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Case Report

# Assisted Laparoscopic Management of a Case of Ruptured Subcapsular Liver Hematoma in an Abruptio Placentae Due to Severe Pre-eclampsia - Case Report

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## Abstract

**Background:** Subcapsular liver hematoma is a very rare clinical phenomenon following severe preeclampsia. It therefore makes it mandatory for at risk patients to be managed and followed up in a health care facility with available intensive care unit. There is no consensus regarding treatment. Options vary from conservative management to surgical treatment including hepatic resection, segmental hepatic artery ligation, segmental portal vein ligature, and up to liver transplantation in certain until resolved cases.

**Case Presentation:** In this report we describe a case of a 27-year-old woman, with irrelevant past medical history, 36 weeks gestation presenting with Ante-Partum Hemorrhage due to severe pre-eclampsia. The woman underwent emergency caesarean section due to fetal distress with extraction of a living fetus. Immediately after the caesarean section, the patient was admitted to I.C.U. for intensive monitoring. One hour later, the patient started complaining of right shoulder pain and the intra-peritoneal drains collected 700cc of blood. Abdominal Ultrasound only revealed fluid in the Douglas pouch reaching the uterine fundus. Vital signs of the patient started deteriorating with intense tachycardia at 155 bpm, rapid shallow respiration with low C.V.P. inspite of fluid replacement. The drains collected a total of 2000cc of blood that mandated exploratory laparotomy. Laparotomy through reopening of the Pfannensteil incision revealed asubcapsular liver hematoma, which occupied the whole posterior segment and part of the anterior segment of the right lobe of the liver (segments VI, VII and encroaching over segment V as well).

Haemostatic measures were performed and ended by packing of the liver. The patient was monitored in the I.C.U. After 72 hours, laparoscopy was performed first to evaluate the liver and the bleeding after mobilization of the packs that showed only minimal bleeding. Therefore, the Pfannensteil incision was reopened and packs exteriorized. An isolated omental pack was applied to the liver surface for extra hemostasis. The early post-operative period was uneventful and the patient's condition improved dramatically.

**Conclusion:** High clinical suspicion is necessary for the prevention of life-threatening events in mother and fetus. For this reason, acute care physicians have to be vigilant of the condition and consider this in the differential diagnosis of shoulder pain during pregnancy and postpartum especially in cases of severe pre-eclampsia.

***Keywords:*** *Ante-Partum Hemorrhage; Abruptio Placentae; Subcapsular Liver Hematoma; Abdominal Packing; Pre-Eclampsia*

## Abbreviations

I.C.U: Intensive Care Unit; C.V.P: Central Venous Pressure; SLH: Subcapsular Liver Hematoma; DIC: Disseminated Intravascular Coagulopathy; Bpm: Beat Per Minute; AST: Aspartate Aminotransferase; N: Normal Value; ALT: Alanine Aminotransferase; Hb: Hemoglobin; PLT: Platelets; USG: Ultrasonography; L.S.C.S: Lower Segment Caesarean Section; RR: Respiratory Rate; RBCs: Red Blood Cells; FFP: Fresh Frozen Plasma; INR: International Normalization Ratio; CT: Computed Tomography; U/S: Ultrasound

## Introduction

Ruptured subcapsular hematoma of the liver in pregnancy is uncommon and occurs in 1:45,000 to 1:225,000 deliveries [1]. The SLH may present as right upper quadrant abdominal pain or shoulder pain, abdominal distension, nausea or vomiting. SLH may lead to life threatening complications such as disseminated intravascular coagulation (DIC), acute hepatic and renal failure. We discuss the SLH secondary to severe Pre-eclampsia and review the literature [2].

## Case Report

A 27-year-old woman, gravida 4, para 3, with irrelevant past or family medical history, was admitted at 36 weeks of gestation with Ante-Partum Hemorrhage due to severe Pre-eclampsia proved later to be Abruptio placentae. The patient's complaints were severe bleeding and absence of fetal kicks. Her heart rate 160 bpm and arterial blood pressure was 180/110 mmHg.

Laboratory findings revealed urine albumin 2+, serum bilirubin 1.2 mg/dL, serum aspartate amino transaminase (AST): 160 IU/L (N: 5 - 34), serum alanine amino transaminase (ALT): 93 IU/L (N: 0 - 55), serum urea 37 mg/dL and creatinine 1.1 mg/dL, hemoglobin (Hb): 7.5 mg/dL (N: 11.5 - 16.0), and platelet count (Plt): 80,000/$mm^3$ (N: 150,000 - 450,000). By obstetric ultrasonography (USG), the data revealed average gestational age of 34 weeks with severe fetal bradycardia and retroplacental hematoma.

