The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 3, 2025

INCIDENCE OF MORBIDLY ADHERENT PLACENTA AFTER PREVIOUS 1 SCAR REPORTED IN PEMH

Dr Faryal Sabir[*1], Dr Ayesha Khawar[2], Dr Abida Islam[3], Dr Muneeba Almas[4], Dr Ayesha Khan[5],

[*1,2,3,4,5]*Pak Emirates Military hospital*

[*1]faryalsabir596@gmail.com

DOI: https://doi.org/10.5281/zenodo.18584536

Keywords
Morbidly adherent placenta, Cesarean section, Placenta accreta, Placenta increta, Placenta percreta, Maternal morbidity, Parity, Obstetric hemorrhage, Antenatal diagnosis.

Article History
Received: 30 Jan 2025
Accepted: 21 Feb 2025
Published: 20 March 2025

Corresponding Author: *
Dr Faryal Sabir

Abstract

Objective: *to determine the incidence of morbidly adherent placenta among women with one previous caesarean section, to identify the associated risk factors, and to highlight the need for early diagnosis and preventive strategies.*

Study Design: *Prospective cohort study*

Place and duration: *Pak Emirates Military Hospital, Rawalpindi over a period of six months, from January 2025 to June 2025*

Methodology: *This prospective cohort study was conducted at Pak Emirates Military Hospital, Rawalpindi, over six months from January to June 2025, including thirty-three pregnant women with one previous cesarean scar diagnosed with morbidly adherent placenta. Ethical approval and informed consent were obtained, and all participants underwent thorough clinical evaluation, ultrasound assessment, and laboratory testing to confirm diagnosis and assess maternal condition. Ultrasound using gray-scale and color Doppler was performed to identify features suggestive of placenta accreta spectrum, such as loss of the retroplacental clear zone and abnormal vascular patterns. All women were delivered by cesarean section under preparedness for major hemorrhage, with intraoperative findings and histopathology confirming the diagnosis and classifying the type of placental adherence. Detailed intraoperative and postoperative outcomes, including complications, transfusions, and surgical management approaches, were carefully recorded to evaluate the clinical course and maternal outcomes.*

Results: *Out of 262 patients studied, 24 (9.2%) were diagnosed with morbidly adherent placenta (MAP), while 238 (90.8%) did not have it. Most MAP cases occurred in women aged 30–35 years (66.7%), showing a significant link between age and MAP ($p = 0.025$), while higher parity (3–4) was also significantly associated (58.3%, $p = 0.042$). Among MAP types, placenta accreta was most common (54.2%), followed by increta (20.8%) and percreta (25.0%). Major complications included massive blood transfusion in 54.2% of cases and bladder injury in 45.8%, indicating that MAP was linked with serious maternal morbidity.*

Conclusion: This study showed that morbidly adherent placenta can occur even after one previous cesarean section, with significant risks of bleeding and surgical complications. Early diagnosis, careful monitoring, and delivery in a well-equipped tertiary care center are essential to reduce maternal morbidity and improve outcomes.

INTRODUCTION

Morbidly adherent placenta (MAP) is a serious obstetric condition in which the placenta attaches too deeply into the uterine wall. It includes three main types: placenta accreta, where the placenta attaches directly to the myometrium; placenta increta, where it invades the muscle layer; and placenta percreta, where it penetrates through the uterine wall and may involve nearby organs such as the bladder.[1] The condition often leads to severe bleeding during delivery and may require hysterectomy to save the mother's life.[2,3]

The most important risk factor for morbidly adherent placenta is a previous caesarean section. When a caesarean scar heals, it may create an area of weakness where the placenta can abnormally attach in future pregnancies. The risk of MAP increases with each additional caesarean section, but it may also occur after only one previous scar.[4,5] Other risk factors include placenta previa, maternal age above 35 years, multiparity, and uterine surgeries such as curettage or myomectomy. Globally, the reported incidence of morbidly adherent placenta ranges between 1 in 250 to 1 in 2,500 deliveries. The incidence is increasing due to the rising rate of cesarean deliveries worldwide. In Pakistan, the caesarean section rate has risen from about 5% in the early 1990s to more than 20% in recent years, especially in urban hospitals. Consequently, the frequency of morbidly adherent placenta has also shown a noticeable upward trend in tertiary care centers across the country.[6]

The rationale of this study is to determine the incidence of morbidly adherent placenta among women with one previous caesarean section, to identify the associated risk factors, and to highlight the need for early diagnosis and preventive strategies. Understanding this relationship can help improve maternal outcomes and reduce complications in future pregnancies.

