Original Article
DOI: https://doi.org/10.70749/ijbr.v3i7.2119

INDUS JOURNAL OF BIOSCIENCE RESEARCH
https://ijbr.com.pk
ISSN: 2960-2793/ 2960-2807

Frequency of Caesarean Hysterectomy in Patients with Placenta Previa

Rehana Sarfraz[1*], Bushra Haq[1], Hira Jabbar[1], Muhammad Ahmad[1]

[1]Department of Obstetrics and Gynaecology, Services Hospital, Lahore, Pakistan

ARTICLE INFO

Keywords: Cesarean section, Placenta accreta spectrum, Hysterectomy, Placenta previa.

Correspondence to: Rehana Sarfraz, Department of Obstetrics & Gynaecology, Services Hospital, Lahore, Pakistan.
Email: Rehanasarfraz17@gmail.com

Declaration
Authors' Contribution: All authors equally contributed to the study and approved the final manuscript.

Conflict of Interest: No conflict of interest.

Funding: No funding received by the authors.

Article History
Received: 26-06-2025 Revised: 07-07-2025
Accepted: 12-07-2025 Published: 15-07-2025

ABSTRACT

Objective: To determine the association of cesarean hysterectomy with placenta previa and placenta accrete spectrum. **Study design:** Prospective Cohort study. **Place and Duration of Study:** Department of Obstetrics and Gynaecology, Services Hospital, Lahore, From January 2025 to June 2025. **Methodology:** Out of n=170 females aged 20–40 with gestational age between 32-37 weeks, divided into two groups. After informed consent, demographic and obstetric details were recorded. All participants underwent standardized abdominal ultrasound by a senior radiologist to confirm the presence or absence of placenta previa or Placenta accrete spectrum. Patients were categorized into exposed (with placenta previa/PA) n=85 and unexposed (without placenta previa/PAS) groups n=85. All underwent cesarean section. Cesarean hysterectomy was performed in cases with life-threatening postpartum hemorrhage unresponsive to conservative measures. Descriptive statistics were used to describe baseline characteristics. Relative risk was calculated to measure the association of cesarean hysterectomy with placenta previa or placenta accrete spectrum. RR>1 was taken as significant. Stratified analysis was performed for age, BMI, parity, gestational age and number of previous cesarean sections to assess effect modifiers on the association between placenta previa/PAS and cesarean hysterectomy. **Results:** Cesarean hysterectomy occurred in 20% of patients with placenta previa or Placenta accrete spectrum compared to 2.4% in those without, yielding a relative risk of 8.5. Stratified analysis showed stronger associations in patients with higher BMI, parity ≥3, and ≥2 previous cesarean sections. **Conclusion:** Cesarean hysterectomy was significantly more frequent in patients with placenta previa or accreta spectrum, highlighting the need for early identification and preparedness in high-risk pregnancies.

INTRODUCTION

In patients with placenta previa, the location of placental attachment significantly affects the outcome of the pregnancy. When the placenta is located on the anterior wall, clinicians should pay attention to the possible adverse pregnancy outcomes and massive postpartum hemorrhage.[1] Placenta previa is a risk factor for preterm birth and postpartum hemorrhage; approximately half of placenta previa cases result in postpartum hemorrhage, leading to ceasarean hysterectomy.[2]

The risk of massive hemorrhage in patients with placenta previa varies according to co-existing risk factors. For instance, placenta previa is the most significant risk factor for placenta accreta spectrum disorders, and if placenta previa is complicated by placenta accreta spectrum, the surgical morbidity and mortality, mean blood loss (1200–3000 mL), and hysterectomy rates (3–42%) increase dramatically.[3-5]

Hysterectomy is a common outcome for postpartum bleeding following vaginal or cesarean delivery in the majority of instances with aberrant placentation leading to ceasarean hysterectomy. However, hysterectomy is not only associated with permanent sterility but also potential physiological and psychological disorders.[6] Present conservative and radical surgical management of placenta previa is associated with significant hemorrhage and the need for blood salvage, transfusion, component therapy and inter disciplinary management conventional ceasarean hysterectomy strategies have high surgical morbidity, despite adequate personnel and resources.