Emergency lower segment Caesarean section (LSCS) was done in view of fetal distress. Intra-operatively, a retroplacental hematoma of 500 mL was removed and another 500 mL of estimated blood loss was suctioned, hemostasis achieved, and the patient was transferred to the I.C.U postoperatively for monitoring, replacement of fluids and replacement of blood or blood constituents. One hour postoperatively, the patient's intra-peritoneal drains collected 700cc of blood and the patient started complaining of right shoulder pain and her vital signs began deteriorating with tachycardia of 155 bpm, rapid shallow respiration (RR 32/m) and blood pressure 100/60 mmhg. Dopamine and blood transfusion were administered to maintain vital signs but the drains collected additional 1300cc of blood during one more hour. Urgent ultrasound revealed moderate amount of echogenic fluid in Douglas pouch reaching uterine fundus.

Emergency exploratory laparotomy via the same Pfannensteil incision of the LSCS showed a well-contracted uterus with intact incision line showing no bleeders. However, a collection of about 1000cc of blood clots was identified in the pelvis getting into and trickling from the right para-colic gutter, while on the left side the gutter was free; raising the suspicion that the source of bleeding to be coming mainly from the upper right side of the abdominal cavity.

After careful removal of the blood clots, further exploration for the source of bleeding revealed a ruptured subcapsular liver hematoma involving the whole postero-lateral surface and encroaching on the anterior surface of the right lobe of liver with dimensions of 10x10 cm approximately (Figure 1).

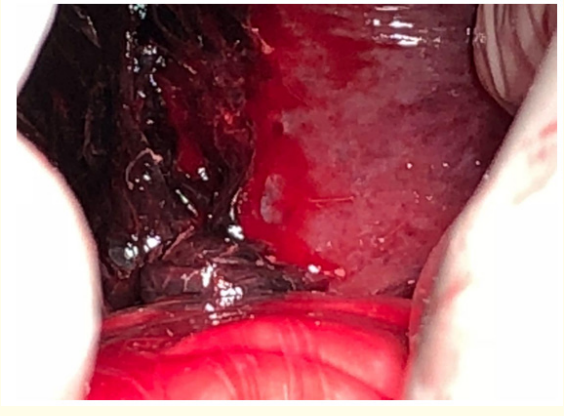

***Figure 1:*** *On laparotomy.*

An actively bleeding surface was present and several trials of compression with abdominal towels were attempted to achieve cessation of the bleeding and good hemostasis but were unsuccessful.

GELFOAM was applied on the bleeding surface but it continued to bleed. Packing of the upper right abdominal compartment around the liver and in between the liver and the lateral abdominal wall was done with eight abdominal towels inserted in the Morrison's space (inferior surface of the liver), over the antero-superior and lateral surfaces of the liver, extending over the bleeding surface. The abdomen was closed with two intra-peritoneal drains, one in the subhepatic space and another in the Douglas pouch. A plan to remove the towels 48 to 72 hours later was agreed upon with the presence of the Hepatobiliary Surgery team.

Follow up investigations within the first 24 hours post-operative showed hemoglobin: 11 gm%; (the patient was transfused with two units of packed RBCs and three units of FFP intra-operatively during the second intervention, followed by four units of packed RBCs, and six units of FFP during the following 24 hours), INR 1.16, platelet: 45,000/cumm, blood urea: 31 mg%, serum creatinine: 1 mg%, AST: 2553 IU/mL and ALT: 2506 IU/mL. During the following 72 hours period the pulse rate settled down near 100/min with 140/90 mmhg blood pressure, minimal subhepatic and intra-peritoneal drains output and maintained normal urine output.

After 72 hours from the second operation, the patient showed hemodynamic stability. In the light of the hypoalbuminemia presented in the patient lab results, the decision of diagnostic laparoscopic assessment, with a 30-degree telescope was taken to assess the bleeding after removal of the peritoneal towels in an attempt of decreasing morbidity associated with midline or Kocher's incision regarding wound healing power, respiratory condition and overall morbidity. Intraperitoneal towels were removed and only minimal oozing from liver surface was encountered (Figure 2).

