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A Comparative Study Between Exteriorization Of Uterus Versus In-Situ Repair In Caesarean Delivery

Dr. Shivangi Yadav[1], Dr. Pawan Agarwal [2]
[1](Resident, Department of Obstetrics and Gynecology, SMS Medical College and attached groups of hospitals, Jaipur, India)
[2](Associate Professor, Department of Obstetrics and Gynecology, SMS Medical College and attached groups of hospitals, Jaipur, India)

Abstract
Background*: Caesarean section is one of the most commonly performed major surgical procedures worldwide. Many variations in the technique of caesarean section have been devised making the operation more efficient, shortening the operative time, decreasing the risk of adverse effects and decreasing postoperative morbidity and duration of hospital stay.*
Aim*: To find out better method of uterus repair during caesarean delivery.*
Methods*: A prospective, randomized controlled study, 200 pregnant women with elective indication for caesarean delivery was randomized as 100 patients each in the exteriorization group and in the in-situ repair group. Data on mean time taken for uterine incision closure time, intra-operative blood loss, peri-operative drop in hemoglobin level, pain score assessment, additional analgesic requirement and postoperative morbidities were collected and compared between the two groups for statistical analysis.*
Results*: A statistically significant trend towards lesser mean time taken for the uterine wound repair was observed in the exteriorization group. The mean drop in hemoglobin level in exteriorization group was significantly lower (0.42 gm/dl) than in in-situ repair group (0.51 gm/dl).The mean intra-operative blood loss was significantly less in exteriorization group (220 ml) as compared to in-situ repair group (250 ml). Mean pain score in exteriorization group were significantly higher as compared to in-situ repair group at 12, 24, 36 and 48 hrs. Number of patients that required additional analgesia were significantly higher in exteriorization group as compared to in-situ repair group. There was no significant difference with respect to incidence of intra-operative nausea and vomiting, incidence of fever, wound infection and length of hospital stay among the two groups.*
Conclusion *: Exteriorization is better than in-situ repair method as it has several advantages in terms of less uterine incision closure time, less perioperative drop in haemoglobin level, less intraoperative blood loss. The only disadvantage obtained was more postoperative pain.*
Keywords*: Caesarean delivery, Exteriorization of uterus, In-situ repair.*

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I. Introduction

Caesarean delivery defines the birth of a fetus via laparotomy and then hysterotomy.[1] Caesarean section is one of the most commonly performed major surgical procedures worldwide.[2] The global caesarean section rate increased from 12.1% in 2000 to 21.1% of all births in 2015.[3] In India, the rate of caesarean section raised from 17.2% in 2015-16 (NFHS-4) in relation to 8.5% in 2005-06 (NFHS-3) data.

The first caesarean birth was documented in 1020 AD.[4]As medical science and especially obstetrics has advanced over the years, there has been an increase in the rate of caesarean births. But cesarean delivery may be associated with risk of both immediate and long-term complications, so obstetric fraternity making constant efforts to make caesarean delivery as much free of morbidity as possible. A considerable decrease in the associated morbidity can be achieved with improvement in surgical techniques.[5] Among these techniques different methods of uterine repair is also included. The method of uterine repair following delivery can either be with the uterus lying within the abdomen (in-situ repair) or uterus can be lifted through the incision on to the draped abdominal wall and the fundus covered with a moistened laparotomy pack (exteriorization).[5]

Exteriorization Of uterus has been postulated as valuable technique particularly when exposure of the incision is difficult and there may be complications such as tearing of uterine angle (rupture of part of uterine wall) or problems with hemostasis (reducing the flow of blood).

The purpose of this study is to find a better way of uterine repair either exteriorization of uterus or in-situ repair in terms of making surgery easier, reducing surgical time and intra-operative & postoperative morbidity as well as lowering cost of surgery.

II. Material and Methods

A prospective, randomized, comparative study was done from November 2022 to April 2023 in the Department of Obstetrics & Gynecology of SMS Medical College & Attached Hospitals, Jaipur. Written and informed consent of each patient was taken prior to study. Institutional review board and ethical committee clearance was taken.

Study Duration: November 2022 to April 2023

Sample Size: 200 patients.

Subjects & Selection Method: 200 pregnant women who have undergone caesarean delivery for various elective indications were included in the study and were randomly allocated as 100 in the exteriorization group (Group-A) and 100 in the in-situ group (Group-B) by coin-tossing method.

Inclusion Criteria

• Women who have given a written informed consent
• Age :- 18-35 years
• Primigravidas who underwent elective caesarean section at term with live singleton fetus under spinal anesthesia
• Abdomen opened by Joel Cohen incision
• Women who comprehended VAS score

Exclusion Criteria

• Inverted T-incision on the uterus
• J-shaped incision on the uterus.

