

## Ruptured subcapsular liver hematoma during pregnancy: a lifesaving multidisciplinary approach

### Rotura de hematoma subcapsular hepático durante a gravidez: uma abordagem multidisciplinar

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#### Abstract

We report a lifesaving multidisciplinary approach to a ruptured subcapsular liver hematoma during the third trimester of pregnancy associated to a HELLP (hemolysis, elevated liver enzymes and low platelets) syndrome. Surgical treatment was performed and both mother and newborn survived. High diagnostic suspicion was crucial to the emergent case management. These patients should be treated in a setting in which adequate supportive care and multidisciplinary teams are available.

**Keywords:** HELLP Syndrome; Liver; Spontaneous rupture; Hematoma.

#### INTRODUCTION

Spontaneous hepatic rupture is a rare and life-threatening event that occurs once in every 45 000 to 225 000 pregnancies<sup>1-3</sup>. It is frequently associated with severe preeclampsia and HELLP syndrome<sup>4,5</sup>. Diagnosis and treatment are often difficult and there is still no consensus on what is the best approach<sup>6</sup>. Maternal mortality rate varies from 18% to 86%<sup>1</sup>. Emergent management and a multidisciplinary team are essential for patient survival. This case report describes a lifesaving multidisciplinary approach to a ruptured subcapsular liver hematoma, where an emergent management saved both mother and newborn.

#### CASE REPORT

A 36-year-old caucasian primigravida at 34 weeks of gestation was admitted at our emergency department complaining of nausea, vomiting, malaise and epigastric, right upper quadrant and shoulder pain. The pa-

tient did not have a headache, visual impairment or lack of fetal activity. Her blood pressure was 155/94 mmHg and the fetal heart rate was normal. Her past medical history was unremarkable, the pregnancy was spontaneous and her antenatal history was uneventful, except for high uterine arteries resistance on the second trimester ultrasound scan.

While waiting for the blood test results, we decided to perform an emergent abdomen ultrasound that revealed a large subcapsular liver hematoma along the anterior segment of the right lobe (maximum thickness of 4 cm) and a small amount of free peri-hepatic fluid. Laboratory investigation revealed a hemoglobin of 12.6 g/dl, a hematocrit of 35.6%, a platelet count of  $106 \times 10^9/L$ , an INR of 0.86, an uric acid of 7.6 mg/dl, and elevated liver function tests with serum alanine aminotransferase of 332 U/L, serum aspartate aminotransferase of 274 U/L and serum lactate dehydrogenase of 600 U/L. Renal function tests were within the normal range, but urinalysis revealed proteinuria (500 mg/dL). She was admitted to the delivery room with the diagnosis of a hepatic subcapsular superimposed on a HELLP syndrome, and started intravenous magnesium sulfate under continuous fetal and maternal monitoring.

One hour and fifteen minutes after admission, the

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patient suddenly became hemodynamically unstable with marked hypotension. Fetal heart rate remained normal. At this moment, with high suspicion of liver rupture, we decided to perform an emergent cesarean through a Pfannenstiel incision. Despite being part of the institution's protocol, fetal lung maturation with corticosteroids was not even initiated. Based on the evidence of hemoperitoneum, we asked for the cooperation of general surgeons. The delivery occurred eighteen minutes after the decision of performing the cesarean section. The newborn weighed 1860g and had an Apgar Index of 9 at the 1<sup>st</sup> minute. Umbilical cord blood gas analysis showed an arterial pH of 7.147 with a base deficit of 5.8 mmol/L and a venous pH of 7.194 with a base deficit of 6.4 mmol/L. General surgeons performed a supraumbilical laparotomy, confirmed that the bleeding was due to rupture of subcapsular liver hematoma (Figure 1) and peri-hepatic packing (4 gauzes) was carried out, after covering it with a fibrin sealant patch. During surgery, support therapy with 2.5 L of crystalloids and transfusion of blood products (three units of fresh-frozen plasma, three units of packed red blood cells and one pool of platelets) were required to maintain hemodynamic stability. Intravenous tranexamic acid (1g) was also used. After surgery, the patient was transferred to an intensive care unit and remained sedated for seventy-two hours. Forty-eight hours later, the intra-abdominal packs were removed through laparotomy and the lesion was covered with an absorbable hemostat. Intravenous magnesium sulfate was stopped before surgery. Another unit of packed red blood cells was transfused, making a total of four units. Antihypertensive therapy



