

Sonographic assessment of placental migration in Second trimester low lying placenta

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ABSTRACT

To assess the migration of low lying placenta diagnosed in the second trimester ultrasonogram (USG). All the women attending antenatal OPD clinic had undergone routine obstetric USG in the second trimester (14 weeks onwards). Those cases who had low lying placenta lower edge of placenta within 3.0 cms from the cervical internal os were included in the study. These cases were subjected to be followed up at 4 weekly interval to repeated serial ultrasonogram by Transabdominal and /or Transvaginal USG well through 3rd trimester of pregnancy or delivery which ever was earlier. Of the total 1229 second trimester USG, 312 (25.3%) women had low lying placenta in the second trimester. Follow up of this 312 cases indicated that in 288 (92.4%) cases it had migrated to upper segment by 3rd trimester. The migration of placenta was 92.4% and 68.0 % where the distance between the leading edge of placenta and cervical internal os was more than 2.0 cm or less than 2 cm respectively. Migration was not observed in women where the distance was less than 1.5 cm. Placental migration was 94.5% in anteriorly situated placenta and 90.2 % in posteriorly situated placenta. The rate of placental migration was 95.1%, 77.7%, 55.5% in women who had previous normal delivery, previous caesarean delivery and prior history of dilatation and curettage (D & C) or manual removal of placenta (MRP), respectively. The prevalence of low lying placenta in 2nd trimester is 25.3%, which reduces to 7.3% at term. The rate of placental migration was over 90.0 %. Factor like initial distance between the lower edge of the placental and cervical internal os, placental position and previous birth by caesarean section influence the placental migration.

Keywords: Low lying placenta, placenta praevia, placental migration.

INTRODUCTION

Placental migration is a phenomenon that document the presence of low lying placenta or placenta praevia in the 2nd trimester of pregnancy with subsequent conversion to upper uterine segment placenta by the end of the 3rd trimester. This phenomenon has been well documented since the advent of transabdominal sonogram.¹⁻⁴ Sonographic diagnosis of placenta praevia has an excellent record of accuracy and safety.^{1,3} Transvaginalsonography is superior to transabdominal as it allows accurate visualization of cervical internal os and lower edge of placenta to be recognized at any stage of the pregnancy and exact relationship between the edge of placenta and internal cervical os can be accurately measured.^{4,5} The prevalence of low lying placenta in the 2nd trimester where the placenta is lying within 3.0 cm from the internal os ranges from 6-46% and reduces to as low as 0.5 % at term.^{1,2,6} The high rate of false positive diagnosis of placenta praevia in early pregnancy is explained by the false impression of lower part of the uterus by the over distended bladder required during abdominal ultrasound examination. It is also explained by the concept of "migration" the term used in literature to describe the positional changes of the lower margin of the placenta from the lower segment to the upper uterine segment. It is related to atrophy of the placental margin due to a poor vascular supply, compared with other placental regions

that continue to grow and therefore migrate towards more vascular sites. In addition it is also possible that the placenta only appears to migrate to a more fundal position with advancing pregnancy because of more rapid growth of the lower uterine segment. It seems likely that both of these mechanisms operate in placental migration.⁵⁻¹⁰ It appears that the rate of caesarean delivery has been increasing steadily over the past two decades. Some studies, have observed an increased frequency of placenta praevia among women with a prior history of caesarean delivery or abortion suggesting an association with surgical procedures that disrupts the uterine cavity.¹¹ The present study was undertaken to evaluate the phenomenon of placental migration and the factors influencing the placental migration.

MATERIALS AND METHODS

All antenatal women attending obstetrics and Gynaecology Department of Nepal Medical College Teaching Hospital from 1st Kartik 2066 to 31st Chaitra 2067 (18thOct 2009 -14thApril 2011) had referred to Radiology department for routine Obstetric Sonogram at 2nd trimester. All patients with low lying placenta that is placenta lying within 3.0 cm of the cervical internal os or overlapping it were included in the study.

Those ladies who had lower lying placenta or placenta

prævia at Obstetric transabdominal USG were subjected to repeat serial 4 weekly interval USG (transabdominal or transvaginal, Model Toshiba Nemid Mode SSA-550A., Vaginal probe-PVF-620ST, 6MHZ) according to the necessities until either the lower edge of the placenta migrated up into upper segment of uterus by 3.0 cm or more from the center of internal os or the patient had delivered, whichever is earlier. The placental distance from the internal cervical os was measured in a longitudinal and axial scan of the cervix in all patients. The line of 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 in centimeters and the films were later inspected for quality and accuracy. A total placental prævia was diagnosed if the placental tissue extended to or covered the internal cervical os. When the placental edge was visible but did not cross the internal os, the smallest intervening distance was measured. We only included in the analysis those cases with the lower edge of the placenta was 3.0 cm or less from the internal cervical os. The attending Obstetrician was informed of the USG finding but the management decision was based on the usual clinical parameters.

RESULTS

A total of 1228 antenatal women had routine obstetric ultrasonogram in second trimester, during the study period of 18 months (14thOct2009-14thApril2011). Out of these, 312 cases (25.3%) had low lying placenta in second trimester ultrasonogram. Follow up USG of these 312 cases at four weeks interval well into the late 3rd trimester showed that 288 cases (92.3%) had migrated to upper uterine segment and 24 cases (7.6%) remained with low lying placenta. This resulted in the prevalence of low lying placenta to be 7.6 % around term (Table-1).

Table-1: Prevalence of low lying placenta in second trimester of pregnancy and rate of placental migration

No. of second trimester low lying placenta	No. of low lying placenta at term	Rate of placental migration
n. (%)	n. (%)	92.3%
312 (25.3)	24 (7.6)	

Age and parity of the women did not influence either the incidence or the migration of low lying placenta in the present study.

