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## Original Research Article

## Complications of placenta previa: A retrospective observational study at tertiary care hospital

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## ABSTRACT

**Background:** Placenta previa (PP) is condition where the placenta is inserted completely or partially into the lower uterine segment, at or after 28 weeks of gestation. Maternal and fetal risks are antepartum haemorrhage (APH), postpartum haemorrhage (PPH), abnormal adherence of placenta, low birth weight (LBW), intra uterine growth restriction (IUGR), preterm births and congenital malformations. The purpose of this study was to determine the proportion of placenta previa, the demographics of patients, types-severity, complications and the fetomaternal outcome in patients of placenta previa.

**Materials and Methods:** After due permission of Institutional Review Board, this retrospective observational study was carried out at tertiary care teaching hospital from July 2020 to November 2022.

**Results:** Proportion of pregnancies with placenta previa was 0.3%. Majority 44(91.7%) patients were registered, 38(79.2%) of patients were in age group of 21-30 years, 38(79.1%) patients were multigravida, 41 (85.4%) had major degree of placenta previa, 29(60.4%) patients admitted after 37 weeks of gestation and 47(97.9%) of patients were delivered by caesarean section. Majority of patients, 20 (41.7%) had mild anemia. Major complications were bleeding episodes during antenatal period/APH in 23 (47.9%) and PPH in 22 (45.8%) patients. Maternal mortality occurred in 1 (2.1%) patient. All babies were live at time of birth and 44(91.7%) babies were alive at the time of discharge and neonatal death occurred in 4 (8.3%) preterm babies (28-33 week gestation).

**Conclusion:** Majority of patients were multigravida. No patient was severely anaemic. Majority of patients were delivered by CS. APH and PPH were major complications. About two third of patients required blood transfusion in ante/intra/post-natal period. Obstetric hysterectomy was required in about one tenth of patients. Majority of babies were alive at the time of discharge due to higher number of registered patients who took regular antenatal care, hospital delivery and good NICU facilities. Once diagnosed, placenta previa and morbidly adherent placenta should be managed at tertiary care centre with multidisciplinary approach so as to lessen the fetomaternal morbidity and mortality. Prevention is better than cure. Multiparity increases the risk of placenta previa. Hence, family planning with an aim to reduce unwanted pregnancies and abortions will help to reduce the chances placenta previa. CS increases the risk of development of placenta previa. Efforts should be made to reduce the primary caesarean section rate as it poses more risk of placenta previa, morbidly adherent placenta and its related complications in subsequent gestations.

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## 1. Introduction

Placenta previa (PP) is condition where the placenta is inserted completely or partially into the lower uterine

segment, at or after 28 weeks of gestation.<sup>1</sup> It complicates 0.3-0.5% of all pregnancies at term.<sup>2</sup> Its incidence is increased due to various reasons including wide spread use of ultrasound scanning and increasing rates of caesarean deliveries. It is fatal in 0.03% of patients. Regardless of etiology, maternal and fetal risks are increased by several folds in patient of placenta previa; in mother, the risks are mainly due to life threatening APH and postpartum haemorrhage (PPH). Placenta previa is a major cause of antepartum haemorrhage (APH) accounting for 35% of all the causes.<sup>3</sup> Chances of abnormal adherence of placenta is also increased several times. With regard to baby, incidences of low birth weight (LBW), intra uterine growth restriction (IUGR), preterm deliveries and congenital malformations are increased. Once diagnosed, placenta previa and morbidly adherent placenta should be managed at tertiary care centre with multidisciplinary approach so as to lessen the maternal and fetal morbidity and mortality. The purpose of this study was to determine the proportion of placenta previa, the demographics of patients, types and severity, complications and the foeto-maternal outcome in patients of placenta previa.

## 2. Materials and Methods

After due permission of Institutional Review Board (NHLIRB/2023/March/32/No.11), this retrospective observational study was carried out at our tertiary care teaching hospital from July 2020 to November 2022. The data was collected after approval of Institutional Review Board. Data was collected from the indoor case papers and hospital records as per proforma that included, demographic profile of patients, detailed history, clinical examination findings, investigations, gestational age at the time of delivery, progress of labour, mode of delivery, foeto-maternal outcome and complications. Analysis of data was done by appropriate statistical methods.

