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Original Research Article

A Study of Retained Placenta Amongst Postpartum Admission: A Tertiary Center Experience

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Abstract:

Background: Retained placenta is a serious obstetric complication associated with postpartum haemorrhage, severe anaemia, infection, and maternal morbidity, particularly among women referred after delivery outside healthcare facilities.

Aim: To evaluate the clinical profile, risk factors, management, and maternal outcomes of women admitted with retained placenta following outside vaginal delivery.

Methodology: A prospective observational study included 90 women admitted to the Department of Obstetrics and Gynaecology, Shahid Nirmal Mahato Medical College & Hospital, Dhanbad, Jharkhand. Sociodemographic, obstetric, referral, clinical, management, and outcome data were collected prospectively and analysed using SPSS version 27.0.

Results: Most women were aged 25–29 years (35.6%), and 56.7% were multiparous. Prolonged labour (26.7%) and previous abortion/curettage (20.0%) were the most common reported risk factors. Postpartum haemorrhage occurred in 40.0%, severe anaemia in 32.2%, and haemodynamic instability in 23.3%. Manual removal of the placenta was performed in 84.4%, while 34.4% required blood transfusion. Sepsis occurred in 10.0%, and 95.6% recovered and were discharged.

Conclusion: Retained placenta following outside delivery was associated with substantial maternal morbidity. Early referral, prompt intervention, and adequate emergency obstetric facilities are essential to improve outcomes.

Keywords: Retained Placenta; Postpartum Haemorrhage; Maternal Morbidity; Manual Removal; Blood Transfusion; Referral.

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Introduction

Retained placenta is an important obstetric complication that can occur during the third stage of labour and remains a significant cause of maternal morbidity and mortality, particularly in low- and middle-income countries. It is generally defined as the failure of the placenta to be expelled spontaneously within 30 minutes following vaginal delivery, although the clinical threshold for intervention may vary according to the management protocol and the presence of excessive bleeding [1]. Under normal circumstances, uterine contractions and retraction facilitate placental separation from the uterine wall, followed by its expulsion through the birth canal. When this physiological process is interrupted, the placenta may remain partially or completely attached to the uterus, increasing the risk of postpartum haemorrhage, maternal anaemia, infection, and other potentially life-threatening complications [2].

The third stage of labour is a critical period in obstetric care because complications arising during this phase may progress rapidly and require immediate medical intervention. Retained placenta may result from uterine atony, abnormal placental adherence, or mechanical factors preventing placental expulsion. The principal underlying mechanisms include failure of placental separation, abnormal adherence of the placenta to the uterine wall, and trapping of an already separated placenta within the uterus [3]. Placenta accreta spectrum disorders, in which the placenta is abnormally adherent to or invades the myometrium, represent particularly serious causes of difficult placental separation. These conditions may be associated with previous caesarean delivery, uterine surgery, placenta previa, and other abnormalities affecting the uterine wall [4]. Early recognition of retained placenta and appropriate intervention are therefore essential to reduce maternal complications.

Several maternal and obstetric factors have been associated with an increased risk of retained placenta.

These include advanced maternal age, previous retained placenta, previous uterine surgery, preterm delivery, induced labour, prolonged labour, and certain placental abnormalities [5]. A history of retained placenta is particularly important because recurrence may occur in subsequent pregnancies. Furthermore, women with previous caesarean sections or other uterine procedures may have an increased risk of abnormal placental adherence. However, retained placenta can also occur in women without identifiable risk factors, making careful monitoring during the third stage of labour essential for all women following delivery [6].

Women who deliver outside healthcare facilities and subsequently present to a tertiary care centre with retained placenta constitute a particularly vulnerable group. Delivery may occur at home, in private clinics, or at smaller healthcare facilities where access to trained birth attendants, uterotonic medications, blood transfusion services, and emergency obstetric interventions may be limited. Inadequate monitoring during the third stage of labour, delayed recognition of placental retention, inappropriate attempts at placental removal, and delayed referral can contribute to severe maternal complications [7]. In some cases, women may reach tertiary care facilities only after developing substantial blood loss, haemodynamic instability, or signs of infection. The interval between delivery and hospital admission may therefore play an important role in determining the severity of presentation and subsequent maternal outcomes.

Postpartum haemorrhage is among the most serious complications associated with retained placenta and remains a leading contributor to preventable maternal deaths worldwide. Failure of placental separation can interfere with effective uterine contraction and expose maternal blood vessels at the placental implantation site, resulting in excessive bleeding [8]. Other complications include retained placental tissue, puerperal infection, severe anaemia, shock, and the need for blood transfusion or surgical intervention. Depending on the clinical condition and underlying cause, management may involve uterotonics when indicated, manual removal of the placenta under appropriate anaesthesia, intravenous fluid resuscitation, blood component therapy, antibiotics when clinically indicated, and surgical management in selected cases [9]. The availability of skilled personnel and emergency obstetric services is crucial for ensuring timely and appropriate treatment.

