



# Ruptured Subcapsular Liver Hematoma: A Rare Complication of HELLP Syndrome

Abtisam Alharam<sup>1</sup> Tawfik Abuzalout<sup>2</sup> Haitham Elmehdawi<sup>3</sup>

<sup>1</sup>Department of General Surgery, Benghazi Medical Center, Benghazi, Libya

<sup>2</sup>Department of Surgery, Benghazi University, Benghazi, Libya

<sup>3</sup>Department of Surgery, Libyan International Medical University, Benghazi, Libya

Address for correspondence Haitham Elmehdawi, MD, Department of Surgery, Libyan International Medical University, Benghazi, Libya (e-mail: haitham.almahdwi@limu.edu.ly).

Libyan Int Medical Univ J 2023;8:60–62.

## Abstract

This case report highlights the rare and life-threatening complication of ruptured subcapsular liver hematoma in the setting of hemolysis, elevated liver enzymes, and low platelets syndrome, a complication associated with pre-eclampsia. A 30-year-old pregnant woman at 38 weeks of gestation presented with high blood pressure, exaggerated neurological reflexes, and high levels of albumin in her urine. Her condition deteriorated over time, and liver function tests revealed elevated readings. An emergency cesarean section was performed, during which a large liver tear with active bleeding and rupture of the liver capsule in the right lobe were discovered. An exploratory laparotomy revealed a massive hemoperitoneum with active bleeding, and hepatic packing was performed using three gauzes. Despite this, the patient's liver parameters continued to worsen, and she was transferred to the intensive care unit for further resuscitation. After 72 hours, she underwent a second operation to remove the gauze packing, and hemostasis was successfully achieved without any active bleeding. Early detection of ruptured subcapsular liver hematoma and a coordinated approach involving medical, obstetrical, radiology, and surgical teams can lead to successful treatment of this rare and dangerous complication.

## Keywords

- ▶ subcapsular liver hematoma
- ▶ HELLP syndrome
- ▶ liver injury
- ▶ pregnancy

DOI <https://doi.org/10.1055/s-0043-1776339>.  
ISSN 2519-139X.

© 2023. The Author(s).

This is an open access article published by Thieme under the terms of the Creative Commons Attribution License, permitting unrestricted use, distribution, and reproduction so long as the original work is properly cited. (<https://creativecommons.org/licenses/by/4.0/>)

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

## ملخص المقال باللغة العربية

## تمزق ورم دموي تحت المحفظة في الكبد، من المضاعفات النادرة لمتلازمة هيلب

**المؤلفون:** هيثم رمضان المهدي، توفيق سالم أبوزلوط، ابتسام منصور الهرم. قسم الجراحة العامة، الجامعة الليبية الدولية للعلوم الطبية، الفوتيات، بنغازي، ليبيا.

**المؤلف المسؤول:** هيثم رمضان المهدي. البريد الإلكتروني: [haitham.almahdwi@limu.edu.ly](mailto:haitham.almahdwi@limu.edu.ly)

يسلط تقرير الحالة هذا الضوء على المضاعفات النادرة والمهددة للحياة نتيجة تمزق ورم دموي في الكبد تحت الكتف في حالة متلازمة هيلب، التي تعتبر من المضاعفات المرتبطة بمقدمات الارتعاج (فرط ضغط الدم عند الحامل). امرأة حامل تبلغ من العمر 30 عامًا في الأسبوع 38 من الحمل تعاني من ارتفاع ضغط الدم وردود الفعل العصبية المبالغ فيها وارتفاع مستويات الألبومين في بولها. تدهورت حالتها بمرور الوقت، وكشفت اختبارات وظائف الكبد عن قراءات مرتفعة. تم إجراء عملية قيصرية طارئة، تم خلالها اكتشاف تمزق كبير في الكبد مع نزيف نشط وتمزق كبسولة الكبد في الفص الأيمن. كشفت عملية فتح البطن الاستكشافية عن تدمي الصفاق الضخم مع نزيف نشط، وتم إجراء التعبئة الكبدية باستخدام ثلاث قطع من الشاش. وعلى الرغم من ذلك، استمرت مؤشرات الكبد لدى المريضة في التدهور، حيث تم نقلها إلى وحدة العناية المركزة لمزيد من الإنعاش. وبعد 72 ساعة، خضعت لعملية ثانية لإزالة غلاف الشاش، وتم تحقيق الإرقاء بنجاح دون أي نزيف نشط.

