

## Placental Drainage Versus No Placental Drainage After Vaginal Delivery in the Management of Third Stage of Labour: A Randomized Study

### Plasental Drenajın Vajinal Doğumun Üçüncü Aşamasının Yönetiminde Etkinliğinin Karşılaştırılması

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#### ABSTRACT

**Objective:** To assess the effectiveness of placental blood drainage after spontaneous vaginal delivery in reducing the duration, the pain and blood loss during third stage of labour against no placental drainage.

**Material and Methods:** In this randomized controlled study, 222 pregnant women who admitted to Zeynep Kamil Women and Children's Health Training and Research Hospital from December 2016 and July 2017 were included. They were randomized into study(111) or control(111) group when they delivered vaginally. In study group; umbilical cord was clamped from fetal side but unclamped from maternal side. After that unclamped side of umbilical cord was left open to drain the blood until the flow stopped. In control group the umbilical cord was clamped both sides.

**Results:** The duration of third stage of labour was 18,39±6,85 min in the study group and 22,78±5,90 min in the control group (p<0,0001). The mean blood loss in study group was 212,75±12,1 and was 308,42±18,4 ml in the control group (p<0,0001). The mean respective visual analog scale (VAS) scores in study group and control group were 5,65 and 6,58 (p<0,0001).

**Conclusion:** Placental blood drainage was effective in reducing the duration of the third stage of labour; the blood loss in the third stage of labour; and also the pain in the third stage of labour.

**Keywords:** placental drainage, duration, third stage of labour, pain, blood loss

#### ÖZET

**Amaç:** Spontan vajinal doğum sonrasında plasental drenajın etkinliğini değerlendirmek.

**Gereç ve Yöntemler:** Bu randomize kontrollü çalışmaya, Aralık 2016 ve Temmuz 2017 tarihleri arasında Zeynep Kamil Kadın ve Çocuk Sağlığı Eğitim ve Araştırma Hastanesi'ne başvuran 222 gebe kadın dahil edildi. Spontan vajinal doğum sonrasında olgular çalışma (111) veya kontrol (111) grubu olarak randomize edildi. Çalışma grubunda; Göbek kordonun fetal yönü kleplendi, maternal tarafı akış duruncaya kadar kanı boşaltmak için açık bırakıldı. Kontrol grubunda umbilikal kord her iki taraftan kleplendi.

**Bulgular:** Doğumun üçüncü evresinin süresi çalışma grubunda 18,39 ± 6,85 dk, kontrol grubunda 22,78 ± 5,90 dk idi (p < 0,0001). Çalışma grubunda ortalama kan kaybı 212,75 ± 12,1 olup kontrol grubunda 308,42 ± 18,4 ml idi (p < 0,0001). Çalışma ve kontrol grubunda VAS skorları 5,65 ve 6,58'dir (p < 0,0001).

**Sonuç:** Plasental drenaj, doğumun üçüncü evresinin süresini, doğumun üçüncü evresindeki kan kaybını ve doğumun üçüncü evresindeki ağrıyı azaltmada etkili olabilir.

**Anahtar Kelimeler:** plasenta drenaj, doğumun üçüncü evresi, kan kaybı

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#### INTRODUCTION

Life-threatening obstetric haemorrhage occurs about 1 in every 1000 deliveries [1]. The cause of 25% of maternal deaths is obstetric hemorrhage [2]. Postpartum haemorrhage (PPH) which develops approximately 6% in worldwide, is most frequently avoidable complication of third stage of labour [3]. 90% of maternal deaths occur in the first 4 hours after delivery due to problems the third and fourth stages of labor [4]. The factors that increase the probability of development of PPH are multiple pregnancy, macrosomia, preeclampsia, instrumental delivery and prolonged labor. Nevertheless the majority of postpartum hemorrhages develop in women with no risk factors [5]. Nowadays the current approach of third stage of labour is to clamp the cord on both sides after the birth of the baby and then to cut it. After then we deliver the placenta by controlled cord traction. When the cord is unclamped at maternal side, blood drains from the placenta thus delivery of placenta is facilitated. It also facilitates uterine contraction because the massiveness in the uterus is reduced. And maybe it may decrease the duration of third stage of labour [6]. Placental cord drainage is used a 32% of maternity unite in Belgium as country's policy and it was 24 % in Portugal [7].

The present study was aimed to compare the placental cord blood drainage and leaving the placental cord clamped after vaginal delivery to determine how it affects the duration of the third stage of labor and the amount of blood loss.

#### MATERIAL AND METHOD

This was a randomized controlled trial on 222 pregnant women who admitted to our hospital from December 2016 and July 2017. After approval of the ethics committee and written consent of the patients were taken, 222 pregnant women were included in this study. They were randomized into study (111) or control (111) group when they delivered vaginally. No additional drugs like methlergonovine maleat was made to any participants. Randomization was performed by means of a computer-generated randomization table.

