Fetomaternal Outcome according to Placental Position in Placenta Previa (PP)

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Abstract

Background: Placenta Previa is a leading cause of hemorrhage and is potentially fatal complication for the mother. In addition, pregnancies complicated by (Placenta previa) are at higher risk for adverse perinatal outcome: IUGR, prematurity and perinatal mortality. These finding may result from pathological implantation of the placenta that interfere with normal placental function and leads to abnormal fetal growth.
Aim of the study: To elucidate whether the location of placenta below uterine incision in caesarean section is important in development of fetomaternal complication in placenta previa patients.
Patients and methods: The study was conducted between 1st of March 2012 and 30th of May 2013 in the department of Obstetrics and Gynecology, Baghdad Teaching Hospital, Medical City Complex, Baghdad, Iraq. The study conducted on 100 patients starting at 32 weeks of gestation on ward being diagnosed as placenta previa by ultra sound scan; the subjects are divided into 2 groups: group (a) placenta is located in anterior wall of lower uterine segment. Group (b) placenta is located in posterior wall of lower uterine segment. The results of the 2 groups were compared to each other regarding fetomaternal complications.
Results: eighty five patients were found to have anterior placenta previa and 15 were posterior. Analysis of data show that antepartum hemorrhage, number of c/s, hysterectomy and placenta accreta, hospital staying (days) were significantly higher in anterior group with p value 0.017,0.006,0.027,0.032,0.008 respectively, while there was no statistically significant difference regarding maternal age, number of abortions, history of curettage, number of curettage, birth weight, apgar score1 and 5, neonatal care admission, blood transfusion, oversewing, visceral injury and maternal death.
Conclusions: anterior previa is more dangerous than posterior previa in view of increasing maternal and neonatal morbidity such as excessive blood loss, massive transfusion, placenta accreta and hysterectomy, as well as perinatal morbidity.
Key Words: Fetomaternal outcome, placental position, and placenta previa

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Introduction:

Placenta Previa is a leading cause of hemorrhage and is potentially a fatal complication for the mother[1]. Other complication include: disseminating intravascular coagulation, transfusion reactions, surgical morbidity includes emergency hysterectomy[2].

In addition, pregnancies complicated by (Placenta previa) are at higher risk for adverse perinatal outcome : IUGR, prematurity and perinatal mortality. These finding may result from pathological implantation of the placenta that interfere

with normal placental function and leads to abnormal fetal growth [3].

The most characteristic event in PP is painless hemorrhage which usually does not appear until near the end of the second trimester or after. Some abortions, however, may result from such an abnormal location of the developing placenta. [4] generally first episode of bleeding occurs before 32 weeks 10%, 32-36th Week 30%, after 36th week 60%.[5] . Frequently bleeding from (PP) has it's onset without warning, presenting without pain in a woman who had an uneventful prenatal course. [6] Fortunately, the initial bleeding is rarely so profuse as to prove fatal. Usually it ceases spontaneously, only to recur in some women, particularly those with a placenta implanted near but not over the cervical os, also can provoke by digital examination or intercourse. [7] Bleeding does not appear until the onset of labour, when it may vary from slight to profuse hemorrhage and clinically may mimic placental abruption or vasa previa which can be differentiated by U/S. [8] When the placenta is located over the internal os, the formation of the lower uterine segment and the dilatation of the internal os result inevitably in tearing of placental attachments .The bleeding is augmented by the inherent inability of the myometrial fibers of the lower uterine segment to contract and thereby constrict the torn vessels. [9] Hemorrhage from the placental implantation site in the lower uterine segment may continue after delivery of the placenta, because the lower uterine segment contracts poorly compared with the uterine body.Bleeding may also result from laceration in the friable cervix and lower uterine segment, especially following manual removal of a somewhat adherent placenta. [10] (PP) may be associated with placenta accreta or one of its more advanced forms, placenta inccreta or perccreta, such abnormally firm attachment of the placenta might be anticipated because of poorly developed decidua in the lower uterine segment. [11] PP should always be suspected in women with uterine bleeding during latter half of pregnancy. The possibility of PP should not dismissed until sonographic evaluation has clearly proved its absence. [10]

Patient & Methods:

This study was conducted as Descriptive observational study on placenta previa with some analytic elements on the association of site with different feto-maternal characteristics and associated factors. Between 1st of March 2012 and 30th of May 2013 . Approval for performing this study was obtained from Ethical Committee in the department of Obstetric and Gynaecology of Baghdad teaching Hospital. This hospital provided a tertiary care and equipped with surgical theater / a blood bank and an Obstetrical and Neonatal intensive care unit .Teams of Obstetricians, anesthesiologists and intensive care specialists are available around the clock. Specialists of other clinical or surgical fields working in other units of the hospital are readily available for consultation. The protocol of the study was certified by Obstetrics and Gynaecology Committee of Arab Board for Medical specializations.

