

PLACENTA ACRETA SPECTRUM DISORDER AT PREVIOUS SCAR REQUIRING EMERGENCY OBSTETRIC HYSTERECTOMY

CASE REPORT

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Abstract

Background: Placenta accreta spectrum (PAS) disorder is a life-threatening obstetric condition often necessitating emergency hysterectomy in severe cases, represent a life-threatening obstetric complication with increasing incidence globally.

Case Presentation

We report a case of a 30-year-old gravida 2, para 1 woman at 37+3 weeks gestation with previous cesarean section who underwent emergency obstetric hysterectomy due to placenta accreta with severe postpartum hemorrhage. Despite antenatal suspicion of PAS on ultrasound, intraoperative adherence and hemorrhage >2 liters (2040 ml) necessitated a multidisciplinary surgical approach and hysterectomy as life saving measure.

Conclusion: Detection of PAS predisposing factors early in life, the multidisciplinary team approach, and early decision making of the hysterectomy plays an essential role in the survival of women. The case epitomizes the need of preparation in treatment of PAS disorders, and the life-saving effect of emergency obstetric hysterectomy. Hence Early recognition, antenatal imaging, and multidisciplinary coordination are essential to optimize maternal outcomes in PAS.

Keywords: Placenta accreta spectrum, Emergency obstetric hysterectomy, Postpartum hemorrhage, Maternal morbidity

I. Introduction

Placenta accreta spectrum (PAS) disorders, which include placenta accreta, increta, and percreta, are one of such complications in the modern obstetrics practice that are the most difficult [1]. The usage of PAS has grown exponentially in the last several decades, following the same trends with the growing cesarean section rates, where the current estimates stand between 0.2 and 2 percent of all pregnancies [2]. Emergency obstetric hysterectomy (EOH), is the surgical removal of the uterus performed during or shortly after delivery (within the puerperium), typically as a life-saving intervention to control severe obstetric hemorrhage unresponsive to conservative management[3].

Placenta previa that accompanies pre-uterine surgery, especially cesarean section, is the key risk factor of PAS [4]. Placenta previa is a condition where the placenta implants in the lower uterine segment, partially or completely covering the internal os. Normal implantation occurs in fundus or

upper uterine segment. After fertilization, the blastocyst implants in the endometrial lining, which provides vascular support. Abnormal implantation in placenta previa, the lower uterine segment has thinner endometrium and less vascularity. The decidualization is defective, especially over prior cesarean scars or areas of inflammation. This leads to abnormal trophoblastic invasion, favoring low implantation. [5] Additional risk factors comprise advanced maternal, multiparity, prior LSCS, prior history of uterine operations, smoking.

In spite of the developments made in prenatal imaging and methods of surgery, PAS is still reported to be accompanied by massive morbidity and mortality among the women. Obstetric hemorrhage at 47 percent in India and 34 percent across the globe is the main cause of maternal death and PAS is a major causal factor [6]. This case report talks about management of a patient with PAS that needed emergency obstetric hysterectomy, and also talks about the current literature that talks about optimum management strategies.

II. Case Presentation

Patient Demographics and History

30 year old female gravida 2, para 1 and live 1 at 37 weeks and 3 days arrived at Sri Ramachandra Medical Centre (SRMC) for safe confinement. Her LMP was on February 4, 2024, with the estimated delivery of November 10, 2024. At the time, she had a prior history of lower segment cesarean section (LSCS) 3 years ago. Present and past pregnancy, all the three trimester history was uneventful.