In study group; umbilical cord was clamped from fetal side but unclamped from maternal side. After that unclamped side of umbilical cord was left open

to drain the blood until the flow stopped. The blood was collected in the metal bowl and measured using a measuring jar. Care was taken not to mix the drained blood from the cord with the blood lost during the third stage. In control group the umbilical cord was clamped both sides.

The inclusion criteria were >37 weeks of gestation, singleton, alive pregnancy, with vertex presentation expected to have spontaneous vaginal delivery. The exclusion criteria were fetal malpresentation, history of postpartum hemorrhage, preterm delivery, multiple pregnancy, fetal anomaly, uterine malformation, fetal demise, women with immediate delivery indications, unable to give written informed consent, a clinically estimated fetal weight >4500, preeclampsia, antepartum hemorrhage, previous cesarean section, instrumental delivery and known coagulation disorders. Patients were recruited regardless of using cervical ripening agents.

General physical and obstetric examination were performed after a detailed history taking. A sample of venous blood was obtained for hemoglobin concentration on admission. Labour was conducted according to the hospital protocol. Labour was augmented with oxytocin in active phase of labour. All patients were monitored with cardiotocography (CTG) before induction of labor and CTG was used continuously during labor. Oxytocin infusion was continued until delivery of both child and placenta, unless complications occurred. For all patients, blood lost in the third stage of labour was measured by collecting the blood in a disposable conical measuring bag. The time of delivery of the neonate was recorded and after then prophylactic uterotonic agents (Synpitan Fort, 5 IU) was given to all patients. Placenta was delivered by controlled cord traction and the time of placental delivery was noted in both groups. If the placenta had not been delivered spontaneously by 30 minutes after birth, it was removed manually. The vital signs (blood pressure, pulse rate, temperature) uterine tone of the patients were monitored after delivery of neonate and placenta. The hemoglobin concentration was estimated 24 hours after delivery.

The outcome measures were the duration of the third stage of labour, defined as interval from birth of the infant to delivery of the placenta, haemoglobin difference between admission and 24 hours after delivery, visual analog scale (VAS) scores, weight of placenta, need for blood transfusion, blood loss from umbilical cord and blood loss in the third stage of labour. PPH was defined as a loss of more than 500 mL of blood within the first 24 hours following childbirth.

Statistical analyses were performed using the Statistical Package of Social Sciences and Problem Solutions (SPSS, version 17; SPSS, Inc. Chicago, IL). Univariate associations between dependent and independent variables were studied using Pearson's  $\chi^2$  test for categorical variables (with Fisher exact test for groups with less than five subject expected in a

cell) and using student tests for continuous ones. In cases of non normally distributed variables (tested by Kolmogorov-Smirnov's normality test), nonparametric Mann-Whitney were used instead.

## RESULTS

Total 222 cases were enrolled for study 111 in study group and 111 in control group. The baseline demographic and clinical characteristics of the patients were similar between the two groups (Table I).

**Table I:** Demographic and clinical characteristics of the patients.

	Plasental Drenaj Grup n=111	Kontrol grup n=111	p value
Age	26,5±5	27,44±6,3	0,842
Gestational age at delivery (wk)	38,54±1,72	38,22±1,79	0,089
Gravida	2,45±1,39	2,41±1,39	0,839
Parity	1,07±1,04	1,12±1,20	0,919
BMI (kg/m <sup>2</sup> )	30,46±3,80	28,96±3,84	0,004*

Almost 90.5% of control group and 92% of study group were augmented with oxytocin. P value was 0.596 which is not significant. The mean birth weight of the babies in the study group was 3296,51±497,72 kg, and in the control group it was 3251,48±427,87kg. Six cases in study group had blood loss  $\geq 500$  ml. Fifteen cases in control group had blood loss  $\geq 500$  ml. None of study group had more than 1000 ml of blood loss. One case in control group had more than 1000 ml of blood loss.

**Table II:** Comparison of the maternal outcomes between groups.

	Drainage group n=111	Control group n=111	P value
The duration of third stage of labour (min)	18,39±6,85	22,78±5,90	0,0001*
The mean blood loss in the third stage of labour (ml)	212,75±12,1	308,42±18,4	0,0001*
Prepartum hg (gr/dl)	11,32±0,96	11,54±1,05	0,043*
Postpartum hg (gr/dl)	10,46±1,35	10,41±1,09	0,994
Haemoglobin difference (gr/dl)	0,85±1,01	1,14±0,45	0,005*
Birth weight (g)	3296,51±497,72	3251,48±427,87	0,446
Placental weight (gr)	544,31±106,83	582,32±97,32	0,005*
VAS skores in the third stage of labour	5,65±1,90	6,58±1,41	0,0001*
Manual removal of placenta	0	0	-
Retained placent	0	0	-
Plasental drainage (ml)	63,91±26,91		
>500 ml blood loss	6 (%5,5)	16 (%14,4)	0,046*
Episotomy	57 (%51,4)	65 (%58,6)	0,345

The duration of third stage of labour was  $18,39 \pm 6,85$  min in the study group and  $22,78 \pm 5,90$  min in the control group. The difference in the duration of third stage of labour is statistically significant ( $p < 0,0001$ ) (Table II). The mean blood loss in the third stage of labour in study group was  $212,75 \pm 12,1$  and was  $308,42 \pm 18,4$  ml in the control group. There was a statistically significant decrease in the blood loss in the study group (Table II).

