



## Case Report

# Emergency Caesarean Section in a Patient with HELLP Syndrome and Intramural Myoma: A Case Report

Muhamad Nofa Cholili\*

Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Brawijaya/Saiful Anwar General Hospital, Malang, East Java, Indonesia

### ARTICLE HISTORY

Received: 3 February 2024

Revised: 5 March 2024

Accepted: 5 April 2024

### CORRESPONDING AUTHOR\*

Muhamad Nofa Cholili

[muhamadnofacholili@gmail.com](mailto:muhamadnofacholili@gmail.com)

Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Brawijaya/Saiful Anwar General Hospital, Malang, East Java, Indonesia

### KEYWORD

HELLP Syndrome; Intramural Myoma Uteri; Uterine Artery Ligation



This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>)

### ABSTRACT

**Introduction:** The syndrome of HELLP, often a complication of severe pre-eclampsia, is influenced by factors like multiparity, advanced maternal age, and potential genetic associations. Intramural Myoma have been linked to a 44% increased risk of hypertension in pregnant women, potentially contributing to the initiation and progression of pre-eclampsia, particularly due to their rapid expansion during pregnancy. This study reported a patient with intramural myoma and HELLP Syndrome in 35-36 weeks of gestation age.

**Case Presentation:** A 40-year-old woman in her 35-36 weeks of gestation sought emergency care at General Hospital Dr. Saiful Anwar Malang due to escalating severe headaches. As a third-time expectant mother with a history of five antenatal visits, she presented with elevated blood pressure (219/110 mmHg), a BMI of 32 kg/m<sup>2</sup>, and various concerning findings, leading to a diagnosis of impending eclampsia, severe preeclampsia (HELLP syndrome), fetal distress, severe hypoalbuminemia, intrauterine growth restriction (IUGR), and other complications. The patient underwent an urgent cesarean section, revealing an intramural uterine myoma, followed by bilateral ligation of uterine arteries to address bleeding and myomectomy. Postoperatively, she received a magnesium sulfate infusion, her blood pressure stabilized at 143/92 mmHg and Hemoglobin 12,40 g/dl.

**Conclusion:** Intramural myoma increases the risk of preeclampsia during pregnancy. Emergency C-section is an effective measure to address complications for both the mother and the baby, and bilateral ligation of uterine arteries can minimize surgical bleeding.

**Cite this as:** Cholili MN (2024) Emergency Caesarean Section in a Patient with HELLP Syndrome and Intramural Myoma: A Case Report. *Asian J Heal Res.* 3 (1): 39–45. doi: [10.55561/ajhr.v3i1.145](https://doi.org/10.55561/ajhr.v3i1.145)

## INTRODUCTION

Pre-eclampsia (PE) is a condition affecting 3-5% of pregnant women worldwide, standing as a significant contributor to maternal and perinatal morbidity and mortality [1]. Women diagnosed with PE face a more than two-fold increased risk of obstetric complications [2,3]. The syndrome known as HELLP, characterized by hemolysis, elevated liver enzymes, and low platelet count, frequently emerges as a complication or progression of severe pre-eclampsia, with factors like multiparity, advanced maternal age, and potential genetic associations further elevating susceptibility to HELLP syndrome [4,5].

Uterine fibroids, the most prevalent type of benign pelvic tumors in women with a prevalence ranging from 20-40%, have been implicated in an increased risk of hypertension. Various studies, corroborated by a recent meta-analysis, affirm a 44% heightened risk of hypertension in women with uterine fibroids compared to their counterparts without [6,7]. Despite being generally asymptomatic, uterine fibroids are often not detected until early pregnancy through obstetrical ultrasound. The prevalence of uterine fibroids complicating pregnancy ranges from 3 to 12%. Drawing parallels between the pathogenic mechanisms of hypertension and pre-eclampsia, such as oxidative stress and endothelial dysfunction, leads to the hypothesis that

the presence of fibroids may be linked to the initiation and progression of pre-eclampsia. Moreover, the influence of fibroids on blood pressure may be accentuated by their rapid expansion during pregnancy [1,8].

Although scant case report literature exists exploring the association between uterine fibroids and hypertension during pregnancy, this case report seeks to present an older patient experiencing a pregnancy complicated by HELLP syndrome. Intriguingly, the surgical intervention, specifically cesarean section, revealed the concurrent presence of uterine fibroids, shedding light on potential links between these factors in the context of maternal health.

