

Placenta Accreta Spectrum: Maternal Outcomes Following Conservative Management and Obstetric Hysterectomy at a Tertiary Care Hospital

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ABSTRACT

Objective: To compare maternal outcomes in patients with PAS disorders managed conservatively versus those undergoing obstetric hysterectomy.

Methodology: A quasi experimental study was conducted at Pak Emirates Military Hospital, Rawalpindi. Fifty-seven patients diagnosed with PAS were included; 25 underwent obstetric hysterectomy, and 32 received conservative management. Data was analyzed for estimated blood loss, operative time, hospital stay, and need for ventilatory support. Statistical significance was set at $p < 0.05$.

Results: The mean patient age was 32.37 ± 3.23 years, and the mean number of previous cesarean sections was 1.97 ± 0.84 . The hysterectomy group demonstrated significantly higher estimated blood loss (2.76 L vs. 1.45 L), longer operating times (3.28 hrs vs. 2.59 hrs), and longer hospital stays (5.96 days vs. 3.94 days) compared with the conservative group ($p < 0.001$ for all). Ventilatory support was required more frequently in the hysterectomy group ($p = 0.016$).

Conclusion: Conservative management of PAS, when applied to carefully selected patients, is associated with reduced intraoperative blood loss, shorter operative times, and faster recovery compared to hysterectomy. These findings emphasize the importance of individualized, multidisciplinary decision-making to optimize maternal outcomes while preserving fertility potential.

Keywords: Placenta accreta spectrum, conservative management, cesarean hysterectomy, maternal morbidity, fertility preservation.

Authors' Contribution:

^{1,2}Conception; Literature research; manuscript design and drafting; ³Critical analysis and manuscript review; ^{1,3}Data analysis; Manuscript Editing.

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Introduction

Placenta accreta spectrum (PAS) occurs when placental tissue abnormally adheres to or invades the uterine wall. It comprises three categories: placenta accreta, placenta increta, and placenta percreta. In placenta accreta, chorionic villi attach to the superficial myometrium; in placenta increta,

they invade more deeply into the myometrium; and in placenta percreta, the invasion extends through the serosa and may involve adjacent organs. The incidence of PAS has increased from approximately 0.8 per 1,000 births in 1980 to nearly 3 per 1,000 births in recent reports, in parallel with rising caesarean delivery rates.¹ The two principal risk

factors are placenta previa and a scarred uterus resulting from previous caesarean delivery.² PAS can cause major obstetric haemorrhage, necessitate massive transfusion and hysterectomy, damage adjacent structures, and lead to maternal death. Maternal mortality rates of 6%-7% have been reported in some series.³

The Royal College of Obstetricians and Gynaecologists, the Society for Maternal-Fetal Medicine, and the American College of Obstetricians and Gynecologists recommend antenatal diagnosis and planned multidisciplinary care.⁴⁻⁶ Delivery should be scheduled at a facility with experienced obstetric and pelvic surgeons, a senior anaesthetist, critical care services, and rapid access to blood products. Diagnosis is primarily based on ultrasonographic findings interpreted by an experienced radiologist. Magnetic resonance imaging may be required when ultrasound does not clearly define the location or depth of placental invasion. Depending on the guideline and clinical circumstances, planned delivery is generally considered between 34- and 37-weeks' gestation.⁴⁻⁶ When definitive surgical management is required, hysterectomy remains an accepted operative strategy. A uterus-preserving approach may be considered in carefully selected patients after assessment of the potential benefits and risks.⁵⁻⁶

The Triple-P technique is a one-step conservative surgical approach that includes repair of the uterine defect after placental removal. Conservative management may involve leaving the placenta in situ or removing a localized area of invaded myometrium. It may also require uterine reconstruction, control of bleeding with balloon tamponade, or compression sutures.^{7,8} The choice of procedure depends on the type of PAS, the extent of placental invasion, the woman's haemodynamic condition, her desire for future fertility, and the experience of the surgical team. Uterus-preserving techniques may carry delayed risks, including secondary haemorrhage, infection, and eventual unplanned hysterectomy. They therefore require

careful patient selection and vigilant postoperative surveillance.⁹

This study compared short-term maternal outcomes among women with placenta accreta spectrum who underwent either obstetric hysterectomy or conservative management at a tertiary care referral hospital.

