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Subcapsular liver hematoma complicating HELLP syndrome: A case report and review of management strategies

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ABSTRACT

Subcapsular liver hematoma is a life-threatening complication of pregnancy. It is associated with preeclampsia and HELLP syndrome.

We present the case of a 36-year-old Caucasian nulliparous woman who was diagnosed at 29 weeks and 6 days of gestation with mild preeclampsia. After brief hospitalization she was discharged. During a daily follow-up, at 31 weeks and 3 days of gestation, she complained of mild abdominal pain and blood tests revealed HELLP syndrome. The cervix was unripe. A healthy baby was delivered by emergency cesarean section. The following day, the patient complained of persistent abdominal pain, and at the same time the hepatic cytolysis worsened dramatically. A computed tomography (CT) scan revealed a significant subcapsular hematoma without any active bleeding or breach of Glisson's capsule. We treated the patient conservatively and she was discharged home 10 days after the diagnosis was made.

The symptoms of subcapsular liver hematoma are non-specific. They include nausea, vomiting and epigastric pain, and pain in the right upper quadrant or shoulder.

Biological analyses can show hepatic cytolysis, haemolysis and coagulation disorders.

Medical imaging can confirm the diagnosis.

The management of subscapular liver hematoma may depends on whether there is hemodynamic stability, active bleeding or breach of Glisson capsule's. If the patient is stable and in the absence of active bleeding, management should be purely symptomatic.

1. Introduction

Subcapsular liver hematoma (SLH) is a recognised complication of preeclampsia and HELLP (hemolysis, elevated liver enzymes, low platelets) syndrome. Almost 6% of pregnancies are affected by preeclampsia, of which 10% are complicated by HELLP syndrome [1]. SLH occurs in approximately 1% of patients developing HELLP syndrome [2]. Frequently, SLH is suspected in the presence of non-specific pain (epigastric, right upper quadrant, and shoulder). The risk is rupture of the haematoma, which occurs in <2% of cases [3]. The maternal mortality of SLH ranges from 17% to 59% [2]. Thus, SLH is a rare but life-threatening complication of pregnancy.

We present the case of a 36-year-old patient who developed HELLP syndrome for which a cesarean section was performed. The day after delivery, in the presence of persistent mild abdominal pain and major hepatic cytolysis, a computed tomography (CT) scan was performed, leading to the diagnosis of SLH, which was treated conservatively.

2. Case Presentation

A 36-year-old patient, gravida 1 para 0, was referred to hospital at 29 weeks and 6 days of gestation with a diagnosis of severe intrauterine growth restriction associated with proteinuria.

The patient had a history of asthma, depression, and sleeve procedure four years before pregnancy leading to 90 kg weight loss. Her body mass index (BMI) at admission was 31 kg/m^2.

During her initial stay in the hospital, blood pressure was strictly normal and all laboratory investigations were normal except for isolated proteinuria of 2410 mg/24 h. Fetal heart rate and doppler ultrasound were normal. She was discharged from the maternity ward at 31 weeks of gestation.

She returned at 31 weeks and 3 days of gestation for follow-up. On

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Table 1
Dynamic evolution of the main biological parameters.

Laboratory tests	The day before	Prior to cesarean section H-1	Delivery +8 h	Delivery +16 h	Delivery +24 h	Postpartum day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 10	Day 11 (discharge)
AST (15–37 U/L)	28	**214**	**1376**	**2979**	**5122**	**3519**	**1544**	**558**	**215**	**82**	**47**	33	29	28
ALT (13–56 U/L)	17	**159**	**1236**	**2528**	**3782**	**3230**	**2082**	**1196**	**726**	**435**	**281**	**217**	**117**	**95**
LDH (84–246 U/L)	/	**428**	**1090**	**2179**	/	**1010**	**356**	236	197	196	/	241	237	**274**
Serum creatin (45–84 umol/L)	48	72	**110**	**135**	**152**	**114**	**85**	72	63	/	62	65	70	70
Serum urea (2.5–6.4 mmol/L)	5.2	6.4	**9.7**	**10.7**	**11.5**	**10.4**	**8.5**	**6.9**	5.4	/	4.1	4	**2.3**	**2**
Hemoglobin (11.8–14.8 g/dL)	11.9	**11.7**	**9.4**	**8.7**	**8.7**	**8.5**	**8.2**	**7.6**	**7.2**	**6.8**	**7.9**	**8.2**	**7.9**	**8**
Platelets (150–400 G/L)	240	150	160	154	**119**	**108**	**118**	169	238	296	318	374	**450**	**462**
Haptoglobin (0.3–2 g/L)	/													
PT (> 70%)	/	99	74	**68**	**65**	70	78	82	84	85	87	89	83	83
Fibrinogen (1.5–3.5 g/L)	2.85	2.66	2.25	2.16	2.28	2.34	3.03	**3.59**	**3.79**	**4.05**	**3.9**	**4.18**	**3.7**	**3.75**

AST = aspartate aminotransferase; ALT = alanine aminotransferase; LDH = lactate deshydrogenase; PT = prothrombin time.

