CASE REPORT

Management of ST elevation myocardial infarction in pregnancy

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SUMMARY

A 33-year-old lady in the second trimester of pregnancy presented to the emergency department having suffered a cardiac arrest at home. An emergency caesarean section was performed in the resuscitation area. On return of spontaneous circulation, a 12-lead ECG showed anterior ST elevation myocardial infarction. She was transferred to our tertiary centre for an emergency coronary angiography and was successfully treated, making a full recovery. This case report examines the relatively rare entity of myocardial infarction in pregnancy and looks at the mechanisms underlying this.

BACKGROUND

Cardiac disease is the single most common cause of maternal death in the UK.¹ Myocardial infarction in pregnancy is a devastating event for mother and baby and is a management challenge for clinicians. Successful treatment of thromboembolism as a cause of myocardial infarction has been reported in

only a handful of cases. This case illustrates that close collaboration of multidisciplinary team efforts and appropriate use of specialist expertise can lead to a favourable outcome for mother and child following cardiac arrest in pregnancy.

CASE PRESENTATION

A 33-year-old lady, 26 weeks into her second pregnancy, suffered a witnessed cardiac arrest at home. Her husband started cardiopulmonary resuscitation (CPR) and the paramedic service were on-site within 7 min. She was found to be in ventricular fibrillation requiring a 200 J direct current cardioversion with subsequent recovery of spontaneous circulation. She was intubated and ventilated and transported to the local A&E department. She had another cardiac arrest on arrival and required further CPR. The on-call obstetric team performed an emergency caesarean section through a midline laparotomy in the A&E department—partly to enable CPR efforts. Return of cardiac output was

Figure 1 (A) Coronary angiogram showing an occluded (arrow) left anterior descending (LAD) artery; (B) flow restored in LAD with appearance of embolic material (arrow); (C) successful aspiration of thrombotic material; (D) normal appearance and flow in LAD.

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Figure 2 (A) Agitated saline contrast echocardiogram demonstrating passage of contrast into the left heart (arrow) suggestive of a patent foramen ovale (PFO); (B) colour flow Doppler during transoesophageal echocardiogram confirming the presence of PFO with spontaneous left-to-right flow.

achieved again and an ECG showed anterior ST elevation myocardial infarction (STEMI) and she was therefore transferred to our tertiary cardiac centre for emergency coronary angiography.

The patient was loaded with aspirin, clopidogrel and bivalirudin. The right and circumflex arteries were smooth and unobstructed. The left anterior descending (LAD) artery was occluded at the midvessel (figure 1A) and a guide-wire was passed easily across the occlusion restoring flow. There was a visible filling defect in the mid-LAD suggestive of embolic material (figure 1B). An aspiration catheter successfully removed the embolus (figure 1C), which was confirmed as thrombus on histology. The final angiogram showed an unobstructed LAD with normal flow (figure 1D).

The patient was admitted to the intensive therapy unit for supportive care and therapeutic hypothermia. She made a gradual but essentially full neurological recovery. An ultrasound of the pelvic veins showed extensive bilateral iliofemoral venous thrombosis. A bubble (agitated saline) contrast transthoracic echocardiogram suggested the presence of a patent foramen ovale (PFO) and this was confirmed on transoesophageal echocardiography (figure 2). Hence, the mechanism of coronary embolism was likely to have been a transient right-to-left shunt across the PFO. The patient was anticoagulated with warfarin and discharged home 11 days after admission.

OUTCOME AND FOLLOW-UP

The patient remains well 6 months later and has undergone percutaneous closure of the PFO.

DISCUSSION

Myocardial infarction during pregnancy has a reported incidence of 0.7/100 000 pregnancies.² Atherosclerotic plaque rupture occurs in only half of cases. Other important mechanisms include coronary artery dissection, coronary vasospasm and thromboembolism. A paradoxical embolism through a PFO and subsequent coronary occlusion and STEMI has been rarely reported.^{3–4} Furthermore, there have been no prior case reports of ventricular fibrillation cardiac arrest secondary to a coronary embolic episode in pregnancy.

An emergency angiography has clear advantages over fibrinolysis in managing STEMI in pregnancy including reducing the risk of major bleeding in the mother and unborn child. In our case, the patient had undergone emergency midline laparotomy to enable CPR and fibrinolysis would have been a relative contraindication. An emergency angiography and coronary intervention also allows treatment of coronary dissection and aspiration of embolic material—as was achieved in our case.

Management of cardiac arrest in pregnancy presents a unique consideration of two lives at risk—the mother and the fetus. Aortocaval compression by the gravid uterus can impair CPR efforts and early obstetric involvement and ‘perimortem’ caesarean section is crucial in the attempts to restore cardiac output. Current evidence suggests caesarean delivery should be performed within 4 min of maternal cardiac arrest to improve the likelihood of successful CPR and to prevent neonatal neurological dysfunction.⁵ In our case, the baby was transferred to a specialist neonatal unit and neurological function appears intact.

Learning points

- ▶ Effective management involves early obstetric involvement for caesarean section to aid cardiopulmonary resuscitation efforts.
- ▶ Emergency angiography is superior to thrombolysis through reduced risk of major bleeding and in its ability to treat coronary dissection and aspirate embolic material.
- ▶ Myocardial infarction in pregnancy often involves mechanisms other than plaque rupture, which is important when planning investigations, for example, contrast echocardiogram for patent foramen ovale.

Contributors AHC was the primary author of the article and was the Senior House Officer looking after the patient during her stay at our tertiary centre. AMM was a supporting author and along with RA (cardiology consultant), performed primary percutaneous coronary intervention and continuing care for the patient.

Competing interests None.

Patient consent Obtained.

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