Original Article
DOI: https://doi.org/10.70749/ijbr.v3i5.2918

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

Frequency of Morbidly Adherent Placenta in Previous Scarred Uterus and its Complications

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ARTICLE INFO

Keywords: Cesarean section, Placenta accreta, Hysterectomy, Postpartum hemorrhage, Premature birth

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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: 14-03-2025 Revised: 09-05-2025
Accepted: 21-05-2025 Published: 30-05-2025

ABSTRACT

Background: Morbidly adherent placenta is a serious complication in obstetrics, where there is abnormal placental implantation in the uterus with failure to separate after delivery. This complication is more common in women who have a scarred uterus, especially after a cesarean delivery. This complication may lead to serious consequences for both mother and child. **Objective:** To determine the frequency of morbidly adherent placenta in previous scarred uterus and to evaluate its associated maternal and neonatal complications. **Study Design:** Descriptive cross sectional study. **Duration and Place of Study:** This study was carried out from 05 September 2023 to 05 March 2024 in the Department of Obstetrics and Gynecology, Lady Reading Hospital Peshawar. **Methodology:** A total of 139 pregnant women aged 18–40 years with previous uterine scar and gestational age ≥28 weeks were included. Detection of morbidly adherent placenta was done using Doppler ultrasonography and magnetic resonance imaging. Data analysis was done using Statistical Package for Social Sciences version 25. **Results:** Morbidly adherent placenta was observed in 44 patients (31.70%). Among them placenta increta was seen in 43.18%, placenta percreta in 29.55% and placenta accreta in 27.27%. Hysterectomy occurred in 81.80%, low birth weight in 59.10%, preterm delivery in 54.50%, neonatal intensive care unit admission in 56.80% and maternal mortality in 4.50% of affected cases. **Conclusion:** Morbidly adherent placenta is relatively common in women with previous scarred uterus and it is associated with serious maternal and neonatal complications.

INTRODUCTION

Morbidly adherent placenta is an obstetric complication characterized by abnormal adherence and separation of the placenta from the uterine wall.[1] Normally, the placenta adheres to the decidua basalis and separates easily after fetal birth; however, in morbidly adherent placenta, there is deep invasion of the placental villi into the myometrium.[2] Morbidly adherent placenta includes three types of abnormalities: placenta accreta, increta, and percreta, based on the depth of invasion.[3] The most common form is placenta accreta, where there is direct adherence of villi to the myometrium; however, increta and percreta are characterized by deep invasion into the muscularis and even adjacent structures, respectively.[4] The incidence of morbidly adherent placenta has increased in recent years, and this is mainly due to increased rates of cesarean sections and uterine-sparing procedures.

Morbidly adherent placenta has a strong association with a previous scarred uterus, especially in women who have had a cesarean section.[5] Scarring of the uterus from a previous surgical procedure results in an abnormal healing response with thinning of the endometrium and myometrium. This increases the risk of abnormal placental implantation. If placental implantation occurs over or adjacent to a previous cesarean section scar, there is an increased risk of trophoblastic invasion deeper into the uterine wall.[6] This risk is thought to be related to the number of previous cesarean sections. Other procedures that may lead to scarring of the uterus and increase the risk of abnormal placentation include myomectomy or curettage.[7]

This condition is associated with many maternal and fetal morbidities. One such serious condition is postpartum hemorrhage, which occurs because the placenta does not separate from the uterine wall.[8] This results in significant blood loss either during or after delivery. Many patients require transfusion and emergency surgery. In some cases, hysterectomy is required to save the mother's life, leading to infertility.[9] In the newborn, such conditions can lead to serious problems such as low birth weight and prematurity because planned delivery is often required early to prevent maternal complications.[10] Premature birth is associated with many neonatal morbidities, and many newborns are admitted to the neonatal ICU for further care.

There is a scarcity of data regarding the prevalence of morbidly adherent placenta among women with a scarred uterus in Peshawar. Similarly, there is a lack of data regarding associated maternal and fetal complications. As a result of a rising number of cesarean sections in tertiary care hospitals, there is a growing incidence of abnormal placentation, which may lead to serious complications such as postpartum hemorrhage, hysterectomy, preterm births, and neonatal ICU admissions. Keeping in view the above-mentioned reasons, the present study aims to quantify the incidence of morbidly adherent placenta and associated complications in the local population.