Patients diagnosed with placenta previa, irrespective of their parity and fetal viability were included.

### 2.1. Inclusion criteria

1. Symptomatic / Asymptomatic patients with clinical and radiological diagnosis of placenta previa including patients of placenta accreta, increta or percreta
2. Undiagnosed placenta previa confirmed intra-operatively during CS.
  - (a) Type I: Minor Previa: lower placental edge inside the lower uterine segment, not up to internal os.
  - (b) Type II: Marginal Previa: lower placental edge just reaching the internal os.
  - (c) Type III: Partial Previa: partially covering the internal os when closed but does not entirely do so when fully dilated.

- (d) Type IV: Complete Previa: Placenta completely covering the internal os.

3. For clinical purpose, the types were graded into mild degree (Type I and Type II A anterior) and major degree (Type II B posterior, Type III and Type IV).

New classification based on ultrasound finding;

Placenta Previa; the internal os is covered partially or completely by placenta.

Low lying placenta; implantation in the lower uterine segment is such that the placental edge does not cover the internal os but lies within a 2-cm wide perimeter around the os.

### 2.2. Exclusion criteria

1. All patients of Placenta Previa, whose follow-up was lost.
2. Patient suffering from bleeding disorder.

## 3. Results

During the study period, 13,354 patients were admitted for management of pregnancy at our tertiary care teaching hospital. Out of these patients diagnosed with placenta previa were 48. Hence, the proportion of pregnancies with placenta previa was 0.3%.

As shown in Table 1, majority 44(91.7%) patients were registered patients. Majority 38(79.2%) of patients were from the peak reproductive age group of 21 to 30 years. Proportion of placenta previa was almost double in age group of 26-30 years compared to 21-25 years. Majority 38(79.1%) patients were multigravida. Majority of patients 41 (85.4%) had major degree of placenta previa in which Type II B (posterior) in 14(29.2%) patients, Type III in 8 (16.6%) and Type IV in 19 (39.6%) and 7 (14.6%) had minor degree of placenta previa in which Type I in 6 (12.5%) patients and Type IIA (anterior) in 1 (2.1%) patients. Majority 29(60.4%) patients admitted with full term after 37 weeks of gestation.

As shown in Table 2, caesarean section remains choice of delivery, majority 47(97.9%) of patients were delivered by caesarean section; of these elective and emergency caesarean sections were 41 (85.4%) and 6 (12.5%) respectively. Normal vaginal delivery occurred in 1(2.1%) patient having minor degree of placenta previa who came in labour.

As shown in Table 3, 23 (47.9%) of patients had bleeding episodes/APH in antenatal period and PPH were reported in 22 (45.8%) patients. Placenta was adherent in 2 (4.2%) patients of placenta previa. Medical management was done in form of uterotonics and pressure was applied for hemostasis in all patients. Complete hemostasis was achieved by medical management and/or surgical management. Bilateral uterine artery ligation (BLUAL) was

**Table 1:** Demographic details and obstetric profile

Demographic Details and Obstetric Profile		Degree of Placenta Previa		Total No. (%) N = 48
		Minor (low lying placenta) No. (%) N = 7	Major (placenta previa) No. (%) N = 41	
<b>Type of Admission</b>	Registered	06 (12.5%)	38 (79.2%)	44 (91.7%)
	Unregistered	01 (2.1%)	03 (6.2%)	04 (8.3%)
<b>Age Group</b>	21-25 years	02 (4.2%)	11 (22.9%)	13 (27.1%)
	26-30 years	04 (8.3%)	21 (43.8%)	25 (52.1%)
	31-35 years	01 (2.1%)	06 (12.5%)	07 (14.6%)
	36-40 years	0	03 (6.2%)	03 (6.2%)
<b>Gravida</b>	Primigravida	03 (6.2%)	07 (14.6%)	10 (20.8%)
	Multigravida	04 (8.3%)	34 (70.8%)	38 (79.1%)
<b>Period of Gestation</b>	28 to 33 weeks	02 (4.2%)	05 (10.4%)	07 (14.6%)
	34 to 36 weeks	01 (2.1%)	11 (22.9%)	12 (25.0%)
	> 37 weeks	04 (8.3%)	25 (52.1%)	29 (60.4%)

