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Resolution of a Low-Lying Placenta and Placenta Previa Diagnosed at the Midtrimester Anatomy Scan

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Abbreviations

CI, confidence interval; IQR, interquartile range; US, ultrasonography

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Objectives—To identify the incidence and resolution rates of a low-lying placenta or placenta previa and to assess the optimal time to perform follow-up ultrasonography (US) to assess for resolution.

Methods—We conducted a retrospective cohort study of women with a diagnosis of a low-lying placenta or placenta previa at routine anatomic screening. Follow-up US examinations were reviewed to estimate the proportion of women who had resolution. A Kaplan-Meier survival curve was generated to estimate the median time to resolution. The distance of the placental edge from the internal cervical os was used to categorize the placenta as previa or low-lying (0.1–10 or \geq 10–20 mm). A time-to-event analysis was used to estimate predictive factors and the time to resolution by distance from the os.

Results—A total of 1663 (8.7%) women had a diagnosis of a low-lying placenta or placenta previa. The cumulative resolution for women who completed 1 or more additional US examinations was 91.9% (95% confidence interval, 90.2%–93.3%). The median time to resolution was 10 (interquartile range [IQR], 7–13) weeks. The distance from the internal cervical os was known for 658 (51.0%) women. The probability of resolution was inversely proportional to the distance from the internal os: 99.5% (\geq 10–20 mm), 95.4% (0.1–10 mm), and 72.3% (placenta previa; $P < .001$). The median times to resolution were 9 (IQR, 7–12) weeks for 10 to 20 mm, 10 (IQR, 7–13) weeks for 0.1 to 10 mm, and 12 (IQR, 9–15) weeks for placenta previa ($P = .0003$, log rank test).

Conclusions—A low-lying placenta or placenta previa diagnosed at the midtrimester anatomy survey resolves in most patients. Resolution is near universal in patients with an initial distance from the internal os of 10 mm or greater.

Key Words—low-lying placenta; obstetrics; placenta previa; transvaginal ultrasonography for placenta location

Placenta previa complicates approximately 0.5% of all live births and is a major source of maternal hemorrhage and morbidity.^{1,2} Routine ultrasonography (US) performed in the mid trimester identifies a high proportion of women with asymptomatic placenta previa or a low-lying placenta.^{3–5} Resolution of placenta previa diagnosed in the mid trimester occurs in 66% to 98% of cases and is more likely if the previa is marginal, low lying, or incomplete.^{6–8} Although consensus guidelines recommend follow-up US at 32 weeks' gestation to assess for persistence of placenta previa or a low-lying placenta, there is limited evidence for when to perform

additional US.^{9,10} Additionally, the influence of maternal and US factors on resolution are understudied.^{7,11,12}

The objective of this study was to identify the incidence and resolution rates of a low-lying placenta or placenta previa. Additionally, we aimed to assess the optimal time to perform additional US in the third trimester to assess for resolution and to identify factors associated with resolution of placenta previa and a low-lying placenta.

Materials and Methods

We conducted a retrospective cohort study of all patients with a diagnosis of a low-lying placenta or placenta previa at the time of anatomy screening at a single institution between February 12, 2010, and April 30, 2015. Patients were eligible if they had a low-lying placenta or placenta previa with continuation of pregnancy beyond viability (defined as a gestational age of ≥ 24 weeks 0 days). Patients were excluded if the pregnancy was terminated or ended in delivery or fetal loss before 24 weeks' gestation. Before initiation of this study, approval was obtained from the Washington University School of Medicine Human Research Protection Office.

Fetal anatomy surveys were performed between 18 weeks 0 days and 23 weeks 6 days. The placental location in relation to the maternal cervix was assessed by US for all patients at the time of the anatomy survey using transvaginal US as part of a policy of universal cervical length screening. Transvaginal US was performed by trained sonographers according to a standard technique.¹³ Briefly, after the patient's bladder had been emptied, the distance from the leading placental edge to the internal cervical os was measured. Patients with a leading placental edge of greater than 0 mm but 20 mm or less from the internal cervical os had a diagnosis of a low-lying placenta, whereas patients with a leading placental edge overlapping the internal cervical os had a diagnosis of placenta previa.

