



G87 Intra-Abdominal Hemorrhage Associated to an Intrapartum Rupture of the Umbilical Cord: A Case Report

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The goal of this presentation is to describe and discuss a case of an intrapartum rupture of the umbilical cord leading to an intra-abdominal hemorrhage and newborn death.

This presentation will impact the forensic science community by demonstrating an uncommon case of intra-abdominal hemorrhage and death of the newborn as a complication of the rupture of the umbilical cord in a precipitous delivery.

Intra-abdominal hemorrhage in the newborn is uncommon. Bleeding from umbilical vessels in the cord can occur in the perinatal period, the predisposing factors being a short cord, varices, velamentous insertion of the cord, or true knot of the cord. Even more uncommon is bleeding secondary to rupture of the umbilical cord.

A 25-year-old gravida 6, para 4, came in active labor at 36 6/7 weeks of gestation. The mother had a late prenatal care and vaginal infection. The case was complicated at delivery due to violent expulsion of the baby girl who was caught by the physician attending the delivery. The umbilical cord ruptured causing hemorrhage to the baby and the mother. Apgar scores were 1, 4, and 6 at 1, 5, and 10 minutes, respectively. The baby was in respiratory distress, pale with poor response to bag-mask ventilation. Neonatologist intubated the baby in delivery room and she was transferred to Neonatal Intensive Care Unit (NICU). Initial work up showed blood gases results as follows: PH 7.35, pCO₂ 32 mmHg, and pO₂ 54 mmHg. Hemoglobin was 15.7 and

Hematocrit 44.1%. Skeletal survey was negative and Head Ultrasound showed mild left ventricle dilation and no evidence of intraventricular hemorrhage. The next day the baby continued with respiratory distress with significant anemia, Hb was 10.9 and Hct 30.4%. Despite blood transfusions and other therapeutic measures the baby remained critically ill with marked hypoxia and poor perfusion. On the 3rd and 4th days at NICU, a tense abdomen was noted with paleness below the level of the diaphragm and plethoric upward, suggestive of compartment syndrome secondary to aortic compression due to hemoperitoneum. A Penrose drain was placed for abdominal decompression but patient did not improve and died.

At autopsy the body corresponded to a female preterm baby. She was 18.7 inches tall and weighed 6.2 pounds. External examination did not show signs of trauma. Among the medical intervention there was an umbilical arterial catheter in place without disruption of the artery. After entering the peritoneal cavity, 30 ml of liquid blood was noted and some blood clots in the right subdiaphragmatic area. As the peritoneal cavity was entered, it was noted that the umbilical vein and falciform ligament were disrupted. A hematoma was noted at the site of disruption adjacent to the peritoneal surface. The liver had a non-ruptured subcapsular hematoma at the anterior and superior surfaces of the left lobe without lacerations of the parenchyma. The rest of the thoracic and abdominal organs had no signs of trauma. The brain had no hemorrhages or lesions. The placenta weighed 509 grams with a centrally inserted umbilical tri-vascular cord that measured 11 x 1.3 cm. On microscopic examination revealed acute chorioamnionitis. Toxicological evaluation was negative for alcohol, cocaine, heroin and cannabinoids.

The normal umbilical cord resists trauma, the forces of normal delivery, and does not bleed. However, in dysmature infants the cord is thin and weak and liable to rupture. In precipitous delivery, a rapid increase in cord tension can rupture the fetal aspect of the cord. Short or entangled cords may rupture, as may abnormal cords, such as those with velamentous insertion on the placenta. Although birth trauma involving intra-abdominal organs is also uncommon, it must be suspected in the newborn with pallor, abdominal distension, anemia, and shock without evidence of external blood loss, intracranial hemorrhage, or gastrointestinal bleeding. The size of the infant and the presentation at delivery are important risk factors for abdominal trauma. The liver is the abdominal organ most commonly injured in the birth process. Subcapsular hematomas rather than hepatic lacerations are more apt to occur.

In this case, several recognizable factors increased the risk of umbilical cord rupture, such as prematurity of the infant combined with a precipitous delivery. Disruption of the umbilical vein represented the source of intra-abdominal bleeding. The subcapsular hematoma could be attributed to the abdominal birth trauma or be part of the tensional injury secondary to the rupture of the umbilical cord.

Umbilical Cord Rupture, Intra-Abdominal Hemorrhage, Subcapsular Hematoma