Migration of Placenta Previa in Patients Presenting in A Tertiary Care Hospital and Feto-maternal Outcome

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Abstract

Objective: To investigate the migration of placenta previa and its feto-maternal outcomes in patients presenting at a tertiary care hospital.

Material and Methods: The study was conducted at the Obstetrics and Gynaecology Department of Ghurki Trust Teaching Hospital over a two-year period, from March 2021 till March 2023, following the approval from the Institutional Review Board. This study included 50 patients who met the specified inclusion criteria. Using a pre-designed proforma, data was collected on placental location (low-lying or previa, anterior or posterior) at both 20 and 32 weeks of gestation to assess migration. Additionally, demographic and clinical information, including maternal age, gravidity, parity, obstetric history, fetal gender, fetal presentation, delivery mode, and neonatal outcomes were recorded. The data was analyzed using SPSS software (version 22) and the results were presented as frequencies, percentages, and tables. The chi-square test was used to evaluate associations (95% confidence interval) considering p-values < 0.05 statistically significant.

Results: The migration of placenta previa was 38%. Posterior placenta previa was more common (62%) and migrated more frequently (63%) than anterior placenta previa. Primigravida women placenta previa. Placenta previa was associated with male fetuses (59%) and breech presentation (22%). Moreover, the study revealed that 42% women needed blood transfusions during childbirth and 6% experienced anemia related complications, underscoring maternal risks.

Conclusion: Understanding placenta previa migration and its associated factors helps to better plan the mode and timing of delivery, improving maternal and fetal outcomes.

Keywords: Placenta previa, migration, Cesarean section, feto-maternal outcome

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Introduction

Placenta previa occurs when the placenta develops in the lower segment of uterus. Initially, a classification system categorized placenta previa into four grades: minor, marginal, partial, and complete. However, a new system now categorizes placenta as low-lying when the leading edge lies within 2 cm from the internal cervical os or previa when it directly lies over the internal os.[1]

Placenta previa is a significant cause of obstetrical hemorrhage, leading to substantial maternal and fetal morbidity and mortality.[2-4] Maternal complications include hemorrhage requiring multiple blood transfusions, disseminated intravascular coagulation, and risk of morbid placental adhesion (placenta accreta), which may lead to partial or total

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hysterectomy. Pregnancies complicated by placenta previa also result in higher frequencies of prematurity, fetal and neonatal death.[5]

Although the precise cause of placenta previa is unknown, it has been linked to previous cesarean delivery, advanced maternal age, parity, gravidity, multiple pregnancies, previous endometrial and myometrial damage, assisted reproductive technology, and maternal smoking.[6] During pregnancy, placenta previa is a leading cause of bleeding in the third trimester.[7,8] At delivery, women with placenta previa have an increased risk of abruptio placentae, cesarean delivery, and fetal malpresentation.[9]

The incidence of placenta previa varies according to gestational age, reported as approximately 5% in the second trimester and approximately 0.5% at term.[10] About 90% of placenta previas diagnosed in the second trimester migrate to a normal position by term with the migration rate dependent on placental location (anterior or posterior).[11-13] A trend of increasing placenta previa incidence was observed in the past decade mainly because of an increasing cesarean section rate and advancing maternal age at the time of first pregnancy.[14]

Accurate and timely diagnosis of placenta previa is crucial to prevent severe complications. While early detection of a dangerous placental position is beneficial, it is also known that placenta previa incidence decreases with advancing gestational age, particularly during the second trimester. Many cases diagnosed early in the second trimester result in normal delivery.[15]

Knowing the rate of placental migration facilitates better antenatal management and helps in counseling the patients on mode of delivery. The literature reveals several reports about the differences in placental migration rates according to position.[16,17] A study by Feng *et al*.[16] found that women diagnosed with placenta previa in the second trimester are more likely to experience resolution if the placenta is located posteriorly. However, another study reported no statistically significant difference in migration rates between anterior and posterior placentas. Furthermore, Jansen *et al.*[17] observed a higher incidence of migration among anterior placentas compared to posterior placentas. To summarize, research on placental migration patterns yields conflicting findings. Therefore, further exploration of placenta previa migration in our population, considering gestational age and maternal and fetal complications, is necessary. Thus, this study aims to evaluate placental migration and associated feto-maternal outcomes among patients presenting to the Outpatient Department of Ghurki Trust Teaching Hospital.