The rate of placental migration depends upon the initial distance between the lower edge of the placenta and internal cervical os the placental migration occurred in 92.3 % (240/260) where the lower edge of placenta lies up more than 2.0 cm from the internal cervical os. Only 68.1% (30/44) migration was observed where the distance was in the range of 1.5-2.0 cm. None of the low lying placenta showed migration where the initial distance was less than 1.5 cm (Table-2).

Table-2: Placental migration in relation to initial distance from internal cervical OS

Initial distance from internal OS	No. of second trimester low lying placenta	No. of placenta migrated	Percentage of migration
<1.5 cm	08	00	0
1.5-2 cm	44	30	68.1%
2.1-3 cm	260	240	92.3%

The rate of placental migration was 95.0% in women with previous vaginal deliveries when compared with women having previous caesarean section delivery at 77.7% and women with prior history of dilatation and curettage or manual removal of placenta (MRP) at 55.5% (Table-3).

Table-3: Relation between previous pregnancy events or outcome and placental migration

Pregnancy events/ outcome	No. of second trimester low lying placenta	No. of placenta migrated	Percentage of migration
Vaginal delivery	267	254	95.1%
Caesarean section	36	28	77.7%
D&C/ MRP	09	06	55.5%

Anteriorly situated placenta showed placental migration at the rate of 94.5% (121/128) slightly higher than posteriorly situated placenta 90.5% (167/184). But the difference was not statistically significant (Table-4).

Table-4: Placental migration in relation to the position of placenta

Position of placenta	No. of low lying placenta in second trimester	No. of placenta migrated	Percentage of migration
Anterior	128	121	94.5%
Posterior	184	167	90.5%

DISCUSSION

Placenta prævia are now diagnosed before they become symptomatic with the practice of routine obstetric USG from second trimester onwards.^{4,7} The incidence of sonographically diagnosed low lying placenta in the second trimester range from 6-46% [Ghourab 2000 reported 6-46%, Mustafa *et al* in 2002 reported 3.9% and Chama *et al* 2004 reported 14.6% of placenta to be low lying in the second trimester.^{2,8-10} This rate however decreases to as low as 0.5% at term.^{2,8-10}

In this study the prevalence of low lying placenta in second trimester is 25.3% which decreases to 7.6% by third trimester both of which is higher compared to other studies.^{1,2,8-10} The factors responsible for this increased prevalence could be due to increased number of antenatal

women undergoing routine obstetric ultra-sonogram (USG) in early second trimester, repeated ultra-sonogram for assessment of migration of low lying placenta, not enough use of transvaginal ultra-sonogram with due time required for complete visualization of internal cervical os and ever increasing prevalence of caesarean section birth over a decade in this institution.

Studies 2-10 has demonstrated progressive migration of low lying placenta during the third trimester. The mechanism by which the placenta migrates away from the cervix and lower uterine segment with advancing gestational age is not fully understood. It seems possible that atrophy of thin portion of placenta implanted over the cervix can occur due to poor blood supply whilst other placental region migrates towards more vascular sites. This process has been called trophotropism, the tendency to grow towards better nutrition and away from poorer nutrition states.¹¹ This may explain why we observe migration in some placenta which overlapped the cervical internal os by up to 20 mm, whilst a greater degree of overlap beyond the body of cervix would establish an improved blood supply and atrophy less likely to occur. Alternatively or additionally, uptake of the lower segment of uterus may contribute to an apparent change in placental change.¹⁰ Placental migration observed depends mainly on the initial distance between the lower leading edge of placenta and the internal cervical os. In this study the migration rate was maximum when the distance was more than 2.0 cm and beyond. When the placenta edge overlaps the internal cervical os by 20.0 mm or more placental migration did not occur and all patients required elective caesarean section. These findings were similar to other studies.^{4,6,8,12} Which reported a mean placental edge to internal cervical os distance measured five weeks prior delivery of 1.1 cm (range 0-2.0cm) in cases requiring a caesarean section as opposed to 3.1cm in those delivering vaginally.^{11,12}

In the present study placental migration was observed slightly more frequently in anterior placenta 94.5 % compare to posterior 90.5% which is similar to other studies.^{4,6} But the difference was not statistically significant in all above studies. No significant placental migration was observed in either anterior or posterior low lying placenta after 36 week of gestation.

Women with prior caesarean section are more likely to have increased incidence as well as persistence of low lying placenta. Almost four decades ago Bender,³ first observed an increased frequency of placenta praevia among women with uterine scarring (caesarean delivery or abortion) in prior pregnancy. Damage to the endometrial and myometrial uterine lining can predispose to a low implantation of the placenta in the uterus. likewise curettage of uterus during spontaneous or induced abortion may significantly damage the endometrium and the uterine cavity so as to predispose to low implantation of the placenta and also impairs the ability of placenta to migrate.¹¹ Women with at least one prior caesarean section were 2-6 times at greater risk for development of placenta praevia in the subsequent

pregnancy and in women with prior MRP, the risk was 1.7 times higher.^{11,14}

Advancing maternal age and multi parity are risk factor for low lying placenta in the mid trimester but they do not appear to be risk factor for the persistence of placenta praevia at the term. Age and parity didnot affect the rate of migration of low lying placenta in our study.

Low lying placenta is a matter of concern in the clinical management. Ninety percent of second trimester low lying placenta migrates to the upper segment when followed with sonogram at 4th weekly interval till term. However the low lying placenta with low distance less than 2.0cm from the internal cervical os, migration is only 60.0%. Factors like prior LSCS and D&C and MRP may hinder the placental migration.

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