

Uterine Incision Pattern and its Effect on Maternal and Fetal Outcome in Morbidly Adherent Placenta

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Abstract

Background: The incidence of morbidly adherent placentation has increased in the current era of obstetrics paralleling the cesarean rate. The problem of abnormal placental adherence is a significant contributor to maternal morbidity and requires multi-disciplinary care for management.

Aim of Study: To assess uterine incision pattern and its effect on fetal and maternal outcome in morbidly adherent placenta.

Subjects and Methods: This was a prospective cohort study, was carried out at damnhour, El-Hussein and Al-Sayed Galal Hospitals on 66 patients with placenta accreta starting from 1/6/2018 till 1/1/2020.

Result: A total of 4400 cases were included with mean age 29.8 years and mean body mass index was 28.07, as regard parity p1-2 accounted for 40.8% of cases, p3-4 in 59.2%, mean gestational age was 36.7, Previous 1 cesarean section in 29.1%, 2 cesarean section in 3.3%, 3 cesarean section in 0.8 and no previous cesarean section in 66.8 of cases, Previous uterine surgery founded in 0.5% of cases, abnormal placenta suspected in 100 cases confirmed only in 66 cases. In comparison between longitudinal or transverse incision in cases with abnormal placenta there was significant relation between Line of management, Dissection of bladder (100.0, 100.0), visceral injuries (83.9, 100.0), mortality (0.0, 10.0).

Conclusion: Early antenatal diagnosis of morbidly adherent placenta through imaging (ultrasound color Doppler and MRI) allows for multidisciplinary planning to minimize potential maternal or neonatal morbidity and mortality. Also, proper counselling of patients regarding associated risks reduces maternal morbidity and mortality.

Key Words: Placenta accreta – Cesarean hysterectomy – Obstetric hemorrhage – Maternal outcome.

Introduction

PLACENTA accreta is the placenta that is abnormally adherent to the uterus. When the placenta invades the myometrium, the term placenta increta is used, whereas placenta percreta refers to a pla-

centa that has invaded through the myometrium to the serosa, sometimes into adjacent organs, such as the bladder [1].

Morbidly adherent placenta (MAP) occurs when there is a defect in the decidua basalis, resulting in an abnormal invasion of the placenta into the substance of the uterus. As a result, there is no clear plane of cleavage between the placenta and the underlying uterus. Depending on the extent of adherence and invasion of the placenta the condition is classified as placenta accreta (reaching the myometrium), placenta increta (into the myometrium) and right through the myometrium to reach) placenta percreta the serosa or beyond) [1].

The incidence of AS has increased remarkably with the increasing prevalence of caesarean delivery, from a rate of 1 in 2500 in the 1980s to as high as 1 in 533 deliveries today. Because of its increasing frequency, Accrete Syndrome is now one of the most serious clinical challenges in obstetric practice [2].

The incidence varies from 1:540 in Thailand to 1:93,000 in the United States. The high incidence reported in Thailand may be related to the increase prevalence of trophoblastic disease in Asia. It has been suggested that the rarest form, placenta percreta, represent 5-7% of all abnormal placentations. About 75% of placenta percreta are evacuation of retained products of conception [3].

It is better to perform surgery for placenta accreta under elective controlled conditions rather than as an emergency without adequate preparation. Therefore, scheduled delivery at 36-37 weeks' gestation, after documentation of fetal lung maturity seems reasonable [4].

The most common location of placenta accreta is the anterior lower uterine wall, especially when associated with a prior cesarean scar [5].

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This association implies difficulties from a technical surgical point of view including adherence bladder, development of neovascularization, destruction of myometrial tissue and access to the pelvic subperitoneal spaces. The uteroplacental tissues of placenta accreta are noticeably fragile and tend to bleed excessively. Absence of surgical planes for dissection makes it difficult or nearly impossible to apply the usual hemostatic procedures if an accurate tissue dissection between invaded tissues cannot be made. Understanding the behavior and development of placenta accreta is essential in order to plan an appropriate surgical approach. Various vascular occlusive mechanisms have been used to reduce the tendency for bleeding [6], but they have not always been effective and, in some cases, have been deficient. Uterine incisions: It is best to avoid cutting through a MAP because of the possibility of massive haemorrhage. Various modifications of the uterine incision Classical incision, to avoid the placenta have been reported high transverse incision, fundal incision, fundal transverse incision have all been used to deliver the fetus [7].

If hysterectomy is not planned, the risk of uterine rupture in a future pregnancy should be considered and explained to the patient in cases where non-lower segment incision is planned. Pre-operative and/or intra-operative ultrasound mapping, to delineate the area of the uterus overlying the placenta prior to the uterine incision is useful [8].

Aim of study:

The aim of the study was to assess uterine incision pattern and its effect on fetal and maternal outcome in morbidly adherent placenta.

Patients and Methods

The study was conducted on all cases of placenta accreta spectrum at damnhour, El-Hussein and Al-Sayed Galal Hospitals starting from June 2018 to Jan. 2020.

Inclusion criteria:

- 1- Patients age from 20-32 years old.
- 2- Patients with gestational age above 28 weeks.
- 3- Informed consent from patients.
- 4- Patients with ultrasound signs suggestive of placenta accrete: (a) Loss of normal hypochoicretroplacental zone. (b) Multiple vascular lacunae (irregular vascular spaces) within placenta, giving "swiss cheese" appearance. (c) Blood vessels or placental tissue bridging uterine-placental margin, myometrial-bladder interface,

or crossing uterine serosa. (d) Retroplacentalmyometrial thickness of <1mm. (e) Numerous coherent vessels visualized with colour Doppler in basal view.

- 5- Patients with previous cesarean section with placenta implanted over the scar and suggestive ultrasonographic signs.
- 6- Patients with MRI signs of placenta accrete: (a) Placenta previa. (b) Uterine bulging. (c) Heterogeneous signal intensity within the placenta. (d) Dark intraplacental bands on T2-weighted images. (e) Focal interruptions in the myometrial wall. (f) Tenting of the bladder. (g) Direct visualization of the invasion of pelvic structures by placental tissue.

