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Uterine Incision Repair by Exteriorization Versus in Situ at Caesarean Section; Effect on Blood Loss and Operative Time

Saadia Saleem[1], Ammara Hafeez[2], Naureen Javed[3], Uzma Manzoor[4], Tasnim Tahira[5], Shaista Jabeen[6]

1 *Associate Professor, Department of Gynecology & Obstetrics, Faisalabad Medical University, Faisalabad Pakistan*
Manuscript writing, Reference

2 *Consultant Gynecologist, Department of Gynecology, MNCH, Social Security Hospital, Faisalabad Pakistan*
Collection of data

3 *Associate Professor, Department of Gynecology & Obstetrics, Faisalabad Medical University, Faisalabad Pakistan*
Completion of data & analysis

4 *Associate Professor, Department of Gynecology & Obstetrics, Independent Medical College, Faisalabad Pakistan*
Proof reading

5 *Professor, Department of Gynecology & Obstetrics, Faisalabad Medical University, Faisalabad Pakistan*
Supervised the study

6 *Senior Registrar, Department of Gynecology & Obstetrics, Allied Hospital, Faisalabad Pakistan*
Review statistical analysis

CORRESPONDING AUTHOR
Dr. Saadia Saleem
Associate Professor, Department of Gynecology & Obstetrics, Faisalabad Medical University, Faisalabad Pakistan
Email: saadiasaleem.ahf@gmail.com

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ABSTRACT

Background: Caesarean section is the commonest obstetric procedure. After caesarean delivery of the fetus and placenta, the uterus may be exposed outside the peritoneal cavity to suture the uterine incision or may be repaired in situ. **Objective:** To compare the outcome of uterine exteriorization versus in-situ repair during cesarean section in term of blood loss and operative time. **Study Design:** It was randomized control trial. **Settings:** Obstetrics and Gynecology department, Allied hospital, Faisalabad Pakistan. **Duration:** From 10th July 2017 to 10th January 2018. **Methods:** 320 patients were selected in this study. All enrolled patients were divided into two groups. In Group A uterine incision was repaired with uterine exteriorization and Group B with in-situ repair. The mean operating time and blood loss was noted. **Results:** The mean age of the group A patients was 28.04 ± 6.13 years and the mean age of the group B participants was 29.21 ± 6.55 years. The mean blood loss in group A was 397.89 ± 29.733 ml and in group B females was 435.97 ± 77.014 ml (p-value=<0.001) and the mean duration of operation in group A was 27.65 ± 1.876 minutes and in group B females was 32.34 ± 4.69 minutes (p-value=<0.001). **Conclusion:** Uterine exteriorization showed significantly better results in terms of operating time and blood loss than in-situ repair during cesarean section.

Keywords: Uterine exteriorization, In-situ repair, Cesarean delivery, Blood loss and operative time.

INTRODUCTION

Caesarean section is most commonly performed procedure worldwide. After caesarean delivery of the fetus and placenta, the uterus may be exposed outside the peritoneal cavity temporarily to make easy repair of the uterine incision.[1] Clinicians are trying for the best surgical technique of caesarean section to reduce maternal morbidity and documented both options in literature. Some obstetricians are in favor of suturing uterus in situ at caesarean section. Intra-abdominal repair of uterine incision lowers the morbidity but may have some difficulty as compared to exteriorization.[2]

Exteriorized and in situ repair of uterine incisions have similar effects on blood loss. Although both methods of uterine incision repair are justified during surgery, cesarean sections took less time when uterine incision was repaired in situ. There was clinically significant difference for intra-operative blood loss. In a randomized trial, it was reported that Operative time was significantly shorter in in-situ repair group, when it was compared to those of which the uterus was exteriorized (30.64 ± 8.65 vs 33.02 ± 9.54 min, p=0.011).[3] Intra-abdominal repair of uterine incision have more blood loss as compared to uterine exteriorization in repeat caesarean section.[4] Uterine incision repair by exteriorization or intra-abdominal, both have similar effects on intra-operative pain and vomiting, febrile morbidity and hemoglobin level.[5] But in another trial showed that uterine incision repaired by exteriorization may have reduced blood loss and reduced level in haemoglobin.[6]

Rationale of this research is to compare the outcome of uterine exteriorization versus in-situ repair during

cesarean section in patients presenting for delivery. Literature has reported that in situ repair is more time effective as compared to uterine exteriorization. But controversial results have been stated in literature which create a dispute whether to apply in-situ repair or uterine exteriorization. Also, there is no local literature available in this regard.

