CASE REPORT

Ventricular Aneurysmectomy for Recurrent Tachycardia

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Ventricular aneurysm is a well-documented complication of myocardial infarction. The usual indications for surgical removal of an aneurysm include congestive cardiac failure or thrombo-embolic episodes refractory to medical treatment. In a review of the published reports we could find no report of any aneurysm being removed for the control of arrhythmias. We wish to report a case of a patient with recurrent refractory tachycardias which were eventually controlled by the surgical removal of the aneurysm.

Case Report

The patient, a 64-year-old woman, was first seen in October 1965, having been referred with a tachycardia of 11 days' duration. For 2 years she had suffered chest pain and occasional palpitations. Clinically, she showed the signs of mild congestive cardiac failure and her blood pressure was 115/90 mm. Hg. Her pulse was regular at 156 a minute, and there was no response to carotid sinus pressure. The electrocardiogram showed a slightly irregular tachycardia with the QRS 0.12 sec. (Fig. 1a). After direct current countershock, the patient reverted to sinus rhythm. The electrocardiogram (Fig. 1b) then showed an extensive anterior infarction with ST elevation. The chest x-ray showed pulmonary congestion, cardiac enlargement, and a ventricular aneurysm, with calcification on the anterior aspect of the left ventricle (Fig. 2). She was discharged on digoxin 0.25 mg. twice a day, propranolol 10 mg. every 6 hours, and procainamide 250 mg. every 6 hours.

She was readmitted in January 1967, with a 3-day history of tachycardia. She had continued on medication, but propranolol had been discontinued in October 1966. Direct current countershock reversion produced ventricular asystole, but she was resuscitated to sinus rhythm. The electrocardiogram was unchanged from that of October 1965. Tachycardia recurred the next day. Further direct current countershock was

attempted, but even after intravenous lignocaine and phenytoin sodium it was unsuccessful. Metaraminol and digoxin were given, but the tachycardia persisted until it reverted to sinus rhythm after 15 mg. intravenous methoxamine. Two days later she again developed the tachycardia and under observation developed ventricular fibrillation. She was defibrillated electrically, but 6 hours later developed ventricular fibrillation and was again resuscitated to sinus rhythm. Intravenous lignocaine infusion and intramuscular phenytoin sodium were given and the patient remained in sinus rhythm. Phenindione was started because of the possible thrombo-embolic complications of the aneurysm. She was discharged on procainamide 500 mg. every 6 hours, digoxin 0.25 mg. twice a day, propranolol 10 mg. every 6 hours, and phenytoin sodium 100 mg. every 6 hours, as well as frusemide, potassium chloride, and phenindione. Tachycardia occurred yet again in March 1967, and was reverted with direct current countershock. Six weeks later, in spite of continuation of the full regimen of the anti-arrhythmic drugs, tachycardia of 170 a minute returned. Reversion to sinus rhythm was achieved easily with countershock. Operative treatment was discussed but was not performed as it seemed unlikely to be successful. The tachycardia recurred a week later and was reverted with further countershock and an intravenous infusion of lignocaine. Five days later during the same admission the tachycardia recurred. Limited cardiac catheterization was performed at this time. Mean right atrial pressure during the tachycardia was 5 mm. Hg. Endocardial pacing in the right atrium and later in the right ventricle was unsuccessful in controlling the tachycardia. After this, the patient was electrically reverted to sinus rhythm. The mean right atrial pressure was then 2 mm. Hg and pulmonary artery wedge pressure showed a mean of 18 mm. Hg.

Five days later the tachycardia recurred once again and emergency operation was performed. Body perfusion was required for 45 minutes to remove the aneurysm which measured 8 cm. in diameter, and contained a large amount of laminated clot, nearly 30 mm. thick, and some calcification. The defect was closed by overlapping the thick fibrous base of the aneurysm with multiple mattress sutures. Apart from atrial

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FIG. 1.—Electrocardiogram, October 1965. (a) During tachycardia. (b) After reversion to sinus rhythm.

FIG. 2.—Chest x-ray, January 1967, showing left ventricular aneurysm.

fibrillation for 12 hours on the second day after operation, the patient remained in sinus rhythm. She developed mild congestive failure and a small left pleural effusion. She was discharged on digoxin, frusemide, spironolactone, and potassium chloride.

One month later the patient was well but had had two bouts of palpitations each lasting five minutes and resolving spontaneously. There were no signs of cardiac failure though the diuretics had been discontinued. There was a regular sinus rate of 100 a minute, but occasional ventricular extrasystoles were present. The patient was given procainamide and phenytoin sodium. Eight months after operation, she had had no further palpitation, was well, and had resumed her housework and gardening. Phenytoin sodium had been stopped, but she continued to take procainamide and digoxin.

Discussion

This patient's clinical course was characterized by recurrent tachycardia which recurred in spite of high doses of various anti-arrhythmic drugs. On two occasions she developed ventricular fibrillation from the tachycardia, and on another occasion direct current countershock was associated with ventricular standstill.

The indirect left atrial pressure, measured immediately after electrical reversion of her rhythm, was raised to a mean of 18 mm. Hg, confirming myocardial decompensation. Thus, the indication for operation in this patient was to control a recurrent tachycardia which had led to ventricular fibrillation or standstill on three separate occasions.

While arrhythmias are uncommon, they are well-documented complications of ventricular aneurysm occurring after myocardial infarction, and include

atrial fibrillation, atrial tachycardia, and ventricular tachycardia (Parkinson, Bedford, and Thomson, 1938; Dubnow, Burchell, and Titus, 1965). Paroxysmal arrhythmias, usually ventricular tachycardias, may also occur (Parkinson *et al.*, 1938; Berman and McGuire, 1950; Likoff and Bailey, 1956). Operation is usual (Abrams *et al.*, 1963; W. Likoff, 1968, personal communication) on patients with progressive cardiac failure unresponsive to medical therapy or when repeated emboli occur in spite of treatment with anticoagulant drugs. Likoff and Bailey (1956) describe 7 patients whose main clinical problems were congestive heart failure and paroxysmal arrhythmias, and it was noted that removal of the aneurysms led to the correction of the congestive cardiac failure and the control of the arrhythmias, though none of the patients were operated on solely for arrhythmias (W. Likoff, 1968, personal communication). Surgical removal of the aneurysm in our patient led to clinical improvement and relief from the recurrent arrhythmias.

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