## CASE PRESENTATION

A 40-year-old woman at 35-36 weeks of gestation presented to the Emergency Department of General Hospital Dr. Saiful Anwar Malang with severe headaches intensifying over the past week. She was referred from RS Mitra Medika Pandaan due to her elevated blood pressure reaching 180/100 mmHg. At the referring hospital, the patient had already received lung maturation induction therapy, oral antihypertensive medications, and full-dose magnesium sulfate. Laboratory results revealed a platelet count of 72,000.

The patient, currently expecting her third child, had a history of five antenatal care visits at a local health center. Upon physical examination, her blood pressure was noted to be 219/110 mmHg, and her BMI was 32 kg/m<sup>2</sup>. Abdominal examination indicated a fundal height of 29 cm, cephalic presentation, fetal heart rate of 170 bpm, estimated fetal weight of 2790 grams, and uterine contractions with a frequency of 10.1.10-15. Laboratory findings are detailed in [Table 1](#).

Based on the examination results, the patient was diagnosed with impending eclampsia, preeclampsia

with severe features (HELLP syndrome), fetal distress, severe hypoalbuminemia, intrauterine growth restriction (IUGR), post-induction of lung maturation, maternal age over 35 years, primigravida at an advanced maternal age, and overweight.

The patient was managed by continuing magnesium sulfate infusion at 40%, 10 grams with a rate of 1 gram per hour until 24 hours postpartum. An urgent cesarean section with a midline vertical incision was performed, revealing an intramural uterine myoma. Subsequently, the patient underwent bilateral ligation of the uterine arteries to reduce active bleeding, followed by a myomectomy.

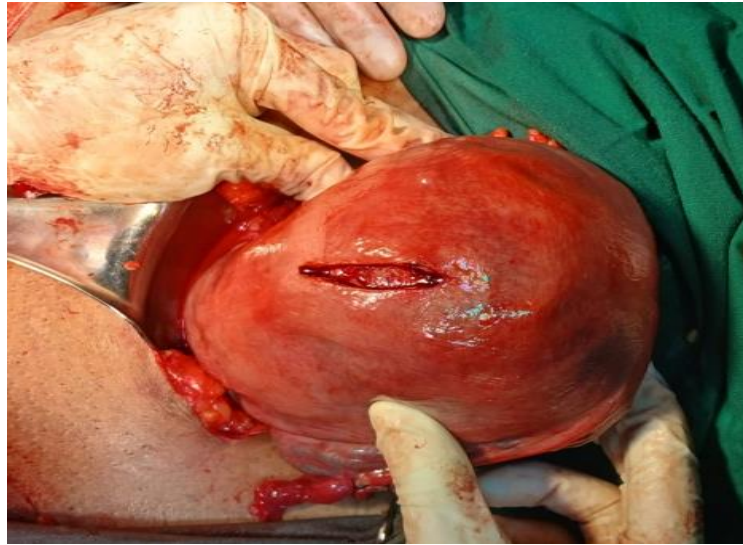
During the operation, there was an observed blood loss of 200 cc. In the follow-up, the patient's blood pressure was recorded at 143/92 mmHg, and the laboratory result of Hemoglobin 12,4 g/dl, she was admitted to the High Care Unit (HCU). On January 15, 2024, at 08:50 AM (WIB), a female infant was delivered, weighing 1630 grams, with a length of 42 cm, and an Apgar score of 3 at 1 minute and 5 at 5 minutes, indicating a gestational age of approximately 34-36 weeks. The newborn experienced intrauterine growth restriction (IVD) and was provided with oxygen via Continuous Positive Airway Pressure (CPAP).

