Received: 13 October 2022 | Revised: 21 March 2023 | Accepted: 5 May 2023

DOI: 10.1002/ccr3.7500

Clinical Case Reports Open Access WILEY

CASE REPORT

A case report of a pregnant woman with compensated liver cirrhosis and pancytopenia

Sreenisha S. S | **Abdulmalik Bako** | **Salwa Abo Yaqoub** | **Feazlin Mohd Din**

Department of Obstetrics & Gynaecology, Women's Wellness and Research Center, Hamad Medical Corporation, Doha, Qatar

Correspondence
Sreenisha S. S, Department of Obstetrics & Gynaecology, Women's Wellness and Research Center, Hamad Medical Corporation, P.O Box 3050, Doha, Qatar.
Email: drsreenisha@gmail.com

Funding information
Qatar National library QNL open access funding; Qatar National Research Fund

Key Clinical Message

Liver cirrhosis may worsen during pregnancy resulting in adverse maternal and fetal outcomes. Proper antenatal evaluation, staging, and variceal screening will facilitate the management. Elective endoscopic variceal ligation (EVL) during the second trimester can prevent unexpected variceal bleeding. A multidisciplinary approach including the planning of delivery and shared decision-making is recommended for favorable pregnancy outcomes.

Abstract

Pregnancy in women with liver cirrhosis is relatively uncommon. During pregnancy, liver cirrhosis and portal hypertension may worsen significantly, placing both the mother and fetus at an increased risk of serious morbidity and life-threatening events. With the use of a wide variety of diagnostic tools and considerably improved treatment strategies, many women with liver disease in pregnancies are being diagnosed with significantly improved obstetric outcomes. We present a case of a 33-year-old lady with a previous medical history of cryptogenic chronic liver disease and schistosomiasis associated with periportal fibrosis, portal hypertension, splenomegaly, and pancytopenia. The mother presented to our tertiary care center at 18 weeks of gestation. She had EVL twice during the second trimester. With multidisciplinary care and follow-up, she labored spontaneously and was discharged home on third postnatal day.

KEYWORDS

endoscopic variceal ligation (EVL), liver cirrhosis, portal hypertension (PHTN), splenomegaly, thrombocytopenia

1 | INTRODUCTION

Pregnancy is relatively rare in women with established liver cirrhosis.[1] In this era of assisted reproductive technologies, advanced maternal age, early detection of cirrhosis with modern diagnostic modalities, and improved treatment strategies for liver disease, an increasing number of pregnancies, and improved obstetric outcomes are being reported.

Cirrhosis in pregnancy can have a wide range of presentations ranging from asymptomatic cases to hepatorenal failure and life-threatening variceal bleeding. Indeed, severe cases can cause significant maternal and fetal morbidity and mortality. About 50% of women with preexisting portal hypertension will develop liver-related complications during or after pregnancy, most commonly manifesting as either variceal hemorrhage or hepatic decompensation, with maternal mortality rates of 8%.[2] Other associated complication of liver cirrhosis includes higher rates of spontaneous abortion and prematurity, hepatic decompensation, splenic artery aneurysm, rupture, and postpartum hemorrhage.[3] The outcome of pregnancy may be influenced by the underlying etiology of liver diseases such as viral and autoimmune hepatitis, and medication use that needs to be carefully selected and monitored.[3,4]

There is a need for a multidisciplinary approach to the management of women with severe liver cirrhosis to minimize the associated adverse pregnancy outcome, including maternal-fetal medicine specialist, high-risk obstetric team, hepatologist, gastroenterologist, intensivist neonatologist, and anesthetist.

2 | CASE PRESENTATION

A 33-year-old Eritrean lady with a previous medical history of cryptogenic chronic liver disease and schistosomiasis associated with periportal fibrosis, portal hypertension, splenomegaly, and pancytopenia was referred to our hospital at 18 weeks gestation. She was Para 4, with no history of miscarriage.

