Evaluating the Safety of Labour in Women With a Placental Edge 11 to 20 mm From the Internal Cervical Os

Khalid Al Wadi, MD,[1,2] Carol Schneider, MD,[1] Craig Burym, MD,[1] Gregory Reid, MD,[1] Jennifer Hunt, MD,[1] Savas Menticoglou, MD[1]

[1]Women's Hospital, Department of Obstetrics, Gynaecology and Reproductive Sciences, University of Manitoba, Winnipeg MB

[2]Women's Specialized Hospital, King Fahad Medical City, Riyadh, Saudi Arabia

Abstract

Objective: The purpose of this study was to evaluate pregnancy outcomes in a cohort of women with a placental edge between 11 and 20 mm from the internal cervical os, and to determine the likelihood of a successful vaginal delivery when trial of labour is attempted in these women.

Methods: We carried out a prospective observational study of women with singleton pregnancies and a placental edge between 11 and 20 mm from the internal cervical os (identified by transvaginal sonography) who underwent a trial of labour.

Results: Fourteen women with the above characteristics underwent a trial of labour during the study period. The mean interval (± SD) from ultrasound to delivery was 17.2 ± 9.6 days. Thirteen women (92.9%) delivered vaginally with no complications, and only one woman (7.1%) required an emergency Caesarean section for intrapartum bleeding. The risks of antepartum and postpartum hemorrhage were 21.4% and 14.3%, respectively.

Conclusion: Having a placental edge more than 10 mm from the internal os, measured by transvaginal sonography near term, justifies allowing a trial of labour and carries a low risk of subsequent obstetrical hemorrhage.

Résumé

Objectif : Cette étude avait pour objectif d'évaluer les issues de grossesse au sein d'une cohorte de femmes qui présentaient un pourtour placentaire se situant à 11-20 mm d'écart par rapport à l'orifice cervical interne; elle cherchait également à déterminer la probabilité d'un accouchement vaginal réussi lorsqu'un essai de travail est tenté chez de telles femmes.

Méthodes : Nous avons mené une étude observationnelle prospective portant sur des femmes qui connaissaient une grossesse monofœtale, qui présentaient un pourtour placentaire se situant à 11-20 mm d'écart par rapport à l'orifice cervical interne (identifié par échographie transvaginale) et qui ont tenté un essai de travail.

Résultats : Quatorze femmes présentant les caractéristiques susmentionnées ont tenté un essai de travail au cours de la période d'étude. L'intervalle moyen (± σ) entre l'échographie et l'accouchement a été de 17,2 ± 9,6 jours. Treize femmes (92,9 %) ont connu un accouchement vaginal sans complications; une seule femme (7,1 %) a nécessité une césarienne d'urgence en raison de la présence de saignements pendant la période intrapartum. Les risques d'hémorragie antepartum et postpartum étaient de 21,4 % et de 14,3 %, respectivement.

Conclusion : La constatation d'un pourtour placentaire se situant à plus de 10 mm d'écart par rapport à l'orifice cervical interne (mesuré par échographie transvaginale peu avant le terme) justifie la tenue d'un essai de travail et ne s'accompagne que d'un faible risque d'hémorragie obstétricale subséquente.

Key Words: Placenta previa, low-lying placenta, transvaginal sonography, Caesarean section, trial of labour

Competing Interests: None declared.

Received on December 9, 2013

Accepted on February 14, 2014

J Obstet Gynaecol Can 2014;36(8):674–677

INTRODUCTION

The classical description of placenta previa relates to the degree to which the placenta encroaches on the cervix. Placenta previa is classified as complete or centralis, partialis, or marginalis. This classification was based on digital palpation of the edge of the placenta through the dilated cervix in cases of antepartum hemorrhage.[1] This remained unchanged until the application of ultrasound in the diagnosis of placenta previa became widespread.[1] Initially, transabdominal sonography was used for this purpose, but this approach was found to have false-positive and false-negative rates of

at least 10%.[2,3] The advent of high-resolution transvaginal transducers led to significant diagnostic improvement, to the point that the exact distance from the placental edge to the internal cervical os can be accurately measured to the nearest millimetre.[4–7] Transvaginal sonography has proved to be a safe procedure in the assessment of women with placenta previa and APH, and it is greatly superior to transabdominal sonography in accurately predicting placental location at delivery.[4,5,8] TVS has therefore become the standard for the diagnosis of placenta previa.[9]