Maternal demographic information and the obstetric history for women undergoing US at our institution are entered into a prospective perinatal database at the time of each US examination. Pregnancy complications, delivery outcome data, and neonatal outcome data are collected by review of electronic medical records and telephone contact with patients or referring physicians and entered into this database by a dedicated perinatal research nurse. Ultrasonographic details, including

gestational age at the time of diagnosis (based on the best obstetric estimate),¹⁴ placental location, and presence of a low-lying placenta or placenta previa, were abstracted from the database. The initial distance of the placental edge from the internal cervical os at the time of diagnosis was abstracted. Follow-up transvaginal US was performed to assess for resolution. The timing of additional US examinations was typically at 28 weeks with further evaluations at 32 and 36 weeks if persistence of a low-lying placenta or placenta previa was noted.

The primary outcome was the proportion of women who had resolution on follow-up US (defined as a leading placental edge >20 mm). We calculated the proportion of patients who had resolution at the first follow-up or at subsequent follow-up US examinations, as well as the proportion of women with persistence to delivery. A Kaplan-Meier survival curve was generated to estimate the median and 95th percentile of the time to resolution for the total cohort. Patients with no follow-up scans in our system were considered lost to follow-up and censored. Baseline demographics, obstetric histories, and maternal outcomes were compared between patients who had resolution and those with persistence of a low-lying placenta or placenta previa. We used the χ^2 test to compare categorical variables and the Student's *t* test for continuous variables as appropriate.

We performed a further analysis for patients who had a quantified distance between the placental edge and the internal cervical os at the initial US examination. Patients were categorized as having placenta previa, a low-lying placenta between 0.1 and 10 mm from the internal os, or a low-lying placenta 10 to 20 mm or greater from the internal os (Figures 1–3). We compared baseline demographics, obstetric histories, and maternal outcomes between the 3 categories. The χ^2 test was used for comparisons between categorical variables, and a one-way analysis of variance was used for continuous variables. A time-to-event analysis was used to estimate the time to resolution by the distance from the internal cervical os. Cox proportional hazard models were used to estimate predictive factors associated with resolution. The proportional hazards assumption was tested by the Schoenfeld global test.

All patients meeting inclusion criteria during the study period were included. No a priori sample size estimation was performed. Tests were 2-tailed, with $P < .05$ considered significant. All statistical analyses were

performed with STATA 12.1 software (StataCorp, College Station, TX).

Results

Of 19,113 women who underwent anatomy screening during the study period, 1663 women had a diagnosis of a low-lying placenta or placenta previa, for an incidence of 8.7% (95% confidence interval [CI] 8.3%–9.1%). After exclusion of women with pregnancies ending in

Figure 1. Representative image of anterior placenta previa on transvaginal imaging.

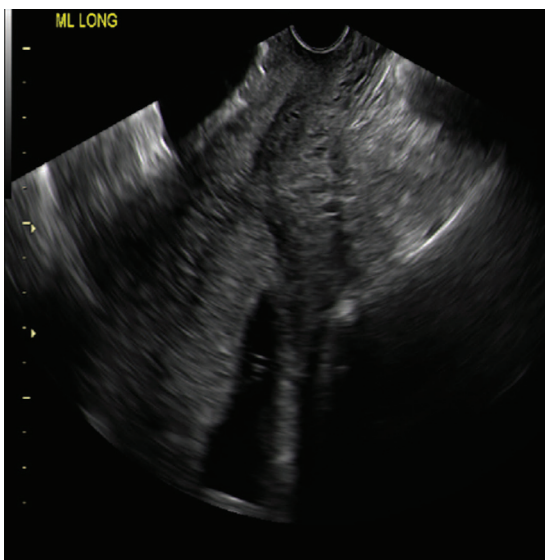


Figure 2. Representative image of a posterior low-lying placenta 4 mm from the internal os on transvaginal imaging.