She was diagnosed with cryptogenic chronic liver disease, hypersplenism, and portal hypertension in 2018 following an investigation of pancytopenia. Her hepatitis B and C virus, human immunodeficiency virus, and anti–smooth muscle antibody (ASMA), anti-mitochondria, anti-liver/kidney microsomal antibodies (anti-LKM), anti-trans glutaminase, ferritin, alfa 1 anti-trypsin, and ceruloplasmin were all negative. However, she was positive for schistosomiasis. Her schistosomiasis was treated by the infectious disease team, and her liver dysfunction and pancytopenia were managed by the hepatology and hematology teams. She was advised to avoid pregnancy due to the high risk of her developing liver decompensation and adverse pregnancy outcome.

The lady was informed of the possibility of termination of pregnancy due to her chronic liver disease by the referring physician and referred to us for further management. However, she wished to continue with the pregnancy.

Her baseline liver transaminases were normal, and an ultrasound of her abdomen showed an enlarged spleen measuring 18.7 centimeters. Under conscious sedation, an upper endoscopy showed three columns of esophageal varices with a severity of Grade 2 with red signs. The red signs (also called red wale signs) are red patches or stripes on the varices and are a sign of an increased risk of bleeding, or of bleeding that has already taken place.[5] The endoscopy also revealed moderate congestive portal gastropathy with no gastric varices. A multidisciplinary team including a maternal-fetal medicine specialist, high-risk obstetrician, hepatologist, gastroenterologist, intensivist neonatologist, and anesthetist reviewed her condition and recommended continuation of pregnancy with very close review and monitoring of her pregnancy and liver function. She was counseled about the importance of compliance with the advice and follow-up appointments.

She had endoscopic variceal ligation (EVL) at 18 and 21 weeks of pregnancy following which she was given propranolol 80 mg once daily and pantoprazole 40 mg twice daily. She had a normal fetal anomaly ultrasound at 19 weeks of gestation and her liver transaminases were stable and normal.

MDT meeting at 34 weeks' gestation recommended induction of labor at 38 weeks. Blood products were crossmatched and made available for labor care. She received six units of platelets for thrombocytopenia of 45,000 in labor and inhalational analgesia. She delivered a male baby weighing 3280 gm, with APGAR scores of 9 and 10 at 1 and 5 min, respectively. Her third stage was managed actively with parenteral oxytocin at the delivery of the anterior shoulder of the fetus, controlled cord traction, and infusion of 40 units of oxytocin in 500 mL of Ringer lactate and per rectal misoprostol 600 microgram.

She remained stable during the immediate postnatal period and was discharged on Day 3 on oral propranolol 80 mg once daily and pantoprazole 40 mg twice daily. She had further contraceptive counseling before discharge, and she chose to use male condoms. The follow-up appointments were scheduled with the gastroenterologist and hematologist. She was seen in the postnatal clinic during which contraception was further discussed and the importance of correct and consistent use of condoms was explained (Figures 1–4).

3 | DISCUSSION

The care of pregnant women with pre-existing chronic liver disease can be challenging to the clinical team. Indeed, pregnant women with underlying chronic liver cirrhosis can have associated anxiety due to the fear of the complications that might arise. Maternal and fetal outcomes are related to the severity of the liver disease. Antenatal scoring and classification of liver cirrhosis, and proper staging of variceal screening will facilitate the management of the woman. Elective EVL during the second trimester can prevent unexpected variceal bleeding Systematic reviews and meta-analyses suggest treatment options like accompanying endoscopic therapy prior to or during pregnancy for (non-bleeding) esophageal varices. However, there is no clear consensus that can be universally used due to the lack of randomized studies. This is considered safe in pregnancy.[5]