A study conducted in Thailand, has reported that the cesarean hysterectomy was required in 7.3% females with placenta previa while in 0% females without placenta previa ($p<0.001$).[7] While another study reported that the ceasarean hysterectomy was required in 2.5% females with placenta previa while in 0% females without placenta previa ($p<0.001$).[1]

Rationale of this study is to determine the association of ceasarean hysterectomy with placenta previa and placenta accereta spectrum. Ceasarean hysterectomy is a major obstetrical procedure with high morbidity. Placenta previa and placenta accrete spectrum are high risk condition and

need preoperative preparations to reduce hazard to maternal life and health. By anticipating high blood loss and preoperative preparations in terms of availability of blood and blood products, senior obstetrician and senior anesthetist several maternal lives can be saved. Caesarean section rate is progressively increasing in Pakistan similarly placenta previa and placenta accrete spectrum cases are also increasing. Literature shows that there is significant association of ceasarean hysterectomy with placenta previa and placenta accreta spectrum after ceasarean section. But not much work has been done before in this regard in local setting. This study was conducted to get evidence from local population.

METHODOLOGY

This prospective cohort study was conducted at the department of Obstetrics and Gynaecology, Services Hospital, Lahore, after Ethical approval from Ethical Review Board Committee. The sample size of 170 females; 85 in each group was calculated using WHO sample calculator with 80% power of study, 5% significance level and percentage of caesarean hysterectomy i.e. 7.3% in females with placenta previa and 0% in females without placenta previa.[7]

Inclusion Criteria: Females aged 20-40 years, gestational age 32-37 weeks, exposed: diagnosed with placenta previa or placenta accrete spectrum, unexposed: without placenta previa or placenta accrete spectrum

Exclusion Criteria: Females with uterine scar other than previous cesarean (on medical record) **,** females with other pelvic pathologies i.e. endometriosis, adenomyosis, fibroid uterus.

After enrollment and informed consent, demographic and obstetric details including name, age, BMI, parity, gestational age and number of previous cesarean sections were recorded on a structured proforma. All participants underwent abdominal ultrasound performed by a single senior radiologist (>4 years of gynecological imaging experience) to ensure diagnostic consistency and eliminate inter-observer variability.

Based on ultrasound findings, patients were categorized into two groups:

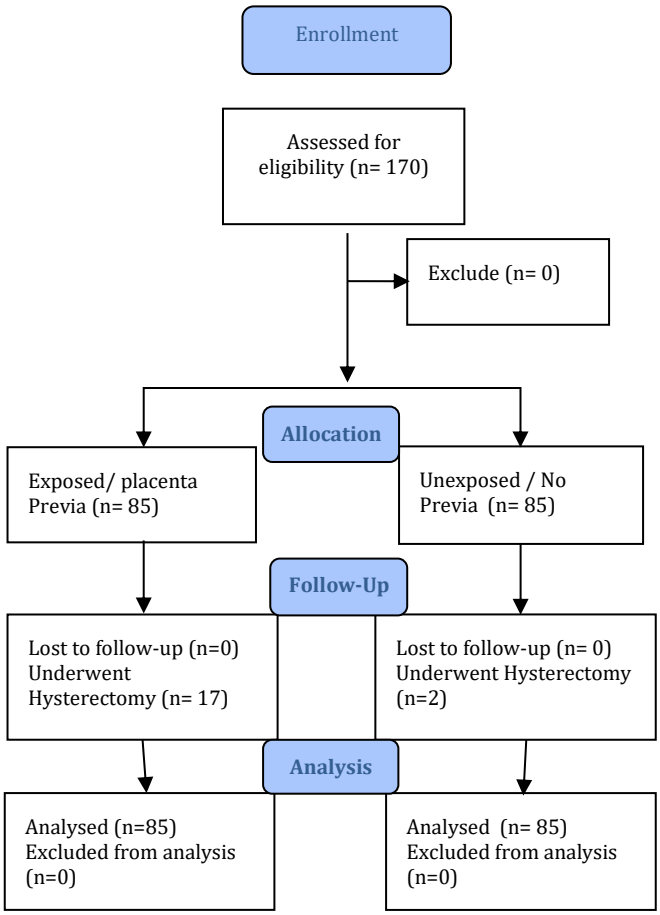
1. **Exposed group:** Presence of placenta previa or placenta accrete spectrum
2. **Unexposed group:** Absence of placenta previa or placenta accrete spectrum

All patients underwent cesarean section for delivery. In cases where postpartum hemorrhage was encountered and failed to respond to initial medical management, including uterotonics and uterine massage as well as conservative surgical interventions such as uterine artery ligation, compression sutures, or segmental resection, cesarean hysterectomy was undertaken as a life-saving definitive procedure, in accordance with standard clinical protocols.

