Primary Aortic Thrombosis

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Primary arterial thrombosis is a rare lesion and may be defined as thrombosis of a vessel without any obvious underlying cause. The condition has been described in the peripheral arteries of the upper and lower extremities but there are few authenticated reports of the condition affecting the aorta. A case of primary aortic thrombosis occurring in a man aged 32 is reported.

THROMBOSIS of the terminal aorta, insidious in onset and progress, is not uncommon. Since 1940 the clinical picture has been made clear, largely owing to the communications of Leriche and Morel.1 The clinical features originally described by Leriche were (1) in the male, inability to maintain a stable erection because of a reduced blood flow through the internal pudendal arteries; (2) extreme fatigability of the lower limbs when walking or standing; (3) generalized atrophy of muscles in both buttocks and in both lower limbs; (4) absence of nutritional changes of the skin and pallor of the feet when the patient was standing. Since then it has been recognized that claudication of the calf muscles is the usual presenting symptom and that nutritional changes proceeding to gangrene may occur. Most cases of aortic occlusion occur in males in the fifth and sixth decades, but the condition has been reported in patients as young as 29 years.2

In the vast majority of instances the thrombosis is secondary to atherosclerosis or embolism. Less commonly, thrombosis may occur in the sac of an aneurysm of either the dissecting or saecular type and has followed syphilitic aortitis,3 pressure by tumors,4 pelvic peritonitis, and irradiation to the abdomen. The following description of a case of aortic thrombosis occurring in a young adult man is of interest because the thrombosis was primary in origin, a rare event.

CASE REPORT

A 32-year-old married man was admitted on December 11, 1955, complaining of a feeling of tightness in the right calf, precipitated by walking 50 yards and relieved by rest. The onset of this symptom was gradual and had been present for 5 months.4 Systematic inquiry revealed that during this period he had increasing difficulty in sustaining an erection. Apart from the usual childhood illnesses the past history was noncontributory. He smoked 3 or 4 cigarettes a day and only occasionally took alcohol.

On examination his general condition appeared good and there was no evidence of anemia. The blood pressure was 140/90 mm. Hg, and the pulse was 80 and regular. The heart was clinically normal and the fundi showed no abnormalities. The major pulses in both upper limbs were present and equal and the arterial walls were soft.

Fig. 1. Percutaneous translumbar aortogram showing a filling defect of the aortic bifurcation and affecting the right common iliac artery more than the left.
The skin nutrition of the lower extremities was good, the plantar surface of the feet showed no pallor on elevation or congestion on dependency. There was no decrease in muscle mass or increased venous filling time. The skin temperature was normal. The femoral pulses were decreased, the popliteal pulses doubtfully present or absent, and the post-tibial and dorsalis pedis pulsations were absent.

The lungs, abdomen, and central nervous system were clinically normal. Because of diminution of the femoral pulses and the inability to maintain an erection, a diagnosis of aorto-iliac obliterative arterial disease was made. The hemoglobin was 15.9 Gm. per cent, the white blood cell count was 14,000 per mm.³, the Wassermann and Kahn tests were negative, the blood urea nitrogen was 31 mg. per cent, and the serum cholesterol was 286 mg. per cent. Urinalysis showed no albumin or glucose. An electrocardiogram and x-ray of the heart and lungs were normal.

A percutaneous lumbar aortogram (fig. 1) revealed a filling defect at the aortic bifurcation and affecting the right common iliac artery more than the left. The appearances were suggestive of extraneous pressure but were consistent with atherosclerosis. The aorta and the iliac arteries adjacent to the affected segment showed no evidence of obvious atheroma. In view of the disabling nature of his symptoms and the localized pathology of the disease, the lesion was considered ideal for resection and grafting.

Through a long left paramedian incision the lower abdominal aorta and common iliac arteries were exposed. The external appearances of these vessels were normal, but palpation revealed marked induration of the aortic bifurcation. The inferior mesenteric, fourth lumbar, and presacral arteries having been ligated and divided, arterial clamps were placed on the aorta below the renal arteries and on both common iliac arteries distal to the diseased vessels. Mobilization and excision of the affected segment was easy in contrast to that usually encountered with atherosclerotic vessels. The thrombosed segment was more extensive than that indicated by aortography and palpation. Figure 2 is a photograph of the excised aorta-iliac segment and figure 3 shows the specimen incised transversely at different levels to show the extent of thrombosis. Continuity was restored by a prefabricated polyvinyl alcohol sponge prosthesis that was sutured in place with 0000 arterial sutures with a continuous over-and-over suture.
The postoperative course was uneventful. All the major pulses in the lower extremities returned and were normal and equal. The claudication disappeared and he was later able to report that his sexual functions were normal.