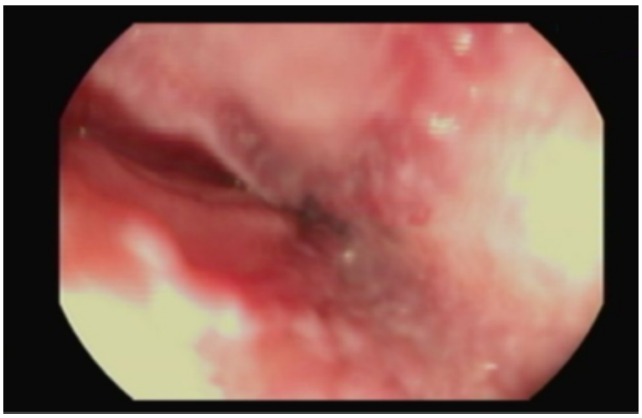

FIGURE 1 Esophagus and EG junction: Showed three columns of esophageal varices Grade 2 with red signs, three bands were applied successfully.

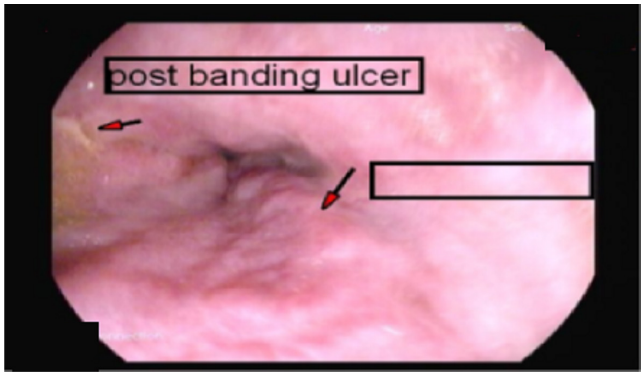

FIGURE 2 Surveillance endoscopy for EV eradication during the second trimester of pregnancy.

A prognostic scoring system such as the model for end-stage liver disease score (MELD score) has been reported to predict outcomes.[6] The MELD score accurately predicts liver-related complications during pregnancy.[7] A preconception MELD score of <6 predicts a positive outcome with minimal complications, while a MELD score of >10 predicts hepatic decompensation during pregnancy and a high risk of mortality.[7]

As this is rare in pregnancy, it helps to accumulate scientific data, would help to do in-depth narrative studies, and serve as a major educational tool. This is a case report, hence there is a lack of ensuring high-quality evidence and representativeness of the pregnant population with cirrhosis.

It is important that women with chronic liver disease that present to the primary care setting with pregnancy are referred to an appropriate unit with resources to care for the patient. An individualized care approach by a multidisciplinary team that is based on shared decision-making is recommended to achieve improved maternal and fetal outcomes. This patient had care provided by a team including a maternal-fetal medicine specialist, a hepatologist, a neonatologist, and an anesthetist.

This patient had a MELD score of 9 (Child-Pugh score A) and had EVL at 18 and 21 weeks of pregnancy. The American College of Gastroenterology recommends

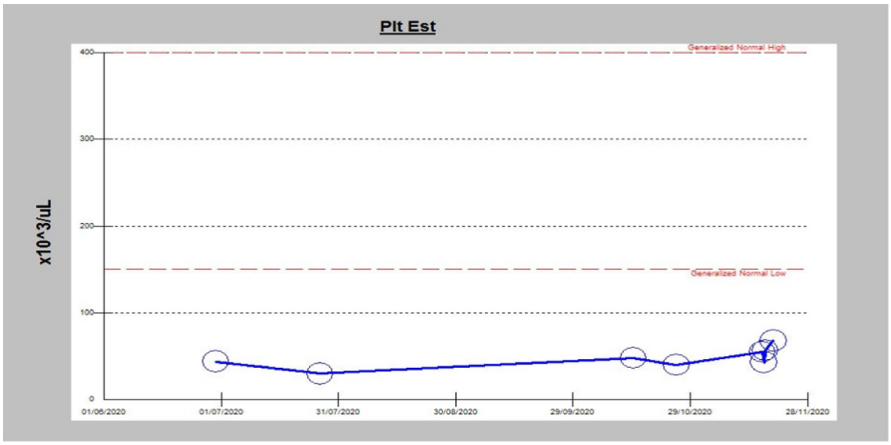

FIGURE 3 Graphic representation of platelet count.

