

## ORIGINAL ARTICLE

# Uterine Exteriorization vs. In situ Repair of Cesarean Section: A Comparative Study at a Tertiary Care Hospital

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### ABSTRACT

**Background:** Exteriorization, a valuable repair of uterus technique during cesarean section, requires removal of uterus temporarily from the abdominal cavity to repair the incision. The objective of this study was to compare the postoperative symptoms of intra-abdominal to extra-abdominal repair of the uterine incision during caesarean procedure.

**Methods:** A quasi experimental study done in the Obstetrics and Gynecology unit of Ziauddin University Hospital, Kamari and Clifton Campus, Karachi from 1st January 2017 to 30th June 2017. A total of 190 patients were divided into two groups (95 patients in each). In Group A Uterine incision was closed extra abdominally and in Group B the closure was done intra-abdominally. The rate of nausea, vomiting, hospital stay, wound infection, fever, returns of bowel sounds, blood loss, and uterine trauma was measured between the two groups. Statistical analyses were done by applying independent sample t-test and chi-square tests.

**Results:** Exteriorization was better option above age 35 years and elective cesarean section (C/S) patients with less Intensity of pain and hospital stay (3 days) but the results were not statistically significant. Cesarean Section, hemoglobin both pre and post-operative, blood transfusion, the return of bowel sound after surgery, surgical site infection and uterine trauma between the two groups showed no significant difference.

**Conclusion:** The postoperative management of Exteriorization was better compared to intra-abdominal repair but the results were not significant. Exteriorization is an easy, convenient and valid option without complications and can be used especially in cases where difficulty in visualization of uterine scar and hemostasis is at stake.

**Keywords:** Uterine Repair; Cesarean Delivery; Exteriorization.

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### INTRODUCTION

Cesarean section, the most common surgical obstetric procedure worldwide, has risen in the last few decades throughout the world. In Latin America, the rate is 33% higher in the private sector<sup>1</sup>, whereas in the United States it has been increased up to 29% of all deliveries<sup>2</sup>. In some countries, the caesarean section accounts for 70% of all deliveries<sup>1</sup>. In Pakistan as in the rest of the world the Caesarean section rate is increasing reaching up to 30 to 35 percent<sup>3,4</sup>. There are many variations

in the techniques for cesarean section; the purpose of all is to reduce the surgical time, to make the procedure easier and more effective, to lower the costs, and lessen the adverse effects and morbidity associated with the procedure, as well as the length of hospital stay<sup>5-9</sup>. It is important to know the details of different surgical techniques to perform the Caesarean sections which have been discussed and assessed in a number of randomized controlled trials<sup>4-7,9</sup>. One of the controversial areas is repair of uterus whether done intra abdominally or extra abdominally.

Exteriorization, the repair of the uterus during Caesarean section outside the abdomen is a valuable method for repair of the uterine incision<sup>5</sup>. There are limited randomized controlled trials on a comparison of on intra and extra uterine repair of uterus and results are not very conclusive. According to the results of some studies, it has reduced postoperative complications with less rate of infection, while in some other studies no relationship between the techniques or intra- or postoperative maternal morbidity and complications were observed. A systematic review of six randomized controlled trails of the Cochrane Library 2004 found no significant difference between both groups while comparing the outcomes of extra-abdominal with in situ repairs of the uterine incision<sup>5</sup>. They found low febrile morbidity in the women with extra-abdominal closure of the uterine incision compares to the intra-abdominal group repair. However, these results are established on a few small sample size studies.

According to another meta-analysis, exteriorization may reduce blood loss and the related drop in hemoglobin, but the difference may not be clinically significant. They also found no statistically significant difference in intra-operative nausea, vomiting, or pain between the two groups but found a faster return of bowel function<sup>10</sup> in the in-situ repair group. Therefore, no definite sign found yet with the surgical technique offers.

This study was designed to compare these two surgical techniques concerning the episodes of vomiting or nausea, blood loss in the intra-operative period by measuring pre and postoperative hemoglobin, postoperative infection and bowel movement in our setting. The result of our study will help us in changing the current practice, choosing the most appropriate, and safe method of uterine closure, and adopting a protocol to close the uterine incision during Caesarean section.

