

Anomalous Celiac Trunk Variation Encountered in Y-90 Radioembolization

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Background:

Yttrium-90 microsphere embolization is a selective internal radiation therapy (SIRT) used in the treatment of hepatocellular carcinoma and liver metastases. Current literature recommends lobar, or more selective, infusion of SIRT to allow for precise radiation administration and to mitigate risk of non-target embolization. Lobar infusion requires knowledge of anatomical variations of hepatic arterial supply. The trifurcation of the celiac trunk into the left gastric artery, splenic artery, and common hepatic artery is the most common presentation representing 51% to 89% of patient anatomy. A replaced right hepatic artery (RHA) arising from the superior mesenteric artery (SMA) is one of the most common variants of hepatic arterial supply with a prevalence of 10.6% to 15%. Common variations such as these are well described and easily mapped using catheter angiography, but rarer variations are not as well described and more challenging to map.

Project Methods:

Mapping catheter angiogram of the celiac trunk and SMA was obtained. Additional aortogram and CT angiogram were obtained to further elucidate patient's anatomy.

Results:

Initial mapping angiogram was only partially successful because the RHA could not be selected. Abdominal aortogram and CT angiogram of the abdomen and pelvis revealed a replaced RHA arising directly from the distal celiac trunk. Additionally, the patient had a replaced cystic artery arising from the left hepatic artery and an arc of Buhler connecting the proximal SMA to the proximal aspect of the right hepatic artery.

Conclusion:

Radiologists need to be aware of rare variations in hepatic arterial supply for the safe and effective treatment of hepatic neoplasms, whether primary or metastatic. Description of arterial variation and informed selection of arterial branches will remain a critical aspect of improving efficiency and reducing risks of hepatic embolization procedures.