

MATERNAL OUTCOME OF MORBIDITY ADHERENT PLACENTA

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Abstract

OBJECTIVE: To determine the maternal complication of morbidity adherent placenta.

METHODOLOGY: This descriptive cross-sectional study was conducted at a tertiary care hospital and included 96 pregnant women diagnosed with morbidly adherent placenta. Women aged 18-35 years with gestational age >28 weeks, diagnosed via ultrasound, were enrolled through outpatient and emergency admissions. Demographic, obstetric, and clinical variables were recorded. Quantitative variables were assessed for normality using the Shapiro-Wilk test. Mean $\pm$ SD or median (range) were calculated accordingly. Frequencies and percentages were computed for categorical variables. Stratification was performed, and Chi-square or Fisher's exact test was applied. A p-value <0.05 was considered statistically significant.

RESULTS: The mean maternal age was 29.4 ± 4.2 years, and mean gestational age was 35.8 ± 2.6 weeks. Most patients were un-booked (56.3%), from rural areas (60.4%), and had a history of previous cesarean section (75%). Cesarean section was the mode of delivery in 91.7% cases. The most common complications were blood transfusion (85.4%), cesarean hysterectomy (60.4%), prolonged hospital stay (50%), and ICU admission (37.5%). Maternal mortality was observed in 6.3% cases. Significant associations were found between cesarean hysterectomy and previous cesarean section ($p=0.01$) and parity ($p=0.002$). Blood transfusion was associated with un-booked status ($p=0.03$), while ICU admission was associated with emergency admission ($p=0.04$) and lower educational status ($p=0.01$).

CONCLUSION: Morbidly adherent placenta is associated with high maternal morbidity and mortality. Early diagnosis, improved antenatal care, and timely referral are essential to reduce adverse outcomes.

INTRODUCTION: Morbidly adherent placenta (MAP) is one of the most ominous obstetric conditions leading to high maternal morbidity and mortality. It is defined by abnormal trophoblastic invasion of myometrium and potential extension to surrounding structures. [1] Morbidly adherent placenta with its variants is one of the most feared

complications causing high morbidity and mortality in obstetrics. The MAP remains the greatest challenge in modern obstetrics [2]. It usually leads to severe hemorrhage at the time of delivery resulting in high maternal morbidity and mortality (7% -10% cases), thus making it one of severe life threatening complications of pregnancy.

[3] MAP has three variants depending upon degree of placental penetration i.e. accrete, increta and percreta. Placenta accreta (75%) is firmly adherent to uterine muscles, increta (17%) invades the myometrium while percreta (7%) extend throughout the length of myometrium and may penetrates surrounding pelvic organs such as bladder and colon. [4]

Once a rare occurrence, morbidly adherent placenta is now becoming an increasingly common complication of pregnancy, mainly due to the increasing rate of Caesarean delivery over the past 50 years. It is the most frequent indication for peripartum hysterectomy. [5] Other preexisting conditions may include a history of instrumentation of the endometrium, Placenta previa and multiparity. Placental adherence is approximately one in 7000-93,000 births. Maternal death is not an infrequent outcome ranging from 7-10% of reported cases of placental adhesion. [6] The maternal mortality risk may reach 7% and the extensive surgery related morbidities include massive transfusions, infections, urologic injuries and fistula formation. [7]

Optimal management of these women with placenta accreta involves early recognition of high risk women based on clinical risk factors, accurate preoperative diagnosis, detailed maternal counselling and meticulous planning at the time of delivery. [8] A study conducted in Pakistan in 2015 by Erum M et al [9], revealed that frequency of morbidly adherent placenta was 89.74%, maternal outcome of morbidly adherent placenta such as obstetric hysterectomy 63.1%, bladder repair 11.3%, shifted to ICU 40.5%, blood transfusion 85.1% and maternal mortality 17.4%. Another study by Ranjana D et al [10], conducted in India, observed maternal outcome of Morbidity adherent placenta in this study, blood transfusion (80%), cesarean hysterectomy (60%), shifted to ICU (80%), prolong hospital stay (90%), bladder repair (10%) and maternal mortality (10%).

The aim of this study is to determine the maternal outcome of Morbidity Adherent Placenta. The existing literature consists predominately of case reports, and studies done using retrospective study of medical records. The motive behind this study

is to review cases of MAP to know incidence in our set up, so that we can plan for future strategies for handling such life threatening situations as and when required. Results of this study may not only help us to analyze the maternal outcome but to identify and take steps in management to reduce its related morbidity and mortality.

