

Table. ACS, Original, and Validation AUC Values, Selected Outcomes

Postoperative outcome model	AUC values			
	ACS	Novel (original)	Bootstrap validation	Cross validation
Urinary tract infection	0.637	0.821	0.859	0.866
Surgical site infection	0.546	0.824	0.830	0.867
Discharge to nursing/rehab	0.588	0.859	0.864	0.771

CONCLUSIONS: Patient populations and their risks are unique to surgical centers, therefore volume-stratified and customized predictive models are ideal. Using predictive and validated models for PD allows accurate, patient-specific delivery of care.

Predictors of Critical Care-Related Complications after



Pancreatoduodenectomy: Analysis of the ACS-NSQIP Database

Valery Vilchez, MD, Colin O'Rourke, Roberto Gedaly, MD, FACS, Gareth Morris-Stiff, MBCh, MD, MCh, PhD, FRCS
Cleveland Clinic Foundation, Cleveland, OH

INTRODUCTION: The objective was to identify specific preoperative and operative risk factors for the development of critical care related complications (CCC) in patients undergoing pancreatoduodenectomy (PD).

METHODS: ACS-NSQIP public use files were queried from 2008 to 2014. Selected cases with the primary procedure code as PD were analyzed. Primary end-points were CCC including prolonged ventilation (>48h), septic shock, renal failure/progressive renal insufficiency, cardiac arrest/AMI, and pulmonary embolism (PE).

RESULTS: A total of 20,412 patients underwent a PD during the study period. Mean age was 64±12 years and 48% were female. The most common CCCs were prolonged ventilation (5%) and septic shock (4%). Mean operative time (OT) was 371.21±133.77 minutes. Mean total length of stay was 12.7±10 days. Readmission rate starting from 2011 was 16%. On Wilcoxon's rank test, predictors of prolonged ventilation and septic shock included age, female sex, BMI, ASA Class I-II, preoperative bleeding disorders, steroid use, dyspnea, preoperative albumin, creatinine and sodium plasma levels; and OT (p<.001). Age, black vs white race, diabetes, preoperative albumin levels, and OT were found to be predictors of LOS in this population. BMI and preoperative total bilirubin levels were the more potent predictors of 30-day readmission rate.

CONCLUSIONS: CCCs are present in 1% to 5% of patients undergoing PD. Independent predictors of CCCs included age, female sex, ASA Class, BMI, laboratory values (albumin, creatinine and sodium plasma levels), and operative time. Identification of high-risk patients is warranted to allow prehabilitation which in turn should lead to improved postoperative outcomes including reduced CCCs.

Radiofrequency Ablation Combined with Hepatic Resection for Colorectal Liver Metastasis: Biology Dictates Long-Term Outcomes



Kazunari KS Sasaki, MD, Georgios Antonios Margonis, MD, PhD, Yuhree Kim, MD, MPH, Ana Wilson, Faiz Gani, MBBS, Neda Amini, MD, Timothy M Paulik, MD, MPH, PhD, FACS
Johns Hopkins Hospital, Baltimore, MD

INTRODUCTION: The concurrent use of surgery and radiofrequency ablation (RFA) has been proposed as an effective treatment modality for patients with unresectable colorectal liver metastasis (CRLM). We sought to identify factors associated with long-term survival after the use of RFA plus hepatic resection vs resection alone among patients undergoing surgery for CRLM.

METHODS: Four hundred eighty-five patients undergoing a curative-intent hepatectomy between January 2003 and April 2015 were identified. Multivariable Cox proportional hazards regression was used to identify risk factors associated with overall survival (OS); stratified analyses were performed based on preoperative risk factors.

RESULTS: At surgery, 86 (17.7%) patients underwent RFA plus hepatic resection while 399 (82.3%) underwent hepatic resection alone. Patients undergoing RFA plus hepatic resection were more likely to present with a greater number of metastatic lesions (5 vs 2; p<0.001) and bi-lobe disease (84.9% vs 29.1%; p<0.001). Overall 5-year survival was 53.8%; patients undergoing RFA plus hepatic resection had a worse OS (HR=1.82, 95% CI:1.32-2.51; p<0.001). Among patients undergoing RFA plus resection, CEA>30 (HR=2.33, 95% CI: 1.13-4.81), primary tumor nodal metastases (HR=2.32, 95% CI: 1.16-4.64), and the presence of KRAS mutation (HR=2.64, 95% CI:1.36-5.14) were associated with a worse OS (all p<0.05). When stratified by a risk score incorporating these 3 factors (low: 0-1 risk factors vs high: 2-3 risk factors), low-risk patients who underwent RFA plus hepatic resection had comparable OS compared with patients who underwent hepatectomy alone (HR=1.23, 95% CI: 0.82-1.83; p=0.323). In contrast, high-risk patients undergoing RFA plus hepatic resection had a markedly worse OS vs patients who had hepatectomy alone (HR=4.72, 95% CI: 2.97-7.46; p<0.001).

CONCLUSIONS: While RFA was associated with a worse OS among the entire cohort, patients who had a low-risk profile and were treated with RFA had a similar long-term outcome compared with patients who underwent hepatic resection alone.

Recurrence Patterns after Irreversible Electroporation for Hepatic Metastases



Russell C Langan, MD, Debra A Goldman, Michael I D'Angelica, MD, Ronald P DeMatteo, MD, FACS, Peter J Allen, MD, FACS, Vinod P Balachandran, MD, William R Jarnagin, MD, FACS, TP Kingham
Memorial Sloan Kettering Cancer Center, New York, NY

INTRODUCTION: Proximity to major vasculature or bile ducts remains an impediment to thermal ablative-therapies. Irreversible electroporation (IRE) has emerged as a novel, safe ablative-therapy for peri-vascular lesions. However, there remains a paucity of data on long-term outcomes.

