Published online . 2026 April **Case Report**

A Rare Case of Spontaneous Hepatic Rupture Secondary to a Solitary Necrotic Nodule of the Liver in a Pregnant Woman; Never Put off the Action Until Tomorrow!

Soosan Nazari[1], Azam Sabri[2], Ghazaleh Khademian[2], Benyamin Fazli[3], Shirin Sadri[4,] *

1. Department of Obstetrics and Gynecology, Razavi Hospital, Imam Reza International University, Mashhad, Iran
2. Department of Anesthesiology, Razavi Hospital, Imam Reza International University, Iran
3. Department of Anesthesiology, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran
4. Department of Obstetrics and Gynecology, Maternity Division, Gloucester Royal Hospital, Gloucester, United Kingdom

*** *Corresponding author:*** Shirin Sadri, Department of Obstetrics and Gynecology, Maternity Division, Gloucester Royal Hospital, Gloucester, United Kingdom E-mail: Shirin.sadri@nhs.net

Received 2025 August 17**; Accepted** 2025 November 16.

Abstract

Background: Spontaneous hepatic rupture (SHR) in pregnancy is a rare and life-threatening event that causes a high burden of maternal and perinatal mortality. Herein, we describe a pregnant woman with a perplexing manifestation that results in maternal mortality followed by SHR.

Case Presentation: A 37-year-old woman at 38 weeks of gestational age, complaining of continuous and worsening epigastric pain with intermittent vomiting, was admitted to the emergency department. Regarding the abdominal pain's unexplained nature, some paraclinical findings, such as deceleration in fetal heart rate and breech presentation, led to the emergent cesarean section being scheduled. After the baby's birth, a massive hemorrhage originating from the Glisson capsule, hepatic right lobe, and the partial section of the left hepatic lobe were seen. Unfortunately, the surgical intervention can not manage the patient at the end of the surgery.

Conclusion: The multidisciplinary approach and aggressive intervention of SHR patients may heighten the chance of survival, especially in pregnant women.

Keywords: Pregnancy, Liver neoplasms, Shoulder pain, Abdominal Pain.

1. Background

Spontaneous hepatic rupture (SHR) in pregnancy is an extremely rare and life-threatening event that causes high maternal and perinatal mortality (1).

Some comorbidities, such as eclampsia, preeclampsia, HELLP syndrome, or hepatic malignancies, may result in spontaneous hepatic rupture (SHR). Nevertheless, the solitary necrotic nodule of the liver is introduced as a scarce benign non-neoplastic lesion of the liver that can occur with this event (2-3).

Herein, we report a rare case of a pregnant woman with a solitary necrotic nodule of the liver (SNNL) and SHR.

2. Case Report

A 37-year-old woman at 38 weeks' gestational age, $G_4AB_1EP_2$, was referred to our Emergency Department (ED). She was complaining of continuous and worsening epigastric pain (pain score=6/10), with intermittent vomiting. She stated that her epigastric pains, before admission, lasted for about one hour, although they lasted for a long time. Also, the right shoulder pain was significant at admission, worsening 12 hours before admission. The patient had a smooth antenatal course and no history of

trauma or intercourse before hospital admission.

Moreover, there was no evidence related to oral contraceptive use or other medications. The patient was transferred to the Department of Obstetrics and Gynecology. On admission, hemodynamic parameters were stable: blood pressure 146/88 mmHg, heart rate 97 bpm, respiratory rate 21 breaths/min, and afebrile with a central temperature of 36.7 °C. His oxygen saturation was 94% at rest, using a finger pulse oximeter on an index finger. Physical examination revealed that the uterine fundus was five fingers above the umbilicus without contractions. Based on the epigastric pain as a non-specific symptom, pantoprazole, with 40 mg intravenously, was administered. After 10 minutes, the symptoms were alleviated, and the pain score was 4/10. Also, the nausea and vomiting were discontinued.

Laboratory findings at this time were normal except A.S.T. 48 IU/L. Regarding the elevated blood pressure at the ED entrance, she was evaluated for probable preeclampsia. Nevertheless, the urinary analysis had no evidence of preeclampsia, such as proteinuria.

