

Abdominal Trauma during Pregnancy with Splenic Rupture and Fetal Death in Utero at Bogodogo University Hospital: A Case Report

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Abstract

Splenic injury caused by abdominal trauma during pregnancy is rare. Splenic injury associated with fetal death in utero following a fall from a tree top is even rarer. The authors report a case of splenic trauma associated with fetal death in utero following a fall from the top of a tree in a 19-year-old pregnant woman at 30 weeks amenorrhoea. She was referred from a 1st level health facility for trauma that had occurred the day before admission. She was in poor general condition (WHO performance status IV) and had a cardiovascular collapse. Ultrasound was used to diagnose haemoperitoneum and fetal death in utero. A CT scan was used to diagnose splenic lesions. Treatment consisted of splenectomy and caesarean section after resuscitation.

Keywords

Trauma, Pregnancy, Splenic Rupture, Stillborn

1. Introduction

Traumatic splenic rupture in pregnancy or postpartum is a rare and frequently misdiagnosed event [1] [2]. It may be a result of trauma or from preexisting pathology of the spleen [2]. The incidence of trauma during pregnancy varies widely between authors [3]. Connolly *et al.* found a prevalence of 60 to 70 per 1000 pregnancies in Nantes. In Burkina Faso, Somé *et al.* found 3.6 per 1000 pregnancies at Bobo Dioulasso [4]. Trauma is mostly secondary to road traffic accidents, with abdominal trauma being the most common. Spleen rupture associated with in

utero fetal death following a fall from a tree top is even rarer. We report a case of splenic trauma associated with in utero fetal death following a fall from a tree top in a 19-year-old pregnant woman at 30 weeks' amenorrhoea.

The aim of this case report is to describe the clinical features of splenic in. jury during pregnancy and to outline the main lines of management.

2. Observation

Mrs O.S., aged 19, a housewife living in a village 60 km from the capital, was referred to us by a first level health facility for trauma resulting from a fall from a tree the day before her admission.

The patient had no known past medical history. She was primigravida and had no significant obstetric history. The date of the last menstrual period was unknown and the patient had not undergone an ultrasound scan to date the pregnancy. However, fetal biometry performed on admission estimated a gestational age of 30 weeks' amenorrhoea. She complained of widespread pain throughout her abdomen.

His general condition was compromised, with cardiovascular collapse and a blood pressure of 80/56 mmHg on admission. Resuscitation was successfully initiated and haemodynamic stability was achieved. On physical examination the abdomen was enlarged, painful to palpation and contractured. Palpation revealed a cry from the navel. Fetal heart tones were absent. Speculum examination revealed a healthy cervix and vaginal walls with no visible bleeding. Vaginal touch revealed a posterior cervix which was long, soft and closed.

The biological work-up revealed a rhesus positive blood group B, a haemoglobin level of 7.2 g/dl and platelets of 83,000/mm³. The blood count showed a prothrombin level of 73%, an activated partial thromboplastin time of 30.8 seconds and a fibrinogenemia of 3.10 ng/dl. Obstetric ultrasound showed no evidence of uterine rupture or placental abruption. There was no fetal cardiac activity and there was a large hyperechoic intra-abdominal effusion which raised the suspicion of haemoperitoneum. Fetal biometry revealed a gestational age of 30 weeks' amenorrhoea.

A bodyscan was suggested to assess the injury. Due to the patient's inability to pay, only an abdominal CT scan was performed, which revealed multiple splenic contusions with fracture of at least three parts of the spleen the deepest of which measured 58 mm. There were also haematomas in the centre of the spleen, the largest of which measured 45×37 mm (**Figure 1** shows splenic lesions). The overall splenic injury was classified as AAST stage IV. There was also a large haemoperitoneum.

There were no traumatic lesions of the liver, pancreas, kidneys or bladder. The abdomino-pelvic bone framework was unremarkable.

Despite resuscitation, in particular the transfusion of 784 ml packed red blood cells, the general condition did not improve.

There were no traumatic lesions of the liver, pancreas, kidneys or bladder. No bone lesions were found.



Figure 1. Contusion and heterogeneous enhancement of splenic parenchyma.

The patient's general condition continued to deteriorate despite a transfusion of 784 ml of packed red blood cells.

Given the haemodynamic instability associated with the large haemoperitoneum, clinical monitoring was inappropriate. A laparotomy was indicated and performed. After celiotomy, we found a large haemoperitoneum of approximately 2 litres, which we aspirated. Exploration revealed multiple sites of splenic contusion with haemorrhagic capsular rupture involving the hilar vessels. The splenic lesions seen when exploring the abdominal cavity are shown in **Figure 2**. Given the complexity of the lesions, conservative management was not possible. In addition, fetal death in utero carries the risk of secondary development of blood clotting disorders. The decision was made to perform a haemostasis splenectomy combined with a caesarean section. A total splenectomy was performed after



Figures 2. Intraoperative diagnosis of splenic rupture.

clamping and dividing the splenic pedicle. A transverse segmental hysterotomy was then performed, allowing the delivery of a stillborn male weighing 1600 grams. **Figure 3** below shows the appearance of the fetus after extraction. Exploration of the other intra-abdominal organs was unremarkable.