METHODS: A retrospective review of a prospectively maintained hepatic resection database identified patients who underwent microwave (MWA), radiofrequency (RFA), or IRE ablation (2008-2015). Oncologic outcomes were classified as local hepatic/ablation zone recurrence (LR). Cumulative incidence (CumI) of LR was calculated and competing risks regression assessed factors associated with IRE LR.

RESULTS: One hundred seventy-four patients had 331 lesions ablated (IRE 77/331, MW 127/331, RFA 127/331). The majority of lesions were of colorectal origin (94%). Median tumor sizes were IRE-1.3cm (range 0.5 - 6), MWA-0.5cm (range 0.5 - 5.6) and RFA-1cm (range 0.5 - 5). Majority of patients (89%) received systemic therapy prior to ablation. Majority of IRE lesions (69/77, 90%) were <5mm from hepatic veins or portal pedicles. LR CumI were 13% following IRE (95% CI: 7.8 -22.2%; median follow-up 25.7 months), 7% (95% CI: 3-13%, median follow-up 18 months) after MWA and 21% (95% CI:15-29%, median follow-up 31 months) after RFA. IRE median time to LR was not reached and no LR occurred after 18 months. Variables associated with IRE-LR are depicted in table.

Table.

Selected variables of IRE local recurrence	HR	95% CI	p Value
Ablation zone size, cm	1.6	[1.1 - 2.2]	0.0093
BMI	1.2	[1.1 - 1.3]	0.0001
Pre-IRE bilirubin	6.2	[0.9 - 43.9]	0.07
Other procedures performed (yes vs no)	0.3	[0.1 - 1.1]	0.06
Close to bile duct (yes vs no)	1.5	[0.4 - 5.0]	0.54
Close to major vasculature (yes vs no)	0.7	[0.1 - 4.0]	0.71
Tumor size, cm	1.4	[0.9 - 2.1]	0.17
Age at surgery, y	1.0	[0.9 - 1.0]	0.08
No. of treatments per lesion	1.3	[0.9 - 2.0]	0.17

CONCLUSIONS: IRE had similar rates of LR when compared to thermally ablated lesions. Associated factors of IRE-LR included ablation zone size and BMI. IRE may be a beneficial ablative-therapy for lesions in anatomic locations precluding thermal ablation.

Single-Incision Laparoscopic Cholecystectomy with the Use of Magnetic Instruments: A Comparison with the Gold Standard

Gabriel Garnica, MD, Daniel Arreola, MD, Rafael Contreras Ruiz Velasco, MD
ABC Medical Center, Mexico City, Mexico



INTRODUCTION: As is the nature of surgeons, we are continually improving techniques and technology that in turn may improve patient outcomes and experience. We evaluated the feasibility of single port laparoscopic cholecystectomy with the use of magnetic instruments (SLMC) compared with the conventional multiport laparoscopic cholecystectomy (CLC).

METHODS: A retrospective review of patients undergoing SLMC over a 5-year period was performed. A cohort of CLC patients over the preceding 5 years was used as historic controls. Demographics, operative data, complications, and cost were compared. Demographics and clinical characteristics were evaluated using the chi-square or Fisher exact test for categorical data and the Student t-test and Mann Withney U test for continuous variables; $p < 0.05$ was accepted as statistically significant.

RESULTS: From 2010 to 2015, 71 patients underwent SLMC and 70 underwent CLC. Mean age was 36.8 years for the SLMC patients and 43.7 years for the CLC ($p = 0.010$). There were no differences in others demographics variables. There was no difference in conversion rate between SLMC and CLC (0 vs 1%, $p=0.49$). Mean operative time for SLMC was greater compared with CLC (81.3 vs 92.0 min, $p=0.102$). No significant differences were noted in narcotics used. Postoperative complications rates were higher in CLC (5.7 vs 1.4 $p = 0.76$). Total cost was greater in CLC group (\$4705 vs \$1882, $p = < 0.0001$).

CONCLUSIONS: SLMC can be safely performed. Although further study is warranted, initial results indicate that may offer the most benefit in cost for outpatient procedures.

Surgical Referral Patterns for Colorectal Liver Metastases: A Multistate Survey



Isaac Payne, DO, Daniel R Freno, MD,
Sandra L Wong, MD, FACS, Marcus Tan, MBBS, FACS
University of South Alabama, Mobile, AL,
Dartmouth-Hitchcock Medical Center, Lebanon, NH

INTRODUCTION: Colorectal cancer rates in the southern United States remain above the national average. Metastatic disease, most commonly to the liver, is the leading cause of mortality for these patients. Despite improved long-term survival with the resection of colorectal liver metastases (CLM), nationwide studies have suggested that liver resection is under-utilized with wide variation in surgical referral patterns for CLM.

METHODS: We surveyed medical oncologists throughout the tristate area of Alabama (AL), Mississippi (MS), and the Florida panhandle (FLP) regarding their practice patterns in referring patients with CLM and what characteristics (clinical and tumor-associated) they considered contraindications to liver resection.

RESULTS: Sixty percent of oncologists reported they had no liver surgeons in their area. Commonly perceived contraindications to liver resection included >4 metastases (65.1%), extrahepatic metastases (63.5%), bilateral liver disease (55.6%), and metastases larger than 5cm (42.9%). High-referring physicians were as likely as