

Research Article

Placenta Accreta Spectrum Disorders: Challenges in Diagnosis and Management Strategies: Observational Case Series Study



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Abstract

Background; PAS is a condition that might endanger life. The occurrence of PAS is projected to rise more over time given the rising frequency of cesarean sections globally. **Objective;** to assess the effectiveness of various care strategies for placenta accreta spectrum patients from January 2022 to December 2022 at Minia Maternity & Children University Hospital. **Subjects and methods;** The current investigation was conducted from January 2022 to December 2022 on all patients at Minia maternity and children University hospital who were either suspected of having or were officially diagnosed with placenta accreta, **Results;** Among the studied women, 15 (14.7%) were managed by Hysterectomy. While the remaining 87 women were managed by Conservative surgical options. There was a statistically substantial connection between GA and hysterectomy, women who underwent hysterectomy were with younger GA as compared with those who managed by Conservative surgical options. There were non-statistically significant differences with other studied variables regarding mode of management, **Conclusion;** PAS can be managed by Conservative surgical options and Hysterectomy. As a result, practitioners need to be aware of the difficulty in making the diagnosis and the difficulties in treating this disorder.

key words; GA gestational age, placenta accreta, CS cesarean section.

Introduction

The placenta, a highly specialized organ of pregnancy, aids in the fetus's healthy growth and development. The major functional components of the placenta are the chorionic villi, their growth and function are carefully controlled and coordinated to ensure the passage of nutrition and waste products between the maternal and fetus circulatory systems runs as efficiently as possible ⁽¹⁾.

When the placenta superficially enters the myometrium, it is referred to as an accreta. When the chorionic villi pierce the myometrium more deeply, placenta increta occurs. However, the word "accreta" is usually used to refer to the three forms of placenta percreta, which is an invasion of the placenta to

the uterine serosa that may also affect other surrounding organs, such as the urinary bladder⁽²⁾.

The rise in prevalence of placenta accreta spectrum (PAS) diseases from 0.12 to 0.31% over the last 30 years and the reported death rate of about 7.0% have made them a serious life-threatening obstetrical problem. It is also associated with significant maternal morbidity, which includes major blood transfusions, urinary tract injuries, hysterectomy, admission to the intensive care unit (ICU), sepsis, and prolonged hospital stays ⁽³⁾.

The challenge of managing PAS comes with delivery—serious hemorrhage may result from failure of the usual hemostatic mechanisms

associated with separation of the normally implanted placenta and/or hypervascularity of adjacent tissues involved in the process.⁽¹⁵⁾

The multidisciplinary team should include specialists from various disciplines: experienced obstetricians and maternal–fetal medicine specialists, gynecological surgeons with advanced expertise e.g. gynecologic oncologists, obstetric anesthesiologists, urologists, interventional radiologists, hematologists and neonatologists.⁽¹⁶⁾

Four different primary methods of conservative management have been described in the international literature: (1) the extirpative technique (manual removal of the placenta); (2) leaving the placenta in situ or the expectant approach; (3) one-step conservative surgery (removal of the accreta area); and (4) the Triple-P procedure (suturing around the accreta area). These methods have been used alone or in combination and in many cases.⁽¹⁷⁾

Cesarean hysterectomy is considered the gold standard for the treatment of invasive placentation. However, also this radical approach is associated with high rates (40–50%) of severe maternal morbidity, mostly related to hemorrhage and insult to surrounding organs during surgery, and mortality rates as high as 7% due to massive untreatable hemorrhage.⁽¹⁸⁾

Patients and Methods

Setting and participants: In the present research, 102 women who had been diagnosed with placenta accreta spectrum diseases between January 2022 and December 2022 at Minia Maternity & Children University Hospital were recruited. Ethical approval was sought from the local ethical committee in the department then institutional ethical approval (no. MUEOB00100). All participants were informed about study and written consent was taken from them.

Inclusion criteria: All individuals who have ultrasound or Doppler criteria as having placenta accreta spectrum diseases during pregnancy.

Exclusion criteria: Those who need a hysterectomy due to any further related uterine pathology and Patient refusal.

Study design: Evaluation of all patients involved:

Proper history taking as Patient's name, Age, Gravidity, Parity, Last normal menstrual period, expected date of delivery, Period of gestation, Past obstetric history, Gynecological history, Past medical & surgical history).

General examination:

Abdominal examination:

Basic routine investigations: Involving CBC, liver function tests, kidney function tests, and coagulation profile). Blood booking of 6 units of cross matched blood & fresh frozen plasma.