Methodology

This prospective cohort study was carried out at Pak Emirates Military Hospital, Rawalpindi over a period of six months, from January 2025 to June 2025. The research included pregnant women who met the inclusion criteria and were diagnosed with morbidly adherent placenta. A total of thirty-three women were enrolled in the study. The purpose of this research was to determine the incidence of morbidly adherent placenta among women with a previous one caesarean scar and to study their clinical features, management, and outcomes. Before starting the study, ethical approval was obtained from the Ethics Committee of the Pak Emirates Military Hospital, Rawalpindi. Each participant was fully informed about the nature and objectives of the study, and written informed consent was taken from all women for participation, ultrasonographic examination, and surgical management. The privacy and confidentiality of every patient were maintained throughout the study.

All included patients had a history of at least one prior caesarean section. Women with unscarred uteri and those who were primigravida were excluded from the study. The study thus focused on pregnant women with a previously scarred uterus who presented during the study period and were found to have morbidly adherent placenta either by ultrasound examination or intraoperative findings.

Each woman was evaluated through detailed history taking, clinical examination, imaging investigations, and surgical assessment. The patient's personal information, including name, age, and hospital file number, was recorded. A complete obstetric history was obtained, covering the number of previous caesarean deliveries, abortions, history of placenta previa, previous ectopic pregnancies, medical disorders during previous pregnancies, number of living children, and the time interval between the last caesarean section and the current pregnancy. The current pregnancy details were also recorded, including presenting complaints, gestational age, presence of antepartum haemorrhage, and any other medical condition. Past history of postpartum sepsis, postpartum haemorrhage, chronic illnesses, and details regarding the previous caesarean section such as place of operation, indication for surgery, emergency or elective nature of the procedure, hospital stay, and any blood transfusion were also noted. Any previous uterine surgery like myomectomy, hysteroscopic resection, or curettage was recorded as these may increase the risk of abnormal placentation.

A general physical and abdominal examination was carried out for each patient, followed by necessary laboratory investigations. These included complete blood count, coagulation profile (INR), liver and kidney function tests, and blood sugar levels, both fasting and postprandial. These tests were performed both before and after delivery to monitor maternal health and detect any complications.

All patients underwent ultrasonographic assessment using both gray-scale and color Doppler techniques. The entire placenta was examined systematically, with the patient's bladder adequately filled to visualize the interface between the uterine wall and bladder. Specific ultrasound features were evaluated to confirm morbidly adherent placenta. On gray-scale imaging, the loss or irregularity of the retroplacental clear zone, thinning of the myometrium to less than two millimeters, interruption of the uterine–bladder interface, and presence of abnormal placental lacunae were considered suspicious signs. On color Doppler, features such as diffuse or focal lacunar blood flow, turbulent flow in vascular lakes, hypervascularity at the uterine–bladder interface, and the presence of dilated vessels extending from the placenta to the bladder were taken as strong indicators of placenta accreta spectrum.

All the enrolled women were delivered by caesarean section at Military Hospital. Operations were conducted under full preparation for possible massive haemorrhage and hysterectomy. The final diagnosis of morbidly adherent placenta was confirmed intraoperatively when the placenta was found to be inseparable from the uterine wall, invaded the myometrium, or extended into surrounding organs. When hysterectomy was performed, histopathological examination of the uterus provided definitive confirmation of the diagnosis.

Intraoperative details were recorded, including the site of placental implantation, the degree of placental invasion, presence of bladder or organ involvement, estimated blood loss, amount of transfused blood, and the type of surgical management—whether conservative management or hysterectomy was performed. Postoperative data such as admission to the intensive care unit, postoperative haemoglobin levels, coagulation profile, platelet count, and the need for further surgical exploration were also documented. Histopathological assessment classified the degree of placental adherence. In placenta accreta, chorionic villi were found attached directly to the myometrium without intervening decidua. In placenta increta, villi invaded the myometrium but did not reach the serosal surface, while in placenta percreta, the villi penetrated through the uterine wall up to or beyond the serosa, sometimes involving the bladder wall.[7]

All collected data were coded and entered into a computer for statistical analysis using the Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics were used to present the data in terms of frequency, percentage, mean, and standard deviation. The incidence of morbidly adherent placenta was calculated among women with previous one cesarean scar who presented during the study period. Chi square test was applied and p-value of ≤ 0.05 was considered as statistically significant.