**Table 2:** Mode of delivery

Mode of Delivery		No.	Percentage (%)
<b>Caesarean Section</b>	<b>Emergency</b>	41	85.4%
	<b>Elective</b>	6	12.5%
<b>Vaginal Delivery</b>		1	2.1%
<b>Total</b>		48	100%

**Table 3:** Complications and relation to degree of placenta previa

Complications and Relation to Degree of Placenta Previa	Minor (N=7)	Major (N=41)	Total (N=48)	Percentage (%)	
<b>Antepartum</b>					
Number of Episodes of Bleeding/APH					
0	3(6.2%)	22(45.8%)	25	52%	
1	4(8.3%)	15(31.3%)	19		
2	0(0.0%)	02(4.2%)	02	47.9%	
>2	0(0.0%)	02(4.2%)	02		
<b>Intra Operative</b>					
Placenta Accreta Syndrome (Adherent Placenta)	Placenta Accreta	0	1	2	4.2%
Urinary Bladder Injury	Placenta Increta	0	1	2	4.2%
<b>Post-Partum</b>					
PPH		2	20	22	45.8%
<b>Management of PPH (more than one modality in some patients)</b>					
			Medical Management	22	45.8%
<b>Medical Management plus</b>					
			Bilateral uterine artery ligation (BLUAL)	19	39.8%
			BLUAL + Uterine packing	2	4.2%
			Uterine packing	1	2.1%
			B-Lynch suture	1	2.1%
			Obstetric hysterectomy	6	12.5%
			Blood and Blood Components	22	45.8%
DIC		0	2	2	4.2%
Renal Failure		1	0	1	2.1%
Fever		1	1	2	4.2%
Wound Gap		1	0	1	2.1%
Maternal Death		0	1	1	2.1%

performed in 19(39.6%) and uterine packing was done in 2(4.2%). BLUAL along with uterine packing and B-Lynch suture was required in 1(2.1%) each. Obstetric hysterectomy was required in 4(8.3%) patients when all other modalities for management of PPH failed and in 2(4.2%) patients of adherent placenta.

Maternal mortality occurred in 1(2.1%) patient due to PPH and patient could not be saved despite obstetric hysterectomy. Placenta was adherent and on HPE, it was diagnosed as placenta increta. This patient had previous history of D/E and history of previous CS done for placenta previa. In all patients of PPH, hypovolemia was corrected by crystalloid and blood transfusion. In present study, all 22(45.8%) patients required transfusion of blood and blood components.

As shown in Table 4, requirement of blood transfusion depended on baseline hemoglobin level and amount of blood loss. More than 4 units of blood was required in 3(6.3%) patients whose baseline Hb was >9gm/dl, but they had developed PPH. In this present study, no patient was severely anemic. Majority of patients, 20 (41.7%) had mild anemia.

As shown in Table 5, all babies were live at time of birth and 44(91.7%) babies were alive at the time of discharge and neonatal death occurred in 4 (8.3%).

As shown in Table 6, of 44 babies who survived, 4 babies weighted below 2kg and 40 babies weighed >2kg. Majority 29(60.4%) babies delivered at full term while 19(39.6%) babies reported preterm. In present study, there was no IUFD. Neonatal mortality occurred in 4(8.3%) preterm babies (28-33 week gestation), of these 2 babies weighed 1.3 kg, 1.4 kg (between 1- 1.5kg).

