

Morbidly Adherent Placenta: A Cross-sectional Study in a Tertiary Care Hospital

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ABSTRACT

Background: Morbidly adherent placenta (MAP) is one of the most dreaded antenatal complications leading to massive hemorrhage, immense blood transfusion, hysterectomy, intensive care unit admission, mechanical ventilation, multi-organ failure and maternal mortality. The study aimed to determine the maternal outcome in terms of complications, interventions, and mortality in patients with MAP in a tertiary care hospital.

Methods: During the study period of one year (2020-2021) a total of 68 patients with MAP were studied. Demographic profiles including age, parity, gestational age and history of previous cesarean sections were recorded. Other complications and interventions were also noted. Data was analyzed by using SPSS version 23 and a *t*-test was applied for comparison between the two groups. *p*-value <0.05 was considered statistically significant.

Results: Total number of deliveries during the study period was 20971. Among these 7183 women had a cesarian section (CS). The total number of CS done due to placenta previa was 319, out of which a total of 68(21.3%) patients were diagnosed with MAP. It was further observed that 0.6% of patients had no history of a previous uterine scar, 39.0% of patients with previous 1 scar and 80% with 4 scars (*p*>0.05). Peripartum hysterectomy was performed in 48.5% of patients. The complications noted were bladder injury 17.6%, ICU admission 45.5% and maternal mortality 4.4%.

Conclusion: Morbidly adherent placenta (MAP) was found directly related to cesarean section (*p*>0.05). Appropriate measures should be taken to reduce the primary scars to reduce the incidence of repeat scars and ultimately MAP related severe maternal outcomes.

Keywords: Morbidly Adherent Placenta (MAP); Caesarean Section; Placenta Previa.

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INTRODUCTION

Cesarean section (CS) is the most common risk factor for the development of placenta previa (PP) and ultimately morbidly adherent placenta. Incidence of PP increases with the repeated number of cesarean sections in any pregnant lady (1%, 1.7%, 2.8% and 10% in 4 cesarean sections respectively)¹⁻³. The risk of MAP is 11-13% in patients with placenta previa after one previous CS and it increases to 21-40% in such patients after two previous cesarean sections¹.

MAP is a clinicopathological condition in which the placenta fails to separate partially or totally from its bed at the uterine wall. Its incidence varies from 1:300 to 1:2000². Failure of normal decidualization due to defect of endometrial-myometrial interface commonly in the area of a uterine scar is the etiology of MAP³.

Complications related to MAP include massive hemorrhage, multiple blood transfusions, disseminated intravascular coagulation (DIC), prolonged surgery, peripartum hysterectomy, urological injuries, ICU admissions and re-laparotomy. These are more associated with an attempt at removing the placenta first and repairing the lower uterine segment before proceeding for hysterectomy^{1,4}. The most generally accepted lifesaving approach to MAP is cesarean hysterectomy with placenta left in situ after delivery of the fetus⁴. Optimal management of these patients involves a standardized approach with multidisciplinary care team^{4,5}.

The present study aimed to analyze the maternal outcome in terms of complications, interventions, and mortality in antenatally diagnosed cases of MAP. The findings of this study will be used to identify patients with the previous scar who are at risk of MAP and its associated morbidity and mortality.

METHODS

During the study period (2020-2021), n=20971 deliveries were recorded. After taking approval from the ethics review board, data of patients were analyzed with the morbidly adherent placenta (MAP) in Holy Family Hospital (HFH), Rawalpindi. Among them, 7183 women had a cesarian section (CS). The total number of CS done due to placenta previa was 319, out of which a total of 68(21.3%) patients were diagnosed to have MAP. Data of patients who had CS due to placenta previa and all cases of MAP, diagnosed either on grey scale ultrasound/color Doppler or intra-operatively.

Demographic profile including age, parity, gestational age, and history of previous cesarean sections was noted. Other parameters include intra-operative blood loss, damage to bladder, ureter, bowel, and need for additional hemostatic procedures to control blood loss e.g., balloon tamponade, B lynch brace suture, uterine artery ligation, peripartum hysterectomy, internal iliac ligation and abdominal packing), total blood products transfusion, need of ICU admission, ventilator support and maternal mortality were recorded. Data obtained were analyzed using SPSS.

Data were expressed as percentages and mean \pm SD. For all the quantitative variables mean and standard deviation were calculated. For all the qualitative variables frequency and percentages were calculated. A sample *t*-test was applied for comparison between the two groups. *p*-value <0.05 was considered statistically significant.

RESULTS

The total numbers of deliveries during the study period were n=20,971. Total numbers of cesarean sections done due to placenta Previa were 319(4.4%) and 68 patients were diagnosed to have morbidly adherent placenta (MAP), making its incidence 3 per 1000 deliveries and 0.9% of total cesarean sections whereas, 21.3% of CS done due to placenta Previa.

The mean age was (Mean \pm SD)32.42 \pm 3.83 years, most of the women were between the age of 25 to 35 years (77.8%), 13 % were between 18-24 years and 9.3% were above 35 years. The mean gestational age at the time of surgery was 35.94 \pm 1.75 weeks. The mean parity of the women was 2.35 \pm 0.91.

