AN INCIDENTAL INTRAOPERATIVE DIAGNOSIS OF RUPTURED SUBCAPSULAR LIVER HEMATOMA SECONDARY TO HELLP SYNDROME: A CASE REPORT

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ABSTRACT

Subcapsular liver hematoma (SLH) though rare, poses a significant risk to maternal health in patients diagnosed with HELLP (hemolysis, elevated liver enzymes, low platelets) syndrome. We report a case of a 29-year-old Gravida 4, Para 2+1(Term 2, Preterm 0, Living 2, Abortions 1) woman at 31 weeks gestation who presented with severe right upper quadrant abdominal pain, nausea and vomiting. Intraoperative findings during an emergency caesarean for fetal compromise revealed an incidental ruptured subcapsular liver hematoma. The patient underwent a successful conservative management and had an uneventful recovery. This case emphasizes the importance of preparedness for unexpected intraoperative complications among women with hypertensive disorders of pregnancy-particularly HELLP syndrome.

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INTRODUCTION

HELLP syndrome represents a severe form of preeclampsia affecting 0.5-0.9% of pregnancies and up to one-fifth of those with severe preeclampsia[1]. First described by Weinstein in 1982, HELLP is characterized by hemolysis, elevated liver enzymes and low platelet count[2]. Risk factors include multiparity, maternal age above 25years, previous history of preeclampsia and chronic hypertension. One of its rare complications is Subcapsular liver hematoma (SLH) with an incidence of rupture ranging from 1/40,000 to 1/250,000 pregnancies[3]. The right hepatic lobe is most frequently affected due to its anatomical and vascular characteristics. The clinical presentation of SLH is often nonspecific but includes right upper quadrant or epigastric pain, nausea, vomiting and signs of circulatory compromise[4]. Prompt recognition and a multidisciplinary approach are essential for maternal and fetal survival. This case highlights an incidental intraoperative diagnosis of ruptured SLH in a patient with HELLP syndrome emphasizing the need for heightened surgical vigilance during obstetric emergencies.

Case presentation

A 29-year-old Gravida 4, Para 2+1(Term 2, Preterm 0, Living 2, Abortion 1) at 31weeks gestation presented with a 12-hour history of severe right upper quadrant pain, nausea and vomiting. The pain was dull, radiating to the back and right shoulder. She had no history of trauma, fever, heartburn or yellowish discoloration of the eyes. She reported no vaginal bleeding or leakage of liquor and was appreciating fetal kicks. She had received regular antenatal care with no prior history of hypertension, liver disease or bleeding tendencies.

On examination she was fully conscious, afebrile, with the following vital signs: blood pressure of 200/140 mmHg, pulse rate 98beats/minute, respiratory rate of 22breaths per minute, temperature of 36.8°C and oxygen saturation of 97% at atmospheric air. She had mild bilateral pedal edema. The sclerae were anicteric and there was no pallor. The cardiovascular and respiratory systems were unremarkable.

Abdominal examination revealed tenderness in the right upper quadrant and a symphsio-fundal height of 29cm.The fetus was in cephalic presentation with a fetal heart rate of 164 beats per minute. The uterus was soft and non-tender. There were no palpable contractions at the time of examination. No organomegaly was detected. No fluid thrill or shifting dullness was demonstrable. Genital examination revealed normal external genitalia, the vagina was warm and moist and cervix posterior, firm, closed and long.

Neurological examination revealed brisk but symmetrical deep tendon reflexes. No abnormal movements were observed.

Investigations revealed a urinalysis with 4+ proteinuria, blood tests showed thrombocytopenia (96x103/µL), anemia (Hb 9.2g/dl), elevated liver enzymes (AST 319IU/L, ALT 329IU/L). Renal function tests were normal.

An obstetric ultrasound scan showed a live singleton intrauterine fetus corresponding to an average gestational age29 weeks with reduced amniotic fluid (Amniotic fluid index of 4.9) but normal umbilical artery and middle cerebral artery doppler studies.
A diagnosis of Pre-Eclampsia with Severe features with HELLP syndrome was made.

She was started on Intravenous Hydralazine 5mg stat for blood pressure control and Magnesium Sulphate (4gram loading, 1g/hour maintenance for 24hours) for seizure prophylaxis. A salvage dose of antenatal steroid (Dexamethasone 12mg) Intramuscular was administered for fetal lung maturity.

A non-stress test done showed persistent fetal tachycardia (180beats/minute) with reduced variability prompting an emergency caesarean section.

Laboratory findings

A summary of laboratory findings at admission showed thrombocytopenia, anemia, with markedly deranged liver function but normal renal function tests. These improved on subsequent reviews on day 3 and day 7 of puerperium as shown in table 1 below.

