

# Traumatic splenic rupture in pregnancy with favourable pregnancy outcome: Case report

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## ABSTRACT

Trauma complicating pregnancy is one of the causes of deaths that are not captured in the maternal mortality ratio, yet it occurs in about 1 in 15 pregnancies. This is a report of a case of splenic rupture occurring after a vehicle hit a pregnant woman who was a pedestrian. Splenectomy was done and, in spite of having a hemoperitoneum of about 2 litres, she recovered without further complication and was able to sustain the pregnancy to term, with the delivery of a healthy female infant. Clinicians should seek to exclude splenic rupture in cases of blunt trauma to the abdomen during pregnancy because of the risk of severe haemorrhage, shock, and possibility of pregnancy loss.

**Key words:** Haemoperitoneum; Pregnancy; Splenectomy; Trauma.

## Introduction

Trauma complicates about 1 in 12 pregnancies in developed countries and is the leading non-obstetric cause of death among pregnant women.<sup>[1,2]</sup> Traumatic injuries in pregnant women may be unintentional or intentional, and can be classified as minor or major,<sup>[3]</sup> although there are a number of injury severity scoring systems available.<sup>[4]</sup> In severe injuries, the rate of fetal death may approach 60% whereas maternal deaths may occur in about 10% of cases.<sup>[1]</sup> Although about 90% of all trauma in pregnancy is minor and the rate of adverse pregnancy outcomes in minor trauma is ~ 4%, more fetus die as a result of lesser injuries than as a result of catastrophic trauma.<sup>[5,6]</sup>

Traumatic splenic rupture in pregnancy or postpartum is a rare and frequently misdiagnosed event. It may be as a result of trauma or from preexisting pathology of the spleen. The first description of splenic rupture was presented by Saxtorph in 1803, with subsequent case reports few and far between.<sup>[7-9]</sup>

We report a case of a pregnant woman who had splenic rupture following a road traffic crash; she was a pedestrian hit by a motor vehicle. The maternal and foetal outcomes were favourable and she had a spontaneous, uneventful vaginal delivery.

## Case Report

A 17 year old primigravida, whose last normal menstrual period was 14<sup>th</sup> of September 2018, was a pedestrian hit from behind by a motor vehicle in Ibadan (a city in Southwestern Nigeria) at about 14:00 p.m. on 20<sup>th</sup> February 2019, at a gestational age of 22 weeks and 4 days. Upon impact, she fell on her abdomen. It was a relatively low-velocity impact and she was propelled a few metres from the point of impact.

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She sustained friction burns on her face and legs. There was no loss of consciousness, but she complained of dizziness and there was an episode of a fainting spell. She developed abdominal pain, which was generalized and characterized as dull, with progressive abdominal distension. On account of the complaints, she was taken to a private hospital for first aid and subsequently referred to the University College Hospital (UCH), Ibadan for further evaluation on account of the persisting abdominal symptoms. The patient arrived from the source of referral about 8 h after the episode of trauma.

She was admitted into the emergency department of UCH and resuscitative measures were instituted. Examination on admission revealed a young woman who was not clinically pale and had a Glasgow Coma Scale score of 15. There were multiple bruises on her face and she looked confused, but there was no other neurological deficit. Her pulse rate was 104 beats per minute, blood pressure was 80/40mmHg and the respiratory rate was 22 cycles/min. There was a uniformly enlarged abdomen which was tense, with generalized tenderness and guarding which limited further examination. On pelvic examination, the cervix was 4 cm long and firm, and the cervical os was closed. There was no vaginal bleeding.

Her hematocrit was 29%, blood group was O Rhesus positive and urinalysis was normal. An abdomino-pelvic ultrasound scan revealed what appeared to be gross hemoperitoneum, splenomegaly with contusion and a live second trimester fetus. The initial clinical diagnosis was an acute abdomen, possibly due to a ruptured intra-abdominal viscus. She was scheduled for an emergency laparotomy which was done under general anaesthesia shortly afterwards. Findings included 2 litres of hemoperitoneum, a 22-week size gravid uterus and a shattered spleen. The liver appeared grossly normal and other intra-abdominal viscera did not appear to have been injured. A splenectomy was done.

She had 2 units of blood transfused intra-operatively. Her postoperative course was uneventful and she was discharged from hospital after 7 days postsurgery. The patient had limited social support and lived far away from the hospital. The subsequent antenatal follow-up was done in a primary healthcare centre in her local community. She had spontaneous onset of labor at 38 weeks and she delivered a live female infant weighing 2.7 kg. The mother and baby were healthy.

## Discussion

Trauma in pregnancy is a public health concern. It complicates 6–7% of pregnancies in developed countries.<sup>[10]</sup> Splenic rupture in pregnancy is a more infrequent entity. It can be as a result

of trauma or it could be spontaneous, with the description of spontaneous rupture of the spleen having strict criteria.<sup>[11]</sup> In view of its rarity, it may often be misdiagnosed and there needs to be a high index of suspicion, as the presence of a pregnant uterus may lead the obstetrician to focus more on the possibility of injuries to the uterus or adnexae and thereby miss a cause of potentially severe morbidity. In this case, as with many others, the characteristics of the abdominal pain may be poorly defined. The presence of hemoperitoneum with peritonism may make abdominal examination difficult. Clinical examination usually leads to a myriad of differentials diagnoses.

A pregnant patient with a blunt abdominal injury should be evaluated holistically in the emergency room. The goal is to stabilize the hemodynamic status of the mother to maintain the oxygen carrying capacity of blood going to the fetus via the placenta. The airway should be patent, breathing effective, with oxygen delivery maintained and circulation sustained.<sup>[12]</sup> In this case, resuscitative measures were deployed at presentation in the hospital, albeit several hours after the incident. Although she was having early signs of cardiovascular de-compensation, she was still relatively stable when she was taken in for surgery.

The spleen is vulnerable to rupture in pregnancy due to a relative hypervolaemic state, with moderate splenic enlargement and a reduced peritoneal volume due to the gravid uterus. Imaging modalities like the focused assessment with sonography (FAST) and computerized tomography scan have proved to be invaluable. In some cases, a diagnostic peritoneal lavage may be of assistance, although this is an invasive method.<sup>[13]</sup> Imaging should also consider the presence of the foetus. Ultrasonography is rapid, less expensive and does not contain ionizing radiation while also providing a means of foetal assessment. Preoperative assessment should also include the complete blood count, coagulation profile, Rhesus blood group with Kleihauer–Betke test for Rhesus negative patients. This patient was Rhesus blood group positive.

The spleen in this patient was shattered and, according to the grading system developed by the American Association for the Surgery of Trauma, the injury was grade V.<sup>[14]</sup> This patient had a splenectomy, but there are reports of the benefit (s) of conserving the spleen at surgery because of the risk of repeated infections postsplenectomy.<sup>[15]</sup>

In a case series of spontaneous postpartum splenic rupture, emergency splenectomy resulted in a 95% survival rate compared to a 100% mortality in the few patients who did not undergo splenectomy, but this was mainly due to poor

patient selection.<sup>[16]</sup> In more recent studies, reported maternal mortality from splenic rupture can be as high as 45% with a 47–82% risk of fetal wastage.<sup>[17,18]</sup> Fortunately, both mother and baby survived the ordeal in this case.

## Conclusion

Although trauma in pregnancy is fairly rare, its contribution to mortality in pregnancy is of public health significance. Splenic trauma should be promptly identified and a multidisciplinary approach should be applied in the definitive management to avoid fatality. Fetal viability should be ascertained and the pregnancy should be closely followed-up till delivery.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

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