demise, termination, or delivery before 24 weeks, 1656 were included in the study. Of those, 1289 (77.8%) underwent at least 1 additional US examination to assess for resolution (Figure 4). Older women were less likely to have resolution on follow-up US. Parity, prior cesarean delivery, and race were not significantly different between the groups. The mean distance from the os was significantly greater for women who had resolution than for those who did not (10.1 versus 1.6 mm; $P < .001$). Women who had resolution were more likely to deliver at a later gestational age, less likely to require cesarean delivery, and more likely to deliver neonates with a higher birth weight. Most women without resolution underwent cesarean delivery (92.7%). Of the 5 patients who delivered vaginally, 1 patient delivered precipitously, and the remaining 4 delivered at other facilities (Table 1).

Of the 1289 women who underwent 1 or more additional US examinations, 1184 had resolution, for a cumulative resolution rate of 91.9% (95% CI, 90.2%–93.3%). The first follow-up US was performed at a median of 28 (interquartile range [IQR], 25–30) weeks' gestation. The median time to resolution was 10 (IQR 7–13) weeks from diagnosis (corresponding to 29 weeks' gestation in our cohort), with a 95th percentile of 17 weeks (corresponding to 36 weeks' gestation in our cohort; Figure 5). Overall, resolution occurred in 1006 women presenting for their first follow-up US (78.0% [95% CI, 75.7%–80.3%]). Of the 283 women who did not resolve at the first follow-up US, 248 returned for

Figure 3. Representative image of a posterior low-lying placenta 17 mm from the internal os on transvaginal imaging.

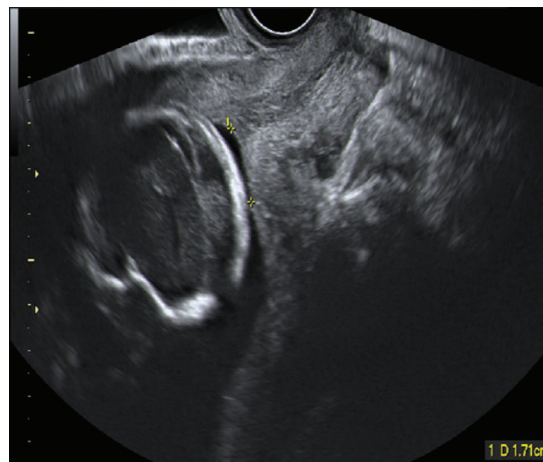


Figure 4. Placenta previa and low-lying placenta at the second-trimester anatomy scan.

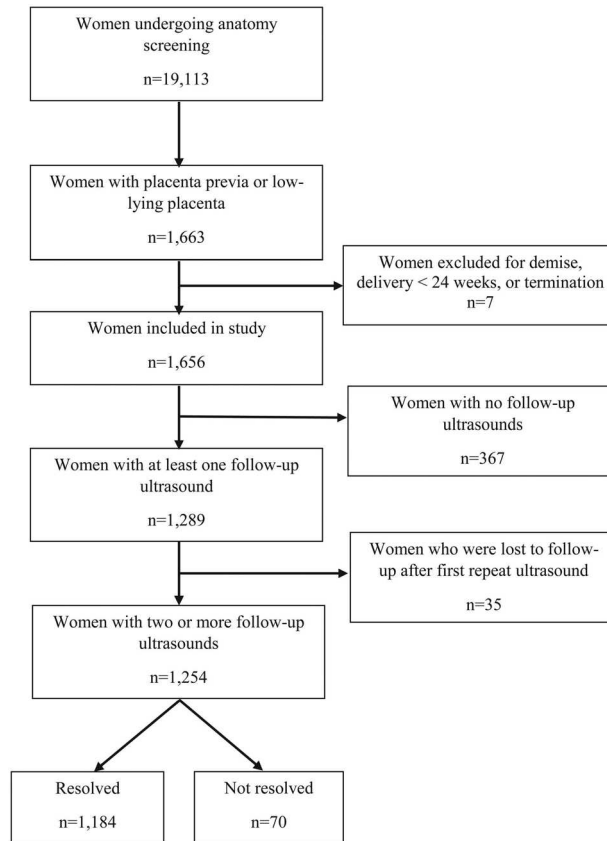


Table 1. Maternal Baseline Characteristics and Delivery Outcomes by Resolution Status

