Open Access

Original Article

Frequency and Perinatal Outcomes of Placenta Previa with Placenta Accreta Spectrum at PEMH Rawalpindi

Irum Mehmood, Umairah Yaqub*, Mahrukh Abid, Adiba Alam, Hadia Chaudary, Maham Shah

Department of Gynecology & Obstetrics, Pak Emirates Military Hospital/National University of Medical Sciences (NUMS), Rawalpindi Pakistan,
*Department of Gynecology & Obstetrics, Combined Military Hospital Murree/National University of Medical Sciences (NUMS) Pakistan

ABSTRACT

Objective: To measure the frequency and perinatal outcomes in patients with placenta previa with Placenta Accreta Spectrum at PEMH Rawalpindi and compare their complications between emergency and non-emergency surgery.
Study Design: Quasi-experimental study.
Place and Duration of Study: Pak Emirates Military Hospital, Rawalpindi Pakistan, from Jan to July 2024.
Methodology: After ethical approval 130 patients with Placenta Accreta Spectrum were randomized into two groups after non-probability consecutive sampling on basis of urgency of surgery. In elective (EL) surgery patients (Group-EL) ureteric stenting was done and in emergency (ER) surgery patients (Group-ER) ureteric stenting was not done. Different perinatal (maternal and neonatal) outcomes were studied in both groups.
Results: The primary outcome was the frequency of cesarean hysterectomy which was done in 32(49%) Group-EL patients and 30(46.2%) Group-ER patients with *p*-value of 0.430. The complications like frequency of intensive care stay, bladder injury, ureteric injury, massive blood transfusion and uterine rupture were higher in the emergency surgery group.
Conclusion: We concluded that the frequency of adverse perinatal outcomes both maternal and fetal is very high in placenta previa with placenta accreta spectrum and these did not differ much between elective and emergency surgery however elective surgery still offers a better safety profile in terms of lower frequency intensive care stay, bladder injury, ureteric injury, massive blood transfusion and uterine rupture.
Keywords: Fetal, Maternal, Placenta Accreta Spectrum, Placenta Previa, Pregnancy, Transfusion and Ureter.

How to Cite This Article: *Mehmood I, Yaqub U, Abid M, Alam A, Chaudary H, Shah M. Frequency and Perinatal Outcomes of Placenta Previa with Placenta Accreta Spectrum at PEMH Rawalpindi. Pak Armed Forces Med J 2026; 76(7): 974-978. DOI: https://doi.org/10.51253/pafmj.v76i7.12994*

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (https://creativecommons.org/licenses/by-nc/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Dysfunctional infiltration of chorionic villi results in development of placenta accreta.[1] The term "placenta accreta spectrum" refers to a group of clinical circumstances when the placenta is unable to separate from the uterus due to the dysfunctional chorionic villi infiltration leading to severe obstetric bleeding.[2] Regretfully, the incidence of morbidly adherent placenta in Pakistani female patients undergoing cesarean delivery has increased sharply and unsettlingly. It now stands at 41 cases out of 10,000 patients, and the mortality rate has increased to 7%.[3] Despite the fact that antenatal care is improved in Pakistan,[4] there are still many patients who do not go to hospital for antenatal care. These patients are present as un-booked or poorly booked and sometime present with ante-partum hemorrhage due to sinister causes like placenta accreta spectrum. Multi-disciplinary team management is required on an emergency basis under such circumstances.[5] Severe bleeding in such patients can be fatal without immediate surgical interventions like vascular ligation or total hysterectomy. Placenta's invasion of bladder or bowel is more perilous and large-scale transfusions of blood and blood products are typical under such situations.[6]

Few studies have been done in Pakistan in the past to find out how common placenta accreta spectrum is and on radiological diagnosis, but perinatal outcomes are not studied extensively. The number of cesarean sections is increasing, the frequency of placenta accreta spectrum, and the list of side effects on maternal and fetal outcomes is also increasing. Therefore, the rationale of this study was to explore perinatal outcomes. In tertiary care hospital we get emergency referrals for placenta accreta spectrum disorders despite routine elective cases. Therefore, we included all the patients in our study to provide insight into this crucial area.