In total 48 (70.5%) were diagnosed during antenatal care on ultrasound while 20 (29.4%) presented in emergency with antepartum hemorrhage. Elective lower (uterine) segment Caesarean section (LSCS) was done in 31 (45.5%) patients and 37 (54.4%) patients had emergency LSCS. The average duration of surgery was 1hr and 30 min.

Only one patient was without a scar (1.5%), 16 (23.5%) had a history of a previous 1 scar, 26 (38.2%) had previous 2 scars, 17 (25%) had previous 3 scars and 8 (11.8%) had previous 4 scars. The incidence of the morbidly adherent placenta in patients with placenta previa was 0.6% without any scar, 39% in patients with a history of previous 1 scar, 46.4% in patients with previous 2 scars, 38.6% in previous three scars and 80% in previous 4 scars (Figure 1).

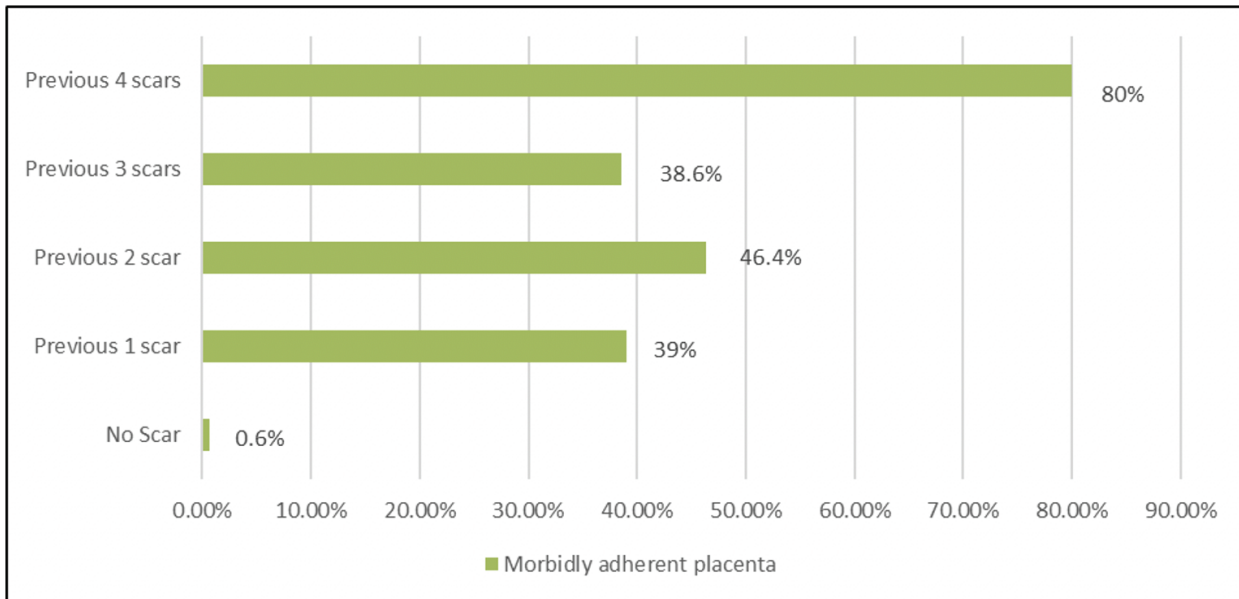


Figure 1: Association of MAP with cesarean section.

The comparison of morbidly adherent placenta according to many previous scars has been shown in Table 1. Massive intraoperative blood loss was the prominent feature in all the women with MAP with a mean blood loss of 2 liters. Balloon tamponade was done in 22 (32.3%) patients, B lynch brace suture was applied in 13 (19.1%), uterine artery ligation was

done in 16 (23.5%), Internal iliac artery ligation in 10 (14.7%), peripartum hysterectomy in 33 (48.5%) and abdominal packing with abdominal sponges after hysterectomy was done in 5 (7.3%) patients who needed re-laparotomy after 48 hours for removal of packs (Table 2).

Table 1: Comparison of morbidly adherent placenta according to the number of previous scars.

Previous History	MAP Positive	MAP Negative	Total Patients n = 319	p-Value
No Scar	1 (1.4%)	167 (66.5%)	168 (52.6%)	0.12
Previous 1 scar	16 (23.5%)	25 (9.9%)	41 (12.8%)	0.08
Previous 2 scar	26 (38.2%)	30 (11.9%)	56 (17.5%)	0.97
Previous 3 scar	17 (25%)	27 (10.7%)	44 (13.7%)	0.67
Previous 4 scar	08 (11.7%)	02 (0.8%)	10 (3.3%)	0.34

Bladder injury was seen in 12 (17.6%) patients. Damage to the bowel and ureter was not seen in any case. Acute renal injury due to excessive intraoperative blood loss was there in 10 (14.7%) patients who underwent hemodialysis. Disseminated intravascular coagulation was diagnosed in

13 (19.1%) patients. Postoperatively 31 (45.5%) patients were transferred to ICU and all of them required ventilator support. There were three maternal deaths (4.4%) due to complications of the morbidly adherent placenta (Table 2).

