MATERNAL BLOOD LOSS BY EXPANSION OF UTERINE INCISION AT CAESAREAN SECTION–A COMPARISON BETWEEN SHARP AND BLUNT TECHNIQUES

Nazli Hameed, Mohammad Asghar Ali

Combined Military Hospital, Peshawar.

Background: In order to minimize intra operative blood loss during caesarean section**,** two techniques of expansion of uterine incision (sharp versus blunt) while performing lower segment transverse caesareans deliveries and their effect upon intraoperative blood loss were studied. Moreover, each method was also compared for its inadvertent extension of uterine incision laterally or into the broad ligament, into the cervix or vagina. **Method:** A quasi-experimental study with convenient sampling, involving two groups of women who underwent lower transverse segment Cesarean section. Both groups were studied for their demographic characteristics and clinical data. Standard surgical techniques were used in both groups except the expansion of uterine incision, either by sharp or blunt methods. Finally a comparison of two groups was made regarding blood loss, change in haematocrit, blood transfusion and uterine tears. The study was conducted at Combined Military Hospital Rawalpindi during May 2002 to April 2003. **Results:** No significant difference was found between the two groups regarding their demographic characteristics and clinical data. Intraoperative blood loss and post-operative hematocrit drop were more significant in the patient group in which a blunt uterine incision was made. Besides, more patients in this group received blood transfusions. Unintended extension of uterine (tears) was also significantly higher in this group. **Conclusion:** Sharp expansion of uterine incision during low segment caesarean section is safer and precise based on these results.
Key words: Caesarean section, surgical techniques, uterine incision.

INTRODUCTION

Maternal mortality rate in Pakistan is 281- 433 per 100,000 live births.[1] The leading cause of this high mortality rate is obstetrical blood loss.[2] Recently there has been an increase in the number of caesarean sections that amounts to 25% of all deliveries in most of the institutions. Although caesarean section delivery is much safer today due to improved techniques, but still it is a major cause of intraoperative and postoperative complications. Its morbidity remains high as compared to vaginal deliveries. Any blood loss greater then 1500 ml or a fall in hematocrit greater than 10 % (American College of Obstetrics and Gynaecology[3]) requires blood transfusion.

Several surgical techniques have been developed to reduce intraoperative blood loss during caesarean section deliveries. One of these techniques that remain debatable is expansion of uterine incision, either by sharp or blunt methods. Different surgeons based on their own experiences have advocated each method. Very few prospective studies have demonstrated any merits or demerits associated with either of these methods.

The present study highlights the technique of extending of uterine incision that is associated with less intra-operative blood loss and complications.

MATERIAL AND METHODS

All the patients reporting for elective caesarean section from May 2002 to April 2003 were included in the study. Nearly half of these patients were assigned to group I (in these patients uterine extension was made by sharp incision). The other half of patients were designated to group II (in which uterine extension was made bluntly (digital maneuver). Distribution of patients to either group was made on the basis of non- randomized (convenience) sampling. Inclusion criteria comprised of all primigravida / multigravida, singleton pregnancy, gestational age 37- 47 weeks, BMI (body mass index) < 30, primary and repeat low segment caesarean section. Similar anaesthetic

techniques were administered to all patients. Indications for caesarean section included fetal distress, failed progress of labour, unstable lie, cephalopelvic disproportion, malpresentation, repeat caesarean section and pre-eclamptic toxemia. All patients with multiple pregnancies, polyhydramnios, ante partum hemorrhage, previous history of postpartum hemorrhage (PPH) and uterine fibroids were excluded from the study. Blood hemoglobin, hematocrit, blood grouping and Rh factor were performed in all patients. Pre-operative preparations and technique were same in both the patient groups, except the procedure for expanding the uterine incision. Pre-operative antibiotics (Augmentin 1.2 Gm IV) were given 30 minutes before induction of anaesthesia. A Pfannensteil skin incision was made followed by low transverse uterine incision. After making an incision of 2 cm in the uterine wall with a scalpel, the incision was extended either by sharp or blunt methods. After delivery of the fetus, placenta was delivered by controlled cord traction. Syntocinon (10 Units IV) was given alongside. Uterine closure was done in two layers. Trained second and third year residents, under supervision of the consultant, performed all surgical procedures. Measuring the amount of blood in the suction apparatus and weighing the pre-weighed sponges estimated intra-operative blood loss and patient drapes. Hematocrit was repeated after 48 hours of operation. A record of blood transfusions was kept along with the number and extent of tears. An extension or tear was defined as inadvertent extension of uterine incision beyond normal limits. All data pertaining to the age of patients, parity, gestational age, and body mass index (BMI), indication for surgery, primary or repeat caesarean section delivery and birth weight of the baby were recorded in a proforma and a comparison was made (Table 1).