Results:

Out of a total of **262** patients, 24 (9.2%) were diagnosed with morbidly adherent placenta (MAP), while **238 (90.8%)** had no MAP. The majority of MAP cases **(16; 66.7%)** occurred in women aged **30–35 years,** showing a significant association between maternal age and MAP occurrence **(p = 0.025).** Regarding BMI, most MAP cases **(13; 54.2%)** were found among women with **BMI < 25 kg/m²,** but this association was not statistically significant **(p = 0.702).** With respect to gestational age, MAP was more frequent at **31 - 35 weeks (15; 62.5%),** though the relationship was also non-significant **(p = 0.065).** Higher parity was linked to increased MAP frequency, with **14 cases (58.3%)** seen among women of parity **3–4**, and this association was statistically significant **(p = 0.042)** shown in Table-I.. f the 24 cases of MAP, the incidence of Placenta accreta, placenta increta, and placenta percreta 13 (54.2%), 5 (20.8%), and 6 (25.0%) respectively as depicted in Figure-1. Massive blood transfusion>10 units of packed cells were major complications found in 13 (54.2%) cases followed by bladder injury 11 (45.8%), DISC 6 (25.0%), reopening 4 (16.6%), and acute renal injury in 3 (12.5%) as depicted in Figure-2.

Table-I: Association of Demographic Characteristics regarding between cases with Morbidly Adherent Placenta and cases without Morbidly Adherent Placenta (n=262)

	MAP (n=24)	No MAP (n=238)	Total	
Age in Years				
20 - 25	1 (4.2%)	72 (30.3%)	73 (27.9%)	0.025
30 - 35	16 (66.7%)	115 (48.3%)	131 (50.0%)	
40 - 45	7 (29.1%)	51 (21.4%)	58 (22.1%)	
BMI (kg/m^2)				
< 25	13 (54.2%)	139 (58.4%)	152 (58.0%)	0.701
25-30	7 (29.2%)	73 (30.7%)	80 (30.5%)	
> 30	4 (16.7%)	26 (10.9%)	30 (11.5%)	
Period of Gestation (weeks)				
26-30	9 (37.5%)	136 (57.1%)	145 (55.3%)	0.065
31-35	15 (62.5%)	102 (42.9%)	117 (44.7%)	
Parity				
2	3 (12.5%)	21 (8.8%)	24 (9.2%)	0.042
3	14 (58.3%)	111 (46.6%)	125 (47.7%)	
4	6 (25.0%)	33 (13.9%)	39 (14.9%)	
5	1 (4.2%)	73 (30.7%)	74 (28.2%)	