Clinical Examination

On admission, the patient was afebrile with stable vital signs (BP: 110/70 mmHg, Pulse: 80/min). General examination revealed no pallor, icterus, cyanosis, pedal edema, or lymphadenopathy. Systemic examination revealed no abnormality. Obstetric examination showed:

- Uterus corresponding to term gestation
- Relaxed uterine tone
- Cephalic presentation (5/5th palpable)
- Clinically normal liquor volume
- Positive fetal heart sounds
- Presence of suprapubic transverse scar
- **Significant finding:** 3×3 cm nodule noted over the right side of the previous scar, suggestive of scar endometriosis

Imaging Findings

Serial growth scans demonstrated concerning placental findings:

30 weeks scan (August 31, 2024):

- Single live intrauterine gestation, cephalic presentation
- Estimated fetal weight: 1363g
- Amniotic fluid index: 12.1 cm
- Placenta: Left lateral wall, posterior and low-lying
- Lower edge completely covering internal os
- Retroplacental space maintained
- No irregular lacunae or placental hypervascularity

35 weeks scan (October 5, 2024):

- Estimated fetal weight: 2221g
- Amniotic fluid index: 11.3 cm
- Persistent placenta previa with complete coverage of internal os
- **Recommendation for MRI to rule out focal adherence**

The imaging findings were consistent with placenta previa with suspicion for PAS, prompting multidisciplinary planning for delivery.

Surgical Course and Intraoperative Events

The patient was scheduled for elective lower segment cesarean section with sterilization and scar endometriosis excision on October 29, 2024, after obtaining anesthesia fitness.

Initial Surgical Findings:

- Well-formed lower uterine segment
- Curvilinear incision made over lower uterine segment
- Membranes ruptured with clear liquor drainage

- **Critical finding:** Placenta was cut through during uterine incision
- Male infant delivered in cephalic presentation, crying at birth
- Baby weight: 2.9 kg, Apgar scores: 8/10 at 1 minute, 9/10 at 5 minutes
- Delivery time: 6:42 AM

Complications and Decision for Hysterectomy:

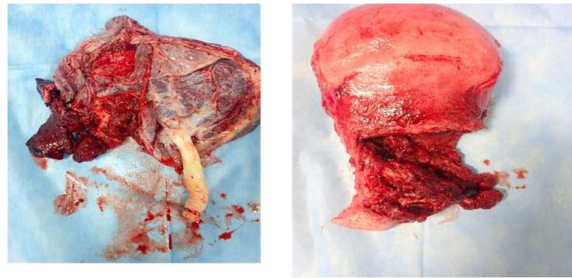
- Excessive bleeding noted from uterine margins and placental bed
- Placenta adherent to lower uterine segment, unable to be delivered intact
- Major portion of placenta manually removed
- Massive hemorrhage noted, secured 2 large IV cannula, immediate blood transfusion initiated, invasive blood pressure monitoring from right radial artery done
- Despite resuscitation with fluids and blood products, persistent hypotension- BP 60/40 mmHg, Pulse 120/min, hemostasis not achieved.
- **Decision for emergency obstetric hysterectomy made at 6:50 AM**

Hysterectomy Procedure

With urological consultation for intraoperative assistance:

1. Sequential clamping of round ligaments, transfixed with 1-Vicryl
2. Tubo-ovarian ligaments secured
3. Successive medial clamps placed at uterine artery, mackenrodts ligaments, uterosacral ligaments until cervix reached
4. Total hysterectomy completed with vault closure using 1-Vicryl
5. Bilateral ureteral integrity confirmed via cystoscopy and bilateral ureterorenoscopy
6. Scar endometriosis excised (4×5 cm from right anterior abdominal wall)
7. Intraperitoneal drain placed

Blood Loss: 2040 mL **Management:** Noradrenaline infusion, 2 units packed red blood cell transfusion

FIG 1. INTRAOPERATIVE FINDINGS**Histopathological Findings**

The surgical specimen confirmed:

- **Placenta accreta** with features consistent with abnormal placental adherence
- **Scar endometriosis** in the excised abdominal wall tissue
- **Placental parenchyma with dystrophic calcification (5%)**

Postoperative Course

Day 0: Stable vitals on noradrenaline support, Hemoglobin: 8.7 g/dL, Noradrenaline tapered and stopped **Day 1:** Oral feeds initiated, adequate urine output with Foley catheter **Day 2:** Foley removed, patient voiding normally, soft diet tolerated **Day 3:** Wound dressing removed, healthy healing noted **Day 5:** Patient symptomatically improved and discharged

III. Literature Review and Discussion**Epidemiology and Risk Factors**

The incidence of PAS has increased substantially, with reports showing a 10-fold increase over the past 50 years [7]. Table 1 summarizes the major risk factors and their associated relative risks.

