

SIO Case Spotlight

HCC Portal Vein Embolization

Tina Sankhla MD, PGY2

Nima Kokabi MD

Emory University School of Medicine

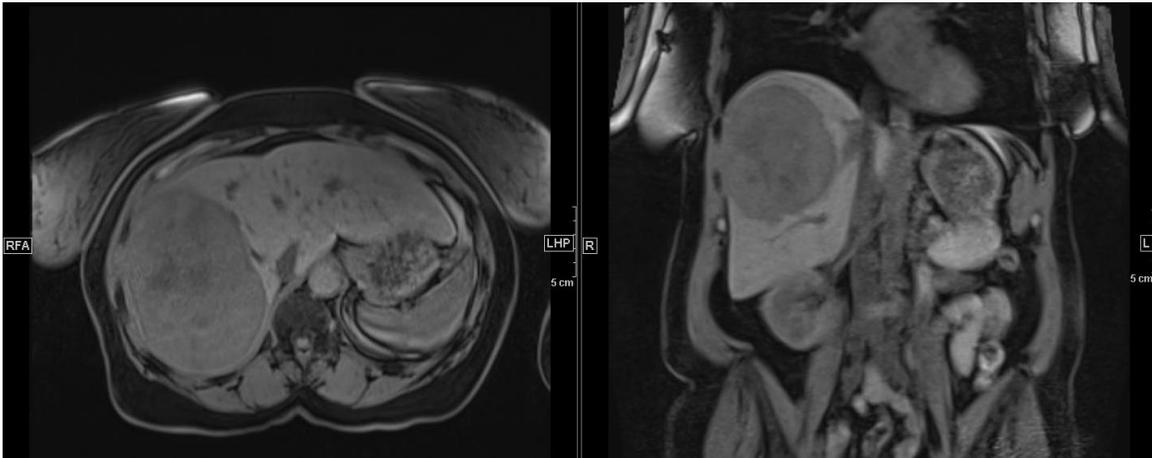
2019



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Patient Scenario

- 62 yo Female diagnosed with HCC and hepatitis C in 2017. She had a MRI in January 2018 that showed a large 13cm right hepatic lobe mass in segment 7/8 and a smaller 1.8cm right hepatic lobe mass in segment 5/6. She was originally referred to transplant clinic, but was deemed not to be a candidate for transplant given the size of her tumor. Referred to IR for evaluation for Y-90 treatment for tumor control and hypertrophy of future liver remnant prior to resection.
- Labs: Albumin 4.1, Tbili 0.4, AST 48, ALT 31



Shunt Study

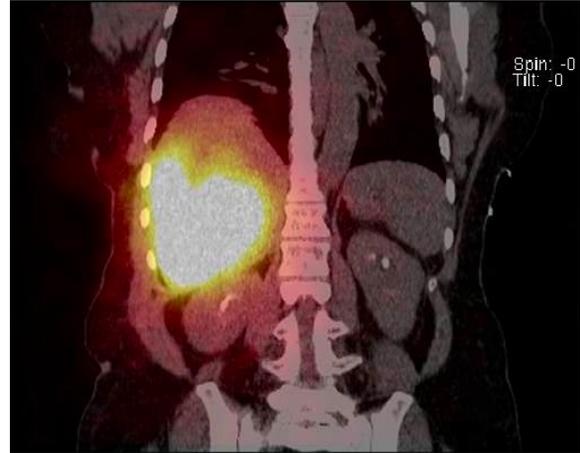
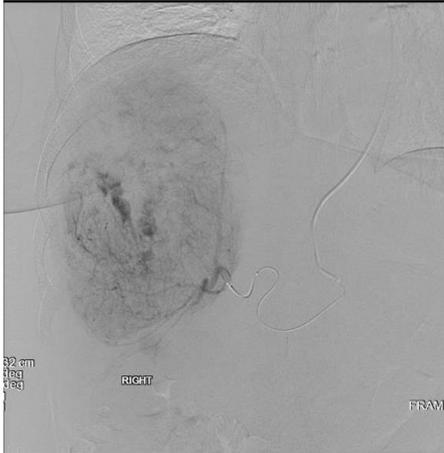
- Plan for radiation lobectomy of right hepatic lobe
- Shunt study for treatment planning on 1/30/2018
- Volume of liver to be treated: 1740 cc
- Estimated tumor burden in area to be treated: 58%
- Lung shunt fraction: 13%

Treatment Planning

- Plan to treat in two steps due to high lung shunt fraction
 - First treatment with target 70 Gy to liver
 - Plan for patient to return in 4 weeks for repeat shunt study
 - Second treatment with target 150 Gy to liver if lung shunt decreased