METHODOLOGY

The permission from hospitals ethical committee was taken (vide registration A/28/ERC/177/24). This quasi-experimental study was carried out at obstetrics & Gynecology Department of Pak Emirates Military Hospital (PEMH), Rawalpindi Pakistan for a period of

Correspondence: Dr Irum Mehmood, Department of Gynecology & Obstetrics, Pak Emirates Military Hospital, Rawalpindi Pakistan
Received: 20 Dec 2024; revision received: 28 Apr 2025; accepted: 13 May 2025

six months from January to July 2024. Sample size was estimated with help of WHO sample size calculator with level of significance 5%, power of test 80%, the anticipated complication rate in emergency surgery to be 40%7 and anticipated complication rate for elective surgery to be 13%.[7] The minimum sample size came out to be 42. We collected study sample of 130 patients through non-probability consecutive sampling. The sample was randomized into two groups based on urgency of surgery that is elective (Group-EL) and Emergency (Group-EM).

Inclusion Criteria: All booked and emergency patients with an age range between 18-45 years with diagnosis of placenta accreta spectrum with abnormal placental invasion, including placenta accreta with penetration <50% of the myometrium were included.8 Patients with gestational age greater than 35 weeks were included and experienced sonologist performed doppler ultrasound to diagnose these patients with placenta accreta spectrum during the prenatal stage (third trimester) or on emergency ultrasound.

Exclusion Criteria: Patients with placenta increta, percreta, gestational diabetes, pre-eclampsia, cardiac disease and BMI greater than 35kg/m2 were excluded from study.

The patients who came in emergency were also included based on the above criteria. Based on urgency, the patients who were operated electively were labelled Group- EL and patients who were operated in emergency were labelled Group-ER. Ureteric stents[9] were inserted in all elective patients from radiology suite a night before surgery by urologist. The patients who started bleeding or developed fetal distress while being admitted in the ward in off-hours were taken to operation theater without ureteric stenting were included in the emergency surgery and included in group ER. The primary maternal outcome was peripartum hysterectomy. The secondary maternal outcomes included, frequency of massive transfusion, uterine rupture, admission in ICU, bladder injury, bowel injury, ureteric injury and ileus. The neonatal outcomes included the presence or absence of low APGAR (APGAR less than 7) and low birth weight (less than 2500 grams) in newborns. The demographics including age, weight, height, parity, BMI and gestational age were also recorded. The elective surgery was defined as surgery in which patient had ureteric stenting day before surgery and surgery was planned with prior liaison with anesthesia and pathology department. The emergency surgery was defined when surgery was done in off-hours, with no prior ureteric stenting and emergency ultrasound was done by sonologist.The study was done in four phases: Enrollment, randomization, intervention, follow-up and analysis as shown in Figure-1 below.

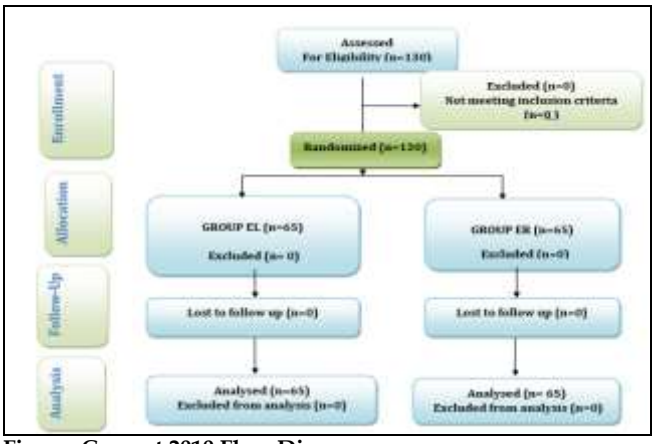


Figure: Consort 2010 Flow Diagram

The data was collected and analyzed on statistical package of social science (SPSS) version 26. Median and Interquartile range was calculated for qualitative variables (age, weight, height, BMI, gestational age) which were not distributed normally. Frequency along with percentages were computed for qualitative variables including complications and previous surgeries. Chi square test (for qualitative variables) and Mann Whittney U-test (for non-normal quantitative data)) were applied and *p*-value of ≤0.05 was considered as statistically significant.

