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Original Research Article

Maternal outcome of caesarean section with or without eventration of the uterus: a prospective observational study

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ABSTRACT

Background: Caesarean section is a commonest surgical procedure performed by an obstetrician. Many variations in technique of caesarean section have been devised with the intent of shortening the operating time, making the operation easier, safer and more efficient; and to decrease the blood loss, postoperative morbidity, other complications as well as to shorten the period of hospitalization. One such variation is in the technique of repair of the uterus, whether it is repaired in situ or taken out from the incision and repaired outside the abdomen before replacing it back in place. This study was designed to compare two techniques of uterine closure and determine the benefit of using one technique over the other.

Methods: A prospective observational study on 100 women who underwent caesarean section. Technique of uterine repair was surgeon dependent and was not influenced by investigator. Based on this, patients were assigned into two separate groups (exteriorised group and in situ repair group). Observation was made and recorded regarding the various preoperative, intraoperative parameters and the surgeon's technique of uterine closure. The patients were then followed up and various postoperative outcome variables were recorded.

Results: There were no statistically significant differences between the two groups with regards to any of the intraoperative or postoperative parameters except that there was a rise in diastolic pressure in exteriorization group during eventration which gradually came down during the suturing and reposition ($P < 0.05$).

Conclusions: With this study, it can be concluded that clinical outcomes remain unaffected by any of the two methods of uterine repair. Both are equally safe. However, a caution must be exercised in intraoperative blood pressure monitoring, especially when the uterus is being exteriorized for repair as there is a statistically significant rise in diastolic blood pressure during eventration.

Keywords: Caesarean section, Eventration, In situ repair

INTRODUCTION

Caesarean delivery is the birth of the fetus through laparotomy (opening of the abdominal cavity) and hysterotomy. This definition does not include delivery of a fetus from abdominal cavity in case of abdominal pregnancy or uterine rupture.¹ Caesarean section as a surgery has well faced the test of time and is also described in the various ancient literature. In England in

2003-2004, 23% of all babies were born by a caesarean section which was increased from 15% in 1993-1994. A similar trend has been seen in figures from united states (31% in 2006) and Australia (29% in 2004).^{2,3}

Many variations in technique of caesarean section have been devised with the intent of shortening the operating time, making the operation easier, safer and more efficient; to decrease the blood loss, postoperative

morbidity, and other complications as well as to shorten the period of hospitalization.

One such variation is the technique of repair of the uterus. Repair of the uterus after eventration has certain benefits. The suggested advantages of eventration of the uterus after the delivery of the placenta are as follows: Relaxed atonic uterus can be recognized quickly, and fundal massage can be applied. The incision and bleeding points are visualized easily and repaired. It is easy to perform tubal ligation due to good exposure of both the adnexa.

Few reports have documented decreased intraoperative blood loss in the eventration group.^{4,5} Lesser intraoperative blood loss, lesser perioperative hemoglobin fall, and reduced febrile morbidity are the suggested advantages of eventration as compared to intraperitoneal uterus repair.^{3,4,6} On the other hand eventration of the uterus for the repair during caesarean section is thought to increase the infectious morbidity and thus the length of hospital stay.⁷

Eventration of uterus particularly with epidural or spinal analgesia is thought to be associated with increased incidence of nausea and vomiting, hemodynamic instability, unintentional trauma to fallopian tubes, potential infection, the possibility of rupture of utero-ovarian veins upon replacing the uterus and venous air embolism [coronary and cerebral embolism].⁸ The above-mentioned complications are avoided if the closure of uterine incision is done without eventration.⁵

This study was designed to compare two techniques of uterine closure and to determine the benefit of using one technique over the other.

METHODS

This study was a prospective observational study of outcome of various parameters in 100 consecutive patients with age nineteen years and above, who have undergone primary or repeat caesarean section under spinal anesthesia. Patient undergoing Classical caesarean section (complete placenta previa), Inverted T incision on the uterus, J-shaped incision on the uterus, caesarean section done under general anesthesia, caesarean hysterectomy, rupture uterus, cases of abruptio placentae and placenta previa, prolonged operating time, rupture of membrane, extension of incision or J-shaped/T-shaped incision, epidural anaesthesia were excluded from the present study.

It was conducted in a tertiary care centre from September 2015 to December 2016. Institutional Ethics Committee's permission was obtained. All the patients were consented before inclusion into the study. The study was carried out on indoor patients. Observations were made and recorded regarding the various preoperative, intraoperative and

postoperative parameters and the surgeon's technique of uterine closure.

All the Caesarean sections were done by any of the resident doctors of the unit along with one qualified staff member who is usually of the grade of an assistant professor and their technique of uterus closure (in situ repair or repair of the uterine incision after eventration) was noted. Based on this, patient were then segregated in two different groups.