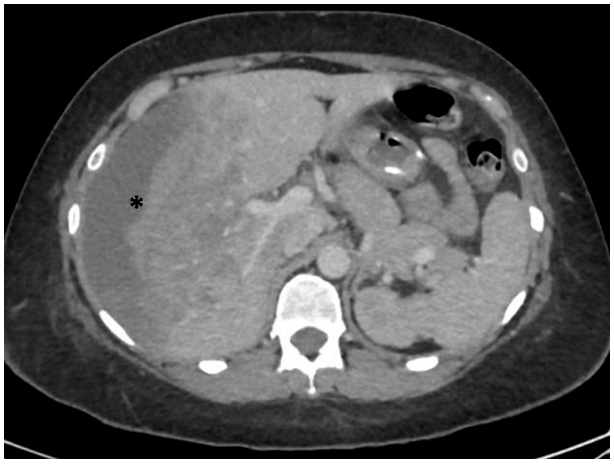

Fig. 1. Axial abdominal computed tomography with contrast at day 1 post-partum: presence of a right hepatic subcapsular collection of heterogeneous density indicated by a black star, measuring 44 mm × 160 mm.

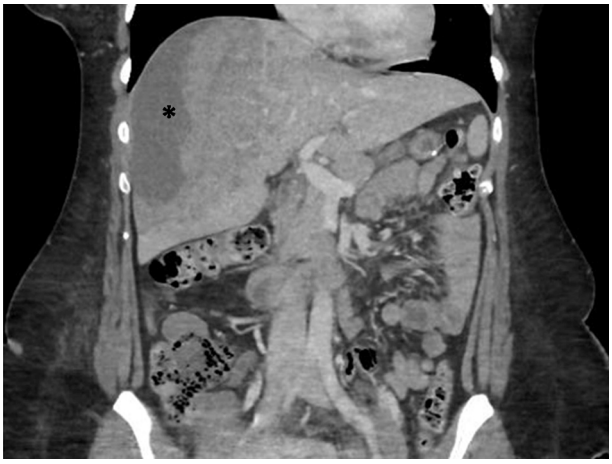

Fig. 2. Frontal abdominal computed tomography with contrast at day 1 post-partum: presence of a right hepatic subcapsular collection of heterogeneous density indicated by a black star, measuring 44 mm × 160 mm.

admission, she complained of mild abdominal pain. She had no functional signs of hypertension such as headache, blurred vision or dizziness. Her blood pressure was 161/95 mmHg and her reflexes were normal. Blood tests showed evidence of HELLP syndrome, as outlined in Table 1.

Fetal cardiac monitoring was normal, with a baseline of 140 beats per minute. Fetal ultrasound showed a breech presentation, a normal amount of amniotic fluid, but cerebroplacental inversion by doppler (umbilical resistance index (RI) was 0,91, which is above the 95th percentile, while middle cerebral artery RI was 0,52, which corresponds to the 14th percentile). Rapid transabdominal ultrasound scan showed no perihepatic or free pelvic fluid.

The diagnosis of HELLP syndrome was confirmed. The cervix was unripe, and induction of labour was not attempted. Instead, a cesarean section was performed shortly after magnesium sulfate infusion, and a male new-born of 1150 g, with APGAR scores of 10, 10 and 10 at 1, 5 and 10 min, was delivered.

During the following hours, the patient complained of persistent abdominal pain, especially epigastric. Meanwhile, we observed a rapid worsening of the liver function test results within 12 h after cesarean section. Laboratory results showed hepatic cytolysis with levels of AST 37 times and ALT 22 times higher than normal (Table 1). An abdominal CT scan with contrast was performed and revealed a 160 × 44 mm subcapsular haematoma of the right liver without active arterial bleeding or capsular rupture (Figs. 1 and 2).