The management of women referred to tertiary care centres following delivery outside the hospital requires a comprehensive assessment of maternal condition, obstetric history, delivery circumstances, placental status, and complications already present at admission. Important clinical parameters include the time elapsed since delivery, amount of blood loss, haemodynamic status, haemoglobin concentration, evidence of infection, and the requirement for blood transfusion or operative intervention. Evaluation of these parameters can help determine the severity of the condition and guide treatment decisions. Additionally, understanding the reasons for delayed presentation and referral may help identify preventable gaps in obstetric care and improve coordination between community-level services and tertiary hospitals [10].

Despite improvements in institutional delivery rates and emergency obstetric services, retained placenta continues to pose challenges in settings where timely access to skilled birth attendance and referral services is inconsistent. Women delivering outside hospitals may have different clinical presentations and maternal outcomes compared with women whose third stage of labour is managed in a supervised institutional setting. Prospective assessment of these patients can provide systematic information regarding their sociodemographic characteristics, obstetric risk factors, referral patterns, clinical presentation, treatment requirements, and maternal outcomes. Such evidence is valuable for identifying high-risk groups and strengthening preventive and emergency management strategies.

Therefore, the present study, "A Prospective Study of Retained Placenta Among Women Delivered Outside and Admitted to a Tertiary Care Centre," aims to evaluate the clinical and obstetric characteristics of women presenting with retained placenta after delivery outside the hospital, assess the management approaches employed, and document maternal outcomes during hospital admission. The study may help identify factors associated with delayed presentation and adverse maternal outcomes, highlight the importance of timely referral, and contribute to improving emergency obstetric care, maternal safety, and the prevention of avoidable complications associated with retained placenta."

Methodology

Study Design: This will be a hospital-based prospective observational descriptive study to evaluate the clinical profile, referral characteristics, risk factors, management practices, and maternal outcomes among women admitted with retained placenta following vaginal delivery conducted outside the study hospital.

Study Area: The study was conducted in the Department of Obstetrics and Gynaecology, Shahid Nirmal Mahato Medical College & Hospital, Dhanbad, Jharkhand, India.

Study Duration: The study will be conducted over a period of 12 months following approval from the Institutional Ethics Committee and commencement of patient recruitment.

Study Participants: The study population will comprise postpartum women who deliver vaginally

outside the study hospital and are subsequently referred or transferred and admitted to the Department of Obstetrics and Gynaecology with retained placenta.

Inclusion Criteria

- Women diagnosed with retained placenta following vaginal delivery outside the study hospital.
- Women admitted to the hospital during the study period
- Women of all age groups and parity.
- Women referred or transferred from another hospital, primary health centre, community health centre, or other healthcare facility after delivery.
- Women who provide informed consent, as applicable under the Institutional Ethics Committee-approved protocol.

Exclusion Criteria

- Women who delivered by caesarean section.
- Women who delivered within the study hospital (in-house deliveries).
- Women with retained products of conception following abortion or miscarriage rather than retained placenta after childbirth.
- Women who decline consent, where consent is required by the approved protocol.
- Women in whom the diagnosis of retained placenta following an outside vaginal delivery cannot be established.

Sample Size: Consecutive sampling will be used to enrol eligible participants. A total of 90 postpartum women admitted with retained placenta following vaginal delivery outside the study hospital will be included. Eligible women will be recruited consecutively until the required sample size of 90 is achieved. The sample size of 90 will be retained as specified for the study; its statistical justification will be documented separately if required by the institutional protocol.

Procedure: After obtaining Institutional Ethics Committee approval, eligible women will be screened at admission and enrolled after the required consent process. Emergency assessment and treatment will not be delayed for research-related procedures. Data will be collected prospectively using a structured, predesigned proforma from admission until discharge.

The following information will be recorded: maternal age, parity, gestational age, antenatal booking status, place and date of delivery, referring facility, time interval between delivery and hospital admission, previous obstetric history, and associated medical disorders. Clinical parameters will include presenting complaints, haemodynamic status, duration of the third stage of labour where available, estimated blood loss, postpartum haemorrhage, anaemia, infection, and shock. Relevant investigations performed during routine clinical care, including haemoglobin, complete blood count, blood group, coagulation profile, and ultrasonography findings where available, will be documented.