Exclusion criteria:

- 1- Patients with medical disorders associated with pregnancy.
- 2- Normal placentation.

Methods:

Patients included in this study were subjected to:

Counseling and explanation of the procedure for every patient:

- 1- Written consent was obtained about the procedure and possible hysterectomy and its complications.
- 2- Complete history taking: (a) Personal history, (b) Obstetric history and 1" day of last menstrual period (LMP). (c) Parity. (d) Gestational age, number of previous cesarean sections. (e) Other uterine surgery and number of attacks of antepartum hemorrhage. (f) Medical or operative history. (g) Past history of any drug allergy or obstetric or operative complication.

3- Examination:

A- General examination:

Vital signs (Blood pressure, Temperature, Heart rate, Respiratory rate).

Height (in cm) and weight (in kg) measurements while subjects were wearing the possible lightest clothing, and body mass index (BMI) was calculated at time of admission by using the Formula:

$$\frac{\text{Weight in Kg}}{(\text{Height in meters})^2}$$

Head and neck examination for jaundice, pallor, pigmentations, oedema, goiter, enlarged lymph nodes and congested neck veins.

Limb examination for oedema, varicose veins, and deformities.

B- Abdominal examination: Abdominal inspection, abdominal palpation, abdominal percussion, and abdominal auscultation.

4- Presentation of the case: Vaginal bleeding, and admitted on ultrasonographic signs of placenta accrete.

5- Investigation:

Laboratory investigation: Complete blood picture (CBC): Hemoglobin concentration (Hb %), red blood cells (RBCs), white blood cells (WBCs), platelet count, and coagulation profile.

2D grey scale ultrasonographic examination and colour Doppler evaluation:

- Gestational age.
- Single or twin pregnancy.
- Signs of placenta accreta.

The criteria fulfilling sufficient specificity and sensitivity to define the morbidly adherent placenta had the rise in the number of lacunae. The second diagnostic feature is loss of retroplacental "clear space".

Using 2D gray-scale/color Doppler transabdominal and transvaginal ultrasonography we investigated the following: (1) Loss/irregularity of the echolucent area between uterus and placenta, termed 'clear space'; (2) Thinning or interruption of the hyperechoic interface between uterine serosa and bladder wall, termed 'bladder line'; (3) Presence of turbulent placental lacunae with high-velocity flow (>15cm/s).

Transabdominal 3D power Doppler was used to map the vascularization of the intraplacental and uterine serosa-bladder interface.

3D volumes were obtained and processed, either on the ultrasound monitor or using the 4D View software application (GE Medical Systems).

With a 180° rotation process, we visualized the sagittal and coronal sections.

This enabled us to investigate: (4) hypervascularity of the uterine serosa-bladder wall interface and (5) irregular intraplacental vascularization characterized by tortuous confluent vessels across the placental width.

In particular, the sagittal sections were used to assess the depth of placental tissue neovascularization and whether this was limited to the basal layer or if it affected the entire remaining placental parenchyma.

Coronal sections were used to assess the extent of the serosa-bladder wall interface neovascularization and to determine if the process involved the whole area or only a portion.

Diagnostic suspicion of MAP was supported by the presence of at least two criteria, and clinical diagnosis was made upon CS.

Magnetic resonance imaging (MRI):

- MRI is indicated in the diagnostic workup when the ultrasound evaluation is equivocal or for patients with high clinical risk factors for placenta accreta. In cases where ultrasound has already made a definitive diagnosis, MRI is often used to plan the cesarean section delivery and peripartum hysterectomy.
- The latter has additional value in detecting the depth of placental invasion and depicts posterior placenta accrete, on the other hand, there is insufficient proof to support routine MRI scanning of patients with sonographically suspected placenta accreta to get better management and result.
- MRI is often suggested when ultrasound findings are questionable
- If the ultrasound findings are not considered definitive or the placenta is located on the posterior wall, magnetic resonance imaging MRI can be performed.
- Magnetic resonance imaging findings considered doubtful for the presence of placenta accrete include placental heterogeneity, uterine bulging, tenting of the bladder, heterogeneous signal strength within the placenta, mass effect of the placenta into the underlying bladder or extending away from the normal uterine contour, destruction of the myometrial zone, and a beading nodularity inside the placenta.
- Dark intra-placental bands can also be seen, appearing as nodular or linear areas of low signal strength on T2-weighted images.
- MRI has proved most helpful when the placenta is located posteriorly. Besides being safe for both mother and fetus, MRI requires slight adjustment in the way of preparation.
- Unfortunately, it lacks portability and is more costly to make than ultrasound.

6- Documentation of interventions performed: (a) Cesarean section. (b) Conservative methods: Intra uterine ballon catheterization to compress blood vessels, bilateral uterine artery ligation, and internal iliac artery ligation. (c) Cesarean

hysterectomy. (d) Blood transfusion: Number of units of blood, plasma, platelets and/or cryoprecipitate transfused to the patient.

7- Maternal outcome(a) Ward's admission. (b) Intensive care unit [ICU] admission. (c) Complications (example: Injury to the urinary bladder). (d) Duration of admission.

8- Fetal outcome: (a) Gestational age. (b) Apgar scoring at (zero and 5) minutes. (c) Neonatal intensive care [NICU] admission. (d) Admission duration and outcome.

Ethical consideration:

Study protocol had been submitted for approval by Institutional Review Board, damnhour, El-Hussein and Al-Sayed Galal Hospital in formed written and verbal consent had been obtained from each participant sharing in the study. Confidentiality and personal privacy had been respected in all levels of the study.