#### 4. Discussion

In present study, proportion of placenta previa was 0.3%. Studies done by Bahar A et al,<sup>4</sup> Rosenberg T et al,<sup>5</sup> Rahim N et al,<sup>6</sup> Meena N et al,<sup>7</sup> Naik VR et al,<sup>8</sup> Ramasamy P et al<sup>9</sup> have reported proportion of placenta previa as 0.7%, 0.4%, 0.7%, 0.8%, 1.4%, 0.6% respectively. The incidence of placenta previa has risen in past 30 years. As per Parkland hospital statistics it has risen from 2.6 per 1000 to 3.8 per 1000.<sup>10</sup>

In our study, majority, 44 (91.7%) patients were registered and 4 (8.3%) were unregistered patients. Mathuriya G. et al<sup>11</sup> and Rahim N et al<sup>6</sup> have reported majority of unregistered patients, that were 96.4% and 65.5% respectively. In present study, majority of patients were registered. This finding suggests that, there is increased awareness regarding early registration and need for antenatal care at tertiary care hospital due to availability of multi-disciplinary care.

In present study, majority of patients were 38 (79.2%) were in age group of 21-30 years. This is because of the peak reproductive age group, early age of marriage and

shorter interval between the pregnancies. Banu N et al,<sup>12</sup> Purohit A et al,<sup>13</sup> Meena et al,<sup>7</sup> Naik VR et al,<sup>8</sup> Maiti GD et al<sup>14</sup> and Ramasamy P et al<sup>9</sup> have also reported majority of patients having placenta previa in age group of 21-30 years as 85.7%, 75.5%, 70.4%, 49.0%, 50.0%, 76.0% respectively.

In present study, 10 (20.8%) patients were primigravida and 38 (79.1%) patients were multigravida. Multiparous patients have shown the higher incidence of placenta previa. This is associated with the ageing of vasculature of the uterus. This causes placental hypertrophy and enlargement which increases the likelihood of the placenta encroaching on lower uterine segment. Advanced maternal age and parity are confounding.<sup>10</sup> Studies by Lele S. B et al,<sup>15</sup> Das B. et al,<sup>16</sup> Tuzovic L et al.,<sup>17</sup> Jilliani K et al,<sup>18</sup> Ojha N. et al,<sup>19</sup> Naik VR et al,<sup>8</sup> Maiti GD et al,<sup>14</sup> Ramasamy P et al<sup>9</sup> have also reported majority of patients having placenta previa were multigravida in 88.95%, 87.8%, 71.6%, 86.2%, 61.4%, 79.2%, 76.7% and 74.0% respectively.

In present study, majority 29 (60.4%) patients were admitted after 37 weeks. But we can diagnose placenta previa and low lying placenta with the help of ultrasound at 32 week.<sup>10</sup> Ojha N. et al,<sup>19</sup> Berhan Y. et al,<sup>20</sup> Maiti GD et al,<sup>14</sup> Ramasamy P et al<sup>9</sup> also have reported 54.3%, 49.4%, 63.3% and 56.0% of patients were admitted after 37 weeks of gestation.

In present study, caesarean section was performed in 47 (97.9%) patients and vaginal delivery occurred in 2.1% cases which present as minor degree of placenta previa. Studies by Brehan Y et al,<sup>20</sup> Purohit A et al,<sup>13</sup> Naik VR,<sup>8</sup> Maiti GD et al<sup>14</sup> and Ramasamy P et al<sup>9</sup> have reported that caesarean section was performed in 92.9%, 92.5%, 81.1%, 93.3%, 100% respectively, majority of patients were delivered with caesarean section. So, it remains gold standard for management of placenta previa. Chances of recurrence of placenta previa are more common in major degree as compare to minor degree of placenta previa. Patients whose USG report shows low-lying placenta or placenta previa, repeat USG can be done at 36weeks and if it shows low-lying placenta lies between 1-2cm of internal os we can give trial of vaginal delivery.<sup>10</sup>

In present study, majority of patients, 25(52.0%) had not any episode of bleeding. Out of these, 22 patients had major degree of placenta previa while 3 patients had minor degree of placenta previa. One or more episodes of bleeding occurred in 23 (45.8%). Single episode of bleeding occurred in 19 (39.6%) patients. Menon M.K.K et al<sup>21</sup> and Lele S. B. et al<sup>15</sup> had reported that, majority of patients had single episode of bleeding per vagina whereas in our study majority of patients had not experienced any episode of bleeding.