## DISCUSSION

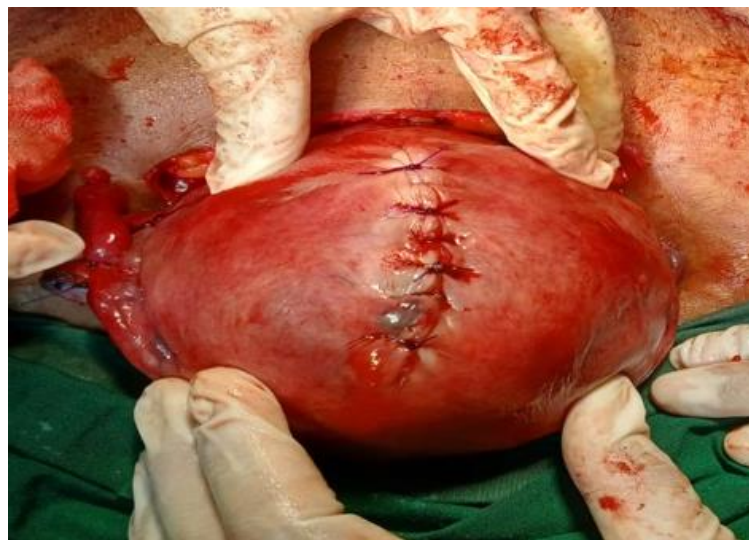
Uterine fibroids, also known as leiomyomata, are the most prevalent benign tumors affecting women. These fibroids originate from the smooth muscle cells (myometrium) of the uterus, and their growth is primarily influenced by circulating estrogen levels. Despite their common occurrence, the pathogenesis of fibroids remains poorly understood [9]. Fibroids may manifest as asymptomatic incidental findings during imaging or present with symptoms. Common symptoms include abnormal uterine bleeding, pelvic pain, disruption of surrounding pelvic structures (such as

**Table 1.** Laboratory Examination Result (January 15, 2024)

Laboratory Examination	Value
Complete Blood Count	
Hemoglobin	12.2 gr/dl
Leukocyte	15900 / $\mu$ l
Platelet	33000/ $\mu$ l
Hemostasis Function	
PPT / aPTT	9.5 (10.9) / 31.6 (24.8)
Liver Function	
OT/PT	106/104
Albumin	2.35
Random Blood Glucose	181 gr/dl
Serum Electrolyte	132/4.16/100
Ur/Cr	48.2/1.45
Urinalysis	Protein +3, Keton (-)



**Fig. 1.** The Macroscopic Examination of the Patient's Uterus During Myomectomy



**Fig. 2.** The Macroscopic Examination of The Patient's Uterus Ligation Myomectomy

bowel and bladder), and back pain. Uterine fibroids typically manifest in three significant locations such as subserosal (outside the uterus), intramural (inside the myometrium), and submucosal (inside the uterine cavity) [10].

The precise pathophysiology underlying fibroid development remains unclear. Current research suggests that the initiation of fibroid development begins with a single uterine smooth muscle cell in the myometrium, followed by deviations from normal signaling pathways of cellular division. Fibroids are characterized as estrogen-dependent tumors, supported by evidence indicating that leiomyomas overexpress specific estrogen and progesterone receptors compared to the

normal surrounding myometrium [11]. In our patient, symptoms indicative of uterine fibroids were not previously experienced. It was only during the surgical procedure that a mass was identified within the intramural region of the uterus.

In a prior case report, early-stage preeclampsia was identified, with approximately one-third of the patients concurrently exhibiting uterine fibroids. Individuals with uterine fibroids often experience chronic inflammation, contributing to an elevated production of inflammatory cytokines. This inflammatory state, coupled with oxidative stress, can lead to endothelial dysfunction, serving as the primary mechanism underlying the development of hypertension in these

**Table 2.** Laboratory Examination Result  
(January 15, 2024, at 01.26 PM)

Laboratory Examination	Value
Complete Blood Count	
Hemoglobin	12.4 gr/dl
Leukocyte	26290 / $\mu$ l
Platelet	49000/ $\mu$ l

patients [12]. Fibroids can lead to compromised blood flow in the placenta, and in some instances, experience rapid and notable enlargement. The excessive production of extracellular matrix, a key element in the pathophysiology of uterine leiomyomas, may also contribute to elevated blood pressure. Factors such as increased body mass index (BMI), central obesity, hyperlipidemia, and insulin resistance may heighten the risk of uterine fibroids through inflammatory pathways. Prospective analyses have revealed a robust and independent correlation between blood pressure levels and the likelihood of developing fibroids [13].

