

Optimizing Postoperative Analgesia

The Use of Global Outcome Measures

ANESTHESIOLOGY is a dynamic specialty that has adapted well to demands from patients to improve the quality of their care and pressures from the healthcare industry to achieve this in a cost-effective fashion. The aging of the population undergoing surgical procedures, increasing proportion of surgical procedures performed in an outpatient setting, and emphasis on cost containment have led clinicians to modify several aspects of perioperative care, including postoperative pain control. Evidence from controlled studies indicates that epidural analgesia is an important and effective method of postoperative analgesia and may lead to a decrease in perioperative morbidity and mortality.¹ The study by Carli *et al.*² in this issue of ANESTHESIOLOGY suggests that there may be additional benefits of postoperative epidural analgesia.

Our increased awareness that perioperative stress may adversely influence postoperative recovery has renewed our attempts to identify optimal postoperative analgesic techniques. For example, investigators who compared the benefits of postoperative patient-controlled analgesia using intravenous opioids to postoperative epidural analgesia reported that postoperative epidural analgesia is preferable based on traditional outcomes, such as pain intensity and time to first flatus and bowel movement.^{1,3,4} Only a few studies examining the impact of postoperative epidural analgesia on morbidity or mortality, however, have properly controlled the confounding influence of differences in intraoperative anesthetic technique.⁵ Despite this lack, studies suggest that a multimodal regimen to facilitate patient convalescence maximizes the benefits of postoperative epidural analgesia.^{6,7}

The effective use of postoperative epidural analgesia increases costs and requires additional resources. Therefore, if this technique is to be generally adopted, we must determine its "value for the money." This will require a careful comparison of the effects of postoperative epidural analgesia with other standard techniques, and this comparison should incorporate global outcome

measures of function and patient preferences, such as health-related quality of life (HRQL).

The HRQL measure provides a comprehensive evaluation of a patient's health status from the patient's perspective. It considers the impact of health on physical and social functioning as well as on the individual's perception of physical, mental, and social well-being.⁸ Although many investigators use HRQL to assess clinical interventions in other fields (*e.g.*, oncology, surgery, internal medicine, and chronic pain), its use is relatively uncommon in anesthesiology research. This may reflect the fact that anesthesiologists, like other healthcare providers who only interact with patients on an acute basis, are generally familiar with "traditional" outcome measures (*e.g.*, mortality and morbidity) and may view "non-traditional" outcome measures as "soft" or "unscientific."⁹ Furthermore, clinicians typically have difficulty translating a significant difference in HRQL into a "clinically meaningful" outcome, perhaps because we lack sufficient data to model this relationship.¹⁰

However, one could postulate ways that perioperative epidural analgesia, which generally provides superior pain control compared to systemic opioids, might improve certain HRQL subgroups (*e.g.*, bodily pain, physical functioning, vitality) and, thus, overall HRQL and functional status.¹¹ Postoperative epidural analgesia may also improve overall patient satisfaction,¹² which, in turn, may positively affect additional HRQL subgroups.

The excellent study by Carli *et al.*² in this issue, therefore, is significant because it compares the effects of epidural analgesia to intravenous patient-controlled opioid analgesia on valid, well-defined functional outcomes and on HRQL after colonic surgery. Each group of patients in this study received a similar multimodal regimen, including early oral nutrition, aggressive postoperative mobilization, and avoidance of nasogastric tubes; however, the group that received epidural analgesia had significantly lower pain and fatigue scores and could mobilize sooner than the intravenous opioid group. In addition, compared with the intravenous opioid group, the patients who received epidural analgesia had an earlier return of gastrointestinal function that favorably affected their nutritional status by facilitating oral intake. As a result, the epidural group met the prospectively defined discharge criteria sooner than did the intravenous opioid group. These findings add weight to the idea that the incorporation of epidural analgesia into a multimodal analgesic regimen will have a positive impact on postoperative functional status and HRQL.

◆ This Editorial View accompanies the following article: Carli F, Mayo N, Klubien K, Schrickler T, Trudel J, Belliveau P: Epidural analgesia enhances functional exercise capacity and health-related quality of life after colonic surgery: Results of a randomized trial. ANESTHESIOLOGY 2002; 97:540-9.

Accepted for publication March 22, 2002. The authors are not supported by, nor maintain any financial interest in, any commercial activity that may be associated with the topic of this article.

Several issues remain to be addressed, however, as we assess use of HRQL as a measure of the benefits of postoperative epidural analgesia. First, investigators have tested the validity, reliability, and responsiveness of most HRQL instruments for use during a period of more than a month. Thus, additional studies are needed to confirm that HRQL scales, such as the Short Form 36, respond to the acute changes that occur during a 1-week postoperative period. Recent instruments have been developed to assess quality of recovery and functional status for this time frame.^{13,14} Second, we have yet to model the relationship and impact of specific clinical variables (*e.g.*, pain, fatigue, nausea or vomiting, cognitive function) or the effect of clinical interventions, such as epidural analgesia, on HRQL.¹⁰

An important implication of the study of Carli *et al.*² study is that a relatively brief perioperative intervention may result in a long-term benefit. As compared with the intravenous opioid group, patients who received postoperative epidural analgesia suffered significantly less deterioration in functional status and HRQL at 6-week postoperative follow-up. This corroborates data from another study demonstrating that the perioperative use of epidural analgesia shortens rehabilitation after major knee surgery.¹⁵ Finally, diminishing postoperative pain may decrease the incidence of long-term chronic pain.^{16,17} The use of perioperative regional anesthetic techniques is just one way in which perioperative interventions may provide long-term benefits to patients,¹⁷⁻¹⁹ allowing our specialty to have a positive impact on patient care that extends beyond the intraoperative period.

