Original Article

# Association of Placenta Acreta Septrum with Previous C-Section and its Feto-Maternal Outcome

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## Abstract

Objective: To evaluate the Association of Placenta Acreta Septrum with previous C-section and its feto-maternal outcome.

Methodology: This Retrospective Cohort study was conducted in the department of Obstetrics and Gynecology, Sheikh Zayed women CMC Hospital Larkana from January 2017 to December 2021. The patients were clinically diagnosed as having Placenta Acreta Septrum and were confirmed from ultrasound findings. The PAS patients were managed by following usual standard protocols. Information related to patients demographics, maternal history of obstetrics and gynaecology, comorbidities and prenatal findings, time of diagnosis, indication and time of delivery, plan of management and surgical procedures performed were all extracted from the patients' medical records. Neonatal outcomes were also documented, including birth weight, APGAR score, admission to critical care, and length of hospital stay.

Results: The mean age was observed 29.36 ± 4.6 years, median gravidity of 3 and median parity of the patients was 2. The history of previous C-section was positive in 27 (45.76%) patients with majority 16 (27.12%) having one caesarian section, followed by 7 (11.86%) women having two previous C-sections. Placenta previa was noted in 21 (35.59%) patients and history of curettage was noted in 34 (57.63%) patients. Anemia was observed in 93.22% women having PAS. A large bulk 44.07% of women had to undergo hysterectomy. Some 18.64% women required admission to ICU. The mean birth weight was noted to be 2.8±0.40 kg, mean APGAR score at one minute 7.3±1.6 and 5 minutes was noted to be 8.6±1.1. A large bulk 45.76% of the newborns required admission to the NICU with median length of stay of 7 days.

Conclusions: The main risk factors for PAS were identified as higher age (>32 years) of mother, previous history of caesarian sections and this risk increases with increasing number of C-sections, multiparity and history of placenta previa and curettage.

Key words: Placenta Acreta Septrum, Previous C-section, Feto-maternal outcome

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## Introduction

Abnormal trophoblast invasion of placenta involving partially or as a whole into the myometrium of the uterine wall is termed as placenta accrete. Placenta accrete spectrum (PAS) is a condition which was known as morbidly adherent placenta previously. It includes a range of pathologic adherence of placenta like placenta increta, placenta percreta and placenta accrete. It results in severe maternal morbidity, even mortality in some cases. The main cause of this severe outcome is usually due to severe and sometime life-threatening hemorrhage requiring blood transfusion. The placenta accrete spectrum increases the maternal mortality rate along with other poor prognostic factors like increased chances of hysterectomy at the time of delivery or in the postpartum period and longer hospital stays.[1]

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Placenta accrete spectrum (PAS) diseases, which are classified as abnormally adherent and invasive placentas, can complicate childbirth by causing unexpected excessive haemorrhage. Few obstetricians have establish a routine in the treatment of PAS. It has a very low incidence, with only 0.17 percent of pregnant cases developing PAS.[2] Due to the lack of a detachment layer to the myometrium, attempting to remove the placenta can result in the tearing of major arteries. A decidua defect is thought to produce an invasive niche, especially in uterine scarring.[3] For decades, the prevalence of PAS has been rising. The frequency of previous caesarean sections is linked to the likelihood of PAS disorders.[4]

PAS is becoming more common around the world. This is most likely due to rising caesarean delivery rates, which are the leading cause of PAS in subsequent pregnancies. PAS is one of the most serious pregnancy disorders, as it is linked to increased maternal morbidity and mortality.[5] When a diagnosis is made before birth and the woman is treated by a multidisciplinary team with experience in the condition, maternal and newborn outcomes are often better. PAS is a diverse disorder with a high maternal morbidity and mortality rate that presents unique diagnostic and therapeutic problems.[6]

The rarity of this syndrome, as well as the lack of high-quality evidence and a systematic approach to reporting PAS cases for ultrasonography, clinical, and pathologic diagnosis, have been the key obstacles to gaining a thorough understanding of it.[7]