Data were statistically analyzed using the Statistical Package for the Social Sciences (SPSS), version 21. Quantitative variables such as age, body mass index (BMI), and gestational age were recorded and presented as mean values along with their respective standard deviations. Qualitative variables including the number of previous cesarean deliveries and the occurrence of cesarean hysterectomy were described in terms of frequency and percentage to provide a categorical summary. Parity was also categorized and mentioned as frequency to reflect distribution across groups. To determine the strength of association between placenta previa or placenta accreta spectrum (PAS) and the incidence of cesarean hysterectomy, the relative risk (RR) was calculated, with an RR greater than 1 considered statistically significant and indicative of increased risk. Additionally, to explore the potential influence of confounding variables and to assess effect modification, data were stratified by key demographic and obstetric characteristics including maternal age, BMI, gestational age at delivery, parity, and number of previous cesarean sections. Following stratification, relative risk was recalculated within each subgroup to evaluate consistency of the association across different groups. Relative Risk (RR) greater than 1 considered statistically significant. (Figure 1)

Figure 1

Patient Flow Diagram (n=170)



RESULTS

A total of 170 females were included in this study. Age range was 20-40 years with mean and standard deviation of 30.9 ± 4.9 years. The mean BMI was 29.8 ± 3.3 kg/m^2. Gestational age was 32 to 37 weeks at the time of cesarean section with mean and standard deviation of 34.5 ± 1.6 weeks. Parity distribution showed that 61.2% of participants were multiparous (parity 2 or more). The majority of patients (71.2%) had 2 or more previous cesarean sections. (Table 1)

Out of the total 170 females, 19 patients (11.2%)

underwent cesarean hysterectomy. 17 (20%) were from the exposed group (placenta previa/accreta), 2 (2.4%) were from the unexposed group (no placenta previa/accreta). (Figure.2). This difference indicates a strong association between abnormal placentation and risk of hysterectomy. The Relative Risk (RR) of cesarean hysterectomy in patients with placenta previa or accreta spectrum compared to those without was 8.5, indicating that affected patients were 8.5 times more likely to undergo hysterectomy. (Table 2)

For effect modifiers, post-stratification analysis was conducted. It showed higher relative risk (RR) of cesarean hysterectomy in exposed patients across most subgroups. The highest RR was observed in patients with ≥2 previous cesarean sections (RR = 10.5) and in those with parity ≥3 (RR = 9.4). Increased risk was also noted in age group 31–35 years (RR = 9.0) and BMI >30 (RR = 7.2). Lowest RR was in patients with no prior cesarean delivery (RR = 1.5). (Table 3)

Table 1

Descriptive Statistics of Demographic Variables

Variable	Mean ± SD / n (%)
Age (years)	30.0 ± 5.0
BMI (kg/m^2)	27.2 ± 3.5
Gestational Age (weeks)	35.1 ± 1.5
Parity: Para 1–2	91 (53.5%)
Parity: Para ≥3	79 (46.5%)
Previous Cesarean: 1	55 (32.4%)
Previous Cesarean: 2	73 (42.9%)
Previous Cesarean: ≥3	42 (24.7%)

Table 2

Frequency and Association of Placenta Previa / PAS and Cesarean Hysterectomy

Group	Total (n)	Cesarean Hysterectomy (n)	Frequency (%)	Relative Risk
Exposed (Previa / PAS)	85	17	20.0%	8.5
Unexposed (No previa)	85	2	2.4%	-
Total	170	19	11.2%	-

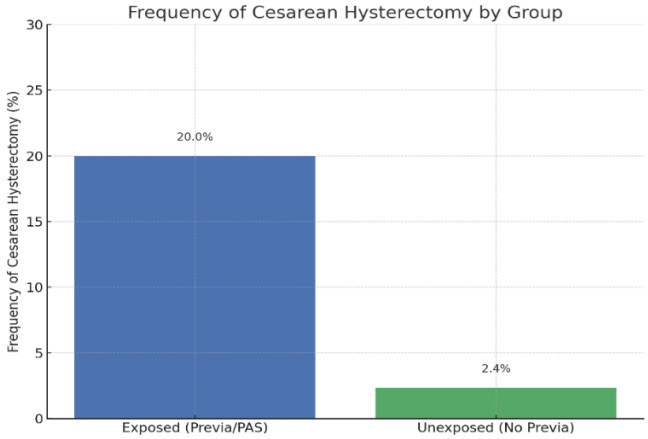
Table 3

Post-Stratification Analysis (Relative Risk in Subgroups)

