Survival found with increasing CD4⁺ cell levels. Patients were also divided into groups with high (n = 26) and low (n = 27) levels of CD3⁺ using median expression as a cutoff. Median survival was 20.5 and 18.8 months, respectively, and the 5-year survival estimate was 18.0 months (95% CI, 6.0-35.1 months) and 5.56 months (95% CI, 0.5-2.6 months), respectively. A similar analysis was performed for those with high (n = 22) and low (n = 22) levels of postoperative circulating monocytes. Median survival was 25.3 and 21.6 months, respectively; 5-year estimate of survival, 21.3 months (95% CI, 4.7-45.9 months) and 9.5 months (95% CI, 0.9-31.1 months), respectively.

Multivariate Cox proportional hazards regression was performed using clinicopathologic and immunohistochemical information. Initially, all variables significant on the univariate analysis were included, and subsequently nonsignificant variables were removed in a stepwise fashion until the final model was generated. American Joint Committee on Cancer stage, CD3⁺ tumor infiltrate, lymphovascular invasion, and postoperative circulating monocytes remained significant (Table 2).

Discussion | Only a subgroup of patients with pancreatic cancer presented with malignant neoplasms that are eligible for surgical resection, and these are skewed toward early-stage disease. Within our study population and within the immune cell types studied, preoperative analysis of peripheral lymphocytes was not associated with survival and was not reflective of the intratumoral immune infiltrate. However, higher levels of tumor-infiltrating CD3⁺ T cells and higher postoperative circulating levels of monocytes were associated with an improved prognosis. These data suggest that, although peripheral blood immunocytes do not reflect the immune environment of the tumor, consideration of the systemic immune response during recovery from resection may be of value. Our data suggest a possible role for the patient’s immune response on the outcome of pancreatic tumor resection and that interventions that change the tumor immune environment and the systemic response in the postresection period could influence patient outcomes.

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PACIFIC COAST SURGICAL ASSOCIATION
Association of Early vs Delayed Cholecystectomy for Mild Gallstone Pancreatitis
With Perioperative Outcomes

Gallstones are the most common cause of acute pancreatitis in the United States.¹⁻⁵ The timing of cholecystectomy among patients with mild acute pancreatitis (Gallstone Pancreatitis; GSP) undergoing medical management has been the subject of much controversy. In the October 2018 issue of JAMA Surgery, Tang et al.² conducted a retrospective study of 4,635 patients with mild acute pancreatitis and a review of NSQIP data from 2011 to 2014 (CPT codes 47562, 47563, 47564, 47600, 47605, and 47610) to determine whether early or delayed cholecystectomy was associated with improved outcomes.

Tang et al.² included participants with acute pancreatitis codes 577.0 and compared hospital outcomes at 30 days for patients undergoing early (<48 h) or delayed (>48 h) cholecystectomy. Patients were excluded if they had a clinical indicator of severe pancreatitis or preoperative indications that required a procedure other than cholecystectomy. The classification of mild acute pancreatitis was based on criteria from the International Classification of Diseases, Ninth Revision; NSQIP, National Surgical Quality Improvement Program.

They found that early cholecystectomy was not associated with improved outcomes compared with delayed cholecystectomy in patients with mild acute pancreatitis. The results indicated that early cholecystectomy did not provide any additional benefit compared with delayed cholecystectomy in patients with mild acute pancreatitis. The study concluded that delayed cholecystectomy should be considered for patients with mild acute pancreatitis, pending further research.
patients with mild gallstone pancreatitis (GSP) remains controversial.1-6 Many institutions delay laparoscopic cholecystectomy (LC) for mild GSP until normalization of laboratory values and resolution of abdominal pain, fearing early surgery may increase complications.1,3-5 Recent studies have shown that early LC (within 48 hours of hospital admission) results in a shorter length of stay (LOS); however, those studies were not statistically powered to detect differences in morbidity.4,5 We hypothesized that compared with delayed LC, early LC among patients with mild GSP would be associated with decreased LOS and with no difference in adverse outcomes.

**Methods** | Adult patients with acute pancreatitis undergoing same-admission cholecystectomy were identified through review of the 2011 to 2014 American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database. Patients with additional nonbiliary procedures and severe...
pancreatitis, defined as preoperative evidence of end-organ dysfunction, were excluded. The remaining patients were then separated into early (<48 hours of hospital admission) vs delayed (≥48 hours of hospital admission) LC groups (Figure). The Los Angeles Biomedical Research Institute at Harbor-UCLA approved this study and waived the need for informed patient consent.

Primary outcome measures were morbidity (presence of any NSQIP-defined postoperative complication) and mortality. Secondary outcomes included LOS, operative time, reoperation, concurrent biliary interventions (including common bile duct exploration, intraoperative cholangiogram, or intraoperative endoscopic retrograde cholangiopancreatography), and 30-day readmissions.

The t test was used to compare continuous data, and Pearson χ² and Fisher exact tests were used to compare categorical data. Any variable with P < .10 following bivariate analysis was included in a multivariate regression analysis. Statistical analyses were performed using SPSS, version 24.0 (IBM Corp), and 2-sided P < .05 was considered statistically significant.

Results | We identified 1937 patients for inclusion in the study, of whom 824 (42.5%) underwent early LC. A comparison of patient demographics is given in the Table. The results of bivariate analyses indicated no statistically significant difference in mortality between the early and delayed LC groups (odds ratio [OR], 0.54; 95% CI, 0.10-2.79; P = .71); however, morbidity was lower for the early group (OR, 0.53; 95% CI, 0.33-0.85; P = .008). The early group had more laparoscopically completed procedures (OR, 1.56; 95% CI, 1.03-2.37; P = .04) and concurrent biliary interventions (OR, 1.69; 95% CI, 1.41-2.03; P < .001) in addition to a shorter mean (SD) operative time (70.1 [39.8] vs 78 [43.2] minutes; P < .001), a shorter mean (SD) total LOS (3.3 [3.7] vs 7.1 [5.4] days; P < .001), and fewer readmissions (OR, 0.37; 95% CI, 0.15-0.91; P = .02). By contrast, 30-day readmissions were not different for early and delayed LC (OR, 0.74; 95% CI, 0.49-1.11; P = .15) (Table).

The multivariate regression analysis results showed that early LC was independently associated with reduced LOS (β, −3.44 days; P < .001) and operative time (β, −8.48 minutes; P < .001) but was not independently associated with morbidity (OR, 0.67; 95% CI, 0.40-1.13; P = .13) or reoperation (OR, 0.46; 95% CI, 0.18-1.15; P = .09).

Discussion | Using the large, multicenter NSQIP database, our study found that early LC was associated with decreased LOS and operative time, with no significant increase in morbidity, mortality, or reoperation compared with delayed LC. Prior studies have supported early LC for treatment of mild GSP based on decreased LOS, including a single-institution observational study (decreased LOS from 7 days to 4 days, P < .001) and a randomized prospective study (decreased LOS from 4 days to 3 days, P = .002). These prior studies were criticized, however, for being underpowered to detect differences in clinical outcomes. The LOS in our study was 4 days fewer in the early LC group than in the delayed LC group, and we observed no increased morbidity or mortality in the early LC group compared with the delayed LC group.

The limitations of the present study included the retrospective study design, with limited data available in the NSQIP database, and the inability to calculate a Ranson score. Thus, severe pancreatitis was inferred based on evidence of organ dysfunction. Despite these limitations, the results of this study add further support to the notion that early LC (<48 hours) among patients with mild GSP appears safe and therefore may be the preferred approach, with the understanding that early LC may be associated with more concurrent intraoperative biliary interventions.

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