100 pregnant women were included in our study. Those pregnant women either attended the hospital directly or referred from Antenatal clinic (ANC) or from primary health center or private clinic.

All women who included in this study had singleton pregnancy with ultrasound report show placenta previa in their 3rd trimester and end with c/s. For each patient a specific questionnaire was filled and verbal consent was taken from all included women.

Inclusion criteria: Pregnant ladies of different age groups in their third trimester and had placenta previa diagnosed by

ultrasound and confirmed during c/s. Gestational age was estimated based on the first day of the last menstrual period or ultrasonographically if the date was unknown or uncertain.

Exclusion criteria: Those pregnant ladies with past medical history of diabetes, multiple gestation, other cases rather than placenta previa like placental abruption, other pregnancy with normally sited placenta.

The gestational age, of the study group started from 32 week on ward being diagnosed as PP by U/S scan.

This study sample was divided into two groups:

1.Anterior group: where the placenta was located on anterior wall of lower uterine segment by ultra sound and their number was 85.

2.Posterior group: where the placenta was located on the posterior wall of lower uterine segment by ultra sound and their number was 15.

The results of the 2 groups were compared to each other regarding the complications that occur to the mother which include; bleeding, blood transfusion, placenta accreta, need for hysterectomy, post-operative morbidity and mortality and hospital staying, as well as fetal outcome.

Results:

The study was conducted between 1st of March 2012 and 30th of May 2013. The study conducted on 100 patients, 85 were found to have anterior placenta previa and 15 were posterior. Analysis of data show that antepartum hemorrhage, number of c/s, hysterectomy and placenta accreta, hospital staying (days) were significantly higher in anterior group with p value 0.017,0.006,0.027,0.032,0.008 respectively, while there was no statistically significant difference regarding maternal age, number of abortions, history of curettage, number of curettage, birth weight, apgar score1 and 5, neonatal care admission, blood transfusion, oversewing, visceral injury and maternal death.

Table 3.1: maternal age distribution in placenta previa

Age	NO.	Percentage %
20--24	10	10.0
25--29	16	16.0
30--34	41	41.0
35--39	27	27.0
=>40years	6	6.0

Table 3.2 shows different maternal characteristics in relation to placenta previa where we found that 51% of patients were gravida 5 and above, 27% were para three, 70% had no history of abortion, 29% had history of curettage where 69% of them had history of one curettage, 55% of them had history of antepartum hemorrhage, 84% were are Rh positive and 84% had history of previous c/s.

Table 3.2: Different maternal characteristics in relation to placenta previa

		No	%
Gravid	G1	3	3.0
	G2	12	12.0
	G3	12	12.0
	G4	22	22.0
	G5&more	51	51.0
	Mean±SD(Range)	4.61±1.87	1-9
Parity	P0	6	6.0
	P1	7	7.0
	P2	18	18.0
	P3	27	27.0
	P4	22	22.0
	P5&more	20	20.0
	Mean±SD(Range)	3.44±1.45	1-8
Abortion	Yes	30	30.0
	No	70	70.0
	Mean±SD(Range)	1.40±0.67	1-4
History of curettage	Yes	29	29.0
	No	71	71.0
Number of curettage	Once	20	69.0
	Twice	8	27.6
	More than 2	1	3.4
APH	Yes	55	55.0
	No	45	45.0
Rh Blood group	Rh-ve	16	16.0
	Rh+ve	84	84.0
ABO Blood group	A	22	22.0
	AB	25	25.0
	B	31	31.0
	O	22	22.0
CS	Yes	84	84.0
	No	16	16.0
	Mean±SD(Range)	2.99±1.41	1-6
GA at presentation	Mean±SD(Range)	33.8±2.3	30-39
GA at delivery	Mean±SD(Range)	35.7±1.7	32-39

The table 3.3 show 50% of the neonate were male and 50% were female , 40% were 3000gram weight with Mean±SD(Range) 2869.5±443.2, 85% were poor apgar score <7 at 1 minute , 75% had good apgar score >7 at 5 minutes, and 17% had history of neonatal care admission.

