Portal vein embolization prior to right hepatectomy using sodium tetradecyl sulfate foam: technique and initial results

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Purpose: Portal vein embolization (PVE) prior to right hepatectomy (RH) has become an integral part of the treatment algorithm for patients with resectable liver tumors. Many techniques and embolic agents have been used for this procedure; however there is no consensus on the ideal agent. We evaluate the safety and efficacy of sodium tetradecyl sulfate (STS) foam as the sole embolic agent for right portal vein (RPV) embolization.

Materials and Methods: Over a 12 month period, PVE with STS foam was performed in 17 consecutive patients (15 male, 2 female; mean age 60) prior to undergoing RH. Tumor pathology included hepatocellular carcinoma (n = 11) and metastases (n = 7). Preoperative liver volume was performed with CT or MRI using a 3D workstation. Ipsilateral percutaneous RPV access was obtained in all patients and a 7F sheath was placed. A 14mm Python occlusion balloon (Applied Medical, Rancho Santa Margarita, CA) was inflated in the RPV just distal to the portal bifurcation. STS foam was prepared using the Tessari method with 3% STS. Foam was slowly injected through the sheath to fill the entire RPV. Mean volume injected was 43mL (range 30-65). This was left to dwell for 40 minutes. The balloon was then removed. Follow up venogram confirmed complete occlusion of the RPV and patency of the left portal vein (LPV). Future liver remnant (FLR) and total estimated liver volume (TELV) measurements were obtained with CT or MRI pre and post PVE. 30 day major and minor adverse events were evaluated.

Results: 100% technical success was demonstrated by complete occlusion of the RPV branches and continued patency of the LPV and its branches. Median hospital stay was 1 day. Mean time to followup imaging was 26d ± 12d. FLR volume increased 46.1% ± 24.2%. FLR/TELV ratio increased 13.1% ± 9.6%. There were no major or minor complications. Fifteen (88.2%) patients went on to RH. Two (11.8%) patients had progression of disease into the left hepatic lobe (LHL) during the follow-up period after PVE precluding RH. Mean time from PVE to RH was 52d ± 32.6d.

Conclusion: PVE with STS foam is safe and effective at achieving LHL hypertrophy prior to RH. Larger scale studies are needed to further demonstrate the efficacy of this technique.