RESULTS

The study included 130 patients in total which were divided into two groups on basis of urgency of surgery. The median age of Group-EL patients was 26.00 years (IQR 31.00-25.00) and median age of Group-ER patients was 28.00 years (IQR 31.00-25.00) with *p*-value of 0.944. The median weight was 69.00 kg (IQR73.50-65.00) in Group-EL and median weight was 69.00kg (IQR 72.00-65.00) in Group-ER. The median height was 160.00 cm (IQR167.50-157.00) in Group-EL which was almost same as Group-ER that is 163.00 cm (IQR 169.00-158.00). The median BMI was 26.50 kg/m2 (28.00-24.27) in Group-EL and 25.65 kg/m2 (IQR28.00-24.00) in Group-ER. The gestational age of Group-EL patients was 36.00 weeks (IQR37.00-35.00) and 36.00 weeks (IQR37.00-35.00) in Group-ER. The frequency of previous cesareans was four in 17(26.2%)

Group-EL patients and 12(18.5%) Group-ER patients. The demographics are tabulated in Table-I.

Table-I: Demographic Characteristics of Study Groups (n=130)

Variable(s)		Group-EL (n=65)	Group-ER (n=65)	*p*-value
Median Age (Years)		26.00.(IQR 31.00-25.00-)	28.00 (IQR25.00-31.00)	0.944
Median Weight (Kg)		69.00 (IQR 73.50-65.00)	69.00 (IQR 65.00-72.00)	0.977
Median height (cm)		160 (IQR167.00- 157.00)	163.00 (IQR 169.00-158.00)	0.982
Median BMI (kg/m2)		26.50 (IQR 28.00-24.27)	25.65 (IQR 28.00-24.00)	0.485
Gestational Age (Weeks)		36.00 (IQR37.00-35.00)	36.00 (IQR37.00-35.00)	0.595
Frequency of Previous Cesarean Sections	1	4(6.2%)	3(4.6%)	0.688
	2	14(21.5%)	14(21.5%)	
	3	29(44.6%)	33(50.8%)	
	4	17(26.2%)	12(18.5%)-	
	5	1(1.5%)	3(4.6%)	

Kg: Kilogram, BMI: Body Mass Index

Table-II: Frequency of Perinatal Complications Among Groups (n=130)

		Group-EL (n=65) n (%)	Group-ER (n=65) n (%)	*p*-value
Maternal complications				
Peripartum Hysterectomy	Yes	32(49.2%)	30(46.2%)	0.430
	No	33(50.8%)	35(53.8%)	
Uterine Rupture	Yes	1(1.5%)	11(16.9%)	0.001
	No	64(98.5%)	54(83.1%)	
Days in Intensive Care Unit	2	1 (1.5%)	0(0%)	0.003
	3	16(24.6%)	6(9.2%)	
	4	26 (40.0%)	16(24.6%)	
	5	13 (20.0%)	19(29.2%)	
	6	7 (10.8%)	14(21.5%)	
	7	2 (3.1%)	10(15.4%)	
Bladder Injury	Yes	6(9.2%)	18(27.7%)	0.006
	No	59(90.8%)	47(72.3%)	
Ureteric Injury	Yes	0(0%)	2(3.1%)	0.248
	No	65(100.0%)	63(96.2%)	
Post-Operative Ileus	Yes	14(21.5%)	16(24.6%)	0.418
	No	51(78.5%)	49(75.4%)	
Massive transfusion	Yes	25(38.5%)	45(69.2%)	<0.001
	No	40(61.5)	20(30.8%)	
Neonatal complications				
Low APGAR Score	Yes	5(7.7%)	11(16.9%)	0.090
	No	60(92.3%)	54(83.1%)	
Low Birth Weight	Yes	55(84.6%)	53(81.5%)	0.408
	No	10(15.4%)	12 (18.5%)	