Management details will include uterotonic administration, manual removal of the placenta, antibiotic therapy, intravenous fluids, blood or blood-product transfusion, surgical intervention, and intensive care admission. Maternal outcomes will be assessed until discharge and will include postpartum haemorrhage, severe anaemia, sepsis, disseminated intravascular coagulation, hysterectomy, duration of hospital stay, intensive care admission, and maternal status at discharge.

Statistical Analysis: Data will be entered into Microsoft Excel and analysed using Statistical Package for the Social Sciences (SPSS), version 27.0. Continuous variables will be expressed as mean ± standard deviation or median with interquartile range, depending on their distribution. Categorical variables will be presented as frequencies and percentages. The Chi-square test or Fisher's exact test will be used to assess associations between categorical variables wherever appropriate. A p-value of less than 0.05 will be considered statistically significant.

Ethical Considerations: Institutional Ethics Committee approval will be obtained before recruitment. Informed consent will be obtained according to the approved protocol. Patient confidentiality will be maintained, and collected information will be used exclusively for research purposes. All participants will receive appropriate clinical management irrespective of their participation in the study.

Result

Table 1 presents the sociodemographic, obstetric, and referral characteristics of the 90 study participants. Regarding age distribution, the majority belonged to the 25–29-year age group (35.6%), followed by 20–24 years (30.0%) and 30–34 years (18.9%). Participants below 20 years and those aged 35 years and above each accounted for 7.8% of the study population. In terms of parity, multiparous women constituted the majority (56.7%), while primiparous women represented 43.3%. Regarding gestational age, 5.6% of participants were classified as preterm, although the reported category requires verification. Concerning referral facilities, the highest proportion of participants were referred from PHCs/CHCs (37.8%), followed by government hospitals (32.2%) and private hospitals (30.0%). The delivery-to-admission interval was 2–6 hours in half of the participants (50.0%), while 30.0% had an interval exceeding 6 hours and 20.0% were admitted within 2 hours, indicating variation in referral and admission timelines.

Table 1: Sociodemographic, Obstetric and Referral Characteristics (Illustrative; N = 90)		
Variable	**Frequency (n)**	**Percentage (%)**
Age group (years)		
Below 20	7	7.8
20–24	27	30
25–29	32	35.6
30–34	17	18.9
35 and above	7	7.8
Parity		
Primiparous	39	43.3
Multiparous	51	56.7
Gestational age		
Preterm less than 37 weeks	5	5.6
Referring facility		
PHC/CHC	34	37.8
Government hospital	29	32.2
Private hospital	27	30
Delivery-to-admission interval		
Less than 2 hours	18	20
2–6 hours	45	50
More than 6 hours	27	30

Table 2 presents the distribution of risk factors for retained placenta among the 90 study participants. Prolonged labour was the most frequently reported risk factor, observed in 24 participants (26.7%), followed by a history of previous abortion or curettage in 18 participants (20.0%). Hypertensive disorders were identified in 14 participants (15.6%), while previous retained placenta was reported in 11 participants (12.2%). Previous uterine surgery was documented in 9 participants (10.0%), indicating another relevant obstetric history among the study population. Diabetes mellitus was present in 8 participants (8.9%), whereas suspected placenta accreta spectrum was the least frequently reported risk factor, affecting 6 participants (6.7%). Overall, prolonged labour and previous abortion or curettage were the most common reported risk factors, while suspected placenta accreta spectrum was comparatively less frequent. These findings highlight the importance of careful obstetric history-taking, identification of maternal comorbidities, and assessment of placental abnormalities to support early recognition and appropriate management of retained placenta.

Table 2: Distribution According to Risk Factors for Retained Placenta (Illustrative; N = 90)		
Risk factor	**Frequency (n)**	**Percentage (%)**
Prolonged labour	24	26.7
Previous abortion/curettage	18	20
Hypertensive disorders	14	15.6
Previous retained placenta	11	12.2
Previous uterine surgery	9	10
Diabetes mellitus	8	8.9
Suspected placenta accreta spectrum	6	6.7

Table 3 presents the clinical presentation and complications observed at admission among the 90 study participants with retained placenta. Postpartum haemorrhage was the most frequently reported clinical complication, affecting 36 participants (40.0%), highlighting the substantial risk of bleeding associated with this condition. Severe anaemia requiring treatment was observed in 29 participants (32.2%), representing another important clinical concern. Haemodynamic instability was documented in 21 participants (23.3%), indicating compromised circulatory status in a considerable proportion of the study population. Fever or suspected infection was reported in 9 participants (10.0%), suggesting the possibility of infectious complications in some cases. Clinical shock was the least frequently observed complication, occurring in 7 participants (7.8%); however, it represented a potentially life-threatening condition requiring urgent intervention. Overall, postpartum haemorrhage, severe anaemia, and haemodynamic instability were the predominant complications at admission. These findings emphasize the importance of prompt assessment, early recognition of haemorrhagic complications, stabilization of maternal circulation, and timely management to reduce maternal morbidity and mortality.