RESULTS

Group I consisted of 98 patients while group II comprised of 100 patients. Both groups were compared for their demographic characteristics and clinical data i.e. maternal age, parity, gestational age, BMI, indication for caesarean section, stage of labour and birth weight of newborn (Table 1). No significant difference was found amongst the two groups. Outcome measurements for both groups regarding blood loss, number of blood transfusions and unintentional uterine tears were compared (Table 2). The mean age of patients in both the groups was similar, along with parity, gestational age, stage of labour, preoperative hematocrit. Predisposing factors, which may affect blood loss during surgery like pre-eclamptic toxemia and type of anesthesia[4], were also similar in both patient groups. Blunt group contained less repeat caesarean (28/100) than the sharp group (33/98). There was no significant difference in birth weights of newborns in both groups of patients. The mean pre-operative hematocrit too was similar. Intra- operative blood loss was more in ones with blunt incisions (range=240ml—1600ml) than the sharp group (range=300ml—1450ml)($p < .01$). Rate of blood transfusions between blunt group and sharp group was 2:1($p < .001$). The post-operative drop in hematocrit was greater in those with blunt incisions ($p < .01$). None of the patients with sharp incisions sustained inadvertent extension of incisions, whereas there were seven such cases in those with blunt incisions, four involved the cervix and three extended into the broad ligament ($p < .007$). All these patients who sustained tears received blood transfusions. The development of tears possibly resulted in a greater blood loss in these patients.

Table-1:Comparison between sharp and blunt group

Character	**Sharp group** **N=98**	**Blunt group** **N=100**
Mean Age	28.4 ± 5.13	27.1±5.35
Parity Nulliparous Multiparous	 32 66	 36 64
Mean Gestational age	38.43 wks±1.26	38.44 wks±1.22

Indication for Cesarean		
*Arrest of Labour	21	25
*Breech	6	8
*CPD	12	14
*FD	17	15
*Previous Cesarean	29	26
*PET	10	12
*Unstable lie	2	
BMI Mean	26.64±1.61	27.16±1.43
Stage of Labour		
0	44	53
1	34	31
2	20	16
Type of Anesthesia		
General	78	81
Spinal	20	19
Preoperative Hct		
Mean	33.64±2.1	33.51±2.5
Birth Weight		
Mean	3.47 Kgs± .259	3.39 Kgs±. .250

Table 2.Comparison of the outcome of the two groups.

Variable	**Sharp**	**Blunt**	**P value**
Tears			
Cervical	Nil	4	
Lateral	Nil	3	.007
Vaginal	Nil	0	
Blood Loss			
Mean	744.38 ml	829.60 ml	.01

Fall of Hematocrit Mean	2.57±1.3	2.86±0.4	.01
Blood Transfusion	11 pint	22 pint	.001

DISCUSSION

In early days caesarean sections were carried out by vertical midline incisions, which were left open. This led to a high maternal mortality due to haemorrhage. Surgical techniques to perform caesarean sections have evolved over the passage of time.[5] In 1926 Kerr introduced the most popular approach of low transverse incision in the uterine wall, which is the one being used by the majority of surgeons today. Advances in anaesthesia, surgical techniques, suture materials, antibiotics and blood transfusion practices have made caesarean section a fairly safe procedure. The overall complication rate of caesarean section is 11.6% although this rate is much higher for emergency caesarean section (14.5%) then for elective CS (6.8%).[6] Intra-operative hemorrhage is one of the most important and a leading cause of caesarean section associated morbidity and mortality.[1] A variety of surgical techniques have been employed to restrict blood loss during caesarean section. These include spontaneous versus manual delivery of placenta,[7] in situ repair of uterine incision versus uterine exteriorization,[7] T and J extension in low transverse births,[8] and comparison of modified Joel – Cohen technique for caesarean section with Pfannensteil technique,[9] blunt versus sharp expansion of uterine incisions in low transverse caesarean section.[10, 11] This technique of expansion of uterine incision by sharp versus blunt method has been evaluated in this study. Various obstetricians based on personal experience and preference has used both techniques. The blunt method involves introduction of fore fingers into the initial uterine incision, followed by forcefully splitting the uterine musculature laterally and superiorly.[12] The main theoretical advantages of this technique are decreased blood loss and reduced operating time. The force required to expand the incision cannot be calculated or controlled and therefore may result in unintended extension of incision into the broad ligament damage the major vessels. Such inadvertent tears may involve the cervix or vagina. In sharp method, using bandaged scissors expands the incision and the extension is therefore controlled and precise. The main disadvantage of this method may be increased blood loss due to severed blood vessels in myometrium[12] and fetal laceration injuries.[13] In 1994 Rodriguez et al were the first to compare these two methods in a study conducted at Tampa General Hospital, Florida from 1st September 1992 to 30th June 1993.[10] Both methods were found to be interchangeable, as there was no significant difference between the two techniques regarding amount of blood loss and uterine tears. Although blood loss was more in sharp group and uterine tears were more in blunt group, but the difference was statistically insignificant. Between June 1998 and June 2000, Magann et al conducted a comparative study between these two techniques.[11] They found that blood loss and uterine scar extension were significantly more in sharp group then the blunt group. It was thus concluded in the study that blunt method of expansion of uterine incision is superior to sharp method in respect of blood loss and inadvertent uterine tears. In our study we were unable to find any such outcome. According to the statistical analysis of our study, there was more blood loss and uterine tears in blunt group than in the sharp group. Unintentional tear formation in the blunt group probably resulted in increased hemorrhage. All those patients who developed uterine tears had a blood loss above 1380 ml and a fall in hematocrit greater than 10 points, thus necessitating blood transfusion.

CONCLUSION

Sharp method of expansion of uterine incision in caesarean deliveries is more precise, accurate and results in less blood loss and inadvertent tear formation when compared with blunt method.

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Address For Correspondence:

Major Nazli Hameed, Consultant Gynaecologist, Combined Military Hospital, Peshawer

Tel: Off: 91-2016142, Res: 91-2026143

Email: nazlihameed@yahoo.com