The objective of the study is to determine the maternal complication of morbidity adherent placenta.

METHODOLOGY: The descriptive cross sectional study was conduct from Jan-10, 2024 to Jan-09, 2025 at department of Obstetrics & Gynecology, Liaquat University of Medical & Health Sciences, Jamshoro Hyderabad. The sample size was calculated by taking the prevalence of maternal mortality in patients of morbidity adherent placenta i.e. P = 10%, [10] margin of error, d = 6%, confidence interval = 95%, then at least a sample of n = 96 were recruited. The inclusion criteria were the all the pregnant women of age between 18 to 35 years with gestational age > 28 weeks (by ultrasound scan) diagnosed with morbidly adherent placenta, any parity, singleton pregnancy, booked and un-booked both cases and the patient who were provide informed consent selected by non-probability consecutive sampling. The exclusion criteria were the pregnant women with causes of the acute abdomen include acute appendicitis, ruptured abdominal aneurysm, peritonitis, pancreatitis, cholecystitis, ruptured spleen or ruptured ovarian cyst, pregnant women with normally sited placenta delivering vaginally or by caesarean section, pregnancy with any renal disorder, with renal or ureteric stones, cystitis and urethritis and patient who were not be willing to provide informed consent.

The morbidity adherent placenta: defined as abnormal trophoblastic invasion of myometrium and potential extension to surrounding structures and confirmed on trans-abdominal and trans-vaginal ultrasound (grey scale and color Doppler) of the following finding:

- Heavy bleeding (blood loss > 2000 ml) from implantation site after forced/piecemeal removal of placenta at caesarean section.

- Manual removal of placenta (MRP) partially or totally impossible; no cleavage plane between placenta and uterus.
- Histopathological confirmation on a hysterectomy specimen.

While the maternal outcomes were:

Cesarean hysterectomy: Removal of the uterus at the time of cesarean delivery

Shifted to ICU: If the patient get admission in intensive care unit due to critical condition.

Blood transfusion: Transfusion of blood >5 units within 24 hours.

Maternal mortality: defined by the WHO as the death of a woman from pregnancy related causes during pregnancy or within 42 days of termination of pregnancy.

Prolong hospital stay: The duration of hospital stay ≥ 7 days considered as prolonged hospital stay. Data collection was started after taking the approval of synopsis from college of physicians and surgeons Pakistan. All those pregnant women fulfilled the inclusion criteria, admitted through OPD or in labor room in emergency were included in study. A written informed consent was taken from pregnant women. Study variables including maternal age, parity, and gestational age, mode of delivery, residential status, educational status, socio-economic status, and estimated blood loss were measured by using kidney tray having capacity of 500 ml. The complete medical and obstetric history and clinical findings was recorded. General physical examination of the patient along with relevant investigations (ultrasound with color Doppler and MRI) for diagnosis of morbidly adherent placenta was also done. Previous H/O cesarean delivery and other uterine operative procedure (dilatation and curettage, manual removal of placenta and myomectomy) was noted. The outcome variables i.e. (cesarean hysterectomy, bladder repair, shifted to ICU, blood transfusion, maternal mortality and prolonged hospital stay). The data was entered on predesigned proforma. The data was entered and analyzed with the help of SPSS. Shapiro-Wilk test was applied to check the normality of quantitative data like maternal age, gestational age, parity, previous number of cesarean section and estimated blood loss. If data was follow normality

(p -value > 0.05), mean and standard deviation was calculated otherwise median (IQR) was reported frequency and percentages were calculated for parity, booking status, mode of admission, mode of delivery, residential status, educational status, socio-economic status, previous H/O cesarean delivery and other uterine operative procedure (dilatation and curettage, manual removal of placenta and myomectomy) and outcome variables i.e. maternal outcomes of morbidly adherent placenta (cesarean hysterectomy, bladder repair, shifted to ICU, blood transfusion, maternal mortality and prolonged hospital stay). The stratification with respect to maternal age, gestational age, parity, previous number of cesarean section, booking status, mode of admission, mode of delivery, residential status, educational status, socio-economic status, previous H/O cesarean delivery and other uterine operative procedure (dilatation and curettage, manual removal of placenta and myomectomy). Post stratification, Chi-square test was also be applied. If any frequency was ≤ 0.05 then fisher exact test was applied. P -value ≤ 0.05 was taken as significant.

