Kathmandu University Medical Journal (2007), Vol. 5, No. 4, Issue 20, 534-537

Case Note

Perimortem caesarean delivery (PMCD)

Saha R
Assistant Professor, Department of Obstetrics & Gynaecology, Kathmandu Medical College, Kathmandu

ABSTRACT
When a woman in late pregnancy has cardiac arrest and resuscitation fails, should an attempt be made to deliver the baby by Caesarean section? Many obstetricians would hesitate to operate in these circumstances for fear of delivery a baby who survives but shows profound neurological handicap. Obstetricians need to have a clear view on whether and when to operate in such cases. Here we report two cases of PMCD.

According to Greek mythology, the physician Asklepios was delivered by his father, Apollo, from the womb of dead Koronis; but the first reliable reference to a successful post-mortem caesarean section is by Pliny the Elder, relating to the birth in 237 BC of Scipio Africanus, the Roman general who defeated Hannibal. The term caesarean comes not from the birth of Julius Caesar but from the ruling made by Numa Pompilius, the second king of Rome, who in 715 BC declared that, if a woman died whilst pregnant, the child must be cut out of her abdomen. This ruling became the part of the *Lex Regia*, which under the emperors became the *Lex Caesare*. Julius Caesar cannot himself have been born by caesarean section since the procedure was done only on dead women and his mother was still alive when he was forty years old. By the Middle Ages, the Catholic Church, supported by the municipal authorities, was releasing edicts requiring post-mortem caesarean section to be conducted so as to save the soul of the child through baptism.[1]

During the late 19th and early 20th centuries, case reports began to arise of PMCDs successfully salvaging the fetus, and the procedure began to be seriously considered as a legitimate medical intervention. During the 1980s, several authors reported unexpected maternal recoveries after post-mortem caesarean deliveries (DePace, 1982; Marx, 1982). This led to the possibility that PMCD might actually improve, rather than worsen, a mother's chance of survival during a collapse. The reason the term "perimortem" caesarean section (C-section) has replaced "Post-mortem" C-section is to emphasize the need to do the procedure as early as possible. Once the physician identifies a potentially viable pregnancy and a mother who is either in arrest on is likely to be so shortly, a C-section should be performed. Waiting until the mother is in full arrest much less another 4-6 minutes that authors suggest, does a disservice to both mother and infant.[1,2,3,4]

Case Report

35 years gravida 4 para 2 + 1 was admitted on 25/12/061 (7th April 2005) at 6.30 AM in early stage of labour at Kathmandu Medical College Teaching Hospital (KMCTH), Sinamangal. At 9.50 AM patient was in active stage of labour. Artificial Rupture of Membrane was done, there was thick meconium stained liquor. She was planned for emergency LSCS for the indication of thick meconium stained liquor with big baby. At 10.10 AM she was shifted to OT table and pre anaesthetic evaluation was done. All of sudden patient became rigid, cyanosed, there was sweating over forehead, pulse and blood pressure was not recordable. Immediate airway management was done, bag and mask done, forceful ventilation was tried, intubation was done. At 10.20 AM, emergency LSCS was started and alive male of 3.74 kg. with apgar score of 1 minute 2/10, at 5 minute 4/10 was born. At the end of the operation blood pressure was 90/60, heart rate was 180 per minute, chest was full of crepitations and there was massive per vaginal bleeding and oozing from abdominal wound. Abdomen was closed with haemostatic suture. Patient was shifted to ICU were she was kept on ventilator with dopamine drip. In ICU patient's condition was critical for next three days. Her coagulation profile was deranged and she received 9 pint of fresh frozen plasma and 4 pint of whole fresh blood and oxytocics. On 3rd day patients started improving and patient recovered and was discharged on day 10 in perfect health. Baby developed severe birth asphyxia, and seizure. Two years follow up showed baby with no neurological deficit.

