Elective Surgery Delays Raise Postop Infections

BY MITCHEL L. ZOLER

LAS VEGAS — The longer elective-surgery patients were hospitalized before their operation, the greater their risk of developing an infection postoperatively, according to a review of 163,000 patients.

Elective-admission patients hospitalized for just 1 day before their surgery had a significant 20%-50% increased risk of subsequent infection, compared with patients whose surgery took place the same day as their hospital admission, Dr. Todd R. Vogel reported at the meeting.

Patients hospitalized for 6-10 days before surgery had a greater than twofold increased risk, said Dr. Vogel, a vascular surgeon at the Robert Wood Johnson Medical School, New Brunswick, N.J.

He and his associates used data collected during 2003-2007 in the Nationwide Inpatient Sample, a database of hospital discharges in 38 states maintained by the Healthcare Cost and Utilization Project. They focused on patients aged 40 years or older who had elective admissions for any of three types of surgery: 87,318 who underwent CABG, 46,728 who had colon resection, and 28,960 who underwent lung resection. Almost a third of the patients were aged 60-69 years, nearly another third were 70-79 years old, and 20% were aged 50-59 years. Nearly two-thirds were men, and 84% were white, 6% African American, and 5% Hispanic. The analysis excluded patients who had had surgery more than 10 days after their elective hospital admission.

The infectious complications analyzed included pneumonia, urinary tract infection, sepsis, and surgical site infections.

Patients undergoing CABG had the highest rate of delays between admission and surgery, with 53% having their surgery on the same day of admission, compared with 79% of colon resection patients and 94% of lung resection patients. Another 23% of the CABG patients had a 1-day delay, 21% had a 2- to 5-day delay, and 3% had their surgery 6-10 days after admission. In the colon resection group, 13% had a 1-day delay, 7% waited 2-5 days, and 2% had a delay of 6-10 days (total is 101% because of rounding). Among those having lung resection, 3% waited 1 day, 2% waited 2-5 days, and 1% waited 6-10 days.

Infection rates were 5.7% and 18.2% for patients who had CABG the same day and 6-10 days after admission.

DR. VOGEL

The postsurgical infection rate for patients who had their surgery on the day they were admitted reached 5.7% in the CABG patients, 8.4% in the lung resection patients, and 10.2% in the colon resection patients. The rates increased for each incremental delay. Among patients whose surgery was performed 6-10 days after admission, postsurgical infection rates were 18.2% for CABG, 21.6% for lung resection, and 20.6% for colon resection.
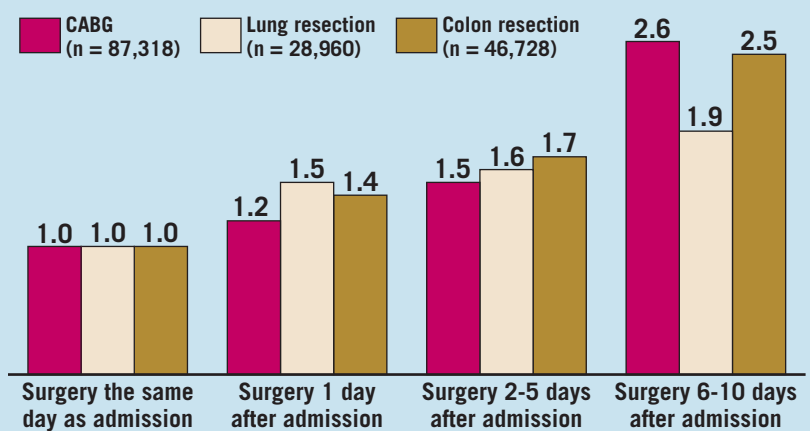
In the CABG and colon resection groups, urinary tract infection was the most common type of infection, followed by pneumonia. In the lung resection patients, pneumonia topped the infection list.

Multivariate analysis that adjusted for age, gender, race, and comorbidities showed that all three delay durations categorized in the study led to significantly greater infection rates relative to patients who had no delay in surgery, for all three operations analyzed (see chart). ∎

Disclosures: Dr. Vogel reported no disclosures.