Characteristic	Resolved (n = 1184)	Not Resolved (n = 70)	P
Age, y	29.8 ± 5.4	31.5 ± 5.6	.010
Gestational age at diagnosis, wk	19.3 ± 1.1	19.8 ± 1.5	.001
Distance, mm ^a	10.1 ± 6.6	1.6 ± 3.7	<.001
Parity ≥ 1	677 (57.2)	42 (60.0)	.643
Prior cesarean delivery	174 (14.7)	14 (20.0)	.227
African American race	317 (26.8)	15 (21.4)	.325
Body mass index, kg/m ^{2b}	26.0 ± 6.9	25.7 ± 5.8	.701
Tobacco use ^c	69 (6.0)	3 (4.4)	.596
Alcohol use ^c	86 (7.4)	4 (5.9)	.633
Delivery outcomes			
Gestational age at delivery, wk ^d	38.8 ± 2.6	35.9 ± 2.4	<.001
Cesarean delivery ^d	408 (35.5)	63 (92.7)	<.001
Birth weight, g ^e	3273.7 ± 620.4	2709.9 ± 578.2	<.001

Data are presented as mean ± SD and number (percent) where applicable.

^aDistance was known for 628 patients in the resolved group and 30 in the not-resolved group.

^bBody mass index was known for 1116 patients in the resolved group and 66 in the not-resolved group.

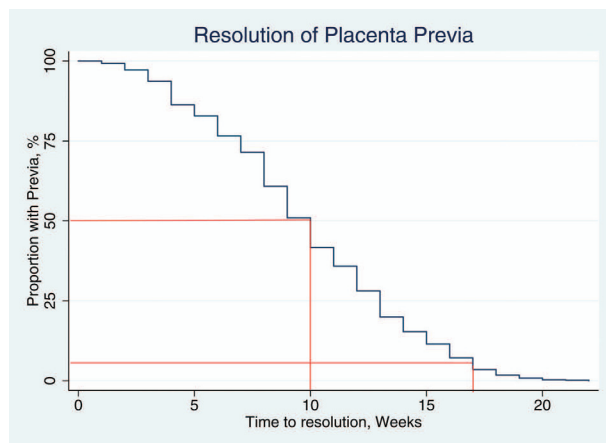
^cTobacco use and alcohol use were known for 1156 patients in the resolved group and 68 in the not-resolved group.

^dGestational age and cesarean delivery were known for 1151 patients in the resolved group and 68 in the not-resolved group.

^eBirth weight was known for 1150 patients in the resolved group and 68 in the not-resolved group.

additional US examinations, and 178 (71.8% [95% CI, 65.7%–77.3%]) had resolution, whereas 70 (28.2% [95% CI, 22.7%–34.3%]) did not. A low-lying placenta or placenta previa persisted in 5.4% of patients who underwent 1 or more additional US examinations. There was 1 vasa previa diagnosed at the midtrimester examination that persisted until delivery and 1 vasa previa diagnosed on follow-up US in a patient who had a resolved low-lying placenta (noted to be within 1 mm of the internal cervical os at diagnosis). The placenta

Figure 5. Time to resolution for the total cohort. The red bars indicate the 50th and 95th percentiles for time to resolution.



location was designated as anterior or posterior for 1536 patients with a low-lying placenta. An anterior low-lying placenta was noted in 482 women at the midtrimester US; a posterior low-lying placenta was noted in 1054 women at the midtrimester US. Of those who returned for follow-up, 371 (98.9%) of women with an anterior low-lying placenta had resolution, whereas 764 (94.1%) of women with a posterior low-lying placenta had resolution.

For women who completed more than 1 additional US examination, those with resolution at the first follow-up scan were younger and more likely to be African American than those with resolution at a later scan or no resolution at all. Women who had resolution at the first follow-up scan were less likely to require cesarean delivery than those who resolved at a later date or did not resolve (data not shown).