## METHODS

A quasi-experimental study conducted in the Department of Obstetrics and Gynecology of Ziauddin hospital Kemari campus Karachi for six months from 1st January to 30th June, 2017, after obtaining approval from the University Clinical Research Committee and Ethics Review Committee. A total of 195 patients were studied. Consent was taken after explaining the purpose and objective of the study.

After an informed consent, women with gestational age more than 37 weeks and who were undergoing both emergency and elective Caesarean section were included in the study. Those women who had repeated Caesarean section twice or more, those with chorioamnionitis, previous pelvic

or abdominal surgeries histories were excluded from the study. Women who fulfilled the inclusion criteria were divided into two groups. Group A were women with Exteriorization that is the repair of uterus was done outside the abdominal cavity and group B were women in whom uterine repair was done intra-abdominally. The non-probability consecutive sampling method was used for the study. All women received preoperative intravenous third generation cephalosporin (Ceftriaxone) which continued for 3 days postoperatively. Caesarean deliveries were performed both by the residents and by the Consultant herself. The Caesarean technique was used as per by Joel Cohen method.

The repair of uterus in group A was done in continuous two layers with vicryl No. 1 suture while in Group B the repair of uterus was done intra abdominally in two layers with vicryl No.1 suture. The visceral peritoneum was sutured wherever possible. Spinal anesthesia of 22 or 24G was given by needle, using 12 mg of 0.5% of hyperbaric bupivacaine. For the post-operative pain relief, diclophenic Sodium was also given in adjusted amounts, starting at 50 mg/dose every 8 hours.

A questionnaire was filled for recording details regarding presence of nausea and vomiting during and in postoperative period, length of hospital stay, surgical site infection, fever and return of bowel sounds. The preoperative hemoglobin level and postoperative hemoglobin level and blood transfusion was also recorded to estimate blood lose. The length of hospital stays beginning from the day of cesarean delivery until discharge of patient was measured in days. The primary outcome was blood loss (reduction in hemoglobin) and the incidence of intra-operative complications such as nausea and vomiting. Secondary outcomes were the return of bowel function, postoperative wound infection, length of hospital stay, postoperative fever, postoperative pain (according to the severity of pain mild, moderate and severe) and exposure of the fallopian tubes and uterus to trauma and possible rupture of the utero-ovarian veins upon replacing the uterus into the abdominal cavity.

Data was analyzed using SPSS version 20. Mean and the standard deviation was calculated for a numerical variable like age, parity, gravidity, the return of bowel sound, length of hospital stay. Frequency and percentages were calculated for qualitative variables like surgical site wound infection, blood transfusion. Independent sample t-test was used for finding differences between the mean and chi-square for establishing an association between categorical variables. p value of <0.05 was considered significant.

**RESULTS**

The demographic data are presented in Table 1 showed that most of the women in both groups fall in the age group 25-35 years. Around 80 percent of women in both groups had low parity between 1 and 2. The association of primary and secondary outcomes such as nausea, vomiting and pain during the Caesarean Section, hemoglobin both pre and post-operative, blood transfusion, the return of bowel sound after surgery, surgical site infection and uterine trauma between the two groups is presented in Table 2.

