Timothy J. Brennan, Ph.D., M.D., Editor

Perioperative Medicine

J. Lance Lichtor, M.D., Editor

What is the impact of endoscopic vein harvesting on clinical outcomes following coronary artery bypass graft surgery? Heart 2012; 98:60–4

Coronary artery bypass graft surgery is a common treatment for patients with ischemic heart disease. However, there are conflicting data regarding the benefits of various arterial and venous conduits used for coronary artery bypass graft. A retrospective analysis of a prospectively collected, multicenter database was conducted to assess the impact of endoscopic (EVH) compared with open vein harvesting for coronary artery bypass graft surgery. Of 4,709 consecutive patients who underwent isolated coronary artery bypass graft, 12.4% had EVH. Propensity score matched 533 patients who underwent EVH with 2,132 patients who underwent open vein harvesting. In-hospital clinical outcomes were similar between the two groups. No difference was found with regard to the combined primary outcome of mortality, repeat vascularization, and myocardial infarction ($P = 0.51$). Midterm mortality was also similar between the EVH and open vein harvesting groups ($P = 0.88$). EVH was not a risk factor for midterm mortality ($P = 0.68$).

Interpretation

Endoscopic vein harvesting, a minimally invasive technique, may be associated with more damage of the vein than are open techniques. In this multicenter study with a median follow-up of 22 months, EVH was not different from open vein harvesting in outcomes for death, repeat revascularization, or myocardial infarction. Additional analysis of long-term outcomes after EVH are warranted.

Maneuvers to decrease laparoscopy-induced shoulder and upper abdominal pain: A randomized controlled study. Arch Surg 2011; 146:1360–6

Laparoscopy-induced pain can occur in the shoulder in as many as 80% of patients, and also in the abdomen. A prospective, randomized, controlled trial compared the benefits of pulmonary recruitment maneuver with intraperitoneal normal saline infusion to remove postlaparoscopic carbon dioxide for the reduction of laparoscopy-induced pain after surgery. Pain was significantly decreased ($P < 0.001$) at 24 and 48 h, respectively, in patients in the intraperitoneal normal saline infusion group (40.7%, 24.1%) compared with pulmonary recruitment maneuver (66.0%, 50.9%) and control groups (72.5%, 54.9%). Abdominal pain was significantly reduced at 24 h after intraperitoneal normal saline infusion ($P = 0.01$) and pulmonary recruitment maneuver ($P = 0.3$) compared with the control group.

Interpretation

Although laparoscopic surgery is associated with rapid recovery, shoulder pain, which is thought to be secondary to carbon dioxide retention, can be troubling. In this study, saline infusion was more effective in reducing upper abdominal and shoulder pain than was no intervention, and the effect lasted longer than that of pulmonary recruitment maneuvers.

Antibiotic prophylaxis before surgery *vs* after cord clamping in elective cesarean delivery: A double-blind, prospective, randomized, placebo-controlled trial. Arch Surg 2011; 146: 1404–9

A large meta-analysis suggested that antibiotic prophylaxis reduces the incidence of endometritis after cesarean delivery by as much as 75%. In a three-arm, double-blind, prospective, randomized, placebo-controlled trial, the comparative effectiveness of cefazolin administered before skin incision (n = 370) *versus* after umbilical cord clamping (n = 371) *versus* placebo (n = 371) was evaluated. Patients were evaluated during hospital stay and at home as long as 2 weeks after delivery. Postoperative infection occurred in 6.9% of patients overall. Antibiotic prophylaxis significantly reduced the incidence of postoperative infection by 7.8% ($P > 0.001$) compared with placebo (fig. 1). No difference was observed based on the timing of antibiotic prophylaxis ($P = 0.60$). The majority of infections occurred during the hospital stay; however, no difference was observed among the three groups. Multivariable logistic regression analysis confirmed that antibiotic prophylaxis was significantly associated with reduced postoperative infectious morbidity (odds ratio = 0.31).

 Anesthesiology 2012; 116:926–30

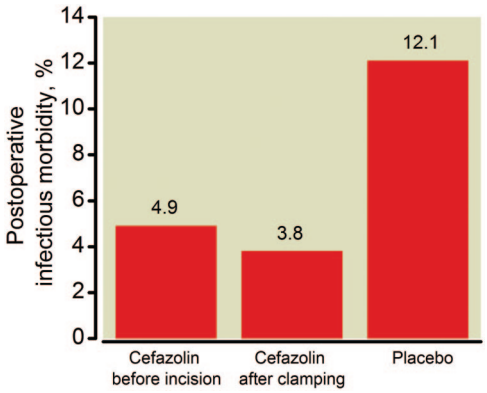

Fig. 1. Postoperative infectious morbidity in patients undergoing cesarean delivery.