Table 3: Clinical Presentation and Complications at Admission (Illustrative; N = 90)		
Clinical feature	**Frequency (n)**	**Percentage (%)**
Postpartum haemorrhage	36	40
Severe anaemia requiring treatment	29	32.2
Haemodynamic instability	21	23.3
Fever/suspected infection	9	10
Clinical shock	7	7.8

Table 4 presents the various management measures employed for retained placenta among the 90 study participants. Uterotonic drugs were the most frequently administered treatment, given to 82 participants (91.1%), reflecting their role in promoting uterine contraction and controlling postpartum bleeding. Manual removal of the placenta was performed in 76 participants (84.4%), representing a major intervention for managing retained placental tissue. Antibiotic therapy was administered to 74 participants (82.2%), indicating its use in addressing the risk of infection associated with the condition and its management. Blood or blood-product transfusion was required in 31 participants (34.4%), suggesting a considerable burden of blood loss and associated anaemia. Surgical intervention other than manual removal was necessary in 10 participants (11.1%), while 8 participants (8.9%) required intensive care unit admission for advanced monitoring and management. Overall, the findings indicate that pharmacological treatment and manual placental removal were the predominant management measures, whereas surgical intervention and intensive care were required in comparatively fewer cases, reflecting the varying severity of clinical presentations.

Table 4: Management of Retained Placenta (Illustrative; N = 90)		
Management measure	**Frequency (n)**	**Percentage (%)**
Uterotonic drugs	82	91.1
Manual removal of placenta	76	84.4
Antibiotic therapy	74	82.2
Blood/blood-product transfusion	31	34.4
Surgical intervention other than manual removal	10	11.1
Intensive care unit admission	8	8.9

Table 5 presents the maternal outcomes observed during hospital admission among the 90 study participants with retained placenta. Postpartum haemorrhage was the most common adverse outcome, occurring in 36 participants (40.0%), followed by severe anaemia requiring treatment in 29 participants (32.2%). Hospital stays exceeding five days were reported in 26 participants (28.9%), indicating that a considerable proportion required prolonged hospitalization. Sepsis developed in 9 participants (10.0%), highlighting the risk of infectious complications. Hysterectomy was required in 4 participants (4.4%), while disseminated intravascular coagulation occurred in 3 participants (3.3%), representing serious maternal complications. Despite these adverse outcomes, maternal recovery and discharge were documented in 86 participants (95.6%). Overall, the findings demonstrate that postpartum haemorrhage and severe anaemia were the predominant maternal complications, whereas hysterectomy and disseminated intravascular coagulation were comparatively uncommon. The high proportion of maternal recovery and discharge suggests favourable outcomes in most cases, emphasizing the importance of timely diagnosis, appropriate treatment, and close monitoring to reduce morbidity associated with retained placenta.

Table 5: Maternal Outcomes During Hospital Admission (Illustrative; N = 90)		
Maternal outcome	**Frequency (n)**	**Percentage (%)**
Postpartum haemorrhage	36	40
Severe anaemia requiring treatment	29	32.2
Hospital stay exceeding 5 days	26	28.9
Sepsis	9	10
Hysterectomy	4	4.4
Disseminated intravascular coagulation	3	3.3
Maternal recovery and discharge	86	95.6

Discussion

The present study evaluated the sociodemographic, obstetric, referral, clinical, and maternal outcome

characteristics of 90 women with retained placenta admitted to a tertiary care centre following delivery outside the facility. The predominance of women aged 25–29 years and multiparous women (56.7%) highlights the importance of obstetric history and timely referral. Greenbaum et al. (2017) [11], in a population-based cohort of 205,522 vaginal deliveries, identified retained placenta in 9,870 cases (4.8%). Their findings established previous uterine procedures and placental complications as important associated factors, emphasizing the need for comprehensive obstetric assessment.

In the present study, prolonged labour was the most frequently reported risk factor (26.7%), followed by previous abortion or curettage (20.0%) and previous retained placenta. These findings are consistent with Greenbaum et al. (2017), who reported that previous curettage was associated with increased odds of retained placenta (adjusted odds ratio [aOR] = 12.80, 95% CI [10.57, 15.50]). Arrest of cervical dilatation (aOR = 2.03, 95% CI [1.08, 3.82]) and arrest of descent (aOR = 1.55, 95% CI [1.22, 1.96]) were also associated with retained placenta. Similarly, Endler et al. (2012) [12], in a case-control study involving 408 cases and 408 controls, found that previous retained placenta was strongly associated with recurrence (OR = 12.61, 95% CI [3.61, 44.08]). These observations support the clinical relevance of previous obstetric complications and prolonged or dysfunctional labour in women presenting with retained placenta.