Table 1: Risk Factors for Placenta Accreta Spectrum

Risk Factor	Relative Risk	95% CI	Reference
Previous cesarean section	2.3-8.1	1.8-11.2	[8]
Placenta previa	9.3	5.4-16.1	[9]
Advanced maternal age (>35)	2.2	1.4-3.5	[10]
Multiparity (≥3)	1.8	1.2-2.7	[11]
Prior uterine surgery	3.4	2.1-5.5	[12]

Diagnostic Imaging

Prenatal diagnosis of PAS relies primarily on ultrasound . Table 2 outlines the diagnostic accuracy of different imaging modalities.

Table 2: Diagnostic Accuracy of Imaging Modalities for PAS

Imaging Modality	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Reference
Ultrasound	77-93	85-98	79-92	89-99	[13]
Color Doppler	82-97	92-96	88-95	91-98	[14]
MRI	75-100	65-85	78-88	84-100	[15]
Combined US + MRI	91-94	85-99	90-95	92-97	[16]

Emergency Obstetric Hysterectomy: Indications and Outcomes

EOH remains the definitive treatment for severe PAS with uncontrolled hemorrhage. Table 3 presents the common indications and their frequencies.

Table 3: Indications for Emergency Obstetric Hysterectomy

Indication	Frequency (%)	Mortality Rate (%)	Reference
Abnormal placentation (PAS)	38-45	2-7	[17]
Uterine atony	29-35	1-3	[18]
Uterine rupture	12-18	5-12	[19]
Cervical/vaginal lacerations	8-12	1-2	[20]
Coagulopathy	<2	8-15	[21]

Maternal Out comes and Complications

Table 4 summarizes the potential complications associated with EOH for PAS.

Complication	Incidence (Management	Reference
Massive transfusion (>10 units)	25-40	Blood bank preparation, Cell saver	[22]
Ureteral injury	2-5	Ureteral stenting, Surgical repair	[23]
Bladder injury	3-8	Primary repair, Catheter drainage	[24]
Wound complications	8-15	Antibiotics, Debridement	[25]
Thromboembolic events	2-4	Anticoagulation, Compression	[26]
Psychological effects	15-30	Counseling, Support groups	[27]

Contemporary Management Strategies

Recent advances in PAS management include the Triple P procedure (Perioperative Placental localization, Pelvic devascularization, and Placental non-separation) as a fertility-preserving alternative [28]. However, EOH remains necessary when conservative measures fail.

The multidisciplinary team approach, including maternal-fetal medicine specialists, anesthesiologists, urologists, and blood bank coordination, has significantly improved outcomes [29]. Pre-operative planning with cell saver technology, interventional radiology backup, and ICU availability are crucial components of modern PAS management [30].

IV. Conclusion

This case demonstrates the critical importance of early recognition and appropriate management of placenta accreta spectrum. Despite antenatal suspicion and multidisciplinary planning, the severity of hemorrhage due to placental adherence necessitated emergency obstetric hysterectomy to achieve hemostasis and ensure maternal survival.

Key learning points include:

1. The significance of recognizing high-risk patients (previous cesarean section with placenta previa).
2. The value of serial imaging for monitoring placental characteristics
3. The importance of immediate decision-making when conservative measures fail
4. Preparedness of multidisciplinary team for emergency obstetric hysterectomy, including blood and blood products
5. The life-saving role of emergency obstetric hysterectomy in severe PAS cases

While PAS continues to pose significant challenges, improved prenatal diagnosis, standardized management protocols, and multidisciplinary team approaches have enhanced maternal outcomes. Future research should focus on developing better predictive models and less invasive management strategies while maintaining the safety net of emergency obstetric hysterectomy for severe cases.

This case helps to support the fact that Emergency obstetric hysterectomy despite the high morbidity rate is a necessary life-savings measure during the management of severe cases of placenta accreta spectrum pathology.