The major underlying cause of PAS is thought to be defective decidualization in a scarred area, most likely due to past uterine surgery. The prevalence of PAS varies from 0.01 to 1.1 percent[8], and it has risen steadily as the rate of caesarean sections has grown, as has the rate of placenta previa. Placenta previa following previous caesarean sections has been the most significant risk factor for PAS, with rates of PAS of 11%, 40%, and 61%, respectively, in cases of placenta previa following one, two, or three previous caesarean sections.[9] Other major contributing risk factors include higher maternal age of > 35 years, other uterine surgeries other than C-sections, high parity, history of infertility and procedures related to infertility. Placenta acreta septrum is a very serious condition if not detected prior to birth, and it can be life-threating.[10] It could cause a major haemorrhage, necessitating an emergency hysterectomy to save the mother's life.[11]

This study aimed to estimate the incidence of placenta accreta spectrum and to analyze its associated factors, management, and perinatal complications among the patients with placenta accrete.

## Methodology

In this retrospective study, all the patients diagnosed with placenta accreta spectrum on a clinical basis from January 2017 to December 2021 were selected. The data was retrospectively collected from the records of patients in department of Obstetrics and Gynecology Sheikh Zayed women CMC Hospital Larkana. The patients' clinical diagnosis of placenta acreta septrum was confirmed by ultrasound findings. Retained placentas, defined as a placenta retained in the uterus after spontaneous separation due to cervical constriction, were excluded. Histological confirmation was not made a mandatory requirement for inclusion. The sample size was calculated with the WHO sample size calculator with a 95% confidence level, anticipated population proportion (rate of PAS among patients of one caesarian section) of 11%, absolute precision of 8% and sample size turned out to be 59 patients.

The PAS patients were managed by following the usual porotocols. The management method was recorded as (1) vaginal delivery along with curettage (2) caesarean section with placental removal with or without curettage (3) caesarian section without removing placenta with or without delayed curettage or hysterectomy (4) caesarian section with planned hysterectomy and (5) caesarian section with immediate hysterectomy for placental removal.

Information related to patients' demographics, maternal history of obstetrics and gynaecology, comorbidities and pernatal findings, time of diagnosis, indication and time of delivery, plan of management, and surgical procedures performed were all extracted from the patients' medical records. Neonatal outcomes were also documented, including birth weight, APGAR score, admission to critical care, and length of hospital stay.

All the collected data was entered and analyzed with SPSS version 25. Descriptive statistics were used to calculate the mean with standard deviation for quantitative variables and frequencies with percentages for qualitative variables. Results were presented in tabular form.

## Results

In this study, a total of 59 patients were identified to have Placenta Acreta Septrum (PAS). The mean age of these patients was 29.36 ± 4.6 years, having median gravidity of 3 with Q1 of 1, and Q3 of 5. The median parity of the patients was 2. The history of previous c-section was positive in 27 (45.76%) patients with majority 16 (27.12%) having one caesarian section, followed by 7 (11.86%) women having two previous c-sections. Placenta previa was noted in 21 (35.59%) patients and history of curettage was noted in 34 (57.63%) patients presented with PAS. Most of the patients had history of one curettage, followed by 11 (18.64%) patients who had history of two curettage. Placental insufficiency was observed in 8 (13.56%) patients as elaborated in table I.

**Table I: Distribution of Demographic Characteristics**

| Characteristics | Distribution |
|---|---|
| Maternal age | |
| Mean ± SD | 29.36 ± 4.6 |
| Gravidity of the patients | |
| median (Q1, Q3) | 3 (1, 5) |
| Parity of the patients | |
| median (Q1, Q3) | 2 (0, 3) |
| History of previous Cesarean Section | |
| Yes | 27 (45.76%) |
| No | 32 (54.24%) |
| Number of caesarian sections | |
| 1 | 16 (27.12%) |
| 2 | 7 (11.86%) |
| 3 | 1 (1.70%) |
| > 3 | 3 (5.08%) |
| Placenta Previa | |
| yes | 21 (35.59%) |
| no | 38 (64.40%) |
| History of Curettage | |
| yes | 34 (57.63%) |
| no | 25 (42.38%) |
| Number of Curettage | |
| 1 | 17 (28.81%) |
| 2 | 11 (18.64%) |
| 3 | 6 (10.17%) |
| Placental Insufficiency | |
| Yes | 8 (13.56%) |
| No | 51 (86.44%) |