The ultrasound performed by the gynecologist showed normal fetal heart rate and normal fetal heart sounds at 152 beats/min. No images suggested placental abruption. Also, the breech presentation was seen. Based on the abdominal pain's unexplained nature, ultrasonography was indicated, but due to the contracture commencing, besides deceleration in fetal heart condition and breech presentation, the emergent cesarean section was scheduled. The patient was transferred to the operating room with stable hemodynamics. After that, under spinal anesthesia, the abdomen was opened with a Pfannenstiel incision. After the peritoneal opening, the abdominal cavity was full of blood. At this time, the uterus incision was done immediately, and the male infant was born with a 9/10 APGAR score.

Due to the continuous massive hemorrhage without the principal source, the laparotomy was done. Simultaneously, the emergent multidisciplinary consultation with the general surgeon, hepatic surgeon, and another gynecologist was performed. A massive hemorrhage in the hepatic surface was found during the primary exploration. The Glisson capsule, hepatic right lobe, and the partial section of the left hepatic lobe were ruptured. Based on these findings, peritoneal lavage with saline was performed, and hepatorrhaphy was initiated. The critical situation was initially controlled, and she underwent a massive blood product transfusion (Red blood cells: 5 Units, Platelets: 5 Units, and fresh frozen plasma: 4 units). The two drains were placed, and drainage was normal. She was transferred to the intensive care unit (ICU) with a stable hemodynamic condition after packing the hepatic region.

The hematologic assessment revealed a hemoglobin of 13.3 g/dL, a hematocrit of 37.5%, and a platelet count of 207,000 microliters. Also, the coagulation parameters showed a prothrombin time of 20.1 sec, a partial thromboplastin time of 35.8 sec, and an INR of 1.56. The hepatologic parameters revealed that A.L.T= 261 IU/L, A.S.T= 425 IU/L, and alkaline phosphatase= 115 U/L. The blood gas sample showed mild primary metabolic acidosis (PH= 7.33, HCO3= 23.8, and PaCO2= 46 mmHg). Unfortunately, after early continuous monitoring in the ICU, sudden hemodynamic deterioration was noted, accompanied by massive drainage. So, she was transferred to the operating room for emergent exploration laparotomy. At this time, multiple hepatic ruptures were observed. There was a massive laceration at the posterior portion of the hepatic and the hepatic branches around the inferior vena cava (IVC). The two red blood cell

transfusions were scheduled. The proximal segment was clamped, although due to the extensive injuries, especially in hepatic branches on IVC, the hemostatic procedure failed, and the patient expired (Supplementary file 1). The wedge biopsy from the fourth hepatic segment was taken.

In the microscopic examination, fragments of the liver showed severe congestion, hemorrhage, hepatocyte necrosis, ballooning changes, and degeneration. Also, central necrotic tissue surrounded by a fibrous capsule containing inflammatory cells was found. The portal tracts show mild lymphocytic inflammation. These findings confirmed the diagnosis of a solitary necrotic liver nodule (Figure 1).