Abbreviations

Abbreviation	Full Form
AFI	Amniotic Fluid Index
AKI	Acute Kidney Injury
BP	Blood Pressure
CI	Confidence Interval
DIC	Disseminated Intravascular Coagulation
EDD	Expected Date of Delivery
EFW	Estimated Fetal Weight
EOH	Emergency Obstetric Hysterectomy
FH	Fetal Heart
FIGO	International Federation of Gynecology and Obstetrics
G	Gravida
HELLP	Hemolysis, Elevated Liver enzymes, Low Platelet count
ICU	Intensive Care Unit
ITP	Idiopathic Thrombocytopenic Purpura
LCB	Living Child Birth
LMP	Last Menstrual Period
LSCS	Lower Segment Cesarean Section
MDT	Multidisciplinary Team
mmHg	Millimeters of Mercury
MRI	Magnetic Resonance Imaging
NPV	Negative Predictive Value
P	Para

PAS	Placenta Accreta Spectrum
POD	Post-Operative Day
PPH	Postpartum Hemorrhage
PPV	Positive Predictive Value
PR	Pulse Rate
SMFM	Society for Maternal-Fetal Medicine
SRMC	Sri Ramachandra Medical Centre
US	Ultrasound
VWD	Von Willebrand Disease
WHO	World Health Organization

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Appendices

Appendix A: Clinical Timeline and Patient Management Protocol

Table A1: Detailed Timeline of Patient Management

Date	Gestational Age	Event/Intervention	Clinical Findings
04/02/2024	-	LMP	Last menstrual period
31/08/2024	30 weeks	First growth scan	SLIUGN, placenta previa, EFW 1363g
05/10/2024	35 weeks	Second growth scan	Persistent placenta previa, EFW 2221g, MRI suggested
29/10/2024	37+3 weeks	Admission for delivery	Vital signs stable, scar nodule noted
29/10/2024 06:42	37+3 weeks	Baby delivery	Male, 2.9kg, Apgar 8/10, 9/10
29/10/2024 06:50	37+3 weeks	Decision for hysterectomy	Hemodynamic instability, adherent placenta

29/10/2024 08:30	37+3 weeks	Hysterectomy completed	Blood loss 2040ml, urologic consultation
30/10/2024	POD 1	ICU management	Stable vitals, Hb 8.7g/dl
03/11/2024	POD 5	Discharge	Symptomatically improved

Appendix B: Surgical Technique and Instruments

Table B1: Surgical Instruments and Materials Used

Category	Instrument/Material	Purpose
Hemostasis	Noradrenaline infusion	Vasopressor support
Suture Material	1-Vicryl	Vessel ligation and vault closure
Monitoring	Cystoscopy equipment	Ureteral integrity assessment
Transfusion	Packed red blood cells (2 units)	Blood loss replacement
Drainage	Intraperitoneal drain	Post-operative monitoring
Anesthesia	General anesthesia	Surgical anesthesia

Surgical Steps Protocol:

1. Initial cesarean section approach
2. Recognition of placental adherence
3. Hemodynamic stabilization
4. Urological consultation
5. Sequential vessel ligation
6. Total hysterectomy completion
7. Ureteral integrity confirmation
8. Scar endometriosis excision

Appendix C: Laboratory Values and Monitoring Parameters

Table C1: Laboratory Values Throughout Hospital Stay

Parameter	Admission	POD 0	POD 1	POD 3	POD 5	Normal Range
Hemoglobin (g/dl)	-	8.7	-	-	-	11.0-15.0
Total Count (cells/mm³)	-	12,234	-	-	-	4,000-11,000
Platelet Count (lakhs)	-	2.14	-	-	-	1.5-4.5
Blood Pressure (mmHg)	110/70	60/40*	Stable	Stable	Stable	90-140/60-90
Pulse Rate (/min)	80	120*	Normal	Normal	Normal	60-100
Urine Output	Adequate	Adequate	Adequate	Normal	Normal	>0.5ml/kg/hr