Interpretation

Some have questioned the need for antibiotics for elective cesarean delivery. In addition, unlike what is done for other operations, most surgeons now give antibiotics after umbilical cord clamping to avoid affecting the neonate's intestinal bacteria. In this study of more than 1,000 women, antibiotics decreased postoperative infectious morbidity compared with no drug. A secondary endpoint, the administration of antibiotic either before incision or after cord clamping, was equally effective. This study supports the use of antibiotic prophylaxis for women undergoing elective cesarean delivery.

Operator experience and carotid stenting outcomes in Medicare beneficiaries. JAMA 2011; 306:1338–43

The use of carotid stenting has more than doubled in Medicare beneficiaries since 2004. There are multiple guidelines regarding training for this technically demanding procedure. To evaluate an association between outcomes and surgeon experience, an observational study using administrative data from the Medicare database was conducted. Of 24,701 procedures performed by 2,339 surgeons, nearly half were performed by 1,792 new surgeons. Multivariable regression adjustment was performed. Patients of surgeons with lower annual volumes had a higher risk of 30-day mortality than did patients treated by high-volume surgeons (odds ratio = 1.9; $P < 0.001$). Patients treated early in a surgeon's experience also had a higher risk of 30-day mortality compared with late (odds ratio = 1.7; $P = 0.001$).

Interpretation

For this population, patients treated by low-volume providers and those treated early in a new provider's experience had greater 30-day mortality when adjusted for risk. Complex, new procedures such as carotid stenting require experience before outcomes can be optimized.

Critical Care Medicine

Jean Mantz, M.D., Ph.D., Editor

A genomic storm in critically injured humans. J Exp Med 2011; 208:2581–90

Genome-wide expression analyses from patients with trauma were conducted and compared with those of healthy subjects to further our understanding of multiple-organ dysfunction syndrome, inflammatory response to trauma, and patterns of clinical recovery. More than 80% of the human genome was altered after severe trauma, burn injury, and sepsis. Significant increases in systemic inflammatory and compensatory antiinflammatory responses were observed after severe blunt trauma. A similar profile of changes was observed in patients with burns or endotoxemia with 98% and 88%, respectively, of changes having the same direction of change.

Interpretation

This study challenges the paradigm on the adult human response to severe injury. The early genomic leukocyte response to trauma, burn, or sepsis is consistent with an unexpected "genomic storm," producing reprioritization that affects more than 80% of the cellular functions and pathways. Increased expression of genes involved in the compensatory inflammatory and innate immune responses was observed. The similarities in gene expression patterns between different injuries were remarkable; the authors propose a new paradigm for the human immunologic response to severe injury.

Diaphragm dysfunction assessed by ultrasonography: Influence on weaning from mechanical ventilation. Crit Care Med 2011; 39:2627–30

Diaphragmatic dysfunction may occur in mechanically ventilated patients and lead to problems with weaning. A small, prospective, observational study was conducted to determine the prevalence of diaphragmatic dysfunction diagnosed by M-mode ultrasonography in medical intensive care unit patients (n = 88) and its effect on weaning outcomes. Twenty-nine percent of patients had diaphragmatic dysfunction, which was associated with longer weaning time, longer total ventilation time, and more weaning failures compared with patients without diaphragmatic dysfunction (see fig. 2).

Interpretation

This prospective observational study provides a simple and interesting approach to improve identification and management of patients at risk for difficult weaning from mechanical ventilation. The results support evaluation of ultrasonography as a routine monitor of diaphragmatic function in intensive care unit patients.