So, we conducted this study to analyze whether the outcome of uterine exteriorization is better than in situ repair at caesarean delivery in term of blood loss and operative time. This will improve local guidelines and practice to do in-situ repair or uterine exteriorization at cesarean section

METHODS

This Randomized Controlled Trial was conducted at Obstetrics and Gynecology department, Allied hospital, Faisalabad Pakistan. The duration of study was six months from 10th July 2017 to 10th January 2018.

Sample size of 320 cases; 160 cases in each group is calculated with 95% confidence level, 80% power of test and taking magnitude of mean blood loss i.e., 966.9 ± 219.1ml in uterine exteriorization and 903.9 ± 181.5ml in in-situ repair at cesarean section by using non probability, consecutive sampling technique.

Patients of 18-40 years of age, parity<5, gestational age >37 weeks and previous scarred uterus<4 caesarean sections were included in the study.

Patients of multiple gestation, uncontrolled chronic hypertension, gestational diabetes, ruptured membrane >12hours and placenta previa and morbid adherent placenta were excluded from the study.

After approval by ethical research committee of Faisalabad medical university, 320 females were included in the study of Department of Obstetrics and Gynecology, Allied hospital, Faisalabad. Informed consent was obtained. All information regarding (name, age, gestational age, parity and body mass index) was collected. The surgeon experience, type of anesthesia, steps of caesarean section and active management (oxytocin) after delivery were standardized. Then participants were randomly divided in two groups by using lottery method. All cesarean sections were done under spinal anesthesia. Operative time was measured from time of skin incision till time when skin stitched out (as per operational definition). During operation, blood loss was measured by collecting blood in kidney trays and the sponges were pre and post-surgery measured in terms of ml (as per operational definition). All details were entered in the proforma.

Statistical Analysis was done on SPSS version 21. Quantitative variables like age, gestational age, BMI, operative time and total blood loss were calculated as mean and SD. Qualitative variable like parity was calculated as frequency and percentage. Both groups were compared for outcome (operative time and total blood loss) by using independent sample t-test. P-value≤0.05 was taken as significant. Data was stratified for age, gestational age, BMI and parity. Post-stratification, independent sample t-test was applied to compare outcome stratified groups. P-value≤0.05 was taken as significant.

RESULTS

In our study total 320 females were selected. In group A uterine incision was repaired by exteriorization of uterus. While in group B uterine incision was repaired in-situ. The mean age of the group A females was 28.04 ± 6.13 years and the mean age of the group B females was 29.21 ± 6.55 years. Table 1

Table 1: Comparison of age (years)

	Group A	Group B	
Age (years)	**n**	**160**	**160**
	Mean	28.04	29.21
	SD	6.13	6.55

Group A= Uterine exteriorization, Group B= In-situ repair

In this study the mean gestational age of the group A females was 37.90 ± 0.77 weeks and in group B females was 37.71 ± 0.76 weeks. Table 2

Table 2: Comparison of gestational age (weeks)

	Group A		Group B
Gestational age (weeks)	**N**	**160**	**160**
	Mean	37.90	37.71
	SD	0.77	0.76

Group A= Uterine exteriorization, Group B= In-situ repair

In our study the mean BMI of the group A females was 22.55 ± 1.09 kg/m2 and in group B females was 22.54 ± 1.634 kg/m2. Table 3

Table 3: Comparison of BMI (kg/m2)

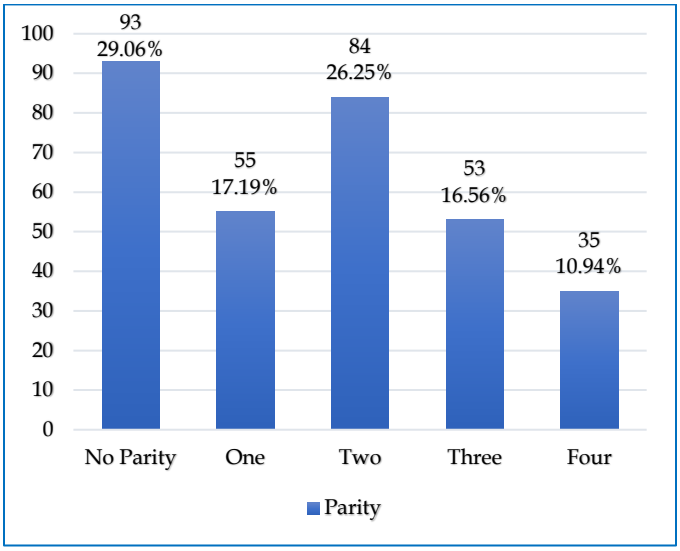
	Group A		Group B
BMI (kg/m²)	**n**	**160**	**160**
	Mean	22.55	22.54
	SD	1.09	1.634

