Postmortem and Perimortem Cesarean Section: Historical, Religious, and Ethical Considerations

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Abstract:

Guillimeau was the first to use the term cesarean section (CS) in 1598, but this name became universal only in the 20th century. The many theories of the origin of this name will be discussed.

This surgery has been reported to be performed in all cultures dating to ancient times. In the past, it was mainly done to deliver a live baby from a dead mother, hence the name postmortem CS (PMCS). Many heroes are reported to have been delivered this way.

Old Jewish sacred books have made references to abdominal delivery. It was especially encouraged and often mandated in Catholicism. There is evidence that the operation was done in Muslim countries in the middle ages. Islamic rulings support the performance of PMCS.

Now that most maternal deaths occur in the hospital, perimortem CS (PRMCS) is recommended for the delivery of a fetus after 24 weeks from a pregnant woman with cardiac arrest. It is believed that emergent delivery within four minutes of initiation of cardiopulmonary resuscitation (CPR) improves the chances of success of maternal resuscitation and survival and increases the chance of delivering a neurologically intact neonate.

It is agreed that physicians are not to be held legally liable for the performance of PMCS and PRMCS regardless of the outcome. The ethical aspects of these operations are also discussed including a discussion about PMCS for the delivery of women who have been declared brain dead.

Key words: Postmortem cesarean section, perimortem cesarean section, history of medicine, medical ethics, Islam, Catholicism, Judaism, brain death.

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Cesarean section is a surgical operation of particular interest medically and historically. The operation is unique in that it concerns two lives simultaneously and brings forth a new life. It is no wonder that "abdominal delivery" has been enshrined in mythology from olden times.

History

Nomenclature

The origin of the name cesarean section is still uncertain. The notion that the name was derived from the fact that Julius Caesar was delivered by this means is almost certainly erroneous, as his mother, Aurelia, was still alive when the emperor undertook the invasion of Britain. She actually buried him when he was 55 years old.[1] Another theory is that the word is derived from the Latin verb "caedare," which means cut, i.e. "delivery by cutting."[2] Another theory was that Numa Pompilius, the King of Rome in 715 BCE, made a law included in the *Lex Regia* (the Roman legal code or law of kings) called *Lex Regis de lnferendo Mortus*. It forbade burial of a pregnant woman until the child had been removed from her abdomen, even when there was but little chance of its survival, so that the child and mother could be buried separately. When ancient Rome became the Roman Empire, the Lex Regia turned into Lex Caesarea under the rule of the emperors, and the theory goes that the operation became called cesarean operation.[2,3] Rousset in 1581 was the first to use the term "cesarean birth" in medical writings; Jacques Guillimeau in 1598 was the first to use the term "cesarean section."[4] However, the use of the term cesarean section became universal only in the 20th century.

Historical Reports

While the antiquity of the operation is definitely established, it is impossible, or at least very difficult, to ascertain when it was first performed and whether the women on whom it was performed in old times were dead or alive at the time of the operation. According to Greek mythology and poetry, both Aesculapius, the god of physic, and Bacchus, the god of wine, were delivered by this operation. The first

was delivered by his father Apollo. The Persian hero Rustum, son of King Sol, was also reported to have been delivered this way.[5] This kind of birth, an "immaculate" one, was often taken as a sign of a high destiny. Gods and heroes tend to avoid the dark confines of the natural channels of birth. Indra, the Indian supreme Vedic god, refused to be born by the old, well-proven way. He wanted to emerge from his mother's side despite all the attendant drawbacks for her. Also, Buddha (Gautama) is reported to have emerged pure and immaculate from the right side of his mother, Maya. Abdominal delivery (probably on dead women) was also performed in other cultures as described in Thompson index of mythology and folklore.[6] In Egypt it is reported that the operation was performed as early as 3000 BCE.[2] Sage Sustra, who practiced around 600 BCE and is one of the founders of ancient Hindu medicine, referred to postmortem abdominal delivery in his medical treatise *Sustra Samhita*.[5] It is possible that in both Egypt and India this procedure was ordained by law.[2]