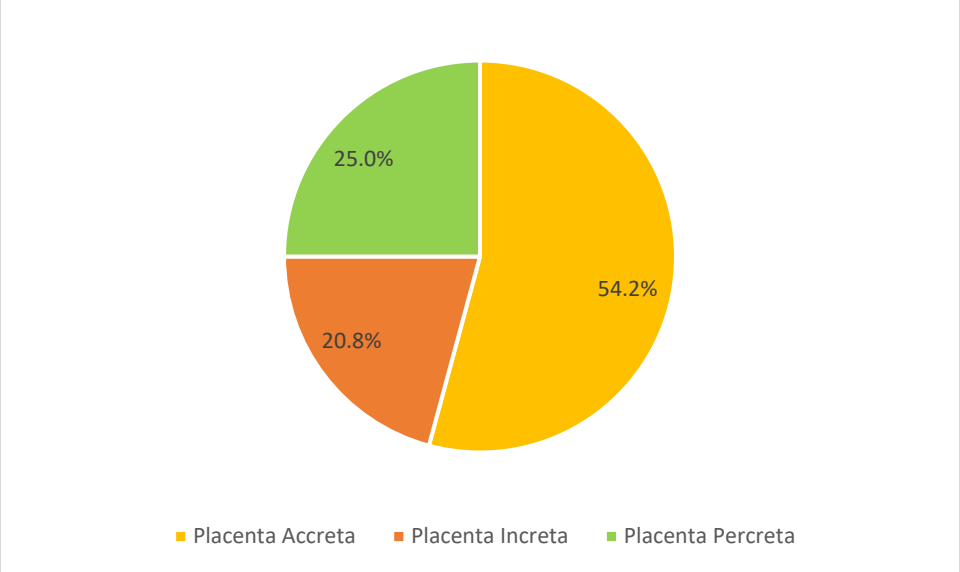

Figure-1: Types of MAP (n=24)

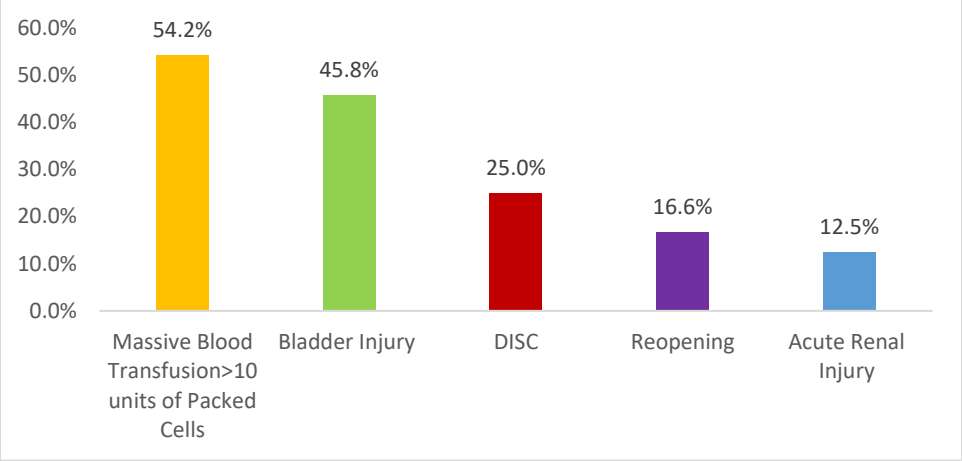

Figure No. 2: Complications associated with MAP (n=28)

Discussion:

The present study examined the incidence and clinical patterns of morbidly adherent placenta (MAP) in women with one previous caesarean scar, reporting an incidence rate of 9.2% over six months at PEMH. This is relatively high compared to earlier studies from other regions, where the reported incidence ranged from 0.3% to 1% in women with a single prior caesarean section. For instance, Morlando et al. [3] found an incidence of 0.8% in their multicenter analysis, while Einerson et al. documented a rate below 1% among similar patient populations.[7] The higher figure observed in this study may be attributed to increasing caesarean delivery rates, referral bias toward a tertiary center, or variations in diagnostic and reporting practices. These results highlight that even a single uterine scar can significantly increase the risk of abnormal placental implantation and that local obstetric trends may play a critical role in shaping incidence rates.[8]

The majority of MAP cases in this study occurred in women aged 30 to 35 years, demonstrating a significant association between maternal age and the development of MAP. This relationship is consistent with findings by Kumari et al., [9] who showed that the likelihood of abnormal placentation increases with

advancing maternal age, possibly due to reduced endometrial receptivity and repeated uterine trauma over time. Similarly, Jaiswal et al. reported that women above 30 years had a higher prevalence of MAP, even when controlling for previous caesarean history.[10] Our data support these observations that maternal age has no statistically significant association as a predisposing factor, other studies, such as by Rehman et al. [11], reported no statistically significant association between age and MAP, suggesting that age alone may not be causal but rather acts in combination with other variables such as parity and uterine scarring.

In the current study, higher parity, particularly among women with three to four children, showed a significant association with MAP, supporting previous findings by Titapant et al. [12] and Sultan et al.[13] These researchers noted that repeated pregnancies and deliveries increase uterine wall damage and scarring, predisposing the placenta to invade deeper into the myometrium. This association between multiparity and abnormal placentation underscores the cumulative effect of uterine trauma, which may result from both surgical and physiological factors.[12,13] Moreover, our results suggest that even in women with only one caesarean scar, repeated pregnancies may amplify the risk through alterations in the endometrial and myometrial interface.

