CASE REPORT

Acute Aortic Dissection Following Cannulation of the Iliac Artery

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The aorta of a patient with aortic valve stenosis may be unduly thin, fragile, and liable to dissect irrespective of the presence or absence of atheroma. Indeed, Coleman (1955) stated that aortic dissection in young people was most commonly associated with coarctation or with bicuspid aortic valve. Petch (1952) reported fatal haemopericardium from ruptured dissecting aneurysm in a man of 35 years with calcific aortic stenosis; a similar example in a man of 65 years was described by Heath, Edwards, and Smith (1958). Hudson (1965) also refers to the association between aortic valve stenosis and aortic dissection, sometimes with Marfan’s disease also.

In the following fatal case this complication followed unsuccessful cannulation of the left external iliac preliminary to establishing cardiopulmonary bypass for surgical replacement of the diseased aortic valve.

Case Report

A man of 59 years with a history of increasing dyspnoea and angina pectoris for 3 years was admitted to hospital with a diagnosis of non-rheumatic calcific aortic valve stenosis. This was verified by the usual confirmatory investigations. The rhythm was normal and the blood pressure 130/80 mm. Hg.

Operation. In January 1965, Mr. Donald Ross undertook replacement of the aortic valve by a stored homograft using full-flow normothermic cardiopulmonary bypass.

Cannulation of the left external iliac artery was apparently successful, but on starting bypass the arterial line was found to be obstructed. The cannula was, therefore, withdrawn and inserted into the corresponding artery on the right side. The heart was electively fibrillated. When the ascending aorta was clamped, it was noted that its proximal portion did not decompress. Incision of the aortic wall, however, produced decompres-
FIG. 1.—(A) Abdominal aorta showing dissection (arrows) which apparently originated in the left external iliac artery. There is severe calcific atheroma with mural thrombosis of the aorta above the bifurcation, and severe atheroma of both iliac branches, which are also dissected. (B) Heart with thoracic aorta. The dissection (arrows) extends to the row of sutures just above the homograft aortic valve; it also extends into the 3 arch branches. (C) Kidneys showing extensive recent infarction. (Photographs by courtesy of Dr. Reginald E. B. Hudson.)

diverticulum, 4 cm. long. The liver weighed 1700 g. Both kidneys were extensively and recently infarcted (C). The brain was normal and the spleen was enlarged to 360 g.

Microscopic Appearances (Fig. 2). Histology of the aorta showed that dissection had extended into the wall below the upper limit of the valve homograft. The dissection space was between the outer third and inner two-thirds of the media—the usual site. The wall just below the bifurcation showed severe atheroma with accompanying adventitial lymphocytic aggregations; in addition the media was thinned and infiltrated with some cells, histiocytes, lymphocytes, a few neutrophils, and an occasional eosinophil; there were no giant cells (B). Similar lesions were present in the dissected left iliac artery, the medial elastic being completely destroyed in places (C). All sections of the abdominal aorta showed excessive polychromasia to toluidine blue, and empty clefts between the elastic lamellae were conspicuous in places; though these clefts are known to be a postmortem artefact, they were more numerous than normally seen. The cell reaction in the media of the distal aorta and iliac arteries was probably due to the severe atheroma rather than to a primary mesarteritis, because no such lesions were found more proximally, where there was little abnormality apart from the dis-
Aortic Dissection after Arterial Cannulation

Fig. 2.—(A) Section of aorta at diaphragm level. There is mild elastic hypoplasia but no other abnormality. (Verhoeff's elastic—van Gieson. x 80.) (B) Aortic dissection at bifurcation to show the cell infiltration of the media bordering both sides of the dissection space running vertically down the picture. (H. and E. x 80.) (C) Left common iliac artery showing an area of almost complete destruction of the dissected medial coat, deep to a thick intimal plaque of atheroma containing numerous cholesterol clefts (below). The adventitia (top) is intact, and the narrow dissection space, in the outer-most media, is just below it. (Verhoeff’s elastic—van Gieson. x 80.) (D) Renal artery dissection. The outermost rim of media has become dissected away by a haematoma which is compressing the original lumen to a narrow cleft inside the remainder of the vessel (top right) which also shows intimal atheroma. (Verhoeff’s elastic—van Gieson. x 8.)

(Photographs by courtesy of Dr. Reginald E. B. Hudson.)
Discussion

In the present case, when the dissecting aneurysm was first observed at operation, obliteration of the false lumen by approximation of the inner and outer layers of the dissection by continuous sutures, both proximally and distally, was thought to be the proper course in view of the serious nature of the operation to be performed, i.e. replacement of the aortic valve by a homograft. However, DeBakey et al. (1962, 1965) in their reviews of the surgical treatment of dissecting aneurysms suggested that obliteration of the false lumen by the above procedure should be followed by end-to-end anastomosis of the transected aorta.

Angiography is the most reliable technique available in the diagnosis of dissecting aneurysm. Hirst, Johns, and Kime (1958) in an extensive review recommended that it be carried out in departments equipped for such specialized radiology.

The commonest causes of death from dissecting aneurysm, after cardiac failure and myocardial infarction, are progression of the dissection and renal failure. In this case the aneurysm had dissected to all the major branches of the aorta as far as the femoral arteries, and the idea of any further operation had, therefore, to be abandoned. Moreover, necropsy showed that both kidneys were extensively infarcted.

Summary

A case is reported of dissection of the whole aorta, originating in traumatic cannulation of the left iliac artery, in a man of 59 years, preparatory to establishing bypass for homograft replacement of a calcified aortic valve.

The accident demonstrates the danger of dissection when perfusing the atheromatous aorta of a patient with aortic valve stenosis.

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References


