MULTIPLE CORONARY ARTERY DISSECTIONS IN A WOMAN AT TERM

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SUMMARY
We report a case of acute myocardial infarction caused by multiple coronary artery dissections in a pregnant woman at term. When reinfarction elicited fetal distress, Caesarean section was performed under carefully administered extradural anaesthesia, with maternal and fetal survival. (Br. J. Anaesth. 1993; 71: 301-302)

KEY WORDS

CASE REPORT
A 35-yr-old gravida 1, 40 weeks pregnant, was admitted to the coronary care unit with substernal pain radiating to the left arm. There was no family history of cardiovascular disease, but the patient was overweight (118 kg, 170 cm) and smoked 20 cigarettes per day. She was pale and dyspnoeic, with an arterial pressure of 140/90 mm Hg, a regular heart rate of 110 beats min⁻¹, and slight pitting oedema. A third heart sound was heard without murmurs; breathing was normal. The ECG demonstrated transmural anteroseptal myocardial infarction, but chest x-ray was normal. Serum concentrations of creatinine phosphokinase (CK), CK-MB and α-hydroxybutyrate dehydrogenase (α-HBD) were increased (CK 1154 u litre⁻¹, CK-MB 101 u litre⁻¹, α-HBD 459 u litre⁻¹). Other laboratory values, including lipid profile, were within normal limits; there was no proteinuria. The symphysis-fundal height was 38 cm; the fetus, in the vertex position, had a reactive heart rate pattern; the cervix was 1 cm dilated.

Treatment consisted of continuous i.v. infusion of nitroglycerin 30 μg min⁻¹ and heparin 25000 iu/24 h. On the third day, the patient experienced renewed chest pain, the ECG showed recurrent (infero-posterior) infarction and concentrations of cardiac enzymes increased further (CK 2300 u litre⁻¹, CK-MB 214 u litre⁻¹ and α-HBD 1112 u litre⁻¹); the haemoglobin concentration decreased from 7.2 to 6.6 mmol litre⁻¹. A thermodilution catheter was introduced via the right brachial vein. Cardiac output and arterial pressures were normal (7.6 litre min⁻¹, 120/80 mm Hg, respectively); heart rate, pulmonary artery pressures and pulmonary capillary wedge pressure were increased (135 beat min⁻¹, 43/32 mm Hg and 28 mm Hg, respectively); pulmonary and systemic vascular resistances were reduced or normal (36 and 898 dyn s cm⁻⁵, respectively). Fetal heart rate showed loss of variability, and a decision to perform Caesarean section was made. The rate of infusion of nitroglycerin was increased to 50 μg min⁻¹, frusemide 40 mg was given and the heparin infusion was discontinued. An extradural catheter was introduced at the L3-4 interspace and 0.25 % bupivacaine 6 ml was injected. Anaesthesia was increased slowly with five 3-ml aliquots of 0.5 % bupivacaine with fentanyl 1 μg ml⁻¹ in 60 min. During this time, fetal heart rate variability returned to normal (fig. 1). As the extradural block developed, Ringer's lactate 1000 ml was infused. Maternal systemic arterial pressure remained relatively stable, while pulmonary pressures decreased towards normal values (fig. 2). An uncomplicated Caesarean section was performed when the block had reached T4. A healthy 3400-g girl was delivered with 1 and 5 min Apgar scores of 9 and 10, respectively, and an umbilical artery pH of 7.29. After clamping of the cord, oxytocin was infused at a rate of 2.5 mg h⁻¹. Blood loss during surgery was estimated at 600 ml, therefore 2 units of packed cells were given. After completion of the procedure, the patient received an additional 40 mg of frusemide.

Coronary angiography the following day showed dissections in all three coronary arteries. Echocardiography showed a dilated left ventricle with hypokinetic apical and infero-posterior regions. Despite unchanged angiographic findings, 1 month later the patient had an exercise performance of 140 W, under medication. After 6 months she still requires medication: digoxin, enalapril, isosorbide-5-mononitrate, acetosalicylic acid and acenocoumarol; she does not smoke and is on a low-salt diet.

DISCUSSION
Myocardial infarction in a term pregnant woman is a rare event and carries a high mortality. Fifty percent of 84 cases reported since 1922 occurred in the third

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Fig. 1. Fetal heart rate pattern. A: Limited variability of fetal heart rate, suggestive of hypoxaemic distress, after maternal myocardial reinfarction. B: Normal variability of the fetal heart rate, suggestive of improvement of hypoxaemic distress, after extradural anaesthesia.

Fig. 2. Some cardiovascular variables during Caesarean section under extradural anaesthesia in a term pregnant woman with myocardial reinfarction. Hypotension at 15 min resulted from increased rate of infusion of nitroglycerin. Extradural anaesthesia was performed with small aliquots of bupivacaine and fentanyl to assure haemodynamic stability. ◊ = Heart rate; ■ = systolic arterial pressure, □ = diastolic arterial pressure; ● = systolic pulmonary arterial pressure, ○ = diastolic pulmonary artery pressure. ▼ = aliquot of extradural anaesthetic; I = abdominal incision; C = abdominal closure.

term trimester, with a mortality of 40%; the mortality in the first two trimesters was 20% [1]. Three of four reported women with myocardial reinfarction died. A diagnosis of dissecting coronary aneurysm was made in two pregnant women at postmortem [2]. The present patient demonstrated that dissecting coronary aneurysm in pregnancy is not invariably fatal.

Our patient was initially managed optimistically to avoid the haemodynamic changes associated with surgery. When fetal distress demanded Caesarean section under the unfavourable condition of recurrent myocardial infarction, maternal haemodynamic stability was maintained throughout the carefully performed extradural anaesthesia and Caesarean section. The improvement in fetal heart rate variability most likely resulted from improved uterine blood flow, which is known to occur under controlled sympathetic block. The standard procedure of preloading with 1–2 litre of crystalloids before the development of extradural block could not be used because the patient was at the limit of decompensation. Instead, by fine tuning of fluid balance and intravascular capacity using nitroglycerin, frusemide and the developing sympathetic block, while at the same time anticipating the autotransfusion from the retracting uterus after delivery, haemodynamic stability could be maintained.

This case report demonstrates that Caesarean section under extradural anaesthesia is a safe and valuable procedure, even in the unfavourable condition of acute myocardial reinfarction caused by coronary artery dissection.

REFERENCES