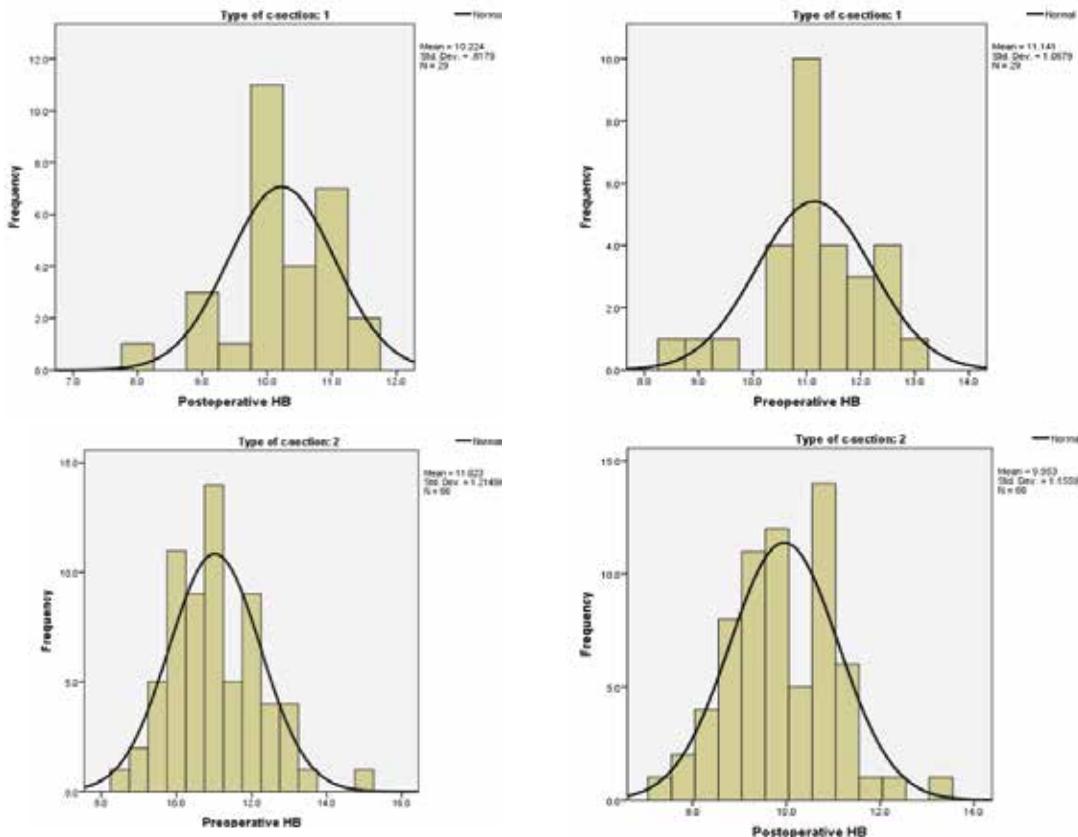
**Table 1: Demographic Data of group A (exteriorization) and Group B (intra-abdominal).**

S. NO.	Factors	Group A n=95 n(%)	Group B n=95 n(%)	p-value
1.	<b>AGE</b>			
	18-24	3(3.1)	4(4.2)	0.032
	25-35	79(83)	85(89.5)	
	More than 35	13(13.7)	3(3.1)	
2.	<b>PARITY</b>			
	1-2	89(93.7)	80(84.2)	0.045
	3-5	4(4.2)	8(8.4)	
	More than 5	2(2.1)	6(6.3)	
3.	<b>TYPE OF CAESAREAN SECTION</b>			
	Emergency	24(25.2)	29(30.5)	0.419
	Elective	71(74.7)	66(69.5)	

We could not find any significant association of these variables between extra and intra-abdominal repair of Caesarean section. In women age above 35 years, exteriorization was observed as a better option [14% in group A, compared to 3% in group B] and also in elective C/S patients. The patients less experienced intensity of pain and the hospital stay was less than 3 days (Figure 1).

**Table 2: Comparison of different variables in group A (exteriorization) and Group B (intra-abdominal).**

S. NO.	Parameters	Group A n=95 n(%)	Group B (n=95) n(%)	p-vdue
1	<b>NAUSEA</b>	12(12.5)	21(22)	0.085
2	<b>VOMITING</b>	4(4.2)	3(3.1)	0.1483
3	<b>PAIN</b>			
	Mild	43(45.2)	52(54.7)	1.9158
	Moderate	47(49.5)	40(42.1)	
Severe	5(5.2)	3(3.1)		
5.	<b>BLOOD TRANSFUSION</b>	7(7.3)	6(6.3)	0.774
6.	<b>RETURN OF BOWEL SOUND</b>			
	Less than 6 hrs.	92(96.8)	92(96.8)	0.999
	More than 6 hrs.	3(3.1)	3(3.1)	
7.	<b>HOSPITAL STAY</b>			
	Less than 3 days	79(83.1)	78(82.1)	0.848
	More than 3 days	16(16.8)	17(17.9)	
8.	<b>SURGICAL INFECTION</b>	1(1.05)	4(4.2)	0.174
9.	<b>UTERINE TRAUMA</b>	0	0	00