Table 3.3: neonatal characteristic in placenta previa

		No	%
Sex of the baby	Male	50	50.0
	Female	50	50.0
Birth weight (grams)	<2500	19	19.0
	2500--	33	33.0
	3000--	40	40.0
	3500--	8	8.0
	Mean±SD(Range)	2869.5±443.2	1800-3800
Apgar 1 score	Dead	1	1.0
	Good (=>7)	14	14.0
	Poor (<7)	85	85.0
	Mean±SD(Range)	5.25±1.42	0-8
Apgar 5 score	Dead	1	1.0
	Good (=>7)	75	75.0
	Poor (<7)	24	24.0
	Mean±SD(Range)	7.34±1.37	0-10
NCU	Yes	17	17.0
	No	**83**	**83.0**

Table 3.4 show maternal complications were in our study 39% of the patients had hysterectomy ,73% had blood transfusion with mean 5.82±3.38 pints, 38% were placenta accreta and 26% ended with oversewing there was only one maternal death and 21% had bladder injury and mean days of hospital staying were 5.35±2.02days.

Table 3.4: Maternal complications in placenta previa

	No	%
Hysterectomy	39	39.0
Blood transfusion	73	73.0
Blood transfusion number	5.82±3.38	1-13
Oversewing	26	26.0
Placenta accreta	38	38.0
Maternal death	1	1.0
Visceral injury (Bladder)	21	21.0
Hospital stay (days)	5.35±2.02	3-10

Table 3.5 show Placenta previa site association with maternal characteristics where we found that there was no statistically significant difference related to maternal age, gravida, number of abortion, history of curettage, number of curettage, blood group between anterior and posterior group, while antepartum hemorrhage, number of c/s were significantly higher in anterior group were P Value 0.017, 0.006 respectively.

Table 3.5: Placenta previa site association with maternal characteristics

		Anterior		Posterior		P value
		No	%	No	%	
Age (years)	20--24	8	80.0	2	20.0	0.703
	25--29	14	87.5	2	12.5	
	30--34	35	85.4	6	14.6	
	35--39	24	88.9	3	11.1	
	=>40years	4	66.7	2	33.3	
Gravid	G1	2	2.4	1	6.7	0.658
	G2	10	11.8	2	13.3	
	G3	9	10.6	3	20.0	
	G4	20	23.5	2	13.3	
	G5&more	44	51.8	7	46.7	
Parity	P0	3	3.5	3	20.0	0.085
	P1	7	8.2	-	-	
	P2	15	17.6	3	20.0	
	P3	25	29.4	2	13.3	
	P4	17	20.0	5	33.3	
	P5& more	18	21.2	2	13.3	
Abortion	Yes	26	30.6	4	26.7	0.760
	No	59	69.4	11	73.3	
History of curettage	Yes	25	29.4	4	26.7	0.829
	No	60	70.6	11	73.3	
Number of curettage	Once	16	64.0	4	100.0	-
	Twice	8	32.0	-	-	
	More than 2	1	4.0	-	-	
APH	Yes	51	60.0	4	26.7	0.017*
	No	34	40.0	11	73.3	
Rh Blood group	Rh-ve	16	18.8	-	-	-
	Rh+ve	69	81.2	15	100.0	
ABO Blood group	A	17	20.0	5	33.3	0.319
	AB	20	23.5	5	33.3	
	B	27	31.8	4	26.7	
	O	21	24.7	1	6.7	
CS	Yes	75	88.2	9	60.0	0.006*
	No	10	11.8	6	40.0	
***Significant using Pearson Chi-square test at 0.05 level.**						

Table 3.6 show neonatal complications according to the site of Placenta previa.

The table show that male sex was significantly higher in posterior group with P value 0.012, no statistical significance between anterior and posterior placenta previa was found related to birth weight, apgar 1 score, apgar 5score and in neonatal care unit admission.