Methodology

This quasi experimental study was conducted at Pak Emirates Military Hospital (PEMH), Rawalpindi, a tertiary care referral hospital for complicated obstetric conditions. Women with a confirmed diagnosis of PAS underwent either obstetric hysterectomy or a conservative uterus-preserving procedure. Approval was obtained from the institutional review board before enrolment. Written informed consent was obtained from each participant, and confidentiality was maintained. Study duration was from January 2022 to December 2024. Consecutive non-probability sampling technique was used. Data were analyzed using SPSS version 26.0. Continuous variables were compared using the independent-samples t-test, whereas categorical variables were analyzed using the Chi-square test or Fisher's exact test where appropriate. Statistical significance was set at $p < 0.05$.

The sample-size calculation was based on a Pakistani report.¹⁰ It yielded a minimum sample of 25 participants using a 5% margin of error and 68 participants when the margin of error was reduced to 3%. Data were recorded on age, obstetric history, ultrasonographic or MRI findings, operative management, estimated blood loss, use of blood products, duration of surgery, postoperative morbidity, infection, ventilatory support, intensive care admission, and length of hospital stay. Where follow-up data were available, subsequent pregnancy, fertility preservation, quality of life, and healthcare utilization were also considered secondary outcomes. Records lacking essential information and cases without available follow-up

data were excluded. Between-group analyses and multivariable regression were planned, and statistical significance was set at $p < 0.05$.

Ethical approval was obtained before commencement of the study IRB No. A/28/ERC/67/2025 Approval Date: 8/7/2025

Results

Fifty-seven women with confirmed PAS were included. Obstetric hysterectomy was performed in 25 women, whereas 32 underwent conservative management. The mean age of the cohort was 32.37 ± 3.23 years. Across both groups, the mean number of previous lower-segment caesarean sections (LSCS) was 1.97 ± 0.84 . Mean estimated intraoperative blood loss was 2.02 ± 0.76 L, mean operating time was 2.90 ± 0.60 hours, and mean length of hospital stay was 4.83 ± 1.47 days.

The two management groups differed across several perioperative measures. Women who underwent hysterectomy had a higher mean number of previous LSCS than those managed conservatively (2.40 versus 1.63; $p < 0.001$). Estimated blood loss was also greater in the hysterectomy group (2.76 versus 1.45 L; $p < 0.001$). The corresponding mean operating times were 3.28 and 2.59 hours, respectively ($p < 0.001$), while the mean hospital stays were 5.96 days after hysterectomy and 3.94 days after conservative management ($p < 0.001$). These comparisons are presented in Table I.

Parameter	Obstetric hysterectomy, mean	Conservative management, mean
Previous LSCS, mean number	2.40	1.63
Estimated blood loss, L	2.76	1.45
Operating time, hours	3.28	2.59
Total hospital stay, days	5.96	3.94

Study group	Yes n(%)	No n(%)	Total
Obstetric hysterectomy	8 (32.0%)	17 (68.0%)	25
Conservative management	2 (6.25%)	30 (93.75%)	32

Parameter	p-value	Between-group finding
Previous LSCS	<0.001	Higher mean in the hysterectomy group
Estimated blood loss	<0.001	Higher mean in the hysterectomy group
Operating time	<0.001	Longer mean duration in the hysterectomy group
Total hospital stay	<0.001	Longer mean stay in the hysterectomy group
Ventilatory support	0.016	Required more often in the hysterectomy group

Ventilatory support was required by 8 of 25 women (32.0%) after obstetric hysterectomy and by 2 of 32 women (6.25%) after conservative management ($p = 0.016$; Table 2). Table 3 summarizes the statistically significant between-group findings. The distribution of transfused blood units is shown in Figure 1, and Figure 2 depicts the between-group difference in postoperative ventilatory support.

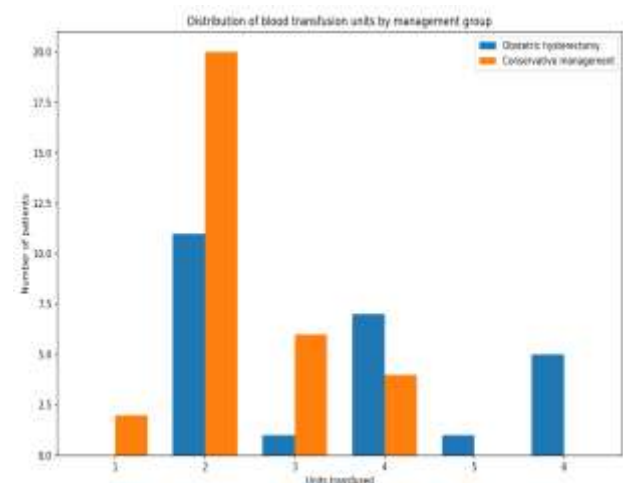


Figure 1. Distribution of blood transfusion units by management group.



