SACCULAR DISSECTING ANEURYSM OF THE ASCENDING AORTA

BY

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Very few dissecting aneurysms having a saccular shape have been described. Our case poses an interesting ætiological problem.

Case Report

The patient was a 50-year-old man, first seen in February, 1958. He gave a history of breathlessness on exertion and palpitation for the previous six years. For two years he had experienced a dull aching pain at the right nipple area, not certainly related to exertion, and often troubling him in bed at night. On examination atrial fibrillation was present, and the blood pressure in both arms was 130/100 mm. Hg. Although the jugular venous pressure did not appear raised, superficial veins coursed over the right side of the chest, which was prominent and pulsating. There was a striking thrill and systolic and diastolic murmurs were widely heard.

An X-ray of the chest confirmed the diagnosis of aneurysm of the ascending aorta. Routine Wassermann and Kahn tests were negative. Treponemal and standard Wassermann and Price's precipitation reactions were negative as was the treponemal immobilization test.

On February 19 Mr. J. A. W. Bingham inserted between two and three hundred feet of steel wire (36 standard wire gauge) into the aneurysm through a needle in the anterior chest wall. This was followed by some pyrexia. The patient was discharged home with considerable subjective improvement on March 30.

He was re-admitted on July 28; the chest pain and breathlessness had become worse. On examination he was dyspnoeic and cyanosed; the neck veins were engorged and the liver margin was four fingerbreadths below the costal margin. There was ankle and sacral œdema. The illness followed a gradual downhill course and the patient died in terminal cardiac failure on August 29, 1958.

Necropsy

A large aneurysm was found occupying the right side of the chest. It measured $22 \times 15 \times 10$ cm. and lay in front of the right lung, which was collapsed. Its wall was thick and fibrous and the cavity contained a large amount of fine steel wire, with loose clot around it (Fig. 1). There was a layer of laminated clot on the inner aspect of the wall. The aneurysm arose from the ascending aorta and communicated with the lumen through a rounded orifice 1.8 cm. in diameter, about 3.7 cm. above the aortic valve. The aortic intima was smooth. The aortic valve was deformed and rigidly stenosed and there was much hypertrophy of the left ventricle. The aneurysm, in its projection downwards, pressed upon the right auricle, deforming it and displacing it to the left. The liver showed chronic venous congestion. No congenital malformations were found: in particular there was no arachnodactyly.

Histological Examination. The wall of the aneurysm was seen to consist chiefly of a thick layer of fibrous tissue but with a few disorganized elastic fibres representing what remained of the media. Inside this there was antemortem thrombus which showed some organization. Sections of the aorta taken at some distance from the origin of the aneurysm showed a gross degree of fragmentation. The aorta at the mouth of the aneurysm showed a sudden break in its muscle coat and the endothelial lining of the aorta extended into the aneurysm at this point.

The mitral valve showed vascularization and calcification. There was also perivascular fibrosis of the myocardium characteristic of healed rheumatism, as well as widespread ischæmic fibrosis.

FIG. 1.—Right side of heart opened to show the aortic aneurysm compressing the wall of the right auricle. The cavity of the aneurysm contains clot and fine steel wire.

There was no arterial change in the kidneys or elsewhere suggestive of hypertension. No lesions suggestive of syphilis were found.

Discussion

Very few cases of saccular aneurysm resulting from medial necrosis have hitherto been described. Shennan (1934) in his review of three hundred dissecting aneurysms mentions four. It has been possible to read the original descriptions of two of these. The first case (Ryan, 1844) is very briefly described, but probably had a spontaneous rupture of the aorta, while the second (Davy and Gates, 1922) seems to have had a lesion similar to the one described above, but it was only "the size of an orange".

There can be no doubt that our patient had a type of dissecting aneurysm, because of the fragmented elements of media in the aneurysm wall and the abrupt rupture of the media at the site of origin of the aneurysm. It is not easy to explain why, in an aorta that shows such widespread-destruction of the media, the dissecting aneurysm should be saccular. A possible explanation is that at the time of origin of the aneurysm there was only a localized area of medio-necrosis, and that the other parts of the media underwent degeneration subsequently.

Another factor in the present case is the finding of rheumatic aortic stenosis: it is possible that the altered hæmodynamics in the ascending aorta induced by this might have been a contributory cause of the lesion and might have helped to determine the form it assumed.

The ætiology of medial necrosis is still a controversial subject. Hypertension has been held to be important in this respect. Gore and Seiwert (1952) described 85 cases, in 42 per cent of which there was no clinical or pathological evidence of hypertension: 32 of these patients were under forty years of age and of these 75 per cent had a normal pressure. It is possible that these younger subjects may have had an inherent weakness at the aortic media, and this may be related to the "forme fruste" of Marfan's syndrome (Marfan, 1896) as suggested by Tobin *et al.* (1947). The present case was in the older age group, the aneurysm appeared to be due to medial necrosis, and none of the stigmata of Marfan's syndrome were present.

It is noted that wiring of the aneurysm was not successful in preventing its further enlargement. The rationale of this operation, first described by Moore and Murchison (1864) is to promote thrombosis inside the aneurysm and so to reduce the space through which blood may flow. Linton and Hardy (1952) reviewed wiring as a treatment of aneurysm and reported moderate success in 18 patients. In the present case, although there was symptomatic relief, the aneurysm had extended prior to death, and at necropsy thrombosis was minimal. Had it been possible to visualize the neck of the sac by angiography, a more radical surgical approach might have been considered. An angiogram was carried out but it failed to define the aneurysm. It is doubtful whether any treatment would have significantly altered the outcome.

Summary

A large saccular dissecting aneurysm of the ascending aorta in a man of fifty years is described. There was no hypertension or syphilis. Rheumatic aortic stenosis was present. There was widespread medial necrosis of the aorta. The ætiology and treatment of the lesion are discussed.

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