In our study, 22(45.8%) patients had developed PPH as there was excessive bleeding from sinuses. Medical management was done in form of uterotonics and

**Table 4:** Maternal hemoglobin and blood transfusion

Baseline Maternal Hb (gm%) On Admission	No. of units of blood Transfused					Blood transfusion required Number of Patients	Blood transfusion not required Number of patients	Total no. of Patients (%)
	1 Unit	2 Unit	3 Unit	4 Unit	>4 Unit			
<7	0	0	0	0	0	0	0	0
7-8.9	0	3	1	1	0	5	0	5(10.4%)
9-10.9	7	4	1	2	2	16	4	20(41.7%)
>11	6	3	0	1	1	11	12	23(47.9%)

**Table 5:** Perinatal outcome in patients of placenta previa (N=48)

Perinatal Outcome	Number	Percentage (%)
Alive	44	91.7%
IUD	0	0.0%
Still Birth	0	0.0%
Neonatal Death	4	8.3%
Total	48	100%

**Table 6:** Relationship of gestational age, baby weight and perinatal outcome

Birth Weight	Gestational Age and Perinatal Outcome									Total Number (%)
	Alive			IUD/Still Birth			Neonatal Death			
	28-33	34-36	>37	28-33	34-36	>37	28-33	34-36	>37	
<1 kg	0	0	0	0	0	0	1	0	0	1(2.1%)
1-1.5 kg	0	0	0	0	0	0	2	0	0	2(4.2%)
1.6-2 kg	2	2	0	0	0	0	1	0	0	5(10.4%)
2.1-2.5 kg	1	7	11	0	0	0	0	0	0	19(39.6%)
>2.5 kg	0	3	18	0	0	0	0	0	0	21(43.7%)
Total	3	12	29	0	0	0	4	0	0	48(100%)

pressure was applied for hemostasis in all patients. Complete hemostasis was achieved by medical management and / or surgical management. Bilateral uterine artery ligation (BLUAL) was performed in 19(39.6%). Obstetric hysterectomy was required in 4(8.3%) patients when all other modalities for management of PPH failed and in 2(4.2%) patients of adherent placenta(placenta accrete spectrum-PAS). On histopathological examination of specimens of these two obstetric hysterectomies, placenta accreta and placenta increta(PAS) were reported. In all patients of PPH, hypovolemia was corrected by crystalloid and blood transfusion. In present study, all 22(45.8%) patients required transfusion of blood and blood components. Naik VR et al,<sup>8</sup> Yadava PA et al,<sup>22</sup> Maiti GD et al<sup>14</sup> have reported BLUAL in 26.3%, 52.3% and 13.3% respectively. Naik VR et al,<sup>8</sup> Yadava PA et al,<sup>22</sup> Maiti GD et al.<sup>14</sup> have reported obstetric hysterectomy in 6.6%, 7.9%, 6.7% and blood transfusion in 36.8%, 36.4%, 36.7% respectively. Hence, BLUAL, obstetric hysterectomy and blood transfusion along with medical management are important modality of management in PPH of placenta previa.

Urinary bladder injury occurred in 2(4.2%) patients which was sutured. DIC, Renal failure occurred in 2(4.2%), and 1(2.1%) respectively. There were 2(4.2%) patients who had reported fever on day 3 of CS, which was managed medically and 1(2.1%) patient reported wound gap on day 14 of CS that was managed by re-suturing. Hence, in present study, major complications were bleeding episodes during antenatal period/APH in 23 (47.9%) and PPH in 22 (45.8%) patients. Maternal mortality occurred in 1 (2.1%) patient.

Naik VR et al,<sup>8</sup> Yadava PA et al.,<sup>22</sup> Maiti GD et al<sup>14</sup> also have reported APH in 21.7%, 52.3%, 30.0% and PPH in 17.9%, 17.0%, 30.0% respectively as major complications of placenta previa. Naik VR et al.,<sup>8</sup> Yadava PA et al.,<sup>22</sup> Maiti GD et al<sup>14</sup> reported adherent placenta in 5.7%, 4.5%, 3.3% and maternal mortality in 0.9%, 2-3%, 0.0% respectively.