METHODOLOGY

A descriptive cross-sectional study was carried out in the Department of Obstetrics & Gynecology, Lady Reading Hospital from 05 September 2023 to 05 March 2024. Before starting the study, approval was obtained from the Ethical Review Committee of the hospital. The ethical approval was granted with reference number 889/LRH/MTI dated 17th August 2023. The total sample size was 139 patients which was estimated by taking 95% confidence level, 8% margin of error and expected proportion of morbidly adherent placenta in previous scarred uterus as 36.40%.[11] Pregnant women fulfilling eligibility criteria were enrolled in the study. Women having singleton pregnancy confirmed on ultrasonography, gestational age ≥28 weeks assessed on last menstrual period and age between 18–40 years were included. Patients having renal disease, antenatal sepsis, ruptured ovarian cyst, placenta abruption, history of pelvic inflammatory disease, intrauterine contraceptive device insertion or those not willing to participate were excluded from the study. Scarred uterus was considered when the patient had previous history of cesarean section, myomectomy or hystrotomy. Written informed consent was taken from each participant before inclusion in the study and they were assured that their information will remain confidential and used only for research purpose. Basic demographic information was recorded including age, gestational age, parity, height, weight and body mass index. Details regarding type of previous surgery (cesarean/myomectomy/hystrotomy) and duration of previous surgery were also documented for each patient.

Detection for morbidly adherent placenta was done through Doppler ultrasonography and magnetic resonance imaging. After enrollment all patients were followed until delivery. Management of patients was done according to standard ward protocol. During delivery and immediate postpartum period, complications were observed and documented including postpartum hemorrhage, obstetric hysterectomy, low birth weight, preterm delivery and NICU admission. Morbidly adherent placenta was considered present when imaging demonstrated thinning of placental myometrial junction measuring <5 mm on ultrasonography or MRI. Post-partum hemorrhage was taken when blood loss was >500 mL after vaginal delivery or >1000 mL after cesarean section. Blood loss was assessed using two methods: (1) collection in a kidney tray with a capacity to hold 500 mL of blood, and (2) measurement of soaked sanitary pads and packs from which the weight before washing was subtracted from the weight after soaking, with a conversion factor of 10 g to 1 mL blood loss. Obstetric hysterectomy was described as surgical removal of the uterus during cesarean section, after vaginal delivery, or within the puerperium due to uncontrollable hemorrhage. Preterm delivery was described as birth before 37 completed weeks of gestation based on last menstrual period. Low birth weight was described as birth weight of less than 2.5 kg, determined immediately after birth. Neonatal intensive care unit admission was described as admission to NICU within the first 24 hours after birth.

All data were entered and analyzed using SPSS version 25. Quantitative variables including age, gestational age, height, weight, BMI and duration of previous surgery were presented as mean ± standard deviation. Qualitative variables such as parity (primiparous/multiparous), type of previous surgery (cesarean/myomectomy / hystrotomy), morbidly adherent placenta and complications including postpartum hemorrhage, hysterectomy, low birth weight, preterm delivery and NICU admission were expressed as frequencies and percentages. Effect modifiers including age, parity, BMI, duration of previous surgery and type of previous surgery were controlled through stratification. Post-stratification chi square test was applied to determine association with morbidly adherent placenta and p-value ≤0.05 was considered statistically significant.

RESULTS

The mean age of the patients was 32.53 ± 3.92 years, while mean gravida and parity was recorded as 4.76 ± 2.05 and 3.23 ± 1.53 respectively. The gestational age at the time of presentation was found to be 36.07 ± 2.29 weeks. Regarding the anthropometric measures, mean height of the patients was 152.68 ± 2.16 cm, mean weight was 80.53 ± 5.85 kg, and body mass index was calculated as 34.55 ± 2.63. The duration of previous surgery was having mean value of 2.24 ± 0.71 years. All the patients in this study was having history of previous cesarean section, that is 139 (100%) (Table 1).

