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## **Natural history of hepatic subcapsular hematoma in mild pre-eclampsia**

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Pre-eclampsia occurs in 5% to 8% of pregnant women all over the world with geographical differences in the prevalence [1]. Subcapsular liver hematoma (SLH) affects 1/250 000 deliveries and 1–2% of women with preeclampsia in the absence of direct maternal trauma [2]. Minor trauma and repeated hypertension episodes may increase the risk of hepatic capsule rupture. Liver rupture is secondary to subcapsular hepatic hematoma that extends the Glisson's capsule resulting in capsular rupture. It is estimated that 92.8% cases of SLH and their rupture in pregnant women is related to HELLP syndrome (haemolysis, elevated liver enzyme, low platelet) [3]. In the short review by Gupta et al. [4], the authors estimated perinatal mortality rate of 41% but maternal up to 15%. Regarding to Dabry et al. [5] the liver bleeding can occur at any time during pregnancy with pre-eclampsia including the labour and postpartum recovery.

A 35-year-old nulliparous woman in the 33<sup>rd</sup> week of gestation, with gestational hypertension and peripheral oedema, was admitted to the Department of Obstetrics with suspicion of pre-eclampsia: elevated blood pressure (BP) and general malaise. Her past

medical history revealed three spine surgeries, obesity (BMI 33 kg/m<sup>2</sup>) and varicose veins. She was on 60 mg of Enoxparine subcutaneous daily because of varicose veins and low-dose acetylsalicylic acid (150 mg per day orally) as pre-eclampsia prophylaxis. On admission she reported increasing peripheral oedema, however, proteinuria was not clinically significant — 75 mg/24 hours in 24-hour urine collection. Fetal ultrasound scan (US) showed appropriate for gestational age weight and amount of amniotic fluid. Baseline laboratory tests results from admission until discharge are presented in Table 1. Despite of intensified pharmacotherapy, her blood pressure was slightly, but constantly rising, reaching the peak of 153/104 mm Hg (Tab. 2). She was receiving methyldopa 2 g orally and additionally verapamil 80 mg per day orally from the 5<sup>th</sup> day of hospitalization. On the 6<sup>th</sup> day, the patient complained of right shoulder pain. After a few hours she reported severe upper right-sided abdominal pain. Her BP was 140/90 mm Hg, heart rate was 78 bpm. Physical examination revealed palpable tender upper abdominal area, negative Blumberg and costovertebral angle tenderness, but positive Murphy's sign. Obstetric examination did not show contractions, neither amniotic fluid leakage nor cervical shortage/dilatation. Cardiotocography (CTG) and fetal US scan were normal. Urgent abdomen ultrasound scan revealed a heterogeneous, well-delineated area measuring 45 × 110 mm in larger diameter, that was indicative of subcapsular hepatic hematoma (Fig. 1). There was no free fluid in the peritoneal cavity. On further laboratory investigations within 3 hours decrease in hemoglobin level from 12.2 to 9.7 g/dL, elevated liver enzymes and prolonged APTT were observed. The patient's condition worsened — she became sleepy and was lying in forced left sided position caused by pain. CTG monitoring detected minimal variability. Due to suspicion of subcapsular liver hematoma related to pre-eclampsia and threatening perinatal asphyxia, urgent laparotomy was performed. Multidisciplinary team comprising obstetricians and surgeons performed caesarean section, followed by liver hematoma evacuation. A 1500 mL hemoperitoneum was found. An alive neonate was born, weighing 1870 grams. Apgar score were 6/6/7/7 (after 1, 3, 5 and 10 minutes, respectively). Subsequently, surgeon confirmed rupture of right hepatic lobe and extensive subcapsular hematoma on the diaphragmatic surface of the liver. Hematoma and damaged parts of Glisson's capsule were removed. Argon plasma coagulation was efficient to control liver bleeding. Blood loss was estimated at 2000 mL, patient required transfusion of four units of red blood cells and two units of fresh frozen plasma.

Within following day's patients' blood pressure, laboratory parameters and clinical condition were getting stabilized. Hydrothorax was diagnosed three days after surgery,

however it resolved spontaneously within two weeks. The patient and her baby were discharged in good condition 17 days after the surgery.

The high suspicion for liver hematoma/rupture should be considered when a pregnant patient complains of epigastric, right upper-quadrant or shoulder pain, especially when it is associated with pre-eclampsia and eclampsia. Proper diagnosis and early treatment increase patient's survival rate. This brief case report underlines the need for prompt diagnosis at symptomatic patients, a multidisciplinary approach with intensive care support and immediate surgery.

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**Figure 1.** Liver ultrasound scan showing large hematoma in the right lobe (hyperechoic area representing blood clots, 45 × 110 mm)



**Table 1.** Patient’s laboratory results from admission until discharge. The fourth column refers to the first symptoms of liver hematoma. Red line represents time of caesarean section and hematoma evacuation

Laboratory findings	Admission	6 <sup>th</sup> day	6 <sup>th</sup> day symptoms	7 <sup>th</sup> day	8 <sup>th</sup> day	15 <sup>th</sup> day	Discharge
HGB [11.5–15.0 g/dL]	12.6	12.2	<u>9.7</u>	9.3	8.0	10.6	13.2
HCT [36%–46%]	37	36.7	<u>27.9</u>	27.5	23.3	33.1	40.9
PLT [130–400 10 <sup>3</sup> /μL]	232	224	<u>192</u>	159	183	329	558
LDH [< 247 U/L]	130	–	–	188	386	–	206
AST [< 31 U/L]	13.0	45	<u>92</u>	335	338	16	18
ALT [< 34 U/L]	13	39	<u>77</u>	487	484	48	23
Total Protein [6.6–8.3 g/dL]	–	4.8	–	3.5	–	5.6	7
Creatinine [0.66–1.09 mg/dL]	0.63	0.62	<u>0.65</u>	0.92	–	0.67	–
APTT [25.4–36.9 sec]	29.3	35.9	<u>38.9</u>	31.5	32.8	30	31.4
INR [0.8–1.2]	0.91	0.88	<u>0.94</u>	1.01	0.97	1.13	1.05

ALT — alanine transaminase; APTT — activated partial thromboplastin time; AST — aspartate transaminase; HCT — haematocrit; HGB — hemoglobin; INR — international normalized ratio; LDH — lactate dehydrogenase; PLT — platelet count

**Table 2.** Patient’s blood pressure from admission until discharge. She was receiving methyldopa 2 g from admission and verapamil 80 mg per day from the 5<sup>th</sup> day of hospitalization. The fourth column refers to the first symptoms of liver hematoma. Red line represents time of caesarean section and hematoma evacuation

<b>Blood pressure</b>	<b>Admission</b>	<b>2<sup>nd</sup> day</b>	<b>3<sup>rd</sup> day</b>	<b>4<sup>th</sup> day</b>	<b>5<sup>th</sup> day</b>	<b>6<sup>th</sup> day</b>	<b>6<sup>th</sup> day symptoms</b>	<b>7<sup>th</sup> day</b>	<b>Discharge</b>
<b>Mean daily blood pressure [mmHg]</b>	130/90	140/95	138/90	140/88	136/89	142/93	<u>124/86</u>	119/82	126/79
<b>Peak blood pressure [mmHg]</b>	141/96	144/99	154/97	139/95	151/90	153/104	<u>125/81</u>	132/84	128/87