

# Delayed postmortem cesarean section due to trauma

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## ABSTRACT

Cardiopulmonary arrest is an occasional occurrence during pregnancy. As soon as maternal arrest is noticed in a woman in the second half of her pregnancy, medical teams should be called for perimortem cesarean (C/S). A 31-week-pregnant female patient was brought to our emergency department by the emergency medical service team with cardiopulmonary resuscitation (CPR) after a traffic accident. The patient, with no pulse or spontaneous breathing, was recognized as exitus. However, CPR was sustained to maintain fetal well-being. Before the arrival of the on-call gynecologist, we as emergency physicians initiated C/S both for fetal well-being and to avoid heightening the risk of fetal mortality and morbidity. The Apgar scores were 0/3/4 and oxygen saturation values were 35/65/75% at 1/5/10 min, respectively. On the postnatal 11<sup>th</sup> day, the patient did not respond despite the advanced cardiac life support (ACLS) and thus was considered exitus. The ACLS team should be knowledgeable and well-equipped to perform C/S, to do aftercare, to watch for related risks in the infant. In our case, it took 40 min for the fetus to be removed from the mother's womb, starting from the estimated time of exitus.

**Keywords:** Emergency department; postmortem cesarean; pregnancy arrest; trauma.

## INTRODUCTION

Cardiopulmonary arrest is an occasional occurrence during pregnancy. The underlying causes of maternal cardiac arrest have a broad spectrum, ranging from direct complications of pregnancy to comorbid diseases and trauma.

Trauma is the most common non-obstetric contributor to morbidity and mortality during pregnancy. Similar to the protocol applied to all trauma patients, the initial step is clinical assessment of airway, respiration, and circulation.<sup>[1]</sup> Spontaneous circulation does not immediately return to normal in maternal cardiac arrests. As soon as maternal arrest is noticed in a woman in the second half of her pregnancy, other medical teams should be called for perimortem cesarean (C/S). As recommended by previous reports, cardiopulmonary resus-

citation (CPR) should be initiated by performing a left lateral uterine deviation (LUD) maneuver.<sup>[2]</sup> Another clinical report did not find sufficient evidence about the conduct of the left lateral tilt and/or LUD maneuver during respiratory support and CPR in pregnant patients.<sup>[3]</sup>

There is no reasonable ground for delaying perimortem C/S in pregnant women suffering trauma incompatible with life. Indeed, pre-term birth seems to be associated with better maternal and neonatal survival. The ideal time of delivery has been reported to be within 5 min after arrest.<sup>[2]</sup>

## CASE REPORT

A 30-year-old female patient was brought to our emergency department (ED) by the emergency medical service (EMS)

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team with CPR after a traffic accident. Based on the information from the EMS team, the patient, at 31 weeks of gestation, was assessed as exitus at the scene but was transferred to ED due to the presence of fetal life. The EMS team reported performing about 5 min of CPR. We consulted the obstetrics department for emergency postmortem C/S and the pediatric department for neonatal advanced cardiac life support (ACLS). In the first physical examination of the patient, there were multiple fractures in the skull bones as well as crushing fractures in the maxillofacial bones, and no bilateral eye globes were observed. We also detected some fragmentation in the mouth in addition to crepitation and emphysema in the thorax. The patient, with no pulse and spontaneous breathing, was recognized as exitus. However, CPR was sustained to maintain fetal well-being. Due to intraoral laceration and maxillofacial multiple fractures, respiratory support of the pregnant patient ventilated with balloon valve mask for fetal oxygenation was delivered by cricotomy, an alternative airway to endotracheal intubation. On detecting the fetal heartbeat during fetal ultrasonography (USG), we made the C/S decision. Until the arrival of the on-call gynecologist, we as emergency physicians initiated C/S both for fetal well-being and to avoid heightening the risk of fetal mortality and morbidity. A suprapubic horizontal incision with a length of approximately 20–25 cm was created, and the skin, subcutaneous tissue, adipose tissue, and rectus muscles were incised until the peritoneum was reached. Once the uterus was reached following the vertical dissection of the peritoneum, a vertical uterine incision was performed carefully. The dissection procedure was sustained until the amniotic sac was visible. After the amniotic sac was removed intact, the amniotic fluid was exposed with a small incision in the sac.

The fetus was removed from the mother's womb and the cord was clamped after stroking and cut in a sterile fashion. CPR was initiated immediately when pulse and respiration were not detected in the premature baby with cyanosis. After CPR, spontaneous circulation was restored. The Apgar scores were 0/3/4, and oxygen saturation values were 35/65/75% at 1/5/10 min, respectively. The premature patient was transferred to the neonatal intensive care unit (NICU) for further treatment. We terminated the conduct of CPR on the pregnant patient following the removal of the fetus. Subsequently, the uterine incision and abdomen were repaired with primary suturing.

Thirty min after the intervention, the emergency call center recontacted our unit, informing us that the EMS team had arrived at the scene 9 min after the phone call. It was also reported that the fire crew took the pregnant patient out as she was stuck in the vehicle and that it had taken approximately 33 min to bring her to our ED. During this period, CPR was performed only in the past 5 min.

Considering the mechanism of the event and the clinical condition of the pregnant patient, we assume that she died at the time of the accident. Forty min after the accident, we delivered the fetus, whose heartbeat was detected by fetal USG.