Table 3.6: Neonatal complications according to the site of Placenta previa

		Anterior		Posterior		P value
		No	%	No	%	
Sex of the baby	Male	38	44.7	12	80.0	0.012*
	Female	47	55.3	3	20.0	
Birth weight (grams)	<2500	17	20.0	2	13.3	0.897
	2500--	27	31.8	6	40.0	
	3000--	34	40.0	6	40.0	
	3500--	7	8.2	1	6.7	
Apgar 1 score	Dead	1	1.2	-	-	0.607
	Good (=>7)	13	15.3	1	6.7	
	Poor (<7)	71	83.5	14	93.3	
Apgar 5 score	Dead	1	1.2	-	-	0.889
	Good (=>7)	64	75.3	11	73.3	
	Poor (<7)	20	23.5	4	26.7	
NCU	Yes	13	15.3	4	26.7	0.280
	No	72	84.7	11	73.3	
***Significant using Pearson Chi-square test at 0.05 level.**						

Table 3.7 shows maternal complications according to the site of Placenta previa.

The table show that hysterectomy and placenta accreta were significantly higher in anterior group with P value 0.027, 0.032 respectively, there was no statistical significant difference between anterior and posterior group in blood transfusion, oversewing, visceral injury and maternal death.

Table 3.7: Maternal complications according to the site of Placenta previa

		Anterior		Posterior		P value
		No	%	No	%	
Hysterectomy	Yes	37	43.5	2	13.3	0.027*
	No	48	56.5	13	86.7	
Blood transfusion	Yes	63	74.1	10	66.7	0.549
	No	22	25.9	5	33.3	
Oversewing	Yes	22	25.9	4	26.7	0.949
	No	63	74.1	11	73.3	
Placenta accreta	Yes	36	42.4	2	13.3	0.032*
	No	49	57.6	13	86.7	
Maternal death	Yes	-	-	1	6.7	-
	No	85	100.0	14	93.3	
Visceral injury	Bladder	21	24.7	-	-	-
	No	64	75.3	15	100.0	
***Significant using Pearson Chi-square test at 0.05 level.**						

Table 3.8 show different maternal and neonatal characteristics according to the site of Placenta previa, the table show that hospital staying (days) was significantly higher in anterior group with p value 0.008, while there is no significant difference at GA at presentation, GA at delivery, Birth weight (grams), Apgar 1 score, Apgar 5 score, Blood transfusion number.

Table 3.8: Different maternal and neonatal characteristics according to the site of Placenta previa

	Placenta previa site		P value
	Anterior	Posterior	
GA at presentation	33.8±2.3	33.9±2.2	0.809
GA at delivery	35.7±1.7	36.0±1.6	0.492
Birth weight (grams)	2864.1±450.6	2900.0±412.3	0.774
Apgar 1 score	5.2±1.5	5.4±1.0	0.659
Apgar 5 score	7.3±1.4	7.5±1.4	0.557
Blood transfusion number	6.08±3.5	4.20±1.9	0.102
Hospital stay (days)	5.5±2.1	4.5±0.9	0.008*
***Significant using Student-t-test for difference between two independent means at 0.05 level.**			

Discussion :

Placenta previa is a major cause of obstetrical haemorrhage. It is associated with severe maternal complication & adverse perinatal outcome.

Our study was performed at Department of Obstetrics and Gynecology in Baghdad teaching hospital, in which 900 women delivered monthly and 110 doctors trained in obstetric and gynecological department annually. In this study, we tried to find the relation between placental position in placenta previa and fetomaternal complications.

It was observed that the incidence of antepartum hemorrhage, placenta accreta and hysterectomy is more common in anterior group.

Our study agreed with Dong Gyu Jang et al (2011) [12]. The maternal characteristics were compared between the anterior and the posterior group.

When compared, maternal age, the number of abortion showed no significant difference.

Factors such as old age, multiparity, previous abortion, previous cesarean section are frequently associated with placenta previa. They are accounted as risk factors of excessive bleeding and peripartum hysterectomy, even if placenta previa does not exist [13, 14, 15]. Therefore Faiz *et al*. claimed that age, parity, history of cesarean section and history of abortion should be adjusted when demographic investigation on placenta previa is pursued [16].