The primary outcome was the frequency of cesarean hysterectomy which was done in 32(49%) Group-EL patients and 30(46.2%) Group-ER patients with *p*-value of 0.430 which shows the primary outcome was similar in both groups, but the frequency of days spent intensive care unit (ICU) was higher in Group-ER patients compared to Group-EL patients. Sixteen (24.6.0%) Group-EL patients spent 4 days in ICU, 13(20.0%) patients spent 5 days in ICU, 7(10.8%) patients spent 6 days in ICU and 2(3.1%) spent 7 days in ICU but none of the patients died. Sixteen (24.6%) Group-EL patients spent 4 days in ICU, 19(29.2%) patients spent 5 days in ICU, 14(21.5%) patients spent 6 days in ICU and 10(15.4%) spent 7 days in ICU but there was no mortality. Bladder injury was seen in 6(9.2%) Group-EL patients, but it was seen in 18(27.7%) Group-ER patients with *p*-value <0.05. Twenty-five patients (38.5%) in Group-EL were given massive blood transfusion and 45(69.2%) patients in Group-ER were given massive blood transfusion with *p*-value <0.001. The rest of maternal outcomes were similar in both groups as mentioned in Table-II. The neonatal outcomes were also analogous in both groups with 5(7.7%) neonates having low APGAR in Group-EL and 11(16.9%) in group ER. Fifty-five (84.6%) had low birth weight in Group-EL and 53(81.5%) had low birth weight in Group-ER as mentioned in tabulated form along with maternal outcomes.

DISCUSSION

The findings of our study show that the rate of complications was quite high in both groups, but emergency surgery had a higher rate of complications overall. Our statistics are better than the tertiary care hospital of Pakistan where rate of hysterectomy is almost 80 percent.[10] Our statistics regarding cesarean hysterectomy were also better than the data presented by Eric Jauniaux *et al.*,[11] who conducted their study in United Kingdom. The rate of hysterectomy in their demographic population was 52% but, in our study, it was 49% in elective surgery patients and 46% in emergency surgery patients. They performed a meta-analysis of ninety-eight studies. Their systematic review had limitations as they found substantial variation across studies regarding parameters studied and methodologies concerning clinical criteria used for the diagnosis of the condition at birth, histopathologic confirmation of the diagnosis, and differentiation between adherent and invasive accreta placentation limited further quantification. We included patients with placenta accreta who had no evidence of placenta percreta and patients were booked with the gynecology obstetrics department. We excluded un-booked and both the above-mentioned studies all placenta accreta spectrum disorders were included.

The local statistics presented in observational by Naila Yasmeen *et al.*,[12] showed that cesarean hysterectomy was performed in 70% patients who came with placenta accreta spectrum including both booked and un-booked patients. The rate was higher compared to our study. The possible explanation may be that 70% of patients in their study were un-booked and they also included patients with placenta percreta. In our study all patients were managed by senior obstetricians and anesthetists with invasive arterial

blood pressure and central venous pressure monitoring.[13] The timely availability of blood for emergency surgeries was ensured with utilization of massive transfusion protocols[14] wherever required. Hematologists, critical care anesthesia team and radiologists were involved in all cases.

According to cohort study by Xueyan Han,[15] comprising three thousand patients of different ethnicities, the frequency of cesarean hysterectomy was 59% which is similar to our study. Their study had limitations like it relied on the authenticity of the databases instead of original records of patients which could have been a source of bias. We on the other hand performed an experimental study based on validated patients records and we compared the outcomes between two groups of patients.

In almost 50% of patients in our study groups, uterine sparing was possible in patients of placenta accreta without any need of re-opening. According to a multicenter study by Sherif A Shazly *et al.*,[16] uterine preservation techniques were successful in seventy-nine percent of patients. In our study 50% of patients had their uterus preserved, which is quite promising. Similar statistical analysis was published in study by Razieh Mohammad Jafari *et al.*,[17] who studied sixty-eight women out which forty-four percent had their uterus preserved due to uterine sparing techniques. Although the incidence of massive transfusion was high in both study groups, it was acceptable to patients who had high fertility demand who did not want hysterectomy.