The distance from the internal os was quantified for 658 women (51.0%) who underwent at least 1 additional US examination to assess for resolution. Of these, 377 had an initial distance of 10 to 20 mm or greater; 216 had a distance between 0.1 and 10 mm; and 65 had placenta previa. Central placenta previa, defined as a substantial portion of the placenta overlapping the internal os, was diagnosed in 7 women who had at least 1 additional US examination. Women with placenta previa were more likely to be multiparous, have a lower body

Table 2. Characteristics of Patients With Quantified Distance at the Initial US Examination

Characteristic	≥10–20 mm (n = 377)	0.1–10 mm (n = 216)	Placenta Previa (n = 65)	P
Age, y	29.6 ± 5.4	29.6 ± 5.2	30.1 ± 5.7	.574
Gestational age at diagnosis, wk	19.4 ± 1.1	19.3 ± 1.1	19.5 ± 1.2	.526
Distance, mm	14.8 ± 3.0	3.8 ± 3.8	0	<.001
Parity ≥ 1	198 (52.5)	124 (57.4)	49 (75.4)	.003
Prior cesarean delivery	42 (11.1)	29 (13.4)	12 (18.5)	.236
African American race	97 (25.7)	55 (25.5)	22 (33.9)	.361
Body mass index, kg/m ^{2a}	25.7 ± 6.4	26.1 ± 6.8	24.7 ± 5.1	.037
Tobacco use ^b	27 (7.3)	16 (7.7)	6 (9.7)	.814
Alcohol use ^b	35 (9.5)	11 (5.3)	6 (9.7)	.180
Delivery outcomes				
Gestational age at delivery, wk ^c	38.9 ± 1.9	38.6 ± 2.3	38.0 ± 2.2	.016
Cesarean delivery ^c	114 (31.1)	74 (35.9)	32 (51.6)	.006
Birth weight, g ^d	3295.0 ± 602.6	3245.5 ± 670.4	3035.3 ± 568.0	.130

Data are presented as mean ± SD and number (percent) where applicable.

^aBody mass index was known for 360 patients in the ≥10–20-mm group, 199 in the 0.1–10-mm group, and 61 in the placenta previa group.

^bTobacco use and alcohol use were known for 368 patients in the ≥10–20-mm group, 209 in the 0.1–10 mm group, and 62 in the placenta previa group.

^cGestational age at delivery and cesarean delivery were known for 367 patients in the ≥10–20-mm group, 206 in the 0.1–10-mm group, and 62 in the placenta previa group.

^dBirth weight was known for 366 patients in the ≥10–20-mm group, 206 in the 0.1–10-mm group, and 62 in the placenta previa group.

mass index, and require cesarean delivery than women with a low-lying placenta (Table 2).

The probability of resolution was inversely proportional to the distance from the internal os: resolution was noted in 375 (99.5% [95% CI, 98.1%–99.9%]) women with an initial distance of 10 to 20 mm or greater, 206 (95.4% [95% CI, 91.7%–97.8%]) with a distance between 0.1 and 10 mm, and 47 (72.3% [95% CI, 59.8%–82.7%]) with placenta previa (Figure 6). Of the 7 patients with central placenta previa, 2 (28.6%) had resolution. Of the 2 patients with an initial distance from the os between 10 and 20 mm who did not resolve, 1 delivered vaginally without complications, whereas the other had a repeat cesarean delivery for a persistent low-lying placenta. The median times to resolution were 9 (IQR, 7–12) weeks for women with a distance of 10 to 20 mm (corresponding to 28 [26–31] weeks' gestation), 10 (IQR, 7–13) weeks for those with a distance of 0.1 to 10 mm (corresponding to 29 [26–32] weeks' gestation), and 12 (IQR, 9–15) weeks for those with placenta previa (corresponding to 31 [29–34] weeks' gestation; $P = .0003$, log rank test; Figure 7).

