

# Laparoscopic Colectomy for Cancer

## *The Tale of Two Studies*

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Law et al report a prospective database series of 1134 patients who underwent elective resection of a colon or upper rectal tumor in one of two periods: 1996 to mid 2000 (period 1) and mid 2000 to 2004 (period 2). In period 1, 478 patients had open surgery performed or supervised by 3 staff colorectal surgeons. In period 2, 656 patients underwent either open surgery (n = 401) by the same 3 surgeons or laparoscopic resection (n = 255) by 2 of the 3 surgeons.<sup>1</sup> In describing their findings, the authors report their data as 2 studies: one a direct comparison of laparoscopic and open surgery and the other an observational study, examining trends following the introduction of laparoscopic surgery.

The first study within the report by Law et al provides a direct comparison of results for laparoscopic and open surgery. These outcomes should logically be compared with results from the 4 large randomized controlled trials (RCTs), including the Clinical Outcomes of Surgical Therapy (COST) Study Group,<sup>2</sup> Conventional versus Laparoscopic-Assisted Surgery in Colorectal Cancer (CLASICC) trial,<sup>3</sup> the Colon Cancer Laparoscopic or Open Resection (COLOR) trial,<sup>4</sup> and the single-institution, Barcelona trial.<sup>5</sup> What Law et al found when they compared patients treated laparoscopically with patients treated with open surgery were faster hospital recovery, lower rates of operative mortality, and better 3-year overall survival rates for patients treated with laparoscopic resection.<sup>1</sup> Data on postoperative recovery parameters, including time to diet, bowel function, and hospital dismissal, are remarkably consistent between the report from Hong Kong and the 4 RCTs.<sup>1-5</sup> The positive impact of laparoscopy on postoperative recovery thus seems irrefutable. The favorable postoperative mortality and 3-year survival rates for laparoscopic patients, reported by Law et al, however, are not consistent with RCT results and require more in-depth consideration.

The current report by Law et al describes an operative mortality of 3.7% and 0.8% and 3-year overall survival rates of 74.4% and 78.8% for open and laparoscopic resection; both statistically significant ( $P = 0.022$  and  $P = 0.0458$ , respectively).<sup>1</sup> Mortality data from the 4 RCTs together, including 2903 randomly assigned patients, report no differences in rates of postoperative morbidities or mortality. The range of complications between RCT studies varied from 11% to 31% and mortality rates ranged from <1% to 5%, but there were no differences within each study based on treatment allocation.<sup>2-5</sup> Survival data are equally divergent from RCT results. The COST Study Group trial with 415 laparoscopic and 395 open cases and 4.4-year median follow-up showed no disease-free or overall survival advantage or disadvantage for patients treated with laparoscopic resection.<sup>2</sup> The Barcelona trial reported 111 patients treated with laparoscopic and 108 patients treated with open surgery with no difference in overall survival between the groups.<sup>5</sup> How can we reconcile these important differences between the RCTs and the single-institution series of Law et al?

In a situation such as this, where results from a large database and several large RCTs do not reach similar conclusions, the RCT provides the more accurate estimate of the impact of the practice variable on the measured outcomes. In the RCT, the process of

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randomization and the inclusion of an adequate number of patients help ensure that selection bias and confounding variables are minimized or eliminated (ie, that the differences can be specifically attributed to laparoscopic techniques). The mortality and 3-year overall survival differences reported by Law et al are likely explained by the process of patient selection. The authors admit that selection for laparoscopy was dependent on patient acceptance, patient preference, operating room and surgeon availability, and specific tumor characteristics (patients with large fixed tumors with invasion to other organs were advised against laparoscopic surgery).

The second part of the Law et al study represents unique observational data; it captures the practice implications of this new surgical technology. Using the prospective database over a 9-year period of time, Law et al identified significant changes in practice, changes that occurred concurrently with the introduction of laparoscopic surgery. For all patients treated in the second period, length of hospital stay was reduced and 3-year overall survival rates were improved. These changes are not due to laparoscopic techniques themselves, since only 255 of the 656 patients were treated laparoscopically.<sup>1</sup> The authors, and the data, suggest a broader impact of laparoscopic surgery on the institutional practice. Considering reduced length of hospital stay, it is easy to imagine how the introduction of laparoscopic surgery could have encouraged all practitioners to embrace the concept of early postoperative feeding and early hospital dismissal. It is more challenging to explain the 3-year survival advantage.

Indeed, it is not yet certain whether the 3-year survival difference Law et al reported is due to cancer-specific mortality. A clearer understanding of the meaning of these data will have to await the 5-year overall and disease-free survival and the recurrence data. That said, the impact of laparoscopic surgery taken together has been favorable. How can the introduction of laparoscopic surgery improve survival in contemporary patients treated with open surgery? We may never know why. Perhaps it could be explained by the

“Hawthorne effect,” which is the impact of constant observation and monitoring on end results. Or, perhaps the many controversies regarding laparoscopic surgery for cancer stimulated discussions and debates on oncologic techniques. In some regards, the laparoscope as a tool invites the opportunity for surgeons to discuss technical details of oncologic surgery. Point in case, it was the ability to record and review laparoscopic colon cancer surgeries that served as the key credentialing and auditing tool for the COST Study Group Trial.<sup>2</sup>

In closing, the authors have reported a database that uniquely illustrates the impact of a new technology on an established practice. That good things can come from new ideas and techniques is not a new concept. In 1947, Dr. Louis A. Buie stated: “. . . if man adopted only the opinions of his forebears and contemporaries, he would create nothing new. . . . Our duty as physicians is clear. We shall freshen the fabric of our knowledge. We shall color anew its various parts and harmonize its apparent discrepancies.”<sup>6</sup> Laparoscopic surgery for cancer has undeniably freshened the fabric of our knowledge.

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