

ADVANCES *in* INTERNAL MEDICINE

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Surgical Treatment of Mitral Stenosis and Aortic Stenosis

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MITRAL STENOSIS

MITRAL VALVOTOMY, or mitral commissurotomy, has over the last 10 years proved to be one of the most valuable operations of modern surgery. Even if it does not cure, and although many patients are still left with other effects of rheumatic heart disease and past effects of a stenosed mitral valve, after a successful operation the clock is put back to the time before severe incapacity developed and an enjoyable and productive life is once more possible. Surgical treatment has now been established long enough to give some indication of its efficacy both in degree and in time.

The stenosed mitral valve is an obstruction to the circulation which increases the work of the heart, like obstruction in other organs of the body which can only be dealt with surgically. This logical treatment was first attempted in the 1920s, but the pioneer surgeons—Cutler and associates (30, 31), Allen and Graham (1), Pribram (65), and Souttar (69)—were all forced to abandon operative treatment because of a lack of early success in a climate of medical scepticism; the time was not yet ripe. After the Second World War, advances in thoracic surgery, in postoperative care, anesthesia, and blood transfusion, and the advent of antibiotics and an awakened interest in the hemodynamics of the heart resulting from the development of cardiac catheterization led to success on both sides of the Atlantic. Bailey and associates (3, 5) in Philadelphia, Harken and co-workers (42) in Boston, and Brock and associates (12) in London, reintroduced surgical treatment of mitral stenosis. The technic adopted by Bailey and by Brock which estab-

lished the present-day operation was essentially the same as that used by Souttar in 1925.

The early results were impressive and the operative mortality was not prohibitive—not always the case in pioneer cardiac surgery—so that in a few years the operation rapidly became widely established, and the demands of patients overcame the hesitancy of the most conservative and sceptical. Surgical treatment emphasized the many gaps in the knowledge of this common disease and stimulated clinical, hemodynamic, and pathologic research which has increased cardiologic knowledge generally. Furthermore, the success of mitral valvotomy paved the way for advance in the surgical treatment of other intracardiac lesions, both congenital and acquired, so that within 10 years most have come to be considered curable or remediable either now or in the not so distant future.

The operative mortality in the earliest reported series was between 10 and 15 per cent, which is very high by modern standards. Operative mortality was naturally higher before the surgical technic was perfected, partly because the proportion of severe cases was higher before surgical treatment had become routine. Even in those early days, the mortality for an emergency operation in a crippling and killing disease compared favorably with other established operations. Today, the operative mortality should not exceed 5 per cent, even when the most severe cases are accepted, and in our own experience over the last few years is under 2 per cent. There is probably more danger that the diminished surgical risk may encourage unnecessary operations on patients with rheumatic heart disease but without tight mitral stenosis, or on patients with signs of mitral stenosis but no true disability, than that the patient who really needs mitral valvotomy, however advanced his disease, will succumb from operation.

IMMEDIATE RESULTS OF OPERATION.—Many patients are conscious of improvement immediately after operation, despite the attendant discomforts of a thoracotomy; they are aware of an increased warmth of the extremities—"an improved circulation"—and particularly of a lessening of tension in the lungs which corresponds to the lowered pressure in the left atrium observed at operation after successful valvotomy. Those with marked pulmonary hypertension may not experience maximum benefit until some months after operation, and it has been shown that the pulmonary pressure may take this time to drop to its lowest level. These patients, and those with associated organic tricuspid disease, may show transient congestive failure in the postoperative period. The only postoperative complication that needs mentioning is the so-called postcommissurotomy or postvalvotomy syn-

drome. The features of the syndrome are fever, chest pain, pericardial effusion which may cause marked increase in the size of the heart (as shown by radiography) and increased venous pressure, pleural effusion particularly on the left side, electrocardiographic changes, and anemia not explained by blood loss at operation; about half of the patients experience it in minor or major degree. It may happen immediately after operation, may be delayed several weeks or months, and may recur during the first year. Its recognition is important because patients may then be warned that the good of the operation has not been undone, as they are naturally apt to think, and that it is consistent with an excellent result. The term "postcommissurotomy (or postvalvotomy) syndrome" is bad, as the syndrome is not confined to this operation, nor is it associated with an exacerbation of rheumatic activity, as was first thought. It occurs after other operations in which the pericardium is opened, as in congenital heart disease, and the same reaction was noted by Wood (71) during the Second World War, associated with foreign bodies in the pericardium. It is a nonspecific inflammatory reaction, and "postpericardectomy syndrome" is the best term to describe it. It is usually self-limited, lasting less than a week, but occasionally may prolong the postoperative period for several weeks. The pain and fever are relieved by aspirin, though in severe or prolonged bouts cortisone may be indicated.

LATE RESULTS OF OPERATION.—There is general agreement among the reported series, recently reviewed by Baden (2), that between 70 and 80 per cent have good or excellent results after valvotomy, though the criteria for this assessment are not always clear. Even when improvement is less than this, due either to inadequate relief of stenosis or to the presence of regurgitation, most patients are grateful for relief of symptoms. The psychologic effect of successfully weathering a major operation and the increased rest of the convalescent period may delude the uncritical physician into thinking that a good result has been obtained when little has been achieved surgically. Although a reasonable functional result may be achieved without marked alteration in physical signs, in those with excellent results there is a striking change. The diastolic murmur may be heard only with difficulty or not at all, though the opening snap rarely disappears. There is a diminution or disappearance of right ventricular hypertrophy and of the "mitral" P wave, if these were present before operation. Radiographic signs of pulmonary hypertension and pulmonary venous congestion diminish, though marked decrease of heart size is uncommon. Improved nutrition is obvious, and marked gain in weight is common. The liability to "chestiness" in cold and wet weather is lessened.

For a proper appraisal of the result of mitral valvotomy, a careful follow-up is essential to observe how long improvement is maintained and to what degree the natural history of the disease is changed. Of paramount interest is restenosis of the valve. As it may take many years for the stenosis to develop to the critical level which produces disability, the period of follow-up is still too short to decide the incidence of restenosis in those whose valves were fully opened at operation. The medical literature is not rich in detailed studies on the long-term effect of mitral valvotomy, so that I prefer to discuss a personal series from Guy's Hospital. It has the advantage of an early start, includes a high proportion of severe cases, and is limited to the first 200 patients, which enabled one physician to know the patients individually and observe them carefully.

FOLLOW-UP OF PATIENTS AFTER MITRAL VALVOTOMY

NATURE OF FOLLOW-UP.—Of 239 consecutive patients who underwent operation, 7 were operated on for mitral regurgitation, 27 (11.7 per cent) died as a result of operation, and 5 could not be followed. The remaining 200 patients, in November, 1958, had been followed for:

<i>Number of Patients</i>	<i>Years after Operation</i>
1	10
2	9
5	8
28	7
62	6
102	5

Most of the 27 operative deaths occurred early in the series, giving a high mortality rate compared with present figures. Functional change assessed by symptoms—and this is very individual and varies with the patient's environment and temperament—was correlated with signs, including repeated radiographic and electrocardiographic evidence. Catheterization was performed preoperatively in 96 patients, post-operative¹⁷ in 44, and repeated more than once in 13. Disability was assessed before and after operation and during the follow-up period, using the same grading system. Before operation, the 200 patients were assessed as follows:

<i>Grade</i>	<i>Number of Patients</i>
0: No disability	None
1: Symptoms only on marked exertion	None
2: Symptoms on mild exertion; able to carry on normal activity with difficulty	28
3: Incapacitated enough to interfere with work and liable to episodes necessitating bed rest or hospitalization	128
4: Totally incapacitated	44