In the Cox proportional hazard model, the distance from the internal os and multiparity were independent predictors of resolution (adjusted hazard ratios, 1.52 [95% CI, 1.15–2.01] for 0.1–10 mm; 1.71 [95% CI, 1.30–2.23] for ≥ 10 –20 mm compared to placenta previa; and 1.22 [95% CI, 1.04–1.44] for multiparity;

Table 3). The proportional hazard assumption was met ($P = .22$, Schoenfeld global test).

Discussion

We found that a low-lying placenta or placenta previa was diagnosed in almost 1 of 10 women at the mid-trimester anatomy survey when using transvaginal US. Although the incidence in our population was high, most women who returned for additional assessments had resolution, and 95% of resolutions occurred by 17 weeks from diagnosis (corresponding to 36 weeks' gestation in our cohort). The distance from the internal cervical os at the time of the midtrimester anatomy survey and multiparity were independent predictors of resolution, whereas prior cesarean delivery was not associated with resolution. Women with a low-lying placenta located 10 mm or greater from the internal cervical os at the midtrimester anatomy survey almost uniformly had resolution before delivery. Vasa previa was rare in our population (0.12% [2 of 1656 cases]) which was similar to the 0.06% incidence described in a recent systematic review.¹⁵

Consensus guidelines recommend an additional US assessment of the placental location at 32 weeks' gestation⁹; however, these recommendations are based on limited data.¹⁰ A previous study by Eichelberger et al⁶ examined the timing of resolution of 366 patients with a

Figure 6. Proportions resolved by initial distance category. The bars indicate the proportions resolved by distance category (placenta previa, low-lying placenta between 0.1 and 10 mm, and low-lying placenta between 10 and 20 mm). The numbers on top of the bars represent the percentages of the groups with resolution.

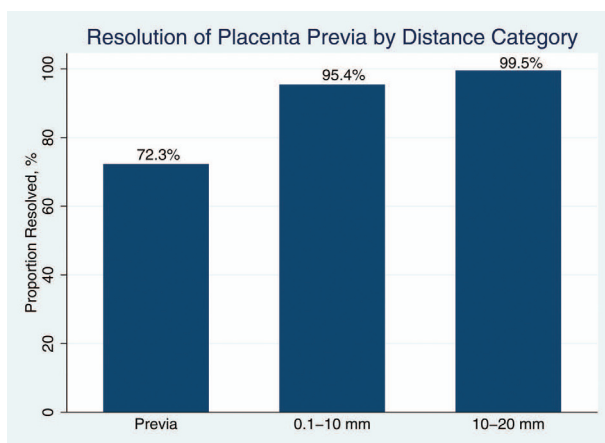
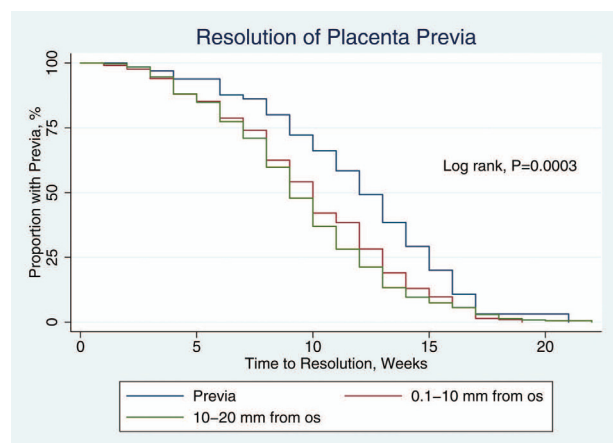


Figure 7. Times to resolution by initial distance category. The blue line represents the time to resolution for placenta previa. The red line represents the time to resolution for a low-lying placenta between 0.1 and 10 mm from the internal os. The green line represents the time to resolution for a low-lying placenta between 10 and 20 mm from the internal os.



diagnosis of complete or marginal previa at 14 weeks' gestation or later. In their analysis, the mean gestational age for patients who had resolution was 28 weeks 4 days, which was similar to our finding of a median gestational age at resolution of 29 weeks. Heller et al⁸ conducted a retrospective analysis of 1240 patients with a diagnosis of a low-lying placenta. Resolution occurred at a mean gestational age of 26 weeks, with 65.9% resolving by 28 weeks and 89.9% by 32 weeks. Our study identified a later median gestational age at resolution but included patients with either a low-lying placenta or placenta previa, which likely biased our results toward a later gestational age at resolution. When limited to patients with a low-lying placenta, our analysis suggests a median gestational age of resolution between 28 and 29 weeks. This gestational age was similar to that in the study conducted by Eichelberger et al⁶ compared to a gestational age of 26 weeks suggested by Heller et al.⁸