The patient was transferred to the intensive care unit (ICU) shortly after the diagnosis was made, and conservative management was decided, consisting of strict bedrest and blood pressure control. Although opioids were required as painkillers, the patient's vital signs stayed within normal limits, including blood pressure, which required no antihypertensive medication. During her stay in the ICU, the patient's liver function test results trended upwards to a maximum of 5122 U/L

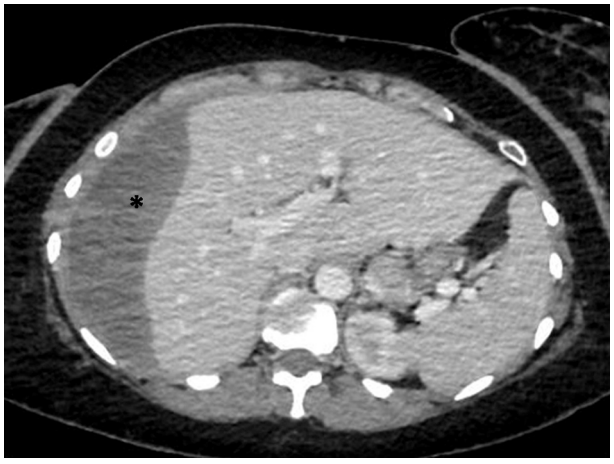

Fig. 3. Axial abdominal computed tomography with contrast at day 8 post-partum: persistence of a right hepatic subcapsular collection of more homogenous density indicated by a black star, still measuring 44 mm × 160 mm.

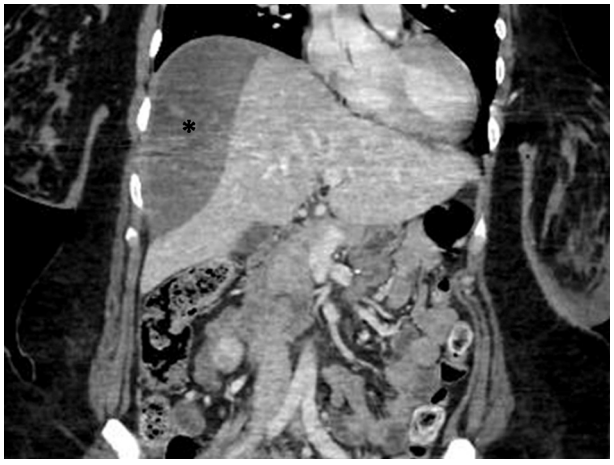

Fig. 4. Frontal abdominal computed tomography with contrast at day 8 post-partum: persistence of a right hepatic subcapsular collection of more homogenous density indicated by a black star, still measuring 44 mm × 160 mm.

for AST and of 3782 U/L for ALT, respectively 138 times and 67 times higher than normal. Platelet count reached a minimum of 108,000/mm3. Proteinuria reached 14 g / day and serum creatinine elevation to 152 µmol/L.

After 48 h in the ICU, the patient was hemodynamically stable, pain had decreased sufficiently to stop opioids, and liver function had improved (as shown in Table 1), allowing her transfer back to the regular maternity department.

The patient's hemoglobin level gradually decreased from 11.7 g/dL before cesarean section to a minimum of 6.8 g/dL at 6 days postpartum (Table 1), requiring one blood transfusion of two units of red cells.

At 7 days postpartum, the patient complained of right lower chest pain, associated with mild fever. An X-ray of the thorax revealed right pleural effusion.

At 8 days postpartum, because of persistent fever and recent drop in hemoglobin requiring blood transfusion another abdominal CT scan with contrast was performed to rule out the presence of active bleeding and verify that there was no other infection site. There was no sign of hepatic rupture or active bleeding. The subcapsular haematoma remained stable in size but was more liquefied and therefore more homogeneous (Figs. 3 and 4). No other infection site was found.

No further investigation was performed considering that both effusion and fever were reactive to subcapsular haematoma resorption.

Daily physical examination and laboratory results were subsequently better, allowing the patient's discharge home at 12 days postpartum. At discharge, her liver function tests showed an almost complete regression of liver cytolysis (AST 28 U/L; ALT 95 U/L), and her hemoglobin level was 8.0 g/dL.

A follow-up transabdominal ultrasound was performed 17 days after discharge, and showed the hepatic hematoma was slowly decreasing in size to a maximum of 103 mm in length.

At her 6-week postpartum visit, the patient had fully recovered clinically and biologically and had no complaint.

3. Discussion

Subscapular liver hematoma (SLH) is a rare condition that can complicate preeclampsia and HELLP syndrome and is potentially fatal (17% to 59%) [2]. Diagnosis of this condition is an emergency. The most important risk is the hematoma's rupture. Consequences and management depend on gestational age, whether the subscapular hematoma appears before or after delivery and the context in which the hematoma occurs [2]. In the antepartum period, in cases of SLH associated with non-traumatic preeclampsia, the first intervention is delivery.