Stratification Variable	Subgroup	RR for Hysterectomy
Age (years)	<30	6.0
	≥30	9.2
BMI (kg/m^2)	<25	6.8
	≥25	9.1
Gestational Age (weeks)	32–34	10.2
	35–37	7.4
Parity	Para 1–2	7.0
	Para ≥3	9.0
Previous C-sections	1–2	7.8
	≥3	10.5

Figure 2

Frequency of Caesarean Hysterectomy in Exposed and Unexposed Group.



DISCUSSION

Cesarean hysterectomy remains a life-saving but high-risk procedure most commonly performed in cases of morbidly adherent placenta and uncontrolled postpartum hemorrhage.[9] Placenta previa and placenta accreta spectrum (PAS) disorders have emerged as leading indications for this intervention, particularly in women with prior cesarean deliveries.[10, 11]

According to this prospective cohort study, women with placenta previa or accreta spectrum had 8.5-fold higher incidence of cesarean hysterectomy (20%) than those without (2.4%). These numbers are consistent with data from around the world, which shows that placenta accreta spectrum (PAS) is a major reason for peripartum hysterectomy.[12] Beekhuizen et al. conducted a large multicenter study that reported a cesarean hysterectomy rate of 57% in women with placenta accreta spectrum, reinforcing the significantly elevated risk of hysterectomy observed in our study among women with placenta previa or PAS (20% vs. 2.4%) in our study.[13]

Stratified analysis revealed a higher relative risk (RR) of cesarean hysterectomy among women aged ≥30 years (RR = 9.2), with elevated risks also noted in those with BMI ≥25 (RR = 9.1), gestational age 32–34 weeks (RR = 10.2), and parity ≥3 (RR = 9.0).

Notably, patients with ≥3 previous cesarean sections had the highest risk (RR = 10.5), underscoring the cumulative impact of prior uterine surgery on the likelihood of hysterectomy. These findings are consistent with Tikkanen et al.[14] who also identified these as key risk modifiers in PAS-associated hysterectomies. Our results align with the foundational work by Oyelese et al., who highlighted placenta previa and accreta as major contributors to obstetric hemorrhage and peripartum hysterectomy, reinforcing the importance of early identification and preparedness in such high-risk pregnancie[15]

Likewise, a review by Belfort et al. highlights the predictive value of prior uterine surgery in PAS and supports antenatal planning to mitigate adverse outcomes.[16] These findings are consistent with Jauniaux et al., who emphasized that while conservative approaches are evolving, cesarean hysterectomy remains the

recommended intervention for managing hemodynamically unstable cases of PAS to minimize maternal morbidity and mortality.[17] Conservative management such as leaving the placenta in situ, local resection, or uterine artery embolization etc could be an effective alternative to cesarean hysterectomy when women with PAS desire to preserve the uterus and are informed about the limitations of conservative management.[18] Despite these encouraging conservative options, we emphasize that cesarean hysterectomy remains the gold-standard in hemodynamically unstable PAS.[19]

Another study by Overton et al. concluded, after studying 7864 hysterectomies during a delivery hospitalization with a diagnosis of placenta accreta spectrum disorder were identified (66.5% with placenta accreta and 33.5% with placenta increta/percreta (Placenta acreta spectrum) between 2016 to 2022, Complication and readmission risks after peripartum hysterectomy with placenta accreta spectrum disorder are high. As Compared to patients with placenta accreta, patients with placenta acreta spectrum had increased risk for delivery and postoperative complications and postpartum readmission, and increased costs and length of stay.[20] In our settings, limited access to multidisciplinary care, delayed referral systems and resource constraints amplify the morbidity associated with placenta accreta spectrum (PAS). Therefore, the need for early diagnosis and planned delivery in equipped tertiary centers becomes even more critical to reduce maternal complications.