Mythology aside, cesarean section during earlier times was performed not on living subjects, but only on the dead if there was hope of rescuing a term child, especially if it is felt that this child may be of value to the community, an heir to the throne for example! According to Boley, the oldest authentic record of a living child born by means of this operation is Gorgias, a celebrated orator of Sicily in 508 BCE.[7] It is reported that Burchard, Abbot of St. Gallen, and Gebhard, Bishop of Constance, were born this way in 959 and 980, respectively. It is also reported that Robert II, King of Scotland, and King Edward VI, son of Henry VIII and Jane Seymour, were born this way on March 2, 1316, and October 12, 1537, respectively.[2] Jane Seymour, the third wife of Henry VIII, is said to have been laboring for two days with slow progress. Her obstetrician told the king that either craniotomy or abdominal delivery is required to terminate the protracted labor. The King, keen to have a legitimate heir to the throne, is said to have directed the doctors to "save the life of the child, for another wife can easily be found."[2] Jane Seymour died 12 days after the birth of her son Edward VI. A lot of controversy exists about the validity of these reports.

There are also reports of women in labor performing cesarean operations on themselves and of husbands performing the operation on their wives. Jacob Nufer, a Swiss pork butcher, is said to have performed the operation in 1500 on his wife with a razor while she was lying on the kitchen table. It is said that is the first record of maternal survival following cesarean section. The authenticity of this tale is doubted.[2] There are also reports of women gored by cows, bulls, and other horned animals with the expulsion of the fetus. The first documented such case occurred in Zaandam, Holland, in 1647. The child survived, but the mother died 36 hours later.[2]

Notwithstanding all these reports, there is no agreement among historians on when and where the first cesarean section was performed on a live woman for the purpose of delivering a live child.

Religious References to Cesarean Section

The *Mischnagoth (Mishna)*, the oldest Jewish book, 140 BCE, gives an account of a delivery of twins through a cut in the mother's abdomen. In the *Nidda*, an appendix to the Talmud, it is stated: "It is not necessary for a woman to observe the days of purification after the removal of a child through the parietes of the abdomen." Children delivered through the flanks of their mothers were given the name of "Jotze Dofan" by ancient Jews.[2,5]

The Roman Catholic church encouraged the use of abdominal deliveries for pregnant women who died to offer the souls of unborn children the chance of salvation through baptism. At the same time, the church banned the use of abortion, craniotomy, and fetal dismemberment as techniques to deliver the child in order to save the mother. Abdominal delivery of a dead woman's fetus was made mandatory by the Church Councils of Cologne in 1280. The Senate of the Republic of Venice in 1608 laid down severe penalties for any doctor who failed to make an attempt to save the child in this way.[2] As late as 1749, a Sicilian physician was condemned to death because of his failure to follow this law.[5] In Italy, a Sicilian friar, Francesco Cangiamila, wrote a medical theological treatise in the 1740s on the baptism of the unborn.[8] In Peru in 1781, Friar Francisco Gonzales Laguna wrote a medical theological treatise. He integrated surgical debates with theological discussions about the nature of the soul and original sin. He argued that original sin will condemn the fetus to an afterlife in hell if left unbaptized. He proposed that all Andean priests should be trained in the art of cesarean section. Furthermore, in the absence of a

qualified expert, they should be obliged to perform it on women in their parishes who died during childbirth.[8] During the Franciscan mission period in the United States (1769-1833), the operation became the responsibility of the missionary priest who attended the dying mother.[2]

The obsession with baptism of infants was especially seen in France. Peu, in his1694 *Practique des Accouchements*, described in great detail how baptism was to be accomplished in operative deliveries.[2] Another important issue was raised. If baptism was of such paramount importance, should the imminent death of the mother be hastened to save her otherwise doomed child? Saint Thomas Aquinas (1225-1274) clearly stated that the mother should not be killed in order to baptize the child.[5]

There is no direct evidence that postmortem abdominal deliveries were done in the Middle Ages in Islamic countries. The famous surgeon Abū al-Qāsim al-Zahrāwī (936-1013) did not mention the operation in his book *al-Tasrīf li man a`jaz `an al-ta'līf* (Explanation for those who are unable to write). This book was the leading textbook of surgery in Europe for about 500 years.[9] Also, in my limited search in the easily available manuscripts I could find, there was no specific textual description of the operation. However, it is historically clear that the operation was performed during the Islamic era. In fact, the first known drawing of an abdominal delivery was done by al-Bīrūnī (973-1048). The drawing exists in a rare manuscript *al-Āthār al-bāqiya `an al-qurūn al-khāliya* ("The chronology of ancient nations") dated 1307, available in Edinburgh University Library (161 folio 6). Further, the illustration of the cesarean birth of Rustum by al-Firdawsī in a 1560 manuscript of his *Shahnameh* (Book of Kings) in the possession of the Metropolitan Museum of Art in New York indicates that he must have seen the operation performed.[10] These historical documents reveal that in the Islamic world, the cesarean operation has not only continued to be performed under special circumstances on recently dead mothers, but probably also has been performed on living wives of Muslim kings, sultans, and princes to rescue both the mother and the fetus.[11]

