success, time-to-stasis, complications, mortality, and splenectomy rates, by estimating rates and 95% confidence intervals. As a pilot study, we did not formally test for differences between groups.

**Results:** 46 of 50 eligible patients were enrolled (92%; CI:90-100%). Overall, splenic salvage was 98% (45/46; CI:94-100%) as one EC patient required splenectomy. Unrelated to pSAE, one patient in each group died within 30 days. Primary technical success was observed in 22 EC patients (96%; CI:87-100%) and 20 VP patients (87%; CI:73-100%). Bayesian analysis suggests a >80% probability that primary technical success is higher for EC. One patient randomized to EC (4%; CI:0-20%) and 2 randomized to VP (9%; CI:0-20%) required additional embolic agents (e.g., gelatin sponge slurry) to achieve secondary technical success. Time-to-stasis was 7.7 (CI:5.6-9.9) min. and 7.0 (CI:4.0-10.1) min. in the EC and VP groups, respectively. Two complications (one major and one minor) occurred in the EC group (9%; CI:0-20%) and one major complication occurred in the VP group (4%; CI:0-13%).

**Conclusions:** Randomized comparisons of endovascular devices used for pSAE after trauma are feasible. We observed no significant differences in outcomes between the two groups, but the trial was not powered for this purpose. High rates of splenic salvage make its use as a primary outcome in a future trial problematic. Consideration should be given to parameters such as primary technical success as a primary outcome for future trials.

**Abstract No. 109**

**Primary tumor location and genomic expression as predictive factors of survival outcomes in colorectal liver metastasis patients undergoing Y90: single-institution retrospective analysis of 45 patients**

N. Shah1, A. Borovik2, K. Shah3, A. Kardan4, M. Al-Natour5, J. Davidson6, S. Tavri7, 1University of Illinois Hospital, Chicago, IL; 2Case Western Reserve University School of Medicine Cleveland, OH; 3Case Western Reserve University/University Hospitals, Cleveland, OH

**Purpose:** Our goal is to investigate survival outcomes in CRLM patients undergoing Y90 therapy based on sidedness of primary tumor and genomic expression analysis.

**Materials and Methods:** IRB-approved single-institution retrospective analysis of CRLM patients who underwent Y90 between January 2010 to December 2019 was performed. Demographic factors, time interval between diagnosis and Y90, primary tumor location in colon and genopathologic data, chemotherapy regimens prior to Y90 were evaluated. Survival outcomes were compared between different groups with statistical analysis.

**Results:** 45 CRLM patients (13 female, 32 male) with a median age of 65 years underwent Y90. There was no significant difference in the time interval between initial diagnosis and Y90 therapy between the Right-sided primary (RSP, n = 24) and Left-sided primary (LSP, n = 21) groups (35.4 months vs 27.6 months, respectively, P = 0.3). RSP and LSP had a median overall survival (OS) of 33.3 months and 31.1 months, respectively, from initial diagnosis (P >0.05). RSP and LSP survival post Y90 was 6.3 months and 6.8 months, respectively (P >0.05). Although there was no statistical difference, negative correlation was noted between the time interval from diagnosis to Y90 and survival after Y90 for both RSP (r = -0.2, P = 0.4) and LSP (r = -0.12, P = 0.63). The OS was 38.2 months when Y90 was utilized after second-/third-line chemotherapy versus 39.2 months when it was used after salvage therapy (P = 0.6). Genetic expression data analysis showed a significantly higher mutant KRAS expression in RSP (n = 13/21) versus LSP (n = 5/24) (P<0.01) while there was no significant difference in wild-type KRAS, NRAS, BRAF, p53 and HNPCC expression (P >0.05). OS was significantly higher in patients with wild-type KRAS (45.1 months) versus mutant KRAS (30.3 months) (P = 0.01).

**Conclusions:** Our study shows RSP CRLM patients have higher mutant KRAS expression compared to LSP patients and the OS is significantly lower in patients with mutant KRAS expression. Negative correlation between time interval from diagnosis to Y90 and survival after Y90 was noted, albeit not statistically significant.

**Abstract No. 110**

**Trans-arterial embolization of renal cell carcinoma: a systematic review and meta-analysis**

B. Wright1, B. Johnson1, A. Saidian2, S. Rais-Bahrami2, M. Vassar3, A. Gunn4; 1Oklahoma State Center for Health Sciences, Tulsa, OK; 4UAB Division of Urology, Birmingham, AL; 3University of Alabama at Birmingham, AL

**Purpose:** To evaluate if trans-arterial embolization (TAE) of the primary tumor in patients with renal cell carcinoma (RCC) improves oncologic outcomes such as progression-free survival (PFS) and overall survival (OS) or symptomatology such as pain and hematuria

**Materials and Methods:** The systematic review search included PubMed, Ovid/MEDLINE, and Embase for full text English articles including randomized and non-randomized prospective trials as well as prospective and retrospective case series. To be included, prospective trials needed ≥25 patients in each arm while case series and retrospective chart reviews required at least two patients. Evaluated outcomes included PFS, OS, change in tumor size, improvements in pain, improvements in hematuria, and adverse events (AEs).

**Results:** 1,327 articles were retrieved and screened. 9 studies met inclusion criteria (retrospective case series, n = 8; non-randomized prospective trial, n = 1) which included 237 patients (M = 156 (65.8%); F = 56 (23.6%); gender unreported = 25 (10.5%); mean age: 69.4 (range: 38-87)) with a mean tumor diameter of 9.3 cm (5.2-10.5). When reported, the TNM stages were stage I (n = 10), II (n = 18), III (n = 36), and IV (n = 121). Median OS ranged from 1-39 months but only one study reported PFS (10.5 months). One study demonstrated a statistically significant improvement in OS with TAE (P = 0.02). A reduction in tumor size was only achieved in 17 patients limiting evaluation. 60 patients had pain and hematuria. After TAE, pain improved in 59 patients (98.3%) and hematuria improved in 57 patients (95%). A meta-analysis for improvements in pain and hematuria demonstrated an event rate of pain improvement of 0.952 (0.788-0.990; P < 0.001) and an event rate for hematuria improvement of 0.923 (0.809-0.971; P < 0.001). AEs included: fever (n = 115), flank pain (n = 72), nausea (n = 58), hematuria (n = 12), hypertension (n = 12), reduced GFR (n = 6), hematoma (n = 6), and ileus (n = 3).

**Conclusions:** TAE of the primary tumor in patients with RCC improves symptomatology such as pain and hematuria, has an acceptable safety profile, and may have benefits to OS. TAE of the primary tumor should be utilized more frequently in patients with RCC, although further studies are needed to better assist in patient selection.