The following is the pathologic report on the excised specimen by Professor C. V. Harrison:

"The specimen is shown in figure 2. It was further cut into a series of transverse slices of which a selection is shown in figure 3. The site of the maximal narrowing was at the bifurcation of the aorta but even here obliteration was not quite complete (fig. 4). Microscopic examination reveals evidence of organizing or organized thrombus at every level and in all sections this affects only part of the circumference, leaving at least a small segment free. The fibrous organization was in layers, indicating that it occurred in episodes. In most of the sections some unorganized thrombus is present. In most cases this is superficial (fig. 4), but sometimes it is deeper. All these recent thrombi are composed of platelets and fibrin with hardly any cells implying that they were built up slowly. That the earlier, now organized thrombi had been mainly of this type can be deduced from the absence of any iron pigment in appropriately stained sections. Some thrombi are covered in parts by no more than a layer of endothelium, indicating that they are very recent. At all levels examined there is absence of any significant atheroma. There is some fat present but there is none of the necrotic atheroma commonly seen in the aortas of elderly people. The medial coat is traversed by enlarged vasa vasorum where it underlay intimal organization, but there is no lesion that can be interpreted as arteritis. There is, in fact, no evidence to indicate what provoked the original thrombosis."

**Discussion**

Primary arterial thrombosis is a rare lesion and may be defined as thrombosis of an artery without any obvious underlying cause. The condition has been described in the major arteries of the upper and lower extremities, but there are few authenticated reports of the condition affecting the aorta. Learmonth, Blackwood, and Richards recorded 4 cases in young adults in which peripheral arteries were affected and termed the condition "localized arterial thrombosis of indeterminate origin." A similar condition was reported by Leriche and Stricker under the heading of "spontaneous localised monarteritis of indeterminate origin." Boyd et al. reported 6 cases of primary popliteal thrombosis in young healthy men. In all these cases, minute injuries, the result of muscular exertion or abnormally developed fascial bands, were considered to be possible causes.

If the definition of primary arterial thrombosis is accepted as thrombosis occurring in

**Fig. 4. Transverse section just below the aortic bifurcation.** The pale staining fibrous organization and the dark staining recent thrombus can be clearly distinguished. Note the unaffected parts of the wall in the upper and out quadrants. (H and E X 9)
an artery showing no obvious underlying pathology, then primary thrombosis of the aorta is a rare condition. In the literature there is confusion concerning the meaning of the term primary thrombosis. Welch reported 7 cases of primary aortic thrombosis in a series of 59 cases of abdominal aortic occlusion. From the description it is doubtful whether they were truly primary; all appeared to be secondary to embolism of either the iliac or femoral arteries. Hinkle and Vinson reported a case of "primary thrombosis of the abdominal aorta associated with primary thrombosis of the left pulmonary artery;" the aortic thrombosis developed on an underlying ulcerated atheromatous plaque.

Most pathologists agree that there is often considerable difficulty in distinguishing between thrombosis and embolism. The symptoms too may not help to clarify the issue. In the case reported here, there was no history of rheumatic fever or myocardial insufficiency, and the clinical examination, electrocardiogram and x-ray findings of the heart were normal. It is then most unlikely that the occlusive process was embolic in origin. Serial histological examination of the affected vessels showed no evidence of arteritis or atheroma and there was no evidence to indicate the etiology of the thrombosis.

SUMMARY
A case of primary aortic thrombosis occurring in a man aged 32 years is reported. There was no evidence to indicate what provoked the original thrombosis. The aortic bifurcation was resected and continuity was restored with a polyvinyl alcohol sponge prosthesis.

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SUMMARIO IN INTERLINGUA
Es reportate un caso de primari thrombose aortice occurrente in un masculo de 32 annos de etate. Esseva trovate nulle indicacion del causa que provocava le thrombose original. La bifurcation aortice esseva resecate, e le continuitate esseva restaurate per medio de un prosthese a spongia de alcohol polyvinylic.

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