Table 1: laboratory findings

Test	Results			Reference range
	20th/Feb/2024	22nd/Feb/2024	27th/Feb/2024	
CBC				
WBC	10.3	13.1	10.3	12-15x103/ µL
HB	9.2	12.4	11	12-16g/dl
RBC	2.5	2.4	2.79	2.5-4.6x106/ µL
Platelets	96	116	125	150-450x103/ µL
RFTs				
Urea	16.5	15	13.9	16-48mg/dl
Creatinine	0.66	0.7	0.53	0.7-1.2mg/dl
LFTs				
AST	319	113	63	<30units/litre
ALT	329	189	52	<25units/litre
RBS	5.4mmol			3-7mmol/litre

Abbreviations:

CBC- Complete Blood Count
HB- Heamoglobin
RBC- Red Blood Cell count
RFTs- Renal function tests
LFTs- Liver function tests
AST- Aspartate transaminase
ALT- Alanine transaminase
RBS- Random blood sugar

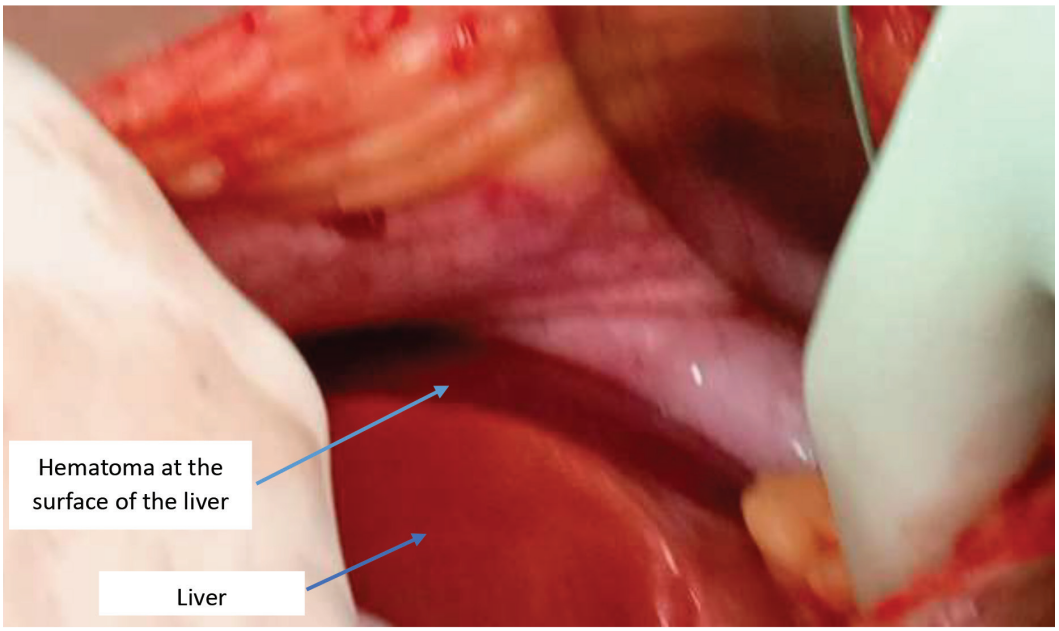
Intraoperative findings

With the client under general anesthesia, the abdomen was opened through a Pfannenstiel incision. There was approximately 200 mls of hemoperitoneum. A live female infant weighing 1.9kgs with an Apgar score of 7 and 9 at 1 and 5minutes, respectively, was delivered. The uterine incision was closed in layers and hemostasis achieved. During exploration for the bleeding source, persistent oozing along the right paracolic gutter prompted extension of the suprapubic incision to a midline incision. A 5x6 cm ruptured subscapular hematoma of the right hepatic lobe was identified and packed with absorbable Surgicel Nu-Knit® hemostat (an oxidized regenerated cellulose). The uterus and adnexa were intact. Intraoperative transfusion included two units of packed red cells, one unit of fresh frozen plasma and one pool of platelets. The patient left the operating theatre with stable vital signs.

The patient was transferred to the high-dependency unit for monitoring. She remained hemodynamically stable. Antihypertensive therapy was maintained with oral labetalol (200mg twice daily) and nifedipine tablets (20mg twice daily). The liver pack was left in situ and there was no need for a re-laparotomy; it was absorbed spontaneously. Follow-up ultrasound at 2 weeks post-partum showed a resolving hematoma. By day 7 post-

partum, laboratory values had normalized. She was discharged home on day 10 in good condition. At 12 weeks post-partum, she was normotensive and asymptomatic.

