THORACIC AND CARDIOVASCULAR DISEASE

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Editorial

The old order changeth

The old order changeth,
Yielding place to new.
God fulfills Himself in many ways
lest one good custom should corrupt the world.
Tennyson
The Passing of Arthur

The only guarantee that time offers is continual change. Perceptible changes in the heart disease patients of today coincide with an array of advances in treatment. The articles in this Thoracic and Cardiovascular Disease issue of the *Cleveland Clinic Journal of Medicine* chronicle a number of these important changes. The changing patient population has had profound impact. Increasingly greater numbers of elderly patients require extensive preoperative investigation. Furthermore, the past decade has seen the prevalence of women patients and patients with insulin-dependent diabetes or peripheral atherosclerosis more than double.

The evolution of all forms of heart surgery has been favorable. Advances in anesthesia and surgical myocardial protection allow time for more intricate valve and coronary reconstructive procedures. Cardioplegia with arterialized blood provides oxygen while the heart is arrested, avoiding much reperfusion damage.

In the past decade, operating time has increased more than an hour. Multivariate analysis of measurable clinical, angiographic, and operative variables reveals that expanded use of arterial grafts and an increasing number of reoperations are primarily responsible for longer operations. Length of operation is also influenced by gender (i.e., it takes longer to operate on women, possibly because of their smaller vessels). Subjective observation indicates poor ventricular function and severe peripheral atherosclerosis lengthen procedures, probably because more complicated and diffuse coronary plaques are found in most cases.

The nearly routine use of the internal thoracic (mammary) artery graft in preference to the aorto-coronary vein graft evolved from findings of increased long-term patency with the arterial conduit, lack of graft degeneration, and a significantly higher 10-year survival for those who received one internal thoracic artery graft to the anterior descending coronary artery, either alone or combined with vein grafts, compared with patients who received vein grafts only. Furthermore, late myocardial infarction, hospitalization for cardiac reasons, and coronary reoperation were significantly reduced by performance of this one arterial graft to the anterior descending coronary artery. It stands to reason that expanded use of the arterial conduit may offer additional benefits; preliminary evidence is encouraging.

The prospect of reoperation is slight (about 3%) during the five years after the original operation, but for patients who had vein grafts only in the 1970s, 17% underwent a coronary artery reoperation within 12 years after the original procedure.[1] Reoperations have increased at the Cleveland Clinic more than 400% annually in the past decade. Thus, 20% of coronary and 30% of valve procedures are reoperations—a pattern of practice far different from that of the 1970s.

Irrespective of the worsening clinical status of many patients, safety has been maintained and mortality and morbidity have not changed appreciably. In the early years of coronary artery surgery, death meant reduced hospital charges because most deaths occurred in the operating room. Today more than twice as much is spent on those who die compared with those who sur-

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vive because so many late hospital deaths occur from multisystem failure. In addition to causing inconvenience and misery, every major complication significantly increases hospital charges.

Ninety percent of primary and 80% of reoperation patients at the Cleveland Clinic have complication-free courses. This can be attributed not only to experience but also to charting trends in selection and results and discussing these issues freely at morbidity-and-mortality conferences. Changes in techniques and results are aired in this forum, which serves as an excellent teaching model. If one does not know the outcome of a procedure, it is difficult to plan corrective action.

Length of stay after heart surgery had been decreasing, but this downward trend stopped in 1985. Nationwide, the duration of hospitalization is rising. One should become familiar with the term "outlier," which signifies a patient whose length of stay exceeds the minimum of the mean length of stay plus 20 days. In reviewing our coronary artery bypass experience, we found outlier length of stay increasing. Outlier patients represent about 4.5% of all cardiac surgery patients, but account for 16% of hospital charges. These patients consume so many resources that their cost of care is escalating far more rapidly than that of patients with uncomplicated courses.

Amidst this scene of a continually changing patient population and better operation, society almost seems to be *against* surgery. Some bias is perpetuated by misinterpretation of randomized studies. Most trials of therapy have been so selective that predominantly low-risk patients have been randomized. Unfortunately, the conclusions do not apply to most coronary atherosclerosis subsets. In contrast, data from the Coronary Artery Surgery Study (CASS) registry confirms what has been suspected for years: most patients fare better with surgical treatment over a four to seven year follow-up, not only by relief of symptoms but also by significantly improved longevity.[2] This statement applies to patients 65 or older[3] and those with left main[4] or narrowing left main equivalent,[5] proximal three-vessel disease,[2] multivessel disease with moderate-to-severe left ventricular impairment,[6] mildly symptomatic three-vessel disease and evidence of ischemia,[7] poor left ventricular function (ejection fraction ≤35%),[8] and left ventricular aneurysms with three-vessel disease.[9] These observational data scattered throughout the literature are referred to infrequently despite the fact that these patients constitute the majority of our practices.

Ironically, the intended change in reimbursement does not consider changing practice. Health planners ignore the extensive training, requisite skill, and organization required to manage these challenging cases and the remarkable palliation afforded by these procedures. But times are changing, and it is incumbent upon the surgeon to know his or her results. Of all the clinical predictors of outcome available for analysis, the operative risk factor of greatest magnitude is still the surgical team.

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