

A Comparative Study of Effects of Spontaneous Delivery of Placenta versus Manual Removal of Placenta During Caesarean Section

Swati¹ Mehta Seema² Kumar Manoj³

¹(IIIrd Year P.G. Student) ²(Professor) ³(Senior Resident) Department of Obstetrics and Gynaecology
S.M.S. Medical College Jaipur-302012 (Rajasthan)

Abstract:

Objective(S): To compare the effects of manual removal of placenta and spontaneous delivery of placenta during caesarean section.

Method(S): A prospective cohort study of 1451 antenatal women at term & singleton pregnancy undergoing caesarean section was conducted in the department of obstetrics and gynaecology, SMS medical college, Jaipur. They were randomly allocated into two groups. In group A placenta was allowed to separate spontaneously followed by its removal by gentle traction. In group B manual removal of placenta was done. Blood loss during the process was noted. Patients were followed till day 5 & 6 weeks postpartum for development of anemia & other complications.

Result(S): The mean amount of blood loss was significantly greater in group B (436.49 ± 213.87 ml vs 320.27 ± 159.12 ml; p value < 0.001). The mean of postoperative fall in haemoglobin was significantly lesser in group A than that in group B (0.75 ± 0.72 gm% vs 1.01 ± 0.70 gm%; p value < 0.001). The mean interval between delivery of the newborn and the placenta was longer in group A compared to group B (45.68 ± 15.50 seconds vs 31.54 ± 15.02 seconds), but the mean duration of surgery was similar in both the groups. The overall rate of endometritis was 9.51% which was found more commonly in group B (14.38%) as compared to group A (4.67%). This difference was statistically significant (relative risk = 0.325; 95% confidence interval 0.224 to 0.472). Delayed complications like wound infection, puerperal sepsis & severe anemia were also found less frequently in group A as compared to group B (relative risk = 0.302; 95% confidence interval 0.168 to 0.545).

Conclusion(S): Postoperative anemia and infections are more commonly seen with manual removal of placenta. Endometritis and blood loss in caesarean delivery is increased by manual removal of the placenta as compared to the spontaneous method of placental removal.

Keywords: caesarean section, spontaneous, manual.

I. Introduction

Caesarean section rates are rising worldwide and becoming a cause of concern as it has been shown to be positively associated with maternal mortality and severe morbidity, even after adjusting for risk factors¹.

Caesarean section is a common operation and needs to be made as safe as possible. Techniques to reduce some of the morbidities associated with this operation are very important. The principal question is whether the practice of manual removal of placenta at caesarean section should continue or not.

As soon as baby is delivered out of uterus, its size starts involuting by contraction and retraction of muscle-fibres and uterine sinuses are closed by the so called living ligature. This process proceeds naturally and takes its own time if placenta is allowed to separate spontaneously². However, if manual removal of placenta is done by introducing hand at placental bed, infection is introduced in the already open uterine sinuses. Moreover these open blood sinuses bleed more if placenta is removed hurriedly leaving them open. Greater blood loss in manual removal of placenta causes anemia and anemia further leads to decreased immunity which increases the chances of infections in postpartum period.

This study was undertaken to see whether manual removal of placenta during caesarean section actually increases intra-operative and post-operative morbidity.

II. Methods

We conducted a prospective cohort study in the Department of Obstetrics and Gynaecology of SMS Medical College, Jaipur from October 2012 to October 2014. The study was approved by the institutional ethics committee before the start of the study.

Women undergoing elective or emergency caesarean section were eligible for the study only when time for information and consent was available. The exclusion criteria were gestational age less than 34 weeks, placenta previa, accidental hemorrhage, intrapartum fever and suspected chorioamnionitis, morbidly adherent

placenta, multifetal gestation, polyhydramnios, large baby (>4 kg), uterine malformations, uterine fibroids, clotting disorder, grand-multigravida, Rh-negative pregnancy and use of tocolytics (in preceding 48 hours).

