Spontaneous Liver Hematoma and a Hepatic Rupture in HELLP Syndrome: Report of Two Cases

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Abstract
Subcapsular liver hematomas and ruptures are unusual fatal complications of HELLP (hemolysis, elevated liver enzymes, and low platelets) syndrome (HS). We present two cases of a spontaneous rupture of subcapsular liver hematoma occurring in HS and review the literature on this subject. One case demonstrated a secondary rupture of a subcapsular liver hematoma due to HS in one patient and HS associated with preeclampsia in another. The defects were on the medial and lateral sectors of the left lobe in one patient and on the medial sector of the right lobe in the other patient. In case 1 deep mattress sutures and omentoplasty were performed, and in the other case a defective area was closed with an absorbable gelatin sponge with a hemostatic effect. In addition, the liver was compressed by abdominal towels. A high index of suspicion and immediate recognition are keys to proper diagnosis and management of affected patients. The multidisciplinary approach to the management of these patients led to a remarkable decrease in the mortality rates. Less aggressive treatment is preferable to aggressive intervention such as a hepatic resection in such patients with coagulopathy.

Key words HELLP syndrome · Subcapsular liver hematoma · Rupture · Pregnancy

Introduction
HELPP syndrome (hemolysis, elevated liver enzymes, low platelet count) was first referred to by Weinstein in 1982 as an extremely progressive form of gestosis.1 In addition to more common gestotic symptoms, such as edema, proteinuria, and hypertension, the clinical picture is characterized by microangiopathic hemolysis, thrombocytopenia and, especially, impaired hepatic function. Within this clinical picture severe complications can occur, such as eclamptic attacks, renal dysfunction, intracranial hemorrhage, intrahepatic hemorrhage, and coagulopathy. The HELLP syndrome (HS) may cause subcapsular liver hematomas. When a hepatic rupture occurs, the mortality of mother and unborn is high. A spontaneous rupture of a subcapsular liver hematoma in pregnancy is a rare and potentially life-threatening complication of preeclampsia. The incidence is approximately 1 in 45,000 live births. A liver hematoma is often not suspected until it ruptures.2-4 We present our experience with two cases of a spontaneous rupture of subcapsular liver hematoma occurring in association with the HS and review the literature on this subject.

Case Reports
Case 1
A 35-year-old multigravida was admitted in the 35th week of gestation because of HS. She complained of severe left upper quadrant and left shoulder pain with no previous trauma history. During the initial examination, the patient had hypertension (150/110 mmHg) and pleural effusion. Laboratory evaluations showed proteinuria (2+), hypalbuminemia, hematuria, anemia, and low platelet count (48,000/µl), high serum alanine aminotransferase (ALT = 486 IU/l), high aspartate aminotransferase (AST = 309 IU/l), high lactate dehydrogenase (LDH = 595 IU/l), and high unconjugated bilirubin. Ultrasonography showed a large liver with structural irregularities and free fluid in the abdominal cavity (Fig. 1). The abdomen was mildly tender without
rebound. On the fifth day of admission, tachycardia and hypotension appeared and the patient was immediately taken to the operating room. A Phannenstiel incision was performed for a cesarean section and a large amount of blood (about 750 cc) was noticed in the abdomen. The baby was successfully delivered and had no problems.

A midline laparatomy was immediately performed. On the diaphragmatic surface of the medial and lateral sector of the left lobe of the liver, a subcapsular hematoma (10 cm × 8 cm) combined with an 8-cm laceration was found. Hepatorrhaphy was done with deep mattress sutures and omentoplasty. Two suction drains were placed in the left subdiaphragmatic area and removed on the third postoperative day. One unit of fresh frozen plasma and 3 units of whole blood were transfused during operation. Postoperatively, the patient was administered parenteral and enteral nutrition, and the serum albumin level increased. Apart from mild pleural effusion no complication was noticed, and the patient was discharged on the ninth postoperative day.

**Case 2**

A 32-year-old multigravida was admitted in the 34th week of gestation because of preeclampsia and HS. The patient had hypertension (200/120 mmHg), proteinuria, hypoalbuminemia, hemolytic anemia, and low platelet count (55,000/µl), high serum ALT (612 IU/l) and AST (623 IU/l). The patient suddenly suffered from severe epigastric pain, nausea, and vomiting while taking magnesium sulfate and methyldopa medication for preeclampsia. At this time her blood pressure had fallen to 100/70 mmHg, heart rate was 120 bpm and urine output had decreased. The abdomen was diffusely tender with right upper quadrant rebound. Coagulation studies were normal. The hematocrit fell from 35% to 24%. Blood transfusions were started and the patient was taken immediately to the operating room. An exploratory laparatomy revealed hemoperitoneum (1000 cc bleeding) and a large subcapsular hematoma (about 10 cm × 8 cm) on the diaphragmatic surface of the right liver combined with a 7-cm laceration. The defect of liver capsule was closed with an absorbable gelatin sponge with a hemostatic effect. In addition, the liver was compressed by abdominal towels which were removed 3 days later. A cesarean section and bilateral tubal ligation were also performed by gynecologists, and the baby was safely delivered without any complications postoperatively. The postoperative course was uneventful and the patient was discharged on the tenth day.

**Discussion**

The median gestational age for HS is 32–34 weeks; however, HS may also develop during the early postpartum period. A spontaneous hepatic rupture in pregnancy is rare, and is often associated with significant maternal morbidity and mortality. The clinical cardinal symptom of the disease is right upper quadrant or epigastric pain accompanied with nausea, vomiting, and sudden hypotension without any obvious external blood loss. However, shoulder pain should also be regarded with suspicion in patients with preeclampsia. One of our patients was in her 34th and the other was at her 35th gestational week. One patient had sudden pain at the left upper quadrant and the shoulder without any trauma, and the other had epigastric pain and vomiting. A subcapsular hematoma was initially suspected in case 1 since she had sudden abdominal pain with defecation 3 days prior to her admission to the hospital. The secondary clinical symptoms were thought to be due to the Glisson sheath laceration.

Early recognition and prompt surgical intervention are crucial to reduce the high fetal and maternal mortality rate associated with this disease. There has been, to date, neither a reliable early recognition nor effective prevention of HS. Pain in the right upper abdomen and signs of abdominal mass bleeding occurring within HS are important evidence for hepatic rupture. An immediate ultrasonic examination may verify the tentative diagnosis. Various modalities including a liver scan, computed tomography, ultrasonography, peritoneal tap, and arteriography have been used to confirm suspicions of subcapsular hematomas. However, in a typical patient the diagnosis can usually be made clinically and these confirmatory tests may delay an urgent laparatomy. The early recognition of hemolysis is most