

ferred lower risk of death within 1 year (adjusted relative risk, 0.693; bootstrapped 95% CI, 0.687–0.697).

CONCLUSIONS: Among individuals with early readmission, return to the hospital of primary procedure is associated with lower mortality following gastric cancer resection. Emphasis on achieving functional disposition on discharge, standardized practices as reflected in accreditation, and greater continuity of care may aid in attaining better outcomes in cancer surgery.

Indocyanine green dye excretion in bile reflects graft function after living donor liver transplantation

Susumu Eguchi MD, PhD, FACS, Mitsuhsa Takatsuki MD, PhD, Kosho Yamanouchi MD, PhD, Masaaki Hidaka MD, PhD, Akihiko Soyama MD, Tetsuo Tomonaga MD, Kamohara Yukio MD, PhD, Yoshitsugu Tajima MD, PhD, FACS, Takashi Kanematsu MD, PhD, FACS
Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

INTRODUCTION: Indocyanine green (ICG) excretion in bile has been reported to be a unique parameter for assessing preoperative liver function in biliary drainage patients by reflecting adenosine triphosphate levels in the liver. To explore this novel indicator of graft function in the partial liver, we tested ICG excretion in bile.

METHODS: Of 37 consecutive adult patients who underwent liver transplantation between 2005 and 2007, 32 patients who received duct-to-duct biliary reconstruction were studied (median age, 53 years; right-left 19:13 graft volume/standard liver volume, 46%). One week and 3 months after living donor liver transplantation (LDLT), an ICG injection test (0.5 mg/kg) was performed, and ICG concentrations in bile were measured before the test and at 30, 120, and 360 minutes.

RESULTS: Changes in the ICG concentration in bile showed 2 distinct patterns. Type I (n = 24) showed a steep peak within 2 hours and returned to baseline within 6 hours, while type II (n = 8) showed a low peak of less than 1 micromol/L during the 6-hour observation period. Aged donor and right posterior sector graft were significantly associated with types of ICG excretion in bile. Type II patients had prolonged jaundice after LDLT, but 75% changed to type I after 3 months over liver recovery.

CONCLUSIONS: ICG excretion in bile is correlated with donor age and the type of the graft and can not only reflect graft function, but also predict prolonged jaundice after LDLT. It was also demonstrated that ICG excretion in bile returns to normal patterns 3 months after liver regeneration.

MK2 inhibitor peptide reduces adhesion formation without affecting colonic anastomotic healing

Sandra L Kavalukas MPA, Arti R Uzgare PhD, Abyssa Panitch PhD, Brian C Ward BS, Adrian Barbul MD, FACS
Sinai Hospital of Baltimore, Baltimore, MD

INTRODUCTION: Adhesions are a major clinical and economic problem that is incompletely understood. Mitogen-activated protein

kinase activated kinase (MAPKAP-K2 [MK2]) controls gene expression at transcriptional and posttranscriptional levels as well as cytoskeletal architecture and, as such, may play a role in the healing response. Herein, we examined the effect of a novel MK2 inhibitor in modulating adhesion formation during colon anastomotic healing.

METHODS: 40 male SD rats underwent sigmoid anastomosis. Controls (n = 20) had normal saline (5 mL) applied topically over the anastomosis and viscera; experimental animals (n = 20) were treated with the MK2 inhibitor YARAAARQARAKALARQLGVA (100 microM/5 mL) applied in the same manner. 10 animals/group were sacrificed on POD 4 or POD 10. Adhesions were graded for extent and tenacity. Anastomotic bursting pressure and hydroxyproline content were also determined. 12 SD rats treated similarly were sacrificed at 12, 24, and 48 hours, and peritoneal fluid was aspirated and analyzed for inflammatory cytokines.

RESULTS: Peptide treatment reduced adhesion formation on POD 4, but this was not statistically significant. On POD 10, the peptide group had significantly fewer adhesions (p=.002). Anastomotic bursting pressure and OHP content did not differ at any time point. Analysis of the peritoneal fluid revealed a 2.5- to 5-fold up-regulation of MIP-1-alpha and MIP-3-alpha at 12 hours, while CINC 2 and 3, IL-1 alpha, and CNTF were decreased 2.5- to 3-fold at 24 hours following peptide treatment.

	POD 4			POD 10		
	Control	Peptide	p	Control	Peptide	p
Adhesion score	4.7 ± 0.4	4.1 ± 0.3	NS	6.0 ± 0.3	3.8 ± 0.4	0.002
Bursting pressure	96.3 ± 32.2	85.6 ± 13.3	NS	174.5 ± 26.6	191 ± 28.6	NS
OHP content	2,678 ± 474	2,055 ± 183	NS	4,980 ± 204	5,284 ± 218	NS

CONCLUSIONS: A new cell-permeant drug that inhibits MK2 is effective in inhibiting adhesion formation in vivo without impairing colon healing. Cytokine analysis of peritoneal fluid demonstrates modulation of postinjury inflammatory cytokines.

NOTES perforated viscus repair is feasible and requires lower peritoneal pressures than laparoscopy in a porcine model

Erica A Moran MD, Christopher J Gostout MD, Juliane Bingener MD
Mayo Clinic, Rochester, MN

INTRODUCTION: Procedure-related complications contribute to 1-year mortality in patients with perforated ulcers. This IACUC-approved study investigated whether natural orifice transluminal endoscopic surgery (NOTES) offers a new approach.

METHODS: Swine were randomized to laparoscopic or NOTES repair. Gastric perforations were created laparoscopically, followed by 4 hours' waiting time. After saline irrigation, repair proceeded with a laparoscopic or NOTES omental patch. For NOTES repair, an endoscope was advanced through the perforation; omentum was grasped with biopsy forceps, pulled into the gastric lumen, and fixed

to the mucosa with clips. Procedure times, Veress needle pressures, and clinical parameters were recorded.

