DISSECTING ANEURYSM OF AORTA

(A Case Report)

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Introduction

The term dissecting aneurysm was first coined by Laennec (1819) and has been used to refer to the condition ever since. Aortic dissection is an emergency, and is catastrophic if not diagnosed and treated promptly [1,2]. Half of the aortic dissections that develop in women of less than 40 years of age occur in association with pregnancy with more than 200 cases reported over the last 50 years. Dissection occurs most commonly during the third trimester or peripartum period [1,2]. It is the Type I aortic aneurysm of DeBakey's classification that is most common during pregnancy and puerperium [1]. Advancing maternal age, hypertension, advancing maternal parity, Marfan's syndrome, coarctation of aorta and bicuspid aortic valve are common findings in pregnancy with aortic dissections, however in 63 per cent of the pregnant patients, none of these lesions are found [3]. The cause in these cases is still unclear though studies on humans and animals have shown some arterial wall changes related to pregnancy [4]. These changes may be related to blood flow dynamics or to the change in the hormonal milieu during pregnancy.

We have presented here one instance of a young primigravida who succumbed to death in the 2nd trimester due to rupture of an undiagnosed dissecting aneurysm of thoracic aorta. Being unaware of this complication during pregnancy in previously healthy young women makes diagnosis and prompt surgical treatment difficult. Also since most pregnant women refuse radiological examination for fear of adverse effects on the foetus, the diagnosis of the aneurysm during pregnancy be-

comes rather difficult. In untreated and unrecognized cases the prognosis is decidedly dismal with the early mortality (first 48 hours) being as high as 1 per cent/hour, 80 per cent within 2 weeks and 90 per cent within 3 months.

Case Report

A 20-year-old primigravida, 24 weeks pregnant, reported to the hospital complaining of severe continuous epigastric pain of a few hours duration. No relevant information was obtained on history. Examination revealed mild pallor. Blood pressure and other vital parameters were normal. ECG did not indicate any abnormality. After giving symptomatic treatment she was asked to come the next day for proper antenatal check up. However, she returned to the hospital after 10 hours as she was having sharp pain on the left side of the chest radiating to the epigastrium. She was admitted and managed conservatively. But after two hours of admission her condition suddenly deteriorated and she died. Laboratory examination revealed Hb 10 g/dL and leucocytosis (14,000/cumm). Radiographic examination could not be carried out as the patient was critically ill.

Autopsy Findings

Gross examination revealed pale internal organs. Both pleural cavities together contained approximately 2.5 litres of blood. The lungs weighed 100 g each and were collapsed. They were soft in consistency. An irregular laceration approximately 1 cm in diameter was present in the wall of the descending thoracic aorta on its posterior aspect. Dissection of the wall extended distally for 3 cm forming a double lumen in the aortic wall. No valvular abnormalities of the heart were present on gross examination. Other organs did not show any abnormality.

Histopathological examination

Sections from the site of aortic laceration showed an intimal tear and few acute inflammatory cells with discontinuity of the aortic wall in its entire thickness. Verhoeff's elastic stain and Masson's trichrome staining showed dissection of the media with condensation of the elastic lamina and cleavage of the laminar planes of the media respectively. Adjacent media on H&E stain showed spotty haemorrhagic areas with inflammatory cells. Medial degeneration was represented by basophilic ground substance and degenerated muscle cells in the aortic media. In addition the endothelialized double lumen of the

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Fig. 1 : Shows the advancing dissection cleaving the laminar planes of media.

dissected aorta was clearly visible on H&E stained sections.

Discussion

Dissection of the aorta in young women without Marfan's disease is related, in most instances, to pregnancy. The cause of this complication during pregnancy is still unclear. A search of literature revealed most of these patients to be multiparous and under 40 years of age, unlike our patient who was a primigravida. The time of onset of rupture of the aneurysm is usually the third trimester and the peripartum period [1,2] and, contrary to what is expected, relatively rare during labor. Thus the stress of labor appears to have little affect on the occurrence of this vascular accident. From the standpoint of the hemodynamic changes during pregnancy it is hard to explain why many dissecting aneurysms rupture in early pregnancy or in the puerperium when circulatory stress is minimal. Hormonal influences on the aorta might rightly be an additional etiologic factor.

