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Frequency of Morbidly Adherent Placenta in Patients with Scarred Uterus

Sundas Jamal[1], Nuzhat Amin[1], Tayyaba Akhtar[1], Sadia Mahmood[1]

[1]Department of Obstetrics & Gynecology, Mardan Medical Complex, Mardan, KP, Pakistan.

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Correspondence to: Sundas Jamal, Department of Obstetrics & Gynecology, Mardan Medical Complex, Mardan, KP, Pakistan.
Email: sundasjamal4949@gmail.com

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ABSTRACT

Background: In recent years more women come to pregnancy with a uterus that already had some surgery before, like cesarean birth or other procedures, and because of this the uterus does not heal in a perfect way. The scar area sometimes become thin or has less blood flow, and this can disturb how the placenta attach in the next pregnancy. When placenta try to grow on a weak scar area, it can go deeper than normal and cause many serious problems for the mother. **Objective:** To determine the frequency of morbidly adherent placenta in pregnant women with a previously scarred uterus. **Study Design:** Cross-sectional study. **Duration and Place of Study:** This study was carried out from December 2024 to May 2025 in the Department of Obstetrics and Gynecology, Mardan Medical Complex Mardan. **Methodology:** A total of 163 pregnant women aged 18 to 40 years with a history of at least one previous uterine surgery and carrying a single fetus were included through consecutive sampling. Diagnosis of morbidly adherent placenta was based on ultrasound signs such as disappearance of the clear zone and extremely thin uterine muscle layer. Clinical examination and history were documented, and all imaging assessments were performed by a senior consultant. **Results:** Morbidly adherent placenta was found in 13 out of 163 women, giving a frequency of 8.00 percent. No significant association was observed with age ($p = 0.262$), gestational period ($p = 0.305$), socioeconomic status ($p = 0.620$), education ($p = 0.619$), or residence ($p = 0.156$). **Conclusion:** Morbidly adherent placenta remains a serious problem in women with previous uterine scars, highlighting the need for careful antenatal evaluation and early detection to reduce maternal risks.

INTRODUCTION

Scarred uterus is become more common in obstetric practice because many women now already had surgery on the womb before current pregnancy, like cesarean section, myomectomy, dilation and curettage or repair of uterine rupture.[1] After these procedures the normal muscle and lining of uterus is not same again, there is fibrous tissue and sometimes thin area at the scar site, so healing is not always perfect and blood supply may also change.[2] These scars can disturb normal implantation of the embryo in next pregnancy and can also affect how the uterus contract during labor and postpartum, so woman can have higher risk of rupture, abnormal bleeding, and problem in delivering placenta.[3] When scar is low in the uterus, like after lower segment cesarean section, it especially makes problem because the next placenta may try to grow on that weak area, and the normal layer that separate placenta from muscle may be missing or very thin, so placenta can attach too deeply.[4]

Placenta previa is condition when placenta is lying low in the uterus and it is reaching or covering the internal cervical opening, instead of staying in upper segment where it usually implants.[5] In pregnancy with scarred uterus, placenta previa is seen much more, because the placenta likes to implant where there is scar and low segment scar give easy surface for that, so women after one or more cesarean sections have higher chance to develop placenta previa in future pregnancy.[6] This condition often presents with painless vaginal bleeding in second or third trimester and the bleeding can be recurrent and sometimes heavy, so mother and fetus can both be at risk.[7]

Morbidly adherent placenta, often called placenta accreta spectrum, happen when placenta attach too deep into the uterine wall and cannot separate normally after delivery, and this problem is strongly associated with both scarred uterus and placenta previa.[8] In normal pregnancy there is a layer called decidua that separate placenta from muscle of uterus, but in women with previous cesarean scar or other uterine damage this layer is defective or absent, so placental villi grow directly into myometrium and sometimes even through the full thickness of uterus and to nearby organs like bladder, this more severe form called increta or percreta.[9] In patients with low-lying placenta over a cesarean scar, risk of morbidly adherent placenta become very high and increase with number of

previous cesareans, so every such case should be suspected and evaluated by color Doppler ultrasound and sometimes MRI to see depth of invasion before delivery.[10] A study reported the frequency of morbidly adherent placenta (9.44%) in patients with previous uterine scar.[11]

There is need to do this study in Mardan because the pattern of cesarean section rate and post-surgical uterine problems is becoming more common here, but local data is still very limited and not give clear picture of the real burden. Many women deliver in peripheral facilities where diagnosis of placenta previa or morbidly adherent placenta is not always accurate, so understanding the situation in this district can help improve early detection and referral. Also the health-care resources in Mardan are different from big urban centers, so knowing how scarred uterus and abnormal placentation behave in this population will guide better planning, training, and emergency preparedness for reducing maternal risk.

