Section: Obstetrics & Gynaecology

Case Series

PLACENTA ACCRETA SPECTRUM - THE HIDDEN COST OF RISING CAESAREAN SECTION RATES - A RETROSPECTIVE CASE SERIES

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ABSTRACT

Background: Placenta accreta spectrum (PAS) is a life-threatening obstetric condition characterized by abnormal placental invasion, with incidence rising in parallel with increasing caesarean section rates. It is associated with severe maternal morbidity, including massive haemorrhage, need for hysterectomy, and risk of maternal death.
Materials and Methods: This retrospective observational study was conducted at a tertiary care government hospital and included 40 cases of PAS diagnosed either radiologically or intraoperatively. Data were collected from hospital records and analysed for demographic profile, risk factors, surgical interventions, and maternal and neonatal outcomes.
Results: The mean maternal age was 25 years. A majority of patients were unbooked (87.5%), with many presenting as emergencies. All cases (100%) had a history of previous caesarean section, with 60% having two prior caesarean deliveries. Placenta increta was the most common subtype (62.5%). Caesarean hysterectomy was performed in 80% of cases. The incidence of bladder injury was 50%, and massive blood transfusion was required in 37%. Mean blood loss ranged between 1.5–2 litres. Postoperatively, 87.5% required ICU admission, with complications including sepsis (10%) and vesicovaginal fistula (5%). The maternal mortality rate was 15%, and maternal near-miss was observed in 45% of cases.
Neonatal outcomes showed a high preterm birth rate (57.5%), with 2 neonatal deaths.
Conclusion: PAS represents a significant and growing burden on maternal health, particularly in resource-limited settings. The strong association with previous caesarean sections highlights the urgent need to reduce unnecessary primary caesarean deliveries. Early diagnosis, timely referral, and management in well-equipped tertiary centres with multidisciplinary teams are essential to improve outcomes.
Keywords: PAS, Rising Caesarean Section, OBG.

INTRODUCTION

The placenta, a vital organ that sustains fetal growth and development, can paradoxically become a life-threatening entity for the mother in cases of placenta accreta spectrum (PAS). PAS encompasses a range of abnormal placental attachments characterized by defective decidualization and excessive trophoblastic invasion into the myometrium, often extending beyond it in severe cases.[1]
The underlying pathophysiology is closely linked to uterine scarring, most commonly following prior caesarean sections. Disruption of the endometrial–myometrial interface leads to failure of normal decidual formation, allowing abnormally deep anchoring villi and uncontrolled trophoblastic invasion. This aberrant placentation forms the basis

of PAS disorders, including placenta accreta, increta, and percreta.
Placenta accreta spectrum has emerged as a serious obstetric emergency, associated with significant maternal morbidity and mortality. It frequently results in massive obstetric haemorrhage, often necessitating large-volume blood transfusions, peripartum hysterectomy, and intensive care unit admission. In severe cases, invasion into adjacent organs such as the bladder may lead to visceral injuries, further complicating surgical management.
Over the past few decades, the incidence of PAS has risen dramatically, paralleling the global increase in caesarean section rates. Prior caesarean delivery is now recognized as the most significant risk factor, with the risk increasing proportionally with the number of previous caesarean births, particularly in the presence of placenta previa.[2,3]
Despite the growing burden, data from high-volume government hospitals in India remain limited. Most available literature represents outcomes from planned, well-resourced settings, often underreporting emergency referrals, delayed presentations, and maternal deaths. In contrast, tertiary care public institutions frequently encounter unbooked cases, late referrals, and resource constraints, reflecting real-world challenges in managing PAS.[4]
In our centre, an increasing number of PAS cases have been observed, many requiring complex and multidisciplinary surgical interventions. This highlights not only the clinical severity of the condition but also the preventable nature of the burden, largely attributable to rising caesarean section rates. Given the increasing incidence and associated complications, there is a pressing need to evaluate maternal outcomes in PAS within real-world clinical settings. This study aims to bridge the gap in existing literature by providing data from a high-volume government hospital, where emergency presentations and resource limitations are common.

