Case reports

Aortic dissection during pregnancy

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SUMMARY Aortic dissection occurred in a nineteen year old woman during the thirty seventh week of pregnancy. Immediate elective delivery of a normal baby by caesarean section was followed by aortic root replacement 48 hours later. It was decided not to proceed immediately to operation on the aortic root because it was believed that the anticoagulation necessary for cardiopulmonary bypass might provoke dangerous haemorrhage from the raw placental site.

Case report

A nineteen year old woman booked in for her first pregnancy at the local hospital. She remained well and fetal growth was normal until the thirty seventh week when she complained to her general practitioner of dizziness and a discomfort in her neck and chest radiating through to her back. Clinical examination at that time was normal. Two days later, however, her husband noted vibration in her chest and the family doctor confirmed the presence of new cardiac murmurs.

She was admitted to the local district hospital, and one week later was referred to the regional centre. On admission she had mild chest discomfort and tiredness. Clinical examination showed no signs of heart failure. She was normotensive with a blood pressure in both arms of 105/55 mm Hg. A systolic thrill was present to the right of the upper part of the sternum, and on auscultation an ejection systolic and early diastolic murmur were heard.

A chest radiograph showed an enlarged cardiac shadow but the upper mediastinum was normal (Fig. 1). The electrocardiogram was normal. Cross sectional ultrasound examination showed that the aortic root was 7 cm in diameter; in the short axis view the aortic root was shown to consist of a normal sized main lumen with a large false lumen on the right side (Fig. 2).

Labour was avoided to protect the mother from the possible extension of the presumed aortic dissection, and a normal baby was delivered by elective caesarean section within 24 hours of admission. Aortography three hours after operation confirmed the diagnosis of a dissecting haematoma confined to the ascending aorta and gross aortic incompetence.

We decided not to proceed to immediate operation on the aortic root because we believed that, as the uterus had only partly contracted, the anti-

Fig. 1 Chest radiograph at admission.

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coagulation necessary for cardiopulmonary bypass might provoke dangerous haemorrhage from the raw placental site. To avoid increasing the patient's blood pressure oxytocin had not been given. Arterial hypotension was maintained by sodium nitroprusside infusion for 48 hours to allow healing of the uterus. Then the ascending aorta was replaced by a Dacron prosthesis containing a Björk-Shiley valve with reimplantation of the coronary arteries. Her postoperative recovery was uneventful apart from persistent symptomatic atrioventricular dissociation for which a permanent pacemaker was inserted. At follow up two months later mother and baby were well.

Examination of the aortic root showed an intimal tear, 3 cm above a bicuspid aortic valve, giving rise to a large dissecting haematoma with no exit point. The histology of the aortic wall was normal with no evidence of cystic degeneration.

Discussion

Most aortic dissections occur as a result of systemic hypertension¹; indeed it has been argued that if systemic hypertension were eliminated, spontaneous aortic dissection would virtually disappear.² Other risk factors, such as Marfan's syndrome, trauma,³ the presence of a bicuspid aortic valve,^{4,5} and pregnancy,⁶⁻⁸ have been identified.

Dissection of the aorta in pregnancy is very rare, and usually occurs in the third trimester when blood volume and cardiac output are rising to a maximum.⁷ It has been known to occur at all stages of pregnancy and during the weeks after delivery.⁸ Pri-

miparous patients seem more susceptible. In one report, 50% of aortic dissections in women of child-bearing age occurred during pregnancy,⁸ but in many of these cases the blood pressure was not documented. Therefore it may be that the systemic hypertension associated with many pregnancies, especially the first pregnancy, is responsible for the high frequency of dissections in pregnant females compared with non-pregnant females of the same age.²

The patient reported here was known to have had normal blood pressure throughout her pregnancy. She had a bicuspid aortic valve, however, which is also known to be associated with aortic dissection.^{4,9} In two necropsy series, bicuspid valves were found in 10% of cases of dissection.^{4,9} Dissection of the ascending aorta is as common in non-stenotic valves as in those causing important obstruction,¹⁰ so a generalised structural disorder of the arterial wall,^{2,11} rather than haemodynamic stress¹² is likely to be responsible.

The histological appearance of the aortic wall in the patient reported here was normal. Cystic medionecrosis is commonly described in cases of dissection, especially in pregnancy,⁸ but the wide range of its reported incidence reflects a considerable difference in the diagnostic criteria used by pathologists.¹³ True cystic medionecrosis probably only leads to dissection in Marfan's syndrome (which accounts for only three per cent of cases of dissections), and other changes labelled cystic medionecrosis, which are often neither cystic nor necrotic, are non-specific and commonly found in aortas routinely examined at necropsy.¹³ Histologi-

Fig. 2 Cross sectional echocardiographic long axis (a) and short axis (b) views of the aortic root. AO, aorta; LA, left atrium; LV, left ventricle; DH, dissecting haematoma.

cal examination will not show the subcellular and chemical changes which are thought to occur in the connective tissue during pregnancy as a result of alterations in lipid metabolism and the high serum concentrations of oestrogen.¹³ A combination of these ultrastructural changes together with a congenital weakness of the aorta associated with a bicuspid aortic valve may have led to this patient's aortic dissection.

Elective caesarean section was the preferred method of delivery. Discussion centred on how much time should be allowed for healing of the placental site in the uterus before proceeding to surgery on the aortic root. The risk of severe haemorrhage from the fresh placental site had to be balanced against the risk of rupture of the aortic wall. Dissection had occurred some days before the patient arrived in our hospital, and, as ischaemic pressure necrosis of the outer aortic wall can develop at any time, the state of her aorta was always felt to be precarious. As a compromise we waited 48 hours and maintained hypotension (<95 mm Hg systolic) with sodium nitroprusside infusion. In the event there was no postoperative uterine bleeding.

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