Material and Methods

This descriptive cross-sectional prospective case-series was conducted at the Obstetrics and Gynaecology Department of Ghurki Trust Teaching Hospital over a two-year period, from March 2021 to March 2023, following the approval from the Institutional Review Board of Lahore Medical & Dental College, Lahore (Ref. No. LMDC/3449/21). Using non-probability convenient sampling, patients with singleton pregnancies with low lying placentas and placenta previa between 18-22 weeks of gestation, presenting to out-patient department were selected after taking informed consent. Patients with multiple gestation, patients with normally situated placenta and incomplete data were excluded. The study comprised 50 patients who met the inclusion criterion. Data was obtained on a pre-designed proforma, and information was collected regarding location of placenta (low lying or previa, anterior or posterior) at 20 weeks scan and again at 32 weeks scan to evaluate the migration. Moreover, age of pregnant women, gravidity, previous parity separately with total number of previous cesarean sections, history of spontaneous or induced abortions, history of previous placenta previa or any other uterine surgeries or anomaly, child gender, abnormal fetal presentations (breech, transverse, or oblique lie), mode of delivery, and neonatal outcome data were recorded. The data was analyzed using SPSS software, version 22. The results were described in the form of percentages and presented in tables. The chi-square test was used to check for associations, with a 95% confidence interval. A p-value of less than 0.05 was considered statistically significant.

Results

This study's demographic analysis revealed that majority of patients (68%) belonged to the 21-30 age range, while 16 (32%) were between 31-40 years old. Regarding obstetric history, 34% of patients were

primigravida, four patients had four previous pregnancies (para 4), and one patient had five (para 5). Notably, 62% of patients had no prior cesarean section, 12% (6/50) had history of one cesarean whereas 16% (8/50) had undergone two previous cesarean sections. Previous dilatation and curettage contributed to 22% of the cases of placenta previa. It was observed that the majority of patients (29/50) had an ultrasound diagnosis of a major type of previa at the anomaly scan, and the percentage of posterior placenta previa was more common (62%) than anterior placenta previa. Thirty-one patients' placenta previa persisted at the 32-week scan, while the placenta migrated up in 19 patients, making the percentage of migration 38% in this study group. Among these patients with persistent previa, 15 had no history of cesarean section, while 16 had previous cesareans **(Table-I).**

With respect to placental location, a considerable difference in migration rates was observed. Posterior placentas exhibited a higher likelihood of migration, with 12 out of 31 (38.7%) showing migration, compared to anterior placentas, where only 7 out of 19 (36.8%) migrated **(Table-II).** The study presents a comprehensive analysis of feto-maternal outcomes in **Table-III,** revealing significant trends. Notably, most infants (39) presented in a cephalic position at term, whereas 11 presented in a breech position, indicating a potential risk for complications during delivery. Furthermore, 9 patients had premature delivery.

Interestingly, placenta previa was found to be more prevalent among male fetuses than female fetuses, suggesting a possible sex-specific association. Regarding birth weight, most of the infants (41) were within the normal range of 2.1-3 kg. However, one baby was delivered as very low birth weight of 1.5 kg and died due to complications arising from prematurity and very low birth weight. Furthermore, the study found that 21 women required blood transfusions during surgery, and 3 women experienced complications related to anemia, highlighting the maternal risks associated with childbirth.