Table 2: Additional hemostatic procedures with complications occurred in patients with the morbidly adherent placenta (MAP).

Additional hemostatic procedures	Peripartum hysterectomy	Balloon tamponade	Bilateral uterine artery ligation	B-Lynch brace suture	Internal iliac artery ligation	Abdominal packing with sponges		
Percentage % (n)	48.5% (33)	32.3% (22)	23.5% (16)	19.1% (13)	14.7% (10)	7.3% (5)		
Complications	Massive blood transfusion > 5 units RCC	ICU admission	Need for ventilator	Disseminated intravascular coagulation (DIC)	Damage to bladder	Acute renal injury	Ionotropic support	Maternal Mortality
Percentage % (n)	67.6% (46)	45.5% (31)	45.5% (31)	19.1% (13)	17.6% (12)	14.7% (10)	7.3% (5)	4.4% (3)

DISCUSSION

The morbidly adherent placenta is a life-threatening condition with severe complications. Grey scale ultrasonography, color doppler and MRI play an important role in diagnosis antenatally. The incidence of MAP is increasing at an alarming rate as a result of an increase in the CS rate. It is a big challenge for developing countries to reduce this massive rise while already having limited resources and facilities. In our study incidence of MAP was 3 per 1000 deliveries which is quite high. Another study conducted at a local hospital in the same city quoted its incidence as 4.7 per 1000 deliveries⁴. Similar studies done in India and Bangladesh have shown its incidence of 1.2 and 2 per 1000 deliveries respectively^{5,6}.

There is a direct association between MAP and many previous uterine scars. In this study from all the patients with placenta, Previa MAP was diagnosed in 0.6% of patients with a history of no previous uterine scar, 39.0% in patients with previous 1 scar, 46.4% in patients with previous 2 scars, 38.6% in previous three scars and 80% in previous 4 scars. A study conducted at tertiary care hospital Lahore has also shown results of all patients with MAP 60 (47.3%) had 1 previous CS, 38 (29.9%) had a previous 2 CS and the rest of 29 (22.9%) had ≥ 3 CS⁷. These findings show that with several previous scars' incidence of MAP increases and there is a need to reduce the number of primary scars.

MAP is associated with significant maternal morbidity, including massive hemorrhage, peripartum hysterectomy, bladder and ureteric trauma, Disseminated Intravascular Coagulation (DIC) and acute renal failure. Its management is quite challenging⁸⁻¹². Where fertility needs to be preserved obstetricians prefer conservative management. In this study conservative or uterine sparing management to achieve hemostasis i.e., balloon tamponade was done in 32.3% of patients, B lynch brace suture was applied in 19.1% of patients and bilateral uterine artery ligation was done in 23.5%. Nonseparation of placenta followed by peripartum hysterectomy was done in 48.5% of patients, internal iliac artery ligation was done in 14.7% and abdominal packing with abdominal sponges due to generalized ooze was done in 7.3% of patients which eventually needed re-laparotomy after 48 hours for packs removal. These findings were following previous studies and showed that with each case of morbidly adherent placenta there is increased use of manpower and hospital facility and there is increased maternal morbidity^{13,14}.

The incidence of the morbidly adherent placenta (MAP) had risen 13-fold since the early 1900s and is directly associated with the increased rate of cesarean delivery. According to the present study, the

increased incidence of MAP highlights the screening of all pregnancies for MAP during the second trimester should be part of antenatal care especially multiple prior cesarean deliveries^{15,16}.

Maternal morbidity of 60% and mortality of 7% have been reported worldwide in literature^{5,11,17}. Whereas in this study maternal mortality was 4.4%, the cause was DIC and multi-organ failure secondary to hemorrhage which is consistent with another study carried out by Yasmeen et al. in which 6.6% of patients with MAP died due to a similar cause¹⁰.

For optimal management and prevention of any complication multidisciplinary team approach is recommended which includes a senior anesthetist, hematologist, urologist, general surgeon, neonatologist, and an experienced consultant obstetrician. The availability of sample blood products, ICU and bed vent is equally important¹⁸⁻²². In our study surgery proceeded after confirming the availability of 8 units of red cell concentrates, 8 units of fresh frozen plasma, 8 units of platelets, bed and ventilator in the ICU and multidisciplinary team.

CONCLUSION

Prenatal diagnosis and adequate pre-delivery planning particularly in high-risk populations are necessary for the reduction of the adverse maternal outcome. Morbidly Adherent Placenta (MAP) is directly related to the cesarean section rate. Appropriate measures should be taken to reduce the primary scars to reduce the incidence of repeat scars and ultimately abnormally adherent placenta.

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CONFLICT OF INTEREST

The authors declared no conflict of interest.

ETHICS APPROVAL

This study has been approved by the ethics review board.

PATIENT CONSENT

The consent of the patients was taken before adding them to the study.

AUTHORS' CONTRIBUTION

All authors contributed equally in this research study.

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