

Reoperation for myocardial revascularization

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We have reported our experience with 50 patients who underwent reoperation. These 50 reoperations were necessary, because of an inadequate first operation in 26% of the cases, occlusion or stenosis of the previous grafts in 46%, and progression of the atherosclerotic process in the native coronary vessels in 6%. The additional 20% were judged as having both occluded grafts as well as an inadequate operation at the first procedure. In our early experience of the 1960s, we performed some Vineberg operations which we now judge as completely inadequate, and these provided some of these cases. From 1969 through 1972, we went through a period of providing only one or two vein grafts even though nearly all the patients had three-vessel disease. Therefore, we left large areas of left ventricular myocardium supplied by obstructed coronary vessels. Almost all these patients had clinical relief of angina, but for the patients requiring a second operation this relief lasted only a few months. In our series, 40% were reoperated on within 1 year and two thirds within 2 years of the first operation.

Now we attempt to revascularize the myocardium completely by placing at least one graft to

each area supplied by an occluded or stenotic coronary vessel. Most patients have four or five coronary anastomoses at the first procedure.

Since this report, additional patients have undergone reoperation and only one could be judged as having had an inadequate first operation. He had two grafts at the first operation, and a moderately diseased right coronary vessel was left ungrafted. Since angina persisted, he was restudied a few months later, and his two grafts were patent but the real left anterior descending artery had been missed, and the graft had been placed in a small diagonal vessel. At reoperation, two more grafts were fashioned, one to the real left anterior descending artery and another to the moderately diseased right coronary artery. We are no longer worried whether a stenosis is critical or significant or not. If there is any doubt about a lesion being significant, we now usually will proceed with a graft to that vessel. With this attitude the problem of the inadequate first operation should disappear. Of the other 13 cases added to our series of reoperations since the published report, all had occluded or malfunctioning grafts from the first operation.

In the 50 patients described in this paper, seven had surgical mishaps whereby five functioning grafts were divided and had to be repaired, and the ventricle was lacerated in two cases. Six of these 50 patients died, an unacceptable high 12% mortality rate. Three of the deaths were directly related to those patients who had the surgical accidents. Most of these accidents occurred in our early experience. It seems that each surgeon is entitled to one of these mis-

haps, following which he develops a tremendous respect for the act of opening the sternum at reoperation.

We have had no surgical misadventures or accidents in the 14 additional cases, and no operative mortality. With greater experience, the safety of the operation has increased so that we now feel that reoperation for myocardial revascularization, although still a difficult operation, carries an operative risk little higher than the risk of a primary attempt if the operative team is a well-experienced one.

In our practice, the frequency of this repeat operation has been about a constant three reoperations for every 100 primary revascularization procedures over the past 7 years. This is despite a rapidly increasing postoperative pool of patients who may some day be candidates for a second try. This is encouraging, and seems to indicate that the primary operation we have been doing in more recent years is greatly reducing the need to reconsider the same problem in the same patient at a later date. I believe that by properly planning the first operation and thereby achieving complete revascularization, we can, in most cases, avoid the need of a second one. Progression of disease as the single responsible factor requiring a second operation has been, and should continue to be, rather unusual.

What about the results of a second operation? What are the chances that a second operation will work when the first one failed? We have recatheterized only nine of these patients, and found a 71% patency rate of the new grafts. This is a 10% lower patency rate than in the primary group, but since the number is so small, I hesitate to make profound state-

ments based on it. The Cleveland Clinic has a much larger restudied group, and the patency rates are similar. The reoperated patients have enjoyed the same relief of symptoms as have those after a primary revascularization procedure. Among the 56 patients who survived the reoperation, there have been only two late deaths, which is better than the long-term follow-up of the primary group. This is about a 1% annual mortality rate, which is better than the mortality rate for the U.S. adult population as a whole. Here again with such small numbers we cannot draw any definite conclusions, but it is suggested that these reoperations are beneficial.

In summary, let us try to answer the question: What are the indications for a reoperation for the purpose of myocardial revascularization? I think the answer is the indications should be the same as those used as

indications for coronary bypass grafting in patients who have not had a previous operation. There should be two provisos to that answer, however. These are, provided the surgical team is well-experienced and not likely to have trouble opening the sternum, and provided the first surgeon's operative report does not describe the distal coronary vessels as being severely involved with the atherosclerotic disease.

The use of the internal mammary artery, if it was not used the first time, makes a lot of sense. We know this is feasible, since rarely does the closure of a routine sternotomy incision cause damage to this artery. The higher patency rates with the internal mammary artery when used as a graft make its use attractive, particularly when the coronary vessel to which it is grafted may provide a relatively low run-off situation.