Table 2: *Migration of placentas with regard to location of placentas*

Placental Migration	Location of placentas		*p*- value
	Anterior	Posterior	
Migrated up	7	12	0.85
Persistent Previa	12	19	

Table 1: *Migration of placentas with regards to history of Cesarean sections*

Previous LSCS	Placental Migration			*p* -value
	Migrated up	Persistent Previa	No of patients n=50	
No Cesarean	16	15	31	0.101
Previous 1	1	5	6	
Previous 2	1	7	8	
Previous 3	0	3	3	
Previous 4	1	1	2	

Table 3: *Feto-maternal outcomes in the study cohort with placenta previa*

Feto-maternal outcomes	Number (n=50)	Frequency (%)
Presentation		
Cephalic	39	78
Breech	9	
Others	2	4
Gestational age at the time of surgery		
34 weeks	1	2
35 weeks	4	8
36 weeks	4	8
37 weeks	20	40
38 weeks	21	42
Gender		
Male	30	60
Female	20	40
Weight		
1-2 kg	1	2
2.1 - 3kg	41	82
3.1 - 4 kg	8	16
Perinatal mortality		
Dead	1	2
Alive and Healthy	49	98
Blood transfusion		
None	29	58
1 unit of blood	10	20
2 units	8	16
4 units and above	3	6
Anemia		
Yes	3	6
No	47	94

Discussion

Low lying placenta and placenta previa is detected more frequently now due to advancement in imaging techniques. Having a cesarean section increases the risk of morbid adherence of placenta. Less than half of the placenta previas in this study moved after a repeat scan in the third trimester. Contrary to existing literature suggesting a positive correlation between placenta previa frequency and prior cesarean sections, our findings indicate a paradoxical trend: placenta previa decreased as the number of previous cesarean sections increased.[11] Patients having a history of cesarean sections had lower migration as compared to those with no history of cesarean section. 38% of placenta previas migrated in the current study which is lower than the 50% rate reported by Jansen *et al.*[18] Our results demonstrated a trend towards increased migration rates for posteriorly located placentas, consistent with Feng *et al.*'s findings,[16] which attributed this phenomenon to differential growth rates of posterior versus anterior uterine smooth muscle. Furthermore, the presence of anterior uterine scars and potentially compromised tissue may impede resolution in anterior placenta previa cases.

In this study population, the history of previous cesarean sections did not affect the finding of placenta previa, as most patients with low-lying placenta had no history of previous cesarean section or uterine surgery. However, 38% of them had migrated placentas on the repeat ultrasound in the third trimester. Therefore, patients should undergo repeat ultrasound for placental localization to facilitate proper planning of the timing and mode of delivery and to reduce morbidity. Jansen et al, on the contrary, suggested that a history of cesarean delivery may increase the risk of placenta previa.[5] The initial distance between the placental edge and internal os predicted the possibility of migration: the greater the distance, the higher the likelihood of placental migration at the repeat scan at 32 weeks, thereby reducing the need for cesarean section due to placenta previa. In this study, it was observed that patients who understood the nature of the disease were better prepared for emergencies, resulting in reduced morbidity. They demonstrated increased compliance with follow-up visits and showed improved adherence to oral iron tablets, as evidenced by the low percentage of women experiencing anemia complications. As a result, no maternal mortality was observed in the current study. Furthermore, minimizing the risks associated with blood transfusion further reduces morbidity if patients adhere to treatment. Overall, the findings of this study emphasize the need for close surveillance and timely interventions in pregnancies complicated by placenta previa to optimize feto-maternal outcome. However, this is a small study, and more extensive research is suggested on a larger scale to evaluate the migration rate according to the distance of placenta from internal os.

Conclusion

The findings of the study revealed that the placenta previa migration was lower than previously reported. Notably, previous cesarean sections reduced migration, whereas posterior placentas exhibited higher migration. Additionally, the initial distance between placental edge and internal os accurately predicted migration. The results of the study underscore the importance of repeat ultrasounds for placental localization to guide delivery planning. Furthermore, patient education leads to improved adherence to treatment, which is crucial for reducing morbidity.

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Authors Contribution

AS: Conceptualization of Project

ZH: Data Collection

SI, ZH: Literature search

AS, SI, AR: Statistical analysis

AS, SS: Drafting, Revision

AS, ZH: Writing of manuscript