

Mechanical circulatory support for maternal cardiac arrest in a patient with class three obesity: a case report.

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INTRODUCTION

- Maternal cardiac arrest is extremely rare in obstetrics.
- The risk is increased in women with obesity. High neuraxial block is among the three leading causes of maternal cardiac arrest identified in the National Audit Project 7 [1].
- This case describes an intrapartum cardiac arrest managed with veno-arterial extracorporeal membrane oxygenation (VA-ECMO).
- Written consent was obtained from the patient and Trust audit department approval was granted to present this case.

CASE REPORT

Context

- 37-year-old patient, Para two, Body mass index (BMI) 57 and 177kg.
- Presented for induction of labour at 39 weeks gestation for fetal macrosomia and diet controlled gestational diabetes.
- Past medical history: anxiety, depression, gastric band insertion (2007) and deflation (2025).
- Obstetric history: uneventful vaginal deliveries in 2012 and 2014.
- Past surgical history: uneventful general anaesthetics.
- Drug history: vitamin D, iron.
- No known drug allergies.

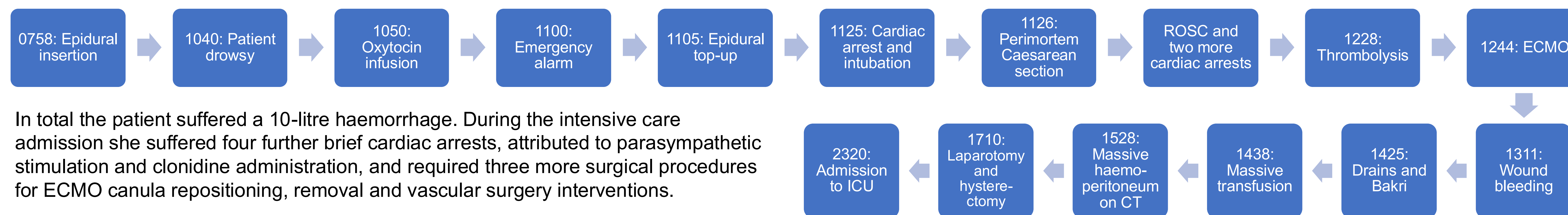
Patient review

- No formal antenatal anaesthetic pre-assessment had been requested or occurred.
- She attended labour ward at 38 weeks for a membrane sweep and the midwife alerted the anaesthetist.
- The patient was reviewed on labour ward by the anaesthetic team.
- The team identified an anticipated difficult airway, vascular access and neuraxial challenges.
- They recommended an early epidural and early escalation plans if fetal distress were to occur.
- Patient preferences: delivery without intervention, good insight into potential challenges.

REFERENCE

1) Soar, Cook. At the Heart of the Matter. Report and Findings of the 7th National Audit Project of the Royal College of Anaesthetists Examining Perioperative Cardiac Arrest. Royal College of Anaesthetists; 2023. ISBN 978-1-900936-35-4.

Timeline



In total the patient suffered a 10-litre haemorrhage. During the intensive care admission she suffered four further brief cardiac arrests, attributed to parasympathetic stimulation and clonidine administration, and required three more surgical procedures for ECMO canula repositioning, removal and vascular surgery interventions.

Outcome

The patient was stepped down to the ward 16 days later. She had a groin haematoma at the canula site, which required ultrasound guided drainage. She was discharged home 33 days after the cardiac arrest without neurological sequelae. She is currently awaiting bariatric surgery work up and doing well.

DISCUSSION

What went well

Favourable maternal and fetal outcomes were attributed to early team activation, rapid decision-to-delivery, ECMO access and effective inter-professional communication in a well-resourced centre. There were good examples of teamwork throughout the case and debriefs for both the family and staff. Duty of candour was also performed promptly and on multiple occasions to ensure good understanding of the events.

What could have been better

- **Anaesthesia:** The epidural insertion was extremely challenging and took place out of hours, just before the morning handover. Due to the labour ward acuity, there was a delayed block review and poor documentation of patient-controlled epidural analgesia use. Lastly, there should have been an earlier activation of maternal cardiac arrest call.
- **Midwifery:** The patient did not have a referral for obstetric anaesthesia pre-assessment review. There was also inadequate documentation of vital observations intrapartum and lack of escalation regarding the epidural.
- **Obstetrics:** There was inadequate counselling antenatally and intrapartum regarding escalation plans.
- **Theatres:** There was an extremely large number of staff present during the resuscitation. A second scribing member would have been beneficial to ensure consistency. There were some equipment availability issues (High Flow Nasal Oxygen, HoverMatt, trolleys, arterial lines) and logistics for patients living with obesity (Lucas device was not appropriate for patient BMI, additional scrub team members required for ECMO).
- **Human factors:** There were difficulties in communication in theatre due to the number of people and high noise level. The cardiac arrest team leader was not experienced in obstetrics or anaesthesia.

Actions and recommendations

Areas for improvement include antenatal and intrapartum communication between obstetric, midwifery and anaesthetic teams, as well as improvements to the obstetric anaesthesia pre-assessment clinic. There has been education of the midwifery team to ensure epidural blocks are checked hourly and appropriate escalations to anaesthetists when there are concerns. There has also been education for anaesthetists for epidural block assessments and epidural top-up safety. Lastly, theatre resources have been optimised for patients living with obesity.