Statistical analysis:

The collected data were coded, processed and analyzed using the SPSS (Statistical Package for Social Sciences) version 22 for Windows® (IBM SPSS Inc, Chicago, IL, USA). Data were tested for normal distribution using the Shapiro Walk test. Qualitative data were represented as frequencies and relative percentages. Chi square test (χ^2) to calculate difference between two or more groups of qualitative variables. Quantitative data were expressed as mean \pm SD (Standard deviation). Independent samples *t*-test was used to compare between two independent groups of normally distributed variables (parametric data). *p*-value <0.05 was considered significant.

Results

A total of 4400 cases were included with mean age 31.18 years and mean BMI was 28.83, as regard parity p1-2 accounted for 40.8% of cases, p3-4 in 59.2%, mean GA was 36.7, Previous 1 CS in 29.1%, 2 CS in 3.3%, 3 CS in 0.8 and no previous CS in 66.8% of cases, Previous uterine surgery founded in 0.5% of cases, Abnormal placenta suspected in 100 cases which confirmed in 66 cases (Table 1).

A total of 66 cases were confirmed to have MAP included with mean age 29. 8 years and mean BMI was 28.07, as regard parity p3 accounted for 93.3% of cases, p4 in 6.6%, mean GA was 36.70, Previous 2 CS in 43.9%, 3 CS in 56.1%, Previous uterine surgery founded in 43.9% of cases (Table 2).

Table (1): Distribution of the studied cases according to demographic data (n = 4400).

	No.	%
Age (years):		
Min. - Max.		26.0 - 35.0
Mean \pm SD.		31.18 \pm 2.71
Median (IQR)		32.0 (29.0 - 33.0)
BMI (kg/m²):		
Min. - Max.		26.0 - 32.0
Mean \pm SD.		28.83 \pm 2.0
Median (IQR)		29.0 (27.0 - 31.0)
Parity:		
P1-P2	1796	40.8
P3-P4	2604	59.2
GA:		
Min. - Max.		35.0 - 38.0
Mean \pm SD.		36.70 \pm 0.67
Median (IQR)		37.0 (36.0 - 37.0)
Previous CS:		
0	2940	66.8
1	1280	29.1
2	146	3.3
3	34	0.8
Previous uterine surgery:		
No	4376	99.5
Yes	24	0.5
Abnormal placenta:		
No	4334	98.5
MAP	66	1.5

Table (2): Distribution of the studied cases according to demographic data in MAP (n = 66).

	No.	%
Age (years):		
Min. - Max.		26.0 - 35.0
Mean \pm SD.		29. 8 \pm 3.52
Median (IQR)		32.0 (29.0 - 33.0)
BMI (kg/m²):		
Min. - Max.		26.0 - 30.0
Mean \pm SD.		28.07 \pm 1.6
Median (IQR)		27.0 (27.0 - 29.0)
Parity:		
P3	56	93.3
P4	10	6.6
GA:		
Min. - Max.		35.0 - 38.0
Mean \pm SD.		36.70 \pm 1.47
Median (IQR)		38.0 (36.0 - 39.0)
Previous CS:		
2	29	43.9
3	37	56.1
Previous uterine surgery:		
No	37	56.1
Yes	29	43.9

As regard mean operative time was 90.15, Mean blood loss was 654.5ml, 50% of cases had blood transfusion (Table 3).

As regard type of abnormal placenta 43.9% were accrete, 40.9% percreta, 15.2% increta. Placental localization was anterior and posterior in 43.9%, 40.9% respectively of cases and complete centralis in 15.2% of cases. Placental invasion founded in 15.2% of cases and retro placental zone of cleavage was normal in 43.9%, lost in 15.2% and partially lost in 40.9%, Placental vasculature (Doppler) not done in 43.9%, normal in 40.9% and increased in 15.2%. MRI showed that 43.9% were accrete, 40.9% percreta, 15.2% increta (Table 4).

90.9% of cases had general anesthesia and 0.1% had spinal, Regarding Type of incision in abnormal placental cases was mainly transverse in 84.8% and 15.2% had longitudinal. Skin incision among abnormal placenta was mainly Pfennig in 84.8% of cases and 15.2% in midline incision. Dissection of bladder Before uterine incision in all cases, placenta Manually separated in 84.8%, Failure of separation in 15.2%, as regard line of management was Conservation in 84.8% and Cs. hysterectomy in 15.2% (Table 5).

As regard CBC before and after mean Hb was 10.4 pre and changed to 8.8 after operation, mean WBCS was 7192.8 pre and changed to 6618.15 after operation and mean pltt count was 208.6 pre and changed to 207.1 after operation (Table 6).

Bladder injury in 9 case, Ureteric injury in 3 cases, Uterine artery ligation in 30 cases and Internal iliac artery ligation in 2 cases. As regard POS operative complications 13.6% shows infection. 1.55% had DVT and DIC in 1.55% cases 3.1% of cases admitted to ICU, mean hospital stay was 4.27 days as regard mortality rate was 1.55% (Table 7).

Mean apgar at 1,5min was 6.45, 8.30 respectively with mean IRTW weight was 3198.4kg, 18.2% of neonates need NICU admission, 12% of neonates were preterm (Table 8).

In Comparison between Conservation and Cs. Hysterectomy according to different parameters we found that there was significant relation between Centralis complete, Placenta invasion, partially loss of Retro placental zone of cleavage of MAP, increased Placental vasculature (Doppler) of MAP, Mortality, lower Hb level, longer operative time and higher blood loss with case undergo to Cs. Hysterectomy (Table 9).

In Comparison between Elective and Emergency Cs delivery according to different parameters there was significant relation with type of incision, deal with placenta, Line of management, Hb level, operative time and blood loss (Table 10).

In Comparison between type of incision either transverse or longitudinal according to different parameters there was significant relation between lineof management (Table 11).

Table (3): Distribution of the studied cases with MAP according to operative technique (n = 66).