The Islamic Ruling on Postmortem Cesarean Section

To derive a ruling on any matter, Muslims have to rely on the primary sources of Islamic jurisprudence, i.e. the Qur'an and Hadith (sayings of Prophet Muhammad ﷺ). If they do not give the answer, one has to rely on what the Muslim jurists decided on the matter using the process of *ijtihād* (personal reasoning).[12]

There is no direct mention of abdominal delivery either in the Qur'an or the Hadith. However, Islamic principles in general will support the performance of postmortem cesarean section (PMCS) on a mother who has just died if there is a reasonable chance to deliver a live baby, as this fulfils the purpose of the preservation of life, one of the *maqāṣid* (the purposes) of *shari`a* (Islamic law).

The only possible reason for objection to the procedure is that it entails desecration of a dead body. Desecration is prohibited as the Arabs in the *jāhiliyya* (period before Islam) used to mutilate the bodies of their dead enemies after a battle. To open the belly of a woman who just died with the aim and intention of delivering a live baby who may survive appears to be quite acceptable. Intention in Islam is the basis of acceptance or rejection by God of any action. The Prophet ﷺ said, "Deeds are based on intentions."[13] The intention in doing a PMCS is good and not evil, and therefore it is acceptable.

In old *fiqh* (Islamic jurisprudence) books are rulings that apply both indirectly and directly to this subject. Opening the grave and violating the sanctity of the dead are prohibited sins. However, it is a duty that needs to be done if the deceased was buried without the ritual washing or the body was not placed properly in the grave facing the *qibla* (direction of *ṣalāt* or ritual prayer). That is because correcting these problems are more beneficial than the harm of violating the sanctity of the grave.[14] In the same ruling it further states that "cutting the abdomen of a pregnant woman to deliver a fetus that is hoped to survive is permissible" because preserving the life of the infant is more beneficial than the harm of violating the mother's sanctity.[14]

In another *fiqh* book, it is stated that if a pregnant woman dies and her baby is alive, it is permissible to open her belly (from the left side) and deliver the baby. Moreover, if the opposite condition occurs, i.e. the fetus dies and the pregnant woman is in danger (from obstructed labor), it is permissible to perform a destructive procedure on the baby to save the mother.[15]

Professor Ebrahim in his book *An Introduction to*

Islamic Medical Jurisprudence cites Ibn Qudāma (1147-1223 CE), a famous Muslim jurist, as stating that Islamic law permits cutting of the belly of the dead pregnant woman in order to remove the fetus should any movement be detected. Professor Ebrahim stresses that it is permissible based on the Islamic principle that "the right of the living person supersedes consideration over the dead."[16]

The permissibility of PMCS from an Islamic viewpoint is therefore quite evident. In light of this fact, it is so strange and bizarre that a physician or scientist states that "Mohammedanism absolutely forbids it (i.e. cesarean section), and directs that any child so born must be slain forthwith as it is the offspring of the devil."[17] A statement like that without any reference or basis only belies ignorance and bigotry. Unfortunately, the same erroneous information has been restated in a more recent article quoting that source without any effort to investigate its accuracy.[2] However, other Western writers did not subscribe to these authors blindly. Quoting from Brandenburg, "Islam upheld the principle that is still mandatory for every obstetrician today. First, save the mother, even if the child has to be sacrificed, only once hope has been abandoned for the mother should an attempt be made to save the child (by postmortem cesarean section)."[18] This was also confirmed by Lurie who stated "Islamic religious authorities also favored PMCS as evident from juridical doctrines written by the Imam Abu Hanifah (699-767 CE).[5]