وبالتالي فإن الكشف المبكر عن تمزق الورم الدموي الكبدي تحت المحفظة واتباع نهج منسق يشمل الفرق الطبية المختلفة من توليد وأشعة وجراحة يؤدي إلى علاج ناجح لهذه المضاعفات النادرة والخطيرة.

**الكلمات المفتاحية:** ورم دموي كبدي تحت المحفظة، متلازمة هيلب، إصابة الكبد، الحمل.

## Introduction

Hemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome is an uncommon condition that can be associated with pregnancy hypertensive syndromes. It is characterized by elevated liver enzymes, hemolysis, and low platelet count with a mortality rate of about 15%.<sup>1</sup> Ruptured subcapsular liver hematoma is a life-threatening complication of HELLP syndrome. Although its clinical presentation with nonspecific symptoms of nausea, epigastric pain, and vomiting, clinical suspicion, and early recognition are crucial in its management and urgent need for emergency cesarean delivery.<sup>2</sup> It has been reported in less than 2% of pregnancies with HELLP syndrome complication.<sup>3,4</sup> This case report presents rare complication of pregnancy.

## Case Presentation

A 30-year-old pregnant woman, who had no known history of chronic illness, presented to the emergency department at 38 weeks of gestation. She complained of headache, epigastric pain, and had experienced multiple episodes of vomiting. Upon examination, she appeared unwell and her blood pressure was measured at 177/96 mm Hg. Neurological reflexes were exaggerated and there was a high level of albumin in her urine. Over time, her condition deteriorated further. Liver function tests revealed elevated levels of aspartate aminotransferase (AST; 147 U/L) and alanine aminotransferase (ALT; 200 U/L), along with a decrease in platelet count (64,000  $\mu$ L). Due to the mother's deteriorating condition, an emergency cesarean section was performed by the

obstetric team. During the procedure, a large tear in the liver with active bleeding and rupture of the liver capsule in the right lobe were discovered. Hepatic packing was performed using three abdominal gauzes. Unfortunately, intrauterine fetal death was confirmed, resulting in the loss of the fetus. The mother was subsequently transferred to the intensive care unit. Postoperative laboratory results showed persistently elevated ALT and AST levels, along with thrombocytopenia and marked hypertension. Labetalol was administered to manage her hypertension. After 72 hours, she underwent a second operation to remove the gauze packing. No active bleeding was observed, and all three gauzes were successfully removed, ensuring hemostasis (→ Fig. 1). However, she developed an intra-abdominal abscess as a complication, requiring drainage. Additionally, her renal parameters deteriorated, necessitating a session of dialysis.

## Discussion

HELLP syndrome is a rare complication of pregnancy that is often associated with pre-eclampsia. Ruptured subcapsular liver hematoma is an uncommon and serious complication of this condition that can result in a high mortality rate for both the mother and fetus, sometimes necessitating termination of the pregnancy to save the mother's life. Although it typically presents with nonspecific symptoms such as epigastric pain, nausea, headache, and vomiting, early detection and management with a high level of suspicion can lead to better outcomes.<sup>5</sup>

Liver enzyme abnormality affects approximately 3 to 5% of pregnant women and can be classified into three categories:



**Fig. 1** Tear in the right lobe of liver with hematoma forming after 72 hours of packing.

pre-existing liver diseases, diseases unrelated to pregnancy but affecting a healthy liver, and pregnancy-related liver diseases. Pregnancy-related liver diseases tend to occur during the last trimester and have a high mortality rate. It is important to consider alternative diagnoses such as microangiopathic hemolytic anemia, hemolytic uremic syndrome, and thrombotic thrombocytopenic purpura, which can be distinguished from HELLP syndrome by the significant increase in liver enzymes and the absence of proteinuria.<sup>6–8</sup>