Table 1

Patient Demographics

Demographics	Mean ± SD
Age (years)	32.53 ± 3.92
Gravida	4.76 ± 2.05
Parity	3.23 ± 1.53
Gestational Age (weeks)	36.07 ± 2.29
Height (cm)	152.68 ± 2.16
Weight (kg)	80.53 ± 5.85
BMI	34.55 ± 2.63
Duration of Previous Surgery (years)	2.24 ± 0.71
Type of Previous Surgery	
Cesarean n (%)	139 (100%)

The morbidly adherent placenta was diagnosed in 44 patients out of total 139, which is making a frequency of 31.70%, while remaining 95 patients (68.30%) was not having this condition (Table 2). Among those patients who was diagnosed with morbidly adherent placenta, the most prevalent type was found to be placenta increta which was

seen in 19 cases (43.18%), followed by placenta percreta in 13 cases (29.55%), and placenta accreta was observed in 12 cases (27.27%) (Table 2).

Table 2
Frequency and Type of Morbidly Adherent Placenta in Previous Scarred Uterus

Morbidly Adherent Placenta	Frequency	%age
Yes	44	31.70%
No	95	68.30%
Total	139	100%
Type of MAP		
Placenta Accreta	12	27.27%
Placenta Increta	19	43.18%
Placenta Percreta	13	29.55%

Among the patients who had morbidly adherent placenta, hysterectomy was needed to performed in 36 cases, this is representing 81.80% of the total MAP cases (Table 3). Low birth weight was observed in 26 neonates, that is account for 59.10% of the MAP patients (Table 3). Preterm delivery was occurring in 24 patients which is corresponding to 54.50% frequency (Table 3). NICU admission was required for 25 neonates, the percentage was 56.80% among MAP cases (Table 3). Maternal mortality was recorded in only 2 patients, this is making percentage of 4.50% in the MAP group (Table 3).

Table 3
Frequency of Complications in Morbidly Adherent Placenta

Complications		Frequency	%age
Hysterectomy	Yes	36	81.80%
	No	8	18.20%
	Total	44	100%
Low Birth Weight	Yes	26	59.10%
	No	18	40.90%
	Total	44	100%
Preterm Delivery	Yes	24	54.50%
	No	20	45.50%
	Total	44	100%
NICU Admission	Yes	25	56.80%
	No	19	43.20%
	Total	44	100%
Maternal Mortality	Yes	2	4.50%
	No	42	95.50%
	Total	44	100%

DISCUSSION

The frequency of morbidly adherent placenta was found to be 31.70% (n=44) in patients with previous scarred uterus. This high frequency can be explained by the fact that previous uterine scar causes defective decidualization at the scar site, which is allowing abnormal trophoblastic invasion into the myometrium. When uterus has already been cut and repaired, the normal decidua basalis layer become thin or absent, so the placenta cannot implant in proper superficial manner and instead it invades deeper layers of uterine wall. Among the types of MAP, placenta increta was most common type, seen in 43.18% (n=19) of MAP cases, followed by placenta percreta in 29.55% (n=13) and placenta accreta in 27.27% (n=12). The predominance of increta and percreta over accreta is suggesting that in scarred uterus, trophoblastic invasion tend to go deeper, possibly because the fibrotic scar tissue offer less resistance to invasion than normal myometrium. Hysterectomy was required in majority of the MAP patients that is 81.80% (n=36), which is most important complication. This high rate is because in morbidly adherent placenta, the placenta cannot be separated from uterine wall without causing massive hemorrhage, and surgeon have no other option except to remove the uterus to achieve hemostasis and save the life of patient. Low birth weight was noted in 59.10% (n = 26) of cases, whereas preterm birth was noted in 54.50% (n = 24) of cases. These two factors are strongly related because placental insufficiency in cases of MAP results in inadequate nutrition and oxygen supply to the fetus. Moreover, planned preterm birth is commonly indicated in these cases because of the risk of catastrophic hemorrhage. NICU admission was noted in 56.80% (n = 25) of neonates. This indicates the high incidence of preterm birth and low birth weight in these cases. Premature neonates have poorly developed organ systems, especially the respiratory system. Therefore, intensive neonatal care is required for the survival of these neonates. Maternal mortality was noted in 2 cases (4.50%) in this series. Although the incidence of maternal mortality in MAP cases is low, it indicates the life-threatening nature of the condition. Death in cases of MAP results from uncontrollable hemorrhage, disseminated intravascular coagulation, and multi-organ failure, which can occur at any time during or after labor.