Consenting women were randomly allocated to one group just before surgery. All the participants were administered 1gm ceftriaxone i.v. after skin sensitivity test preoperatively. For women allocated to Group A, the obstetrician was instructed to wait until spontaneous delivery of placenta. Controlled cord traction was performed to facilitate placental delivery. To avoid excessive bleeding in the interval, clamps were placed on the uterine incision for hemostasis. If spontaneous delivery had not occurred after 5 minutes, or in case of excessive bleeding, manual removal of placenta was performed and the cases were excluded from the study. After delivery, the placenta and membranes were examined and, if found complete, manual exploration of the cavity was not performed.

In Group B, the surgeon introduced her hand into the uterine cavity to detach and remove the placenta as soon as possible after the delivery of infant. In both the groups, 10 IU oxytocin in i.v.drip was infused immediately after delivery of the infant. All uterine incisions were low transverse and all were closed after exteriorisation of the uterus.

Estimated blood loss was evaluated by the operating theatre staff, taking into account the volume of liquid suctioned during the operation, minus the estimated volume of liquor suctioned before delivery of placenta. Weight of blood-soaked sponges minus weight of dry sponges were also considered for estimation of blood loss. Blood loss estimation during caesarean section is known to be inaccurate and subjective³. The primary outcome of the study was measured as amount of blood loss in terms of measured volume during the surgery, fall in haemoglobin and need for blood transfusion.

Secondary outcome measures included time taken in removal of placenta, overall operating time, presence of post-operative endometritis and delayed complications. Post-operative endometritis was defined by the presence of any two of the following: fever, uterine tenderness, sub-involution of uterus and leucocytosis. Fever was defined as a temperature above 37.8 °C (excluding the first 24 hours). Post-operative uterine tenderness was defined as sensation of extreme pain on uterine palpation. A rise in TLC of 2500/ml over pre-operative value was considered as leucocytosis. Delayed complications included severe anemia (Hb < 7 gm%), puerperal fever (excluding fever due to mastitis, UTI, dengue, malaria and respiratory tract infections) and wound sepsis.

The data was analyzed statistically using SPSS software. Quantitative data was summarized in mean and standard deviation. The difference in mean value was analyzed using independent sample 't'-test. Qualitative data was summarized in proportion and analyzed using Chi-square and 'Z' test. A p value of <0.05 was considered statistically significant. All the statistical analysis was done keeping power of study at 80% and 95% confidence level.

III. Result

A total of 1451 women were randomised, 728 in Group A and 723 in Group B. Baseline characteristics were similar between the two groups (Table 1). The result for the primary outcome for the whole sample and various subgroups are shown in Table 2, and other outcomes are presented in Table 3.

The mean amount of blood loss in Group A and Group B was 320.27±159.12 ml and 436.49±213.87 ml respectively. The difference was statistically significant reflecting greater amount of blood loss associated with manual removal of placenta (p value <0.001). The mean fall in haemoglobin was 0.75±0.72 gm% in Group A and 1.01±0.70 gm% in Group B which shows that patients in whom placenta was allowed to separate spontaneously had significantly lesser fall in haemoglobin (p value < 0.001).

The overall time taken between delivery of baby to delivery of placenta was significantly lesser in manual method (31.54±15.02 seconds) as compared to spontaneous one (45.68±15.50 seconds) [p value < 0.001]. The mean duration of surgery in Group A and Group B was 34.35±8.00 minutes and 34.54±7.96 minutes respectively. This difference was not statistically significant [p value > 0.05]. Manual removal of placenta was associated with higher incidence of fever, post-operative uterine tenderness, subinvolution of uterus and leucocytosis. This is reflected by an increased incidence of endometritis with manual removal of placenta as opposed to spontaneous delivery of placenta during caesarean section (RR=0.325[0.224 to 0.472]).

46 patients in Group B developed delayed complications (wound infection, puerperal fever, anemia of severe grade) whereas only 14 in Group A suffered from the same. This difference was statistically significant (RR=0.302[0.168 to 0.545]).

IV. Discussion

Our study shows that allowing spontaneous delivery of the placenta during caesarean section reduces significant blood loss without increasing the overall operative time. Some previous studies showed a difference in estimated blood loss^{4,5,6}, while others did not⁷. The mean of fall in haemoglobin was significantly higher with manual removal of placenta and this has been documented by several previous trials^{4,5,8,9}. However we found no difference in fall in haemoglobin > 2.5 gm/dl which does not corroborates with the study of Michel Morales et

al¹⁰. There was no difference in the requirement of blood transfusion in the two groups during intra-operative period or till one week post-operatively.