Ultrasound: for criteria of placenta accreta:

We considered the presence of the following criteria indicate placenta accreta: Reduced myometrial thickness, Abnormal placental lacunae, Loss of the retro placental clear space, placental bulge, focal exophytic mass and Bladder wall interruption.

Doppler: Abnormal color Doppler imaging patterns in the form of Disruption of the normal continuous color flow appearance resulting in a gap in myometrial blood flow evaluated with color Doppler imaging, also numerous large blood vessels are often seen surrounding the myometrium bridging vessels, uterovesical hypervascularity, subplacental hypervascularity and placental lacunae feeder vessels.

Operative intervention: How to choose the mode of management? For all assigned patients. After delivery of the baby, the placenta is observed to be seen if it will separate or not by gentle cord traction. Bilateral uterine artery ligation is performed during this period to decrease the blood loss from the placental bed if the placenta separates, the following clinical scenarios in our cases:

A. If the placenta separates partially (focal accreta), the remaining portion is manually removed, one-step conservative surgery (removal of the accreta area) resecting the invaded area of the uterus together with the placenta and reconstructing the uterus. It is performed at the time of cesarean delivery as a “one-step procedure” or the Triple-P procedure it involves three main steps: perioperative localization of the upper placental edge, pelvic devascularization and

the placental non-separation with myometrial excision followed by the repair of the myometrial defect. Cervical inversion with intra uterine tamponading due to placental bleeding (as using of intra uterine packing, intra uterine catheters, intra uterine backery) to avoid or minimize post-partum hemorrhage /or without intra uterine tamponading (if placenta separated with no or little placental site bleeding). These methods have been used alone or in combination in many cases. but if the bleeding is excessive, cesarean hysterectomy is the only available option.

B. If the placenta separates partially (focal accreta) or did not separate manually (diffuse accreta) the placenta left in situ with uncomplicated resorption, placenta in situ followed by planned or unplanned delayed hysterectomy.

C. If the placenta didn't separate at all (diffuse accreta or percreta) cesarean hysterectomy with placenta in place was performed, cesarean hysterectomy with cases of sever uncontrollable intra operative bleeding, or cases of high parity, completing her family,

refusal of conservative management.

Follow up: The patients admitted to post-operative ward or ICU for close daily follow up & monitoring.

Statistical method: The statistical analysis was conducted using the SPSS software (version 20). The categorical data were represented as No. (%) refers to categorical data, while continuous data is mean and standard deviation (SD). The chi-square test compared the two groups regarding categorical data, while an independent sample t-test was utilized for continuous variables. Calculations were performed to determine the odds ratios and 95% confidence intervals (CI).

Results

All patients suspected with placenta accreta spectrum disorders by ultrasound examination from (January 2022 to December 2022) in Minia Maternity & children university hospital were recruited in the current study, a total of 102 women were included.

Table (1): characteristics of the analyzed women's demographics:

	N	Minimum	Maximum	Mean	Std. Deviation
Age	102	19.0	41.0	31.98	4.93
Gestational Age	102	32.0	38.0	36.79	1.16
Gravidity	102	2.0	11.0	5.21	1.99
Parity	102	1.0	8.0	3.43	1.50
Previous abortion	47	1.0	4.0	1.68	0.78
Number of prev. CS	99	1.0	7.0	2.92	1.32

Table (2): PAS risk factors among studied women:

		Frequency	Percent
Surgical	Surgical risk factors	39	38.23
	Prev. CS	38	37.25
	Previous exploration (rupture uterus)	1	0.98
Medical	Medical risk factors	8	7.84
	GM	4	3.92
	GHTN	1	0.98
	Thrombocytopenia	1	0.98
	RH -ve	1	0.98
	RHD	1	0.98
Others	Other risk factors	6	5.88
	Multiple gestations in this pregnancy	3	2.94
	Previous IUFD	1	0.98
	Old age	2	1.96
	No	77	75.5
	Yes	7	6.9
Scar pregnancy suspected in 1st TA	Not Sure	18	17.6

Table (3): Two-dimensional ultrasound and Doppler findings among studied women:

US findings		Frequency	Percent
Loss of clear zone		59	57.8
Myometrial thinning		49	48.0
Abnormal placental lacunae		69	67.6
Bladder wall interruption	Positive	12	11.8
	not known	5	4.9
Placental bulge	Positive	20	19.6
	not known	5	4.9
Focal exophytic mass	Positive	14	13.7
	not known	7	6.9
Doppler findings		Frequency	Percent
Bridging vessels	Negative	73	71.6
	Positive	19	18.6
	not known	10	9.8
Placental lacunae feeding vessels	Negative	32	31.4
	Positive	66	64.7
	not known	4	3.9
Suspicion of invasion into parametrium	Negative	89	87.3
	Positive	7	6.9
	not known	6	5.9
Uterovesical hypervascularity	Positive	31	30.4
	not known	10	9.8
Sub-placental hypervascularity	Positive	42	41.2
	not known	16	15.7