Regarding body mass index (BMI), our findings showed that most MAP cases occurred among women with BMI below 25 kg/m², although this relationship was not statistically significant. This result differs from the observations of Brandstetter et al., who reported an increased risk of MAP among overweight and obese women.[14] The inconsistency may be due to population-specific variations in nutritional profiles and health behaviours. It may also indicate that BMI is a less important determinant compared to uterine structural factors such as scarring and placental implantation site. Similarly, gestational age did not show a statistically significant relationship with MAP in this study, which is consistent with Vora et al., who concluded that abnormal placentation is largely determined in early pregnancy and is less influenced by gestational length.[15]

The distribution of MAP subtypes in this study showed placenta accreta as the most frequent form (54.2%), followed by percreta (25.0%) and increta (20.8%). This trend is similar to global observations, where placenta accreta is generally the most prevalent type. For example, Desai et al., reported that accreta constitutes over 60% of MAP cases, while increta and percreta account for the remaining proportions.[16] The predominance of placenta accreta in our findings suggests that early-stage invasion is more common, possibly reflecting improved diagnostic sensitivity that allows earlier identification before deeper invasion develops. However, the presence of percreta in one-fourth of cases underlines that severe invasion still occurs and poses substantial surgical challenges.

The maternal complications observed in this study underscore the clinical significance of MAP. Massive blood transfusion was required in over half of the patients (54.2%), while bladder injury occurred in 45.8%, disseminated intravascular coagulation (DIC) in 25%, and acute renal injury in 12.5%. These findings are consistent with the reports by Maqsud et al. [5] and Wasim et al. who noted high rates of haemorrhagic and urological complications among women with MAP.[6] Massive obstetric haemorrhage remains the leading cause of maternal morbidity and mortality in these patients, often necessitating hysterectomy or complex reconstructive procedures. Our study further supports the need for multidisciplinary management and preparedness, as significant blood loss and surgical injury are common even with careful preoperative planning. The observed complication rates in this study also emphasize the crucial role of antenatal diagnosis. Previous Studies demonstrated that accurate antenatal detection of MAP through ultrasonography and MRI allows for planned delivery in a tertiary care setting, which significantly reduces maternal morbidity.[17,18] In our hospital, most cases were diagnosed intraoperatively, which may explain the high rate of complications. Strengthening early screening practices could therefore reduce adverse outcomes. Moreover, implementing standardized management protocols and referral pathways can further improve maternal safety.

Overall, the findings of this study align with global evidence showing that morbidly adherent placenta is

an increasing problem linked closely to prior caesarean delivery, advancing maternal age, and higher parity. The slightly higher incidence observed in our population calls attention to regional variations and emphasizes the need for preventive strategies, including cautious use of primary caesarean sections and enhanced antenatal surveillance in women with previous uterine surgery. The results also reaffirm that even a single caesarean scar can pose a substantial risk for MAP, highlighting that preventive and diagnostic measures should not be limited to women with multiple prior caesareans.

Conclusion:

This study contributes valuable local data to the understanding of MAP in women with one previous scar, showing a high incidence and significant associated morbidity. It reinforces previous international findings while drawing attention to the urgent need for better preventive and diagnostic strategies. Promoting awareness among obstetricians and ensuring that high-risk pregnancies are managed in well-equipped tertiary centers are essential to reducing the burden of this life-threatening condition.

References:

Kingdom JC, Hobson SR, Murji A, Allen L, Windrim RC, et al. Minimizing surgical blood loss at cesarean hysterectomy for placenta previa with evidence of placenta increta or placenta percreta: the state of play in 2020. Am J Obstet Gynecol. 2020 ;223(3):322-329. doi: 10.1016/j.ajog.2020.01.044.

Royal College of Obstetricians and Gynaecologists. Birth options after previous caesarean section; 2025. (Cited 13th September 2025) Available from: https://www.rcog.org.uk/media/na3nigfb/pi-birth-options-after-previous-caesarean-section

Morlando M, Schwickert A, Stefanovic V, Gziri MM, Pateisky P, Chalubinski KM, et al; International Society for Placenta Accreta Spectrum (IS-PAS). Maternal and neonatal outcomes in planned versus emergency cesarean delivery for placenta accreta spectrum: A multinational database study. Acta Obstet Gynecol Scand. 2021 ;100 (Suppl 1):41-49. doi: 10.1111/aogs.14120.