Operative technique	No.	%
<i>Operative time (min.):</i>		
Min. - Max.	80.0 - 120.0	
Mean ± SD.	90.15±13.4	
Median (IQR)	90.0 (18.0 - 90.0)	
<i>Blood loss (ml):</i>		
Min. - Max.	250.0 - 1000.0	
Mean ± SD.	654.5±348.3	
Median (IQR)	750.0 (250.0 - 7500.0)	
<i>Blood transfusion:</i>		
No	33	50
Yes	33	50

Table (4): Distribution of the studied cases with abnormal placenta according to different parameters (n = 66).

	No.	%
<i>Type abnormal placenta:</i>		
Accreta	29	43.9
Percreta	27	40.9
Increta	10	15.2
<i>Placental localization of MAP:</i> (n = 66)		
Anterior	29	43.9
Posterior	27	40.9
Centralis complete	10	15.2
<i>Placenta invasion of MAP:</i> (n = 66)		
Absent	56	84.8
Present	10	15.2
<i>Retro placental zone of cleavage of MAP:</i> (n = 66)		
Normal	29	43.9
Lost	10	15.2
Part. lost	27	40.9
<i>Placental vasculature (Doppler) of MAP:</i> (n = 66)		
Not done	29	43.9
Normal	27	40.9
Increased	10	15.2
<i>MRI of MAP:</i> (n = 66)		
Increta	10	15.2
Accreta	29	43.9
Percreta	27	40.9

Table (5): Distribution of the studied cases with abnormal placenta according to operative methods (n = 66).

Operative methods	No.	%
<i>Anesthesia:</i>		
General	60	90.9
Spinal	6	0.1
<i>Type of incision:</i> (n = 66)		
Transverse	56	84.8
Longitudinal	10	15.2
<i>Type of CS:</i>		
Emergency	37	56.1
Elective	29	43.9
<i>Skin incision:</i>		
Pfenniel	56	84.8
Midline	10	15.2
<i>Dissection of bladder:</i> (n = 66)		
Before uterine incision	66	100
<i>Deal with placenta:</i> (n = 66)		
Manually separated	56	84.8
Failure of separation	10	15.2
<i>Line of management:</i> (n = 66)		
Conservation	56	84.8
Cs. hysterectomy	10	15.2

Table (7): Distribution of the studied cases with abnormal placenta according to maternal outcome (n = 66).

Maternal outcome	No.	%
<i>Visceral injuries:</i> (n = 66)		
No	57	86.4
Bladder	9	13.6
Ureteric injury	3	4.5
Uterine artery ligation	30	45.45
Internal iliac artery ligation	2	3.03
<i>Postoperative complications:</i> (n = 66)		
No	55	83.3
Infection	9	13.6
DVT	1	1.55
DIC	1	1.55
<i>Admitted to ICU:</i> (n = 66)		
No	64	96.9
Yes	2	3.1
<i>Hospital admission (days):</i>		
Min. - Max.	2.0-5.0	
Mean \pm SD.	3.37 \pm 1.2	
Median (IQR)	3.0 (2.0-5.0)	
<i>Mortality:</i>		
No	65	98.45
Yes	1	1.55

Table (6): Distribution of the studied cases with MAP according to CBC before and after surgery (n = 66).

	No.	%
<i>Hb before:</i>		
Min. - Max.	10.0 - 11.0	
Mean \pm SD.	10.4 \pm 0.49	
Median (IQR)	10.0 (10.0 - 11.0)	
<i>Hb after:</i>		
Min. - Max.	8.0 - 9.0	
Mean \pm SD.	8.8 \pm 0.35	
Median (IQR)	9.0 (8.0 - 9.0)	
<i>WBCs before:</i>		
Min. - Max.	4356 - 9878	
Mean \pm SD.	7192.8 \pm 1529.4	
Median (IQR)	6789 (4356 - 9878)	
<i>WBCs after:</i>		
Min. - Max.	4567 - 8796	
Mean \pm SD.	6618.15 \pm 1213.12	
Median (IQR)	6546 (4567 - 8796)	
<i>plt before:</i>		
Min. - Max.	178 - 234	
Mean \pm SD.	208.6 \pm 16.5	
Median (IQR)	212 (178 - 234)	
<i>plt after:</i>		
Min. - Max.	100 - 300	
Mean \pm SD.	207.1 \pm 22.4	
Median (IQR)	213 (100 - 300)	

Table (8): Distribution of the studied cases with abnormal placenta according to fetal outcome (n = 66).

Fetal outcome	No.	%
<i>APGAR:</i>		
1 min.		
Min. - Max.	6.0 - 7.0	
Mean \pm SD.	6.45 \pm 0.50	
Median (IQR)	6.0 (6.0 - 7.0)	
5 min.		
Min. - Max.	7.0 - 9.0	
Mean \pm SD.	8.30 \pm 0.76	
Median (IQR)	8.0 (8.0 - 9.0)	
<i>Birth weight:</i>		
Min. - Max.	2400.0 - 3456.0	
Mean \pm SD.	3198.4 \pm 405.5	
Median (IQR)	3425.0 (3000.0 - 3456.0)	
<i>NICU admission:</i>		
No	54	81.8
Yes	12	18.2
<i>Preterm neonates:</i>		
No	54	81.8
Yes	12	18.2

Table (9): Comparison between conservation and CS hysterectomy according to different parameters (n = 66).