Not only mother but also fetus is a victim of placenta accreta spectrum. According to Gamal A Kassem *et al.*, 3-5 percent fetal growth restriction is expected in patients with abnormal placentation, but in their study, it was more than this global figure and most of neonates had birth weight between 10th and 50th percentile of weight mentioned in Hadlock growth chart. However, they did not find significant difference in fetal outcomes between placenta previa and placenta accreta patients.[18] In our study we included only placenta accreta patients and fetal outcome in our study showed that almost 80 percent kids were low birth weight. This is since most of the fetuses did not reach term due to early surgery. The age range in their study was 26-40 weeks and the age range in our study 35-37 weeks.

The bladder injury is associated with placenta accreta spectrum disorders. It has been established that 149 percent of patients develop bladder injury in placenta accreta surgery.[19] In our study the frequency of bladder injury was 9 percent in the elective surgery group and 27 percent in emergency surgery group. Ureteric injury was not found in electively operated patients as uterine stenting offered advantage,[20] but two patients developed ureteric injury in emergency surgery patients and urologist was called for ureteric reconstruction.

LIMITATIONS OF STUDY

Our study had few limitations. It was a single center experience. We excluded placenta percreta and placenta inccreta as we go for hysterectomy in such patients and do not attempt uterine preservation. All our emergency surgery patients were admitted to hospital already due to institutional protocols and entitlement. Blood products were arranged by all patients on admission so no Uncross-matched or O negative blood transfusion was given to any patient.

RECOMMENDATIONS

The patients diagnosed with placenta previa with placenta accreta spectrum should be operated electively preferably early and uterine preservation should be done in carefully selected patients to improve perinatal outcomes.

CONCLUSION

We concluded that the frequency of adverse perinatal outcomes both maternal and fetal is very high in placenta previa with placenta accreta spectrum and these did not differ much between elective and emergency surgery however elective surgery still offers a better safety profile in terms of lower frequency intensive care stay, bladder injury, ureteric injury, massive blood transfusion and uterine rupture.

Conflict of Interest: None.

Funding Source: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

IM & UY: Data acquisition, data analysis, critical review, approval of the final version to be published.

MA & AA: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

HC & MS: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

REFERENCES

1. Sergi CM, Sergi CM. Placenta, Abnormal Conception, and Prematurity. Pathology of Childhood and Adolescence: An Illustrated Guide 2020: 1409-1569. https://doi.org/10.1007/978-3-662-59169-7_18