In early pregnancy, anomalies in spiral artery remodeling can result in ischemia, hypoxia, and inadequate placental formation. The extent of spiral artery remodeling is closely linked to the onset of preeclampsia. Endothelial activation and vasoconstriction in the second and third trimesters can elevate blood pressure and give rise to obstetric complications like abruption. Research has indicated that fibroids experience rapid and significant growth during pregnancy, with a propensity for red degeneration, particularly in the second trimester. Therefore, it is reasonable to suggest that the rapid expansion of fibroids early in pregnancy may lead to

suboptimal placental perfusion by compressing uterine blood vessels, contributing to an increased risk of preeclampsia [12,14].

Furthermore, molecules released by fibroids may trigger inflammation, oxidative stress responses, and endothelial dysfunction, playing a role in the development of preeclampsia. Several studies directly demonstrate the association between uterine fibroids and preeclampsia. A meta-analysis involving 8,361 women revealed a 44% elevated risk of high blood pressure in women with fibroids. Fibroids pose a substantial risk of accelerated growth in early pregnancy, potentially resulting in miscarriages and serving as a causative factor for preeclampsia and other obstetric complications in the second and third trimesters [15].

The occurrence and progression of preeclampsia (PE) can be delineated into two distinct stages based on underlying pathophysiological processes. In the initial phases of pregnancy, deficiencies in spiral artery remodeling give rise to ischemia, hypoxia, and suboptimal placental formation. The extent of spiral artery remodeling is intricately linked to the likelihood of developing PE. Systemic activation of endothelial function and vasoconstriction in the second and third trimesters lead to elevated blood pressure and various abnormal manifestations [12,15].

In our patient, there is no history of hypertension or previous preeclampsia in prior pregnancies. This supports the hypothesis that uterine fibroids may be involved in the pathogenesis of preeclampsia in our case. Additionally, other risk factors such as obesity and age over 35 years also contribute to the pathogenesis of preeclampsia in our patient.



**Fig. 3.** The Macroscopic Examination of The Patient's Uterus Post-Myomectomy



Remarkably, fibroids undergo rapid and substantial growth during pregnancy, particularly in the first trimester. Consequently, it is plausible to hypothesize that the swift expansion of fibroids early in pregnancy may result in compromised placental perfusion due to the compression of uterine blood vessels, thereby contributing to an augmented risk of PE. Furthermore, substances released by fibroids have the potential to induce inflammation, elicit oxidative stress responses, and contribute to endothelial dysfunction, actively participating in the pathogenesis of PE. Nonetheless, comprehensive studies with larger sample sizes are imperative to delve deeper into these potential mechanisms [14,16].

HELLP syndrome, an acronym for Hemolysis, Elevated Liver Enzymes, and Low Platelet Count, is recognized as a severe complication of pregnancy, commonly coexisting with preeclampsia in approximately 70–80% of cases [17]. HELLP syndrome signifies compromised placentation during the early stages of pregnancy and involves hepatic and coagulation cascade complications. The diagnostic criteria for HELLP syndrome include the presence of (1) microangiopathic hemolytic anemia with abnormal blood smear and low serum haptoglobin, (2) elevated levels of lactate dehydrogenase (LDH) above 600 IU/L and aspartate aminotransferase (ASAT) above 70 IU/L (both enzyme levels exceeding twofold the upper limit of normal values) or bilirubin levels surpassing 1.2 mg/dL, and (3) a platelet count below  $100 \times 10^9/L$  [18,19].

The severity of HELLP syndrome is categorized using the Mississippi classification, which emphasizes the gravity of the disorder based on the nadir of the platelet count. Instances where HELLP syndrome manifests before 28 weeks' gestation constitute approximately 20–30% of cases and are associated with a severe form of the disease characterized by a rapid onset of clinical manifestations, often concurrent with fetal growth restriction [20]. Based on the laboratory findings, our patient exhibits thrombocytopenia (33,000) accompanied by elevated liver enzymes. This is consistent with the condition of HELLP syndrome experienced by our patient.

In the previous study, temporary clamping of the bilateral uterine artery was performed 2 cm below the uterine incision and compared with the control group. The mean amount of bleeding in the clamped and control groups was  $267.3 \pm 131.8$  mL and  $390.2 \pm 116.4$  mL, respectively. The clamped group demonstrated a significant reduction in bleeding volume ( $p < 0.001$ ). The experimental group, undergoing temporary uterine artery clamping, exhibited a notable decrease in pre- and postoperative hemoglobin and hematocrit differences, operation duration, and uterine incision closure time. Temporary uterine artery ligation emerges as a viable

approach for diminishing bleeding during uncomplicated cesarean delivery, thereby preventing postpartum hemorrhage [21].