Table (4): management options among studied PAS women:

	Frequency	Percent
Hysterectomy	15	14.7%
Conservative surgical options	87	85.3%
IU gauze pack	9	8.9
Bilateral uterine arteries ligation	89	87.2
Extirpative technique	13	12.7
Cervical tamponade	39	38.2
Dissection of bladder Central/Lateral	33	32.4
Bladder repair	16	15.7
Plication of LUS	17	16.7
Reinforcement reconstruction of LUS	9	8.8
Under-running sutures	12	11.8
Triple-P Technique	4	3.9

Table (5): Difference between cases managed by Hysterectomy& those managed by conservative surgical options:

		Mean	Std. Deviation	p-value
Age	Conservative surgical options	31.6	5.0	0.067
	Hysterectomy	34.1	4.2	
Gestational Age	Conservative surgical options	37.0	0.8	0.001*
	Hysterectomy	35.9	2.1	
Gravidity	Conservative surgical options	5.1	2.0	0.334
	Hysterectomy	5.7	2.0	
Parity	Conservative surgical options	3.4	1.5	0.513
	Hysterectomy	3.7	1.3	
Cervical length	Conservative surgical options	28.3	3.7	0.221
	Hysterectomy	26.9	5.8	
Abortion	Conservative surgical options	1.7	0.8	0.416
	Hysterectomy	1.5	0.7	
Number of prev. CS	Conservative surgical options	2.9	1.3	0.199
	Hysterectomy	3.3	1.4	

Discussion

Abnormally invasive placenta (AIP), commonly known as placenta accreta spectrum disorder (PAS), is a clinical condition in which the placenta does not naturally separate after birth and cannot be forcefully removed without causing severe and sometimes fatal hemorrhage⁽⁴⁾.

Placenta accreta become the most serious problems during third stage of delivery and

some obstetricians call it “Obstetricians Nightmare”. PA leads to massive intractable hemorrhage with loss of about 3-5 liters of blood, disseminated intravascular coagulopathy, adult respiratory distress syndrome, massive blood transfusion, electrolyte imbalance, and renal failure⁽¹⁹⁾

A major challenge is determining the appropriate timing of delivery to balance the neonatal risks of preterm birth with planned

early delivery against the risk of bleeding or labor leading to emergency surgery. Because most patients with placenta accreta spectrum have placenta previa, delaying delivery toward term decreases the risk of prematurity but increases the likelihood of labor and bleeding.⁽²⁰⁾

Late preterm (34+0 to 36+6 weeks of gestation) delivery should be considered for women presenting with placenta praevia or a low-lying placenta and a history of vaginal bleeding or other associated risk factors for preterm delivery. C Delivery timing should be tailored according to antenatal symptoms and, for women presenting with uncomplicated placenta praevia, delivery should be considered between 36+0 and 37+0 weeks of gestation.⁽²¹⁾

In the current thesis demographic features of the studied women showed that, a total of 102 cases were enrolled in our research, the median age was 31.98 ± 4.93 years old. Gestational age was with an average GA of 36.79 ± 1.16 weeks. gravidity was ranged from two to 11 times with an average gravidity of 5.21 ± 1.99 times, their parity was with an average of 3.43 ± 1.5 , number of women with reported abortion were 47 women, number of previous CS was ranged from one to seven times.

In agreement was a study done by El Gelany et al., 2019 contained 102 instances classified as PAS disorders; the average age of the patients was 32.4 ± 4.2 years; 60% of the cases had a parity $\geq$ three; and 82% had $\geq$ two prior CSs. Also, 1/3 of them had previous history of placenta previa⁽⁵⁾.

As regarding the risk factors for placenta accreta in our study, it is demonstrated that the most prevalent risk factors were surgical risk factors among 39 women (38 previous CS and one case with previous exploration). Medical risk factors were present among 8 women (GM in 4 women, one woman with GHTN, one woman with thrombocytopenia, women woman with RH -ve and one woman with RHD). Other risk factors were Twins in this pregnancy among three women, old age among two women. Also, the distribution of the studied women according to scar pregnancy suspected in 1st TA. It was positively suspected among 7 women (6.9%), and negatively

suspected among 77 women (75.5%) while it was not sure among 18 women (17.6%).

