Amniotic Fluid Embolism: A Case Report

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Abstract
Amniotic fluid embolism (AFE) is known to cause a serious reaction triggered by the entry of amniotic fluid or other debris into the maternal circulation.[1] It has been recently suggested that amniotic fluid embolism is an anaphylactic syndrome of pregnancy involving the complement system, causing vasospasm, oedema, and early onset disseminated intravascular coagulation (DIC), which is one of the causes of sudden death in obstetrics.[1] Suspicion of (AFE) should be considered in any antepartum or postpartum collapse if no obvious cause is known. We present a case of a 35-year-old mother at 35 weeks of gestation who collapsed during her early labour with no clue about the diagnosis and died soon after the admission despite vigorous resuscitation.

Keywords: Embolism, amniotic fluid, foetal squames, mucin.

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Introduction

Amniotic fluid embolism (AFE) is known to cause a serious reaction triggered by the entry of amniotic fluid or other debris into the maternal circulation.[1] It has been recently suggested that amniotic fluid embolism is an anaphylactic syndrome of pregnancy involving the complement system, causing vasospasm, edema, and early onset disseminated intravascular coagulation (DIC), which is one of the causes of sudden death in obstetrics.[1] Suspicion of (AFE) should be considered in any antepartum or postpartum collapse if no obvious cause is known. We present a case of a 35-year-old mother at 35 weeks of gestation who collapsed during her early labour with no clue about the diagnosis and died soon after the admission despite vigorous resuscitation.

Case report

A 35-year-old housewife having one child was in her third pregnancy with a period of gestation of 35 weeks and had a history of intrauterine death presented with the onset of labour and in unconscious state. The attempt at vigorous cardiopulmonary resuscitation was failed and pronounced dead half an hour after the admission.

According to her husband, on the 8th of May 2023, she had been examined by VOG, and an Ultrasound Scan was done and found to have a single live foetus, on breach presentation.

She developed mild abdominal pain since 03 am on the 9th of May 2023 and had a history of dribbling and showing since 4.30 am, was void for defecation, and went to the bathroom twice. She was preparing to come to the Hospital to see her elder child receiving treatment at a nearby rural hospital for a fever. In the meantime, she felt dizziness, faintishness, nausea, and vomiting and left home with the idea to see her child. In a few minutes, she collapsed inside the trishaw and was admitted to the District General Hospital Embilipitiya at around 5.30 am and died despite three rounds of cardiopulmonary resuscitation in the presence of a multidisciplinary team. Her cervix was dilated up to 2cm.

A blood sample taken during resuscitation shows a marginal elevation of liver functions.

At the autopsy, did not find anything other than focal fatty changes of the liver (Fig 1). Her heart was 200 grams in weight and was unremarkable.

Figure 1. Liver, lungs, kidneys, spleen, heart, and pancreas. Note the fatty changes in the liver.

The uterus and the placenta were unremarkable (Fig. 2). A 35-week head fully engaged male fetus was found.

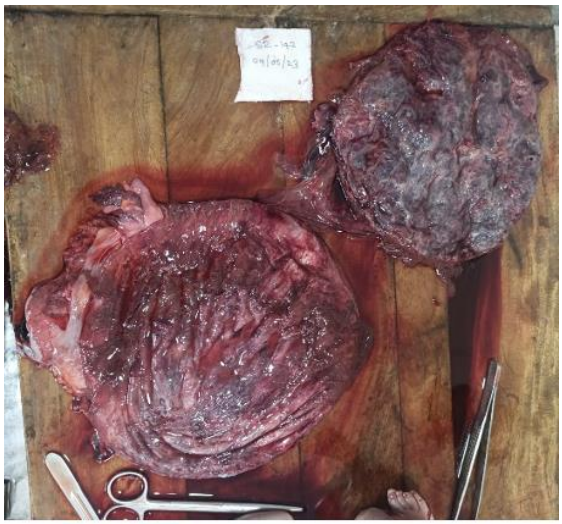

Figure 2. Uterus and the Placenta

Multiple histopathological samples were taken from the lungs while fixating the lungs. The histopathology revealed numerous semilunar enucleated fetal epithelial squamous cells in maternal pulmonary microvasculature (Fig 3 and 4).

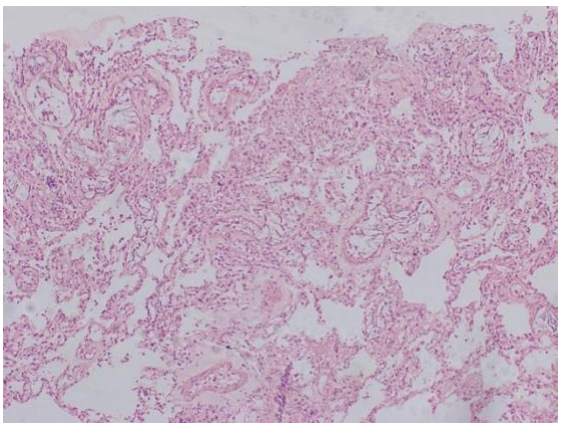

Figure 3.