When associated with preeclampsia, SLH generally appears in multiparous patients over 30 years of age and 50% of cases occur after 36 weeks of gestation [3–5]. It is revealed before labor in 85% of cases, and in the immediate post-partum period in the remaining 15% [4].

Physiopathology is not completely established. Preeclampsia releases toxins acting on vessels, creating vasospasm and a coagulation disorders. SLH results from fibrin deposition in the hepatic capillaries, necrosis, thrombosis and bleeding from the small sinusoidal vessels. [3,6,7]

Non-specific symptoms like epigastric or hypochondrial pain, vomiting, and blood tests such as elevated liver enzyme or haemolysis can lead to the diagnosis of SLH [2].

The first investigation recommended for the diagnosis of SCH is abdominal ultrasound. Ultrasound is an easy and rapid investigation, but normal results do not rule out the diagnosis, as reported by Doumiri et al. [8]. The other key investigation is CT with contrast, which provides a reliable diagnosis and can identify active bleeding. Thus, if easily available or with a normal ultrasound and a strong suspicion of SLH, a CT scan with contrast should be performed.

The management of SLH may depend on whether there is hemodynamic stability, active bleeding or breach of Glisson's capsule. [2]

In the presence of hemodynamic instability or major active bleeding, particularly during cesarean section, surgical management must be undertaken immediately and may require vascular ligation, packing, and transplantation. [2,8–18]

In the presence of active bleeding, suspected on the basis of anaemia and confirmed by CT scan with contrast, embolization is an option in case of hemodynamic stability. [2,9–12,15]

If the patient is hemodynamically stable and in the absence of active bleeding, expectant management is recommended, even if there is significant abdominal pain (which may lead to the use of opioids), major hepatic cytolysis or an alarming scan image, as long as Glisson's capsule is intact. [2,7,9–12,15–17,19–22].

This case report enhances the possibility of conservative management in this severe condition in an expert center.

In our case, maternal and fetal surveillance enabled early treatment because it was diagnosed during a daily systematic check-up. This raises the question of how to identify and manage patients at risk.

Contributors

Agnès Villart contributed to conception of the case report, acquiring and interpreting the data, drafting the manuscript and revising the article critically for important intellectual content.

Pauline Burban contributed to conception of the case report, acquiring and interpreting the data, drafting the manuscript and revising the article critically for important intellectual content.

Elie Mosnino contributed to patient care, conception of the case report, drafting the manuscript, undertaking the literature review and revising the article critically for important intellectual content.

Mohamed Derouich contributed to conception of the case report, acquiring and interpreting the data, drafting the manuscript, undertaking the literature review and revising the article critically for important intellectual content.

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Patient consent

Obtained.

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Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

References

[1] M.C. Mushambi, A.W. Halligan, K. Williamson, Recent developments in the pathophysiology and management of pre-eclampsia, Br. J. Anaesth. 76 (1996) 133–148, https://doi.org/10.1093/bja/76.1.133.

[2] A. Ditisheim, B.M. Sibai, Diagnosis and management of HELLP syndrome complicated by liver hematoma, Clin. Obstet. Gynecol. 60 (2017) 190–197, https://doi.org/10.1097/GRF.0000000000000253.

[3] S. Aziz, R.C. Merrell, J.A. Collins, Spontaneous hepatic hemorrhage during pregnancy, Am. J. Surg. 146 (1983) 680–682, https://doi.org/10.1016/0002-9610(83)90311-2.

[4] B. Langer, N. De Manzini, E. Boudier, C. Bassi, A.-M. Bader, C. Meyer, et al., Hématome sous-capsulaire du foie rompu. Conduite à tenir. A propos d'une observation, Hématome Sous-Capsul Foie Rompu Conduite À Tenir Propos Une Obs 92 (1997) 188–190.

[5] A. Karateke, D. Silfeler, F. Karateke, R. Kurt, A. Guler, I. Kartal, HELLP syndrome complicated by subcapsular hematoma of liver: A case report and review of the literature, Case Rep. Obstet. Gynecol. 2014 (2014), e585672, https://doi.org/10.1155/2014/585672.

[6] Circulating Angiogenic Factors and the Risk of Preeclampsia | NEJM. https://www.nejm.org/doi/full/10.1056/nejmoa031884, 2023 (accessed September 4, 2023).

[7] G. Beucher, T. Simonet, M. Dreyfus, Management of the HELLP syndrome, Gynecol. Obstet. Fertil. 36 (2008) 1175–1190, https://doi.org/10.1016/j.gyobfe.2008.08.015.