This was in agreement with Kabiri et al., 2014 and Sentilhes et al., 2018 noted the same results. Risk factors were present among 50 women (49%) of the studied cases. The most prevalent risk factors were surgical risk factors among 40 women (38 previous CS, one case with previous exploration and one case with ureteric stent). Medical risk factors were present among 7 women (GM n 4 women, one woman with GHTN, one woman with thrombocytopenia and women woman with RH -ve).^(6,7)

These findings supported by numerous authors, Fitzpatrick et al., 2012, Balayla et al., 2013 and Zhang et al., 2017. Prior cesarean birth, advanced maternal age, GHTN, and placenta previa were revealed to be relevant risk factors in studies of risk variables for PAS disorders.^(8, 9, 10)

Also, another research done by Farquhar et al., 2017 reported that Placenta previa, greater maternal age, high parity, and previous cesarean section were all independent risk factors for PAS abnormalities.⁽¹¹⁾

As regarding US and Doppler findings of placenta accreta in our study, it is demonstrated that the US findings among the studied women as follow: loss of clear zone was detected among 59 women (57.8%), Myometrial thinning 49 women (48%), Abnormal placental lacunae among 69 women (67.6%), Bladder wall interruption among 12 women (11.8%), Placental bulge among 20 women (19.6%), Focal exophytic mass among 14 women (13.7%). Also, Doppler findings among the studied women as bridging vessels was detected among 19 women (18.6%), Utero-vesical hypervascularity among 31 women (30.4%) and Sub-placental hypervascularity 42 women (41.2%) Placental lacunae feeding vessels was detected among 66 women (64.7%) while Suspicion of invasion into parametrium was detected among 7 women (6.9%).

Jauniaux et al., 2018 showed that the thickness and make-up of the placental bed, the number of prior uterine scars, the existence of scar deformities between pregnancies, the depth of

invasion, and the lateral extension of the villous tissue all affect the ultrasound signs of adherent and invasive placentation, which vary with gestational age.⁽⁴⁾

Chong et al., 2018 used color Doppler ultrasound to describe a scoring system in which 0, 1, and 2 were given according to presence or absence of certain ultrasound criteria, such as lacunae, sub-placental vascularity, loss of the 'clear zone' and bladder wall interruption, among other criteria. Suspicion of invasion into parametrium was reported in (11.4%), Bridging vessels was detected in (23.6%) from the studied PAS women.⁽¹²⁾

In our study, the management options of placenta accreta were among the studied women, 15 (14.7%) were managed by Hysterectomy. While the remaining 87 women were managed by Conservative surgical options as illustrated in table 4.

In a previous study by El Gelany et al., 2019 There were 38 (37.3%) examined women who had cesarean hysterectomy among the 102 cases with PAS problems, and 48 (47.0%) analyzed women who underwent CS with cervical inversion and bilateral occlusion of both uterine arteries⁽⁵⁾.

The current results showed that, there was a statistically significant association between GA and hysterectomy, women who underwent hysterectomy were with younger GA as compared with those who managed by Conservative surgical options. There were non-statistically significant differences with other studied variables regarding mode of management.

Sentilhes et al., 2018 reported that, there were 38 (37.3%) examined women who had cesarean hysterectomy among the 102 cases with PAS problems, and 48 (47.0%) analyzed women who underwent CS with cervical inversion and bilateral occlusion of both uterine arteries.⁽⁷⁾ Morlando and Collins, 2020 reported that, Placental villi are seen in the muscle fibers of hysterectomy specimens or in the lumen of the deep uterine vasculature (radial or arcuate arteries) in the increta region, with a noticeably lower GA in women who had hysterectomy.⁽¹³⁾

Kutuk et al., 2018 noted that, 27 (34%) patients had caesarean hysterectomy without placental removal, 15 (19%) patients had the placenta left in place, and 37 (47%), patients underwent placental removal with conservative surgery. Two women initially desired extreme surgery, but due to extensive bladder and pelvic side-wall invasion, hysterectomy was deemed to be too dangerous, and the placenta was left in place. Three ladies were initially going to have drastic surgery or have the placenta left in place, but because of intraoperative results that showed partial invasion, they ended up having placental removal and conservative surgery⁽¹⁴⁾.

Conclusion

PAS is a condition that might endanger life. The incidence of PAS is projected to rise more over time given the rising frequency of cesarean sections globally. As a result, practitioners need to be aware of the difficulty in making the diagnosis and the difficulties in treating this disorder. Our strength is large sample size and different management techniques. The study limitations were absence of long-term flow up data and limiting data to one tertiary hospital

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