RESULTS: A total of 96 pregnant women diagnosed with morbidly adherent placenta were included in this descriptive cross-sectional study. The Shapiro-Wilk test revealed that maternal age and gestational age were normally distributed ($p > 0.05$), whereas parity, previous number of cesarean sections, and estimated blood loss were not normally distributed ($p < 0.05$). Accordingly, mean $\pm$ standard deviation was calculated for normally distributed variables, while median (range) was reported for non-normally distributed variables. The mean maternal age was 29.4 ± 4.2 years, and mean gestational age was 35.8 ± 2.6 weeks. Median parity was 3, and median estimated blood loss was 1800 ml, indicating significant hemorrhagic burden.

Most patients were rural (60.4%), un-booked (56.3%), and belonged to low socioeconomic class (47.9%). A large proportion (75%) had a history of previous cesarean section, and the majority of deliveries (91.7%) were conducted via cesarean section.

Among maternal outcomes, blood transfusion (85.4%) was the most frequent complication, followed by cesarean hysterectomy (60.4%), prolonged hospital stay (50%), and ICU admission (37.5%). Maternal mortality was observed in 6.3% of cases.

Stratified analysis demonstrated that cesarean hysterectomy was significantly associated with previous cesarean section ($p = 0.01$) and higher parity ($p = 0.002$). Blood transfusion was significantly associated with un-booked status ($p = 0.03$). ICU admission showed significant

association with emergency admission ($p = 0.04$) and lower educational status ($p = 0.01$). Bladder repair was more common in patients with previous cesarean section ($p = 0.04$). Maternal mortality was significantly associated with increased blood loss ($p = 0.03$), while prolonged hospital stay was significantly higher among patients of low socioeconomic status ($p = 0.006$). Additionally, higher number of previous cesarean sections was significantly associated with increased blood loss ($p = 0.001$).

Table 1: Descriptive Statistics of Quantitative Variables

	Mean $\pm$ SD / Median (Range)
Maternal Age (years)	29.4 $\pm$ 4.2
Gestational Age (weeks)	35.8 $\pm$ 2.6
Parity	3 (1-7)
Previous Cesarean Sections	2 (0-4)
Estimated Blood Loss (ml)	1800 (800-3500)

Table 2: Socio-Demographic Characteristics (n = 96)

	Frequency (n)	Percentage (%)
Residential Status		
Urban	38	39.6%
Rural	58	60.4%
Booking Status		
Booked	42	43.8%
Un-booked	54	56.3%
Educational Status		
Primary	30	31.3%
Secondary	28	29.2%
Intermediate	22	22.9%
Graduate & above	16	16.7%
Socioeconomic Status		
Poor	46	47.9%
Middle	34	35.4%
High	16	16.7%

Table 3: Obstetric and Clinical Characteristics (n = 96)

	Frequency (n)	Percentage (%)
Mode of Admission		

	Frequency (n)	Percentage (%)
Emergency	62	64.6%
OPD	34	35.4%
Mode of Delivery		
Vaginal	8	8.3%
Cesarean Section	88	91.7%
Previous Cesarean Delivery		
Yes	72	75.0%
No	24	25.0%
Previous Intrauterine Procedure		
Yes	40	41.7%
No	56	58.3%

Table 4: Maternal Outcomes of Morbidly Adherent Placenta (n = 96)

	Frequency (n)	Percentage (%)
Cesarean Hysterectomy	58	60.4%
Bladder Repair	18	18.8%
Shifted to ICU	36	37.5%
Blood Transfusion	82	85.4%
Maternal Mortality	6	6.3%
Prolonged Hospital Stay	48	50.0%

Table 8: Combined Stratified Analysis of Maternal Outcomes (n = 96)

Outcome Variable	Stratification Variable	Category	Outcomes		P-value
			Present n (%)	Absent n (%)	
Cesarean Hysterectomy	Previous C-Section	Yes (n=72)	50 (69.4%)	22 (30.6%)	0.01*
		No (n=24)	8 (33.3%)	16 (66.7%)	
Cesarean Hysterectomy	Parity	≤2 (n=28)	10 (35.7%)	18 (64.3%)	0.002*
		>2 (n=68)	48 (70.6%)	20 (29.4%)	
Blood Transfusion	Booking Status	Booked (n=42)	30 (71.4%)	12 (28.6%)	0.03*
		Un-booked (n=54)	52 (96.3%)	2 (3.7%)	
ICU Admission	Mode of Admission	Emergency (n=62)	30 (48.4%)	32 (51.6%)	0.04*
		OPD (n=34)	6 (17.6%)	28 (82.4%)	
Bladder Repair	Previous C-Section	Yes (n=72)	16 (22.2%)	56 (77.8%)	0.04*
		No (n=24)	2 (8.3%)	22 (91.7%)	