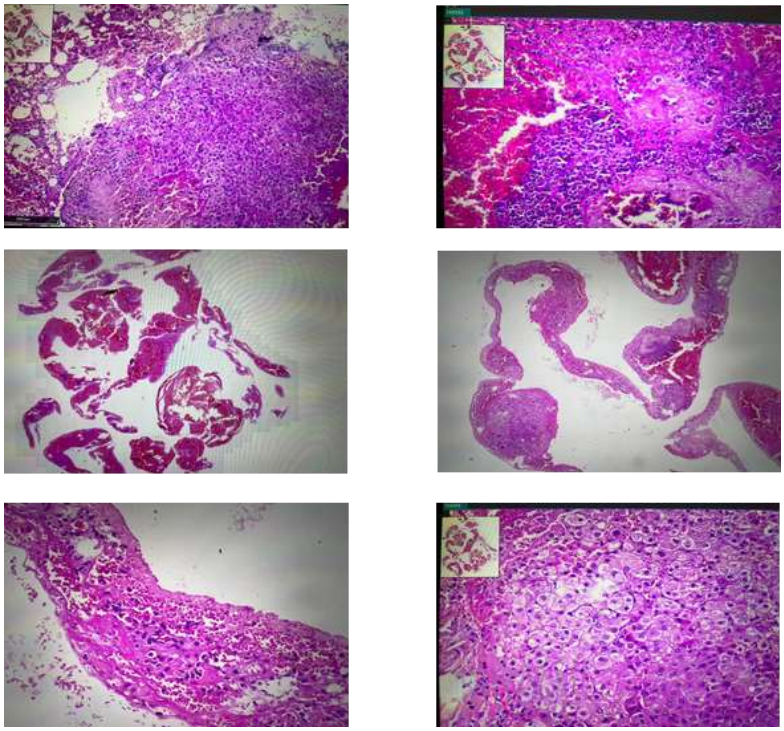

Figure 1: The microscopic evaluation showed severe hepatocyte congestion, necrosis (upper), ballooning changes, and degeneration (middle). The central necrotic tissue, surrounded by a fibrous capsule containing inflammatory cells (lower), was seen

3. Discussion

Spontaneous hepatic rupture (SHR) during pregnancy is known as a rare event that results in a high mortality rate, even with rapid diagnosis and treatment interventions (2).

In the majority of cases, the SHR during pregnancy is associated with severe preeclampsia, eclampsia, or HELLP syndrome. Some of the literature indicated that this fatal event may be presented due to primary or metastatic liver tumors (1, 3).

The non-specific signs and symptoms of SHR may be altered, delay the management process, and result in maternal mortality. Meanwhile, severe abdominal pain, shoulder pain, and vomiting are considered a figure of SHR in pregnant women, which requires emergent action. Imaging modalities such as abdominal ultrasonography, CT, or MRI can facilitate the approach to definite diagnosis (4-6).

In this case, concerning the rapid deceleration of the fetus's conditions, multidisciplinary discussion caused the emergent induction of the cesarean section

with prominent clinical findings related to the SHR as a standard management approach. Also, an immediate exploratory laparotomy was established.

Various procedures were introduced at this point, including hepatorrhaphy, perihepatic packing, and hepatectomy (1). Since the hemorrhagic point was secondary to the rupture of the Glisson capsule, the hepatic right lobe and the partial section at the left hepatic lobe were explored, and we performed hepatorrhaphy, which successfully controlled the massive bleeding and removed the lesions.

If the intraoperative condition is favorable, hepatic artery embolization may even be considered as an alternative procedure to hemorrhagic ceasing. Conservative non-operative management could be attempted for highly selected patients, although (7). Because of the excessive hemorrhage and the critical situation that may cause maternal or fatal mortality in our case, the conservative treatment was seen as unreasonable.

The development of liver tumors in pregnant women, especially in the late pregnancy period, is scarce (8). However, we confirmed that the nodule under the hepatic lesion that caused the SHR was an SNNL.

Although the etiology of SNNL remained unclear, other studies suggested that trauma-related diseases, underlying hemangioma, or parasitic infections are the most probable causes of it (9).

Our patient had no evidence of any potential SNNL causes of hepatic rupture. So, the decision-making for the base practice in this case was very challenging.

The other studies showed that under multidisciplinary consultation, a treatment plan combining a simultaneous cesarean section and an exploratory laparotomy could preserve both maternal and neonatal survival (9).

4. Conclusion

Unfortunately, in our case, due to the excessive hepatic ruptures, despite the aggressive and emergent surgical intervention, treatment was not successful. So, it is suggested that multidisciplinary collaboration and immediate surgical intervention are considered crucial cornerstones to enhance the perinatal outcomes when SHR is suspected in a pregnant patient.

Acknowledgements: We are very grateful to all the department of meternity block and pathology staff, Razavi hospital, Mashhad, Iran.

Availability of data and materials: The dataset presented in the study is available on request from the corresponding author during submission or after publication.

Conflicts of interests: The authors declare no conflict of interest.

Consent for publication: Written informed consent was obtained from the patient's guardians to publish.

Ethics approval and consent to participate: Written informed consent was obtained from the patient's guardians to publish. Also, this study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki

Financial disclosure: No financial support was received for this study.

Author contributions: S.N.: Contributed to the conception of the work, revising the draft, approving the final version of the manuscript, and agreeing on all aspects of the work; A. S. B: Contributed to acquiring data, drafting the manuscript, and approving the final version; G. K. and B.F.: Contributed to the conception and design of the study, critical revision, and approval of the manuscript's final version; Sh. S., Contributed to the conception and design

of the study, drafting of the manuscript, critical revision, and approval of the final version.

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