The optimal time for an additional assessment should balance the need for multiple follow-up examinations with the potential benefit of diagnosing resolution at an earlier gestational age. Although the median gestational age for resolution was 29 weeks in our population, greater than 75% of women had resolution by 32 weeks' gestation. Performing repeated examinations before 32 weeks leads to additional US examinations and could potentially increase patient anxiety or iatrogenic interventions. When the cohort was examined separately, low-lying placentas resolved earlier than placenta previa, and the 75th percentile for resolution of a low-lying placenta between 10 and 20 mm corresponded to 31 weeks' gestation and 32 weeks' gestation for a low-lying placenta between 0.1 and 10 mm, respectively. The 75th

percentile for resolution of placenta previa corresponded to 34 weeks' gestation. Our findings should be viewed as reinforcement of professional society recommendations, which recommend additional US at 32 weeks' gestation or even deferring it to later in pregnancy.⁹ In particular, women with placenta previa who had resolution were more likely to do so later, and an initial additional assessment at a later gestational age would be reasonable.

The incidence and likelihood of resolution of placenta previa or a low-lying placenta vary widely in the literature. One explanation for this variation is heterogeneity in the timing of diagnosis (mid trimester versus anytime in the second or third trimester) as well as the type of placenta previa included (complete, marginal, or low-lying). Dashe et al⁷ conducted a cohort study of 714 pregnancies with placenta previa (complete or incomplete) diagnosed between 15 and 35 weeks' gestation. Placenta previa diagnosed in the mid trimester (between 15–19 and 20–23 weeks) persisted in 12% and 34% of women, respectively. Our study suggests a similar persistence in women with placenta previa diagnosed in the mid trimester, with 27.7% of women not having sonographic evidence of resolution in our cohort. Eichelberger et al⁶ noted a slightly lower persistence rate of 20% for patients with placenta previa; however, the timing of diagnosis was not limited to the mid-trimester. When limited to low-lying placentas, our combined resolution rate of 98.0% (derived from 581 of 593 patients with a low-lying placenta who resolved on follow-up US) mimics the resolution rates from 2 previous studies reporting resolution in 98.4% and 98.5% of patients with a low-lying placenta.^{5,8} However, those previous studies analyzed the resolution rate of any placenta within 20 mm of the internal os, whereas our study categorized low-lying placentas into 2 groups (within 10 mm and 10–20 mm) and determined the resolution rate for each. In doing so, we found near-universal resolution in women with an initial low-lying placenta greater than 10 mm from the internal cervical os (99.5%).

Our study did not identify an association between previous cesarean delivery and persistence of a low-lying placenta or placenta previa. Our study included a similar number of patients identified as having a previous cesarean delivery in the mid-trimester compared to the study conducted by Dashe et al.⁷ However, the analysis by Dashe et al⁷ was limited to patients with previa that completely covered the internal os, incompletely covered the internal os, or reached the margin of it.

Table 3. Predictors of Resolution of Placenta Previa Diagnosed at the Midtrimester Anatomy Scan

Characteristic	Resolution		
	n (%)	Adjusted HR	95% CI
Distance			
Placenta previa (n = 65)	47 (72.3)	Reference	
0.1–10 mm (n = 216)	206 (95.4)	1.52	1.15–2.01
≥10–20 mm (n = 377)	375 (99.5)	1.71	1.30–2.23
Parity			
Nulliparous (n = 287)	273 (95.1)	Reference	
Multiparous (n = 371)	355 (95.7)	1.22	1.04–1.44
Prior cesarean delivery			
Yes (n = 83)	75 (90.4)	1.04	0.82–1.33

HR indicates hazard ratio.

