Results of coronary artery surgery in women

Leonard R. Golding, M.D.

Laurence K. Groves, M.D.

Department of Thoracic and Cardiovascular Surgery

Many clinicians have the impression that coronary artery disease in women is more diffuse and severe than in men, and hence the surgical results are often not as good. In a small series of patients, Bolooki et al[1] showed that in women the results of saphenous vein bypass grafting to the coronary arteries were less than satisfactory. For these reasons we have reviewed the short-term results of coronary artery surgery in women at the Cleveland Clinic and compared them with those in men operated upon during the same time period.

Patients

The angiographic criteria used in the selection of patients for coronary artery surgery at the Cleveland Clinic are 70% to 80% or greater obstruction in a major branch of the coronary circulation, a distal segment relatively free of significant occlusive disease, and normal or mild to moderate ventricular impairment. Many patients had a myocardial infarction previously, and most had experienced classic or atypical angina pectoris. Initially, many of the operations consisted of single vein grafting, but now multiple grafting is done in the majority of cases.

This series includes both elective and emer-

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gency cases. Except for emergencies, contraindications to surgery have been gross obesity, florid tabacco bronchitis, recent treatment with propranolol, or active peptic ulcer disease. In recent years internal mammary artery (IMA) grafting has been performed more frequently.

Results

From 1971 through 1975, 7,941 patients underwent revascularization surgery. Saphenous vein grafting without the use of an IMA was done in 5,273 patients (76%). Women constituted 11% of the cases, and the distribution of the type of revascularization done is shown in *Table 1*.

The overall results for saphenous vein grafts are shown in *Table 2*. There was no significant difference between the rate of myocardial infarction for men and that for women, nor in the mortality rate for those who received a single vein graft.

Table 1. Revascularization surgery, 1971 through 1975

Revascularization procedure	7,064 men	877 women
SVG × 1	1,648 (35.4%)	296 (47.4%)
SVG × 2	2,149 (46.2%)	246 (39.4%)
SVG × 3 or more	852 (18.4%)	82 (13.2%)
Total	4,649 (100%)	624 (100%)
IMA	645 (26.7%)	107 (42.3%)
IMA & SVG × 1	1,117 (46.3%)	108 (42.7%)
IMA & SVG × 2 or more	653 (27.0%)	38 (15.0%)
Total	2,415 (100%)	253 (100%)

There was, however, a significant difference in mortality for men and women having two or more grafts. *Table 3* shows the results for IMA grafts alone or when combined with vein grafts. The mortality rate in both groups was very low, but there was a consistently high rate of myocardial infarction for women in all groups.

Recatheterization is done in about 40% of the patients undergoing revascularization at the Cleveland Clinic. Patency rate for single IMA or single vein grafts is shown in *Table 4*. Women with single vein grafts appear to do less well than men, but the number of IMAs restudied is too small to be significant.

Discussion

Bolooki et al[1] studied the results of saphenous vein grafting in 34 women. In that series the early mortality rate was 8%, and the early myocardial infarction rate was 20%. Furthermore, in the women that were restudied, the patency rate was only 50%. The present study did not include long-term follow-up, but showed an overall early mortality rate of 2.2% and postoperative myocardial infarction rate of 5.9%. For women the patency rate of single vein grafts at 1 year was 74.4%.

These results indicate that there are some minor differences in men

Table 2. Results in pure vein grafts

	SVG × 1		SVG × 2		SVG × 3 or more	
	No. men	No. women	No. men	No. women	No. men	No. women
No. patients	1,648	296	2,149	246	852	82
Mortality rate	15 (0.9%)	1 (0.3%)	29 (1.4%)	8 (3.3%)	24 (2.8%)	5 (6.1%)
Definite MI	46 (2.8%)	14 (4.7%)	92 (4.3%)	10 (4.1%)	49 (5.7%)	3 (3.7%)
Questionable MI	15 (0.9%)	1 (0.3%)	25 (1.2%)	7 (2.8%)	10 (1.2%)	2 (2.4%)
Total no. MI	61 (3.7%)	15 (5.1%)	117 (5.5%)	17 (6.9%)	59 (6.9%)	5 (6.1%)

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Table 3. Results of internal mammary artery grafting

	IMA		IMA and SVG × 1		IMA and SVG × 2 or more	
	No. men	No. women	No. men	No. women	No. men	No. women
No. patients	645	107	1,117	108	653	38
Mortality rate	1 (0.16%)	0	4 (0.3%)	0	9 (1.4%)	1 (2.6%)
Definite MI	7 (1.1%)	2 (1.9%)	40 (3.6%)	8 (7.4%)	46 (7.1%)	4 (10.5%)
Questionable MI	2 (0.3%)	3 (2.8%)	14 (1.2%)	1 (0.9%)	10 (1.5%)	2 (5.3%)
Total no. MI	9 (1.4%)	5 (4.7%)	54 (4.8%)	9 (8.3%)	56 (8.6%)	6 (16.8%)

Table 4. Results of recatheterization in single graft cases

	Men	Women
No. of single IMA	182	21
Occluded	9 (4.9%)	2 (9.5%)
No. of single SVG	946	110
Occluded	150 (15.9%)	26 (23.6%)
Patency	84.1%	74.4%

and women as regards patency, myocardial infarction, and mortality, but these differences are not as significant as we had expected. They certainly do not contraindicate operative correction of obstructive coronary artery disease. Our present policy is to continue to make the decision for or against coronary artery surgery without consideration of the sex of the patient.

Reference

1. Bolooki H, Vargas A, Green R, et al: Results of direct coronary artery surgery in women. J Thorac Cardiovasc Surg **69:** 271–277, 1975.

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