Christopher L. Wu, M.D.,* **Srinivasa N. Raja, M.D.†** *Associate Professor, †Professor, Department of Anesthesiology and Critical Care Medicine, The Johns Hopkins University, Baltimore, Maryland. sraja@jhmi.edu

References

- Liu SS, Carpenter RL, Mackey DC, Thirlby RC, Rupp SM, Shine TS, Feinglass NG, Metzger PP, Fulmer JT, Smith SL: Effects of perioperative analgesic technique on rate of recovery after colon surgery. *ANESTHESIOLOGY* 1995; 83:757-65
- Carli F, Mayo N, Klubien K, Schrickler T, Trudel J, Belliveau P: Epidural analgesia enhances functional exercise capacity and health-related quality of life after colonic surgery. Results of a randomized trial. *ANESTHESIOLOGY* 2002; 97: 540-9
- Carli F, Trudel JL, Belliveau P: The effect of intraoperative thoracic epidural anesthesia and postoperative analgesia on bowel function after colorectal surgery: A prospective, randomized trial. *Dis Colon Rectum* 2001; 44:1083-9
- Mann C, Pouzeratte Y, Boccara G, Peccoux C, Vergne C, Brunat G, Domergue J, Millat B, Colson P: Comparison of intravenous or epidural patient-controlled analgesia in the elderly after major abdominal surgery. *ANESTHESIOLOGY* 2000; 92:433-41
- Norris EJ, Beattie C, Perler BA, Martinez EA, Meinert CL, Anderson GF, Grass JA, Sakima NT, Gorman R, Achuff SC, Martin BK, Minken SL, Williams GM, Traustman RJ: Double-masked randomized trial comparing alternate combinations of intraoperative anesthesia and postoperative analgesia in abdominal aortic surgery. *ANESTHESIOLOGY* 2001; 95:1054-67
- Brodner G, Van Aken H, Hertle L, Fobker M, Von Eckardstein A, Goeters C, Buerkle H, Harks A, Kehlet H: Multimodal perioperative management—combining thoracic epidural analgesia, forced mobilization, and oral nutrition—reduces hormonal and metabolic stress and improves convalescence after major urologic surgery. *Anesth Analg* 2001; 92:1594-600
- Kehlet H: Multimodal approach to control postoperative pathophysiology and rehabilitation. *Br J Anaesth* 1997; 78:606-17
- Kind P: Measuring quality of life in evaluating clinical interventions: An overview. *Ann Med* 2001; 33:323-7
- Cleary PD, Greenfield S, McNeil BJ: Assessing quality of life after surgery. *Control Clin Trials* 1991; 12(suppl):189S-203S
- Wilson IB, Cleary PD: Linking clinical variables with health-related quality of life: A conceptual model of patient outcomes. *JAMA* 1995; 273:59-65
- McNeill JA, Sherwood GD, Starck PL, Thompson CJ: Assessing clinical outcomes: Patient satisfaction with pain management. *J Pain Symptom Manage* 1998; 16:29-40
- Wu CL, Naqibuddin M, Fleisher LA: Measurement of patient satisfaction as an outcome of regional anesthesia and analgesia. *Reg Anesth Pain Med* 2001; 26:196-208
- Myles PS, Hunt JO, Nightingale CE, Fletcher H, Beh T, Tanil D, Nagy A, Rubinstein A, Ponsford JL: Development and psychometric testing of a quality of life recovery score after general anesthesia and surgery in adults. *Anesth Analg* 1999; 88:83-90
- Hogue SL, Reese PR, Colopy M, Fleisher LA, Tuman KJ, Twersky RS, Warner DS, Jamerson B: Assessing a tool to measure patient functional ability after outpatient surgery. *Anesth Analg* 2000; 91:97-106
- Capdevila X, Barthelet Y, Biboulet P, Ryckwaert Y, Rubenovich J, d'Athis F: Effects of perioperative analgesic technique on the surgical outcome and duration of rehabilitation after major knee surgery. *ANESTHESIOLOGY* 1999; 91:8-15
- Perkins FM, Kehlet H: Chronic pain as an outcome of surgery: A review of predictive factors. *ANESTHESIOLOGY* 2000; 93:1123-33
- Senturk M, Ozcan PE, Talu GK, Kiyani E, Camci E, Ozyalcin S, Dilege S, Pembeci K: The effects of three different analgesia techniques on long-term postthoracotomy pain. *Anesth Analg* 2002; 94:11-5
- Gottschalk A, Smith DS, Jobs DR, Kennedy SK, Lally SE, Noble VE, Grugan KF, Seifert HA, Cheung A, Malkowicz SB, Gutsche BB, Wein AJ: Preemptive epidural analgesia and recovery from radical prostatectomy. *JAMA* 1998; 279: 1076-82
- Poldermans D, Boersma E, Bax JJ, Thomson IR, van de Ven LL, Blankensteijn JD, Baars HF, Yo TI, Trocino G, Vigna C, Roelandt JR, van Urk H: The effect of bisoprolol on perioperative mortality and myocardial infarction in high-risk patients undergoing vascular surgery. *N Engl J Med* 1999; 341:1789-94