We found reduction in the risk of post-operative endometritis with spontaneous removal of placenta. This is supported by some of the previous trials^{4,6,8,9,11}, whereas other trials did not do so^{7,12}.

Delayed complications like wound infection and gaping, anemia of severe grade and puerperal sepsis in six weeks follow-up period was seen more frequently with those whose placenta was removed manually. Similar findings were seen by some of the trials^{4,13}, whereas some trials did not find any difference¹⁴.

V. Conclusion

Thus we conclude that manual removal of placenta only seems to be superior in saving the time taken to extract out placenta, but it is actually not so. The overall duration of surgery remains comparable. Manual removal of placenta adds to the post-operative complications in form of greater blood loss and infections. Thus we recommend to wait for spontaneous separation of placenta during caesarean section so as to decrease the morbidity associated with caesarean section. Manual removal of placenta should be reserved for those cases in whom placenta does not separate spontaneously till 5 minutes.

References

- [1]. Villar J, Valladares E, Wojdyla D, Zavaleta N, Carroli G, Velazco A, et al. for the WHO 2005 Global Survey on Maternal and Perinatal Health Research Group. Caesarean delivery rates and pregnancy outcomes: the 2005 WHO global survey on maternal and perinatal health in Latin America. *The Lancet* 2006; 367 (9525):1796-1797.
- [2]. www.sciencedaily.com
- [3]. Cunningham F, Gant N, Leveno K, Gilstrap III L, Hauth J, Wenstrom K. *Williams Obstetrics*, 21st edition. New York: McGraw-Hill,2001.
- [4]. Rose I Anorlu, babalwa Maholwana, G Justus Hofmeyr. Methods of delivering the placenta at caesarean section. *Cochrane Database of Systematic Review* 2008, Issue 3, Art No. : CD004737
- [5]. Fareesa Waqar, Razia Nasar, Anisa Fawad. THE COMPARISON OF PLACENTAL REMOVAL METHODS ON OPERATIVE BLOOD LOSS. *J Ayub Med Coll Abbottabad* 2008;20(3)
- [6]. Wilkinson C, Enkin MW. Manual removal of placenta at caesarean section. *Cochrane Database Syst Rev*. 2007;(2):CD000130.
- [7]. Chandra P, Schiavello HJ, Kluge JE, Holloway SL. Manual removal of the placenta and postcesarean endometritis. *J Reprod Med* 2002;47:101– 106.
- [8]. Baksu A, Kalan A, Ozkan A, Baksu B, Tekelioğlu M, Goker N. The effect of placental removal method and site of uterine repair on postcesarean endometritis and operative blood loss. *Acta Obstet Gynecol Scand*. 2005 Mar;84(3):266-9.
- [9]. Dehbashi S, Honarvar M, Fardi FH. Manual removal or spontaneous placental delivery and postcesarean endometritis and bleeding. *Int J Gynaecol Obstet*. 2004 Jul;86(1):12-15.
- [10]. Michel Morales,a Gilles Ceysens,b Nicole Jastrow,a Caroline Viardot,c Gilles Faron,d Yvan Vial,c Christine Kirkpatrick,b Olivier Irion,a Michel Boulvaina Spontaneous delivery or manual removal of the placenta during caesarean section: a randomised controlled trial. *BJOG: an International Journal of Obstetrics and Gynaecology* September 2004, Vol. 111, pp. 908–912
- [11]. MD M. Wendy Atkinson , MD John Owen , MD Allison Wren, MD John C. Hauth. The effect of manual removal of the placenta on post-cesarean Endometritis. *Obstetrics & Gynecology* Volume 87, Issue 1, January 1996, Pages 99-102
- [12]. Ramadani H. Cesarean section intraoperative blood loss and mode of placental separation. *Int J Gynaecol Obstet*. 2004 Nov;87(2):114-8.
- [13]. Deborah S. Lasley, MD, Abbey Eblen, MD, Michael K. Yancey, MD, Patrick Duff, MD. The effect of placental removal method on the incidence of postcesarean infections. *American Journal of Obstetrics and Gynecology* Volume 176, Issue 6, June 1997, Pages 1250-1254
- [14]. S Merchavy, A Lew, G Holcberg, En Fredman, E Sheiner. Method of placental removal during caesarean delivery and postpartum complications. *International Journal of Gynaecology & Obstetrics*, September 2007; 98(3) : 232-236

