A Case of Syphilitic Aneurysm of the Aortic Sinus and Aortic Regurgitation

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SUMMARY

A 73-year-old male, with complaints of chest pain and dyspnea died after the recurrent attacks of congestive heart failure on the base of aortic regurgitation. Autopsy showed the dissecting aneurysm of the posterior sinus of Valsalva caused by syphilitic mesoaortitis. Rarity of the acquired aneurysm of the aortic sinus was emphasized.

Additional Indexing Words:
Mesoaortitis Unruptured aneurysm of aortic sinus Dissecting aneurysm

Many cases of congenital aneurysm of the sinus of Valsalva have been reported,1,2) but there have been few cases of acquired nature.1,3,4) In this paper an elderly case of unruptured syphilitic aneurysm of aortic sinus associated with aortic regurgitation was presented.

CASE REPORT

A 70-year-old man entered the hospital complaining of a sudden onset of precordial and back pain in September, 1965. He had been well until 1960, when he was noted to be hypertensive. He had a history of venereal disease, when he was 30 years old. There was no remarkable family history except a case of cerebral apoplexy in his paternal uncle.

On admission his pulse rate was 60/min. and face was pale. But the patient had neither edema nor anemia. Blood pressure was 190/90 mm.Hg. Cardiac ausculatation disclosed a systolic murmur (Levine 2/6) at the apex and blowing diastolic murmur (Levine 2/6) with the point of maximum intensity at the 4th intercostal space along the left lower sternal border. Liver was palpable by 2 finger-breadths below the right costal margin. Edema was not present. X-ray film of the chest (Fig. 1) revealed a marked cardiac enlargement with the cardio-thoracic ratio of 74% and markedly dilated and elongated aorta. Electrocardiogram (Fig. 2) revealed a left ventricular hypertrophy with left axis deviation on

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admission, followed by a transient atrial fibrillation and marked changes of ST-T segments in his clinical course. Phonocardiogram (Fig. 3) showed the diastolic murmur and the presence of the 3rd heart sound at the 4th intercostal space along the left sternal border and apical systolic murmur of ejection type. One year later, this systolic murmur developed to the holo-systolic type, suggesting the complication of mitral regurgitation. Cardiac index measured by dye dilution method was 3.4 L./min./M.² The hemogram, urinalysis, serum electrolytes and liver function
test were normal. Total cholesterol was 254 mg./100 ml., and serum test for syphilis was negative. Diagnosis of congestive heart failure due to aortic regurgitation and coronary insufficiency was made. And the treatments by digitalis and coronary dilator were started. Whole clinical course was characterized by frequent episodes of precordial and back pain associated with shortness of breath. On August 6, 1968, a sudden attack of dyspnea occurred and he died at the age of 73.

Autopsy showed a heart weight of 640 Gm., with marked hypertrophy and dilatation of both ventricles. Three main branches of the coronary artery have slight atherosclerosis and no remarkable calcified or atheromatous changes near the coronary orifices, which measured 6.5×5.8 mm. on the left and 6.5×6.2 mm. on the right side. Dilated aortic ring was 104 mm. and jet lesion was present in the outflow tract of the left ventricle. Mitral and tricuspid rings were 130 mm. and 124 mm., respectively, without any rheumatic or syphilitic changes. In the ascending aorta there was a syphilitic mesoaortitis with a dissecting hemorrhage of aortic media with 20 mm. in length at the point 15 mm. above the aortic valve. In the posterior (non-coronary) aortic sinus there was an aneurysm of 15 mm. in diameter (Fig. 4), which protruded towards the right atrium, without any perforation (Fig. 5). Vertical section of the aneurysm revealed that the aneurysm was formed by a dissecting process though it was incomplete and a bulging area like gumma formation, which histologically showed the changes of elastolysis and collagenosis (Fig. 6). Histological examination of this section further showed that the vasa vasorum was swollen by the endothelial swelling and hyperplasia (Fig. 7), and that infiltration of the plasma cells was found around the aortic adventitia (Fig. 8) and there was the partial loss of elastic fibers in the wall of the aneurysm (Fig. 9). The other pathological findings consisted of marked congestion of liver, kidney and spleen. The syphilitic changes were also recognized in the other portions of the aorta, which showed the vasculitis of vasa vasorum with the infiltrated plasma cells, and in liver and testis with the presence of gummatous microabscesses.
Fig. 6 (left). Vertical section of the aneurysm of the aortic sinus, showing dissecting hemorrhage of aortic media containing thrombus in it. Gummatoous portion is marked as "g" (E.v.G. ×3).

Fig. 7 (right). Endothelial swelling, hyperplasia and occlusive lesions of the vasa vasorum (E.v.G. ×200).

Fig. 8 (left). Infiltration of the plasma cells around the aortic adventitia (H.E. ×200).

Fig. 9 (right). Partial loss of the elastic fibers of the wall of aneurysm (E.v.G. ×200).
DISCUSSION

Although there have been accumulated reports on the congenital aneurysm of the aortic sinus, reports on the acquired aneurysm of the aortic sinus have been quite limited. Unlike the congenital ones, acquired aneurysm does not always rupture, and in cases of rupture, it may rupture outside the heart.\textsuperscript{1,3} Jones and Langley\textsuperscript{1} reviewed a total of 17 cases of syphilitic origin, including the first report by Smith in 1914. Merten\textsuperscript{3} reviewed 19 cases of syphilitic aortic sinus aneurysms, diagnosed at autopsy, including those of Jones and Langley. Additional 1 case was reported by Sohn and Levine.\textsuperscript{4} Thus there could be collected a total of 21 cases of syphilitic aneurysm of the aortic sinus including our case. Seventy-seven per cent of cases were male. As for the affected sinus, right and left sinuses show almost the same incidence and an involvement of the non-coronary (posterior) sinus was the least affected one. Ruptured aneurysms were found in the half of them.

In our case the etiology of the aortic sinus aneurysm was considered to be syphilitic, despite the negative test for syphilis, because the patient had venereal disease in his youth and a mesoaortitis was found, with infiltration of plasma cells and the vasculitis of the vasa vasorum around the adventitia of the aortic aneurysm. About 15\% of the cases of cardiovascular syphilis may be serum-negative.\textsuperscript{5} On a case of aortic regurgitation with serum-negative neurosyphilis, Bedford and Caird\textsuperscript{6} considered the etiology of aortic regurgitation as unknown. The morphological features in our case speak for the syphilitic origin.

Concerning the pathogenesis of aortic regurgitation in the aged, the authors\textsuperscript{7} proposed the degenerative type with prolapsed cusp without ring dilatation, which did not correspond to this case. Though the circumference of the aortic ring has a tendency to increase with aging,\textsuperscript{6,8} aortic ring in this case far exceeded the upper limit of normality,\textsuperscript{8} which could be attributed to syphilitic mesoaortitis. London described a case of 76-year-old male, in whom aortic regurgitation was formed by the failure of apposition of each cusp due to congenital aneurysmal protrusion of the aortic sinus.\textsuperscript{9} Aortic regurgitation in our case is attributed to the aortic ring dilatation caused by mesoaortitis, which could be further emphasized by the outward bulging of unruptured aneurysm of sinus of Valsalva.

REFERENCES