MATERIALS AND METHODS

Study Design and Setting: This was a retrospective observational study conducted at a high-volume tertiary care government hospital. The study analysed cases of placenta accreta spectrum (PAS) managed at our centre over the study period.
Study Population: A total of 40 patients diagnosed with PAS were included in the study.
Inclusion Criteria
All cases of placenta accreta spectrum diagnosed either:
Radiologically (antenatal ultrasound and/or MRI), or
Intra-operatively during delivery/surgery
Exclusion Criteria
Cases with incomplete medical records
Suspected PAS without confirmation intra-operatively or radiologically
Data Collection
Data were collected retrospectively from:
- Hospital case records
- Labour room and operation theatre registers

The following parameters were recorded:
- Demographic details
- Obstetric history (including prior caesarean sections)
- Risk factors
- Type of PAS (accreta, increta, percreta)
- Intraoperative findings
- Surgical interventions performed
- Estimated blood loss
- Requirement of blood and blood products
- Intraoperative and postoperative complications (e.g., bladder injury)
- Maternal outcomes
- Neonatal outcomes

Outcome Measures
Primary Outcome
- Maternal outcomes in cases of PAS (including morbidity and mortality)

Secondary Outcomes
- Risk factor profile
- Type and extent of surgical interventions
- Intraoperative complications (e.g., haemorrhage, bladder injury)
- Requirement for massive blood transfusion
- Neonatal outcomes

Definitions Used
- **Massive blood transfusion**: Requirement of ≥4 units of packed red blood cells within 24 hours or as per institutional protocol
- **Estimated blood loss**: Calculated intraoperatively (mean blood loss observed: **1.5–2 litres**)

Statistical Analysis
Data were entered and analysed using descriptive statistics.
- Categorical variables were expressed as frequencies and percentages
- Continuous variables were expressed as mean and range

Ethical Considerations
- Institutional ethical clearance was obtained prior to the study
- Patient confidentiality was maintained
- As this was a retrospective study, informed consent was waived.

RESULTS

A total of 40 cases of placenta accreta spectrum (PAS) were analysed.

Table 1: Demographic Characteristics and Clinical Presentation of Patients with Placenta Accreta Spectrum

Parameter	Value
Total cases	40
Mean age	25 years
Booked cases	5 (12.5%)
Unbooked cases	35 (87.5%)
Emergency presentations	18
Bleeding per vaginum	25 (62.5%)

The mean maternal age was 25 years. The majority of cases were unbooked (35/40, 87.5%), with 17 presenting as emergencies. Only 5 cases were booked, of which 1 was an emergency. Bleeding per vaginum was the most common presenting complaint, observed in 25 patients (62.5%).

Table 2: Distribution of Placenta Accreta Spectrum Subtypes

Type of PAS	Number (n)	Percentage (%)
Placenta accreta	10	25%
Placenta increta	25	62.5%
Placenta percreta	5	12.5%

Placenta increta was the most common type (25 cases, 62.5%), followed by placenta accreta (10 cases, 25%) and placenta percreta (5 cases, 12.5%).

Table 3: Risk Factor Profile with Respect to Previous Caesarean Sections

Risk Factor	Number (n)	Percentage (%)
Previous LSCS (any)	40	100%
1 previous LSCS	14	35%
2 previous LSCS	24	60%
3 previous LSCS	2	5%

All patients (100%) had a history of previous caesarean section. Among them, 24 patients had two prior caesarean sections, 14 had one previous caesarean, and 2 had three prior caesarean sections.

Table 4: Gestational Age at Delivery in Placenta Accreta Spectrum Cases.

Gestational Age	Number (n)	Percentage (%)
<30 weeks	6	15%
31–36 weeks	22	55%
>37 weeks	12	30%

Most deliveries occurred between 31–36 weeks (22 cases, 55%), followed by >37 weeks (12 cases, 30%) and <30 weeks (6 cases, 15%).

Table 5: Surgical Interventions and Intraoperative Complications in PAS.

Intervention	Number (n)	Percentage (%)
Caesarean hysterectomy	32	80%
Uterine artery ligation	28	70%
Bladder injury	20	50%
Balloon tamponade	12	30%
Adhesiolysis	10	25%
Compression sutures	10	25%
Massive transfusion	15	37%

Caesarean hysterectomy was performed in 32 patients (80%). Uterine artery ligation was done in 28 patients (70%). Bladder injury occurred in 20 cases (50%). Balloon tamponade was used in 12 cases (30%), while adhesiolysis and compression sutures were performed in 10 cases each (25%). Massive blood transfusion was required in 15 patients (37%).

Table 6: Intraoperative Blood Loss and Transfusion Requirements.

Parameter	Value
Mean blood loss	1.5–2 litres
Massive transfusion	15 (37%)

The mean estimated blood loss ranged between 1.5–2 litres.

Table 7: Postoperative Outcomes and Complications.