**Figure 1: Pre and Post Abdominal Uterine Repair.**

## DISCUSSION

This study confirmed that the procedure of exteriorization is easy, convenient without complications especially where difficulty in visualization of uterine scar. Exteriorization of the uterus, the repair of uterus outside the abdominal cavity during Caesarean section, is a valuable practice by the obstetrician especially if there is difficulty in controlling hemostasis and if there is inadequate exposure of the incision. To do repair intra abdominally or outside abdomen is so controversial among the obstetricians, and there is a lot of fear and hesitancy to repair the uterus outside the abdomen.

There are studies done comparing intra-abdominal with extra abdominal repair with varying results<sup>11</sup>. In the present study, we observed different signs and symptoms women developed during and after cesarean section with these methods so a better technique of uterine repair can be appraised and practiced. We compared different postoperative complications in two groups comprising 95 women in each group. In our present study, we could not find any significant difference in postoperative nausea, vomiting and pain, pre and post-operative hemoglobin, the requirement of blood transfusion, surgical site infection, and length of hospital stay, return of bowel sounds and uterine trauma between the two groups. While a similar study done in Quetta<sup>12</sup> found a significant difference in return of bowel function. Zafar et al.<sup>13</sup> in a randomized controlled trial concluded no significant difference between the two methods of uterine repair, considering different variables, however they found fewer sutures and shorter time in the exteriorized group.

Another study from Pakistan showed a significant difference between the operating times and fall in hemoglobin between the exteriorized and in situ repair. Studies by Lakshmi Priya<sup>14</sup>, Zaphiratos et al.<sup>15</sup> also found no significant fall in the hemoglobin levels between the two groups while Ezechi et al.<sup>16</sup> in their randomized study observed significant fall in hemoglobin level in the intra-abdominal repair group. Regarding the operating time though we did not find any difference but previously most authors report short operating time in the exteriorization group<sup>15,17-21</sup>.

In a recent study from India, comparing two groups of intra-abdominal and extra-abdominal repair the author found no significant difference between the two groups. He found similar post-operative caesarean section morbidity outcomes. However, in situ repair of the uterus in their study was associated with lesser post-operative pain, while exteriorization of the uterus was associated with lesser operating time<sup>22</sup> El-Khayat et al.<sup>19</sup> also found no significant difference in intra-operative pain, nausea and vomiting. However, their patients suffered from moderate to severe postoperative pain in the

exteriorization group.

Study by Lakshmi Priya<sup>14</sup> found a significantly high rate of blood loss and blood transfusion rates in situ group compared to exteriorization repair probably due to better visualization and traction on uterus. While studies by several others as well as ours reported no significant difference in blood loss and blood transfusion rates<sup>6,9,14,15</sup>. In their comparison of two groups concluded that exteriorization of the uterus is a valid option. Compared to our study where we found no difference in wound infection between the two groups Coutinho et al. found more surgical site infection in the in-situ group than the exteriorized group<sup>21</sup>.

A Cochrane systemic review comparing similar groups as ours found no significant difference in most of the variables between the two groups except for shorter hospital stay and less postpartum fever in the exteriorized group<sup>5</sup>. Similarly, Walsh and Walsh<sup>22</sup> in their meta-analysis on large number of women undergoing caesarean section and comparing two groups found no significant difference between the two groups regarding different variables such as nausea, vomiting, postoperative pain, thromboembolism, infection etc.

## CONCLUSION

Exteriorization of the uterus is the safe and valid option of uterine repair during Caesarean section with no significant increase in complications compared to the in-situ repair of the uterus.

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## CONFLICT OF INTEREST

The authors declared no conflict of interest.

## ETHICS APPROVAL

The Ethics Review Committee of the Institute approved the study.

## AUTHORS' CONTRIBUTIONS

All the authors contributed equally in the research write-up.

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