	Line management				Test of sig.	p
	Conservation (n=56)		Cs. Hysterectomy (n=10)			
	No.	%	No.	%		
<i>Placental localization of MAP:</i>						
Anterior	29	51.8	0	0.0	$\chi^2=47.801^*$	MC $p<0.001^*$
Posterior	27	48.2	0	0.0		
Centralis complete	0	0.0	10	100.0		
Placenta invasion	0	0.0	10	100.0	$\chi^2=66.0^*$	FE $p<0.001^*$
<i>Retro placental zone of cleavage of MAP:</i>						
Normal	29	51.8	0	0.0	$\chi^2=47.801^*$	MC $p<0.001^*$
Lost	27	48.2	0	0.0		
Part. lost	0	0.0	10	100.0		
<i>Placental vasculature (Doppler) of MAP:</i>						
Not done	29	51.8	0	0.0	$\chi^2=47.801^*$	MC $p<0.001^*$
Normal	27	48.2	0	0.0		
Increased	0	0.0	10	100.0		
<i>MRI of MAP:</i>						
Increta	29	51.8	0	0.0	$\chi^2=47.801^*$	MC $p<0.001^*$
Accreta	27	48.2	0	0.0		
Percreta	0	0.0	10	100.0		
<i>Visceral injuries:</i>						
No	47	83.9	10	100.0	$\chi^2=1.861$	FE $p=0.334$
Bladder	9	16.1	0	0.0		
Mortality	0	0.0	1	10.0	$\chi^2=5.686$	FE $p<0.001^*$
<i>Hb:</i>						
Pre						
Min. - Max.	10.0 - 11.0		10.0 - 10.0		$t=7.686^*$	<0.001*
Mean ± SD.	10.52±0.50		10.0±0.0			
Median	11.0		10.0			
Post:						
Min. - Max.	9.0 - 9.0		8.0 - 8.0		—	—
Mean ± SD.	9.0±0.0		8.0±0.0			
Median	9.0		8.0			
<i>Operative time (min.):</i>						
Min. - Max.	80.0 - 90.0		120.0 - 120.0		$t=52.212^*$	<0.001*
Mean ± SD.	84.82±5.04		120.0±0.0			
Median	80.0		120.0			
<i>Blood loss (ml):</i>						
Min. - Max.	250.0 - 1000.0		1000.0 - 1000.0		$t=8.794^*$	<0.001*
Mean ± SD.	592.86±346.47		1000.0±0.0			
Median	300.0		1000.0			
<i>Hospital admission (days):</i>						
Min. - Max.	2.0 - 5.0		2.0 - 5.0		$t=0.479$	0.634
Mean ± SD.	3.41±1.28		3.20±1.32			
Median	3.0		3.0			

p: p-value for comparing between Conservation and Cs. Hysterectomy.

*: Statistically significant at $p\leq 0.05$.

Table (10): Comparison between elective and emergency CS delivery according to different parameters (n = 66).

	Type of delivery				Test of sig.	p
	Elective (n=29)		Emergency (n=37)			
	No.	%	No.	%		
<i>Skin incision:</i>						
Pneustiel	29	100.0	27	73.0	$\chi^2=9.234^*$	FE _p =0.002*
Midline	0	0.0	10	27.0		
<i>Dissection of bladder:</i>						
Before uterine incision	29	100.0	37	100.0	–	–
<i>Deal with placenta:</i>						
Manually separated	29	100.0	10	27.0	$\chi^2=9.237^*$	FE _p =0.002*
Failure of separation	0	0.0	27	73.0		
<i>Line of management:</i>						
Conservation	29	100.0	27	73.0	$\chi^2=9.237^*$	FE _p =0.002*
Cs. Hysterectomy	0	0.0	10	27.0		
Mortality	0	0.0	1	2.7	$\chi^2=0.796$	FE _p =1.000
<i>Hb:</i>						
Pre:						
Min. - Max.	11.0 - 11.0		10.0 - 10.0		–	–
Mean ± SD.	11.0±0.0		10.0±0.0			
Median	11.0		10.0			
Post:						
Min. - Max.	9.0 - 9.0		8.0 - 9.0		t=3.651*	0.001*
Mean ± SD.	9.0±0.0		8.73±0.45			
Median	9.0		9.0			
<i>Operative time (min.):</i>						
Min. - Max.	80.0 - 80.0		90.0 - 120.0		t=8.701*	<0.001*
Mean ± SD.	80.0±0.0		98.11±13.51			
Median	80.0		90.0			
<i>Blood loss (ml):</i>						
Min. - Max.	300.0 - 1000.0		250.0 - 1000.0		t=5.604*	<0.001*
Mean ± SD.	875.86±251.64		481.08±320.67			
Median	1000.0		300.0			
<i>Hospital admission (days):</i>						
Min. - Max.	2.0 - 5.0		2.0 - 5.0		t=0.384	0.702
Mean ± SD.	3.31±1.26		3.43±1.30			
Median	3.0		3.0			

p: p-value for comparing between Conservation and Cs. Hysterectomy.

*: Statistically significant at $p \leq 0.05$.

Table (11): Comparison between type of incision either transverse or longitudinal according to different parameters (n = 66).

	Type of incision				χ^2	FE _p
	Transverse (n=56)		Longitudinal (n=10)			
	No.	%	No.	%		
<i>Line of management:</i>						
Conservation	56	100.0	0	0.0	66.0*	<0.001*
Cs. Hysterectomy	0	0.0	10	100.0		
<i>Dissection of bladder:</i>						
Before uterine incision	56	+ 0.0	10	100.0	–	
After uterine incision	0		0	0.0		
<i>Visceral injuries:</i>						
No	47	83.9	10	100.0	1.861	0.334
Bladder	9	16.1	0	0.0		
Mortality	0	0.0	1	10.0	5.686	0.152

*: Statistically significant at $p \leq 0.05$.

Discussion

A total of 4400 cases were included with mean age 31.18 years and mean BMI was 28.83, as regard parity p1-2 accounted for 40.8% of cases, p3-4 in 59.2%, mean GA was 36.7, Previous 1 CS in 29.1%, 2 CS in 3.3%, 3 CS in 0.8 and no previous CS in 66.8% of cases, Previous uterine surgery founded in 0.5% of cases, normal placenta in 98.5% of cases 1.4% of cases had MAP and 0.1% had placenta previa.