Study group

Patients, who have undergone a Caesarean section and Insitu repair of uterine lower segment transverse incision (myometrial layer full thickness).

Control group

Patient with age nineteen years and above, undergone Caesarean section and repair of uterine lower segment transverse incision (myometrial layer full thickness) after eventration.

Operating time, need for emergency blood transfusion Intra operatively or post operatively, intra operative hemodynamic changes, preoperative and 72 hours postoperative hemoglobin level (a measure of perioperative blood loss), postoperative pain i.e. a number of analgesic doses given on the first and second postoperative day, return of bowel function, incidence of paralytic ileus, febrile morbidity, postoperative complications (Foul smelling discharge, burning micturition, wound infection), period of hospitalization, suture removal, postnatal check up at the end of 2weeks were all the parameters recorded in analyzed.

RESULTS

One hundred women were included in the study (segregated in to two groups of 50 each in whom the uterus was exteriorised for repair (control group) and the study group (in whom the uterus was repaired insitu). Data were tested first for normal distribution by Kolmogorov-Smirnov test.

Student t test was applied for an independent quantitative variable if normally distributed. For comparing categorical qualitative data, Chi square test was performed. A probability value (p-value) less than 0.05 was considered statistically significant.

Table 1 is showing various demographic details of study and control group. The most common indication for the caesarean section in both the study groups was fetal distress. In the study group, out of total 50 caesarean section, 28% (14) were performed for fetal distress whereas it was 26% (13 out of 50) in control group.

In the study group 16% of the total caesarean sections were done for CPD, 14% meconium stained amniotic fluid (MSAF) whereas CPD was 10%, MSAF was 12% of total caesarean sections in the control group. 12% of the caesarean sections in both groups were done for nonprogress of labor.

In study group 4% for previous LSCS were not willing for VBAC, 10% for breech presentation whereas none of the caesarean sections in the control group done for non-willingness for VBAC, 6% for breech presentation. 4% of the caesarean sections in each group were done for scar tenderness.

Table 1: Parameters of the women in the exteriorisation (EXT) and insitu repair (ISR) groups. Values are given in numbers. Hb=haemoglobin in grams %.

Parameters	ISR (n=50)	EXT (n=50)
Maternal age (years)	40 (19-30)	34 (19-30)
	10 (>30)	16 (>30)
Gravidity	Primi (22)	Primi (18)
	Multi (28)	Multi (32)
Primary versus repeat LSCS	Primary (24)	Primary (35)
	Repeat (26)	Repeat (15)

Table 2 is representing various perioperative outcome variables recorded during the study. All subjects in study group had spontaneous placental separation whereas in control group, one placenta had to be removed manually. Tubal ligation was done in 5 subjects (10%) of the total in the case group. Exteriorization was not required in any of these 5 cases for visualization of the fallopian tube. In control group, tubal ligation was performed concomitantly in 7 (14%) cases. Out of total 50 subjects in study group 5 cases (10%) had cystitis. Urine culture of one patient had shown the growth of *E. coli*; one patient had insignificant bacteriuria, and three patients' urine culture showed no growth. In control group four patient had cystitis, but urine culture of all those had no growth. In study group, one patient had wound infection in the form of full-length wound gap involving skin and subcutaneous tissue. Wound culture report of which had shown growth of *E. coli* sensitive to ciprofloxacin.

Table 2: Intra-operative and postoperative outcome variables; values are given as mean.

Parameters	ISR (n=50)	EXT (n=50)	P value
Operating time (in minutes)	61.2	62.4	0.749
Need of intra operative blood transfusion	Hb >10=2 Hb <10=7	Hb >10=2 Hb <10=3	
Mean dose of analgesics required on day 1	4	4.06	0.1792
Post-operative hospital stay (in days)	5.42	4.96	0.2793
Day of suture removal	12.36	11.68	0.1960
Perioperative hemoglobin decrease (in gram %)	0.748	1.142	0.4380
Passage of 1 st stool (in days)	3.44	3.46	0.8826
Return of bowel function (in hour)	25.72	24.48	0.2809

None of the subjects in both the study groups had PPH. There were no study group in case group as well as in control group who had endometritis. Diastolic blood pressure of in situ repair group was compared with the exteriorized group during eventration, suturing and reposition. The diastolic pressure was increased during eventration as compared to in situ group, which was statistically significant (p <0.05). During suturing the diastolic pressure in the exteriorized group has decreased somewhat but was higher than insitu group. This difference in diastolic blood pressure, however, was not significant statistically. Similarly, the diastolic blood pressure further decreased during repositioning, but it was higher than the diastolic blood pressure of insitu repair group, but it was also not significant statistically. The rise in diastolic blood pressure can be attributed to the shifting of venous blood back to circulation. Table 3 is summarising all the vital parameters reading recorded intraoperatively.