Correspondence
Dr. Rachana Saha
Assistant Professor
Kathmandu Medical College Teaching Hospital, Sinamangal, Nepal

Case 2

26 years primigravida at 33+ weeks of gestation was admitted at KMCTH, Sinamangal, Nepal on 01/05/2063 at 6:30 P.M. referred from Shahid Gangalal Heart Institute. She presented with shortness of breath for 4 day, central constricting type of non-radiantly chest pain with 2-3 episodes of haemoplysis with bilateral swelling of face and legs (~ 2 month) patient had no previous history of heart disease. At Shahid Gangalal Heart Institute she underwent cardiac ECHO which showed ejection fraction of 18% with moderate Mitral Regurgitation (MR) and mild Tricuspid Regurgitation (TR). She was diagnosed as dilated peripartum cardiomyopathy. After complete medical obstetric, anaesthetic evaluation it was decided for LSCS with informed High Risk consent of the patient and patient relatives. Under epidural anaesthesia emergency LSCS was performed where a male baby of 1.6Kg with Apger score of 6/10, 8/10. patient tolerated the procedure well enough. Post operative stay was uneventful. On 10th post partum repeat ECHO was done Left Ventricular Ejection Fraction (LVEF) was 35% with enlarged Left Ventricle (LV) with mild MR, Pulmonary Regurgitation (PR) with normal cardiac valves. Patient was discharged after one month.

Perimortem caesarean really helps[1,2,3,4]

There have been several reports of successful resuscitation of both mother and baby after caesarean section even when there was no apparent maternal cardiac output or audible fetal heart. Indeed, caesarean section is well established as part of the resuscitation process in the near-term pregnant woman. In late pregnancy the effectiveness of cardiopulmonary resuscitation is compromised by aortocaval compression, with obstruction of the inferior vena cava limiting venous return to the heart. The stroke volume of a term pregnant woman lying supine is only 30% of normal, but if the patient is placed in a left lateral tilt, stroke volume and cardiac output increase by at least 25%. Lateral tilting should therefore be the first manoeuvre in the event of cardiac arrest, but if sufficient cardiac output is not achieved within five minutes, delivery of the fetus should be considered. Emptying of the uterus will increase cardiac output by 60-80% of pre-pregnancy levels, and thus gives a chance for recovery of maternal circulation, with potential for survival of both mother and fetus. It is important to continue cardiopulmonary resuscitation throughout delivery so as to maintain blood flow to the uterus. Speed is even more important than in a non-pregnant patient, since the higher oxygen requirements render the pregnant woman (and the fetus) less tolerant of hypoxia.

Indication

Currently, maternal diseases are vastly different in the industrialized world than they were a century ago. A 1986 review (Katz, 1986) highlighted the shift over the past century from primarily chronic, mostly infectious causes of death to primarily acute, mostly cardiorespiratory causes of death. The distinction is vitally important; a chronically ill mother may be inadequately nourishing her unborn child for month, thus making a good outcome of any delivery less likely. However, an acute event, such as pulmonary embolus, leaves the infant with some reserves and allows a less-than-optimal delivery setting to produce a good outcome.

In addition, the ability to monitor high-risk patients and intervene in the event of a crisis has greatly expanded over the past 50 years. The advent of advanced emergency transportation systems, advanced life support protocols, and intensive cardiorespiratory support units allows much better outcomes after prolonged anoxia than might have been the case before these advances.

Accurate data regarding the incidence and outcome of post-mortem and perimortem caesarean section are difficult to obtain, since the Confidential Enquiry reports only those deliveries where the mother has died and not those where the mother has been successfully resuscitated. Additionally, the circumstances and cause of maternal death are not always recorded.

Cause of maternal death where delivery occurred by post-mortem caesarean section 1970 – 1996 (Confidential Enquiries into Maternal Deaths in the United Kingdom 1970 – 1996)[1]

Table 1: Cause and number of deaths

Cause of death		No. of deaths
Direct		
	Amniotic fluid embolism	5
	Pre-eclampsia	4
	Pulmonary embolism	3
	Anaesthesia-related	1
Indirect		
	Cardiac disease	4
	Subarachnoid haemorrhage	4
	Endocrine causes	3
	Epilepsy	2
	Meningitis	2
	Asphyxia due to inhaled vomitus	12
Fortuitous		
	Road traffic accident	12
	Suicide	2
	Electrocution	1
	Fall	1
	Accidental burning	1

