

# A Neonatal Death Due To Rupture Of The Normal Spleen

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## Abstract

Splenic rupture is a rare cause of hemoperitoneum in the neonate. Severe or fatal intra-abdominal injury may be present without a mark on the skin. Severe trauma to the left upper quadrant of the abdomen can produce lacerations or bursting ruptures of the spleen. Even a nontraumatic delivery may cause blunt abdominal trauma and splenic rupture. In this study a case of a neonatal death due to rupture of the normal spleen is presented and in the light of this case birth injuries are discussed.

## INTRODUCTION

Birth is a traumatic process to both the mother and the child. Depending upon the ease of delivery, the severity of trauma that the child may incur can vary from minor to fatal (1). Birth injuries are those sustained during the birth process, which include labor and delivery. They may be avoidable or unavoidable and occur despite skilled and competent obstetric care, as in an especially hard or prolonged labor or with an abnormal presentation. Fetal injuries related to amniocentesis and intrauterine transpositions and neonatal injuries following resuscitation procedures are not considered birth injuries. However, injuries related to the use of intrapartum monitoring of fetal heart rate and collection of fetal scalp blood for acid-base assessment are included. Factors predisposing the infant to birth injury include macrosomia, prematurity, cephalopelvic disproportion, distocia, prolonged labor, and abnormal presentation (2). A small amount of haemorrhage into the scalp is normal. It is not rare for children to present with caput succedaneum, a haemorrhagic edema of the scalp and superficial fascia, due to the traumatic delivery. Subperiosteal and epidural haemorrhage are rare (1). The liver, intestine, spleen and mesentery are most vulnerable due to blunt injury to the abdomen (3). The spleen lies in left upper quadrant of the abdomen, extending to the epigastric region, lying between the fundus of the stomach and the diaphragm. Splenic rupture is a rare cause of hemoperitoneum in the neonate and it's not as frequently injured as the liver because of its well-protected position in the left upper quadrant of the abdomen (1, 4, 5). Whatever the mechanism of infliction, the following features may be present: bruising of the abdominal wall, both of the skin and the underlying muscles, is usually seen

in the abdominal trauma. Severe or fatal intra-abdominal injury may be present, however, without a mark on the skin. This can occur if clothing protects or if a blunt impact is applied over a relatively large surface (3). Severe trauma to the left upper quadrant of the abdomen can produce lacerations or bursting ruptures of the spleen. Rupture of the spleen may occur alone or in association with rupture of the liver. The causes, complications, treatment and prevention are similar (6). The extent of injury is dependent upon the severity of the force and whether it is localised or generalised. Injuries may range from a small superficial capsular laceration up to virtual disintegration of the spleen. Rupture of the spleen is a common surgical emergency after trauma but may be first found at autopsy if undiagnosed, or if death occurs from lack of speedy surgical treatment, or if the other injuries made recovery impossible. An enlarged spleen is more vulnerable and more fragile than a normal organ. The most common fatal sequel to intra-abdominal trauma is haemorrhage from any of the contained organs. The spleen and mesentery tend to bleed most copiously and quickly, though even here there can be a delay of many hours before serious symptoms are obvious-and in the case of a subcapsular laceration of the spleen the time can be far longer (1, 3).

## CASE REPORT

A 20-year-old mother, gravida 2, partus 1 (she is alive, twelve months old) referred to social security hospital. There is no significance in the history. Her last menstrual period began 260 days before, she hasn't referred to any other health care center during all her present pregnancy. Her blood group type was O Rh (+). At her referral at 19.00

o'clock vital findings were as; blood pressure 130/80 mmHg, pulse rate 84/min, body temperature 37 C, dilatation 7 cm, effacement % 70-80 and amniotic membranes were intact. One hour after referral an alive male fetus with 2800 gm weight and 48 cm height was born with vaginal delivery, head presentation. Placenta and membranes were separated intactly. Apgar scores of the neonate at 1<sup>st</sup> and 5<sup>th</sup> minutes after birth were 8 and 10 respectively. After delivery the child has been examined in every three hours periodically like all the other healthy neonates. About seven hours after delivery the child was found as dead by nurse. It was accepted as a medico-legal case by physicians and was informed to the public prosecution office.