Limitation

This study is single center and reliance on ultrasonographic rather than histopathological confirmation may limit generalizability, diagnostic accuracy and can introduce observational bias.

CONCLUSION

Cesarean hysterectomy was significantly more frequent in patients with placenta previa or accreta spectrum, highlighting the need for early identification and preparedness in high-risk pregnancies.

Recommendations

Our findings reinforce the importance of:

1. Minimizing unnecessary cesarean sections
2. Risk stratification based on age, BMI, parity, and surgery history
3. Antenatal diagnosis and planned hysterectomy in specialized centers with blood-bank support
4. Considering conservative management only in controlled settings with multidisciplinary follow-up

Consent and Ethics Permission

Ethical approval was obtained from the Institutional Review Board with a reference number of IRB/2025/1501/SIMS..

REFERENCES

1. Jing L, Wei G, Mengfan S, Yanyan H. Effect of site of placentation on pregnancy outcomes in patients with placenta previa. PLOS ONE. 2018;13(7):e0200252. https://doi.org/10.1371/journal.pone.0200252
2. Nagase, Y., Matsuzaki, S., Endo, M., Hara, T., Okada, A., Mimura, K., Hiramatsu, K., Kakigano, A., Nakatsuka, E., Miyake, T., Takiuchi, T., Ueda, Y., Tomimatsu, T., & Kimura, T. (2021). Placenta previa with posterior extrauterine adhesion: clinical features and management practice. BMC surgery, 21(1), 10. https://doi.org/10.1186/s12893-020-01027-9
3. Collins, S. L., Alemdar, B., van Beekhuizen, H. J., Bertholdt, C., Braun, T., Calda, P., Delorme, P., Duvekot, J. J., Gronbeck, L., Kayem, G., Langhoff-Roos, J., Marcellin, L., Martinelli, P., Morel, O., Mhallem, M., Morlando, M., Noergaard, L. N., Nonnenmacher, A., Pateisky, P., Petit, P., … International Society for Abnormally Invasive Placenta (IS-AIP) (2019). Evidence-based guidelines for the management of abnormally invasive placenta: recommendations from the International Society for Abnormally Invasive Placenta. American journal of obstetrics and gynecology, 220(6), 511–526. https://doi.org/10.1016/j.ajog.2019.02.054
4. Allen, L., Jauniaux, E., Hobson, S., Papillon-Smith, J., Belfort, M. A., & FIGO Placenta Accreta Diagnosis and Management Expert Consensus Panel (2018). FIGO consensus guidelines on placenta accreta spectrum disorders: Nonconservative surgical management. International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics, 140(3), 281–290. https://doi.org/10.1002/ijgo.12409
5. Iacovelli, A., Liberati, M., Khalil, A., Timor-Trisch, I., Leombroni, M., Buca, D., Milani, M., Flacco, M. E., Manzoli, L., Fanfani, F., Calì, G., Familiari, A., Scambia, G., & D'Antonio, F. (2020). Risk factors for abnormally invasive placenta: a systematic review and meta-analysis. The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians, 33(3), 471–481. https://doi.org/10.1080/14767058.2018.1493453
6. Chen, Juan-Juan1; Yu, Lin1; Su, Chun-Hong1; Zhang, Chun-Fang1; Chen, Yan-Hong1; Zhou, Yan-Mei1; He, Wen-Jun1; He, Fang1; Song, Ting2; Wang, Shou-Ping3; Su, Zhi-Yuan3; Jiang, Qing-Ping4; Zou, Zi-Hao5; Yu, Bin2; Shen, Xiao-Ya1; Guan, Xiao-Ming6; Chen, Dun-Jin1,∗. Precision Surgery for Placenta Previa Complicated with Placenta Percreta. Maternal-Fetal Medicine 1(1):p 18-24, July 2019. https://doi.org/10.1097/FM9.0000000000000004
7. Suknikhom, W., & Tannirandorn, Y. (2011). Previous uterine operation and placenta previa. Journal of the Medical Association of Thailand = Chotmaihet thangphaet, 94(3), 272–277.
8. Grobman, W. A., Rice, M. M., Reddy, U. M., Tita, A. T. N., Silver, R. M., Mallett, G., Hill, K., & Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal–Fetal Medicine Units Network. (2018). Labor induction versus expectant management in low-risk nulliparous women. The New England Journal of Medicine, 379(6), 513–523. https://doi.org/10.1056/NEJMoa1800566
9. Khanum, F., Sadaf, R., un-Nisa, M.-., & Zahid, M. (2013). EMERGENCY PERIPARTUM HYSTERECTOMY IN A TERTIARY CARE HOSPITAL. Journal of Medical Sciences, 21(2), 58–61. https://jmedsci.com/index.php/Jmedsci/article/view/343
10. Silver, R. M., Landon, M. B., Rouse, D. J., Leveno, K. J., Spong, C. Y., Thom, E. A., Moawad, A. H., Caritis, S. N., Harper, M.,