Tables

Table 1 Characteristics of the study participants. Spontaneous (Group A) Manual (Group B)

| | (n = 728) | (n = 723) | p value |
|------------------------------------|--------------|--------------|---------|
| Maternal age (years) | 24.50±3.89 | 24.34±3.66 | > 0.05 |
| Gestational age (weeks) | 37.50±2.76 | 37.62±3.35 | > 0.05 |
| Primigravida | 400 (54.94%) | 382 (52.83%) | > 0.05 |
| Preoperative Hb level (gm%) | 9.23±2.45 | 9.56±4.06 | > 0.05 |
| Indication for caesarean | | | |
| Emergency | 330 (45.32%) | 346 (47.85%) | > 0.05 |
| Elective | 398 (54.67%) | 377 (52.14%) | > 0.05 |
| Previous caesarean | 328 (45.05%) | 341 (47.16%) | > 0.05 |
| Membranes ruptured | 160 (21.97%) | 148 (20.47%) | > 0.05 |
| Type of anesthesia | | | |
| Spinal | 712 (97.80%) | 710 (98.20%) | > 0.05 |
| General | 16 (2.19%) | 13 (1.79%) | > 0.05 |
| Birthweight (kg) | 2.78±0.53 | 2.74±0.47 | > 0.05 |

Table 2 Primary outcome measured as estimated blood loss, fall in Hb & requirement of BT reported as frequencies [n (%), n/n(%) and P values.

| | Group A (n = 728) | Group B (n = 723) | p value or RR (95% CI) |
|---|-------------------|-------------------|------------------------|
| Estimated blood loss | | | |
| Mean blood loss [ml] | 320.27±159.12 | 436.49±213.87 | < 0.001 |
| ≤250 ml | 276 (37.91%) | 162 (22.40%) | < 0.001 |
| 251-500 ml | 379 (52.06%) | 340 (47.02%) | > 0.05 |
| 501-750 ml | 54 (7.41%) | 171 (23.65%) | < 0.001 |
| ≥ 751 ml | 19 (2.60%) | 50 (6.91%) | < 0.001 |
| Fall in Hb | | | |
| Mean fall [gm%] | 0.75±0.72 | 1.01±0.70 | < 0.001 |
| ≤ 1 gm% | 620 (85.16%) | 480 (66.39%) | < 0.001 |
| 1.1-2.5 gm% | 100 (13.73%) | 230 (31.81%) | < 0.001 |
| > 2.5 gm% | 8 (1.09%) | 13 (1.79%) | > 0.05 |
| Requirement of BT | 12 (1.64%) | 22 (3.04%) | > 0.05 |
| Hb = haemoglobin; BT = blood transfusion | | | |

Table 3: Other outcomes, reported as frequencies [n (%)] and relative risks (RR) with 95% confidence intervals (CI) or as mean [SD] and P values.

| | Group A (Spontaneous) (n = 728) | Group B (Manual) (n = 723) | RR(95%CI) or P value |
|--------------------------------------|------------------------------------|-------------------------------|-------------------------------|
| Time taken to remove placenta | 45.68±15.50 sec | 31.54±15.02 sec | < 0.001 |
| Overall operative time | 34.35±8.00 min | 34.54±7.96 min | > 0.05 |
| Post-operative endometritis | 34 (4.67%) | 104 (14.38%) | 0.325 (0.224 to 0.472) |
| Delayed complications | 14 (1.92%) | 46 (6.36%) | 0.302 (0.168 to 0.545) |
| Wound sepsis | 10 (1.37%) | 30 (4.14%) | 0.331 (0.163 to 0.672) |
| Puerperal fever | 2 (0.27%) | 10 (1.38%) | 0.199 (0.044 to 0.903) |
| Severe anemia | 2 (0.27%) | 6 (0.83%) | 0.331 (0.067 to 1.635) |

Sec = seconds; min = minutes