Outcome of Postmortem Cesarean Section

PMCS is meant to deliver a live baby. However, its results until recently were very poor. In the German duchy Kurhessen in 1848 there were 107 PMCS with no survivors.[6] In 1864 a physician collected and presented a series of 147 PMCS at the Berlin Obstetrical Society. Only three infants survived.[19] Katz et al reviewed the literature from 1879 through 1985 and reported a total of 269 cases of PMCS with 188 infants surviving. However, these authors cautioned that because of probable underreporting of unsuccessful cases, the true percentage of survivors is impossible to ascertain.[6] Katz et al reported on the relation of infant survival to the time interval between maternal death and the delivery. In their review of cases from 1900 to 1985 there were 61 cases with neonatal survival and known time interval. Fifty-seven (93%) were born within 15 minutes, and only two had neurological damage, one mild and one severe. Seventy percent of the survivors were born within five minutes.[6] Although this seems to be the usual, in one reported case a live infant was delivered by PMCS 22 minutes after documented maternal cardiac arrest and 47 minutes after the fatal injury she sustained. Follow-up of the infant at 18 months of age demonstrated no evidence of neurologic damage.[19]

Perimortem Cesarean Section

The occasion to perform PMCS is now very rare as the great majority of maternal deaths occur in the hospital. The pregnant woman is being treated for a serious medical or obstetric complication or brought to the hospital while still alive but in extremis because of a grave medical emergency or a major trauma, usually a car accident or gunshot wounds. The proximate cause of death in these circumstances is usually cardiac arrest. Cardiopulmonary resuscitation (CPR) should be immediately instituted, and if the pregnancy is past fetal viability (>24) weeks it is recommended to perform emergent delivery by cesarean section, a perimortem CS (PRMCS).[6] The primary concern of this procedure is to improve the chance of maternal survival, but it will also result in the delivery of a potentially live baby. CPR is less successful in late pregnancy because of compression of the inferior vena cava by the gravid uterus, the difficulty in chest compression, etc. Once the fetus is delivered, autotransfusion of the blood in the uterus and the relief of the pressure on the pelvic veins and the inferior vena cava will increase the venous return and hence the cardiac output. Also chest compression will be easier to perform, and the pulmonary functional residual capacity will be increased, improving oxygenation. All these factors tend to increase the success of CPR and maternal survival. It is believed that neonatal survival is best if CPR is initiated within four minutes of cardiac arrest and the delivery accomplished within five minutes.[3,6,20-22] Katz et al reported on the outcome of PRMCS in pregnant women who had cardiac arrest. There were 35 women, 20 of whom had potentially resuscitable causes. Of these, 13 survived. In 22 cases, information was provided regarding the effects of PRMCS on the maternal hemodynamic status. Twelve women had sudden and often profound

improvement once the uterus was emptied. In eight women there was no significant change. In no case was there deterioration of the maternal condition with the cesarean delivery. These operations resulted in 34 surviving infants including three sets of twins and one set of triplets.[22]

Medico Legal Aspects

Theoretically one can be criminally sued for performing PMCS. The offense will be "mutilation of a corpse." Mutilation is defined as wrongful dissection. An operation performed to save an infant cannot be wrongful as there is no criminal intent. Also operating without consent may be construed as battery. However, the doctrine of "emergency exception" applies. This principle also applies to the performance of PRMCS. The unanimous consensus of the literature and of legal authorities is that a civil suit against a physician for performing a PMCS or PRMCS, regardless of the outcome, would not result in judgment against the physician.[3,6]

Ethical Aspects

The physician may feel hesitant to perform a PMCS, especially if some time has passed since death. The physician may be reluctant to perform PRMCS if there has been a relatively long interval since cardiac arrest before initiation of CPR as there is a possibility of leaving the husband with a neurologically damaged baby in addition to his dead wife. This should not be the case. A review of the outcome of PMCS as reported in Confidential Enquiries over the past 25 years showed that there were no reported cases where survival beyond the early neonatal period was accompanied by neurological disability.[23] Further, there are two reports of intact infant survival after 25 and 47 minutes of maternal death. The authors stated that "although these cases are unusual they highlight the fact that a decision not to deliver the fetus may well leave unanswered questions not only for the obstetrician but also for the remaining family."[23]

This hesitancy is also unwarranted from both the ethical and Islamic points of view, provided that the procedure was performed on the basis of the physician's best judgment that the neonate will survive and probably will be neurologically intact. This judgment should not be based only on the gestational age and the time interval involved but also on the maternal health status before death. The prognosis of the newborn will be better in case cardiac arrest or death was due to an acute cause, for example a car accident, than if it was due to chronic maternal disease like chronic hypertension, diabetes, lupus, etc. In the latter cases, the fetal status probably already had been compromised by being subjected to poor intrauterine environment, hypoxemia, medications, etc.