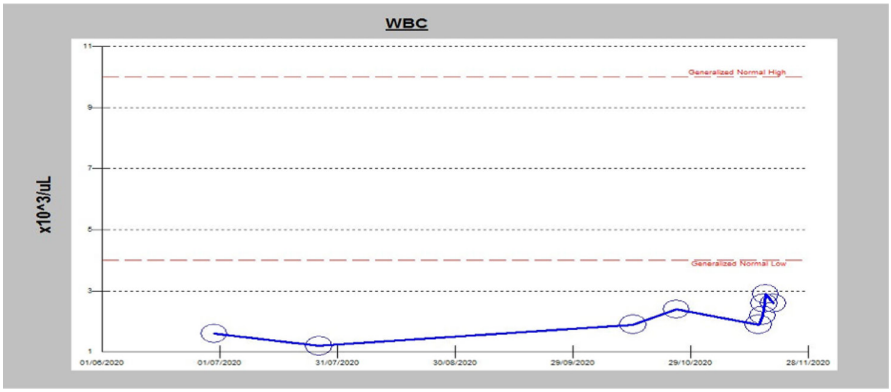

FIGURE 4 Graphic representation of WBC count.

variceal screening in the second trimester in women with suspected portal hypertension (PHTN).[8] Variceal screening during the second trimester or pre-conceptional surveillance is debatable, which could be an important topic for future research in the field. Underlying severity of cirrhosis and pregnancy outcome, which could in future studies help in individualized pre-conceptional and antenatal counseling and management.

There is an increased portal blood flow and intrahepatic resistance in women with cirrhosis leading to portal hypertension and subsequent formation of esophageal varices. Indeed, raised intrabdominal pressure because of pregnancy contributes to an increased risk of bleeding from the esophageal varices, particularly during repeated Valsalva maneuvers at delivery.[9]

The patient was treated with propranolol—a non-selective beta blocker to minimize the risk of bleeding from esophageal varices. Non-selective beta blockers are commonly used to manage esophageal varices in patients with cirrhosis and act by (1) blocking β1 receptors and reducing the cardiac output and (2) by blocking β2 receptors, producing splanchnic vasoconstriction and reducing portal flow.[10] The Food and Drug Administration of the United State classified propranolol as category C because its potential benefits may outweigh the fetal risks of growth retardation, bradycardia, and neonatal hypoglycemia.[11]

Our patient had thrombocytopenia of 45,000. Thrombocytopenia is seen in about 70% of women with liver cirrhosis.[12] Indeed, thrombocytopenia is a marker of the severity of the liver disease. Moderate-to-severe thrombocytopenia can be a strong independent predictor of mortality.[13,14]

Spontaneous bleeding is unlikely to occur at mild-to-moderate thrombocytopenia (platelet count 100,000–150,000/microL).[15] Moderate-to-severe thrombocytopenia (moderate 50,000–99,000/microL), and severe thrombocytopenia (<50,000/microL) can prevent patients from receiving vital interventions such as medications and invasive procedures. Delayed procedures and correction of platelet abnormalities can increase hospitalization time and increase overall health care costs.[15]

Abnormalities in hematological parameters are common in patients with cirrhosis. The pathogenesis of abnormal hematological indices (HIs) in cirrhosis is multifactorial and includes portal hypertension-induced sequestration, alterations in bone marrow stimulating factors, viral- and toxin-induced bone marrow suppression, and consumption or loss.[16] Up to 90% of circulating platelets may be redistributed to the large spleen. In portal hypertension, splenic sequestration and destruction of platelets, white blood cells (WBCs), and red blood cells (RBCs) in the enlarged spleen is defined as hypersplenism.[16] This could be the reason for this patient's cytopenia (thrombocytopenia and leucopenia). The patient had an enlarged spleen.