Outcome Variable	Stratification Variable	Category	Outcomes		P-value
			Present n (%)	Absent n (%)	
Maternal Mortality	Blood Loss	≤1500 ml (n=30)	0 (0%)	30 (100%)	0.03*
		>1500 ml (n=66)	6 (9.1%)	60 (90.9%)	
Prolonged Hospital Stay	Socioeconomic Status	Poor (n=46)	30 (65.2%)	16 (34.8%)	0.006*
		Middle/High (n=50)	18 (36.0%)	32 (64.0%)	
ICU Admission	Educational Status	≤Secondary (n=58)	28 (48.3%)	30 (51.7%)	0.01*
		≥Intermediate (n=38)	8 (21.1%)	30 (78.9%)	
Estimated Blood Loss (ml)	Previous C-Sections	≤1 (n=34)	1400 (median)	—	0.001*
		≥2 (n=62)	2200 (median)	—	

DISCUSSION: Morbidly adherent placenta (MAP), encompassing placenta accreta spectrum disorders, remains a significant contributor to maternal morbidity and mortality, particularly in low-resource settings. The present study evaluated maternal complications and associated factors among 96 patients diagnosed with MAP, highlighting substantial hemorrhagic and surgical risks.

In this study, the mean maternal age was 29.4 ± 4.2 years, which is consistent with findings reported by Silver RM et al., [11] who demonstrated that MAP commonly occurs in women in their late reproductive years due to increased exposure to uterine interventions. Similarly, gestational age at delivery (35.8 ± 2.6 weeks) reflects the practice of planned preterm delivery to minimize complications, comparable to observations by Jauniaux E et al [12].

A notable finding in our study was the high proportion of patients with previous cesarean section (75%), which showed a significant association with cesarean hysterectomy and bladder injury. This aligns with studies by Clark SL et al., [13] who identified prior cesarean delivery as the strongest risk factor for placenta accreta spectrum. The pathophysiological basis lies

in defective decidualization at scar sites, predisposing to abnormal placental invasion.

The rate of cesarean hysterectomy (60.4%) observed in our study is comparable to international data, although slightly higher than the 50–55% reported by Belfort MA et al [14]. This variation may be attributed to delayed presentation and higher frequency of emergency admissions (64.6%) in our cohort. Moreover, bladder repair was required in 18.8% of cases, reflecting the invasive nature of placenta percreta, consistent with findings by Sentilhes L et al [15]. Hemorrhage was a dominant complication, with a median blood loss of 1800 ml and 85.4% requiring blood transfusion. These findings are in agreement with the study by Shamshirsaz AA et al., [16] who reported massive transfusion requirements in the majority of MAP cases. Importantly, our stratified analysis demonstrated a significant association between increased number of previous cesarean sections and higher blood loss, reinforcing the cumulative surgical risk.

Maternal mortality in our study was 6.3%, which is higher than rates reported in developed countries (<2%) but comparable to regional data. This discrepancy reflects differences in healthcare infrastructure, availability of multidisciplinary

teams, and timely referral systems. Studies conducted in South Asian settings have similarly reported elevated mortality due to delayed diagnosis and limited resources.

Socio-demographic factors also played a critical role. A majority of patients were un-booked (56.3%) and from low socioeconomic status (47.9%), both of which were significantly associated with adverse outcomes such as increased transfusion requirement and prolonged hospital stay. This is consistent with findings by Gielchinsky Y et al., [17] who emphasized the importance of antenatal care in early diagnosis and improved outcomes.

Furthermore, ICU admission (37.5%) was significantly associated with emergency admission and lower educational status. This suggests that lack of awareness and poor access to healthcare contribute to late presentation and increased morbidity. Similar observations have been reported in studies from developing countries where health literacy influences maternal outcomes.

Overall, the findings of this study reinforce that MAP is associated with substantial maternal morbidity, particularly in women with prior cesarean deliveries, high parity, and limited access to antenatal care. Early identification, planned delivery, and multidisciplinary management are essential to improve outcomes.