Outcome	Number (n)	Percentage (%)
ICU admission	35	87.5%
Mean hospital stay	7 days	—
Prolonged stay (>10 days)	15	37.5%
Sepsis	4	10%

Vesicovaginal fistula	2	5%
Transfusion reactions	2	5%

ICU admission was required in 35 patients. The mean duration of hospital stay was 7 days, with prolonged stay (>10 days) in 15 cases (37.5%). Postoperative complications included sepsis in 4 cases, vesicovaginal fistula in 2 cases, and transfusion reactions in 2 cases.

Table 8: Maternal Outcomes in Placenta Accreta Spectrum.

Outcome	Number (n)	Percentage (%)
Maternal death	6	15%
Maternal near miss	18	45%
Recovered	16	40%

Maternal mortality was observed in 6 patients (15%). Maternal near-miss occurred in 18 patients (45%), while 16 patients (40%) recovered without major complications.

Table 9: Neonatal Outcomes in PAS Cases.

Outcome	Number (n)
Neonatal deaths	2
Abortions	3
Preterm	23
Term	12

There were 2 neonatal deaths and 3 abortions. Preterm deliveries accounted for 23 cases, while 12 were term deliveries.

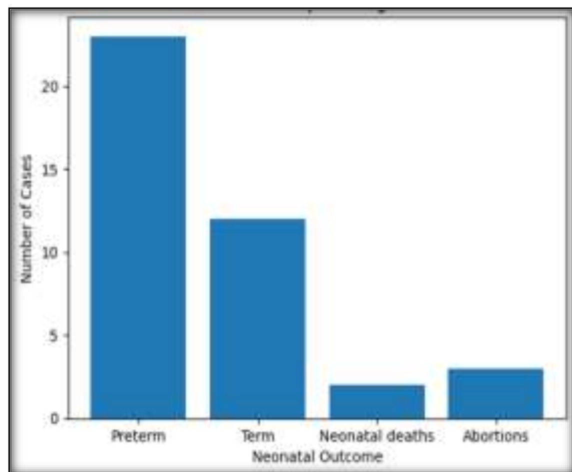
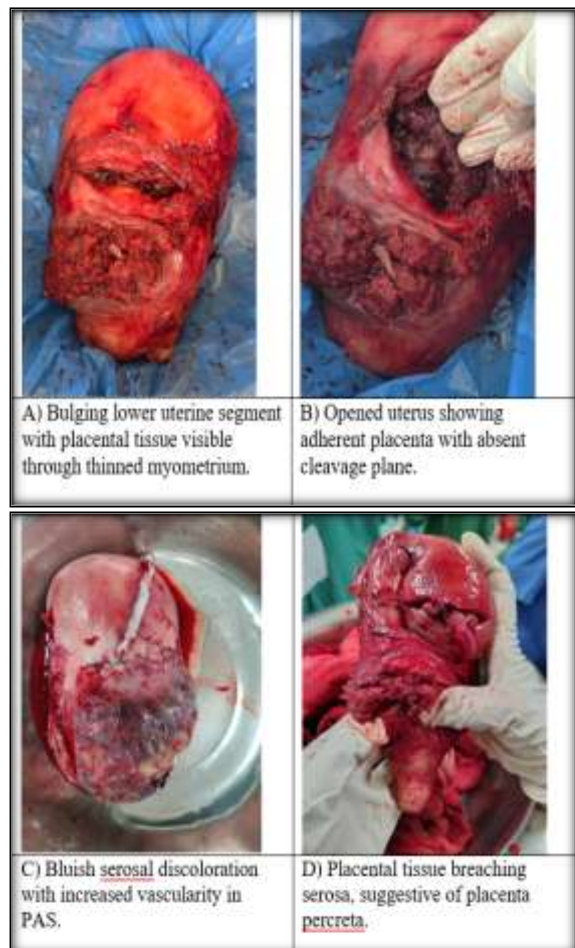
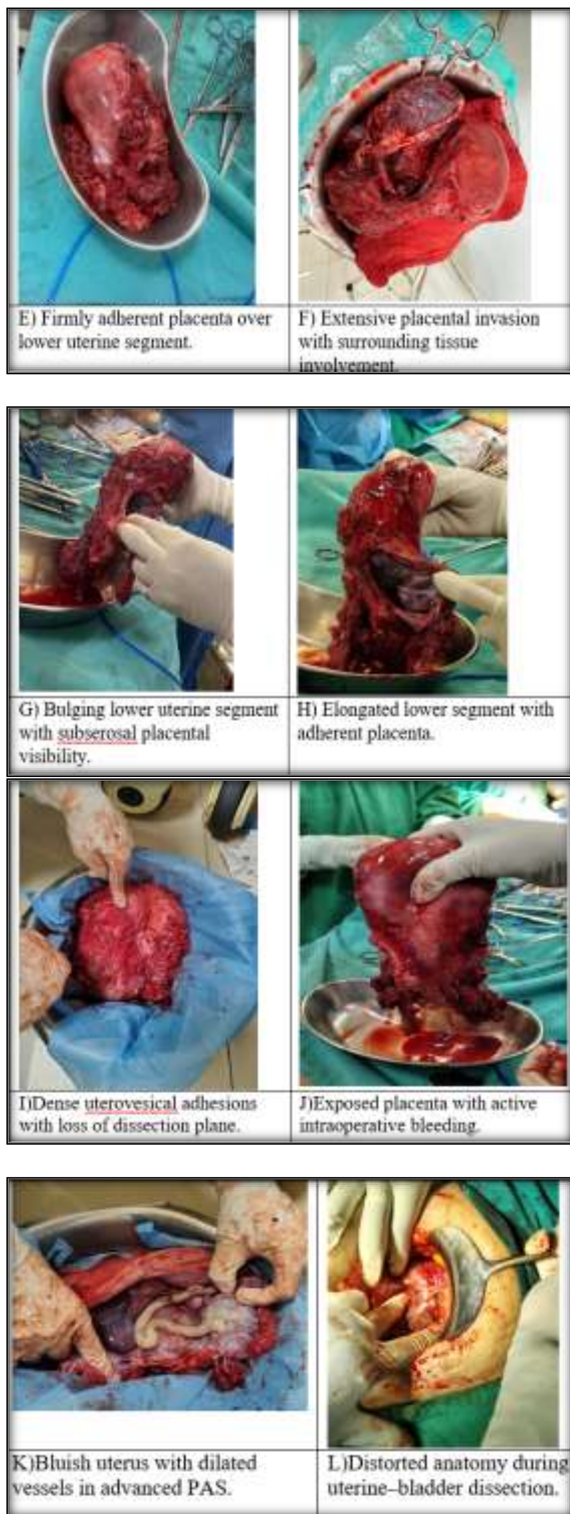