Our results were supported by study of Abd Elsalam et al. [9] as they reported that the mean age of the included cases was 31.7 ± 4.8 year ranged between 17:43 years and the mean gestational age was 35.8 ± 2.1 weeks. Regarding parity, about half of them (226 cases, 48.4%) were P3:P4, 170 cases (36.4%) were P1:P2, 62 cases 13.3% were grand MP (>5) and only 9 cases were Primiparous. There were 458 cases (98.1%) with previous caesarian section about two thirds of them 264 cases (56.5%) had 2-3 CSs. A total of 110 cases (23.5%) had previous other uterine surgery (91 cases had D and C, 9 cases had Myomectomy, 6 cases hysteroscopic surgery and 4 cases had hysterotomy).

These obtained results were comparable with another retrospective study held by El-Shalakany et al. [10] (for five years) carried out in their studied hospital, they found that the incidence of MAP was 7/1000 deliveries (0.7% of total deliveries). Also, this incidence is comparable with published studies in the last decade (0.4-0.9%) [11]. In the same line, Stafford & Belfort [12] found that the incidence of MAP was 4.8/1000 which is slightly lower from our obtained results.

The present study showed that as regard type of delivery of all cases 20.8% had CS and 97.2% had NVD, all cases with abnormal placenta had CS 48.5% were elective CS, 51.5% had emergency CS. As regard pre and post Hb level was 11.88, 11.19 respectively. Mean operative time was 27.42min.

In the study of Bi et al. [13], the placental edge was lower and reached or even covered the cervix in women with more numbers of previous abortions, vaginal deliveries, or cesarean sections (≥ 2) (22.3%, 24.8%, 27.1%, 30.6%; 1.3%, 2.4%, 3.6%, 3.6%; and 2.1%, 3.5%, 6.4%, and 6.8%, in women with low-lying placenta, marginal, partial, and complete PP, respectively).

In a study conducted by Soyer-Caliskan et al. [14] preoperative Hb and Htc levels were not different between the groups, postoperative Hb and

Htc levels were significantly lower in vertical-vertical incision group than transverse-transverse group (7.66 ± 0.75 ; 8.21 ± 0.98 , $p=0.004$ for Hb; 21.76 ± 3.19 ; 23.15 ± 3.68 $p=0.044$ for Htc respectively). Intraoperative blood loss was higher in vertical-vertical incision group. Difference between preoperative and postoperative Hb and Htc levels were 3.30 ± 1.04 and 12.99 ± 5.07 respectively ($p=0.012$; $p=0.033$).

The current study showed that mean blood loss was 293.7ml, all abnormal placental cases had blood transfusion 1.5% of all cases.

Whereas Abd Elsalam et al. [9] reported that 409 patients (87.6%) received blood product transfusion with a mean of 8.74 ± 2.57 units and the mean estimated blood loss was 1978 ± 255 ml.

In a study, El-Shalakany et al. [10] found that the majority of MAP cases needed blood transfusion with a mean of 9.06 units and the mean estimated blood loss was 2027ml.

In the study in our hands, as regard type of abnormal placenta 43.9% were accrete, 40.9% percreta, 15.2% increta. Placental localization was anterior and posterior in 43.9%, 40.9% respectively of cases for each site and complete centralis in 15.2% of cases. Placental invasion founded in 15.2% of cases and retro placental zone of cleavage was normal in 43.9%, lost in 15.2% and partially lost in 40.9%, Placental vasculature (Doppler) not done in 43.9%, normal in 40.9% and increased in 15.2%. MRI showed that 43.9% of MAP was accrete, 40.9% percreta, 15.2% increta.

Our results were supported by study of Jinget al. [5] as they reported that among the 676 cases, there were 157 cases (23.2%) of anterior placentation, 492 cases of posterior placentation (72.8%), and 27 cases of lateral placentation (4.0%).

In the study of Bi et al. [14], in total, 466, 1233, 140, and 2651 women had low-lying placenta, marginal, partial, and complete PP. The incidence of low-lying placenta, marginal, partial, and complete PP was 5%, 31%, 4%, and 60%.

The present study showed that 90.9% of cases had general anesthesia and 0.1% had spinal, regarding Type of incision in abnormal placenta cases was mainly transverse in 84.8% and 15.2% had longitudinal. Skin incision among abnormal placenta was mainly Pfenniel in 84.8% of cases and 15.2% in midline incision. Dissection of bladder before uterine incision in all cases, placenta manually separated in 84.8%, Failure of separation

in 15.2%, as regard line of management was Conservation in 84.8% and Cs. Hysterectomy in 15.2%.

In the study of Soyer-Caliskan et al. [14], bladder injury was found to be significantly lower in the transverse-transverse group (13 patients, 37.1% in vertical-vertical group versus 9 patients, 11.1% in transverse-transverse group ($p=0.001$)).

In a study conducted by Wylie et al. [15] skin incisions were compared in emergency CS due to abruption, and hemorrhage due to previa, and they reported that even though transverse skin incisions prolong the surgical time by 1-2 minutes, there was no statistical difference for the surgical outcomes in the two skin incision types. Authors reported that vertical skin incisions may increase postpartum endometritis, and the neonatal outcomes were not superior in the vertical incision group, even if most of the CS were performed through suprapubic transverse skin incisions together with uppertransverse uterine incisions. So, even in emergency surgery, suprapubic transverse incision may be safely selected in emergency CS.

Furthermore, in another study conducted by Kilicci et al. [16], surgeons performed hysterotomy by upper transverse incision without increase the hysterectomy rates, with no substantial difference in comparison to vertical uterine incision.

The current study showed that as regard maternal outcome; bladder injury in 9 case, ureteric injury in 3 cases, uterine artery ligation in 30 cases internal iliac ligation in 2 cases. As regard post operative complications 13.6% shows infection, 1.55% had DVT and DIC in 1.55% cases. 31% of cases admitted to ICU, mean hospital stay was 4.27 days as regard mortality rate was 1.55%.