The distribution of maternal outcome showed that median estimated blood loss was noted to be 1750 ml with Q1 of 1250ml and Q3 of 2800 ml. The record showed that 55 (93.22%) women having PAS, presented with anemia. Grade 1 (Hb > 6.2) anemia was seen in 18 (30.51%) women, grade 2 (Hb 4.9-6.2) in 29 (49.15%) majority of the women and 12 (20.34%) women presented with grade 3 (Hb < 4.9) anemia. Urinary tract infection was observed in 7 (11.186%) women. A large bulk 26 (44.07%) of women had to undergo hysterectomy. Some 11 (18.64%) women required admission to intensive care unit. The median hospital stay of the women was 6 days with Q1 of 5 and Q3 of 9 days as shown in table II.

**Table II: Distribution of Maternal Outcome**

| Outcomes | Distribution |
|---|---|
| Estimated blood loss (ml) | |
| Median (Q1, Q3) | 1750 (1250, 2800) |
| Anemia | |
| Yes | 55 (93.22%) |
| No | 4 (6.78%) |
| Grade of Anemia | |
| Grade 1 (Hb > 6.2) | 18 (30.51%) |
| Grade 2 (Hb 4.9-6.2) | 29 (49.15%) |
| Grade 3 (Hb < 4.9 | 12 (20.34%) |
| Urinary Tract Infection | |
| Yes | 7 (11.86%) |
| No | 52 (88.14%) |
| Hysterectomy | |
| Yes | 26 (44.07%) |
| No | 33 (55.93%) |
| Admission to ICU | |
| Yes | 11 (18.64%) |
| No | 48 (81.35%) |
| Hospital Stay (days) | |
| Median (Q1, Q3) | 6 (5, 9) |

The distribution of fetal outcome elaborates that mean birth weight of the babies born to women with PAS was noted to be 2.8±0.40 kg. The man APGAR score at one minute was 7.3±1.6 and at 5 minutes the mean APGAR score was noted 8.6±1.1. The median value of umbilical cord artery pH was noted to be 7.21 with Q1 of 7.08 and Q3 of 7.42. A large bulk 27 (45.76%) of the neoborns to the mothers having PAS required admission to the neonatal intensive care unit with median length of stay in NICU of 7 days having Q1 of 0 and Q3 of 10 days as elaborated in table III.

**Table III: Distribution of Fetal Outcome**

| Outcome | Distribution |
|---|---|
| Birth weight of the baby (kg) | |
| Mean ± SD | 2.8 ± 0.40 |
| APGAR Score at 1 minute | |
| Mean ± SD | 7.3 ± 1.6 |
| APGAR Score at 5 minutes | |
| Mean ± SD | 8.6 ± 1.1 |
| Umbilical Cord Artery pH | |
| Median (Q1, Q3) | 7.21 (7.08, 7.42) |
| NICU Admission | |
| Yes | 27 (45.76%) |
| No | 32 (54.24%) |
| Length of NICU stay | |
| Median (Q1, Q3) | 7 (0, 10) |

## Discussion

The placenta accreta spectrum is a complicated obstetric condition with a high rate of maternal morbidity. It's a relatively recent placental condition that results from damage to the uterine wall's endometrium-myometrial interface. It was initially described 80 years ago, and it mostly happened after manual placenta removal, uterine curettage, or endometritis. The entire or partial absence of the decidua on histology is a sign of superficial injury, which results in an unusually adherent placenta. The most common cause of placenta accreta today is uterine surgery, namely uterine scarring after caesarean delivery. Because there is no endometrial re-epitheliization of the scar area, trophoblast and villous tissue can attack deeply within the myometrium. This can include its circulation and can reach surrounding pelvic organs.[12,13]