Figure 1: Neonatal outcomes emphasizing preterm burden.

Bar chart depicting neonatal outcomes among PAS cases. Preterm births constituted the majority (23 cases), significantly higher than term deliveries (12 cases), highlighting the substantial preterm burden associated with placenta accreta spectrum.


A) Bulging lower uterine segment with placental tissue visible through thinned myometrium.
B) Opened uterus showing adherent placenta with absent cleavage plane.
C) Bluish serosal discoloration with increased vascularity in PAS.
D) Placental tissue breaching serosa, suggestive of placenta percreta.



E) Firmly adherent placenta over lower uterine segment.
F) Extensive placental invasion with surrounding tissue involvement.
G) Bulging lower uterine segment with subserosal placental visibility.
H) Elongated lower segment with adherent placenta.
I)Dense uterovesical adhesions with loss of dissection plane.
J)Exposed placenta with active intraoperative bleeding.
K)Bluish uterus with dilated vessels in advanced PAS.
L)Distorted anatomy during uterine–bladder dissection.

Figure 2: images in the study

DISCUSSION

Placenta accreta spectrum (PAS) represents one of the most challenging obstetric conditions, with rising incidence paralleling increasing caesarean section rates. The present study highlights the significant maternal morbidity and mortality associated with PAS in a high-volume government tertiary care setting, reflecting real-world clinical challenges.

In our study, the mean maternal age was 25 years, which is relatively younger compared to other series. Studies by Parween et al,[5] and Kumari et al,[6] reported slightly higher mean ages, suggesting that PAS is increasingly affecting younger women in developing countries, likely due to early and repeated caesarean deliveries.

A striking finding was that 87.5% of cases were unbooked, with a substantial proportion presenting as emergencies. This contrasts with many published studies, where cases are often antenatally diagnosed and electively managed. Jahnavi et al,[7] and Aryananda et al. (2023) also emphasized that late referrals and lack of antenatal care significantly worsen outcomes, a pattern clearly reflected in our cohort.

In terms of PAS distribution, placenta increta (62.5%) was the most common subtype, followed by accreta (25%) and percreta (12.5%). This distribution is comparable to other Indian studies, although some series, such as Sonawane et al,[8] reported higher percreta rates due to selective inclusion. The predominance of increta in our study suggests progression of disease severity due to delayed diagnosis.

