G6 Fatal Pulmonary Fat Emboli Following First Trimester Elective Abortion: Is This Amniotic Fluid Embolism

Kenneth D. Hutchins, MD, Miami-Dade County, Medical Examiner Department, #1 on Bob Hope Road, Miami, FL 33136; Erin A. Barnhart, MD, Mississippi State Medical Examiner, 1700 East Woodrow Wilson Avenue, Jackson, MS 39216; and Briza V. Walter, MD, Morristown Medical Center-Atlantic Health System, Department of Obstetrics and Gynecology, 100 Morris Avenue, Morristown, NJ 07962*

After attending this presentation, attendees will understand the clinical presentation, pathophysiology, differential diagnosis, and histological diagnosis of fat and amniotic fluid embolism.

This presentation will impact the forensic science community by reminding attendees of the different approaches to post-abortion deaths and the steps needed to accurately determine the cause of death.

A healthy 28-year-old G5P1041 Haitian woman underwent an elective first trimester abortion at a licensed clinic. The procedure lasted four minutes and there were no complications. During the procedure, she was administered diazepam, meperidine, and propofol. In the recovery room, vital signs taken at five minute intervals were normal. At five minutes after the last vital sign check, 20 minutes into recovery, she was found in asystole. Cardiopulmonary resuscitation lasted 82 minutes with the patient in asystole throughout. At autopsy, the patient was not obese and there were no significant external findings. The right and left lungs were 590 and 530 grams respectively. No thromboemboli were seen grossly. The uterus was 190 grams and approximately 5 milliliters of blood and blood clot, were in the uterine cavity. There was no uterine perforation. A small laceration was on the ectocervix. Accompanying the decedent were two surgical specimens consisting fragmented placental and membranous tissue. The fetus was reported approximately eight weeks gestation. Osmium tetroxide staining of lung tissue revealed obstruction of pulmonary capillaries by fat globules. Mucin stains were negative and no intravascular squamous cells, trophoblasts, or bone marrow elements were identified. There was no polarizable material. The surgical specimens consisted of chorionic villi, gestational endometrium, and membranous tissue. Testing for drugs of abuse was negative, though diazepam, temazepam, and meperidine were detected. Postmortem hemoglobin electrophoresis revealed the decedent to have sickle cell trait. The cause of death in this case was non-traumatic pulmonary fat embolism associated with therapeutic abortion procedure and the manner of death is natural.

Fat embolism syndrome and amniotic fluid embolism syndrome (AFE) have similar clinical presentations though their causes are distinctly different. Fat embolism is usually associated with skeletal trauma but has been described in acute pancreatitis, extensive burns, liposuction, decompression sickness, orthopedic procedures, parenteral infusion of lipids, and sickle cell disease. AFE usually occurs in term childbirths or in the early postpartum period. Risk factors include cesarean section, vacuum and forceps delivery, increased maternal age, diabetes, fetal macrosomia, placenta previa or abruption, and cervical laceration or uterine rupture. Deaths from AFE have been reported following abortion in the first or second trimester of pregnancy but none have been reported in therapeutic abortions performed at as little as eight weeks gestation. In fact, advanced gestational age at the time of abortion is a powerful risk factor for AFE and no deaths have been reported to have occurred at or prior to 12 weeks gestation. Postmortem diagnosis of AFE is made microscopically. One can see amniotic debri in the pulmonary microvasculature including lanugo hair, epithelial squamous cells, granules of bile pigment, meconium, as well as abundant fatty globules. Special stains for mucin and cytokeratin may be of use. In this case abundant fat is seen in the pulmonary microcirculation in a patient who died after a therapeutic abortion at eight weeks gestation. The patient was found to carry sickle cell trait after postmortem hemoglobin-electrophoresis. Rarely have complications during pregnancy been described in patients with sickle cell trait. Case reports have described pulmonary thrombo-embolism following delivery and probable peripartum cardiomyopathy aggravated by intravascular sickling. Sickle cell trait has also been reported to possibly be associated with acute chest syndrome which may be due to fat embolism while sickle cell anemia is definitely associated with fat embolism syndrome caused by bone marrow necrosis and infarction. This patient had diffuse multifocal fat in the pulmonary microcirculation without evidence of other amniotic fluid constituents and at present it is unknown whether the fat emboli are due to amniotic fluid or associated with her sickle cell hemoglobinopathy.

Amniotic Fluid Embolism, Fat Embolism, First Trimester Abortion

 ** Presenting Author*