Placenta accreta is a serious obstetric condition in which the placenta adheres to the myometrium entirely or partially. The global incidence of placenta accreta spectrum (PAS) is rising every day, owing primarily to rising caesarean section rates. To optimise the feto-maternal outcome, precise and quick detection of placenta accreta is critical. Despite the fact that conventional ultrasonography is a valid and important technique for diagnosing placenta accreta, the absence of ultrasound evidence does not rule out the diagnosis. As a result, a clinical assessment of risk variables is equally important for predicting aberrant placental invasion.[14]

In this present study, the mean age was observed 29.36 ± 4.6 years, median gravidity of 3 and median parity of the patients was 2. The history of previous C-section was positive in 27 (45.76%) patients with majority 16 (27.12%) having one caesarian section, followed by 7 (11.86%) women having two previous C-sections. Placenta previa was noted in 21 (35.59%) patients and history of curettage was noted in 34 (57.63%) patients, in which most of the patients had history of one curettage, followed by 11 (18.64%) patients who had a history of two curettage. Placental insufficiency was observed in 8 (13.56%) patients. These results are in agreement with previous studies showing placenta previa and previous C-section as a major risk factor for PAS.[15] This risk further increases drastically with increasing number of C-sections. A large multicenter study conducted in the United States discovered that the risk of PAS is 3%, 11%, 40%, 61%, and 67% with the first, second, third, fourth, and fifth caesarean sections, respectively[16], half of the patients presented with PAS have plancenta previa.[17]

PAS is linked to a high rate of maternal morbidity and mortality. Because of the rising trend of caesarean sections and assisted reproductive procedures, the number of PAS cases has been rising in recent years and is expected to continue to rise in the coming years. Prenatal imaging and clinical examination of risk factors for placenta accreta may aid in diagnosis. The key to enhancing mother and foetal outcomes and lowering morbidity and mortality is antenatal diagnosis. Obstetric hysterectomy is the most common traditional treatment for placenta accreta, and it should be performed by the best and most experienced surgeons in a centre with a multidisciplinary team, resources, and adequate blood products. Only in carefully chosen cases can cautious therapy of placenta accreta be considered.[18]

According to this study, 93.22% of women having PAS, presented with anemia, with the majority of the women presened with grade 2 (Hb 4.9-6.2) in 49.15% women. A large bulk 44.07% of women had to undergo hysterectomy. Some 18.64% women required admission to intensive care unit and the median hospital stay of the women was 6 days. These maternal outcomes are consistent with other studies, such as a multicenter cohort study by Ornaghi S, which discovered that the median blood loss was 1500 ml, 49.7% of women underwent hysterectomy, and 24% required ICU admission.[11,19]

The distribution of fetal outcome elaborates that mean birth weight of the babies born to women with PAS was noted to be 2.8±0.40 kg. The mean APGAR score at one minute was 7.3±1.6 and at 5 minutes the mean APGAR score was noted 8.6±1.1. The median value of umbilical cord artery pH was noted to be 7.21. A large bulk 45.76% of the neoborns to the mothers having PAS required admission to the neonatal intensive care unit, with a median length of stay in NICU of 7 days.

The placenta accreta spectrum is getting more common, and it's linked to a lot of morbidity and mortality. The diagnosis can aided by knowledge of risk factors and prenatal imaging skills. A multidisciplinary team should be included in preparing for delivery and postpartum care, as well as early antepartum consultations guided by maternal care levels.[20] In patients who have not completed their family and have a desire of future fertility, it is tried to the utmost to avoid hysterectomy. In such patients desiring future fertility and patients with focal placenta accreta the use

of the cervix as tamponade along with bilateral uterine artery ligation appears to ba safe alternate. But in patients with diffuse placenta accrete and having a desire for further fertility could be managed by leaving the placenta aiming at conservative management after proper counselling.[21]

## Conclusion

The independent factors found to be highly associated with C-section delivery, including higher maternal age (> 35 years), comorbid disease, preterm delivery (< 37 weeks), no history of vaginal delivery, history of previous C-section, obstetrical complications, birth weight of (< 2500 g) and (⩾ 3500 g), and requirement of NICU admission. Pregnant women were expected to utilise these measures to determine their risk of a C-section on their own. Mothers, families, and healthcare providers would be encouraged to schedule early consultations with obstetricians and make better preparations for mothers to deliver at hospitals if the chance of C-section was high.

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