Odds Ratios for Infection After Surgery

Legend: CABG (n = 87,318); Lung resection (n = 28,960); Colon resection (n = 46,728)

	Surgery the same day as admission	Surgery 1 day after admission	Surgery 2-5 days after admission	Surgery 6-10 days after admission
CABG	1.0	1.2	1.5	2.6
Lung resection	1.0	1.5	1.6	1.9
Colon resection	1.0	1.4	1.7	2.5

Note: All differences in infection rates between patients who had same-day surgery and those in the groups whose surgery was delayed reached statistical significance.
Source: Dr. Vogel

ELSEVIER GLOBAL MEDICAL NEWS

Risk Factors Predict Infective Endocarditis Surgery Outcome

BY ROBERT FINN

OJAI, CALIF. — Surgical treatment for infective endocarditis is notoriously risky, with mortality up to 20% in some studies and morbidity much higher. But a new scoring system designed to identify the 13 most significant risk factors for morbidity and mortality might help guide clinical decision making.

Using data from the Society of Thoracic Surgeons Adult Cardiac Surgery Database, a research team led by Dr. Jeffrey G. Gaca of Duke University Medical Center, Durham, N.C., conducted a multivariate analysis to identify the risk factors and from that, they developed a simple bedside scoring system, Dr. Gaca said at the meeting.

The investigators identified every patient in the STS database who underwent surgery on the aortic, mitral, or tricuspid valve during 2002-2008. Of those 416,277 patients, 19,730 had the surgery for infective endocarditis.

The investigators randomly selected 70% of those cases to develop the scoring system, reserving the remaining 30% to test it. They then developed two separate scoring systems, one intended to predict mortality alone and the other intended to predict a composite of deep external wound infection, mortality and serious morbidity, prolonged ventilation, postoperative stroke, pneumonia, renal failure, dialysis, multisystem organ failure, and readmission within 30 days of surgery.

The patients' average age was 55 years, and 67% were male. Preoperatively, 52% had active endocarditis, 23% were in renal failure, 21% had prior valve surgery, 19% had arrhythmia, and 19% had prior cerebrovascular disease.

The surgery was urgent for 50% of the patients, elective for 43%, and emergent for just under 7%. Fewer than 1% of the patients had salvage surgery.

Overall, 8.2% of the patients died, a lower percentage than that seen in other studies. But 53% had postoperative complication such as prolonged ventilation (28%), strokes within 72 hours (3%), and transient neurological deficits (1%).

After conducting a multiple logistic regression controlling for relevant demographic and clinical characteristics, the investigators used the top 13 significant risk factors to develop their scoring systems (see box). The top two risk factors were the same in the mortality and mortality/morbidity scoring systems: Patients who were emergent, salvage, or in cardiogenic shock were three times more likely to die or to have major morbidity than was the average patient. And patients in renal failure were twice as likely to experience adverse outcomes.

Dr. Gaca explained using the example of a 65-year-old man with active mitral valve endocarditis, NYHA class IV heart failure, type 1 diabetes, serum creatinine of 2.2 mg/dL, and chronic obstructive pulmonary disease. His risk score for major morbidity and mortality would be 36, and his score for mortality alone would be 35.

When those values are plotted on risk graphs, a score of 35 translates to an 11% chance of mortality, and a score of 36 translates to about a 65% chance of mortality or major morbidity.

In commenting on the study, Dr. James M. Douglas of St. Joseph's Hospital in Bellingham, Wash., noted that most of the identified risk factors were functional or physiologic, whereas in his experience anatomical peculiarities such as aneurysms and fistulae present the most vexing challenges in these patients.

Dr. Gaca acknowledged that anatomic issues do affect a patient's risk, and those factors are not included in the STS database. Another limitation of that database is the lack of microbiological data. ∎

Disclosures: The investigators had no relevant disclosures.

Scoring System for Operative Morbidity and Mortality in Infective Endocarditis

Risk Factor	Odds Ratio	Point Value
Status: emergent, salvage, or cardiogenic shock	3.1	17
Renal failure or creatinine above 2.0 mg/dL	2.2	12
Preoperative intra-aortic balloon pump or inotropes	2.3	12
Insulin-dependent diabetes mellitus	1.6	7
Multiple valve surgery	1.6	7
Active endocarditis	1.6	7
Status: urgent or emergent, no cardiogenic shock	1.5	6
NYHA class IV	1.5	6
Prior valve surgery	1.4	5
Prior coronary artery bypass graft	1.4	5
Arrhythmia	1.4	5
Female gender	1.4	5
Age greater than 60 years	1.3	4

Note: Based on data from 19,730 patients who underwent surgery for infective endocarditis.
Source: Dr. Jeffrey G. Gaca

ELSEVIER GLOBAL MEDICAL NEWS