Schistosomiasis is a common parasitic infection that affects at least 240 million people worldwide and is found mostly in Africa[17] and it is a frequent cause of liver fibrosis worldwide.[18] Indeed, schistosomiasis is the second most common human parasitic infection causing approximately 280 thousand deaths annually due to renal failure and shock as a result of hematemesis.[17] It also causes morbidities such as hematuria, bladder cancer, hydronephrosis, kidney failure, and portal hypertension.[19] The patient lived in a region with widespread schistosomiasis.

The mode of delivery in women with chronic liver disease should be based on obstetric factors, with a cesarean section reserved for obstetric indications. Assisted vaginal birth can be offered to shorten the second stage to minimize the excessive increase in intra-abdominal pressure due to the Valsalva maneuver. Increased intra-abdominal pressure might increase the risk of variceal hemorrhage in a patient with higher grades of esophageal varices.[3] The risk of postpartum hemorrhage is greatly increased, particularly in patients with previous shunt surgery, deranged clotting factors, and thrombocytopenia. The patient had peripartum platelets transfusion and active management of the third stage. The adverse fetal outcome is largely due to premature delivery and stillbirth. Prior to discharge and

during the postnatal follow-up, effective contraception was discussed, and she was advised to seek evaluation and counseling prior to embarking on any future pregnancy.

4 | CONCLUSION

Liver cirrhosis and portal hypertension may worsen during pregnancy resulting in adverse maternal and fetal outcomes. The management of liver cirrhosis in pregnancy can be challenging to the clinical team and is associated with maternal anxiety. Counseling about the risks associated with pregnancy with chronic liver cirrhosis, a multidisciplinary approach to management including the planning of delivery, and shared decision-making is recommended for favorable pregnancy outcomes. Preconception counseling about the effects of pregnancy on chronic liver disease and the risks of pregnancy should be discussed, and effective and acceptable contraception offered.

Antenatal scoring and classification of liver cirrhosis, and proper staging of variceal screening will facilitate the management of the woman. Elective EVL during the second trimester can prevent unexpected variceal bleeding. Risk stratification can help in improving antenatal care and perinatal outcome.

AUTHOR CONTRIBUTIONS

Sreenisha S. S: Writing – original draft. **Abdulmalik Bako:** Writing – review and editing. **Salwa Abo Yaqoub:** Supervision. **Feazlin Mohd Din:** Methodology.

FUNDING INFORMATION

The publication of this article was funded by Qatar National Library.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

The data supporting the findings of the study are available within the article.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

ORCID

Sreenisha S. S https://orcid.org/0000-0002-1111-675X
Abdulmalik Bako https://orcid.org/0000-0003-2397-5196