Table 3: Intraoperative vital parameters; values are given as mean.

Parameters	ISR (n=50)	EXT (n=50)		
		Eventration	Suturing	Reposition
Mean blood pressure (mmHg)	117.2/71.96	117.6/75	117/74.6	117.8/73.8
P value		0.8306 (systolic) 0.022653 (diastolic)	0.9124 (systolic) 0.0520 (diastolic)	0.7351 (systolic) 0.1894 (diastolic)
Pulse (per minute)	86	87.92	86.76	86.56
P value		P=0.41169	P=0.749189	P=0.7925419
P value		P=0.071867	P=0.662505	P=0.532706
SPO2	100	100	100	100

DISCUSSION

It is still a matter of debate among obstetricians the superiority of exteriorization of the uterus to facilitate repair during Caesarean section over suturing the uterine incision while the uterus lies intraabdominally. In the present study, we found no significant difference in the two techniques of uterine repair at caesarean section except for the rise in diastolic blood pressure during eventration in exteriorized group as compared to in situ repair of uterus group.

Intraoperative nausea and vomiting in present study were not reported in any of the patients probably due to pre-induction medications (including antiemetics) given by the anaesthetists. Similar results were reported by the studies of Edmond et al, Wahab et al, Coutinho IC et al.^{3,6,7} None of our patients had anesthesia related complication. No other study has mentioned about this.

In the present study, there was no statistically significant difference in the operating time between the case and control group. This finding is in accordance with a similar study conducted by Sood and Edmond et al, Mughina Siddhiqui et al, Swapandas et al and also in CORONIS multicentric trial.^{1,6,2,9,10}

None of our patients in either study groups had PPH as it was also reported in CORONIS trial. No other study has reported the incidence of PPH. None of our patients had paralytic ileus and endometritis

As per routine postoperative protocol all patients in both the study groups have received four doses of injection paracetamol (500mg) and need of additional analgesic dose requirements on postoperative day one was recorded. In the present study, there was no difference in the number of analgesic doses required between the two groups. Statistically, there was no significant difference between the two groups with regard to the number of analgesic doses required, similar to the study by Sood, Coutinho Cand Coronis trial the analgesic doses required were same in both the study group.^{1,7,10} As reported by Sood and Wilkinson, there was a significant lower febrile morbidity in the exteriorized group.^{1,11} But some other groups, Wahab and Edi-Osagieetal reported no difference in the incidence of febrile morbidity as in present study.^{3,16}

The fall in perioperative hemoglobin was relatively higher in exteriorized group, but it was not statistically significant, similar findings reported by Edmond et al.⁷ Need of blood transfusion did not vary significantly between the two groups (pvalue-0.2490). This is supported by the studies of Sood, Wahab, Edmond and also by Coronis trial.^{1,3,6,10} 5 out of 50 in in-situ repair group and 4 out of 50 in exteriorized group had cystitis. This difference is not significant statistically. Edmondetal and SwapanDas et al. Also reported the incidence of cystitis in their patients to be not significant

statistically.^{6,9} In present study, there was no significant difference in the two groups regarding the return of bowel function. In the study by Sood there was also no significant difference in the opening of bowel function.¹

In the present study, there was no significant difference between the two groups regarding the period of hospitalization (p-value-0.2793), as according to Edi-Osagieetal and Sood, Wahab etal, Mughina Siddhiqui et al, Coutinho IC et al, Cheng Vei et al and also in Coronis trial.^{1,3,6,2,7,10,13} However, Magann et al have reported longer hospital stay in the manual placental removal and increase infection rate in a patient in whom uterus was sutured after exteriorization.¹¹ Similarly, Swapan Das et al. Reported a statistically significant less duration of hospital stays in the exteriorized group (pvalue-0.01).⁹

With regard to the day of suture removal, there was no significant difference between the two groups in the present study. In present study, only one patient among the In situ repair group has superficial surgical site infection, which is statistically not significant (p-value-0.31488). This is in accordance with all other studies (Wahab, Mughina, Swapan Das, Coutinho IC, Cheng Vei.^{3,2,7,9,13}

There was no statistically significant difference in relation to intraoperative vital parameters in between the two groups except rise in diastolic pressure during eventration in exteriorised group which was statistically significant (p<0.05).

CONCLUSION

In conclusion, there is no difference in the two methods of uterine repair. Both the methods are equally safe. However, a caution must be exercised in intraoperative blood pressure monitoring, especially when the uterus is to be exteriorized for repair as there is a rise in diastolic blood pressure during eventration which gradually settles down during suturing and reposition and has no adverse effect on patient.

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