Group A= Uterine exteriorization, Group B= In-situ repair

In our study, there were 93(29.06%) nulliparous females, 55(17.19%) females had parity one, 84(26.25%) females

had parity two, 53(16.56%) females had parity three and 35(10.94%) females had parity four. Figure 1

Figure 1: Frequency distribution of parity



Mean operative time in group A was 27.65 ± 1.876 minutes and in group B females was 32.34 ± 4.69 minutes. Statistically significant difference found between both groups for operative time i.e., p-value=0.001. Table 4

Table 4: Comparison of operative time (minutes)

	Group A		Group B
Operative time (minutes)	**N**	**160**	**160**
	Mean	27.65	32.34
	SD	1.876	4.69

Ind. t test=-11.742, p-value=0.001, Group A= Uterine exteriorization, Group B= In-situ repair

According to this study the mean total blood loss in group A was 397.89 ± 29.733 ml and in group B females was 435.97 ± 77.014 ml. Statistically significant difference found between both groups for operative time i.e., p-value=0.001. Table 5

Table 5: Comparison of total blood loss (ml)

	Group A		Group B
Total blood loss (ml)	**n**	**160**	**160**
	Mean	397.89	435.97
	SD	29.733	77.014

Ind. t test=-5.83, p-value=0.001, Group A= Uterine exteriorization, Group B= In-situ repair

The study results showed that among females with age ≤30 years the mean operative time in group A females was 27.78 ± 1.95 minutes and in group B females was 31.83 ± 4.73 (p-value=<0.001). Among females with age >30 years the mean operative time in group A females was 27.46 ± 1.76 minutes and in group B females was 32.99 ± 4.59 (p-value=<0.001). Similarly, among females with age ≤30 years the mean total blood loss in group A females was 398.92 ± 29.69 ml and t in group B females was 435.04 ± 78.36 ml (p-value=<0.001). Among females with age >30 years the mean total blood loss in group A females was 396.32 ± 29.96 ml and in group B females was 437.13 ± 75.83 ml (p-value=<0.001). Table 6

Table 6: Comparison of operative time and total blood loss (ml) stratified by age

	Age (years)	Group A	Group B	p-value
Operative time (minutes)	**≤30**	27.78 ± 1.95	31.83 ± 4.73	**<0.001**
	>30	27.46 ± 1.76	32.99 ± 4.59	**<0.001**
Blood loss (ml)	**≤30**	398.92 ± 29.69	435.04 ± 78.36	**<0.001**
	>30	396.32 ± 29.96	437.13 ± 75.83	**<0.001**

Group A= Uterine exteriorization, Group B= In-situ repair

The study results showed significant difference between the study groups with operative time and blood loss of the females stratified by gestational age except the blood loss in 38th weeks of gestation i.e., p-value<0.05. Table 7

Table 7: Comparison of operative time and total blood loss (ml) stratified by gestational age

	Gestational age (weeks)	Group A	Group B	p-value
Operative time (minutes)	**37**	27.89 ± 1.97	32.21 ± 4.91	<0.001
	38	27.42 ± 1.88	32.38 ± 4.26	<0.001
	39	27.74 ± 1.56	32.60 ± 4.99	<0.001
Blood loss (ml)	**37**	399.44 ± 29.98	447.24 ± 78.36	<0.001
	38	401.39 ± 31.97	419.41 ± 75.105	0.108
	39	390.47 ± 29.84	437.23 ± 74.065	0.002

Group A= Uterine exteriorization, Group B= In-situ repair

The study results showed that among nullipara and para one the mean operative time in group A females was 27.79 ± 2.04 minutes and in group B females was 32.21 ± 4.83 (p-value=<0.001). Among multi-parity females the mean operative time in group A females was 27.53 ± 1.73 minutes and in group B females was 32.45 ± 4.58 (p-value=<0.001). Similarly, among nullipara and para one the mean total blood loss in group A females was 397.58 ± 30.33 ml and in group B females was 420.39 ± 78.17 ml (p-value=0.021). Among multi-parity females the mean total blood loss in group A females was 398.16 ± 29.38 ml

and in group B females was 449.37 ± 73.85 ml (p-value=<0.001). Table 8

Table 8: Comparison of operative time and total blood loss (ml) stratified by parity