*During hemorrhagic shock before intervention

Appendix D: Risk Stratification and Scoring Systems

Table D1: PAS Risk Assessment Score (Modified from Literature)

Risk Factor	Points	Present in Case
Previous cesarean section	3	✓ (3 points)
Placenta previa	4	✓ (4 points)
Maternal age >35 years	1	✗ (0 points)
Multiparity (≥3)	1	✗ (0 points)
Previous uterine surgery	2	✗ (0 points)
Total Score	-	7/11 points

Risk Interpretation:

- Low risk: 0-3 points
- Moderate risk: 4-6 points
- **High risk: ≥ 7 points** (This case)

Appendix E: Imaging Characteristics and Diagnostic Criteria**Table E1: Ultrasound Features Assessment**

Feature	30 Weeks	35 Weeks	Significance
Placental lacunae	Not reported	Not reported	Absent
Retroplacental space	Present	Present	Normal
Placental hypervascularity	Absent	Absent	Normal
Lower edge coverage	Complete	Complete	Placenta previa
Myometrial thinning	Not assessed	Not assessed	-

MRI Recommendation: Made at 35 weeks but not performed before delivery

Appendix F: Post-operative Care Protocol**Table F1: Post-operative Management Checklist**

System	Monitoring Parameter	Frequency	Target
Cardiovascular	Blood pressure, pulse	Hourly \times 24h, then q4h	Stable vitals
Respiratory	Oxygen saturation, respiratory rate	Continuous \times 24h	SpO ₂ >95%
Renal	Urine output, creatinine	q4h \times 48h	>0.5ml/kg/hr
Hematologic	Hemoglobin, coagulation	Daily \times 3 days	Stable Hb
Wound	Inspection, dressing change	Daily	No infection

Neurologic	Mental status, pain score	q4h × 48h	Alert, pain <4/10
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Appendix G: Complications Prevention and Management

Table G1: Potential Complications and Management Strategies

Complication	Prevention	Early Recognition	Management
Hemorrhage	Cell saver, blood bank preparation	Vital signs monitoring	Transfusion, hemostatic agents
Ureteral injury	Urological consultation	Cystoscopy	Stenting, surgical repair
Infection	Prophylactic antibiotics	Fever, wound assessment	Culture-directed antibiotics
Thromboembolism	Early mobilization, compression	Swelling, pain assessment	Anticoagulation
Psychological trauma	Counseling, family support	Depression screening	Professional counseling

Appendix H: Multidisciplinary Team Roles**Table H1: Team Member Responsibilities**

Specialty	Role	Timing
Obstetrics	Primary surgical team	Throughout procedure
Anesthesiology	Hemodynamic management	Pre-op to recovery
Urology	Ureteral assessment	Intra-operative
Blood Bank	Transfusion services	On-call availability
ICU	Post-operative monitoring	Post-operative care
Pediatrics	Neonatal resuscitation	At delivery

Appendix I: Quality Improvement Measures**Table I1: Lessons Learned and Process Improvements**

Issue Identified	Improvement Strategy	Implementation
Late booking	Enhanced prenatal education	Community outreach

MRI not performed	Streamlined referral process	Protocol development
Blood loss quantification	Use of standardized collection	Equipment procurement
Team communication	Structured briefings	Communication protocols

Appendix J: Patient Consent and Ethical Considerations

Informed Consent Elements:

- Risks of placenta accreta spectrum
- Possibility of hysterectomy
- Blood transfusion consent
- Alternative management options
- Long-term implications

Ethical Considerations:

- Maternal life prioritization
- Future fertility loss
- Informed decision-making
- Family involvement in care

Appendix K: Follow-up Protocol

Table K1: Post-discharge Follow-up Schedule

Timeline	Assessment	Purpose
1 week	Wound check, vital signs	Early complication detection
2 weeks	Suture removal, symptom assessment	Healing evaluation
6 weeks	Complete examination, counseling	Recovery assessment
3 months	Psychological evaluation	Mental health support
6 months	Long-term complications screening	Quality of life assessment
Annual	Routine gynecologic care	Ongoing health maintenance