REFERENCES

1. Mikolasevic I, Filipec-Kanizaj T, Jakopcic I, et al. Liver disease during pregnancy: a challenging clinical issue. *Med Sci Monit*. 2018;24:4080-4090. Published 2018 Jun 15. doi:10.12659/MSM.907723
2. Robertson M, Bathgate A, Hayes P. Pregnancy in patients with established liver cirrhosis – an uncommon but high-risk situation. *Ann Clin Case Rep*. 2017;2:1426.
3. Tan J, Surti B, Saab S. Pregnancy and cirrhosis. *Liver Transpl*. 2008;14(8):1081-1091. doi:10.1002/lt.21572
4. Hagström H, Höijer J, Marschall HU, et al. Outcomes of pregnancy in mothers with cirrhosis: a national population-based cohort study of 1.3 million pregnancies. *Hepatol Commun*. 2018;2(11):1299-1305. Published 2018 Sep 25. doi:10.1002/hep4.1255
5. Kamani L, Achakzai MS, Ismail FW, Kayani F. Safety of endoscopy and its outcome in pregnancy. *Cureus*. 2019;11(12):e6301. Published 2019 Dec 5. doi:10.7759/cureus.6301
6. Said A, Williams J, Holden J, et al. Model for end stage liver disease score predicts mortality across a broad spectrum of liver disease. *J Hepatol*. 2004;40(6):897-903. doi:10.1016/j.jhep.2004.02.010
7. Westbrook RH, Yeoman AD, O'Grady JG, Harrison PM, Devlin J, Heneghan MA. Model for end-stage liver disease score predicts outcome in cirrhotic patients during pregnancy. *Clin Gastroenterol Hepatol*. 2011;9(8):694-699. doi:10.1016/j.cgh.2011.03.036
8. Tran TT, Ahn J, Reau NS. ACG clinical guideline: liver disease and pregnancy [published correction appears in Am J Gastroenterol. 2016 Nov;111(11):1668]. *Am J Gastroenterol*. 2016;111(2):176-196. doi:10.1038/ajg.2015.430
9. Britton RC. Pregnancy and esophageal varices. *Am J Surg*. 1982;143(4):421-425. doi:10.1016/0002-9610(82)90190-8
10. López-Méndez E, Uribe M. Beta blockers in portal hypertension. Are they really a good option? *Ann Hepatol*. 2006;5(2):86-91.
11. Garcia-Tsao G, Sanyal AJ, Grace ND, Carey W, Practice Guidelines Committee of the American Association for the Study of Liver Diseases; Practice Parameters Committee of the American College of Gastroenterology. Prevention and management of gastroesophageal varices and variceal hemorrhage in cirrhosis [published correction appears in Hepatology. 2007 Dec;46(6):2052]. *Hepatology*. 2007;46(3):922-938. doi:10.1002/hep.21907
12. Hayashi H, Beppu T, Shirabe K, Maehara Y, Baba H. Management of thrombocytopenia due to liver cirrhosis: a review. *World J Gastroenterol*. 2014;20(10):2595-2605. doi:10.3748/wjg.v20.i10.2595
13. Bleibel W, Caldwell S, Curry M, Northup PG. Peripheral platelet count correlates with liver atrophy and predicts long-term mortality on the liver transplant waiting list. *Transplant Int*. 2013;26:435-442.
14. Qamar AA, Grace ND, Groszmann RJ, et al. Incidence, prevalence, and clinical significance of abnormal hematologic indices in compensated cirrhosis. *Clin Gastroenterol Hepatol*. 2009;7(6):689-695. doi:10.1016/j.cgh.2009.02.021
15. Poordad F. Review article: thrombocytopenia in chronic liver disease. *Aliment Pharmacol Ther*. 2007;26(Suppl 1):5-11. doi:10.1111/j.1365-2036.2007.03510.x

16. Peck-Radosavljevic M. Hypersplenism. *Eur J Gastroenterol Hepatol*. 2001;13(4):317-323. doi:10.1097/00042737-200104000-00004
17. World Health Organization. *Current Estimated Total Number of Individuals with Morbidity and Mortality due to Schistosomiasis Haematobium and S. mansoni Infection in Sub-Saharan Africa*. World Health Organization, 23 September 2016.
18. Richter J, Bode JG, Blondin D, et al. Severe liver fibrosis caused by Schistosoma mansoni: management and treatment with a transjugular intrahepatic portosystemic shunt. *Lancet Infect Dis*. 2015;15(6):731-737. doi:10.1016/S1473-3099(15)70009-5
19. Fenwick A, Savioli L, Engels D, Robert Bergquist N, Todd MH. Drugs for the control of parasitic diseases: current status and development in schistosomiasis. *Trends Parasitol*. 2003;19(11):509-515. doi:10.1016/j.pt.2003.09.005

How to cite this article: S. S S, Bako A, Yaqoub SA, Din FM. A case report of a pregnant woman with compensated liver cirrhosis and pancytopenia. *Clin Case Rep*. 2023;11:e7500. doi:10.1002/ccr3.7500