Pathiraja PD, Jayawardane A. Evaluation of peripartum hysterectomy in a tertiary care unit. future emerging problem in obstetric practice? J Womens Health Dev. 2020;3(3):365-372. doi: 10.26502/fjwhd.2644-28840043

Einerson BD, Gilner JB, Zuckerwise LC. Placenta Accreta Spectrum. Obstet Gynecol. 2023;142(1):31-50. doi: 10.1097/AOG.0000000000005229.

Meng X, Xie L, Song W. Comparing the diagnostic value of ultrasound and magnetic resonance imaging for placenta accreta: a systematic review and meta-analysis. Ultrasound Med Biol. 2013;39:1958–65. doi: 10.1016/j.ultrasmedbio.2013.05.017.

Maqsud M, Aiman Z, Ayub N, Tufail N, Waris N, Jabeen F. Placenta previa and its effects on feto-maternal health at a Tertiary Care Hospital. J Society Obstetricians Gynaecologists Pak 2020;10 (1):30-34.

Wasim T, Bushra N, Riaz S, Iqbal HI. Fetomaternal outcome in patients with placenta previa. Pak J Med Sci. 2020;36(5):952-957. doi: 10.12669/pjms.36.5.1647.

Kumari U, Naniwal A, Rani V, Chandat R, Yadav S, Pipal DK. A Study of Clinical Characteristics, Demographic Characteristics, and Fetomaternal Outcomes in Cases of Placenta Previa: An Experience of a Tertiary Care Center. Cureus. 2022 ;14(12):e32125. doi: 10.7759/cureus.32125.

Rehman S, Bilqis H, Deeba F, Sheyryar S, Urooj A, Khan S. Morbidly Adherent Placenta: A Cross-sectional Study in a Tertiary Care Hospital. Pak J Med Dent. 2022;11(4): 50-54. doi: 10.36283/PJMD11-4/008

Jaiswal N, Yadav R, Tayal P, Pawar P. Outcomes of pregnancies with a morbid adherent placenta from a tertiary referral Centre in North India. Int J Clin Obstet Gynaecol. 2020; 4(3):158-160. doi: 10.33545/gynae.2020.v4.i3c.597

Titapant V, Tongdee T, Pooliam J, Wataganara T. Retrospective analysis of 113 consecutive cases of placenta accreta spectrum from a single tertiary care center. J Matern Fetal Med. 2020;33(19):3324-3331. doi: 10.1080/14767058.2018.1530757

Sultan S. Fatima SS. FareedA. Frequency of Morbidly Adherent Placenta in Previous Scar: An Experience in a Tertiary CareHospital.Med Forum2023;34(7):202-206. doi:10.60110/medforum.340747

Brandstetter M, Eiben C, Bogner G, Jacobs VR, Jaksch-Bogensperger H, Fazelnia C, et al. Evaluation of risk factors and pregnancy outcome of placenta previa in a long-term comparative single-center study. J Matern Fetal Neonatal Med. 2025 Dec;38(1):2498550. doi: 10.1080/14767058.2025.2498550.

Vora K, Chandana P, Patel A, Jain M. A prospective study of 20 cases of maternal outcome in morbidly adherent placenta in tertiary care hospital. Int J Reprod Contracept Obstet Gynecol 2017; 6(2): 571-574. https://doi:10.18203/2320-1770.ijrcog2017.

Desai R, Jodha B, Garg R. Morbidly adherent placenta and it's maternal and fetal outcome. Int J Reprod Contracept Obstet Gynecol 2017; 6(5): 1890-1893. https://doi:10.18203/0122320-1770.ijrcog20171943.

Tahir N, Adil M, Afzal B, Kiani S, Kiani R, Khan S. Definitive management of morbidly adherent placenta: analysis of maternal outcomes. Pak Armed Forces Med J 2018; 68(5): 1156-1160.

Cheng KK, Lee MM. Rising incidence of morbidly adherent placenta and its association with previous caesarean section: a 15-year analysis in a tertiary hospital in Hong Kong. Hong Kong Med J 2015; 21(6): 511-517. https://doi: 10.12809/hkmj154599.