2. Liu X, Wang Y, Wu Y, Zeng J, Yuan X, Tong C, et al. What we know about placenta accreta spectrum (PAS). Eur J Obstet Gynecol Reprod Biol 2021; 259: 81-89. https://doi.org/10.1016/j.ejogrb.2021.02.001
3. Tahseen H, Khokhar S, Qurban S, Khurshid N, Tayyab M, Muneer N. Morbidly adherent placenta in patients with placenta previa and feto-maternal outcomes. J Soc Obstet Gynecol Pak 2023; 13(2): 69-72.
4. Asim M, Hameed W, Saleem S. Do empowered women receive better quality antenatal care in Pakistan? An analysis of demographic and health survey data. PLoS One 2022; 17(1): e0262323. https://doi.org/10.1371/journal.pone.0262323
5. Young H, Ehrig JC, Hammonds K, Hofkamp MP. Effect of a placenta accreta spectrum multidisciplinary team and checklist on maternal outcomes for planned hysterectomy at time of cesarean delivery. Proc (Bayl Univ Med Cent); 35(6): 755-758. https://doi.org/10.1080/08998280.2022.2109113
6. Shah N, Khan NH, Unit III G. Emergency Obstetric Hysterectomy: a review of 69 cases. Rawal Med J 2009; 34: 75-78. https://doi.org/10.1002/ijgo.14121
7. Flores-Mendoza H, Chandran AR, Hernandez-Nieto C, Murji A, Allen L, Windrim RC et al. Outcomes in emergency versus electively scheduled cases of placenta accreta spectrum disorder managed by cesarean-hysterectomy within a multidisciplinary care team. Int J Gynaecol Obstet 2022; 159(2): 404-411. https://doi.org/10.1002/ijgo.14121
8. Arakaza A, Zou L, Zhu J. Placenta accreta spectrum diagnosis challenges and controversies in current obstetrics: a review. Int J Womens Health 2023; 31: 635-654. https://doi.org/10.2147/ijwh.s395271
9. Horgan R, Hessami K, Diab YH, Scaglione M, D'Antonio F, Kanaan C et al Prophylactic ureteral stent placement for the prevention of genitourinary tract injury during hysterectomy for placenta accreta spectrum: systematic review and meta-analysis. Am J Obstet Gynecol MFM 2023; 5(10): 101120. https://doi.org/10.1016/j.ajogmf.2023.101120
10. Rehan S, Tabassum H, Tufail S, Nawaz Q, Mushtaq N, Khan AA. Maternal Factors and Complications Associated with Morbidly Adherent Placenta: An Experience at a Tertiary Care Hospital in Pakistan. Pak Armed Forces Med J 2023; 73(3): 866-869. https://doi.org/10.51253/pafmj.v73i3.9113
11. Jauniaux E, Bunce C, Grønbeck L, Langhoff-Roos J. Prevalence and main outcomes of placenta accreta spectrum: a systematic review and meta-analysis. Am J Obstet Gynecol 2019; 221(3): 208-218. https://doi.org/10.1016/j.ajog.2019.01.233
12. Yasmeen N, Ahmad S, Khanum Z, Khanum F, Khan S. Fetomaternal Out Come in Placenta Accreta Spectrum (Pas) in a Tertiary Care Teaching Hospital. J Allama Iqbal Med Coll 2023; 21(1): 34-39. https://doi.org/10.59058/jaimc.v21i1.88
13. Reale SC, Farber MK. Management of patients with suspected placenta accreta spectrum. BJA educ 2022; 22(2): 43-51. https://doi.org/10.1016/j.bjae.2021.10.002
14. Munoz JL, Ramsey PS, Greebon LJ, Salazar E, McCann GA, Byrne JJ. Risk factors of massive blood transfusion (mtp) in cesarean hysterectomy for placenta accreta spectrum. Eur J Obstet Gynecol Reprod 2024; 293: 32-35. https://doi.org/10.1016/j.ejogrb.2023.12.006
15. Han X, Guo Z, Yang X, Yang H, Ma J. Association of placenta previa with severe maternal morbidity among patients with placenta accreta spectrum disorder. JAMA Netw Open 2022; 5(8): e2228002. https://doi.org/10.1001/jamanetworkopen.2022.28002
16. Shazly SA, Hortu I, Shih JC, Melekoglu R, Fan S, Ahmed FUA. Prediction of success of uterus-preserving management in women with placenta accreta spectrum (CON-PAS score): A multicenter international study. Int J Gynaecol Obstet 2021; 154(2): 304-311. https://doi.org/10.1002/ijgo.13518
17. Jafari RM, Najafian M, Barati M, Saadati N, Jalili Z, Poolad A. Comparison of uterine preservation versus hysterectomy in women with placenta accreta: A cross-sectional study. Int J Reprod Bio Med 2022; 20(9): 739. https://doi.org/10.18502/ijrm.v20i9.12063
18. Kassem G. A, Alzahrani A. K. Maternal and neonatal outcomes of placenta previa and placenta accreta: three years of experience with a two-consultant approach. Int J Womens Health 2013; 5(1): 803–810. https://doi.org/10.2147/IJWH.S53865
19. Giuseppe C, Salvatore P, Federica C, Francesco L, Francesco D, Alessandro L, et al. Urinary tract injuries during surgery for placenta accreta spectrum disorders. Eur J Obstet Gynecol Reprod Biol 2023; 287: 93-96. https://doi.org/10.1016/j.ejogrb.2023.05.036
20. Riedrich L, Mor N, Weissmann-Brenner A, Kassif E, Friedrich SN, Weissbach T, et al. Risk factors for bladder injury during placenta accreta spectrum surgery. Int J Gynaecol Obstet 2023; 161(3): 911-919. https://doi.org/10.1002/ijgo.14567

.....