The hesitancy to perform these procedures can be overcome partly by special training or education.[24] A special training course "Managing Obstetric Emergencies and Trauma (MOET)" was introduced in the Netherlands in 2004. This course recommends including PRMCS in the management of cardiac arrest in late pregnancy. In their study of the rate of performance of PRMCS over a 15-year period from 1993 to 2008, they reported a significant increase from 0.36 to 1.6 procedures a year following the introduction of this course. There were 55 cardiac arrest patients, 12 of whom underwent PRMCS. Of these, two mothers and five neonates survived. The authors recommend that even if the pregnancy is preterm or intrauterine fetal demise (IUFD) has occurred, the obstetrician should not refrain from performing PRMCS to facilitate maternal resuscitation.[24]

An especially significant ethical problem arises if a pregnant woman is declared "brain dead" before the age of fetal viability. Would she be maintained on life support for the sole purpose of allowing fetal maturation to occur before delivery is effected and life support then withdrawn?

Very few such cases have been reported. The longest interval between brain death and "somatic death" was reported in 1988.[25] Brain death occurred in a pregnant woman at 22 weeks. She was maintained on intensive life support and close fetal monitoring for 63 days. The treatment included intensive cardiovascular and respiratory support, parenteral nutrition through artificial feeding either by IV fluids or feeding tubes, aggressive treatment of infections and treatment of diabetes insipidus, diabetes mellitus, and hypothyroidism. The delivery was decided at 31 weeks because of the failure of the fetus to grow over a period of two weeks. An apparently healthy 1,440-gram infant was delivered. The child was developing normally at 18 months.[25]

In ethical deliberations of obstetric interventions

on behalf of the fetus, one has to consider the risks to the mother. In this case there is no maternal risk. Withdrawal of life support will result in certain fetal death. On the other hand, its continuation may improve the chances of neonatal survival if it is continued long enough to achieve fetal lung maturity (32 weeks, ideally). However, one cannot be sure that despite intensive supportive treatment the woman can survive longer than two weeks after brain death.[26] Further, this supportive treatment cannot guarantee a normal intrauterine environment conducive to normal fetal development. From the medical point of view, the preponderance of argument is that it is acceptable to strive to resuscitate the fetus by maintaining life support if there is a reasonable chance the pregnancy will continue at least until fetal lung maturity is achieved.

Still other considerations exist. What are the risks and benefits to the family and society? Cost is a major concern. In the above cited case the cost of maternal care was $183,081 and that of neonatal care $34,703 in 1983 dollars.[25] Now it could be four times greater. Obviously, if brain death occurred earlier than 22 weeks the cost of maternal support and neonatal intensive care would be even more prohibitive. Would squandering costly medical services be justifiable in the current period of health care budgetary restrictions? From the Islamic point of view, one has to ask whether this significant amount of money should be spent to potentially save one individual. The concept of "preserving property," the fifth purpose of *sharī`a*, should be invoked here. Further, in *sharī`a*, the honoring of the dead person is burial. Is it justifiable to delay burial of a dead woman for such a long time? What about the various *sharī`a* rulings of the dead person? Should they take effect at the time of brain or somatic death? These questions should be answered by Islamic scholars and are outside the scope of this paper.

All these points should be discussed with the family, particularly the next of kin who has the authority to make decisions about the disposition of the body of the dead woman and the father of the baby who will have to take care of a baby who may be born with a significant neurological impairment. Fully informed consent of the next of kin is required. However, conflicts may arise if the father requests continued somatic support while the woman's next of kin objects. In the United States, courts usually uphold the father's request.[25]

Finally, should an advance directive against continued life support signed by the patient, if available, be respected? In the state of Georgia, advance directives specify that the directive to withhold life support generally will have no force and effect in case of pregnancy unless the fetus is not viable and the woman specifically asks for her directive to be carried out.[27]

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