RESULTS: NOTES repair failed in 1 animal (technical failure); repair was completed laparoscopically, data were analyzed as intention to treat. Specific NOTES repair time (minutes) was comparable with laparoscopy time (36 vs 46; $p = 0.2$). Mean total procedure time (minutes; set-up, irrigation, repair) for NOTES was longer than for laparoscopy (excluding trocar placement) (132 vs 76; $p = 0.002$). The mean abdominal pressure (mm Hg) required to complete NOTES repair was lower than laparoscopic (4 vs 12; $p < 0.001$). Of 23 animals, 19 thrived until necropsy at 2 weeks. Three animals (1 laparoscopic, 2 NOTES) died of airway compromise in recovery; 1 NOTES animal failed to thrive on POD 7. No intraabdominal cause of death was found. At necropsy, all repairs were intact.

CONCLUSIONS: Endoscopic ulcer repair appears technically feasible with lower required pneumoperitoneal pressures. This may be advantageous in critically ill patients. Evaluation of feasibility in humans appears warranted.

Operative findings do not predict the development of intraabdominal abscess after appendectomy

Patrick L Wagner MD, Soumitra R Eachempati MD, Ronald Brooks MD, Frederic Pieracci MD, Jian Shou MD, Philip S Barie MD, MBA, FACS
Weill Medical College of Cornell University, New York, NY

INTRODUCTION: Several factors are believed to contribute to postoperative intraabdominal abscess (IAA) after appendectomy. We hypothesized that operative findings, rather than patient clinical parameters, laboratory or radiology results, appendectomy technique, or surgeon, would be most predictive of subsequent IAA.

METHODS: Retrospective review of 1,425 consecutive appendectomies performed for suspected acute appendicitis in a single institution (2000–2006) was performed. Intraoperative findings for each case, including position of and gross appearance of the appendix, presence and character of free fluid, and presence of perforation, were derived from operative reports. Patient demographics, history and physical examination findings, laboratory values, computed tomography (CT) findings, ASA score, surgeon, appendectomy technique, pathology, and antibiotic use were also recorded. Statistics: Fisher exact and Student t tests; multivariable logistic regression analysis; $p < 0.05$.

RESULTS: IAA developed in 57 patients (4.0%). Factors associated with IAA by univariate analysis are listed in the Table; IAA was not associated with any of the intraoperative factors noted during surgery or with surgeon identity or technique of appendectomy. By multivariable analysis, factors independently associated with IAA were as follows: ASA score >1 (likelihood ratio, 3.7; 95% confidence interval [CI], 1.6–18.6); higher admission temperature (1.16 [1.13–1.20]); rebound/guarding (3.0 [1.3–7.0]); palpable mass on physical exam (5.8 [1.5–21.0]); abscess by CT (3.5 [1.0–11.9]); appendicolith by CT (3.7 [1.7–8.0]); and use of more than 3 doses of IV antibiotics postoperatively (2.8 [1.2–6.6]).

Variable (Univariate Analysis)	No Abscess	Abscess	P
Mean age (y)	36 ± 18	43 ± 21	.004
ASA score >1 point	46%	68%	.003
Temperature on admission (°C)	37.1 ± 0.3	37.3 ± 1.0	.001
Rebound or guarding on physical exam	39%	54%	.020
Palpable mass on physical exam	10%	23%	.007
WBC count ($\times 10^3$ /dL)	12.0 ± 4.8	14.6 ± 4.1	.008
Abscess by CT	3%	15%	.007
Extraluminal air by CT	3%	12%	.020
Appendicolith by CT	2%	48%	.001
Histologic perforation	6%	25%	.0001
>3 doses postoperative antibiotics	20%	39%	.002

CONCLUSIONS: Patient characteristics, physical findings, and radiographic features predict the development of IAA after appendectomy, whereas operative findings and technique of appendectomy do not.

Roux-en-Y gastric bypass (RYGB) alters intestinal glucose transport

Derek M Culnan MD, Qinghe Meng MD, Mingjie Sun MD, Ming Pan MD, PhD, Christopher J Lynch PhD, Charles H Lang PhD, Robert N Cooney MD, FACS
Penn State University College of Medicine, Hershey, PA

INTRODUCTION: Improvements in type 2 diabetes (T2DM) after RYGB occur prior to weight loss and are hypothesized to be due to endocrine sequelae of altered gastrointestinal anatomy. The current study examines the effects of RYGB on intestinal glucose transport and metabolism.

METHODS: Two groups of obese Zucker rats were studied: RYGB and sham surgery pair-fed (PF). Segments of small intestine (biliopancreatic, Roux limb, and common channel) were harvested, and brush border membrane vesicles (BBMVs) were isolated on postoperative day (POD) 28. Glucose transporter activity, sodium-dependent glucose transporter-1 (SGLT1), glucose transporter type 2 (GLUT2), phosphoenolpyruvate carboxykinase-cytosolic (PEPCK-C)/glucose 6-phosphatase (G6Pase) mRNA, and protein levels were measured using ^3H -glucose, Northern and Western analysis. Data are mean \pm SE; $n = 8$ per group; statistical significance, $p < 0.05$ v. PF by Student t test.

RESULTS: RYGB decreased glucose transport activity in the Roux (40%) and common channel (50%) limbs compared with PF rats. SGLT1 mRNA and protein levels were significantly decreased in the Roux and common channel segments, whereas GLUT2 protein was increased. There were no changes in transporter activity or expression in the biliopancreatic limb. Expression of the rate-limiting gluconeogenic enzymes PEPCK-C and G6Pase was significantly decreased in all segments compared with PF rats.