	Parity	Group A	Group B	p-value
Operative time (minutes)	**Nullipara & Para one**	27.79 ± 2.04	32.21 ± 4.83	**<0.001**
	Multipara	27.53 ± 1.73	32.45 ± 4.58	**<0.001**
Blood loss (ml)	**Nullipara & Para one**	397.58 ± 30.33	420.39 ± 78.17	**0.021**
	Multipara	398.16 ± 29.38	449.37 ± 73.85	**<0.001**

Group A= Uterine exteriorization, Group B= In-situ repair

DISCUSSION

Abdominal route of delivery (cesarean delivery) is one of the most commonly performed obstetrics procedure worldwide. For several decades, it has been under research for surgical technique and various other aspects to decrease maternal morbidity. Rates of primary cesarean sections are increasing and in turn repeat cesarean sections with increase in both short and long term morbidity.[7] In our department almost 55% patients are delivered by caesarean section for last 5 years. Some Obstetrician preferred to repair uterus in-situ while others did repair by exteriorization at caesarean section. In our study there was no statistical differences between 2 groups regarding age, Body mass index, parity, gestational age at cesarean delivery. Same demographic distribution was reported by Das etal.[8]In this study the mean operative time in Uterine exteriorization group was 27.65 ± 1.876 minutes and in In-situ repair group females was 32.34 ± 4.69 minutes (p-value=<0.001). Similarly, the mean total blood loss in Uterine exteriorization group was 397.89 ± 29.733 ml and in In-situ repair group females was 435.97 ± 77.014 ml (p-value=<0.001). Our outcomes were similar with a study conducted by Zafer *et al*, which demonstrated that operative time and hemoglobin fall was less in exteriorization (32.38 minutes) versus 36.38 minutes in intra peritoneal repair.[9] A study conducted by MS Abdella *et al*[10] showed intra-abdominal repair of uterine incision during repeat cesarean delivery have much better results in term of intra operative nausea vomiting and early bowel movements as compared to exteriorization. In current study we found operative time and total blood loss was statistically less in exteriorization group. Another study by Mohr-sasson *et al* demonstrated that intra-abdominal repair of uterine incision have significant more blood loss as compared to uterine exteriorization at caesarean section.[4,11] Zaphiratos V *et al* statistically analyzed sixteen randomize controlled trials.[6,12] They showed uterine incision repaired by exteriorization of uterus may have less blood loss and small decrease in hemoglobin level, same was noted in our study. It may be due to better hemostatis control in uterine exteriorization. In current study we observed statistically less operative time in exteriorization group as compared to in situ group. Similar findings were noted by Cuotinho IC *et al*[13] and Chauhan S *et al*.[14] Another study by Siddiqui M at *et al* supported that there was decrease in blood loss in extra abdominal uterine incision repair as compared to intra-abdominal.[15] In present study operative time was significantly less(p-value=<0.001)in exteriorization group than intra peritoneal repair of uterine incision .Similar findings to our study were reported by Das *et al*.[8] However, Shuja A *et al*[16] and El Khayat *et al*[17] reported that duration of surgery in exteriorization group was significantly longer when compared to in-situ group. On the other hand, one trial by Gode F *et al*[18] documented that Operation time was significantly shorter in in-situ repair group, when it was compared to those of which the uterus was exteriorized (37.8 ± 9.1 vs 45 ± 14.3min, p=0.000). Lakshmi Priya *et al* show that there was no significant difference between two groups in operating time but more blood loss and high rate of blood transfusion in intra peritoneal repair of uterine incision at caesarean delivery.[19] Results may vary because of different indications of caesarean section and experience of surgeon.

CONCLUSION

This study concluded that the uterine exteriorization for uterine incision repair showed significantly better results in terms of operating time and blood loss than to in-situ repair during cesarean section. Better results may be due to good visualization of uterine incision making repair easier and reduced blood loss.

LIMITATIONS

- Small patient sample size and short duration of study.
- Unfeasibility to blind the surgeon regarding surgery.

SUGGESTIONS / RECOMMENDATIONS

Uterine incision at cesarean section can be repaired by exteriorization of uterus. Further research is required on other aspects like intraoperative nausea vomiting pain, risk of endometritis and surgical site infection in exteriorization versus in situ repair at caesarean delivery.

CONFLICT OF INTEREST / DISCLOSURE

None declared.

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