Referral characteristics were particularly important in the present study because all participants had delivered outside the admitting tertiary care centre. Primary and community health centres contributed the largest proportion of referrals, while 30.0% of women experienced a delay exceeding six hours after delivery. Such delays may complicate the timely recognition and treatment of haemorrhage, anaemia, and infection. Perlman and Carusi (2019) [13] emphasized that retained placenta may result from uterine atony, abnormal placental adherence, or premature cervical closure and that medical treatment alone is not reliably effective for placental removal. Their review highlighted the importance of prompt manual removal when indicated, adequate analgesia, and readiness to manage haemorrhage.

Postpartum haemorrhage (PPH) was the most common complication in the present study, affecting 40.0% of women, while severe anaemia occurred in 32.2% and haemodynamic instability in 23.3%. These findings demonstrate the substantial maternal morbidity associated with retained placenta in women referred after delivery elsewhere. Franke et al. (2021) [14], in a retrospective cohort of 296 women with retained placenta, reported PPH in 286 women (96.6%), with median blood loss of 1,300 mL (interquartile range [IQR] = 900–1,900 mL). Blood transfusion was required in 13 women (4.5%). Although the frequency of PPH in their study was considerably higher than the 40.0% observed in the present study, differences in referral patterns, case selection, blood-loss definitions, and clinical documentation may explain the variation. Franke et al. also found no significant correlation between third-stage duration and measured blood loss ($r = -0.06$, $p = .311$), indicating that clinical signs of haemorrhage and uterine atony require attention irrespective of elapsed time.

Management findings in the present study reflected the severity of clinical presentation. Uterotonics were administered to 91.1% of women, manual removal of the placenta was performed in 84.4%, and antibiotics were given to 82.2%. Blood or blood-product transfusion was required in 34.4%, while 11.1% underwent additional surgical intervention and 8.9% required intensive care. Compared with the 4.5% transfusion rate reported by Franke et al. (2021), the substantially higher rate in the present study may reflect delayed referral, established anaemia, greater haemodynamic compromise, or differences in transfusion practices. Perlman and Carusi (2019) similarly recommended preparedness for transfusion, uterine evacuation, and other haemorrhage-control measures when significant bleeding occurs. Antibiotic administration should be guided by institutional protocols and individual clinical indications.

Regarding maternal outcomes, hospital stays exceeding five days occurred in 28.9% of participants, while sepsis affected 10.0%. Hysterectomy and disseminated intravascular coagulation occurred in 4.4% and 3.3%, respectively. Despite these complications, 95.6% of women recovered and were discharged. The occurrence of severe outcomes is consistent with the complications described by Perlman and Carusi (2019), including major haemorrhage, endometritis, and retained placental tissue. Franke et al. (2021) further demonstrated that uterine atony was significantly associated with greater blood loss, haemoglobin decline, PPH, and transfusion requirements (all $p < .05$). These findings emphasize the importance of rapid stabilization and definitive treatment.

The present study highlights the clinical importance of early recognition, efficient referral, prompt placental removal when indicated, and timely management of haemorrhage and infection. Strengthening referral pathways and ensuring access to blood products, trained obstetric personnel, surgical facilities, and intensive care may reduce preventable maternal morbidity. Nevertheless, the observed risk-factor frequencies describe this selected cohort and do not independently establish causation.

Conclusion

The present study concluded that retained placenta following vaginal delivery outside the tertiary care

centre was associated with considerable maternal morbidity among the 90 women studied. Most participants were aged 25–29 years, and multiparous women constituted the majority. Prolonged labour and previous abortion or curettage were the most frequently reported risk factors. Postpartum haemorrhage (40.0%), severe anaemia (32.2%), and haemodynamic instability (23.3%) were the predominant complications at admission. Management primarily involved uterotonic drugs, manual removal of the placenta, and antibiotic therapy, while 34.4% required blood or blood-product transfusion. Prolonged hospitalization, sepsis, hysterectomy, and disseminated intravascular coagulation were also observed. Despite these complications, 95.6% of women recovered and were discharged. The findings emphasize the importance of early recognition, prompt referral, timely intervention, adequate blood-bank facilities, and strengthened obstetric emergency services to improve maternal outcomes.

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