Ventricular aneurysms and akinesis

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With the advent of cardiopulmonary bypass, excision of postinfarction ventricular aneurysms became one of the first acquired cardiac lesions to be treated surgically with success. The earlier results reported by Bailey and associates of ventricular resection by the closed technique and with the beating heart were truly remarkable, but by present standards would not be acceptable. In 1958 we reported our initial results with the open technique and pointed out the advantages of a more anatomic repair preserving and restoring left ventricular function and the careful removal of contained thrombus. The technique of aneurysmal excision remained essentially the same until 10 years later when development of selective coronary arteriography led to direct myocardial revascularization by the vein procedure. Thus, we have divided our experience with ventricular aneurysms into two groups, i.e., before and after the bypass became available, and the year 1969 was selected as the dividing point (*Table*). Before 1969, 100 patients underwent aneurysmal resection without cardiopulmonary bypass and 19 died within 30 days (19%). Since 1969, 684 patients underwent operation with 61 deaths (8.9% mortality). The mortality was actually higher in the revas-

Table. Results of surgical excision of left ventricular aneurysm (to December 31, 1976)

	No. of patients	Mortality (%)
Before 1969	100	19.0
After 1969		
Without bypass	148	7.4
With bypass	536	9.3
Total	684	8.9

cularized patients (*Table*). The results between the two periods reveal an improvement in surgical mortality, and we believe the survivors have a better prognosis in terms of both symptomatic relief (angina) and a better chance for subsequent cardiac functional recovery. During the period since 1969 the slightly increased mortality among the revascularized patients reflects in part the greater severity and extent of their coronary vascular disease rather than complications related to a more extensive cardiac operation.

Many patients who have a ventricular aneurysm demonstrable mostly by ventriculography and without obvious alteration in overall cardiac silhouette have extensive involvement of the interventricular septum. Paradoxical motion of the fibrotic septum reduces left ventricular performance in the same manner as fibrosis of the free ventricular wall. Often, extensive thrombosis is found on the septum, and debridement leaves a ragged surface which may cause embolization and a thinned-out wall subject to perforation. To prevent these complications and control the paradoxical septal motion, we have used a technique of patch graft septoplasty with an overlay patch of knitted velour Dacron sutured to the septum. The purpose of the septoplasty, therefore, is to (1) control paradoxical motion of the thin interventricular septum, (2) prevent embolism of mural thrombi attached to the septum. Since 1975 we have performed septoplasty in 85 high risk patients (12.9% mortality): 16 had resection of a ventricular aneurysm without bypass grafts and 49 had resection with single or multiple bypass grafts. Comparison of left ventricular ejection fraction and angiographic observation of ventricular wall motion, before and after operation, supports the effectiveness of this adjunctive technique for patients with left ventricular aneurysm or dyskinesia.

Often the surgeon is confronted with the decision whether to open the left ventricle when the external appearance of the heart may not clearly indicate the presence of an aneurysm. The preoperative ventriculogram and left ventricular function studies may have shown substantial functional impairment. At one time we used closed or blind plication of the dyskinetic wall, but in a few cases systemic embolism resulted, probably from an unsuspected underlying thrombus that was loosened by the plication. At present, therefore, we advocate open plication of dyskinetic or akinetic areas. The finding on venticulogram of a thrombus in the apex of the damaged left ventricle is always an indication for ventriculotomy, thrombectomy, and ventricular plication.

Severe mitral valve dysfunction in patients with extensive myocardial damage occurs mostly with posterior infarctions. Selection of the appropriate technique of valve repair or replacement depends upon a number of factors. Recently we have used a transatrial "C" ring posterior annu-

loplasty for those patients with ischemic papillary muscles or generalized annular dilatation. Mitral valve replacement using a low profile double cone disc prosthesis (Cooley-Cutter*) is used in patients with extensive papillary muscle rupture. The unique cases are those of severe mitral incompetence associated with posterior left ventricular aneurysm. Once the aneurysm is excised, an excellent view of the mitral valve is afforded, permitting and facilitating valve replacement from the ventricular aspect.

Experience with postinfarction sequelae has demonstrated strikingly that if sufficient viable myocardium remains after extensive repair, if the volume of the left ventricular cavity is adequate, and if the mitral and aortic valves are relatively competent, the heart has a unique ability to recover. Thus, we conclude that exceedingly large aneurysms are no contraindication to surgical excision; indeed, if the patient has enough functioning myocardium to survive when the aneurysm is present, he may actually thrive after its removal.

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