Editorial:
Aortic Valve Replacement Without Myocardial Revascularization

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BONOW AND COLLEAGUES, in the preceding paper, concluded that coronary artery bypass grafting (CABG) at the time of aortic valve replacement (AVR) is not advantageous as a near-routine procedure for patients with combined important aortic valve and coronary artery disease. We believe that such a conclusion is premature and unwarranted.

The information that is required for making a reliable statement about the advantages (or disadvantages), disadvantages, or neutrality of concomitant CABG when replacing the aortic valve in persons with combined disease is simple, but operationally difficult to obtain. Survival (both early and late) and symptomatic results, with and without bypass grafting, and the incidence of late complications (for example, myocardial infarction and need for subsequent CABG) related to coronary artery lesions are all that must be known. At best, the authors have given us some of this only in patients without concomitant CABG, but with such a small patient group as to make it highly unlikely that it is representative of the broad spectrum of conditions included in either aortic valve disease or coronary artery disease, let alone their combination. Forty-five of their 55 patients had one- or two-vessel disease, where an effect of CABG would be expected to be difficult to demonstrate.

Survival is a combination of hospital mortality and late deaths, and the survival of those dismissed from hospital as well as overall survival must be analyzed actuarially to be of maximal use. Symptomatic results need to be evaluated reliably for each patient. Because the conclusion that concomitant CABG is or is not advantageous involves a comparison by one method or another (randomization, or concurrent clinical trial, or retrospective study) of a group treated with CABG and one treated without it, for each of these analyses either the groups being compared must be relatively homogeneous or they must be large enough and the information complete enough that a multivariate analysis can give significant results. The wide variability of aortic valve disease, coronary artery pathology and left ventricular function makes fulfilling these requirements difficult, and taking into account also the associated conditions of systemic arterial hypertension, hypercholesterolemia, smoking habits before and after operation, other atherosclerotic disease, and so on, poses additional problems.

We are not implying that one can never know whether concomitant CABG is advantageous for this group of patients as a whole, or for certain subsets within it. Nor are we implying that data and analyses that pertain to the question but don't address it directly, such as those of Bonow and colleagues, are without value. We wish only to indicate that determining the answers with reasonable certainty will require more information and many more analyses than are available. A beginning can be made, but it is a small one, and we should not prematurely reach im properly supported conclusions.

The hospital mortality for AVR is probably not affected by the presence or absence of coronary artery disease, whether or not CABG is done. In Bonow and colleagues' selected group of 55 patients with combined aortic valve and coronary artery disease undergoing only AVR (13 others underwent combined AVR and CABG, with mortality not given) two patients (4%, 70% CL* 1–8%) died, while seven (5%, 70% CL 3–8%) of 142 without coronary artery disease operated on in the same period died. In our institution CABG has been done almost routinely when significant coronary artery disease has coexisted with aortic valve disease. Our experience from 1970–1977, as well as that of others, is quoted by the authors. More recently, between January 1, 1975 to July 1, 1979, of 489 patients who underwent primary isolated AVR in our institution, 10 (2.0%, 70% CL 1.4–2.9%) died; of 251 who underwent primary AVR plus CABG, nine (3.6%, 70% CL 2.4–5.2%) died (p = 0.21). A multivariate analysis of that experience has also supported the idea that concomitant CABG is not an incremental risk for hospital death after AVR. Many other reports could be quoted to support the idea that, in general, concomitant CABG for patients with combined aortic valve and coronary artery disease is neither advantageous nor disadvantageous in regard to early (hospital) mortality. Even the idea (accepted by Bonow and colleagues) that the combined procedure is mandatory when the coronary artery disease affects the left main coronary artery has not been shown conclusively to be the case in regard to hospital mortality.

Late deaths, apparently unrelated to the device used to replace the valve and often sudden or obviously from coronary artery disease (these accounting for 42% of the late deaths in the Mayo Clinic experience*), have been occurring since the early days of

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Circulation 63, No. 2, 1981.

*CL = confidence limits.
AVR. This is one reason the 5-year actuarial survival after isolated AVR has been only about 80%, less than that of an age-sex-race-matched population. These facts have been strong contributors to the idea that CABG should be combined with AVR when coronary artery disease is present. Yet, we know of no study that directly and satisfactorily compares the late survival rates after isolated AVR with those of combined AVR and CABG in comparable subsets of patients with combined aortic valve and coronary artery disease. This is particularly regrettable because it is the effect on late survival that is particularly desired in the combined procedure. However, this is not surprising because even in the setting of the much simpler problem of isolated coronary artery disease, the effect of CABG on late survival continues to be debated. Again, some information is available, but it does not answer the questions. Much of this information has been reviewed by Bonow and colleagues in their paper. Bonow and colleagues' demonstration of an 80% survival at 3 years after isolated AVR for the patients with coronary artery disease, compared with 82% for patients without coronary artery disease, is interesting, as is the fact that survival was not different in those with one-, two- or three-vessel disease. The more important questions concern the reasons for the survival not being 90% or 95%, the possibility that concomitant CABG would have achieved higher survival, and the possibility that at 5 or 10 years postoperatively differences may be significant. Further, the old adage about "type II errors" applies, and the failure to demonstrate a difference in long-term survival between the single and combined procedure does not prove that the two procedures have the same effect.

Relief of symptoms, particularly angina pectoris, has also not been directly compared after the two methods of treatment. We believe this is unlikely to be a major consideration in determining the advantages of combining CABG with AVR in patients with both aortic valve and coronary artery disease, because the failure of AVR to relieve symptoms has not been a prominent consideration in searching for therapeutic alternatives.

In the face of these uncertainties, which are apt to persist, can the cardiologist and cardiac surgeon give useful advice to their patients? Of course they can, and they must base it on their knowledge of these two diseases and their interactions, special features of the individual patient's case, such as age, extent of coronary artery disease, left ventricular function and coexisting disease, and on their knowledge of the risks and imperceptibles in their hands of AVR alone vs AVR and CABG. Obviously, the bias of Bonow and colleagues is against near-routine choice of the combined procedure. Our bias is for near-routine choice of the combined procedure. In our opinion, neither of us has demonstrated, with near certainty, that the other is wrong.

References
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Circulation. 1981;63:252-253
doi: 10.1161/01.CIR.63.2.252

Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0009-7322. Online ISSN: 1524-4539

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the World Wide Web at:
http://circ.ahajournals.org/content/63/2/252.citation

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