The term "low-lying placenta" refers to a placenta that extends into the lower uterine segment, and it is typically used in cases where the placental edge is 20 mm or less from the internal cervical os. This minimum distance of 20 mm has become the generally accepted threshold for performing Caesarean section to prevent obstetrical hemorrhage resulting from proximity of the placenta to the cervix.[9,10] However, there is very little evidence to support this 20 mm threshold. The Society of Obstetricians and Gynaecologists of Canada, in the 2007 Clinical Practice Guideline "Diagnosis and Management of Placenta Previa," called for further studies to better establish the relationship between the placenta-to-cervix distance and the likelihood of subsequent maternal hemorrhage during labour for patients with low-lying placenta.[9]

The purpose of this study was to evaluate the pregnancy outcomes in women with a placental edge between 11 and 20 mm from the internal cervical os, and specifically to determine the likelihood of a successful vaginal delivery when a trial of labour is attempted in these women.

METHODS

We carried out a prospective observational study of all women with singleton pregnancies in our hospital who had a placental edge between 11 and 20 mm from the internal cervical os and who attempted vaginal delivery. We recruited participants between August 2010 and June 2013 in our tertiary-level obstetrical unit, which has approximately 5400 deliveries per year.

All women who presented with APH and/or the ultrasound diagnosis of placenta previa or low-lying placenta were referred for further evaluation in the fetal assessment unit in our centre. All women underwent an initial TVS, and if a low-lying placenta was identified, serial TVS examinations were performed before delivery, according to our departmental protocol. All women with low-lying placenta were identified at presentation and their clinical information recorded for future follow-up. All of these women had at least one TVS at approximately 36 weeks' gestation to aid in deciding about mode of delivery.

Eligible women, in whom the placental edge was between 11 and 20 mm from the internal cervical os at approximately 36 weeks' gestation, with a singleton fetus in a cephalic presentation, and with no contraindications to vaginal delivery, were counselled regarding a TOL by a member of the maternal-fetal medicine team.

All participants were admitted to the high-risk labour and delivery unit when they presented in labour. All had intravenous access established and were cross-matched for blood to be available.

Data collected included antenatal medical or obstetrical complications, occurrence of antepartum, intrapartum, or postpartum hemorrhage, progress in labour, mode of delivery, indications for intrapartum interventions, requirement for blood transfusion, and maternal and neonatal complications.

Ethics approval was obtained from the Research Ethics Board of the University of Manitoba Bannatyne Campus.

RESULTS

During the study period, 17 women met our study eligibility criteria. All women were counselled about the ultrasound findings and were offered a vaginal delivery. In three cases, the attending obstetrician decided with the patient to proceed with an elective Caesarean section solely because the low-lying placenta had been identified. Elective Caesarean section was performed in these three cases with no maternal or neonatal complications.

Fourteen women underwent a TOL at our centre in accordance with our study protocol. The mean (± SD) gestational age at the final TVS was 37+5 weeks ± 12.6 days and the mean ultrasound-to-delivery interval was 17.2 ± 9.6 days (Table 1).

Of these 14 women, three (21.4%) had a history of APH. All were very mild episodes requiring no intervention other than admission to hospital for several days of observation. No emergency Caesarean section was prompted by antepartum bleeding, nor was blood transfusion required. All three women subsequently delivered vaginally.

One woman had three episodes of mild APH, once at 29 weeks and twice at 40 weeks. All bleeding episodes stopped during observation without intervention in hospital. At 41+0 weeks' gestation, this woman presented

ABBREVIATIONS

APH	antepartum hemorrhage
TOL	trial of labour
TVS	transvaginal sonography

Table 1. Summary of the population and delivery characteristics

Characteristic	Placental edge to internal cervical os distance of 11 to 20 mm (n = 14)
Maternal age, years*	31.8 ± 5.3
Nulliparity, n (%)	5 (35.7)
Scan to delivery interval in days*	17.2 ± 9.6
Gestational age at last TVS*	37+5 weeks ± 12.6 days
Gestational age at delivery*	40+1 weeks ± 6.9 days
Anterior placenta, n (%)	4 (28.6)
Antepartum hemorrhage, n (%)	3 (21.4)
Intrapartum bleeding, n (%)	2 (14.3)‡
Postpartum hemorrhage, n (%)	2 (14.3)
Emergency Caesarean section, n (%)†	1 (7.1)
Birth weight, grams*	3565 ± 615

*Mean ± SD.

†Indication for emergency Caesarean section: intrapartum vaginal bleeding.

‡One of these women delivered vaginally and the other required emergency Caesarean section.