The frequency of morbidly adherent placenta was found to be 31.70% (n=44) in patients with previous scarred uterus. This frequency is considerably higher than what was reported by Farzana T *et al.* [12] who found MAP in only 11.76% (n=20) of patients with previous uterine scars, and also higher than Un Nissa F *et al.* [13] who reported frequency of 9.76% (n=20). The higher frequency in present study can be explained by the difference in sample characteristics, as all 139 patients in this study was having previous cesarean section and mean parity was 3.23 ± 1.53, which is indicating a higher risk population as compared to above mentioned studies. Shabab U *et al.* [14] reported MAP in only 46 cases (0.83%) out of 5515 deliveries, however this was hospital-based denominator frequency which is not directly comparable to present study that was specifically recruiting scarred uterus patients only.

Regarding the type of morbidly adherent placenta, placenta increta was most common type in present study, seen in 43.18% (n=19), followed by placenta percreta 29.55% (n=13) and placenta accreta 27.27% (n=12). This distribution is in contrast to findings of Shabab U *et al.* [14] and Rehan S *et al.* [15] where placenta accreta was the most predominant type, reported in 47.8% (n=22) and 61.1% (n=11) respectively. The reason for this difference may be related to the higher mean parity and longer duration of uterine scar in present study, as repeated uterine surgeries tend to cause more severe fibrosis and defective decidualization, which is allowing deeper trophoblastic invasion and hence more increta and percreta types. Un

Nissa F *et al.* [13] also reported placenta increta as most common type with 6.76% (n=14), which is showing similarity with present study findings.

Hysterectomy was required in 81.80% (n=36) of MAP patients in present study, which is closely comparable to findings of Rehan S *et al.* [15] who reported hysterectomy rate of 83.3% (n=15), and also similar to Sultana N *et al.* [16] who performed total or subtotal hysterectomy in majority of cases. Shabab U *et al.* [14] reported hysterectomy in 30 patients which is also reflecting same clinical trend. This consistently high hysterectomy rate across all studies is scientifically justified because in MAP the placenta is pathologically invaded into myometrium and cannot be safely separated, so surgical removal of uterus remain the most definitive treatment option to control life threatening hemorrhage.

Preterm delivery was observed in 54.50% (n=24) and low birth weight was recorded in 59.10% (n=26) of MAP cases in present study. These findings is consistent with what Shabab U *et al.* [14] reported, as mean gestational age in their study was 33.63 ± 4.69 weeks which is clearly indicating a high burden of preterm births in MAP patients. The scientific reason is that placental dysfunction in MAP cases compromise fetal growth, and additionally planned preterm delivery is often necessary to prevent sudden catastrophic hemorrhage, both of these factors together contributing to high rates of low birth weight and prematurity.

Maternal mortality was recorded in 2 patients (4.50%) in present study. Shabab U *et al.* [14] reported 3 maternal deaths (6.5%) while Sultana N *et al.* [16] also recorded one maternal death in their series. On other hand, Rehan S *et al.* [15] reported no maternal mortality, which may be because of smaller sample size and better surgical preparedness in their tertiary care military hospital setting. Sultana N *et al.* [17] highlighted that MAP contributes to 7–10% maternal mortality globally, and present study findings is falling within this reported range, confirming serious life-threatening nature of this condition. NICU admission was required in 56.80% (n=25) of neonates, which is directly related to high rates of prematurity and low birth weight as discussed above, and this finding is also consistent with overall pattern seen in literature on MAP complications.[18]

This study was carried out in one institution. Therefore, the findings of the study were not representative of the larger population. The study was based on 139 patients. This number was small and might not be representative of the total number of patients who might be suffering from morbidly adherent placenta within the total population of patients who have a scarred uterus. Since the study was descriptive in nature and lacked a control group, the cause and effect of the previous scar in the uterus and the development of morbidly adherent placenta could not be established. The patients were not followed up after the study. Therefore, the outcomes of the patients after they were discharged and the implications of the study on the reproductive health of the patients could not be established.

CONCLUSION

The findings of the present research conclude that morbidly adherent placenta is a relatively common condition among women with a history of a scarred uterus and that a history of cesarean section is a major cause of morbidly adherent placenta. Placenta increta was found to be the most common form of MAP in the present population sample.

Disclaimer: None

Acknowledgment: The authors are grateful to the medical staff of the department for providing support during the course of this research. Their meticulous maintenance of patient records has been quite significant in completing this research.

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