Increased overall survival in a recent single-center cohort of patients treated with yttrium-90 (Y-90) resin microspheres for unresectable hepatocellular carcinoma

Jimmy Shah, Dr. Parvez Mantry, Dr. Rucha Shah, Dr. Islam Shahin, Dr. Alejandro Mejia, Elaina Vivian, Sarah Sheikh

MEDTHODIST DIGESTIVE INSTITUTE

AIM

We hypothesize that patients treated with SIR-Spheres yttrium-90 (Y-90) resin microspheres for unresectable hepatocellular carcinoma between April 2013 and March 2017 have increased overall survival (OS) than our previous reported retrospective study.

Background

Hepatocellular carcinoma (HCC) may be treated with surgical treatments such as resection, ablation and liver transplantation. For unresectable intermediate-stage HCC patients, selective internal radiation therapy (SIRT) is currently a treatment option.[1] SIRT also known as Radioembolization, is an intra-arterial catheter-based locoregional therapy administered by Interventional Radiologist to treat unresectable HCC.

SIRT with Y-90 resin microspheres contain radioactive isotope yttrium-90 which emits beta radiation. Once delivered, the microspheres largely remain in the tumors, minimizing the effects on surrounding healthy liver tissue. In a previous study of patients treated at our center from 2004 to 2013, the overall survival was 13 months. [2]

We are retrospectively examining a more recent cohort of patients to determine whether outcomes have improved from those we reported earlier and to further examine factors associated with the predictive response.

Description of the Research Project

Demographics, disease etiology and presentation, Y-90 treatment parameters, response, selected laboratory values, and OS were abstracted from the charts of patients with unresectable HCC treated with Y-90 SIRT at MDMC from April 2013 through March 2017 (n = 165). Patients with incomplete data (<20% of parameters available) were excluded.

The Model for End-Stage Liver Disease (MELD) score was calculated to measure mortality risk in patients with end-stage liver disease and also used as a disease severity index to help prioritize allocation of liver transplant. The MELD score ranges from 6 (less ill) to 40 (gravely ill). Response evaluation criteria in solid tumors (RECIST) criteria were used to evaluate a patient's response to the therapy. OS (from the first Y-90 SIRT treatment to death or last follow-up) was assessed with the Kaplan-Meier method.

Fig1 SIRT delivery of Y-90 microspheres to primary HCC [3]

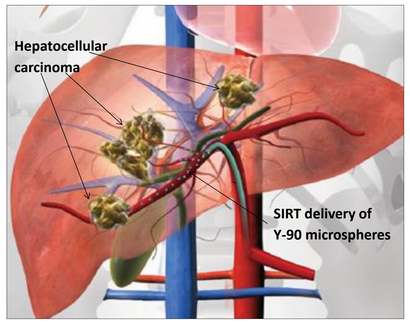
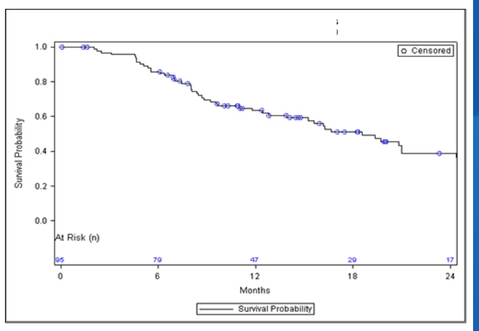


Fig2. Product-Limit Survival Estimates
Median OS months (95%CI): 18.57 (12.82, 24.36)



Results

To date, we have analyzed data from 95 patients with HCC who underwent 149 SIRT procedures. Most were male (74%) and white (63%). Hepatitis C was the most common etiology (57%), followed by nonalcoholic steatohepatitis (15%). Mean MELD score was 7.0 (SD 4.5). Most patients (55/95, 58%) had a single Y-90 SIRT treatment, 30 (32%) had 2 treatments, and 10 (11%) had >2 treatments; bilobar treatment was given in 2 sequential sessions and was considered 2 treatments. Best RECIST response was available for 73 patients and was complete response in 15 (21%), partial in 25 (32%), stable disease in 19 (26%), and progression in 14 (19%).

Median OS was 18.6 months (95% CI 12.8, 24.4). The presence of ascites (n = 32/80 patients with available data) was associated with shorter OS (9.6 vs. 21.0 months, P = .02), as was bilobar treatment (n = 48/93; 13.9 vs. 20.8 months for treatment of a single lobe, P = .046) and alcohol as an etiology (n = 13/95; 8.4 vs. 19.7 months, P = .02). Patients with subsequent liver transplant (n = 12/95) also had longer OS (26.8 vs. 16.2 months, P = .04). Survival decreased in patients with >1 SIRT treatment (12.8 vs. 26.1 months, P < .001), possibly because of more extensive (bilobar) disease at baseline. Albumin and total bilirubin levels were significantly higher at 1, 3, and 6 months after SIRT than at baseline; INR was significantly higher at 3 and 6 months.

Conclusion/ Next Steps

Survival in this analyzed subset of patients (18.6 months) was longer than in our previously reported cohort (13.1 months), possibly due to improvements in technique (especially the use of single-lobe and segmental SIRT) and patient selection over time. Future analyses will compare factors predicting survival between our current and previous cohorts and in the 2 cohorts combined.

References:

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3. Eric A. Wang, Scott R. Broadwell, Ross J. Bellavia, Jeff P. Stein (2017). Selective internal radiation therapy with SIR-Spheres in hepatocellular carcinoma and cholangiocarcinoma. Journal of Gastrointestinal Oncology; Vol 8, No 2.

Contacts:

Jimmy Shah, MHA, Data Manager, Methodist Digestive Institute, Methodist Dallas Medical Center: JimmyShah@mhd.com
Elaina Vivian, MPH, CPHQ, Quality and Outcomes Manager, Methodist Digestive Institute, Methodist Dallas Medical Center: ElainaVivian@mhd.com