Table 2. Proposed tool for counselling patient regarding mode of delivery based on placental edge to internal cervical os distance measured by TVS near term

Placental edge to internal cervical os distance, mm	Recommended mode of delivery
0 to 10	Caesarean section
11 to 20	TOL in a high risk labour and delivery unit
> 20	Normal intrapartum care

in spontaneous labour and had mild intrapartum bleeding. She delivered vaginally without complication and needed no interventions. Her live born female infant had Apgar scores of 7 and 8 at one and five minutes respectively and an umbilical artery pH of 7.24.

Of the 14 women who underwent TOL, 13 (92.9%) successfully delivered vaginally and only one (7.1%) required an emergency Caesarean section for intrapartum bleeding. This latter patient had a posterior placenta with the edge 17 mm from the internal cervical os at five days before delivery. She had no episodes of APH and presented in spontaneous labour at 40 weeks' gestation. At 5 cm cervical dilatation, she had intrapartum vaginal bleeding judged significant enough to warrant an emergency Caesarean section. No complications occurred during delivery, and the estimated blood loss was normal. Her male infant had Apgar scores of 9 and 9 at one and five minutes respectively and an umbilical artery pH of 7.31. Her postoperative hemoglobin concentration was 132 g/L, and no blood transfusion was required.

Two cases (14.3%) of postpartum hemorrhage occurred; both were managed with the administration of uterotonics, and neither woman required blood transfusion.

Two newborns had an Apgar score < 7 at five minutes. Both had 10-minute Apgar scores of 7 and an umbilical artery pH of 7.20. No infants required NICU admission.

DISCUSSION

In its 2007 Clinical Practice Guideline for diagnosis and management of placenta previa, the SOGC issued a category II-2A recommendation that "the os-placental edge distance of 0 to 20 mm away from the os is associated with a higher CS rate, although vaginal delivery is still possible depending on the clinical circumstances."[9]

The 20 mm threshold resulted from the 1991 retrospective study by Oppenheimer et al., in which the use of TVS in women with low-lying placentas was evaluated.[6] The authors reported that seven of eight women with a placental edge 20 mm or less from the internal cervical os were delivered by Caesarean section because of bleeding. They concluded that a placental edge more than 20 mm from the internal cervical os, measured by TVS, reliably predicted a safe vaginal delivery. In their study, a placental edge less than 20 mm from the internal os was often associated with increased risk of antepartum or intrapartum bleeding necessitating Caesarean section.[6]

Three subsequent studies confirmed that a placental edge to cervical os distance > 20 mm was associated with safe vaginal delivery.[11–13] Twenty millimetres then became a minimum distance required for a TOL, and women with measurements of 20 mm or less were usually delivered by elective Caesarean section.[9,10]

More recent studies, however, have questioned the appropriateness of this distance (≤ 20 mm) as an indication for Caesarean section. Vergani et al., in a retrospective study, described the outcome of expectant management in a series of 53 women with a placental edge to internal cervical os distance of between 1 and 20 mm, measured by TVS.[14] These women were subdivided into two groups: those in whom the placental edge was 1 to 10 mm from the internal cervical os (24 cases) and those in whom the placental edge was 11 to 20 mm from the internal os (29 cases). The risk and severity of APH was higher in the 1 to 10 mm group than in the 11 to 20 mm group (29% vs. 3%). Of the seven women with APH in the 1 to 10 mm group, three required emergency Caesarean section. On the other hand, none of the 11 to 20 mm group needed Caesarean section for APH. Twenty of the 29 women in the 11 to 20 mm group had a TOL, and none required Caesarean section for intrapartum bleeding.[14]

In another retrospective observational study evaluating the effect of the distance from placental edge to internal os on mode of delivery, vaginal delivery was successful for 76.5% of the 34 women with an 11 to 20 mm distance who underwent TOL.[15] Eight women (23.5%) required an emergency Caesarean section for either bleeding or failure to progress in labour.[15] The authors did not mention the number of emergency Caesarean sections performed for intrapartum vaginal bleeding.

When our data are pooled with the data of Vergani et al.[14] and Dawson et al.[11] (since these studies reported the number of Caesarean sections done for intrapartum bleeding), we see that emergency Caesarean section for intrapartum vaginal bleeding was required in only three of 41 women who underwent TOL (7.3%) with a distance from placental edge to internal os of 11 to 20 mm**.** Our data, and those of others, support the following management of women near term with a low-lying placenta visualized by TVS:

1. if the distance from placental edge to internal os is more than 20 mm, no change in obstetrical management is required;
2. if this distance is 11 to 20 mm, expectant management with admission at onset of labour to a high-risk labour and delivery unit is recommended, with Caesarean section reserved for those who develop an indication intrapartum;
3. if the placental edge is less than 10 mm from the internal os, delivery by elective Caesarean section is indicated, as the risk of obstetrical hemorrhage is high (Table 2).