[8] M. Doumiri, M. Elombila, N. Oudghiri, A.T. Saoud, Ruptured subcapsular hematoma of the liver complicating acute fatty liver of pregnancy, Pan Afr. Med. J. 19 (2014) 38, https://doi.org/10.11604/pamj.2014.19.38.4009.

[9] S. Wilson, A. White, A. Young, M. Davies, S. Pollard, The management of the surgical complications of HELLP syndrome, Ann. R. Coll. Surg. Engl. 96 (2014) 512–516, https://doi.org/10.1308/003588414X13946184901362.

[10] E.E. Moore, T.H. Cogbill, G.J. Jurkovich, S.R. Shackford, M.A. Malangoni, H. R. Champion, Organ injury scaling: spleen and liver (1994 revision), J. Trauma 38 (1995) 323–324, https://doi.org/10.1097/00005373-199503000-00001.

[11] N. Mamouni, A. Derkaoui, H. Bougern, C. Bouchikhi, H. Chaara, A. Banani, et al., Subcapsular hematoma of the liver complicating preeclampsia: about 6 cases, Pan Afr. Med. J. 9 (2011) 47, https://doi.org/10.4314/pamj.v9i1.71229.

[12] S. Dubey, J. Rani, Hepatic rupture in preeclampsia and HELLP syndrome: A catastrophic presentation, Taiwan J. Obstet. Gynecol. 59 (2020) 643–651, https://doi.org/10.1016/j.tjog.2020.07.003.

[13] D. Cernea, A. Dragoescu, M. Novac, HELLP syndrome complicated with postpartum subcapsular ruptured liver hematoma and purtscher-like retinopathy, Case Rep. Obstet. Gynecol. 2012 (2012), 856135, https://doi.org/10.1155/2012/856135.

[14] A. Pa, Rupture of subcapsular hematoma of liver in severe preeclampsia with HELLP syndrome: A nightmare to an obstetrician, J. Case Rep. 6 (2016) 26–29, https://doi.org/10.17659/01.2016.0007.

[15] C. Wicke, P.L. Pereira, E. Neeser, I. Flesch, E.A. Rodegerdts, H.D. Becker, Subcapsular liver hematoma in HELLP syndrome: Evaluation of diagnostic and therapeutic options–a unicenter study, Am. J. Obstet. Gynecol. 190 (2004) 106–112, https://doi.org/10.1016/j.ajog.2003.08.029.

[16] A.C.P.F. Araujo, M.D. Leao, M.H. Nobrega, P.F.M. Bezerra, F.V.M. Pereira, E.M. M. Dantas, et al., Characteristics and treatment of hepatic rupture caused by HELLP syndrome, Am. J. Obstet. Gynecol. 195 (2006) 129–133, https://doi.org/10.1016/j.ajog.2006.01.016.

[17] T. Reck, M. Bussenius-Kammerer, R. Ott, V. Müller, E. Beinder, W. Hohenberger, Surgical treatment of HELLP syndrome-associated liver rupture — an update, Eur. J. Obstet. Gynecol. Reprod. Biol. 99 (2001) 57–65, https://doi.org/10.1016/S0301-2115(01)00358-X.

[18] Hind Lahyani, Hematome sous capsulaire du foie compliquant une preeclampsie: a propos dun cas, Int. J. Adv. Res. 8 (2021) 726–729 (accessed September 4, 2023), https://www.journalijar.com/article/.

[19] K. Luhning, H. MacCormick, B. Macaulay, M. Saunders, C. Craig, Subcapsular hepatic hematoma as a complication of severe preeclampsia: a case report, J. Med. Case Rep. 15 (2021) 625, https://doi.org/10.1186/s13256-021-03166-w.

[20] S. Grigorakis, G.N. Tzimas, C. Alexakis, B.E. Morea, N. Kontomitros, Subcapsular liver hematoma: A rare complication of hemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome managed conservatively, Cureus 14 (2022), e22058, https://doi.org/10.7759/cureus.22058.

[21] H. Fan, P. Zhang, D. Yang, L. Sun, W. Zhao, D. Pan, et al., HELLP syndrome complicated by subcapsular liver hematoma: A case report, Med. Case Rep. Study Protoc. 1 (2020), e0020, https://doi.org/10.1097/MD9.0000000000000020.

[22] M. Kapan, M.S. Evsen, M. Gumus, A. Onder, G. Tekbas, Subcapsular liver hematoma in HELLP syndrome: case report, Gastroenterol. Res. 3 (2010) 144–146, https://doi.org/10.4021/gr.v3i3.205.