Wapner, R. J., Sorokin, Y., Miodovnik, M., Carpenter, M., Peaceman, A. M., O'Sullivan, M. J., Sibai, B., Langer, O., Thorp, J. M., Ramin, S. M., Mercer, B. M., … National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network (2006). Maternal morbidity associated with multiple repeat cesarean deliveries. Obstetrics and gynecology, 107(6), 1226–1232. https://doi.org/10.1097/01.AOG.0000219750.79480.84

11. Wu, S., Kocherginsky, M., & Hibbard, J. U. (2005). Abnormal placentation: twenty-year analysis. American journal of obstetrics and gynecology, 192(5), 1458–1461. https://doi.org/10.1016/j.ajog.2004.12.074
12. Fitzpatrick, K. E., Sellers, S., Spark, P., Kurinczuk, J. J., Brocklehurst, P., & Knight, M. (2014). The management and outcomes of placenta accreta, increta, and percreta in the UK: a population-based descriptive study. BJOG : an international journal of obstetrics and gynaecology, 121(1), 62–71. https://doi.org/10.1111/1471-0528.12405
13. Beekhuizen HJ, Stefanovic V,Schwickert A, et al. A multicenter observational survey ofmanagement strategies in 442 pregnancies with suspectedplacenta accreta spectrum. Acta Obstet Gynecol Scand.2021;100. https://doi.org/10.1111/aogs.1409620
14. Tikkanen, M., Nuutila, M., Hiilesmaa, V., Paavonen, J., & Ylikorkala, O. (2006). Clinical presentation and risk factors of placental abruption. Acta obstetricia et gynecologica Scandinavica, 85(6), 700–705. https://doi.org/10.1080/00016340500449915
15. Oyelese, Y., & Smulian, J. C. (2006). Placenta previa, placenta accreta, and vasa previa. Obstetrics and gynecology, 107(4), 927–941. https://doi.org/10.1097/01.AOG.0000207559.15715.98
16. Publications Committee, Society for Maternal-Fetal Medicine, & Belfort, M. A. (2010). Placenta accreta. American journal of obstetrics and gynecology, 203(5), 430–439. https://doi.org/10.1016/j.ajog.2010.09.013
17. Eric Jauniaux, John C. Kingdom, Robert M. Silver,A comparison of recent guidelines in the diagnosis and management of placenta accreta spectrum disorders,Best Practice & Research Clinical Obstetrics & Gynaecology,Volume 72,2021,Pages 102-116,ISSN 1521-6934, https://doi.org/10.1016/j.bpobgyn.2020.06.007.
18. Pan, S., Han, M., Zhai, T., Han, Y., Lu, Y., Huang, S., Zuo, Q., Jiang, Z., & Ge, Z. (2024). Maternal outcomes of conservative management and cesarean hysterectomy for placenta accreta spectrum disorders: a systematic review and meta-analysis. BMC pregnancy and childbirth, 24(1), 463. https://doi.org/10.1186/s12884-024-06658-x
19. Loukopoulos, T., Zikopoulos, A., Plachoura, M., Galani, A., Zikopoulos, K., & Kolibianakis, E. (2023). Emergency Obstetric Hysterectomy after Conservative Management of Placenta Accreta. Case reports in obstetrics and gynecology, 2023, 2420333. https://doi.org/10.1155/2023/2420333
20. Overton, E., Wen, T., Friedman, A. M., Azad, H., Nhan-Chang, C. L., Booker, W. A., Khoury-Collado, F., & Mourad, M. (2023). Outcomes associated with peripartum hysterectomy in the setting of placenta accreta spectrum disorder. American journal of obstetrics & gynecology MFM, 5(12), 101174. https://doi.org/10.1016/j.ajogmf.2023.101174