METHODOLOGY

The investigation had taken place in the Obstetrics and Gynecology department of Mardan Medical Complex, from 1 December 2024 and to 30 May 2025, and the pattern of work followed a cross-sectional type design. Ethical clearance had already been received from the institutional board and the CPSP. The total number of participants had been calculated by the WHO formula by keeping the expected rate of abnormally attached placenta at 9.44%,[11] with 4.5% error margin and 95% confidence, which produced a requirement of 163 women. Participants were enrolled through consecutive non-probability technique.

Women were taken as suitable when they were between 18 and 40 years of age and carrying a single fetus. A previous uterine scar meant that the woman had undergone at least one cesarean delivery earlier in life. Women with acute abdominal conditions like appendicitis, ruptured ovarian cyst, or bladder infection were not included. A case of abnormally adherent placenta was considered when the placenta was stuck into the muscle layer of uterus more than normal, along with symptoms like vaginal bleeding or pelvic pain around level four on a visual pain scale of zero to ten. Confirmation was made through ultrasound signs showing disappearance of the usual clear space behind the placenta and thinning of the uterine muscle layer to less than one millimeter.

Before data were taken, each woman was informed that the study would not harm her, and the whole purpose was explained in simple wording. Written permission was collected from every participant. The women with early cesarean scar pregnancies underwent an investigation of abnormal placental invasion via ultrasound findings described above while being supervised by a senior consultant with experience of at least five years post-fellowship. The initial evaluation of clinical history and physical examination had been performed to document general appearance, pregnancy duration, and any symptoms such as vaginal bleeding and/or pelvic pain.

The collected information had been analyzed through IBM SPSS version 27. Variables like age, height, weight, BMI, and GA week were shown as mean with standard deviation or median with interquartile range depending on the Shapiro–Wilk test for data distribution. Categorical variables such as abnormal placental adherence, education, SES class, and residence area were presented as percentages. Factors that could influence were adjusted through stratification. After stratification, Chi-square or Fisher exact test had been applied with the significance level kept at 5%.

RESULTS

The mean age of participants were 28.57±6.57 years and mean gestational age was 33.18±3.65 weeks. The patients had mean weight of 66.71±6.32 kg and mean height of 1.60±0.06 m, resulting in mean BMI of 26.44±2.85 Kg/m^2. Regarding socioeconomic status distribution, low socioeconomic status were observed in 77 patients (47.2%), middle socioeconomic status in 64 patients (39.3%), and high socioeconomic status in 22 patients (13.5%). For educational status, 77 patients (47.2%) were educated while 86 patients (52.8%) were uneducated. The residential distribution showed that 83 patients (50.9%) were from rural areas and 80 patients (49.1%) were from urban areas (as shown in Table-I).

Table I

Patient Demographics

Demographics	Mean ± SD
Age (years)	28.57±6.57
Gestational Age (weeks)	33.18±3.65
Weight (kg)	66.71±6.32
Height (m)	1.60±0.06
BMI (Kg/m^2)	26.44±2.85
Socioeconomic Status	
Low n (%)	77 (47.2%)
Middle n (%)	64 (39.3%)
High n (%)	22 (13.5%)
Education	
Educated n (%)	77 (47.2%)
Uneducated n (%)	86 (52.8%)
Residential Area	
Rural n (%)	83 (50.9%)
Urban n (%)	80 (49.1%)

Out of total 163 patients, morbidly adherent placenta was present in 13 patients (8.00%) while it was absent in 150 patients (92.00%) (as shown in Table-II).