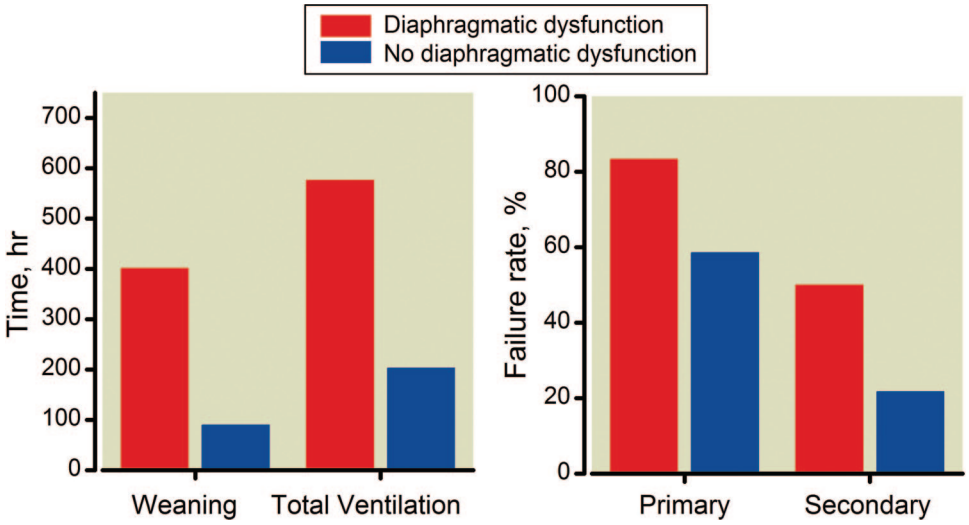

Fig. 2. In mechanically ventilated patients, diaphragmatic dysfunction was associated with worse outcomes, including weaning time and total ventilation time (*left*) and weaning failures (*right*).

Evaluation of dexmedetomidine: Safety and clinical outcomes in critically ill trauma patients. J Trauma 2011; 71:1164–71

Dexmedetomidine, a highly selective α_2-receptor agonist, may be a useful alternative to benzodiazepines for sedation and analgesia in mechanically ventilated patients. A retrospective review of mechanically ventilated trauma patients (n = 127) who received propofol, high-dose dexmedetomidine, or low-dose dexmedetomidine was conducted to compare safety and clinical outcomes. Patients who received high-dose dexmedetomidine had a significantly higher rate of hypotension ($P = 0.02$), longer median hospital length of stay ($P < 0.001$), longer intensive care unit length of stay ($P = 0.004$), and longer ventilator time ($P = 0.008$) compared with patients who received propofol. Hospital length of stay was also longer in patients who received the standard dexmedetomidine dose compared with propofol ($P < 0.001$). Patients in the high-dose group also required significantly more medications compared with the propofol group.

Interpretation

This retrospective analysis suggests critically ill trauma patients sedated with high doses (more than 0.7 $\mu g \cdot kg^{-1} \cdot h^{-1}$) of dexmedetomidine exhibited more complications and worse outcomes compared with patients sedated with propofol. The risks and benefits of sedation of trauma patients with dexmedetomidine warrants additional investigation.

Time course of organ failure in patients with septic shock treated with hydrocortisone: Results of the Corticus study. Intensive Care Med 2011; 37:1765–72

The Corticosteroid Therapy of Steroid Shock (CORTICUS) study was a multicenter, randomized, double-blind, placebo-controlled study evaluating hydrocortisone therapy in patients (n = 499) with septic shock in the intensive care unit. No difference was observed in the primary outcome, 28-day mortality, between the groups (34.3% *vs.* 31.5%, hydrocortisone and placebo, respectively). Sequential organ failure assessment scores significantly decreased in the hydrocortisone-treated patients compared with placebo ($P = 0.0027$). There was a significant time effect ($P < 0.001$) and a time-by-treatment interaction ($P = 0.0025$). Hydrocortisone-treated patients had a higher mean number of vasopressor-free days in the first 7 days, and had bilirubin concentrations less than 6 mg/dl sooner than did patients in the placebo group. Coagulation, renal, and central nervous system components were similar between groups.

Interpretation

This multicenter, randomized, double-blind, placebo-controlled study failed to show a difference between groups in the primary endpoint (mortality at day 28). This should temper any other conclusion derived from secondary outcomes, particularly that supplemental treatment with hydrocortisone may improve organ failure at any time of intensive care unit stay in these patients.

Incident stroke and mortality associated with new-onset atrial fibrillation in patients hospitalized with severe sepsis. JAMA 2011; 306:2248–54

The relative causal relationship between new onset atrial fibrillation in patients with severe sepsis is not known. A retrospective, population-based, cohort study was conducted using California State Inpatient Database administrative claims over a 1-yr period. Of more than 3 millions claims, 49,082 patients had severe sepsis. New-onset atrial fibrilla-

tion was more common in patients with severe sepsis than in those without (5.9% *vs.* 0.7%), and severe sepsis was present in 14% of all new-onset atrial fibrillation hospitalized patients. Among patients with severe sepsis and new-onset atrial fibrillation, the risks of in-hospital stroke and in-hospital mortality were significantly higher ($P < 0.001$ for both) compared with those of patients without new-onset atrial fibrillation.

