



Maternal and Neonatal Outcomes in Midtrimester low-Lying Placenta

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Date of Submission: 01-05-2023

Date of Acceptance: 10-05-2023

ABSTRACT:

Objectives: To evaluate maternal and neonatal outcomes in women with low lying placenta (within 3 cm of the internal os) that were identified between 16-24 weeks of gestation using TVS.

Methods: A prospective longitudinal study was conducted. 250 antenatal women were screened and 40 having low lying placenta diagnosed on TVS at 16-24 weeks were recruited. They were followed up till delivery and maternal and neonatal outcomes were recorded.

Results: Significant association was found between low lying placenta and LSCS. ($p=0.03$). Antepartum hemorrhage was also seen in 7.5% of women in the study ($p=0.001$). No association was found between low lying placenta and post-partum hemorrhage and adverse neonatal outcomes.

Conclusion: Routine screening for placental localization should be offered to all women in midtrimester. TVS provides a more accurate measurement for the exact distance of placental edge from internal os. Women diagnosed with low lying placenta should be carefully monitored till delivery. Further studies are needed for evaluating adverse maternal and neonatal outcomes in these cases.

Keywords: TVS, low lying placenta, APH, PPH.

I. INTRODUCTION

In pregnancies at more than 16 weeks of gestation, the term low-lying placenta is used when the placental edge is covering or within 2 to 3 cm from the internal os on transabdominal (TAS) or transvaginal scanning (TVS).^{1,2,3} The incidence of low-lying placenta with second-trimester ultrasonography lies between 6 to 46% which decreases to 0.3-0.5% at delivery owing to the phenomenon of placental migration.⁴

Asymptomatic low-lying placenta is now frequently diagnosed at routine mid-trimester ultrasound.⁵ For a low-lying placenta the mode of delivery is not very clearly defined. It is hypothesized that a lower placental-decidua surface area may confer an increased risk of adverse maternal and neonatal outcomes⁶. There has been a

significant increase in the incidence of low-lying placentas⁵ and a paucity of data regarding the maternal and neonatal outcomes of such cases in India. The purpose of our study was to prospectively follow patients with low lying placenta during midtrimester and determine the maternal and neonatal outcomes.

II. METHODS:

Approval from the Institutional Research Ethics Committee was taken prior to starting the study. It was a prospective longitudinal study. All patients with placenta lying within 3 cm of the internal cervical os on transvaginal ultrasound (TVS) between 16-24 weeks of gestation were included in the study. Transvaginal sonography was performed using a 5-MHz probe after the patient had emptied their bladder. The line of the cervical canal was visualized and the distance between the center of the internal cervical os and the leading edge of the placenta measured. An average of three measurements was used to calculate this distance. All recruited patients were followed up till delivery and evaluated for maternal and neonatal outcomes.

III. RESULTS:

The collected data were transformed into variables, coded and entered in Microsoft Excel. Data was analyzed and statistically evaluated using SPSS-PC-25 version. A total of 250 antenatal mothers underwent transabdominal sonography between 16-24 weeks of gestation to identify low lying placenta out of which 40 women had low lying placenta which was confirmed by transvaginal sonography and were recruited for the study. 80% women underwent LSCS at term and only 20% delivered vaginally. There was statistically significant association between low-lying placenta and the incidence of LSCS in our study. ($p=0.03$)

Table 1 depicts the various obstetric complications seen in the participants with low-lying placenta.



Table 1: Obstetric complications in study subjects

	Participants	P value
Antepartum Hemorrhage (APH)	7.5%	0.001
Pre term delivery	0	1.0
Post Partum Hemorrhage (PPH)	1%	0.33
Adherent placenta	0	
Antepartum	0	-
Intrapartum	0	-
Postpartum	1%	0.33
Duration of hospital stay	4.0±1.41	0.52
Surgical site infections (SSI)	0	-

7.5% out of women in our study experienced APH. All of them were managed conservatively and none required blood transfusion. A statistically significant association was found between persistent low-lying placenta and APH in our study. (**p=0.001**) No significant association between low-lying placenta and PPH was seen in our study. (p=0.33)

The incidence of preterm birth in our study was 4%, which was not found to be significant. 37.5% of newborns had a low birth weight (<2500g) among which 80% were small for gestational age (SGA). 62.5% had a birth weight ≥2500g of which 8% were SGA. APGAR score of ≤7 at 5 mins was seen in 5% of newborns who required NICU admission. No statistically significant difference was found in mean birth weight, APGAR and rates of NICU admission in our study.