This classification of the management of placenta previa was first suggested by Oppenheimer and Farine.[16]

One of the problems encountered in all of the published studies to date, including ours, is the effect of antepartum diagnosis of low-lying placenta on the attending obstetrician's willingness to undertake expectant management, or willingness not to intervene when mild intrapartum vaginal bleeding is observed. In our series, in three women eligible for a TOL the attending obstetrician recommended an elective Caesarean section in the absence of any other obstetrical indication.

We acknowledge that a limitation of this study was the small sample size. Nevertheless, we hope that our results (consistent with those of Vergani et al.[14] and Dawson et al.[11]) will provide further reassurance to obstetricians about the safety of TOL in women with a placental edge more than 10 mm from the internal cervical os.

CONCLUSION

A placental edge that is ≤ 20 mm from the internal os on TVS has become an accepted indication for performing elective Caesarean section in women near term. However, a placental edge that is 11 to 20 mm from the internal os, measured by TVS at approximately 36 weeks' gestation, appears safe to justify a TOL and carries a low risk of subsequent obstetrical hemorrhage.

ACKNOWLEDGEMENT

The authors wish to thank the Fetal Assessment Unit nurses and clerks for help and support.

REFERENCES

1. Stander HJ. Hemorrhage. Williams obstetrics. 7th ed. New York: Appleton Century; 1936.
2. Cotton DB, Read JA, Paul RH, Quilligan EI. The conservative aggressive management of placenta previa. Am J Obstet Gynecol 1980;137:687–95.
3. Smith RS, Lauria MR, Comstock CH, Treadwell MC, Kirk JS, Lee W, Bottoms SF. Transvaginal ultrasonography for all placentas that appear to be low-lying or over the internal cervical os. Ultrasound Obstet Gynecol 1997;9(1):22–4.
4. Farine D, Peisner DB, Timor-Tritsch IE. Placenta previa—is the traditional diagnostic approach satisfactory? J Clin Ultrasound 1990;18:328–30.
5. Leerentveld RA, Gilberts ECA, Arnold MJC, Waldimiroff JW. Accuracy and safety of transvaginal sonographic placental localization. Obstet Gynecol 1990;76:759–62.
6. Oppenheimer LW, Farine D, Ritchie JW, Lewinsky RM, Telford J, Fairbanks LA. What's a low-lying placenta? Am J Obstet Gynecol 1991;165:1036–8.
7. Trimor-Tritsch IE, Yunis RA. Confirming the safety of transvaginal sonography in patients suspected of placenta previa. Obstet Gynecol 1993;81:742–4.
8. Farine D, Fox HE, Jakobson S, Timor-Tritsch IE. Is it really placenta previa? Eur J Obstet Gynecol Reprod Biol 1989;31:103–8.
9. Oppenheimer L; SOGC Maternal Fetal Medicine Committee. Diagnosis and management of placenta previa. SOGC Clinical Practice Guideline no. 189, March 2007. J Obstet Gynaecol Can 2007;29(3):261–73.
10. Royal College of Obstetricians and Gynaecologists. Placenta praevia, placenta praevia accreta and vasa praevia: diagnosis and management. Green-top guideline No. 27. January 2011. Available at: http://www.rcog.org.uk/womens-health/clinical-guidance/placenta-praevia-and-placenta-praevia-accreta-diagnosis-and-management. Accessed November 5, 2013.
11. Dawson WB, Dumas MD, Romano WM, Gagnon R, Gratton RJ, Mowbray RD. Translabial ultrasonography and placenta previa: does measurement of the os-placenta distance predict outcome? J Ultrasound Med 1996;15:441–6.
12. Bhide A, Prefumo F, Moore J, Hollis B, Thilaganathan B. Placental edge to internal os distance in the late third trimester and mode of delivery in placenta praevia. BJOG 2003;110:860–4.
13. Sallout B, Oppenheimer LW. The classification of placenta previa based on os-placental edge distance at transvaginal sonography. Am J Obstet Gynecol 2002;187(6): S94.
14. Vergani P, Ornaghi S, Pozzi I, Beretta P, Russo FM, Follesa I, Chidini A. Placenta previa: distance to internal os and mode of deliver. Am J Obstet Gynecol 2009;201:266–8.
15. Bronsteen R, Valice R, Lee W, Blackwell S, Balasubramaniam M, Comstock C. Effect of a low-lying placenta on delivery outcome. Ultrasound Obstet Gynecol 2009;33:204–8.
16. Oppenheimer LW, Farine D. A new classification of placenta previa: measuring progress in obstetrics. Am J Obstet Gynecol 2009;201:227–9.