In this study we found that surgical evacuation of the uterus is not a significant risk factor for pp with P value of 0.829, that does not agrees with:

Cande V. Ananth, et al (2001) [17] , Faiz A. S. Ananth C. V. et al (2003) [16], Paul Kiondo, Julius Wandabwa, et al. (2008) [18] all those found that history of previous evacuation & or dilatation & curettage of the uterus were associated with risk of pp. Evacuation is associated with scarring of the uterus, this leads to under perfusion of the uterus & predisposes women to pp. The possible reason for this discrepancy is that the studied number of patient was small in our study and it's unicenter study.

This study agrees with the below studies, that the risk of pp increases with previous caesarean deliveries with statistically significant of p value 0.006 .Cande V. Ananth, et al (2001) [17] , Faiz A. S. et al(2003) [16] , Darios Getahun, Yinka Oyelese, et al(2006) [21], Q Yang, SW Wen, et al(2007) [19]، (Tai-Ho Hung, Ching-Chang Hsieh, et al(2007) [20] , Paul Kiondo, Julius Wandabwa, et al(2008) [18] Dong Gyu Jang et al (2011)[12],. All these studies agree that patients who had previous delivery by C/S were associated with an increased risk of pp. Most studies have reported a dose related response pattern of risk factors of pp was found with increasing number of C/S deliveries. [20, 18] The reason may be due to the damage & scarring of the uterus during c/s, these pathological changes in the myometrium & endometrium of the uterus have been described in the presence of previous cesarean delivery include polyp formation, lymphocyte infiltration, capillary dilatation, & infiltration of the endometrial tissue that surround the scar by free red blood cells.[22] These observations suggest that the pathological changes in the vicinity of cesarean delivery scars may create suboptimal implantation of the placenta.

Regarding multiparty, this study agrees with: Paul Kiondo, Julius Wandabwa, et al (2008), show that parity not found to be risk factors for pp. [18]

In contrast to Faiz A. S. & Ananth C. V.(2003) [16] , Tuzo Vic L, Dielmis J, et al (2003) [20] , Tai-Ho Hung, Ching-Chang, et al(2007) [23] , they show a greater risk of pp with higher parity.

About bleeding during pregnancy, we found that there was a significant risk with p value of 0.017 this is compatible with the study of Dong Gyu Jang et al (2011)[12], Paul Kiondo, Julius Wandabawa, et al (2008) [18], Lawerence Oppenheirmer, et al(2007) [24] , they found that women who develop bleeding during pregnancy are more vulnerable for bleeding later on after adjustment for confounders, this is likely to occur when the lower segment of the uterus begins to form.

Regarding complication as placenta accreta, hysterectomy, our findings consistant with the findings of the following:

Dong Gyu Jang et al (2011)[12], Ihab M, Usta, et al (2005)[11] , Paul Kiondo, Julius Wandabwa, et al (2008).[18]

In our study, in addition, to evaluate the effect of the placental location beneath incision site on fetomaternal morbidity, it was also adjusted by multivariate logistic regression analysis. The result was when the placenta located beneath the incision site, the incidence of excessive blood loss, massive transfusion, placental accreta and hysterectomy significantly increased.

This implies that in placental previa patients, the location of placenta beneath incision site is a risk factor of maternal morbidity. [12]

Placental accreta itself can raise the maternal morbidity rate as report by Usta *et al*. Therefore we adjusted placental accreta together by multivariate logistic regression analysis. It thus speculated that high incidence of placental accreta in the anterior group affected the increased the risk of massive transfusion and hysterectomy. [12]

Our result with regard to perinatal outcomes were more encouraging. Perinatal morbidity risk were also increase in subject with prior c/s but not significantly. These risks could be due to an increased risk of prematurity , as expected preterm birth and neonatal intensive care admission were increased but not significantly as both anterior and posterior placenta previa expose to preterm delivery.

Our study show significant increase in male baby in placenta previa with significant P value 0.012 in posterior group this agreed with Wen SW et al (2000)[25], Kitaw Demissie et al (1999)[26].

Conclusions:

anterior previa is more dangerous than posterior previa in view of increasing maternal and neonatal morbidity such as excessive blood loss, massive transfusion, placenta accreta and hysterectomy, as well as perinatal morbidity.

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