Procedure Methodology: After written informed consent was obtained, both the groups were subjected to routine blood investigations and examination followed by which they underwent caesarean section. All operations were performed under regional spinal anaesthesia using hyperbaric bupivacaine in a dose of 10 mg in 2 ml solution. Technique of performing surgery was standardised in all 200 patients till delivery of the placenta, following which in the exteriorisation group (Group-A) uterus was brought out of the peritoneal cavity for repair, while intraperitoneal repair was done in in-situ group (Group-B). Remaining steps of the closure were also standardised in all 200 patients.

Intraoperatively we have observed: -a) Uterine incision closure time b) Blood loss was assessed by weighing the dry and soaked mops preoperatively and postoperatively respectively c) Nausea & vomiting. d) Vital parameters like pulse, blood pressure and temperature were noted and recorded.

Postoperatively vitals were noted. Postoperative antibiotics given to all patients were standardized. Inj. Diclofenac sodium 75 mg was given IM 8 hourly for first 24 hours and then as per requirement. Postoperatively we have looked for: -a) Pain scores b) Peri-operative fall in hemoglobin level (from preoperative and 3rd postoperative day hemoglobin level estimation) c) Additional analgesic requirements d) Presence of fever e) Wound infection f) Duration of hospital stay was also noted. Subjective pain scoring was done with visual analogue scale which consists of numerical pain rating scale using a 10 cm line with the numbers ranging from 0-10 Numeric intensity scale. Patients were made to understand the significance of number and were asked to point out number that corresponded to the level of severity of pain which they have experienced. Pain score was assessed 12 hourly for first 48 hours. All the results were then statistically analysed.

Statistical Analysis: Continuous variables were summarized as mean and were analyzed by using unpaired t test. Nominal / categorical variables were summarized as proportions and were analyzed by using chi square / Fischer exact test. p-value <0.05 was taken as significant.

III. Results

In our study, the mean age in exteriorization group was 27.06 ± 2.26 yrs and in in-sit repair group was 26.71 ± 2.09 yrs. The age wise difference between the 2 groups was found statistically insignificant (p-value=0.231).

As observed in Table-2, the mean uterine incision closure time in exteriorization group was 11.76 ± 0.97 minutes and in in-situ repair group was 13.48 ± 0.94 minutes. In our study a significant trend towards more time taken for the closure of the uterine incision in the in-situ repair group was observed (p-value=0.001). In our study in exteriorization group 4 (4%) cases had intraoperative nausea and vomiting and in in-situ repair group 3 **(**3%) cases had intraoperative nausea and vomiting, values were not statistically significant. In our study the mean intraoperative blood loss in exteriorization group was 220 ± 21.04 ml and in in-situ repair group was 250 ± 21.81 ml, which was found to be statistically significant (p-value=0.001).As observed in Table-3, the two

groups were similar with respect to preoperative haemoglobin. The mean postoperative haemoglobin in exteriorization group was 10.60 ± 0.45 gm/dl whereas in in-situ repair group was 11 ± 0.53 gm/dl, the difference was found to be statistically significant (p-value=0.001). In our study, the mean drop in haemoglobin level in exteriorization group was 0.43 ± 0.11 gm/dl and in in-situ repair group was 0.55 ± 0.11 gm/dl. The difference in both the groups was statistically significant (p-value=0.001).Findings on Table-3 shows that the mean pain score in exteriorization group was 7.27 ± 0.51 at 12 hrs, 6.28 ± 0.32 at 24 hrs, 5.81 ± 0.62 at 36 hrs, 4.96 ± 0.72 at 48 hrs whereas in in-situ repair group it was 6.71 ± 0.61 at 12 hrs, 5.71 ± 0.60 at 24 hrs, 4.73 ± 0.56 at 36 hrs, 4 ± 0.69 at 48 hrs. Pain scores were higher in exteriorization group at 12, 24, 36 and 48 hrs as compared to in-situ repair group. In our study, in exteriorization group 27 (27%) patients and in in-situ repair group 10 (10%) patients required additional analgesia, values were statistically significant (p-value=0.001). However, there were no statistically significant differences noted between the 2 groups in terms of incidence of fever, incidence of wound infection and duration of hospital stay (p-value=0.616, 0.55 and 0.745 respectively).