Haemoglobin difference before and after delivery was calculated in both control and study groups. The mean difference in Hb % in control group was 1,14. In study group, it was 0,85. P value is highly significant ( $p = 0,005$ ). The mean VAS scores in the third stage of labour in study group was 5,65 and was 6,58 in the control group. The difference in VAS scores in the third stage of labour is statistically significant ( $p < 0,0001$ ) (Table II). Also there was a statistically significance ( $p = 0,005$ ) difference between groups about placental weight.

## DISCUSSION

In our study, placental drainage was revealed to shorten the duration of third stage of labour and reduced the blood loss in the third stage of labour and also decreased the VAS scores significantly. To our knowledge, this is the first study that placental drainage is associated with VAS scores.

Consistly to our series; the first study which placental drainage was evaluated is designed by Razmkhah et al, in 1999 and reported that duration of third stage labor was significantly shorter in placental drainage method and no significant increase in postpartum complications[8]. Priyankur et al. assessed that placental cord drainage after vaginal delivery was shortened the duration of third stage of labour (210.5s versus 302.5s). Haemoglobin difference was detected significantly (0,6% versus 1,1%). Also they reported that placental cord drainage after vaginal delivery was reduced statistically the amount of blood loss in the third stage of labour (227.5 versus 313.3 ml). The incidence of postpartum hemorrhage was also decreased (1 % versus 9 %)[9]. Giacalone et al. reported a randomized controlled study which was involved 239 women in study group, 238 women in control group. They assessed that placental cord drainage together with cord traction after vaginal delivery was shortened the duration of third stage of labour (8 versus 15 min). They found that the mean drop in hemoglobin was significantly lower in the cord drainage group than in the control group (0.95 vs. 1.40 g/dL) [10]. In another study by Gulati et al. involved 100 women in study group, 100 women in control group. They assessed that placental cord drainage after vaginal delivery was shortened the duration of third stage of labour (2.94 versus 5.72 min). Also they reported that placental cord drainage after vaginal delivery was reduced the amount of blood loss in the third stage of labour (193.63 versus 247.59 ml) and presence of postpartum hemorrhage was decreased (6% versus 12%) [11].

Shravage et al. reported that the amount of blood loss was decreased (175.05 versus 252.05 ml). Also they reported that the duration of third stage was shortened (5 versus 7.4 min). The incidence of postpartum hemorrhage was also decreased (3% versus 10%) [5]. Ascioglu et al included 242 cases in study and 243 cases in control group. They reported that postpartum blood loss (70 mL) and third-stage duration were reduced significantly. They found that PCD was effective in reducing the blood loss and third-stage duration (4.2 minutes) [12]. In another study by Mohammed M, was involved 100 women in study group, 100 women in control group and shortening of the duration of third stage of labour was detected (5.35 versus 8.9min). Decreasing of the amount of blood loss was revealed (184.3 versus 249.7ml) [13]. Meena SA et al. reported that placental drainage reduced the blood loss significantly (185 versus 308ml) and haemoglobin difference was revealed (0,28 versus 0,68 gms). Also third-stage duration was decreased (214 versus 303 sec) [4]. In a review by Soltani H et al revealed that third-stage duration was shortened and cord blood drainage reduced the amount of blood by average of 77 ml [14]. Addition to literature, Hang-lin Wu et al revealed that, placental drainage might reduce needing of additional uterotonic drugs [15].

Inconsistly to our series; Soltani et al. assessed that there was no significant change in haemoglobin difference (1.2 gm% versus 1.3 gm%) [16]. Lankeshwara et al reported that placental cord drainage after vaginal delivery increased amount of blood loss, presence of postpartum hemorrhage and the duration of the third stage [17]. Also Vasconcelos et al concluded that placental cord drainage after vaginal delivery was ineffective on reducing the duration of the third stage of labour or blood loss [18]. A Cochrane database review concluded that placental drainage not determined at satisfactory efficiency. Small reduction in blood loss and the length of the third stage of labor was detected [14].

In our study, more placental drainage ( $63,91 \pm 26,91$ ml) was detected according to other studies. But the majority of studies did not specify the amount of placental drainage. Jongkolsiri et al. found that; placental drainage was  $32.3 + 22.5$ ml[6]. We think that this situation is related to the placental volume.

In our study, we assessed that the VAS score in the third stage of labour was significantly lower in placental drainage group (5,65 versus 6,58 ). We think that this is related to the reduction of swelling in the uterus by placental drainage.

Our study had some limitations: first, researchers were not blind to participations. Second cord traction was used in the cord drainage group, which differed from the control group.

## CONCLUSION

Placental drainage is effective in reducing the duration, the blood loss of third stage of labour. In addition placental drainage is effective in reducing pain in the third stage of labour.

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