

# Placental Migration of Low-Lying Placenta Diagnosed on Second Trimester Ultrasonography and Its Fetomaternal Outcome - An Observational Study in a Tertiary Care Health-Facility in West Bengal

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## ABSTRACT

### BACKGROUND

We wanted to determine the incidence of a low-lying placenta diagnosed on routine ultrasonography in second trimester and those diagnosed as placenta previa in the third trimester. We also wanted to evaluate the factors affecting such migration and evaluate the fetomaternal outcome.

### METHODS

In this prospective study all cases of low-lying placenta detected on routine ultrasound scan in second trimester were followed up with serial sonography evaluating placental migration in third trimester and also in those whose placentas never cleared of internal os and persisted as placenta previa. The study included a total 200 antenatal primigravida mothers without any risk factors and was conducted over a period of one year.

### RESULTS

Out of 200 mothers, 13 patients had no further follow-up, sonographic examinations or obstetric care in our institution leaving 187 patients. Among 187 women, placental migration occurred in 175 women and 12 had placenta previa. Anterior low lying placentas were more common and most of them migrated from internal os between 28w - 31w 9d of gestation. A small number of placentas cleared after 36 weeks but before delivery. Anterior placenta previa were more common than posterior ones. Diagnosis of low lying placenta occurred at 18w - 18w 9d of gestation. Among low lying placenta in mid trimester whose initial distance from internal cervical os was < 10 mm are not migrated, and end in placenta previa. Maternal complications like antepartum haemorrhage, postpartum haemorrhage were more common in low lying placenta. Fetal complications include intrauterine growth restriction (IUGR), preterm birth and neonatal complications like low Apgar score at birth, and sick newborn care unit (SNCU) admissions were more common in placenta previa compared to normal location of placenta.

### CONCLUSIONS

A low lying placenta diagnosed by ultrasonography in second trimester resolves by mid of third trimester. Only rarely 6.4 % persist to term or near term. Follow up sonography is required to diagnose persistence of placenta previa.

### KEYWORDS

Low Lying Placenta, Placental Migration, Placenta Previa, Sonography

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## BACKGROUND

During second trimester obstetric sonography, the position of the placenta in relation to the internal cervical os should be assessed to determine as to whether the placenta is low lying, or distant from the cervical canal. The term low-lying placenta refers to placentas that is ending within 2 cm of the internal cervical os but not covering it, before 24 weeks<sup>1</sup>. A low-lying placenta can be associated with antepartum haemorrhage and may be an indication for Caesarean delivery if it persists into the third trimester. There are multiple studies<sup>2,3</sup> that document the migration over time of the lower edge of the placenta away from the internal cervical os as pregnancy progresses<sup>2,3</sup> and the lower uterine segment develops.

Therefore, patients with diagnoses of a low-lying placenta in the second trimester are scheduled to return for follow-up sonographic examinations to re-evaluate the placental location. Placentas covered internal os partially or completely were complete, from 24 weeks gestation onward; those placentas that end within 1 cm of the internal os reported as marginal placenta previa, and low lying where the lower placental edge is within 2 cm of the internal cervical os. Our study was conducted to determine how often cases of a low-lying placenta diagnosed in the second trimester persist into the third trimester as placenta previa. We also assessed at what gestational age (GA) those low-lying placentas migrate to upper uterine segment and evaluate the factors affecting such migration.

## Objectives

- To determine the incidence of low-lying placenta diagnosed by ultrasonography (USG) in second trimester and follow up there for migration to upper uterine segment.
- To determine the incidence of placenta previa among low lying placenta in second trimester.
- To evaluate the factors affecting such migration.
- To evaluate the maternal and fetal outcomes of those who were diagnosed as placenta previa.

## METHODS

It is a prospective observational study carried out in the Department of Obstetrics and Gynecology, Burdwan Medical College, Burdwan, for a period of one year from April 2018 to March 2019, after approval from ethical committee of this institution. Convenience sampling technique was followed to include a total 200 antenatal primigravida mothers without any risk factors. Multiple pregnancy, previous cesarean pregnancy, hypertensive disorders in pregnancy or any other complications affecting this pregnancy were excluded. All the cases were subjected to detailed history, general, and obstetrical examination at the time of their antenatal visit. The location of placenta was determined by transabdominal ultrasonography at 16 to 24 weeks of gestation with optimal bladder preparation. Low lying placenta is defined as the placental edge ending within 2 cm from the internal cervical

os but did not reach the os. If contraction is present at the start of the examination, the lower uterine segment is re-evaluated after contraction passes off. In those instances in which visualisation of the cervix and placental location is inadequate because of overlying fetal parts or other factors, a transvaginal scan is performed. For each patient, subsequent sonographic records were reviewed at 4 weeks interval to determine the gestational age at which the placenta was no longer low lying. We divided cases into two groups, one group is persistence of placenta previa whose placenta never cleared from internal cervical os and another group whose placenta migrated to upper segment called normal location placenta.