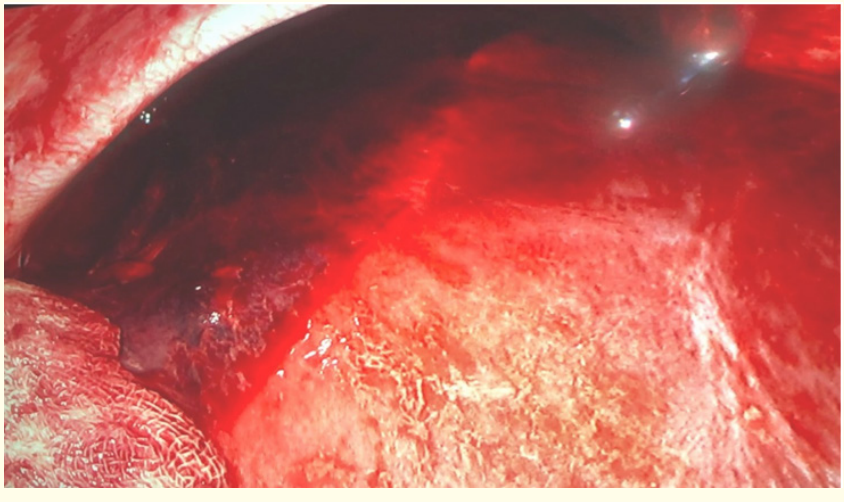

***Figure 2:*** *Minimal oozing by laparoscopic assessment.*

The patient was converted to laparotomy via reopening of the Pfannensteil incision to remove the towels. An Absorbable hemostat sheets (FIBRILLAR) and an isolated omental pack were tailored and positioned over the bleeding surface of the ruptured hepatic subcapsular hematoma, with complete covering of the oozing liver surface. The patient was left for around ten minutes to ensure complete haemostasis without rebleeding from the raw area of the ruptured SLH, before closing layers over one intra peritoneal drain in the morrison pouch.

The patient was stable and was extubated, then transferred to ICU for optimum monitoring.

Over the time, drain output reduced and drain was removed Day 3 post-operatively. Liver enzymes and kidney function returned to normal after 2 weeks. Patient was discharged on antihypertensive therapy.

Follow up was done for our patient and the CT scan provided the complete disappearance of the SLH, as shown in figure 3 (the huge SLH), figure 4 (complete disappearance)