Another investigation revealed that the ligation group exhibited a significantly lower intraoperative blood loss compared to the control group ( $569.3 \pm 202.1$  mL vs.  $805.1 \pm 224.5$  mL, respectively;  $p = 0.002$ ). The need for blood transfusion significantly increased in the control group in comparison to the ligation group ( $786 \pm 83$  mL vs.  $755 \pm 56$  mL, respectively;  $p = 0.03$ ). In the control group, three cases necessitated additional surgical interventions to manage intraoperative bleeding, while no such cases were observed in the ligation group, and this difference was statistically significant ( $p = 0.001$ ) [22]. Following the ligation of arteries in our patient, there was an intraoperative bleeding of 200cc. In the follow-up, the patient's Laboratory Examination result of Hemoglobin 12.4 g/dL.

HELLP syndrome, a severe complication of pregnancy marked by Hemolysis, Elevated Liver enzymes, and Low Platelet count, poses significant risks if not promptly addressed, particularly through urgent delivery. Maternal complications may include organ failure, disseminated intravascular coagulation (DIC), the potential for stroke, and, in extreme cases, maternal death. Fetal and neonatal consequences encompass preterm birth, intrauterine growth restriction (IUGR), stillbirth, and neonatal complications associated with prematurity. The compromised placental function in HELLP syndrome necessitates emergency interventions like cesarean section, leading to preterm delivery. It is vital to emphasize that immediate diagnosis and timely intervention significantly enhance outcomes for both the mother and the baby. Continuous monitoring and collaboration with healthcare professionals are crucial in managing HELLP syndrome and mitigating potential complications [23].

In our patient, the newborn experienced Intrauterine Fetal Distress (IVFD) with an Apgar score of 3 at 1 minute and 5 at 5 minutes after birth. The Apgar score serves as a rapid assessment of the newborn's condition, considering parameters such as heart rate, muscle tone, response to stimuli, skin color, and respiratory function. A low Apgar score at the first minute indicates challenges or stress during the birthing process. Further medical monitoring and interventions may be required to support the health and recovery of the newborn after birth.

## CONCLUSION

Intramural uterine fibroids can pose a risk factor for preeclampsia during pregnancy. Emergency cesarean section (C-section) management is an appropriate

measure to mitigate pregnancy complications for both the mother and the neonate. Bilateral ligation of uterine arteries can be employed to reduce bleeding during the surgical procedure.

## ACKNOWLEDGMENT

We thank all the authors of the articles reviewed in this article.

## CONFLICT OF INTEREST

The authors declare there is no conflict of interest.