Figure 2. Requirement for ventilatory support by management group.

Discussion

In this cohort, the perioperative course differed appreciably between women who underwent obstetric hysterectomy and those managed conservatively. The hysterectomy group had a greater number of previous caesarean deliveries and, during the index admission, experienced greater blood loss, longer operations, longer hospital stays, and a more frequent need for ventilatory support. This pattern is consistent with previous reports in which hysterectomy was more often required for extensive PAS and was accompanied by substantial surgical morbidity.^{11,12,15} Postoperative ventilatory support was required in almost one-third of the hysterectomy group, compared with approximately one in sixteen women in the conservative-management group.¹³

The difference in estimated blood loss was clinically important: the mean was 2.76 L among women undergoing hysterectomy and 1.45 L among those managed conservatively. Haemorrhage remains the principal perioperative hazard in PAS because rapid blood loss may lead to massive transfusion, coagulopathy, organ dysfunction, and prolonged recovery.¹⁴ However, the observed difference

cannot be attributed to the operation alone. Hysterectomy is generally selected when placental invasion is more extensive or bleeding is expected to be more difficult to control. The greater mean number of previous LSCS in that group (2.40 versus 1.63) supports the possibility of a greater scar burden and more advanced disease, consistent with the established association between repeated caesarean delivery and PAS risk.¹⁵ The results should therefore be interpreted as an association between management strategy and outcome rather than as evidence that hysterectomy caused the excess morbidity.

Women selected for conservative management had lower mean blood loss, shorter procedures, and earlier discharge in the present series.^{11,12,16} For a patient who wishes to preserve reproductive potential, uterine preservation may be appropriate when the disease is technically amenable to conservative surgery and an experienced multidisciplinary team is available.^{13,17} These findings do not establish that conservative treatment is preferable for PAS. Selection bias is likely because women offered a uterus-preserving procedure may have had more localized invasion, greater haemodynamic stability, or more favorable operative findings. Moreover, conservative management carries its own morbidity. Delayed bleeding, pelvic infection, readmission, and secondary emergency hysterectomy have all been reported.^{9,13,18}

The transfusion pattern shown in Figure 1 is also informative. Although the groups did not differ significantly in the simple presence or absence of transfusion, intensive care admission, or bladder support, the distribution of the number of units administered differed between groups. In PAS, transfusion volume may therefore reflect clinical burden more clearly than a binary transfusion variable. The lack of statistical significance for some outcomes may also be related to the sample size. General anaesthesia was used in both groups, in

keeping with the institution's perioperative approach to these high-risk procedures.¹⁹

A strength of this study is that both management strategies were evaluated within a single tertiary care service, thereby reducing variation in institutional practice. Several limitations remain. The study was conducted at a single center and included only 57 patients. Treatment was not randomized; the decision to proceed with hysterectomy or conservative surgery was probably influenced by the location and severity of placental invasion, intraoperative findings, haemodynamic status, and the patient's reproductive preferences. The conservative procedures were not classified according to specific techniques, and PAS severity was not reported using a standardized grading system. Residual confounding is therefore unavoidable. In addition, data on delayed haemorrhage, infection, menstrual recovery, future fertility, and outcomes of subsequent pregnancies were unavailable. Future multicenter studies should apply uniform diagnostic and severity criteria, describe operative procedures precisely, adjust for baseline disease extent, and extend follow-up beyond the index hospitalization.^{17,18}

Conclusion

Among women treated for PAS at this single tertiary center, obstetric hysterectomy was associated with greater estimated blood loss, longer surgery and hospitalization, and a higher requirement for ventilatory support than conservative management. Because management was not randomized and the hysterectomy group may have had more extensive disease, these differences do not demonstrate the superiority of conservative treatment. Uterus-preserving surgery remains a possible option for carefully selected women when the required surgical expertise, transfusion support, and postoperative follow-up are available. Larger prospective studies that account for PAS severity

and include long-term maternal and reproductive outcomes are needed.

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