Chapter 12 Indications for Coronary Artery Surgery and Patient Selection

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General Considerations

Coronary bypass surgery is now a common procedure in many hospitals, but indications for coronary surgery vary from one center to another and at any hospital are influenced by such factors as previous experience of the surgical team, operative survival, symptomatic improvement following surgery, and long-term graft patency. The following discussion will, of necessity, be based on the authors' experience.

Without a doubt, the greatest limitation in the selection of patients for surgery has been our lack of knowledge concerning the natural course of coronary disease. The advent of coronary surgery has been a great stimulus in the search to establish the natural history, and the evidence now accumulating on nonsurgical therapy will probably further stimulate surgery (4). From the Framingham and other studies in which large population groups were sampled, it became clear that symptoms do not always correlate with risk. Many persons may have repeated infarcts without pain. At St. Luke's Hospital in Milwaukee severe symptoms are not a prerequisite to angiographic studies. As one cardiologist expressed it, angiography is indicated on the reasonable suspicion of coronary disease. Therefore, regardless of age or sex, patients who can reasonably be assured of at least a moderate period of productive life and present with a reasonable suspicion of coronary disease should be studied.

Not every patient advised to have surgery accepts this recommendation, and groups of these patients have been followed since the early years of bypass surgery. One hundred and twelve such patients advised to have surgery, but never operated upon were reviewed (6). The data available from the time of catheterization correlated poorly with subsequent death or survival in these unoperated patients (61 of 112 were dead in 2 years). Only the symptom complex of crescendo pain related to outcome, and this pattern was associated with higher mortality. Other symptom categories, including no symptoms or number of previous infarcts, showed no correlation with subsequent survival or death. There was a highly significant correlation between the number of arteries involved and risk of subsequent death without surgery. Single-artery disease, particularly nondominant right, was not associated with increased attrition rates; while the yearly risk of death rapidly increased in double- and triple-artery disease. Even more significantly associated with early death was a major impediment to flow in the left main or proximal anterior descending artery. Regardless of the total number of other arteries involved or the degree of ventricular malfunction, the major stenosis of the proximal left coronary was the most significant predictor of early death. Essentially the same conclusions evolved from studies of similar groups of patients at other institutions (3) and provide the basis for the evolution of our philosophy of patient selection for surgery.

While most patients referred for catheterization are symptomatic, symptoms have played less and less of a role in the selection of patients for surgery. The obvious ex-
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caption is the patient with crescendo anginal pattern in whom surgery may be urgently indicated, as in severe triple or proximal left disease (5). The mortality rate in these patients waiting for surgery is higher than the surgical risk, and the operation should be performed without delay.

Most patients suffering an infarction should subsequently be considered for catheterization. Myocardial infarction is the strongest indicator of coronary artery disease, short of death and autopsy. Many of these patients had no symptoms prior to the infarct and it seems irrational to avoid surgery assuming that the patient would subsequently develop a warning sign and symptoms prior to a second and possibly fatal infarct. In many patients who have had an infarct the stage of coronary artery disease plays a more important role in the decision for surgery than does the degree of symptoms.

Maximal stress testing should be considered part of a periodic checkup in patients falling into higher risk coronary prone groups. When the stress test is positive, cine angiograms should be performed. Occasional patients have been found with severe coronary artery disease and no symptoms. Despite the absence of symptoms, surgery has been performed because of the life-threatening nature of the coronary lesions.

Angina can be controlled or relieved with vigorous medical therapy in many patients but there is no effective medical therapy for coronary insufficiency. Relieving angina does not relieve coronary insufficiency. Nitrates and beta-blocking agents relieve symptoms by depressing the workload on the heart, and this approach to symptom control is very safe and preferred in certain circumstances. For example, a totally occluded artery in the presence of good collateral rarely represents a major threat to the patient. The patient has demonstrated that he can live without the vessel, and the total block can not get worse and further compromise circulation. Significant angina associated with an occluded artery is strong indication for vigorous medical therapy. Such a patient would be considered a candidate for surgery only after prolonged medical therapy fails.

However, when the collateral to an occluded artery is poor or arises from an artery in jeopardy, surgery should be considered. Our studies, plus others, have indicated anatomic situations that are a threat to life. In the authors’ opinion, tight stenosis of the proximal left system (left main, proximal anterior descending) or severe three-vessel disease with good myocardial function does not deserve a trial of medical therapy. No known medical therapy affects patency of stenotic arteries and none improves coronary flow. With reasonably good ventricular function, the surgical risk in triple-coronary disease is in the 1 percent range. What can be accomplished surgically for this patient, in terms of vascular patency, preservation, and improved myocardial function, and survival is much better established than what can be accomplished with medical therapy. With our present knowledge, medical therapy for triple artery disease is more experimental than surgical therapy. Symptoms per se are not the only indication for surgery, but must be considered along with the angiographic findings. Likewise the lack of symptoms is not necessarily a contraindication to surgery.

Age

Age is only relative when surgery is considered. The age of patients who have undergone coronary revascularization, in the authors’ experience, ranged from 19 to 79. Increasing caution is used with increasing age, and with increasing age, less and