## REFERENCES

- Gong L, Liu M, Shi H, Huang Y. Uterine fibroids are associated with increased risk of pre-eclampsia: A case-control study. *Front Cardiovasc Med.* 2022 Oct 18;9.
- ROCHA G. Consequences of early-onset preeclampsia on neonatal morbidity and mortality. *Minerva Pediatrics.* 2023 Feb;75(1).
- Girardi G, Bremer AA. The Intersection of Maternal Metabolic Syndrome, Adverse Pregnancy Outcomes, and Future Metabolic Health for the Mother and Offspring. *Metab Syndr Relat Disord.* 2022 Apr 5;
- Fitzpatrick KE, Hinshaw K, Kurinczuk JJ, Knight M. Risk Factors, Management, and Outcomes of Hemolysis, Elevated Liver Enzymes, and Low Platelets Syndrome and Elevated Liver Enzymes, Low Platelets Syndrome. *Obstetrics & Gynecology.* 2014 Mar;123(3):618–27.
- Wallace K, Harris S, Addison A, Bean C. HELLP Syndrome: Pathophysiology and Current Therapies. *Curr Pharm Biotechnol.* 2018 Nov 27;19(10):816–26.
- Go VAA, Thomas MC, Singh B, Prenatt S, Sims H, Blanck JF, et al. A systematic review of the psychosocial impact of fibroids before and after treatment. *Am J Obstet Gynecol.* 2020 Nov;223(5):674-708.e8.
- Haan YC, Oudman I, de Lange ME, Timmermans A, Ankum WM, van Montfrans GA, et al. Hypertension Risk in Dutch Women With Symptomatic Uterine Fibroids. *Am J Hypertens.* 2015 Apr 1;28(4):487–92.
- Parazzini F, Tozzi L, Bianchi S. Pregnancy outcome and uterine fibroids. *Best Pract Res Clin Obstet Gynaecol.* 2016 Jul;34:74–84.
- De La Cruz MSD, Buchanan EM. Uterine Fibroids: Diagnosis and Treatment. *Am Fam Physician.* 2017 Jan 15;95(2):100–7.
- Di Serafino M, Iacobellis F, Schillirò ML, Verde F, Grimaldi D, Dell'Aversano Orabona G, et al. Pelvic Pain in Reproductive Age: US Findings. *Diagnostics.* 2022 Apr 9;12(4):939.
- Yang Q, Ciebiera M, Bariani MV, Ali M, Elkafas H, Boyer TG, et al. Comprehensive Review of Uterine Fibroids: Developmental Origin, Pathogenesis, and Treatment. *Endocr Rev.* 2022 Jul 13;43(4):678–719.
- Agrawal P, Garg R, Rani R, Sharma S. Uterine Fibroid as a Cause of Severe Preeclampsia: A Case Report. *Journal of South Asian Federation of Obstetrics and Gynaecology.* 2024 Jan 10;16(1):60–2.
- Ciavattini A, Delli Carpini G, Clemente N, Moriconi L, Gentili C, Di Giuseppe J. Growth trend of small uterine fibroids and human chorionic gonadotropin serum levels in early pregnancy: an observational study. *Fertil Steril.* 2016 May;105(5):1255–60.
- Chen Y, Xiong N, Xiao J, Huang X, Chen R, Ye S, et al. Association of uterine fibroids with increased blood pressure: a cross-sectional study and meta-analysis. *Hypertension Research.* 2022 Apr 15;45(4):715–21.
- Garg R, Ismail S. Uterine Fibroids Association with Pregnancy-induced Hypertension: A Case Report. *Journal of South Asian Federation of Obstetrics and Gynaecology.* 2023 Oct 31;15(5):610–1.
- Benaglia L, Cardellicchio L, Filippi F, Paffoni A, Vercellini P, Somigliana E, et al. The Rapid Growth of Fibroids during Early Pregnancy. *PLoS One.* 2014 Jan 20;9(1):e85933.
- Petca A, Miron BC, Pacu I, Dumitrașcu MC, Mehedintu C, Șandru F, et al. HELLP Syndrome—Holistic Insight into Pathophysiology. *Medicina (B Aires).* 2022 Feb 21;58(2):326.
- Malmström O, Håberg SE, Morken N. Probability and outcomes of second pregnancy after HELLP syndrome in the first: A population-based registry study. *Acta Obstet Gynecol Scand.* 2020 Sep 17;99(9):1206–13.
- van Lieshout LCEW, Koek GH, Spaanderman MA, van Runnard Heimel PJ. Placenta derived factors involved in the pathogenesis of the liver in the syndrome of haemolysis, elevated liver enzymes and low platelets (HELLP): A review. *Pregnancy Hypertens.* 2019 Oct;18:42–8.
- Rimaitis K, Grauslyte L, Zavackiene A, Baliuliene V, Nadisauskiene R, Macas A. Diagnosis of HELLP Syndrome: A 10-Year Survey in a

- Perinatology Centre. *Int J Environ Res Public Health*. 2019 Jan 3;16(1):109.
21. Erin R, İssak A, Baki Erin K, Kulaksiz D, Bayoğlu Tekin Y. The Efficiency of Temporary Uterine Artery Ligation on Prevention of the Bleeding in Cesarean Section. *Gynecol Obstet Invest*. 2021;86(6):486–93.
22. Sanad AS, Mahran AE, Aboufotouh ME, Kamel HH, Mohammed HF, Bahaa HA, et al. RETRACTED ARTICLE: The effect of uterine artery ligation in patients with central placenta previa: a randomized controlled trial. *BMC Pregnancy Childbirth*. 2018 Aug 29;18(1):351.
23. Mossayebi MH, Iyer NS, McLaren RA, Moussa HN, Sibai BM, Al-Kouatly HB. HELLP syndrome at <23 weeks' gestation: a systematic literature review. *Am J Obstet Gynecol*. 2023 Nov;229(5):502-515.e10.