Although the exact etiology of HELLP syndrome is unknown, many studies suggest an immunological role in its pathogenesis. Endothelial injury, vascular spasm, and platelet aggregation are believed to play important roles in the inflammatory reaction that leads to hepatic sinusoidal obstruction, ischemia, and necrosis. Hepatic rupture can occur when intrahepatic pressure increases beyond the capacity of Glisson's capsule.<sup>8–10</sup>

To successfully manage ruptured subcapsular liver hematoma, a multidisciplinary team consisting of medical, surgical, obstetrical, and radiology specialists is necessary. The initial step should be to provide good resuscitation with blood transfusions and intensive care management. Although some rare cases can be managed conservatively, urgent surgical intervention is often required, especially in cases with hemodynamic instability. Surgical interventions that may be performed include ligation of the portal vein, hepatic artery, and pre-hepatic packing.<sup>4,11</sup> Hepatic packing is the most common intervention, while partial hepatic resection is not preferred. In some cases, transarterial embolization has been a successful intervention. If acute hepatic failure occurs, the patient should be referred to a high-volume center for liver transplant.<sup>12</sup>

Although ultrasound can be used for the diagnosis of ruptured subcapsular liver hematoma, a computed tomographic

scan is more sensitive. In the presented case, the hematoma was discovered intraoperative because the patient was hemodynamically unstable.

## Conclusion

Identifying ruptured subcapsular liver hematoma can be challenging due to its nonspecific symptoms, making it difficult to distinguish from other diseases with similar presentations. However, it should be considered as a possible diagnosis, particularly in cases where there is hemodynamic instability. Although this complication of pregnancy has a high mortality rate, early detection and a coordinated approach involving medical, obstetrical, radiology, and surgical teams can lead to successful treatment.

## Conflict of Interest

None declared.

## References

- García González LA, Rodríguez Uría R, Noriega Menendez P, et al. Ruptured subcapsular liver hematoma as a rare complication of HELLP syndrome. A therapeutic challenge. *Rev Esp Enferm Dig* 2023;115(08):465–466
- Grigorakis S, Tzimas GN, Alexakis C, Morea BE, Kontomitros N. Subcapsular liver hematoma: a rare complication of hemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome managed conservatively. *Cureus* 2022;14(02):e22058
- Singh P, Warren K, Collier V. Ruptured subcapsular liver hematoma: a rare complication of HELLP syndrome. *Case Reports Hepatol* 2020;2020:8836329
- Wicke C, Pereira PL, Neeser E, Flesch I, Rodegerdts EA, Becker HD. Subcapsular liver hematoma in HELLP syndrome: evaluation of diagnostic and therapeutic options—a unicenter study. *Am J Obstet Gynecol* 2004;190(01):106–112
- Henríquez-Villaseca MP, Catalán-Barahona A, Lattus-Olmos J, Vargas-Valdebenito K, Silva-Ruz S. Hematoma subcapsular hepático roto en síndrome HELLP. [Ruptured subcapsular liver hematoma in context of HELLP syndrome.]. *Rev Med Chil* 2018;146(06):753–761
- Mazzola A, Magro B, Perdigo F, et al. Acute liver failure and HELLP syndrome: a clinical case and literature review. *Clin Res Hepatol Gastroenterol* 2021;45(02):101498
- Gupta M, Feinberg BB, Burwick RM. Thrombotic microangiopathies of pregnancy: differential diagnosis. *Pregnancy Hypertens* 2018;12:29–34
- Poimenidi E, Metodiev Y, Archer NN, Jackson R, Bangash MN, Howells PA. Haemolysis, elevated liver enzymes and low platelets: diagnosis and management in critical care. *J Intensive Care Soc* 2022;23(03):372–378
- Stojanovska V, Zenclussen AC. Innate and adaptive immune responses in HELLP syndrome. *Front Immunol* 2020;11:667
- Westbrook RH, Dusheiko G, Williamson C. Pregnancy and liver disease. *J Hepatol* 2016;64(04):933–945
- Wilson SG, White AD, Young AL, Davies MH, Pollard SG. The management of the surgical complications of HELLP syndrome. *Ann R Coll Surg Engl* 2014;96(07):512–516
- Marinelli A, Hill J. Management of ruptured subcapsular liver hematoma as a result of hemolysis, elevated liver enzyme, and low platelet syndrome in a rural facility. *Cureus* 2023;15(01):e33852