Those patients whose placentas never cleared internal os, second-trimester sonography were reviewed to record the distance from the inferior placental edge to the internal os. We also assessed maternal complications in terms of Antepartum hemorrhage, postpartum hemorrhage and fetal outcome, which is defined by intrauterine fetal death (IUFD), IUGR, low Apgar score, admission to SNCU, low birth weight and perinatal death.

## Statistical Analysis

Statistical significance of the results was evaluated using various statistical parameters like percentage, t-test and chi-square test ( $\chi^2$ ) test. A value of  $P < 0.05$  was considered statistically significant.

## RESULTS

Majority of cases of low lying placenta were diagnosed at 18w - 19w 9d of gestation. Mean GA for diagnosis of low-lying placenta was  $19.89 \pm 2.31w$  and for diagnosis of placenta previa  $21.08 \pm 1.92 w$ . In majority of cases placenta migrate between 28 w - 31 w 9 d of gestation. Marginal placenta previa was more common, 5 cases (41.66 %).

Initial GA at which Low Lying Placenta Diagnosed	Total No. of Mid trimester Low Lying Placenta	Placental Migration	Placenta Previa	P. Value	Significance
16 w - 17 w 9d	31	31	0	< 0.001*	Significant
18 w - 19 w 9d	54	51	3		
20 w - 21 w 9d	53	48	5		
22 w - 24 w	49	45	4		
Mean $\pm$ SD		$19.89 \pm 2.31w$	$21.08 \pm 1.92w$	< 0.001#	

**Table 1. Gestational Age at Which Low Lying Placenta is Diagnosed**

\* Fisher's exact test # t-test

Placental Migration at GA Wks.	No.	Percentage
16 w - 23 w 9d	20	11.4
24 w - 27 w 9d	47	26.9
28 w - 31 w 9d	55	31.4
32 w - 35 w 9d	43	24.6
36 w - 40 w 9d	10	5.7
<b>Total</b>	<b>175</b>	<b>100.0</b>

**Table 2. Gestational Age at Which Migration of Placenta Occurred**

Anterior placenta migrates more (94.35 %) than posterior placenta (92.06 %). In majority of cases placenta is located in between 16 - 20 mm from internal cervical os and of them majority migrated at the time of delivery. Placenta which are within 10 mm from internal os persisted as placenta previa at time of delivery. Mean distance from internal os for migration of placenta  $17.34 \pm 2.41$  mm and mean distance from internal os for placenta previa  $10.08 \pm 3.55$  mm.

	Total No.	Placental Migration	Percentage	P Value (chi-square Test)	Significance
Anterior	124	117	94.35	0.546	Not significant
Posterior	63	58	92.06		
<b>Total</b>	<b>187</b>	<b>175</b>	<b>93.58</b>		

**Table 3. Placental Migration among Anterior and Posterior Mid Trimester Low-Lying Placenta**

Initial Distance from Internal OS	Total No. of Mid trimester Low Lying Placenta	Placental Migration	Placenta Previa	P Value	Significance
< 10 mm	7	0	7	< 0.001*	Significant
11 - 15 mm	31	28	3		
16 - 20 mm	149	147	2		
Mean $\pm$ SD		$17.34 \pm 2.41$	$10.08 \pm 3.55$	< 0.001#	

**Table 4. Initial Placental Distance from Internal OS**

N\* Fisher's exact test, # t-test

	No	Percentage
Complete	3	25.0
Marginal	5	41.7
Low lying	4	33.3
<b>Total No.</b>	<b>12</b>	<b>100.0</b>

**Table 5. Types of Placenta Previa at the Time of Delivery**

In our study out of 12 cases 7 cases (58.33 %) had antepartum haemorrhage and 3 cases (25 %) had postpartum haemorrhage in comparison to 2 (1.14 %) and 14 (8 %) cases had similar complications respectively in cases those who had placenta situated in normal location. Intrauterine fetal death occurred in one case (8.33 %) out of 12 cases whereas 2 cases (1.14 %) had same in normal placental location. In this study out of 12 cases those who had persistence of low lying placenta, intrauterine growth restriction 2 (16.66 %), preterm birth 6 (50 %), low Apgar score 5 (41.66 %) and SNCU admission 4 (33.33 %) occurred in comparison to IUGR 3 (1.71 %), Preterm birth 16 (9.14 %), low Apgar score 18 (10.28 %) SNCU admission 20 (11.4 %) in those who had migration of placenta to upper uterine segment.