All patients in our study had a history of previous caesarean section (100%), reinforcing its role as the most significant risk factor. Notably, 60% had two prior caesarean sections, demonstrating a clear dose–response relationship. This finding is consistent with global evidence and studies such as Eweis et al,[9] which highlight the exponential rise in PAS risk with increasing number of caesarean deliveries.

The rate of caesarean hysterectomy (80%) in our study was higher than most reported series (60–75%). While Parween et al,[5] reported a comparable rate (75%), studies like Jahnavi et al,[7] (61%) and Eweis et al,[9] (60%) showed lower rates. This likely reflects the advanced disease stage at presentation and limited scope for conservative management in our setting. Caesarean hysterectomy remains a life-saving procedure, especially in uncontrolled haemorrhage.

Table 10: Comparison of the Present Study with Published Case Series on Placenta Accreta Spectrum

Study (Year)	Setting	Study Duration	Sample Size (n)	% Percreta	Caesarean Hysterectomy (%)	Bladder Injury (%)	Maternal Mortality (%)
Present study (2025)	Govt tertiary care centre, India	1 year	40	12.5%	80%	50%	15%
Parween et al.[5]	Tertiary care centre, India	2 years	12	16–20%	75%	33%	8%
Jahnavi et al.[7]	Rural tertiary centre, India	3 years	18	11%	61%	22%	5%
Kumari et al.[6]	Teaching hospital, India	2 years	24	20%	70%	29%	4%

Sonawane et al.[8]	Tertiary care centre, India	1.5 years	15	100%*	100%	40%	6%
Aryananda et al.[10]	Resource-poor settings (multicentre)	5 years	27	19%	67%	26%	7%
Eweis et al.[10]	Tertiary centre, Europe	6 years	50	14%	60%	18%	<2%

One of the most notable findings was the high incidence of bladder injury (50%), significantly higher than other studies (18–40%). This can be attributed to dense adhesions, distorted anatomy, and increased prevalence of invasive forms of PAS, particularly in unbooked and emergency cases.

The mean blood loss (1.5–2 litres) and massive transfusion requirement (37%) further emphasize the haemorrhagic severity of PAS. Comparable studies have reported similar trends, underscoring the need for adequate blood bank support and multidisciplinary preparedness. Postoperative morbidity in our study was considerable. ICU admission was required in 87.5% of cases, reflecting the severity of clinical presentation. Complications such as sepsis (10%), vesicovaginal fistula (5%), and transfusion reactions were observed, highlighting the burden on healthcare resources. The maternal mortality rate of 15% in our study is notably higher than most published series, which report rates ranging from 4% to 8%, and <2% in developed settings (Eweis et al.).[9] This disparity likely reflects delayed referrals, poor antenatal detection, haemodynamic instability at presentation, and resource limitations. Similarly, the maternal near-miss rate (45%) indicates a substantial burden of severe maternal morbidity. Neonatal outcomes were also affected, with 57.5% preterm births, consistent with the need for early delivery in PAS due to maternal indications. Neonatal deaths and abortions further highlight the indirect fetal impact of this condition.

Overall, when compared to other published case series, our study demonstrates Higher surgical morbidity (bladder injury, hysterectomy rates), Higher ICU admissions and maternal mortality, Greater proportion of unbooked and emergency cases. These findings underscore the critical gaps in antenatal diagnosis, referral systems, and primary prevention strategies.

CONCLUSION

Placenta accreta spectrum is an increasingly encountered obstetric emergency with substantial maternal morbidity and mortality, particularly in settings with high caesarean section rates and limited antenatal care. The present study demonstrates that PAS is strongly associated with prior caesarean delivery, with risk escalating as the number of caesarean sections increases.

The high rates of caesarean hysterectomy, bladder injury, massive transfusion, and ICU admission observed in this study reflect the severity of the condition and the challenges in its management, especially among unbooked and emergency cases. The maternal mortality rate of 15% underscores the critical need for early recognition and optimal management.

Preventive strategies remain paramount. Reducing unnecessary primary caesarean sections is the most effective measure to curb the rising incidence of PAS. Additionally, antenatal identification of high-risk cases, planned delivery in tertiary care centres, and a multidisciplinary approach involving obstetricians, anaesthetists, urologists, and intensivists are essential to improve maternal and neonatal outcomes.

Strengthening referral systems and improving access to quality antenatal care will be crucial in addressing the real-world burden of PAS in developing healthcare settings.

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