Resuscitation (2007) **75**, 180—183

RESUSCITATION

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CASE REPORT

# Amniotic fluid embolism after blunt abdominal trauma☆

**Christian Lycke Ellingsen**[a,*], **Torbjørn Moe Eggebø**[b], **Kristian Lexow**[c]

[a] *Department of Pathology, Stavanger University Hospital, Stavanger, Norway*
[b] *Department of Gynaecology and Obstetrics, Stavanger University Hospital, Stavanger, Norway*
[c] *Department of Anaesthesia and Intensive care, Stavanger University Hospital, Stavanger, Norway*

Received 22 December 2006; received in revised form 14 February 2007; accepted 15 February 2007

**KEYWORDS**
Amniotic fluid embolism;
Maternal cardiac arrest;
Pregnancy;
Trauma

**Summary** Amniotic fluid embolism (AFE) is a rare, but potentially fatal complication of pregnancy, with an incidence between 1 in 8000 and 1 in 80,000 pregnancies. The pathogenesis is not fully understood, but the generally accepted belief is that amniotic fluid enters the mother's circulation, most commonly via tears in the lower uterine segment. In the fluid there are substances with pro-inflammatory, vasospastic and pro-coagulative properties. AFE after blunt trauma is very rare, only described a few times in the literature. We report a case of fatal AFE after probable minor blunt trauma to the abdomen and give a review of the literature.


## Introduction

The tenth revision of the International Classification of Diseases (ICD-10) defines a maternal death as ''the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to, or aggravated by, the pregnancy or its management but not from accidental or incidental causes.''[1]

The risk of death from complications of pregnancy has decreased dramatically during the 20th century, especially in the developed countries. In the developed regions, the maternal mortality rate is about 20 per 100,000 births, while the figure for the developing regions is 440 per 100,000.[2] Amniotic fluid embolism (AFE) is a rare, but grave complication of pregnancy, characterised by poor response to treatment and high mortality. AFE caused by trauma has been described only in individual cases.[3—5] We present an enigmatic case of amniotic fluid embolism, arising after blunt abdominal trauma.

## Case report

The patient was a 24-year-old woman, 37 weeks pregnant (ultrasound dating). She had had one earlier uncomplicated pregnancy and this pregnancy had also been uneventful.

☆ A Spanish translated version of the summary of this article appears as Appendix in the final online version at 10.1016/j.resuscitation.2007.02.010.

* Corresponding author at: Department of Pathology, Stavanger University Hospital, PO Box 8100, N-4068 Stavanger, Norway. Tel.: +47 5151 9339; fax: +47 5151 9910.
*E-mail address:* elch@sus.no (C.L. Ellingsen).

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doi:10.1016/j.resuscitation.2007.02.010

Bystanders heard her crying for help, standing ankle-deep in water in a shallow creek with a toddler on her arm. The bank was 1.5—2 m high and steep, so she could not climb out of the water without help. Sixty meters upstream there were sliding-marks in the grass on the bank and the toddler's pram was lying in the creek.

After retrieval from the stream, the patient became unresponsive with blood-tinged sputum in her mouth. An ambulance and a local general physician arrived at the scene within 13 min. The patient then developed cardiac arrest, and basic resuscitation was started. An anaesthesiologist-manned ambulance helicopter arrived after few minutes. She was intubated and advanced cardiopulmonary resuscitation (including drugs) in accord with the 2000 Guidelines for Cardiopulmonary Resuscitation from the European Resuscitation Council was continued during the transport to hospital (17 min).

On arrival at hospital she still was in asystole. The foetus had bradycardia (60 beats per minute) and an emergency caesarean section was immediately performed in the emergency department. The obstetrician noted a small amount of blood in the abdominal cavity and a larger amount of blood in the uterus, but no focus of bleeding could be detected, and there was no sign of abruption of the placenta. Despite the resuscitative efforts there were no signs of life, and the patient was pronounced dead 1 h 20 min after initiation of basic life support. The child, a girl, was resuscitated. She had an APGAR score of 1—2—4 at 1, 5 and 10 min. There was no spontaneous respiration. After a few hours she developed seizures, EEG was isoelectric and the blood pressure was falling. On clinical grounds a diagnosis of severe hypoxic—ischemic brain damage was made. The prognosis was deemed hopeless and active treatment was discontinued. There was no request for an autopsy.

The police requested a forensic autopsy of the mother. A very broad investigation was made, including a full external and internal examination with histology, neuropathological examination of the brain, toxicological screening and basic blood and vitreous fluid chemistry. There were no external signs of trauma except superficial abrasions on the forehead and forearms and minor haematomata in the chest wall. The lungs were congested, and in the vessels there were mucus and epithelial squames (Figure 1), diagnostic of amniotic fluid embolism. In the uterus, we could not find any significant tears in the lower segment. In one histological section from the lower segment there was mucus inside a blood vessel.

## Discussion

The incidence of amniotic fluid embolism has been reported in between 1 in 8000 and 1 in 80,000 live births with mortality ranging from 61% to 86%.[6,7] More recent surveys suggest a lower mortality rate, less than 30%, probably because of increased recognition of ''milder'', non-fatal cases. It accounts

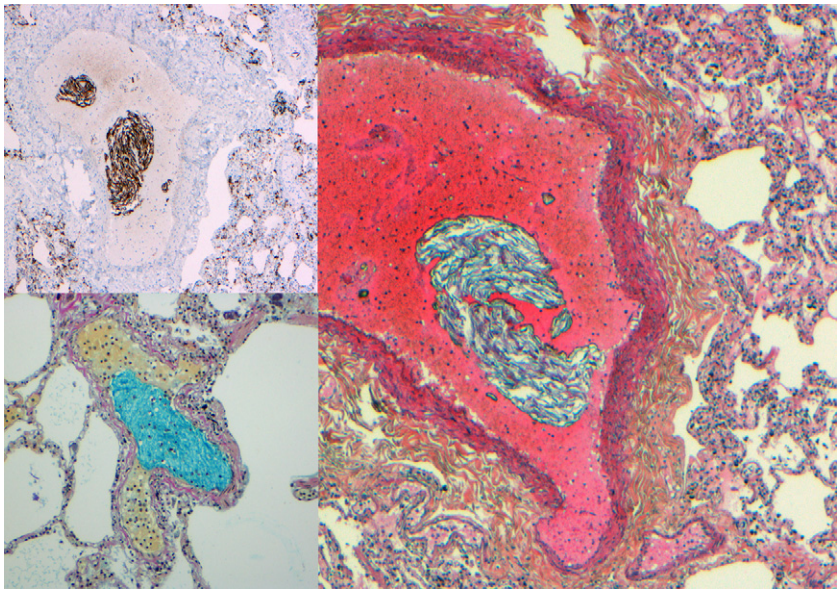

**Figure 1** Histological section from lung showing epithelial squames inside an artery (HES stain, magnification 4×). (Insert) Immunohistochemical stain for Pan-cytokeratin, highlighting epithelial squames and Alcian Blue-PAS stain, highlighting mucus.