

# Perimortem caesarean delivery

K A S U A Kodithuwakku<sup>a</sup>, S Padumadasa<sup>b</sup>

## Introduction

Although it is said that one maternal death occurs every minute, performing of a caesarean delivery at the time of cardiorespiratory arrest (CRA) is extremely rare. We present a case of perimortem caesarean delivery (PMCD), which to the best of our knowledge is the first reported on a Sri Lankan woman.

## Case history

A 29 year old primigravida presented at 39 weeks of gestation to the Accident and Emergency (A&E) Department of North Colombo Teaching Hospital, Sri Lanka, with shortness of breath. She was a diagnosed patient with pre-eclampsia who had defaulted follow up since 31 weeks. On admission, she was found to have a blood pressure of 230/120 mmHg and diffuse fine crepitations over both lung fields. The working diagnosis was flash pulmonary oedema due to pre-eclampsia, and she was treated with oxygen via face mask, intravenous (IV) furosemide, IV labetalol and 2 g of IV magnesium sulphate.

Upon arrival of the obstetric team to the A&E, she developed CRA. Cardiopulmonary resuscitation (CPR) was commenced immediately with intubation, bag and mask ventilation, and chest compressions while the

uterus was manually displaced to the left. The possible need for a PMCD was anticipated and the necessary instruments (Bard Parkar handle, No.10 surgical blade), and a few gauze towels were readied. As there was no return of spontaneous circulation (ROSC) at four minutes into the CRA, a PMCD was performed using a suprapubic transverse incision and a transverse incision on the lower segment of the uterus. Resuscitation of the woman was continued during the surgery, and bleeding was minimal. The baby was delivered within one minute, and the umbilical cord was cut after clamping between two artery forceps. The placenta was left in situ, and the abdominal and uterine incisions were packed with sterile gauze towels. The Apgar scores were 0 and 5 at birth and at five minutes respectively, and the baby was taken to the neonatal intensive care unit.

Signs of ROSC were observed after a further three minutes into resuscitation of the woman. She was transferred to the operating theatre, broad spectrum IV antibiotics were administered, placenta was removed and the uterine incision was sutured under general anaesthesia. As there was bleeding due to uterine atony despite the administration of oxytocin IV and misoprostol rectally, and as the blood pressure dropped to 80/60 mmHg despite the transfusion of

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<sup>a</sup> Consultant Obstetrician and Gynaecologist, Base Hospital, Medirigiriya, Sri Lanka.

<sup>b</sup> Professor in Obstetrics and Gynaecology, University of Kelaniya, Sri Lanka.

Correspondence: KASUAK, e-mail: [sajithkodithuwakku@gmail.com](mailto:sajithkodithuwakku@gmail.com)

 <https://orcid.org/0000-0003-4063-6786>

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two units of packed red cells, a total hysterectomy and bilateral internal iliac artery ligation were performed after a collective decision by the team which included two consultant obstetricians, a consultant anaesthesiologist, two obstetric senior registrars and two obstetric registrars. The oxygen saturation remained at 80-85% throughout the surgery which lasted for nearly two hours, and there was evidence of aspiration. Once haemostasis was achieved, the skin incision was closed and she was transferred to the intensive care unit. Although there was an improvement in her vital parameters during the first three days, she developed cerebral oedema which progressed to cerebellar coning, at which point there was a rapid deterioration of her condition before she succumbed on day 14 following surgery despite multidisciplinary care. The baby which weighed 4.9 kg at birth did not require any special care following the initial resuscitation, and was discharged on the sixth day following birth.

### Discussion

Maternal CRA is an obstetric emergency which puts the judgement and skills of the obstetrician as well as those of the team to the ultimate test. A gravid uterus greater than 20 weeks size impairs venous return, cardiac output and functional residual capacity. Although manual displacement of the uterus to the left is preferred over a left lateral tilt which carries the disadvantage of making chest compressions less effective with only around 10% of cardiac output achieved, PMCD is recommended if the uterus is palpable above the level of the umbilicus and there is no ROSC after four minutes of CRA. Although it improves the chances of survival of the baby, PMCD is performed primarily to aid resuscitation of the woman, and is recommended irrespective of whether the fetus is alive or otherwise. A PMCD is performed in the best interests of the woman, and obtaining any form of consent is not plausible.

A timeline of four minutes of CRA to initiate the procedure with the aim of completing the delivery of the baby within the next minute is recommended at present on theoretical considerations of hypoxic neurological injury. However, although this was achievable in our case, this may not be possible in most instances. In addition, maternal resuscitation is more challenging compared to in a non-pregnant woman. Therefore, there are suggestions to initiate PMCD much earlier. No time should be wasted in determining whether the fetus is alive or not, or trans-

ferring the woman to the operating theatre. Preparation with regard to sterility may be considered, but this should not delay the surgery. Perimortem caesarean delivery should be performed at the site of CRA, and it is important to anticipate the need for the procedure and get ready with the necessary resources immediately following the CRA, as in this case. It is vital that a PMCD kit which includes a Bard Parkar handle, a surgical blade, two umbilical cord clamps and a few gauze towels, is made available at every location maternal CRA is likely to occur, such as the antenatal ward, labour ward, intensive care unit and A & E Department.

Although a hysterectomy was performed in our case due to uncontrollable bleeding, a hysterectomy is not required in every case of PMCD, and it is important that the closure of uterine and abdominal incisions is performed as quickly as possible and the woman transferred to the intensive care unit for continued care. Historically, PMCD was performed in order to separate the baby from the mother before burial due to religious beliefs, and if possible, to save the baby from a dying woman. Today, it is performed primarily with the intent of aiding maternal resuscitation and improving her chances of survival. Therefore, there are suggestions for the procedure to be named 'resuscitative hysterotomy'. Although PMCD, and for that matter caesarean deliveries have been performed in the past using midline incisions on both the skin and the uterus, it is recommended that the procedure is performed utilizing incisions that one is mostly familiar with. As maternal CRA is extremely rare and largely unforeseeable, it is imperative that multi-professional training with regard to technical as well as non-technical skills including for PMCD forms an integral part of simulation based training in obstetric emergencies.

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