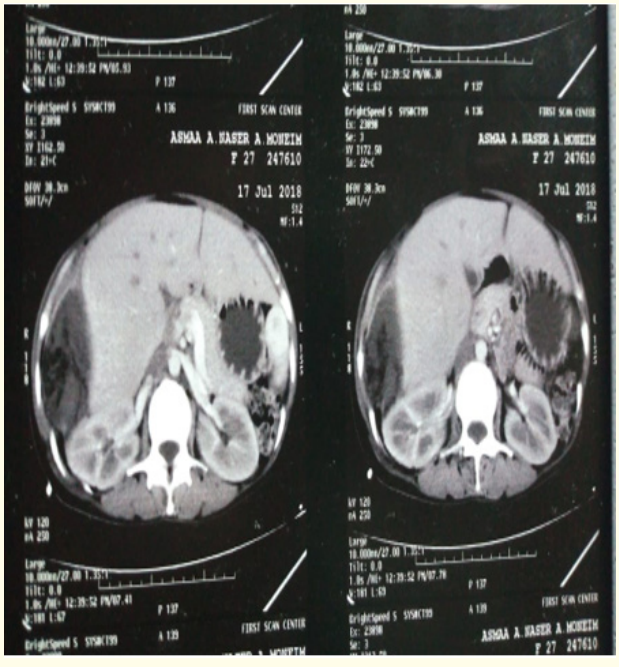


***Figure 3***

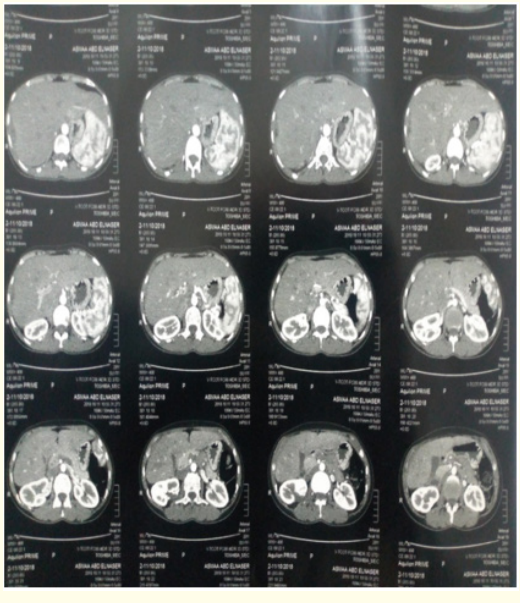

***Figure 4***

## Discussion

Virchow described hepatic changes in women with fatal Eclampsia or severe pre-eclampsia in 1856. The characteristic lesions commonly found were regions of periportal hemorrhage in the liver periphery. In their elegant autopsy studies, Sheehan and Lynch (1973) described that some degree of hepatic infarction accompanied hemorrhage in almost 50% of women who died with Eclampsia. These corresponded with reports from 1960 describing elevated serum hepatic transaminase levels. Along with earlier observations by Pritchard and colleagues (1954), who described hemolysis and thrombocytopenia with Eclampsia [3]. Abercombie reported SLH in pregnancy firstly in 1844 [2]. The incidence of SLH has been reported to be higher in the group of advanced maternal age and multiparous patients [4]. Remarkably, the etiopathogenesis still remains unclear [2]. An interesting hypothesis is based on the formation of fibrin thrombus within the hepatic arteries and sinusoid capillaries, which in turn leads to periportal necrosis, intrahepatic hemorrhage, and finally subcapsular hematoma [2]. In the vast majority of cases (75% of the patients) right hepatic lobe is more frequently affected [4].

Preeclampsia and related hypertensive disorders of pregnancy impact 5 - 8% of all births in the United States [4,5]. Incidence rates for preeclampsia alone - in the United States, Canada and Western Europe, range from 2 - 5% [4,5]. In the developing world, severe forms of preeclampsia and eclampsia are more common, ranging from a low of 4% of all deliveries to as high as 18% in parts of Africa [4].

The variation in incidence rates is driven by the diversity of definitions and other criteria (including procedures, tests and their methodologies). In Latin America, preeclampsia is the #1 cause of maternal death [6].

The cases of subcapsular liver hematomas must be treated in tertiary centers for prompt recognition and optimal treatment. Because the prognosis can be changed by the timely diagnosis and treatment [6], ultrasound, CT and MRI can be used for the diagnosis [7]. Liver hemangiomas or hematomas in pregnancy must be closely monitored by hemodynamic and coagulation parameters during the management of Pre-Eclampsia and other hypertensive disorders. Serial evaluation with imaging techniques, avoidance of the liver manipulation and immediately replacement of blood products are essential. Postpartum follow-up should include serial assessment with ultrasound, CT or MRI until the defect resolves [7].

Hemodynamically stable patients should be followed up conservatively.

Non-operative, conservative management includes intensive medical support with infused fluid, and replacement of blood and blood products with or without percutaneous embolization of the hepatic arteries supplying these hematomas. If rupture has occurred and the patient is unstable hemodynamically, surgery will be necessary. Packing of the bleeding surfaces (if there is no bleeding branches) with drainage of the perihepatic space, packing with collagen fleece or up to partial hepatic resection (formal or aformal), may be used during surgical operation. Liver transplantation has been reported when the hemorrhage cannot be controlled and/or acute liver failure occurs [7].

In our case reopening the initial Pfannensteil incision for exploration was sufficient to locate and manage the source of bleeding.

Owing to the slim physique of the patient, diagnostic laparoscopy was an optimum choice when removing the abdominal towels and was of utmost help to plan for the abdominal incision. Therefore, avoiding extensive incisions as first choice of entry in all the laparotomies should be further studied to prevent the associated morbidity.

## Conclusion

Subcapsular liver hematoma due to severe Pre-Eclampsia is a rare clinical entity and should be highly suspected in the presence of unstable vital signs or in the presence of intraperitoneal haemorrhage.

Vigilant monitoring of patients with Pre-Eclampsia by advanced imaging techniques in pre and postpartum period is mandatory, primarily by abdominal U/S with liver survey to exclude SLH.

Although midline incision is the standard approach for exploratory laparotomies, Pfannensteil incision may give a suitable access in selected cases.

The benefit of laparoscopy prior to laparotomy to evaluate the condition aids in avoiding a more extensive incision like midline or Kocher incisions with their associated morbidity.

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