However, Abd Elsalam et al. [9] showed that 22 cases (4.7%) were complicated with disseminated intravascular coagulation and 31 cases (6.6%) were complicated by surgical site infection (SSI).

Regarding mortality, the present results showed that only one case (0.21%) was recorded (it had DIC after massive blood loss) with a mortality rate of 2/1000. This rate is obviously lower than that was reported in the literature. In their study, about half of the cases were admitted to ICU 222/467, (47.5%) with a mean duration of 1.67 ± 1.59 day and the mean of hospital admission duration was 7.7 ± 4.1 days.

The present findings were more than those of El-Shalakany et al. [10] who recorded DIC in 4.4% and SSI in 7.2% of MAP cases. However, Eller

al. [17] reported that DIC was found 27.6% of patients with MAP. This highly significant difference between both rates may be attributed to vigorous blood products replacement.

On the other hand, recently, Vijayasree [18] found that the maternal mortality of MAP cases was 25% and all of them died due to DIC, this is obviously higher than our obtained results.

As similar to our findings, Vijayasree [18] found that 60% of MAP cases had to be shifted to ICU. Also, El-Shalakany et al. [10] found that 47.8% of MAP patients were admitted to the ICU with a mean duration of 1.6 day and they found that the mean hospital stay duration was 7.6 days. However, Paneerselvam & Sundaram [19] found that the average total hospital stay was 20.46 days, which is higher than our results. As lower to our rate, Eller et al. [17] carried out a retrospective cohort study in two tertiary care teaching hospitals in USA and they found that 27.6% of patients with MAP were admitted to the ICU.

Our results showed that as regard fetal outcome, mean Apgar at 1,5min was 6.45, 8.30 respectively with mean birth weight was 3198.4kg, 18.2% of neonates need NICU admission, 12% of neonates were preterm.

While, Abd Elsalam et al. [9] demonstrated that a total of 118 cases (24.8%) had NICU admission, neonates were 333 (69.9%), intrauterine fetal demise (IUFD) was recorded in 58 neonates (12.2%).

The present findings are comparable with a retrospective study done by Asıcıoglu et al. [20] at two tertiary hospitals in Istanbul in the 5-year period from 2005 to 2010. The perinatal outcomes for patients who had placenta accreta were as following: The mean gestational age at delivery was 35.4 ± 4.4 weeks, gestation. The mean birth weight (kg) was 2.8 ± 8.1 , 8.7 Apgar score at 5 minutes < 7 , 19.5% NICU admission and 4.3% Neonatal mortality. There is not statistically significant between the perinatal outcomes of both studies.

Paneerselvam & Sundaram [19] found the perinatal mortality rate was 6.25%, 61.0% of neonates were premature while 27.7% were term neonates. Neonates had an average birth weight of 1.7kg. The NICU admission rate was 81%. There were 2 preterm intrauterine fetal demise. Respiratory distress syndrome was the leading cause of neonatal death accounting for 80% and sepsis in 20%. In the study done by Balayla & Bondarenko [20] the

NICU admission rate was 86%. In present study the NICU admission rate was lower comparatively.

Conclusion:

Early antenatal diagnosis of morbidly adherent placenta through imaging (ultrasound color Doppler and MRI) allows for multidisciplinary planning to minimize potential maternal or neonatal morbidity and mortality. Also, proper counselling of patients regarding associated risks reduces maternal morbidity and mortality.