The presence of acid mucopolysaccharides within the aorta is not always pathologic and is observed to increase with age. Focal collections of mucoid substances could be a secondary or reactive phenomenon following degeneration of elastic fibres and smooth muscles or it could be a primary over-production of this substance. Degeneration of aortic media, perhaps, is the initial lesion in dissecting aneurysm and has been reported in all cases [1] including ours. However there is no clear evidence to implicate hormonal changes of gestation as a specific precipitator of the disruption of elastic fibres. Hypertrophy and hyperplasia of

smooth muscles are rarely seen in dissecting aneurysms, though it appears to be characteristic feature of pregnancy [1].

Classically, aortic dissection has been associated with degenerative changes in the elastic tissue and smooth muscle layer of the aortic media associated with cystic changes (so called cystic medionecrosis). Gore & Seiwart have pointed out that in dissections occurring in patients under 40 years of age and in Marfans syndrome the degenerative changes are predominantly in the medial elastic tissue, and in patients over 40 years degeneration and loss of medial smooth muscles is more evident [6]. In the former, there are accumulations of mucinous material with focal loss of elastic tissue involving short segments of a few laminae (or all of the laminae) in a segment of the aorta. The latter, also described as medial degeneration limited to muscle, shows loss of normal wavy pattern of elastic laminae. The muscle fibres of the aortic media normally insert into the elastic laminae and serve in an auxiliary fashion to prevent overstretching and so facilitate recoil. Degeneration of muscle is therefore signalled by changes in the arrangement of elastic laminae. The fibres are seen in small clusters separated from neighbouring muscle bundles by wide bands of mucoid material. Furthermore, depletion of intervening muscle permits the elastic fibres to fall together. Stains for elastic tissue therefore demonstrate condensation of lamina. Lesions of both types are seen in intermediate age groups [6].

Dissection is usually heralded by the onset of severe chest pain which is present in 90 per cent of the patients, but painless dissection can occur [7]. Pain may lead to a mistaken diagnosis of myocardial infarction, hence ECG and cardiac enzyme studies are required to differentiate between the two conditions. Routine lab studies are not very revealing. Two thirds of these patients have moderate leucocytosis (above 10,000 WBC/cumm). Levels of LDH may be increased because of haemolysis of blood in the false channel. If the patients condition allows, a radiological examination may provide valuable diagnostic information. A localized aortic bulge may overlie the site of origin. Another clue could be a disparity in the size of the ascending and descending aorta. Transoesophageal echocardiography and MRI can now

detect aortic dissection without radiation exposure. Aortic dissection can rupture into the pericardial space leading to cardiac tamponade, or to haemothorax with rupture into the pleural cavity.

REFERENCES

1. Konoshi Y, Tatsuta N, Kumada K, Minami K, Matsuda K, Yamasato A, et al. Dissecting aneurysm during pregnancy and the puerperium. *Jpn Circ J* 1980; 44: 726-33.
2. Elkayam U, Rose J, Jamison M. Vascular aneurysms and dissection during pregnancy. In: Elkayam U, Gleicher N, editors. *Cardiac problems in pregnancy*. 2nd ed. New York: Alan R Liss, 1990; 251-30.
3. Snir E, Levinsky L, Salomon J, Findler M, Levy MJ, Vidne BA. Dissecting aortic aneurysm in pregnant women without Marfan disease. *Surg Gynecol Obstet* 1988; 167: 463-5.
4. Hume M, Krosnick G. Dissecting aneurysm in pregnancy associated with aortic insufficiency. *N Engl J Med* 1963; 268: 174-8.
5. Khanderia KB. Aortic dissection. The last frontier (Editorial comment). *Circulation* 1993; 87: 1765-8.
6. Gore I, Siewart JV. Dissecting aneurysm of the aorta, pathologic aspects. An analysis of 85 fatal cases. *Arch Pathol Lab Med* 1952; 53: 121-39.
7. Greenwood WR, Robinson MD. Painless dissection of the thoracic aorta. *Am J Emerg Med* 1986; 4: 330-3.