First Treatment

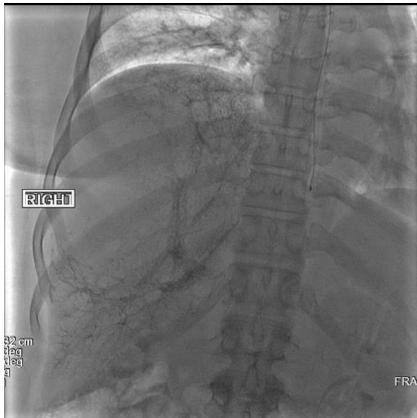
- 2/14/2018: Successful radioembolization of right hepatic artery using 76.8 mCi of Y-90 theraspheres



- 3/14/2018: Repeat shunt study shows lung shunt of 32.2%
 - High shunt fraction precludes further Y-90 at this time.

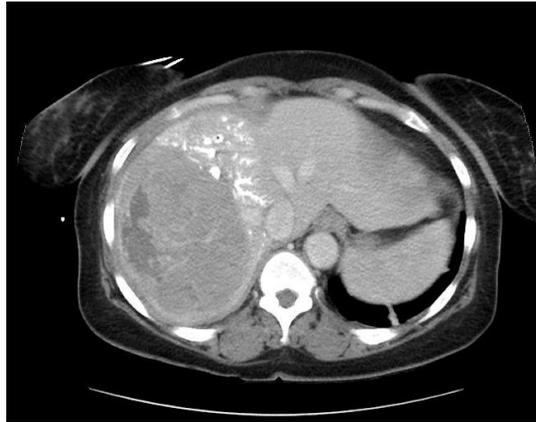
Right Portal Vein Embolization

- Patient discussed in multidisciplinary tumor board. Ultimate decision to proceed with surgical resection
- Plan for right portal vein embolization prior to surgery to promote hypertrophy of the left hepatic lobe
- 4/26/2018: Successful right portal vein embolization with STS foam. Maintained patency of left portal venous system.
- Plan to undergo SBRT of the right hepatic lobe and eventual right hepatectomy.



Follow-up

- 4/30/2018: Patient presents to ER with abdominal pain. MRI shows hypoenhancing liver tumor and hyperdense STS foam in the portal vein branches of right hepatic lobe.



- 5/14/2018: IR clinic visit, patient experiencing constant right abdominal pain, night sweats, and anorexia, consistent with post-embolization syndrome.
- 6/25/2018-7/9/2018: Patient underwent SBRT with cumulative 50 Gy dose to segment 7/8. Tolerated well. Post embolization syndrome symptoms improving.

Resection

- 9/11/2018: MRI shows continued decrease in size of treated right hepatic lobe lesions. Thrombosis of the entire right portal vein. Compensatory hypertrophy of left hepatic lobe.
- 10/30/2018: Surgical right hepatectomy.
- Other than post-op pain, patient doing well in follow-up visits. No evidence of recurrence on short interval follow-up scans.

Discussion

- To minimize risk of radioembolization related lung injury (RILI), a patient should not receive more than total lung dose of 50Gy in a lifetime or 30Gy in a single TARE treatment
- In cases where high shunt fraction would otherwise preclude TARE treatment, options exist to reduce the shunt fraction. Options include:
 - Bland/chemoembolization
 - Low dose radioembolization (as performed in this case)
 - Hepatic vein occlusion balloons
 - Embolization of collateral portosystemic outflow
- When employing any of these reduction techniques, it is crucial to re-assess the lung shunt with repeat Tc-99m MAA prior to TARE to confirm adequate shunt reduction. As in the presented case, response may not be as predicted.

References

Rose S and Hoh C. Hepatopulmonary shunt reduction using chemoembolization to permit yttrium-90 radioembolization. *Journal of Vascular and Interventional Radiology*. 2009;20(6)849-851.

Schiro BJ, Amour ES, Harnain C, Gandhi RT. Management of High Hepatopulmonary Shunts in the Setting of Y90 Radioembolization. *Techniques in Vascular and Interventional Radiology*. 2019;22(2):58-62. doi:10.1053/j.tvir.2019.02.004.

Ward TJ, Tamrazi A, Lam MG, et al. Management of High Hepatopulmonary Shunting in Patients Undergoing Hepatic Radioembolization. *Journal of Vascular and Interventional Radiology*. 2015;26(12):1751-1760. doi:10.1016/j.jvir.2015.08.027.