Intraoperative imaging



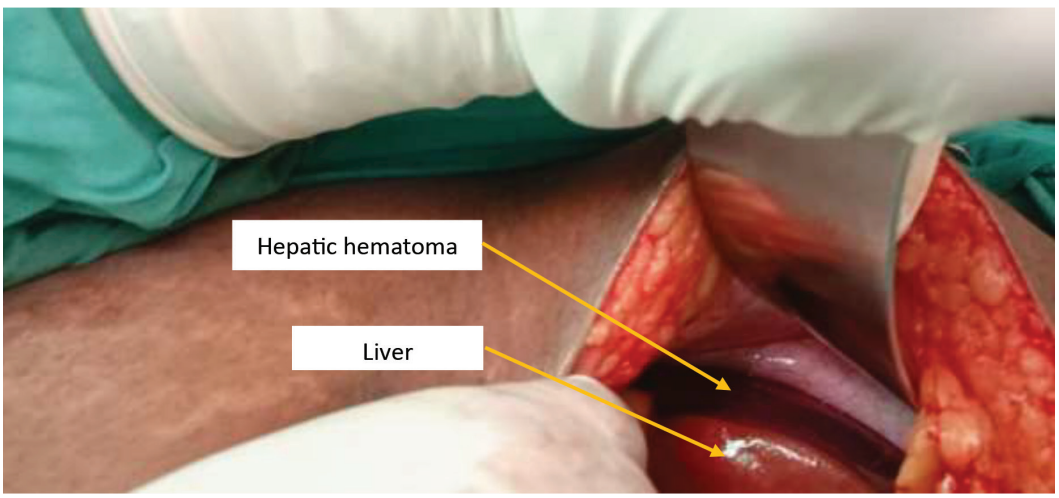


Figure 1 & 2: intraoperative findings at laparotomy showing the surface of the liver and subcapsular hematoma

DISCUSSION

This case demonstrates an incidental intraoperative diagnosis of ruptured subcapsular liver hematoma secondary to HELLP syndrome. SLH rupture is a rare complication occurring in less than 2% of patients with HELLP, with a reported incidence of 1 in 40,000 to 1 in 250,000 pregnancies[5]. Pathologically the condition is linked to endothelial injury within the microvasculature prompting platelet activation, fibrin accumulation, ischemic hepatic injury, and eventual tissue necrosis, which may progress to hematoma formation and rupture[6,7]

The condition often presents with nonspecific symptoms that may mimic other abdominal emergencies. In our case, the diagnosis was made unexpectedly during surgery, as preoperative evaluation did not indicate hepatic rupture. The classic presentation of HELLP includes epigastric or right upper quadrant pain, nausea, vomiting, and systemic signs of preeclampsia[8]. In this patient, these symptoms were accompanied by grade 1 pedal edema, severe hypertension (BP 200/140mmHg), elevated liver enzymes (AST 319 IU/L, ALT 329IU/L), and thrombocytopenia (platelet count 96,000/ul).

What makes this case particularly instructive is the intraoperative discovery of hemoperitoneum without an immediately identifiable source during caesarean section. This prompted a midline exploratory laparotomy, which confirmed the presence of a ruptured 5x6cm subcapsular liver hematoma, emphasizing the critical importance of early intraoperative recognition and surgical readiness.

In HELLP syndrome, SLH may remain undetected until rupture occurs, at which point the patient is at a high risk of hemorrhagic shock. In this case, hemorrhage was managed effectively through surgical packing with absorbable hemostats (Surgicel Nu-Knit®) and blood product transfusion, including platelets and fresh frozen plasma, which contributed to the favorable maternal outcome.

Literature suggests that the right hepatic lobe is most commonly involved, consistent with our case[9]. Mortality rates for ruptured SLH vary significantly depending on timing of diagnosis to tertiary care. Maternal mortality ranges from 17 to 59%, while perinatal mortality may reach 42%[5]

Management of HELLP syndrome and its complications is multidisciplinary, involving obstetricians, neonatologists, anesthesiologist, and often general surgeons. Delivery remains the definitive treatment for HELLP, and corticosteroids (e.g. Dexamethasone) are sometimes administered to enhance fetal lung maturity[10]. In this case, magnesium sulphate for seizure prophylaxis, antihypertensives (hydralazine, labetalol, nifedipine) and supportive critical care led to full maternal recovery and neonatal stabilization.

The decision to proceed with a caesarean section was based on fetal distress (tachycardia at 180bpm, reduced variability and no accelerations), which was prudent given the risks of delaying delivery. This case also highlights the importance of serial laboratory monitoring, which demonstrated improvement in hematologic and liver function parameters over the first postpartum week.

In summary, this case highlights the need for Intraoperative vigilance while managing HELLP syndrome patients. While a high index of suspicion is essential in symptomatic cases, this report emphasizes that unexpected intraoperative findings in the form of hemoperitoneum may also occur even in the absence of overt hepatic symptoms.

Conclusion:

Ruptured subcapsular hepatic hematoma is a rare but potential serious complication of HELLP syndrome. Intraoperative awareness and preparedness for such unexpected findings are vital

in improving maternal outcomes. Timely diagnosis, close fetal monitoring, timely surgical care with a multidisciplinary approach is crucial to optimize maternal and fetal outcomes.

Ethical Considerations

Written informed consent was obtained from the patient for the publication of this case report and the accompanying clinical images. All identifying information has been anonymized to protect the patient's privacy.

Conflict of Interest

The authors declare that they have no conflicts of interest.

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