References

- 1- JAUNIAUX E., COLLINS S. and BURTON G.J.: Placenta accreta spectrum: Pathophysiology and evidence-based anatomy for prenatal ultrasound imaging. *American Journal of Obstetrics and Gynecology*, 218 (1): 75-87, 2018.
- 2- POLAT I., YÜCEL B., GEDIKBASI A., ASLAN H. and FENDAL A.: The effectiveness of double incision technique in uterus preserving surgery for placenta percreta. *BMC Pregnancy and Childbirth*, 17 (1): 1-8, 2017.
- 3- ASGHAR S., CHEEMA S. A. and NAZ N.: To determine the incidence and risk factors associated with placenta previa in a tertiary care hospital of Pakistan. *Journal of Gynecology and Obstetrics*, 8 (3): 67-70, 2020.
- 4- GUPTA N.: Antepartum hemorrhage. In *Principles of Critical Care in Obstetrics*. Springer, New Delhi., Pp. 281-301, 2016.
- 5- JING L., WEI G., MENG FAN S. and YANYAN H.: Effect of site of placentation on pregnancy outcomes in patients with placenta previa. *PloS One*, 13 (7): e0200252, 2018.
- 6- MORLANDO M., SAMO L., NAPOLITANO R., CAPONE A., TESSITORE G., MARUOTTI G.M., et al.: Placenta accreta: Incidence and risk factors in an area with a particularly high rate of cesarean section. *Acta Obstet. Gynecol. Scand*, 92: 457-460, 2013.
- 7- ABO-ELROOSE A.A.E., AHMED M.R., SHAABAN M.M., GHONEIM H.M. and MOHAMED T.Y.: Triple P with T-shaped lower segment suture; an effective novel alternative to hysterectomy in morbidly adherent anterior placenta previa. *The Journal of Maternal-Fetal & Neonatal Medicine*, 34 (19): 3187-3191, 2021.
- 8- CHAUDHARI H.K., SHAH P.K. and D'SOUZA N.: Morbidly adherent placenta: Its management and maternal and perinatal outcome. *The Journal of Obstetrics and Gynecology of India*, 67 (1): 42-47, 2017.
- 9- ABD ELSALAM E.S.H., ABOU ELNOUR A.A., AHMAD A.M.B. and ABD ELHADY R.M.M.: Maternal and Neonatal Outcomes of Morbidly Adherent Placenta in Ain-Shams University Maternity Hospital From 2012 to 2017. *Evidence Based Women's Health Journal*, 12 (1): 22-35, 2022.
- 10- EL-SHALAKANY A.H., AMR ABDEL AZIZ ELSAYIED and AHMED MOHAMMED RAGAB: Outcomes of Patients with Morbidly Adherent Placenta in Ain Shams Maternity Hospital: A Retrospective Study. *The Egyptian Journal of Hospital Medicine*, Vol. 69 (3): Page 2149-2158, 2017.
- 11- MORLANDO M. and COLLINS S.: Placenta accreta spectrum disorders: Challenges, risks, and management strategies. *International Journal of Women's Health*, 12: 1033, 2020.
- 12- STAFFORD I. and BELFORT M.A.: Placenta accrete, increta and percreta: A team-based approach starts with prevention. *Contemp Ob/Gyn.*, 77: 1-5, 2008.
- 13- BI S., ZHANG L., WANG Z., CHEN J., TANG J., GONG J. and CHEN D.: Effect of types of placenta previa on maternal and neonatal outcomes: A 10-year retrospective cohort study. *Archives of Gynecology and Obstetrics*, 304 (1): 65-72, 2021.
- 14- SOYER-CALISKAN C., CELIK S., BASBUG A., HATIRNAZ S., GUCLU M., AKBABA E. and TINELLI A.: Morbidly adherent placenta and cesarean section methods. A retrospective comparative multicentric study on two different skin and uterine incision. *Ginekologia Polska*, 92 (5): 359-364, 2021.
- 15- WYLIE B.J., GILBERT S., LANDON M.B., et al.: Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Maternal-Fetal Medicine Units Network (MFMU). Comparison of transverse and vertical skin incision for emergency cesarean delivery. *Obstet. Gynecol.*, 115 (6): 1134-1140, 2010.
- 16- KILICCI C., OZKAYA E., ESER A., et al.: Planned cesarean hysterectomy versus modified form of segmental resection in patients with placenta percreta. *J. Matern Fetal Neonatal Med.*, 31 (22): 2935-2940, 2017.
- 17- ELLER A.G., BENNETT M.A., SHARSHINER M., MASHETER C., SOISSON A.P., DODSON M. and SILVER R.M.: Maternal morbidity in cases of placenta accreta managed by a multidisciplinary care team compared with standard obstetric care. *Obstet. Gynecol.*, 117: 331-337, 2011.
- 18- VIJAYASREE M.: Retrospective Analysis of Morbidly Adherent Placenta in a Tertiary Care Referral Centre - A Decade of Experience. *SM J. Gynecol. Obstet.*, 4 (2): 1031, 2018.
- 19- PANEERSELVAM A. and SUNDARAM A.: Fetomaternal outcome in morbidly adherent placenta in a tertiary referral hospital. *Int. J. Reprod Contracept Obstet. Gynecol. Nov.*, 7 (11): 4540-4544, 2018.
- 20- ASİCİOĞLU O., ŞAHBAZ A., GÜNGÖRDÜK K., et al.: Maternal and perinatal outcomes in women with placenta praevia and accreta in teaching hospitals in Western Turkey. *Journal of Obstetrics and Gynaecology, Early Online*, 1-5, 2014.
- 21- BALAYLA J. and BONDARENKO H.D.: Placenta accreta and the risk of adverse maternal and neonatal outcomes. *J. Perinat Med.*, 41 (2): 141-149, 2013.

طريقة شق الرحم أثناء القيصرية وتأثيره على نتائج الحمل في حالات المشيمة المرضية

خلفية الدراسة : لقد زاد معدل حدوث المشيمة الملتصقة مرضياً في العصر الحالي من التوليد الموازي للمعدل القيصرى. تعد مشكلة الالتزام المشيمى غير الطبيعى مساهماً هاماً فى مراضة الأمهات وتتطلب رعاية متعددة التخصصات للإدارة.

الهدف من الدراسة : تقييم طريقة شق الرحم وتأثيره على نتائج الحمل فى حالات المشيمة المرضية.

المريضات وطرق الدراسة : كانت هذه دراسة جماعية استطلاعية، أجريت فى مستشفيات دمنهور والحسين والسيد جلال على ٦٦ مريضاً يعانون من المشيمة الملتصقة ابتداءً من ٢٠١٨/٦/١ حتى ٢٠٢٠/١/١.

نتائج الدراسة : تضمنت الدراسة ٤٤٠٠ حالة بمتوسط العمر ٢٩.٨ سنة وكان متوسط مؤشر كتلة الجسم ٢٨.٨٢، فيما يتعلق بعدد مرات الولادة ١-٢ يمثل ٤٠.٨٪ من الحالات، ٣-٤ فى ٥٩.٢٪، متوسط عمر الحمل كان ٣٦.٧، ولاده واحدة قيصرية سابقة فى ٢٩.١٪، ولادتين فى ٣.٣٪، ثلاث ولادات فى ٠.٨ ولا يوجد ولادة قيصرية سابقة فى ٦٦.٨ من الحالات، جراحة الرحم السابقة وجدت فى ٠.٥٪ من الحالات، المشيمة الطبيعية فى ٩٨.٥٪ من حالات ١.٥٪ كانت بها المشيمة المرضية. بالمقارنة بين الشق السفلى والشق العلوى أثناء الولادة القيصرية فى حالات المشيمة غير الطبيعية كان هناك ارتباط معنوى بين الإدارة، تشريح المثانة، الإصابات الحشوية، الوفيات، والتخثر الوريدي العميق، وتجلط الدم داخل الاوعية ونوع الشق.

الاستنتاج : التشخيص المبكر قبل الولادة للمشيمة الملتصقة مرضياً من خلال التصوير (دوبلر ملون بالموجات فوق الصوتية والتصوير بالرنين المغناطيسى) يسمح بالتخطيط متعدد التخصصات لتقليل المراضة والوفيات المحتملة للأمهات أو حديثى الولادة. كذلك، فإن الاستشارة المناسبة للمرضى فيما يتعلق بالمخاطر المرتبطة تقلل من معدلات الاعتلال والوفيات النفاسية.