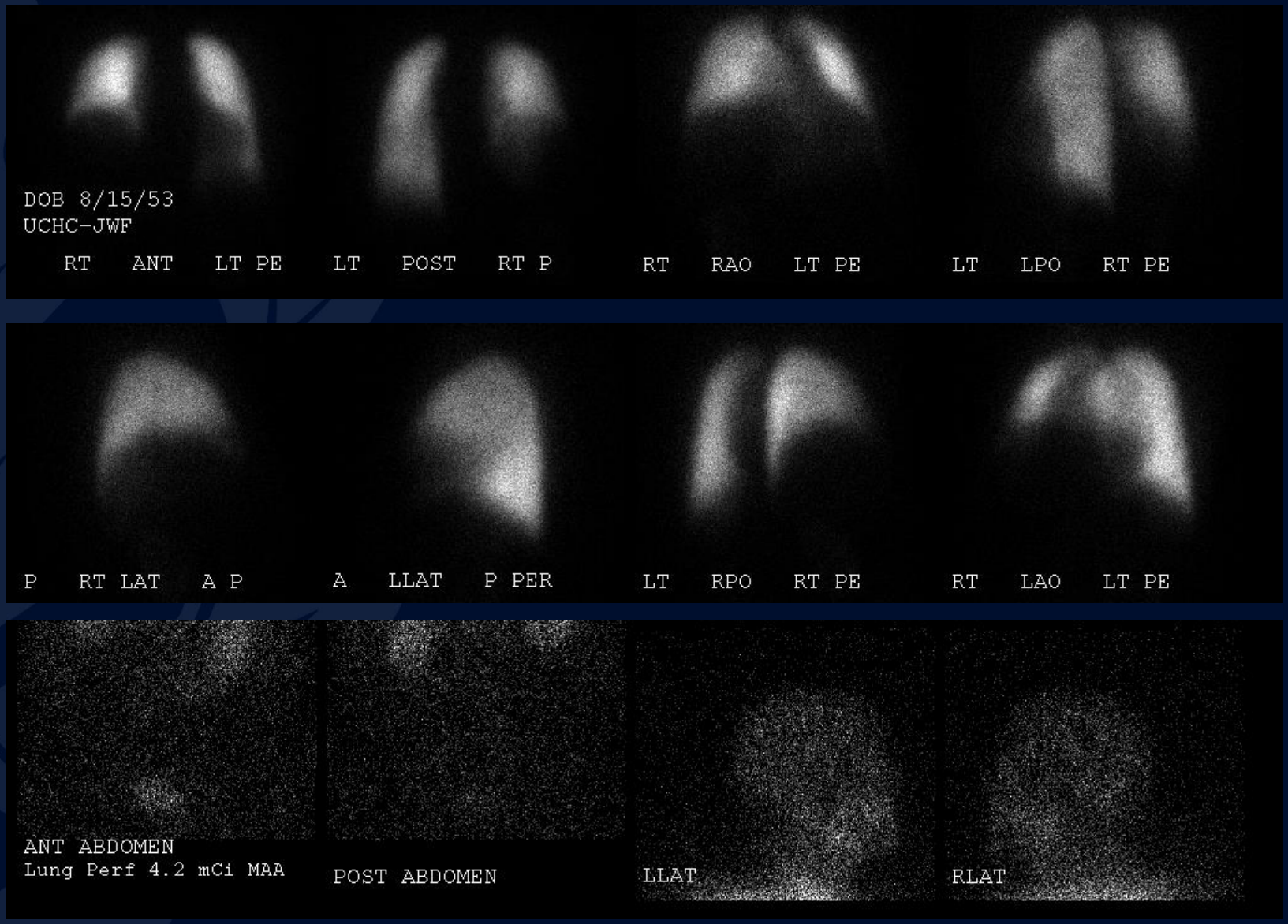


4.2 mCi Tc-99m MAA IV

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# Hepatopulmonary Syndrome (pulmonary-to-systemic shunting)

