Operative Blood Loss and Survival in Pancreatic Cancer

Kazanjian et al. recently reported determinants of survival in 182 patients who underwent pancreaticoduodenectomy for adenocarcinoma of the pancreatic head. Through multivariate analysis, the authors found that operative estimated blood loss (EBL) and time of surgery (1987-1995 or 1996-2005) were significantly related to survival, whereas perioperative blood transfusion was not. We have 3 comments on this important study. First, the significance of EBL should be interpreted with caution, because this variable is highly subjective and notoriously inaccurate.1-3 Simulations have found that operative personnel (including surgeons) visually underestimate EBL. Because surgeons have an obvious bias, which is amplified when EBL becomes a performance indicator or end point of a study, it is not surprising that the most accurate estimations of EBL are from anesthesiologists.4

Second, the lack of significance for perioperative transfusion should be interpreted with caution because patients who undergo pancreaticoduodenectomy may receive blood preoperatively for anemia, postoperatively during adjuvant therapy, or at other points during their overall care. Consideration of nonperioperative transfusions is essential.

Third, while we fully agree that minimization of EBL and blood transfusion is important and more than 90% of our patients do not receive transfusions, the effect of patient selection must be acknowledged. For example, modern imaging has allowed early recognition of metastatic disease and precise assessment of perivascular planes. Furthermore, increased use of neoadjuvant therapy removes patients who develop early metastatic disease from the operative pool, and performance status has been recognized as being important. Attention to these and other patient selection factors can minimize EBL and improve postoperative survival.

William Charles Conway, MD
Singh Gagandeep, MD

Correspondence: Dr Conway, Department of Surgical Oncology, John Wayne Cancer Institute, 2200 Santa Monica Blvd, Santa Monica, CA 90404 (wcconway2@gmail.com).

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In reply

We thank Drs Conway and Gagandeep for their comments. We agree that the EBL is less accurate than one might wish, and in our review of the University of California—Los Angeles experience with resection for pancreatic cancer, the recorded EBL value was that of the anesthesiologist’s, taken from the operative record. Because our report is a retrospective case series, the suggestion that EBL values were biased because they were being used as a performance indicator or end point is incorrect. The anesthesiologists (none of whom were coauthors of the article) “called it as they saw it” during the entire study period, and the data speak for themselves.

Drs Conway and Gagandeep also suggest that the selection of patients with less aggressive or advanced disease might allow for resections with less blood loss and that such patients might inherently have better prognoses. On the contrary, we found no evidence to support that contention and discussed this in the article. In support of this, there were no differences in the degree of tumor differentiation, the incidence of R1 resections (positive resection margins), or the frequency of lymph node metastases or perineural invasion in the 2 groups.

The lack of a relationship between prognosis and blood transfusion is curious. However, the 5-year survival for patients who received a blood transfusion was less than half that of those who did not (14.3 vs 34.2 months), and this was significant on univariate analysis (P = .008). Patients most certainly do receive blood at times other than the perioperative period, but it is unclear how this would affect the significance of our observations or recommendations that surgeons should strive for a technically precise operation with minimal blood loss.

Most statistics about pancreatic adenocarcinoma continue to be depressing, and many in the general medical community may even be reluctant to refer patients with resectable disease for surgical resection. This is suggested by the recent finding that almost 40% of patients with early stage disease in the United States do not undergo pancreaticoduodenectomy.5 It may reflect pessimism that is still prevalent in the community based on a presumed high operative...
mortality rate for resection and the low likelihood of long-term survival even after successful resection. Thus, patients are not even referred for surgical evaluation. We, as well as other high-volume centers, have had no operative deaths in our entire series. The finding that patients can look forward to a 5-year survival rate of 35.5% is good news indeed. These observations need to be disseminated more widely.

Howard A. Reber, MD
O. Joe Hines, MD

Correspondence: Dr Reber, Department of Surgery, University of California–Los Angeles School of Medicine, 10833 Le Conte Ave, 72-215 CHS, Los Angeles, CA 90095-6904 (hreber@mednet.ucla.edu).

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Correction

Middle Initial Missing From Author Name. In the article titled “Laryngeal Complications After Thyroidectomy: Is It Always the Surgeon?” by Echternach et al, published in the February issue of the Archives (2009; 144[2]:149-153), the second author's middle initial was omitted from the byline on page 149. It should have read as follows: Christoph A. Maurer, MD.