

Coronary arterial surgery

Denton A. Cooley, M.D.

Houston, Texas

Myocardial revascularization for arteriosclerotic disease with the bypass technique has been used at the Texas Heart Institute for a decade. Before that we had used the technique to correct certain anomalies of the coronary anatomy in instances of anomalous origin of the left and right coronary artery to restore a two-vessel coronary system.

Prior to December 31, 1978, a total of 15,487 patients had undergone operation with fresh saphenous vein autografts (*Table 1*). Of these, 13,049 patients had the bypass procedure as the only cardiac procedure; and in the majority the indication included angina pectoris, which was inadequately controlled by medical therapy. In those patients for whom follow-up was possible 90% were improved and more than 60% were symptom free. In early experience single and double bypass were frequently done, but more recently the trend has been toward triple, quadruple, and quintuple bypass with asequential grafts with side-to-side anastomoses. Results in the more extensive or complete revascularizations revealed no increase in early mortality even though the patients were presumably at higher risk. Moreover, most of the patients who had to undergo a second procedure later were discovered to have unbypassed stenoses demonstrable on the initial arteriograms. During the 10-year

period surgical mortality has steadily decreased, and during the past 2 years the rate has been less than 2%.

Other lesions operated upon at the time of saphenous vein bypass included postinfarction aneurysm, aortic valve, mitral valve and other lesions of the lung, ascending or abdominal aorta, or gastrointestinal organs (Table 2). Usually, where anatomically feasible, we believe that additional procedures do not increase the risk of surgery and that all pathologic surgical indications should be corrected in one stage. Contrary to other reports, in our experience the combination of carotid endarterectomy and cardiopulmonary bypass has caused a higher incidence of neurologic complications than when the endarterectomy

is performed at a separate operation. This opinion is probably subject to change since it may reflect some increased vulnerability of the revascularized brain to the hemodilution technique, which we employ for open heart operations.

Studies of attrition of patients after operation indicate that not only do the patients experience important symptomatic improvement, but life expectancy is also better than a medically controlled group. Further technical improvement will provide even better results in the future. But unless the higher-risk patients are excluded as surgical candidates, the surgical mortality and long-term results will not change significantly.

Table 1. Coronary artery bypass at the Texas Heart Institute prior to December 31, 1978

	Patients	Asymptomatic	Improved	Same	Worse	Early deaths	Late deaths	No reply	No letters sent
Total	15,487	3,125	4,941	370	315	700	661	2,576	2,799
Alone	13,049	2,818	4,277	321	258	444	456	2,168	2,307
Single	1,162	267	436	44	49	31	51	168	116
Double	3,732	794	1,452	138	105	127	198	537	381
Triple	5,508	1,261	1,773	119	82	212	169	963	929
Quadruple	2,239	427	545	16	19	64	35	441	692
Quintuple	374	64	66	4	3	8	3	55	171
Sextuple or more	34	5	5	2	...	4	18

Table 2. Coronary artery bypass in conjunction with other lesions

	Patients	Asymptomatic	Improved	Same	Worse	Early deaths	Late deaths	No reply	No letter sent
With left ventricular aneurysm	1,001	107	285	20	23	87	75	195	209
With aortic procedure	477	90	111	10	8	73	40	65	80
With aortic and mitral procedures	41	4	11	1	1	10	4	4	6
With mitral procedure	391	34	110	8	13	51	42	64	69
With other procedures	348	51	98	5	7	31	24	50	82