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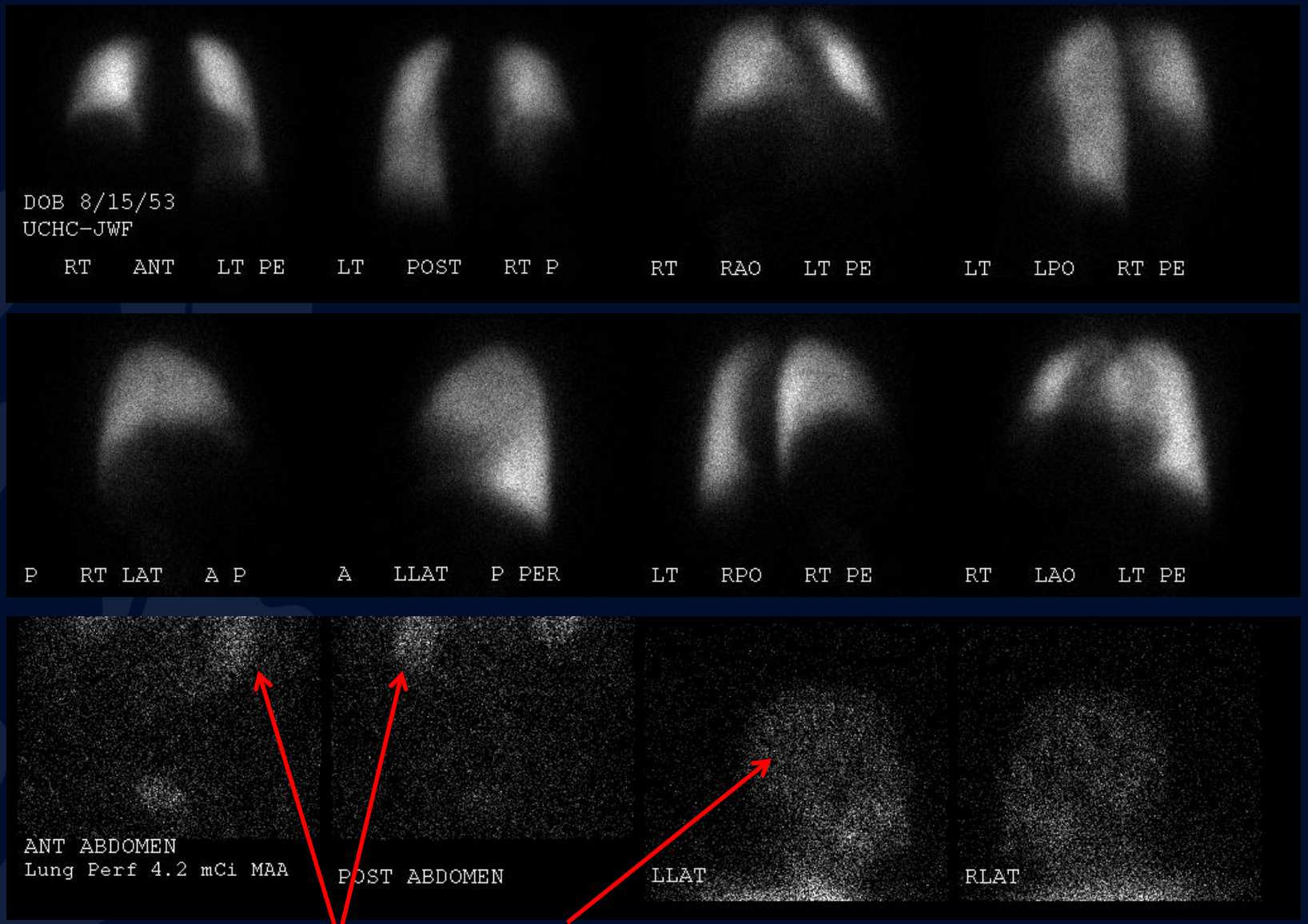
Normal lung perfusion




Uptake of radionuclide in the kidneys, brain, or both suggests shunting through the lung caused by an intrapulmonary shunt

Tc-99m MAA, 4.2 mCi, IV

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Using total lung radioactivity, correct for percentage of systemic circulation to the brain (20%)

~ 5% pulmonary-to-systemic shunting.

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# Hepatopulmonary Syndrome

Diagnosis facilitated by $^{99m}$Tc-MAA lung scan lung perfusion and brain uptake quantification:

- particles are efficiently trapped by the pulmonary capillaries such that normally only about 3% of the activity is seen outside the lungs

-Brain or kidney uptake indicates arteriovenous shunt (R-L shunt)

- R-L shunts develop in the lungs secondary to portal hypertension

*Probably due to increased levels of circulating vasodilators, likely nitric oxide

*Dilated precapillary and capillary vessels; pleural/pulmonary arteriovenous shunts, portopulmonary anastomoses

- Percentage R-L shunt is expressed as the fraction of perfusion reaching the body outside the lungs to the total body perfusion including the lungs

*Percentage brain uptake $\geq$ 6% is considered abnormal and suggestive of presence of an anatomic shunt in the lungs

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# Hepatopulmonary Syndrome

- Hepatopulmonary syndrome (HPS) triad:
  1. hepatic dysfunction (cirrhosis)
  2. hypoxemia (alveolar-arterial $O_2$ gradient of >15 mmHg; >20 mmHg in >64 years old patients)
  3. peripheral pulmonary arterial dilatation (due to right to left micro-shunts)
- Presentation: progressive dyspnea, cyanosis, clubbing in a patient with established cirrhosis
- Rx:
  - Mild to moderate: Observation ± oxygen
  - Severe HPS: Oxygen, liver transplantation

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# References


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2. Gerard P, Patel B, Ahmad N. "Head shunting": Nuclear medicine evaluation of hepatopulmonary syndrome: Diagnosis, evaluation and review. J Nucl Med May 2013 54:1246
3. Statdx


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