Once the newborn patient handed over to the pediatric team was intubated promptly in the resuscitation ward, she was transferred to the NICU for further examination and treatment with a transport incubator following the CPR. As a result of the examination performed by the newborn team at the admission to the NICU, it was found that the intubated patient was at 31 weeks of gestation (compatible with 30 weeks, based on New Ballard score), suffered poor general medical condition, had body temperature at 34.7°C, weighed 1780 g, had anterior fontanel measuring 1x1 cm and posterior fontanel measuring 0.5x0.5 cm, had rhythmic heart auscultation, had no change in heart sounds and no additional heart murmur, had oxygen saturation at a rate of 70–75%, and suffered respiratory distress. The newborn was monitored with the appropriate mode and parameters on the mechanical ventilator as intubated. In addition to the clinical findings, since respiratory distress syndrome (RDS) was detected in the PA chest radiography, the initial intratracheal surfactant (200 mg/kg/dose) was administered in the postnatal 1<sup>st</sup> half h.

As low oxygen saturation and RDS findings continued during the follow-up, a second surfactant (100 mg/kg/dose) administration was performed 6 h later. After an umbilical vein catheter was inserted, the patient was administered with appropriate parenteral fluid-electrolyte and antibiotherapy along with supportive treatments (total parenteral nutrition, caffeine and inotrope). During the abdominal examination, the patient was observed to be comfortable and have no organomegaly, and she was evaluated as a baby girl based on her external genitalia. The first blood gas assessment of the baby after birth revealed that pH was 6.51, base excess (BE) was -28, and the lactate value was 13. After the required treatments were performed properly, the blood gas pH at the postnatal 48<sup>th</sup> h rose to 7.37, BE decreased to -4, and the lactate value fell to 2.35 in the follow-up.

The findings of the cranial USG performed at the postnatal 6<sup>th</sup> h were evaluated as normal. Based on the cranial USG performed on the 9<sup>th</sup> day, however, an echogenic appearance compatible with Grade 1–2 intraventricular hemorrhage was observed in the left caudothalamic notch, and the newborn follow-up was performed.

On the detection of seizure-like abnormal movements in the NICU follow-up, the patient was monitored through amplitude integrated electroencephalography (aEEG). Bilateral severe abnormal electrical activity and burst suppressions were observed in the aEEG at the postnatal 6<sup>th</sup> h. After the presence of spike wave discharges and continuing burst suppressions as well as tachycardia and desaturations were identified in the aEEG at the postnatal 12<sup>th</sup> h, the patient was accepted as suffering symptomatic seizures, and an anticonvulsant treatment was initiated. In addition, bilateral isoelectric line was detected in the aEEG at the postnatal 24<sup>th</sup> h.

On the postnatal 4<sup>th</sup> day, the patient's general condition was

poor, while her pupillary fixation was dilated. In addition, she had a comatose appearance and exhibited no spontaneous movement. She was hypotonic, hypoactive and decerebrate, and her neonatal reflexes also began to be absent. During her follow-up in the NICU, the patient was screened frequently based on the clinical and laboratory findings. Throughout this process, the relevant departments were consulted for the indications and the patient was supported with blood and blood products many times. On the postnatal 7<sup>th</sup> day, her consciousness was comatose and her pupils were fixed dilated. She was hypotonic and showed no spontaneous movement, nor did she have any neonatal reflexes in decerebrate posture. On the postnatal 11<sup>th</sup> day, the patient did not respond despite the ACLS and thus was considered exitus.

## DISCUSSION

In rare cases of pregnancy arrest, the ACLS team should be knowledgeable and well-equipped to perform C/S, to do aftercare, to watch for related risks in the infant. In addition, the C/S decision should be made quickly due to the possibility of both pregnant and fetal mortality and morbidity. In our case, it took 40 min for the fetus to be removed from the mother's womb, starting from the estimated time of exitus. During this time, the 28-min period in which CPR could not be performed as the pregnant patient was stuck in the vehicle was followed by a 12-min CPR process.

## Conclusion

Based on the previous clinical reports, we have investigated, we encountered no similar case in which the period spent

without performing CPR on the arrested pregnant patient was so long, and in which a fetus was born whose heartbeat was detected in the fetal USG after starting CPR.

**Informed Consent:** Written consent was obtained from the patient's relative for publication of study.

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## OLGU SUNUMU - ÖZ

### Travmaya bağlı gecikmiş postmortem sezaryen

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Kardiyopulmoner arrest hamilelik sırasında nadir görülen bir durumdur. Gebeliğinin ikinci yarısında annenin arrest olduğu fark edilir edilmez, tıbbi ekipler perimortem sezaryen (C/S) için çağrılmaktadır. Olgumuzda 31 haftalık gebe hasta trafik kazası sonrası acil servise (AS) 112 ekibi tarafından kardiyopulmoner resüsitasyon (KPR) eşliği ile getirildi. Nabızı olmayan veya spontan solunumu olmayan hasta eksitus olarak kabul edildi. Bununla birlikte, CPR fetüsün sağkalımını korumak için sürdürüldü. Nöbetçi kadın doğum doktoru gelmeden önce, acil servis hekimleri olarak fetüsün fetal mortalite ve morbidite riskinin artmasını önlemek için C/S'yi başlattık. 1/5/10 dakikada Apgar skorları 0/3/4 ve oksijen saturasyonu değerleri sırasıyla %35/65/75 idi. Postnatal 11. günde ileri kardiyak yaşam desteğine rağmen yanıt vermeyen hasta exitus olarak kabul edildi. Acil servis ekibi, C/S ve yenidoğan ve bakımı konusunda bilgili ve donanımlı olmalıdır. Bizim olgumuzda ise annenin tahmini saatine göre fetüsün anne rahminden çıkarılması 40 dakika sürmüştür.

**Anahtar sözcükler:** Acil servis; gebe arrest; postmortem sezaryen; travma.

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