



### **H135 A Case of Maternal and Fetal Death by Spontaneous Rupture of Splenic Artery Aneurysm (SAA) in a Nulliparous Pregnancy at the Third Trimester**

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The goal of this presentation is to examine the clinical and histopathological aspects of a case of SAA in a nulliparous pregnant woman at the third trimester.

This presentation will impact the forensic science community by illustrating the necessity of considering the occurrence of atypical and unrelated symptoms in pregnant women, especially in the third trimester, that could require prompt attention in diagnosing SAA rupture before a catastrophic evolution in hemorrhagic shock, characterized by an increased risk of maternal and fetal death.

SAA is the third most common intra-abdominal aneurysm (after aortic and iliac artery aneurysms), and the most common splanchnic artery aneurysm (60% of all visceral aneurysms). Its incidence is between 0.02% and 10.4% in the general population, with a prominent occurrence in women (4:1 female-to-male ratio), commonly multiparous pregnant women. More than two-thirds of aneurysms of the splenic artery are true aneurysms; infrequently they are pseudoaneurysms. They are usually saccular and occur at a bifurcation in the splenic hilum. The true cause of SAA formation is unclear; however, an increase in splenic blood flow may play a role in the development of SAA in patients with portal hypertension. The increased prevalence in multiparous women may be related to increased splenic blood flow and the effects of estrogen on the elastic tissue of the tunica media. Approximately 80% to 95% of SAAs are asymptomatic until rupture and are incidentally found during evaluation of unrelated symptoms, such as left upper quadrant pain, nausea, and vomiting. The most ominous presentation is hypovolemic shock secondary to aneurysmal rupture; however, the overall risk for rupture is low, about 5%, and it is associated with aneurysm size of at least 2cm, commonly during the last trimester in multiparity pregnancy. Rupture of the SAA is associated with a disproportionately high maternal and fetal mortality rate, 64%-75% and 72.5%-95%, respectively. Fortunately, it is observed to be a rare event. The major contributing factors to mortality are the minimal prodromal symptoms and the misdiagnosis with other common obstetric emergencies, like placental abruption, uterine rupture, or amniotic fluid embolism, as well as pulmonary thromboembolism, cholecystitis, appendicitis, or perforated peptic ulcer disease. In the non-pregnant population, mortality has been reported to be approximately 10%-25%. Fortunately, SAA is more frequently diagnosed today than in the past decades with the advancement and liberal use of imaging modalities.

A 28-year-old nulliparous, 39-week pregnant woman was taken to the emergency room showing 90/60mmHg blood pressure, 58b/min pulse rate, 90% SpO<sub>2</sub>, and 15 score Glasgow Coma Scale (GCS). Her past medical history was unremarkable. After 25 minutes, the patient suddenly developed a shock status. She was immediately intubated and, despite the resuscitation efforts and epinephrine, a cardiac arrest occurred and the woman died. The gynecologist decided to deliver the fetus by cesarean section and before incision he described the wall of the uterus as pale but intact. A live fetus was delivered, with zero Apgar Score at birth, and three Apgar Score at five minutes. The exploration of the peritoneal cavity revealed a massive hemoperitoneum and 3,000cc of blood were removed. The prosecutor's officer requested an autopsy to verify if a rescue delay occurred.

The autopsy showed a transverse laparotomy with Pfannenstiel incision. The lesser sac was found to be filled with 30cc of blood and 60 grams of clots; a careful examination showed a 2cm splenic artery saccular aneurysm arising from the distal third of the artery's length, 2cm near the splenic hilum, in which was found a 5mm in length rupture.

The uterus presented a sharp lower uterine segment incision due to transverse cesarean delivery.

A complete histological examination was also performed using Hematoxylin-Eosin (H&E) staining, confirming the typical aspect of a hypovolemic shock, lack of blood in all organs with hypoxic-ischemic changes in particular of cerebellum and heart. The study of placenta after formalin fixation was unremarkable.

In conclusion, the cause of death was attributed to a hypovolemic shock due to the rupture of a splenic artery saccular aneurysm in a 3<sup>rd</sup> trimester pregnant woman and any responsibility of the rescue team was excluded. The infant died after four months due to hypoxic-ischemic brain injury.

#### **Splenic Artery Aneurysm, Pregnancy, Fetal Hypoxic-Ischemic Injury**