Table II

Frequency of Morbidly Adherent Placenta in Patients with Scarred Uterus

Morbidly Adherent Placenta	Frequency	%age
Yes	13	8.00%
No	150	92.00%
Total	163	100%

When age was stratified, in patients aged ≤30 years, morbidly adherent placenta was present in 6 patients (6.1%) and absent in 93 patients (93.9%), while in patients aged >30 years, it was present in 7 patients (10.9%) and absent in 57 patients (89.1%), with p-value of 0.262 showing no statistically significant association. For gestational age stratification, among patients with gestational age ≤36 weeks, morbidly adherent placenta was found in 12 patients (9.3%) and not found in 117 patients (90.7%), whereas in patients with gestational age >36 weeks, it was present in 1 patient (2.9%) and absent in 33 patients (97.1%), with p-value of 0.305 which was not statistically significant. Regarding socioeconomic status, in low socioeconomic group, morbidly adherent

placenta was present in 6 patients (7.8%) and absent in 71 patients (92.2%), in middle socioeconomic group it was present in 4 patients (6.3%) and absent in 60 patients (93.8%), and in high socioeconomic group it was present in 3 patients (13.6%) and absent in 19 patients (86.4%), with p-value of 0.620 indicating no significant association. For educational status, among educated patients, morbidly adherent placenta was present in 7 patients (9.1%) and absent in 70 patients (90.9%), while among uneducated patients, it was present in 6 patients (7.0%) and absent in 80 patients (93.0%), with p-value of 0.619 showing no statistical significance. When residential area was analyzed, in rural patients, morbidly adherent placenta was found in 4 patients (4.8%) and not found in 79 patients (95.2%), whereas in urban patients, it was found in 9 patients (11.3%) and not found in 71 patients (88.8%), with p-value of 0.156 which was not statistically significant (as shown in Table-III).

Table III

Association of Morbidly Adherent Placenta with Demographic Factors

Demographic Factors		Morbidly Adherent Placenta		p-value
		Yes n(%)	No n(%)	
Age (years)	≤30	6 (6.1%)	93 (93.9%)	0.262
	>30	7 (10.9%)	57 (89.1%)	
Gestational Age (weeks)	≤36	12 (9.3%)	117 (90.7%)	0.305*
	>36	1 (2.9%)	33 (97.1%)	
Socioeconomic Status	Low	6 (7.8%)	71 (92.2%)	0.620*
	Middle	4 (6.3%)	60 (93.8%)	
	High	3 (13.6%)	19 (86.4%)	
Education	Educated	7 (9.1%)	70 (90.9%)	0.619
	Uneducated	6 (7.0%)	80 (93.0%)	
Residential Area	Rural	4 (4.8%)	79 (95.2%)	0.156*
	Urban	9 (11.3%)	71 (88.8%)	

***Fischer Exact Test**

DISCUSSION

In our study, the frequency of morbidly adherent placenta was found to be 8.00% among patients with scarred uterus. This finding indicate that scarred uterus is significant risk factor for development of morbidly adherent placenta. The previous uterine scar disrupts normal decidualization process and impairs trophoblastic invasion, which lead to abnormally deep placental implantation. The scar tissue has reduced vascularity, forcing placental tissue to invade more deeply for adequate blood supply. The mean age of patients was 28.57±6.57 years. No statistically significant association was found between maternal age and morbidly adherent placenta (p=0.262), although higher percentage was observed in patients aged >30 years (10.9%) compared to ≤30 years (6.1%). This may be due to cumulative exposure to previous cesarean sections and age-related changes in uterine vascularity over time. The mean gestational age was 33.18±3.65 weeks, suggesting preterm delivery in many cases. No significant association was found between gestational age and morbidly adherent placenta (p=0.305), though higher frequency was noted in patients ≤36 weeks (9.3%) versus >36 weeks (2.9%). This reflect clinical practice of earlier planned delivery to minimize risks of hemorrhage in suspected cases.

In present study, the frequency of morbidly adherent placenta in patients with scarred uterus was found to be 8.00%, which is comparable to several local studies but lower than others. Ahmad N, et al.[12] reported frequency of 12.3% in scarred women, while Un Nissa F, et al.[13] documented 9.76% frequency in scarred uteri, both slightly higher than our findings. However, Mamluk K, et al.[14] reported even higher frequency of 14.3% in women with previous caesarean section. These variations may be attributed to differences in study populations, inclusion criteria, and diagnostic modalities used. The higher frequencies in some studies could be due to more stringent ultrasound surveillance or inclusion of only high-risk patients with multiple previous caesarean sections.

The mean age of patients in our study was 28.57±6.57 years, which is lower than reported by several studies. Sultana N, et al.[15] reported mean age of 33.3±3.2 years, Shaikh S, et al.[16] documented 32.5±4.7 years, and Akhtar O, et al.[17] found mean age of 30.9±4.0 years. This difference may reflect different demographic patterns or could indicate that younger women in our setting are undergoing caesarean sections at earlier age. The younger age might also be related to higher fertility rates and shorter inter-pregnancy intervals in our population.