Surgical technique

Where speed of delivery is of utmost importance, there is no doubt that a classical approach is faster, aided by the natural diastasis of the recti muscles that occurs in late pregnancy. The Royal College of Obstetricians ad Gynaecologists does not have guidelines for post-mortem delivery, but several texts cite the classical method as indicated. We have found no published recommendation for use of the lower-segment approach. The 'classical' method of caesarean section is via a midline abdominal incision and a 12 – 15 cm uterine incision, longitudinally along the midline of the anterior uterine wall after correction for dextrorotation.

Medicolegal consideration

Fear of litigation may prevent intervention in what would be, by all medical judgment, appropriate circumstances for a PMCD. However, no lawsuits filed on the basis of wrongful performance of PMCD have been reported in the literature. Only one legal penalty has been levied in perform the procedure.

Generally, PMCD is deemed an emergency procedure for which consent is not possible. When maternal consent is not an issue, no other opinion should be deemed as legally binding in the emergency setting. Clearly, when the situation involves a ventilator-dependent, brain-dead patient being kept alive solely as a nursery, next-of-kin decisions become relevant and legal and, possibly, spiritual, counsel should be sought.

Outcome

The likelihood of post-mortem caesarean section resulting in a living and neurologically normal infant is related to the interval between onset of maternal cardiac arrest and delivery. In the most comprehensive review of the world literature, Katz et al. summarized the successful cases of post-mortem caesarean section reported between 1900 and 1985. 93% (57 of 61) of the surviving neonates were born within 15 minutes of maternal death, and only 2 had neurological deficits. 70% of the survivors were delivered within five minutes.

More importantly, the shorter the interval between onset of maternal cardiac arrest and commencement of cardiopulmonary resuscitation, and the shorter the time taken to deliver the fetus once cardiopulmonary resuscitation is in progress, the more likely it is that a surviving fetus will be neurologically intact. This is undoubtedly why the fetal survival figures are so much better for perimortem than for post-mortem caesarean section.

The Confidential Enquiry has expressed concern in the past that post-mortem delivery was being undertaken by inexperienced junior staff, with poor

fetal outcome when fetal rescue operations are attempted 'in understandable but inappropriate circumstances'. It emphasizes the need for clear policies on performance of perimortem and post-mortem caesarean section, known to all staff, including accident and emergency. It further recommends that the decision to proceed to caesarean section should be made at consultant level, preferably after discussion with the relatives.

Discussion

The negative prognosticators are lack of pre-hospital basic life support by the lay pubic, the delay in activating the emergency medical services, the time taken to transport the patient to the hospital and inadequate experience in organising PMCD.

In both cases reported we were fortunate enough to salvage both mother and baby because the patient were already in the hospital and advanced life support they received. In case of Amniotic fluid embolism inspite the delay there was no neurological deficit. The Caesarean section was done within 10 minutes leading to neurological sequelae in the baby. In second case of peri-partum DCM Caesarean section resulted in recovery of both mother and baby with gradual improvement in the mother.

It is hoped that this report will serve to heighten awareness of this rare condition. An established protocol for PMCS made known to both medical and nursing staff in hospital would appear warranted.

Acknowledgement

I am thankful to our patients without whom this study would not have been possible. I am also thankful to faculty members and staff of Obstetrics & Gynaecology of KMCTH for their active cooperation for preparing this case report.

Reference

1. Whitten M, Irvine LM: Postmortem and perimortem caesarean section: what are the indications? Journal of the Royal Society of Medicine, 2000;93(1)(6-9)
2. Stallard CT, Burns Bo, Emergency delivery and perimortem C-section. Emerg med clin N Am. 2003; 21, Pg. 679-693.
3. A Ajit N, P Prasad N, Guruprasad P, VN J, Sundaram P, Perimortem caesarean delvery. J obstet gynaecol India 2006;56(3) pg 258-259.
4. Lyon deboran. Perimortem caesarean delivery. www.emdicine.com