Figure 3. Total splenectomy specimen and stillbirth.

The patient was monitored post-operatively for seven days before being discharged.

3. Discussion

The incidence of trauma during pregnancy varies greatly between authors [3]. Connolly et al. found a prevalence of 60 to 70 per 1000 pregnancies in Nantes. Somé in Burkina Faso found an incidence of 3.6 per 1000 pregnancies [3] [4]. Trauma is mostly secondary to road traffic accidents, with abdominal trauma being the most common [4]-[6].

According to Somé *et al.*, falls from the top of a tree accounted for 19% of victims, most of whom were from rural areas. This is the case of this patient, who comes from a village and fell from the top of a tree. Several organs can be affected by abdominal trauma, including the spleen, which was affected in this patient.

In the case of abdominal contusions during pregnancy, the anatomical and physiological changes associated with pregnancy must be taken into account when analysing the clinical presentation, which is often atypical, and in therapeutic management [1]. From the second trimester, the pregnant uterus is particularly vulnerable to trauma, which can lead to obstetric complications such as preterm delivery, placenta abruption, fetal death or even uterine rupture and death [1] [4] [7].

Therefore, the involvement of the gravid uterus with another intra-abdominal organ is possible. This was the case in our patient, in whom, in addition to intra-

uterine fetal death, splenic contusion was diagnosed.

Damage to the pregnant uterus in association with another intra-abdominal organ is therefore possible. This was the case of this patient, in whom a splenic lesion was diagnosed in addition to fetal death in utero. Correct preoperative diagnosis of splenic injury during pregnancy is rarely made, this condition usually being confused with other pathologies [3] [4] [8]. In fact, traumatic uterine injury may be associated with haemoperitoneum, simulating splenic rupture [1]. Abdominopelvic ultrasound is the first-line investigation in cases of abdominal contusion [7]. Combined with obstetric ultrasound in pregnant women, it can detect haemoperitoneum, damage to intra- and retroperitoneal organs, and damage to the uterus and its contents. In severe injuries, the rate of fetal death may approach 60% whereas maternal deaths may occur in about 10% of cases [8].

If the fetus is alive and viable, recording the fetal heart rate is essential to assess fetal well-being. Coupled with obstetrical ultrasound in pregnant women, it can reveal hemoperitoneum, damage to intra- and retroperitoneal organs, and damage to the uterus and its contents. When the fetus is alive and viable, fetal heart rate recording is essential for assessing fetal well-being.

Abdomino-pelvic CT provides a more complete assessment of the lesion, but may have consequences for the pregnant woman in terms of fetal irradiation. In our patient, this risk was no longer considered, given the absence of fetal vitality.

The management of splenic trauma depends on the extent of the injury. Until the 1970s, splenic trauma formally required splenectomy. Today, the benefits of splenic preservation are well recognised: on the one hand, the long-term risk of developing Overwhelming Post-Splenectomy Infection (OPSI) after splenectomy and, on the other hand, the avoidance of unnecessary laparotomy [9]-[13]. Spleenpreserving surgical techniques (mesh, partial splenectomy, haemostatic agents) have been used to preserve the spleen for the last 2 decades [14]. Spleen preservation is more delicate than splenectomy and can be difficult to perform in emergency situations where there is significant bleeding. Non-operative management of closed splenic trauma is common. Some authors have reported that up to 65% of closed splenic injuries can be managed non-operatively, with a success rate of up to 98% [15] [16]. The success of conservative management depends on a number of clinical and radiological factors. Clearly, haemodynamic stability and associated life-threatening lesions are important criteria in the decision to proceed with immediate surgery. In the case of abdominal contusion in pregnant women, persistent signs of hypovolaemia despite cardiovascular resuscitation require emergency laparotomy [17].

According to Velmahos *et al.*, the decision not to operate is initially based on haemodynamic stability and the absence of any other intra-abdominal lesion, but also on an evolutionary criterion [18]. For this patient, the decision to proceed with laparotomy was based on haemodynamic instability with a large haemoperitoneum and fetal death in utero, which may lead to secondary coagulopathy.

Non-conservative surgery is often motivated by the potential haemostasis

difficulties associated with pregnancy and the fear of the secondary development of haemostasis disorders [19]. This potential haemostasis risk was even greater in this patient who had a fetal death in utero.

Obstetric management depends on the integrity of the uterus and its contents. If the fetus is alive, management depends on its viability. The gestational age of fetal viability varies from country to country, depending on the technical facilities available. Before the period of fetal viability, surgical abstinence is the rule; only maternal lesions should be treated. Once the fetus is viable, caesarean section is performed in the event of placental abruption or acute fetal distress. In this case, the fetus had died, and the risk of developing coagulopathy as a result of in utero fetal death was an important argument for a caesarean section.

4. Conclusion

Abdominal trauma during pregnancy is uncommon. A comprehensive clinical examination, including an obstetrical examination, is essential. Splenic involvement is rare and challenging to diagnose in pregnant women with trauma. Abdominopelvic ultrasound is the primary examination, but a CT scan provides a superior assessment of the lesions. Management is contingent upon the associated lesions, particularly the potential impact on the uterus and the product of conception.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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