Table 1: Distribution of Cases According to Age

Age (in yrs)	Group-A	Group-B	p-value
Mean ± SD	27.06 ± 2.26	26.71 ± 2.09	0.231

Table 2: Comparison of Intra-operative Variables

	Group-A	Group-B	p-value
Uterine Incision Closure Time (in minutes)	11.78 ± 0.97	13.46 ± 0.94	0.001
Incidence of Nausea and Vomiting	4 (4%)	3 (3%)	0.410
Blood Loss (in ml)	220 ± 21.04	250 ± 21.81	0.001

Table 3: Comparison of Postoperative Variables

	Group-A	Group-B	
Pre-operative Hemoglobin Level (in g/dl)	11.40 ± 0.48	11.26 ± 0.51	0.03
Post-operative Hemoglobin Level (in g/dl)	10.98 ± 0.49	10.75 ± 0.53	0.001
Drop in Hemoglobin Level (in g/dl)	0.42 ± 0.11	0.51 ± 0.11	0.001
Pain Score			
At 12 hrs	7.27 ± 0.51	6.71 ± 0.61	0.087
At 24 hrs	6.28 ± 0.32	5.71 ± 0.60	0.074
At 36 hrs	5.81 ± 0.62	4.73 ± 0.56	0.001
At 48 hrs	4.96 ± 0.72	4 ± 0.69	0.001
Additional Analgesic Requirement	27 (27%)	10 (10%)	0.001
Fever	7 (7%)	10 (10%)	0.616
Wound Infection	3 (3%)	2 (2%)	0.99
Hospital Stay (in days)	5.20 ± 0.74	5.23 ± 0.81	0.745

IV. Discussion

In our study, the mean uterine incision closure time was significantly less in exteriorization group as compared to in-situ repair group. In a trial done by Siddiqui M et al[6], they observed that the duration of uterine repair was significantly shorter in exteriorization group (10 minutes) as compared to in-situ group (11 minutes) (p-value=0.04). Results of our study were also consistent with study conducted by Carvalho JC et al[7] who noted significantly faster uterine repair in exteriorised group. In another study conducted by Chauhan S et al[5] a statistically significant trend was observed towards lesser mean time taken for the uterine repair in the extraabdominal repair group (11.4 ± 2.63 minutes) as compared to in-situ repair group (12.4 ± 2.70 minutes) (p-value=0.05).

In our study we found statistically significant difference in the mean intraoperative blood loss in both the groups (p-value=0.001). Blood loss was significantly greater in in-situ repair group. Ezechi OC et al[8] noted that estimated blood loss was significantly less in exteriorization group than the intraperitoneal group (p-value=0.048). In a study conducted by Das KK et al[9] they observed significant difference in the intraoperative blood less between the two groups (p-value=0.0014); blood loss being less in exteriorization group. In another study conducted by Lakshmi P et al[10] they noted significant difference in blood loss during surgery in in-sit repair and significant increase in transfusion rates in in-situ group were also noted. In our study the mean drop in haemoglobin level in exteriorization group was significantly less as compared to in-situ repair group. In a study conducted by Kumar SA et al[11] they noted that drop in haemoglobin level was significantly lower in the exteriorization group as compared to intraperitoneal repair group (p-value<0.05). Ezechi OC et al[8] noted significantly less postoperative anaemia rates in the exteriorised group. In a study conducted by Das KK et al[9] they observed that perioperative fall in haemoglobin was significantly less in the exteriorised group than in-situ group (p-value<0.0001).

In our study, there was no statistically significant difference noted in postoperative pain assessment at 12 hrs and 24 hrs (p-value=0.087 and 0.074 respectively) whereas postoperative pain assessment at 36 hrs and 48 hrs using VAS-score was found to be statistically significant in both the groups (p-value=0.001 and 0.001 respectively). Results of our study were consistent with study done by Edi-Osagie EC et al[12], he noted higher immediate and late pain scores in the exteriorization group, reaching statistical significance on Day 3. In a study conducted by Chauhan S et al[5] it was found that significantly more number of patients had increased postoperative pain in exteriorization group as compared to in-situ repair group (p-value=0.025). In our study, additional analgesic requirement was more in exteriorization group as compared to in-situ repair group; found to be statistically significant (p-value=0.001). In a study conducted by El-Khayat W et al[13] it was found that more number of patients in extraabdominal repair group needed additional postoperative analgesia than in-situ repair group (100 v/s 50 respectively, p-value <0.001).In yet another study conducted by Chauhan S et al[5], they noted that significantly more number of patients needed additional analgesia in extraabdominal repair group as compared to in-situ repair group (p-value=0.034).

V. Conclusion

In our study, we conclude that exteriorization is better than in-situ uterine repair as it has got several advantages in terms of less uterine incision closure time, less intra-operative blood loss, less peri-operative drop in hemoglobin level. The only disadvantage in exteriorization group is that it has more postoperative pain, which can be reduced by adding analgesics.

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