Interpretation

This large, retrospective, cohort study supports the idea that new-onset atrial fibrillation increases the risk of stroke and death in patients with severe sepsis in comparison with no atrial fibrillation or preexisting atrial fibrillation. These data offer an interesting hypothesis to better track and prevent the occurrence of atrial fibrillation in this patient subpopulation.

Pain Medicine

Timothy J. Brennan, Ph.D., M.D., Editor

Examining the role of positive and negative affect in recovery from spine surgery. Pain 2011; doi: 10.1016/j.pain.2011.10.012

Patients may present for surgery with negative affect (anxiety and depression) and chronic pain. This study aimed to determine whether preoperative and postoperative affect were predictive of postoperative pain after spinal surgery. Patients (n = 141) undergoing laminectomy and/or fusion surgery for lumbar or cervical degeneration completed self-report questionnaires before surgery and 6 weeks and 3 months after surgery. Preoperative variables were not predictive of postoperative pain, pain interference, disability, or functional status based on multivariate, mixed-model linear regression analysis (see fig. 3). Six-week postoperative positive affect was significantly associated with functional status at 3 months ($P < 0.05$). Negative affect at 6 weeks was significantly associated with pain interference and disability at 3 months ($P < 0.05$), and depression at 6 weeks was significantly associated with pain intensity, pain interference, and disability at 3 months ($P < 0.05$).

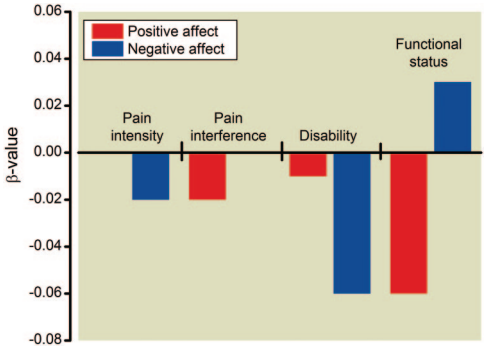

Fig. 3. Preoperative affect was not predictive of postoperative outcomes at 6 weeks and 3 months.

Interpretation

This study evaluated patients undergoing spine surgery before surgery and at 6 weeks and 3 months after surgery. Surprisingly, preoperative affect was not predictive of postoperative outcomes. Postoperative outcomes at 3 months were predicted by testing at 6 weeks after surgery. This study does not support preoperative psychologic screening to predict long-term postoperative pain in patients undergoing spine surgery.

Does lumbar disc degeneration on magnetic resonance imaging associate with low back symptom severity in young Finnish adults? Spine 2011; 36:2180–9

Several studies provide conflicting results regarding the association between disc degeneration and low back pain in adults; however, little is known about these disorders in adolescents. This cross-sectional magnetic resonance imaging study with questionnaires on low back pain and functional limitations was conducted to investigate the association between lumbar intervertebral disc degeneration and low back pain in young adults (ages 18–21 yr). Complete data were available from 554 subjects, with a mean age of 21.2 yr and a 73% prevalence of low back pain within their lifetime. Disc degeneration was found in 54% of patients and was higher in men. Patients with at least one degenerative disc were significantly more likely to report pain ($P < 0.001$). Disc degeneration was higher in men than in women in all pain clusters, except "always painful." Degree of disc degeneration correlated with severity of low back symptoms.

Interpretation

In this young patient population, lumbar disc degeneration was related to symptom severity, with moderately degenerative discs predictive of severe low back symptoms. However, disc degeneration was also found in one third of asymptomatic subjects. These results support that intervertebral disc degeneration can be a source for low back pain; however, it can also occur in asymptomatic individuals.

T1ρ magnetic resonance imaging and discography pressure as novel biomarkers for disc degeneration and low back pain. Spine 2011; 36:2190–6

Low back pain is often caused by disc degenerative disease. T1ρ magnetic resonance imaging (MRI) provides a greater

dynamic range than does T2 MRI, thus providing higher sensitivity for identifying small structural changes. A prospective MRI study of patients with low back pain (n = 17) and control subjects (n = 11) was conducted to determine whether T1ρ MRI and discography opening pressure are quantitative biomarkers of pain from disc degeneration. Compared with either asymptomatic volunteers or nonpainful discs in patients with back pain, T1ρ MRI ($P < 0.001$) and mean opening pressure were significantly lower ($P < 0.001$) for painful discs.

Interpretation

This study used a specific MRI mode to probe early biomechanical changes in cartilage that may be used as a biomarker of disc degeneration. The study demonstrated a significant correlation between T1ρ MRI and opening pressure on discography in patients with low back pain. The results provide information that may aid in the identification of patients who have disc degeneration and low back pain that may benefit from specific procedures.