At the postmortem external examination about ten hours after the death: a male child with 2820 gm weight, 48 cm length. Head circumference was 31 cm. The sole was 7 cm in length, lanugo was over the shoulders, the testes were palpable in the scrotum, the ossification centre in the lower end of the femur was 5 mm diameter. Hypostasis was over the back of the body as routinely and violet, rigor mortis was present on a large scale, umbilical cord had been clamped. On external examination there was not any significant finding of trauma.

At autopsy: There was a large caput succedaneum. Meningeal membranes and intracranium were normal. The brain was 280 gm weight. There wasn't any traumatic signs under the neck and chest skin and deeper. Thoracic cavities, lungs, thymus, pericard and heart were normal, macroscopically. Left lung was 25 gm and the right one was 30 gm weight. Heart was 20 gm and thymus was 10 gm weight. There was 150 cc free uncoagulated blood in the abdominal cavity. The liver was 135 gr weight and its surfaces were intact. When the spleen was removed, it was seen that there were two ruptures of it that one of them was on the medial face just above the hilus, and the other was on the back edge near the bottom pole, they were 1.5 cm and 2 cm in length respectively. The spleen was 20 gm weight. Retroperitoneum, the kidneys, suprarenal glands and the vascularity of the abdomen were normal macroscopically. There was dark meconium in large intestine. The blood group type was determined as O Rh (+) and postmortem routine histopathological analysis showed no abnormality. The cause of death was accepted as bleeding due to traumatic splenic rupture and the manner of death was accepted as birth trauma.

## **DISCUSSION**

The significance of birth injuries is assessed most accurately by review of mortality data. In recent years these data have demonstrated a steady decline in birth injuries. In 1981 birth injuries ranked sixth among major causes of neonatal mortality resulting in 23.8 deaths per 100000 live births. In 1984 birth injuries caused 8.9 deaths per 100000 live births falling to eight among leading causes. As of 1988 birth injuries continued to rank eight but caused 4.6 deaths per 100000 live births, a reduction of approximately 50 % in 4 years. This ungoing improvement reflects refinements in obstetric techniques, increased use of cesarean section over difficult vaginal deliveries, and decreased use of vacuum extraction and version and extraction. Despite this decrease, birth injuries still represent an important source of neonatal morbidity. In fact Cyr and associates have demonstrated an increase in fractures and paralyses, which they attribute to more liberal use of midforceps to expedite deliveries in which the second stage is slowed (2). During a nontraumatic delivery, splenic rupture is very uncommon unless there is a condition that produces splenomegaly and an increased fragility of the parenchyma. The most common of such conditions are infectious mononucleosis, malaria and leukemia. In some cases maternal drug administration like anticonvulsant therapy may cause this predisposition (1, 7, 8). Diez Pardo and friends reported a case which has laceration of liver and spleen that the only possible etiologic factor was a oxtocin-induced rapid delivery (9). And it's reported that also erythroblastosis fetalis may cause splenic rupture during the delivery (5, 10). In our case none of the predisposing factors was present and there wasn't any findings of a traumatic delivery except caput succedaneum. We offer that it's possible to accept that splenomegaly or severe traumatic delivery is not a necessity for abdominal trauma and splenic rupture during the delivery (5, 11). Therefore the clinician should consider the broad spectrum of birth injuries in the differential diagnosis of neonatal clinical disorders. Roentgenogram may show free peritoneal fluid, abdominal ultrasonography is helpful in the detection of intraabdominal bleeding and paracentesis is the most effective diagnostic procedure for the confirmation of hemoperitoneum (2, 12, 13). The definitive evaluation of the child with abdominal trauma is the contrast-enhanced abdominal computed tomography (CT) scan (14). Peritoneoscopy is an important diagnostic aid and facilitates the indication for conservative treatment (15).

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