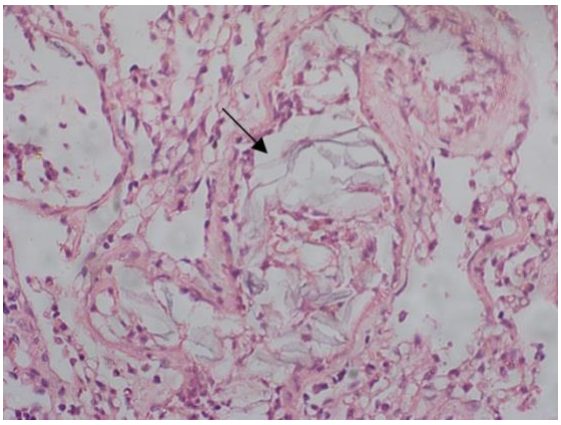

Figure 4.

Figures 3 and 4. Photomicrographs (H and E x04 and x40) revealed multiple foetal squamous (arrow) in the maternal pulmonary microvasculature

Considering the history, circumstances and investigations, the cause of death was concluded as amniotic fluid embolism.

Discussion

The case highlighted the need for high index suspicion in the background of her clinical scenario and negative autopsy findings despite focal fatty changes (Fig. 1).

The histopathology revealed numerous semilunar enucleated fetal epithelial squamous cells in maternal pulmonary microvasculature (Fig 3 and 4). However, wavy mucin streaks, lanugo hair, and meconium of amniotic fluid were not evident.[1]

Amniotic fluid embolism (AFE) is initiated by the entry of amniotic fluid into the bloodstream of the mother, which leads to a serious reaction causing cardiopulmonary arrest and massive coagulopathy.[2,3]

AFE is a rare complication of pregnancy, associated with significant morbidity and mortality, occurring in 2-8 per 100 000 pregnancies.[4] They usually present with sudden and unexplained

cardiorespiratory collapse and disseminated intravascular coagulopathy.[5] However, the platelet aggregations of DIC were not found. AFE is one of the causes of sudden death in obstetrics with a high mortality rate ranging from 20-60%.[2] Early recognition and prompt resuscitation are the key components for the management of AFE. It is characterized by sudden cardiovascular collapse, dyspnea, or respiratory collapse, and disseminated intravascular coagulopathy.[6] The causes of maternal collapse could be due to hemorrhagic shock, pulmonary embolism, anaphylaxis, septic shock, and aortic dissection.[7]

The associated risk factors for AFE include; age more than 35 years, multiparty, cesarean section, instrumental delivery, antepartum hemorrhage, eclampsia, labor induction, fetal distress, fetal death, and male baby.[8,9,10] Here the mother was a 35 years old multiparous woman in her early labour and having a male child.

There are three hypotheses for the development of AFE. One is occlusion of pulmonary microvasculature by fetal squamous cells leading to acute pulmonary hypertension which leads to acute heart failure, hypotension, dyspnea, and hypoxia leading to mortality and morbidity.[11] In this kind of case, the right heart might be distended. The other method is a hypersensitivity reaction to amniotic fluid leading to an anaphylactoid/anaphylactic-like reaction leading to death.[11] Sometimes first and only symptom is a life-threatening hemorrhage due to DIC.[12]

Clinical diagnosis of AFE is based on exclusion. The most significant diagnosis of AFE is made by findings at autopsy, which are limited to the lungs and clinical diagnostic criteria, and assisted by serum markers.[13] Serum markers such as C3, C4, and C1 esterase inhibitors are reduced.

In this case, Mother collapsed soon after the dizziness, faintishness, nausea, and vomiting suggested the anaphylactoid/ anaphylactic type of death. Further, the diagnosis was based on a basic histopathological stain (H and E) and found multiple semilunar fetal squamous cells. Finally, the cause of death was concluded as Amniotic fluid embolism.

Conclusions

This is a rare but fatal condition. The autopsy was negative and it was diagnosed as amniotic fluid embolism (AFE) by clinical features and histopathology. The above case highlights the importance of basic H and E stains in the diagnosis of AFE. Special stains and immunohistochemistry will help to diagnose the cases when basic H and E are failed. However, how many of us raise concerns about the underdiagnosis of AFE cases in developing and underdeveloped countries?

Disclosure statement

Conflicts of interest: The author declares that she has no conflicts of interest.

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