**FIGURE 1.** Subcapsular liver hematoma

with carvedilol (2.5 mg 12/12h) and nifedipine (30 mg 12/12h) was needed to control blood pressure. The patient made an uncomplicated recovery and was discharged from the hospital seven days later, with laboratory findings that showed a hemoglobin of 9.3 g/dl, a hematocrit of 28.2%, a platelet count of  $367 \times 10^9/L$ , an uric acid of 4.1 mg/dl, and elevated liver function tests with serum alanine aminotransferase of 42 U/L, serum aspartate aminotransferase of 133 U/L and serum lactate dehydrogenase of 529 U/L. Antihypertensive therapy was maintained after discharge and the subsequent month of puerperium was uneventful, with stabilization of hepatic function. Placental histological analysis did not reveal significant abnormalities and its weight was within the 25-50<sup>th</sup> percentil. The newborn was discharged twenty-one days after the cesarean section, without apparent severe sequelae.

## DISCUSSION

Spontaneous hepatic rupture is a rare and life-threatening condition associated to a high fetal and maternal mortality rate<sup>8</sup>. The underlying pathogenesis is not well-known, but during pregnancy it is often associated to severe preeclampsia and HELLP syndrome<sup>4,5</sup>. Subcapsular bleeding and hematoma usually precede hepatic rupture and its accurate diagnosis might be challenging. The most common clinical signs are nausea, vomiting, malaise, right upper quadrant or epigastric pain, and severe shoulder pain<sup>1</sup>. Other symptoms, such as hypertension, visual changes, edema and headaches, suggest a hypertensive disorder. The onset of hemodynamic instability and hypovolemic shock represent an emergency and usually result from hepatic bleeding. As our patient presented most of the classical symptoms previous described, differential diagnosis was easier.

According to Karateke *et al*, hemodynamically stable patients might be managed with conservative treatment (including intensive medical support and replacement of blood products), while unstable patients might require surgery<sup>3,6</sup>. Pregnancy termination is crucial for better outcomes. As our patient became suddenly unstable with marked hypotension, we decided to perform an emergent cesarean and immediately asked for general surgeons' cooperation. Although small for gestational age, the delivery of a preterm newborn without signs of hypoxia was due to the prompt suspicion and diagnose of a life-threatening condition.

Abnormal placentation is significantly associated with severe preeclampsia and it is expressed through abnormal placental vascular lesions<sup>7</sup>. However, placental histological analysis did not reveal significant abnormalities.

According to Sibai, operative management includes packing, drainage, hepatic artery ligation and/or hepatic resection of affected areas of the liver. Liver transplantation might be needed in the setting of hepatic failure<sup>9</sup>. As so, a team experienced in liver trauma surgery should be consulted. At our hospital, general surgeons are the ones that have more surgical experience in liver trauma surgery and, after confirming the diagnosis, they covered the lesion with a fibrin sealant patch and performed a peri-hepatic packing. Re-intervention, also made by general surgeons, was only needed to remove the intra-abdominal packs.

This case report illustrates that patients with hepatic rupture and HELLP syndrome should be treated in a setting in which adequate supportive care and multidisciplinary teams are available. Prognosis can be adversely affected by delayed or less than optimal diagnosis and treatment.

#### DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication. The patient authorized the submission and publication of this paper.

#### CONFLICTS OF INTEREST

The authors report no conflict of interest.

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