In present study, 32(66.7%) patients required blood transfusion in ante/intra/post-natal period. Hb level between 7– 8.9 g/dl, 9 – 10.9 g/dl and > 11 g/dl were reported in 5(10.4%), 20(41.7%) and 23(47.9%) patients respectively. Khosla et al.,<sup>23</sup> had reported 95% of anemic patients who required blood transfusion while in present study, 21(43.7%) of anemic patients required blood transfusion. In

present study, no patient was severely anaemic, majority of patients were registered who were taking regular antenatal care. Therefore, correction of anaemia by oral and/or injectable iron therapy and blood transfusion were advised as and when required.

In present study, 44(91.7%) babies were alive at the time of discharge. Ojha N. et al,<sup>19</sup> Mathuriya G. et al.,<sup>11</sup> Purohit A et al.,<sup>13</sup> Berhan Y. et al.,<sup>20</sup> Naik VR et al<sup>8</sup> and Ramasamy P et al<sup>9</sup> have reported 88.6%, 65.7%, 67.9%, 55.3%, 86.2% and 92.0% live births respectively. No IUD or Stillbirth occurred in present study. Purohit A et al.,<sup>13</sup> and Naik VR et al,<sup>8</sup> have reported 15.1% and 1.9% IUD.

In present study, neonatal mortality occurred in 4 (8.3%) due to preterm and prematurity followed by early onset septicemia and difficulty in maintaining saturation of preterm babies. Ojha N et al.,<sup>19</sup> Mathuriya G. et al,<sup>11</sup> Purohit A et al,<sup>13</sup> Berhan Y. et al,<sup>20</sup> Naik VR et al<sup>8</sup> and Ramasamy P et al<sup>9</sup> have reported neonatal mortality as 10.0%, 13.5%, 15.1%, 10.3%, 10.03% and 6.0% respectively. Out of 48 live births, 35(72.9%) babies did not require NICU admission and 13(27.1%) babies required NICU admission, out of these 4 died and 9 babies were discharged. In present study, majority of babies were alive due to higher number of registered patients who took regular antenatal care, hospital delivery and good NICU facilities.

## 5. Conclusion

No patient was severely anaemic as patients were aware of importance of antenatal care and haematinics. Majority of patients were delivered by CS. APH and PPH were major complications. About two third of patients required blood transfusion in ante/intra/post-natal period. Obstetric hysterectomy was required when other modalities of management of PPH failed or in adherent placenta in about one tenth of patients. Majority of babies were alive at the time of discharge due to higher number of registered patients who took regular antenatal care, hospital delivery and good NICU facilities.

Mainstay of management in patients of placenta previa is early diagnosis, careful evaluation, timely intervention by appropriate mode of delivery and management of complications. Feto-maternal morbidity and mortality can be reduced when placenta previa once diagnosed, should be managed at tertiary care hospital with availability of expert obstetrician, obstetric intensive care unit, sonologist, anaesthetist, well equipped neonatal intensive care units (NICU), and availability of blood and blood components. Patients and relatives must be made aware that, placenta previa is a high-risk pregnancy and therefore, there is a need for regular ANC, awareness about warning signs and delivery at a tertiary care hospital.

Prevention is better than cure. Multiparity increases the risk of placenta previa. Hence, family planning with an

aim to reduce unwanted pregnancies and abortions will help to reduce the chances placenta previa. Caesarean section increases the risk of development of placenta previa. Efforts should be made to reduce the primary caesarean section rate as it poses more risk of placenta previa, morbidly adherent placenta and its related complications in subsequent gestations. Patient needs to be counselled regarding possibility of placenta previa when she demands delivery by caesarean section. In addition, patient who has history of previous caesarean section and history of D/E also needs to be counselled regarding possibility of placenta previa and complications associated with it. In present study, there were no any identifiable causes for placenta previa in primi gravida patients.

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None.

## 7. Conflict of Interest

None.

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