Therefore, we suspect the lack of an association between persistence of placenta previa or a low-lying placenta and prior cesarean delivery in our study to be a result of different inclusion criteria, as our study included predominantly patients with a low-lying placenta.⁷ The incidence of placenta accreta has increased dramatically in recent years, which is thought largely to be due to the increasing number of cesarean deliveries.¹⁶ Although we did not identify an association between prior cesarean delivery and resolution of placenta previa and low-lying placenta in our cohort, it is important for clinicians to evaluate the placental location (anterior and posterior) with the obstetric history to further guide patient counseling.

Usual obstetric practice is to perform cesarean delivery for patients with a low-lying placenta. This recommendation stems from the results of a study conducted by Oppenheimer et al.¹⁰ In their study, 7 of 8 patients with a low-lying placenta in the third trimester required cesarean delivery for bleeding complications related to their placental location.¹⁰ Another study by Matsubara et al¹⁷ similarly identified an increased risk of blood loss during vaginal delivery with a low-lying placenta; however, their study included all women with a placental edge within 40 mm of the internal cervical os and therefore makes these results difficult to generalize to usual obstetric practice. When they analyzed the 9 women with a low-lying placental edge within 20 mm of the internal os, there was no significant increase in blood loss at the time of vaginal delivery.¹⁷ Two previous studies addressed the mode of delivery in women with a low-lying placenta located within 20 mm of the internal cervical os in the third trimester.^{18,19} In a study conducted by Bronsteen et al,¹⁸ 76.5% of women with a placental edge between 10 and 20 mm in the third trimester were successful in delivering vaginally. Similarly, Vergani et al¹⁹ identified a much higher proportion of women who successfully delivered vaginally (69%) without increased rates of hemorrhage with a placental edge-to-os distance of greater than 10 mm. These studies suggest that vaginal delivery for women with a low-lying placenta, particularly the subset with a placental edge between 10 and 20 mm from the internal os in the third trimester, may be reasonable.

Our study had several strengths. Our institution performs universal transvaginal US for cervical length screening, which affords the best assessment of the placental location. Previous reports have demonstrated that

the use of transvaginal US for refinement of the placental location is more reliable for diagnosing a low-lying placenta or placenta previa than transabdominal US, which can overestimate the diagnosis.^{3,13} Our study represents a modern cohort and adds to the current body of literature regarding the incidence of a low-lying placenta and placenta previa and the likelihood of resolution. We used a survival analysis to determine the gestational age at resolution, which allowed us to take into account the varying intervals of follow-up US.

Our study also had limitations. Although we included a large proportion of women who returned for at least 1 follow-up US examination, almost 1 in 4 women did not receive an additional US examination in our unit. Additionally, only 51% of patients had an initial distance from the os measurement recorded for our secondary objective determination. This factor could have led to a selection bias. Given the retrospective design, we could not account for unmeasured factors that may have influenced the likelihood of persistence or resolution of a low-lying placenta or placenta previa. Additionally, as not all deliveries in our analysis occurred at our institution, we were unable to ascertain how many pregnancies were complicated by placenta accreta and therefore did not assess the potentially confounding effect of placenta accreta on the resolution rate. Finally, because our study was conducted at a tertiary center, our cohort was likely of higher risk and may have resulted in overestimation of the incidence of a low-lying placenta or placenta previa. This factor may reduce the generalizability of our findings.

In conclusion, most women with a diagnosis of a low-lying placenta or placenta previa at the midtrimester anatomy survey have resolution before delivery. The median time to resolution was 10 weeks from diagnosis (corresponding to 29 weeks' gestation in our cohort), with a 95th percentile of 17 weeks (corresponding to 36 weeks' gestation in our cohort). Women with a low-lying placenta between 10 and 20 mm from the internal os have near-universal resolution by the third trimester. This finding calls into question the utility of multiple follow-up US examinations in these patients. Our findings will be useful for patient counseling and for decision making regarding the timing of additional US examinations for placental location. The optimal timing should balance the potential benefit of diagnosing resolution at an earlier gestational age with the possible need for multiple additional US assessments.

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