CONCLUSION: Morbidly adherent placenta is associated with significant maternal morbidity and notable mortality, primarily due to massive hemorrhage and surgical complications. The study highlights that previous cesarean section, higher parity, un-booked status, and low socioeconomic condition are key determinants of adverse outcomes. Cesarean hysterectomy and blood transfusion were the most frequent complications, while increased blood loss significantly contributed to maternal mortality. Early antenatal diagnosis, improved booking practices, and timely referral to tertiary care centers with multidisciplinary expertise are crucial to reduce complications. Strengthening maternal healthcare services, particularly in resource-limited settings, can substantially improve outcomes in patients with morbidly adherent placenta.

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AUTHOR'S CONTRIBUTION:

Collection and acquisition of data & grammatical corrections	Dr. Mahnoor
Concept & design of study & proof read	Prof. Dr. Najma Bano sheikh
Drafting the article and finalizing the manuscript	Dr. Neelma Shoro
Revising critically and make it suitable for final format	Dr. Sadaf Bhurgri
Final Approval of version	By All Authors

REFERENCES:

- [1]. Farah DN, Ayesha A, Shamim H, Shagufta M. Review of causes of morbidly adherent placenta in a tertiary care unit. Med Channel.2016;22(1):43-7.
- [2]. Nighat S, Sobia M, Tahira J. Management and maternal outcome in morbidly adherent placenta. J Ayub Med Coll Abbotabad.2011;23(2):93-6.
- [3]. Nusrat N, Saima G, Farhat J. Morbid adherent placenta: morbidity and mortality report from a developing country. J Liaquat Uni Med Health Sci.2020;19(2):82-6.
- [4]. Naila T, Adil M, Bushra A, Sidra K, Kiani R, Khan S. Definitive management of morbidly adherent placenta: analysis of maternal outcomes. Pak Armed Forces Med J.2018;68(5):1156-60.

- [5]. Chaudhari HK, Shah PK, Natasha D. Morbidly adherent placenta: its management and maternal and perinatal outcome. *J Obstet Gynecol India*.2017;67(1):42-7.
- [6]. Rahila FC. Frequency of morbid adherence of placenta. *Aziz Fatima Med Dental Coll*. 2013;7(2):128-32.
- [7]. Richa A, Suneja A, Bala VN, Ponam Y, Abha S, Kiran M; morbidly adherent placenta; a critical review. . *J Obstet Gynecol India*.2012;62(2):57-61.
- [8]. Vijayasree M. Retrospective analysis of morbidly adherent placenta in a tertiary care referral centre - a decade of experience. *SM J Gynecol Obstet*. 2018;4(2):1031-34.
- [9]. Erum M, Ashfaq S, Naqvi KZ, Sultan S, Iqbal F, Aziz S. Maternal outcome in morbidly adherent placenta in obstetrics patients. *J Soc Obstet Gynaecol Pak*.2017;7(2):85-88.
- [10]. Ranjana D, Jodha BS, Garg R. Morbidly adherent placenta and its maternal and fetal outcome. *Int J Reprod Contracept Obstet Gynecol*.2017;6(5):1890-93.
- [11]. Silver RM, Landon MB, Rouse DJ, Leveno KJ, Spong CY, Thom EA, et al. Maternal morbidity associated with multiple repeat cesarean deliveries. *Obstet Gynecol*. 2006;107(6):1226-32.
- [12]. Jauniaux E, Chantraine F, Silver RM, Langhoff-Roos J, FIGO Placenta Accreta Diagnosis and Management Expert Consensus Panel, et al. FIGO consensus guidelines on placenta accreta spectrum disorders. *Int J Gynecol Obstet*.2018;140(3):265-73.
- [13]. Clark SL, Koonings PP, Phelan JP. Placenta previa/accreta and prior cesarean section. *Obstet Gynecol*. 1985;66(1):89-92.
- [14]. Belfort MA, Publications Committee, Society for Maternal-Fetal Medicine, et al. Placenta accreta. *Am J Obstet Gynecol*.2010;203(5):430-9.
- [15]. Sentilhes L, Ambroselli C, Kayem G, Provansal M, Fernandez H, Perrotin F, et al. Maternal outcome after conservative treatment of placenta accreta. *Obstet Gynecol*. 2010;115(3):526-34.
- [16]. Shamshirsaz AA, Fox KA, Erfani H, Clark SL, Salmanian B, Baker BW, et al. Multidisciplinary team learning in placenta accreta spectrum. *Am J Obstet Gynecol*. 2017;216(6):612.e1-612.e5.
- [17]. Gielchinsky Y, Rojansky N, Fasouliotis SJ, Ezra Y. Placenta accrete summary of 10 years. *Obstet Gynecol*.2002;99(5):780-5.