Our study found mean gestational age of 33.18±3.65 weeks, indicating preterm delivery in most cases. This is consistent with Shaikh S, et al.[16] who reported mean gestation of 34.7±2.9 weeks and Tahir H, et al.[18] with mean gestation of 34.79 weeks. However, Mamluk K, et al.[14] reported higher mean gestational age of 37.1±1.4 weeks. The earlier gestational age in our study is likely due to planned early delivery in suspected cases to prevent catastrophic hemorrhage, or emergency deliveries prompted by antepartum bleeding.

Regarding association with age, our study showed no significant association (p=0.262), which is consistent with Shaikh S, et al.[16] and Mamluk K, et al.[14] who also found no significant stratification by age. This suggest that age itself is not independent risk factor, but rather cumulative surgical history and number of previous scars are more important.

Our study found no significant association between gestational age and morbidly adherent placenta (p=0.305). Similarly, Mamluk K, et al.[14] reported no significant association with gestation. This pattern reflect clinical practice of earlier delivery in suspected cases rather than true biological association.

Educational status and socioeconomic status showed no significant association in our study (p=0.619 and p=0.620 respectively). The lack of association suggest that morbidly adherent placenta is primarily biological complication related to uterine scarring rather than being influenced by sociodemographic factors.

Residential area showed no significant association (p=0.156), though urban patients had higher frequency (11.3%) compared to rural patients (4.8%). This may be explained by higher caesarean section rates in urban areas and better antenatal surveillance. Rural patients may have undiagnosed cases or present only after complications develop.

The overall frequency of 8% in our study is substantially lower than specialized tertiary care studies.

Yasmeen N, et al.[19] reported that all 60 patients with previous caesarean and placenta previa had morbidly adherent placenta. Tahir H, et al.[18] found 36% frequency among placenta previa patients, while Shaikh S, et al.[16] documented 23.7% in major placenta previa with previous caesarean. These much higher frequencies are explained by their specific inclusion of high-risk combination of placenta previa with scarred uterus, whereas our study included all scarred uteri regardless of placental location.

Some studies examined scar duration not evaluated in our research. Ahmad N, et al.[12] found highest MAP rates in 2-5 year scar interval, with previous surgeries including caesarean (46.4%), myomectomy (33.3%), and hysterotomy (20.3%). Un Nissa F, et al.[13] observed scar duration to be 5.04 ± 2.9 years, with increased risk if shorter. This indicates that scars which are relatively newer can have inadequately healed tissues that are predisposed to abnormal placentation.

The management results also revealed extremely significant trends. Yasmeen N, et al.[19] found that 58.33% underwent total hysterectomy due to blood loss ranging between 2.5-3 L in 90% cases. Akhtar O, et al.[17] concluded that 69.8% underwent hysterectomy, 77% developed postpartum hemorrhage, and maternal mortality rate 3.6%. The research carried out by Mamluk K, et al.[14] revealed 69% developed hemorrhage and 51% underwent hysterectomy. This also reflects morbidity due.

Antenatal diagnosis is critical factor. Akhtar O, et al.[17] achieved antenatal diagnosis in 91.1% and showed mortality was significantly higher when diagnosis made during caesarean ($p<0.001$). Ansar A, et al.[20] demonstrated that interval hysterectomy after antenatal diagnosis resulted in less blood loss (1507±855 mL vs 2615±416 mL) compared to immediate hysterectomy. These emphasize importance of antenatal ultrasound surveillance in scarred uteri.

This study has some limitations that should be kept in mind. First, it was a single-center study, so the results may not fully represent the whole population and might be different in other hospitals. The sample size also not very large, so some associations maybe could not reach significance. Because the data was collected in a limited time period, seasonal or yearly variations were not captured. Diagnosis of morbidly adherent placenta was mainly based on ultrasound findings, so there is chance of observer variation. Also, information on number of previous cesarean sections, inter-pregnancy interval, and exact scar condition was not completely recorded, so their effects could not be properly studied. Follow-up after delivery was also short, so long-term maternal outcomes could not be assessed.

CONCLUSION

The conclusion on our research is that morbidly adherent placenta is a significant complication among women with previous uterine scar because scarring on the uterus is one important factor responsible for morbidly adherent placenta. The pattern mostly reflect the biological effect of previous surgeries rather than patient background. Overall, the study highlight the need for better antenatal screening and early detection in women with scarred uterus so complications can be reduced and maternal outcomes can be improved.

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