IV. DISCUSSION:

Given its location over the cervical os, a proportion of the low-lying placental surface is exposed and lacks a proper uteroplacental interphase. Consequences of this condition include the potential for severe antenatal bleeding and preterm birth, as well as the need for caesarean delivery.^{7,8} Uterine contractions and gradual changes in the cervix and lower uterine segment apply shearing forces to the inelastic placental attachment site, leading to partial detachment. This poses a significant risk of antepartum hemorrhage.

It is hypothesized that a lower placental-decidua surface area may confer an increased risk of adverse neonatal outcomes, including neonatal anemia, respiratory distress, hyperbilirubinemia, neonatal intensive care unit (NICU) admission and perinatal death.⁹ Though the pathophysiology of decreased placental surface and inadequate circulation may in theory explain an increased risk of adverse neonatal outcomes, whether or not the risk of intrauterine growth restriction (IUGR)/small for gestational age (SGA) is increased in low-lying placentas is still a matter of controversy.⁶

In our study, the caesarean section rate was found to be statistically significant (p = 0.03). Bhide et al in their study stated that the likelihood of vaginal delivery rose significantly as the placental edge to internal os distance increased.⁵ In a similar study by Bronsteen et al, the vaginal delivery rate was 76.5% in patients with a placenta to cervical os distance of 1–2cm, significantly greater than the rate of 27.3% in patients in whom the placenta was within 1 cm of the cervix (P = 0.0085).¹⁰ These studies also suggest that patients with a low-lying placenta have a high incidence of caesarean delivery.

A statistically significant association (p=0.001) was found between low-lying placenta and antepartum hemorrhage. Khan AT et al from their study concluded that amongst the patients with low-lying placentas the incidence of antepartum hemorrhage of indeterminate type was



significantly high ($P < 0.001$) and a careful surveillance of such patients is required.¹¹

We did not find significant association between low-lying placenta and the incidence of PPH ($p = 0.33$). Many other studies have reported similar findings as our study. Wortman et al stated that though pregnancies complicated by a low-lying placenta had a higher risk of PPH, the association was not found to be significant ($p = 0.09$).¹² Similarly, in the study of Vergani et al, there was no significant association between low lying placenta and PPH (odds ratio, 2.3; 95% CI, 0.5–9.7).¹³

No significant association was found between low lying placenta and preterm delivery ($p = 1$). Our finding is backed by the results of the study of Ogueh et al who also concluded that there was no significant association between low lying placenta and preterm delivery (odds ratio of 0.74 at a 95% CI of 0.54-1.02 and $p = 0.06$).¹⁴ In another study by Sevan et al, risk of preterm was not found to be significant.¹⁵

In our study, low lying placenta was not associated with any adverse neonatal outcomes. Our findings are similar to study conducted by Ogueh et al. and Magann et al.^{14,16} More studies with bigger sample sizes are needed to further investigate the possible adverse neonatal outcomes due to a low-lying placenta and the mechanisms behind the same.

V. CONCLUSION:

Our study found a significant association between low lying placenta and the rate of LSCS and antepartum hemorrhage. We can recommend that all patients detected with a low-lying placenta at 16-24 weeks by TAS should have a confirmation of the same by TVS for an accurate measurement of the distance of the lower edge of the placenta from the os. Careful monitoring should be done for all the patients having a low-lying placenta. Patients should be warned prior regarding possible adverse effects and to report immediately especially in cases of antepartum hemorrhage.

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