## DISCUSSION

We use the term low-lying for those placentas that end within 2 cm of the internal os but do not cover it before 24 weeks' gestation. From 24 weeks' gestation onward, we differentiate those placentas that end within 1 cm of the

internal os by reporting them as marginal previa, from those ending 1 to 2 cm from the internal os, which we report as low lying. Placentas that end more than 2 cm from the internal os are reported as "no previa."

At the time of second trimester sonography, it is important to assess the location of the placenta with respect to the cervix to identify those placentas that end close to the internal os. Low-lying placentas diagnosed in the second trimester that persist to or near term have been implicated in cases of antepartum haemorrhage,<sup>4,5</sup> postpartum hemorrhage<sup>6,7</sup> and small-for-dates neonates.<sup>8</sup>

Many advocate repeated sonographic evaluations later in pregnancy to reassess the placenta location.<sup>5,9,10</sup> Cephalad migration of the lower placental edge has been well documented, and some postulate that the degree of migration may be dependent on whether the placenta is situated anteriorly or posteriorly<sup>4</sup>. No specific recommendations have been made regarding the timing of a follow-up examination. In Table 1 it was found that mid trimester low lying placenta were more diagnosed at 18w - 19w 9d of gestational age but rate of placenta previa was more common when diagnosed at 22 - 24 week of gestational age. Number of placenta previa was more in 20w - 21w 9d of gestational age. Mean gestational age of diagnosis among placenta previa was more ( $21.08 \pm 1.9$ ) w than placental migration ( $19.89 \pm 2.31$ ) w P value < 0.001 which was significant. These findings were similar to Taipale et al.<sup>11</sup>

Our study (Table 2) showed majority of placentas clear lower segment in between 28w to 31w9d of gestation (29.41 %). A small no of placentas clear in between 36w to 40w 9d of gestation (5.34 %) (P < .001) which was significant. In their study Heller HT et al<sup>12</sup> showed only 66 % of low-lying placentas resolve by the end of 27 weeks' gestation, whereas almost 90 % of cases will be clear of the cervix by 32 weeks. The rate of clearance was not dependent on the GA at initial diagnosis of a low-lying placenta; it differs somewhat from the results of at least one other study.<sup>13</sup> In the present study (Table 3) anterior placental migration was more (94.35 %) compared to posterior placental migration (92.06 %) which was comparable with the study done by Cho JY et al.<sup>2</sup> Table 4 elaborates initial distance of placenta from internal cervical os in mm among mid trimester low lying placenta. Initial distance of placenta from internal cervical os in mid trimester low lying placenta were more between 16 - 20 mm and migration of placenta was also more common in such cases. Incidence of placenta previa was almost always associated in whose initial distance of placenta from internal cervical os below 10 mm. Mean placental distance from internal cervical os was more ( $17.34 \pm 2.41$ ) mm than placenta previa ( $10.08 \pm 3.55$ ) mm P value < 0.001 which was significant. In their study Vergani P<sup>14</sup> et al showed incidence of placenta previa was closely associated not only with the distance of placental edge from internal os but also the mode of delivery.

In our study (Table 5) marginal placenta previa was more common 5 (41.66 %) at the time of delivery. In their study Heller HT et al<sup>12</sup> reported 5 cases of placenta previa and 3 cases of vasa previa. They also reported that 3 cases of low-lying placenta in the second trimester became vasa

previa with velamentous cord insertion by the time of delivery. A low lying placenta is a known risk factor for the development of vasa previa<sup>15</sup> and this factor must be kept in mind. In our study antepartum and postpartum haemorrhage were more common among placenta previa (58.33 %) than normal location of placenta (1.14 %) P value < 0.001 is significant when followed up on an earlier diagnosis of a low-lying placenta.

The study conducted by Kollmann M<sup>16</sup> et al also showed similar findings. Fetal complications include IUGR, preterm birth and neonatal complications like low Apgar score at birth, and SNCU admission were more common in placenta previa compared to normal location of placenta. In their study Harper LM et al<sup>17</sup>, Enkoro EE et al<sup>18</sup> also showed similar findings.

### CONCLUSIONS

Low lying placenta was diagnosed by ultrasonography at 16 - 24 wks. of gestation. Among low lying placenta in mid trimester whose initial distance from internal cervical os was < 10 mm did not migrate and end in placenta previa. Patients with initial placental distance from internal cervical os between 16 - 20 mm were more in number and usually migrated. In our study anterior low lying placentas were more common and most of them migrated from internal os between 28w - 31w9d of gestation. A small number of placentas cleared after 36 weeks but before delivery. So careful scanning at follow up is essential to determine the location of placenta in relation to internal os for planning the mode of delivery.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.

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