



Necessity of Parietal Peritoneum Layer Closure to Prevent Severe Adhesion in Repeat Caesarean Section

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Abstract

Background: Repeated cesarean section involves various complication and one of the most common is adhesion. Some studies suggest that by closing the parietal peritoneum layer, the adhesion rate after surgery can might be decreased. The aim of this study was to assess the necessity of parietal peritoneum layer closure to prevent severe adhesion in repeat caesarean section. **Material & Methods:** This cross-sectional study was conducted in department of obstetrics and gynaecology, Care Medical College Hospital, Dhaka, Bangladesh from 2020 to 2022. Total 100 pregnant women were included in this study. These patients were divided into two groups where each groups contained 50 pregnant women. Here the two groups are parietal peritoneum layer closure and of parietal peritoneum layer non-closure. **Results:** Mean age of the pregnant women was 28.6 years (SD±4.50 years) in parietal peritoneum layer closure group and 30.4 years (SD±4.91 years) in parietal peritoneum layer non-closure group. 58% pregnant women in parietal peritoneum layer closure group and 60% in parietal peritoneum layer non-closure group had short inter delivery interval. The commonest comorbidity was hypertension in both groups (22% and 20%). Mean operating time was 35.6 minutes (SD±8.93 minutes) in parietal peritoneum layer closure group and 32.4 minutes (SD±9.50 minutes) in parietal peritoneum layer non-closure group. Mean hospital stay was 4.2 days (SD±1.01 days) in parietal peritoneum layer closure group and 4.8 days (SD±1.02 days) in parietal peritoneum layer non-closure group. The adhesion rate was 12% in parietal peritoneum layer closure group and 28% in parietal peritoneum layer non-closure group. The parietal peritoneum layer closure group had adhesion commonly in fascia to uterus (4%) and omentum to uterus (4%). The parietal peritoneum layer non-closure group had adhesion commonly in omentum to fascia (12%). **Conclusion:** Closure of the parietal peritoneum layer in caesarean section resulted in less adhesion formation. Thus, it is necessity to perform parietal peritoneum layer closure to prevent severe adhesion in repeat caesarean section.

Keywords:- Parietal Peritoneum Layer Closure, Severe Adhesion and Repeat Caesarean Section.

INTRODUCTION

The most popular and commonly done procedure in obstetrics is a cesarean section. The prevalence of cesarean sections has steadily risen around the world. Over 27% of all births between 2004/05 and 2007/08 involved a caesarean section, making it one of the most frequent obstetric procedures globally.^[1] This causes the number of pregnant women who have had a previous cesarean section to rise. Given that the current repeat cesarean birth rate is approximately 91%, having a first cesarean section almost ensures that following pregnancies will result in cesarean deliveries.^[2] The intraoperative problems are increased by repeated cesarean sections. Closing the visceral and parietal peritoneum has long been a part of the surgical procedure for lower segment cesarean sections.^[3] However, there are a number of reasons why caesarean section supporters and detractors disagree on topics like whether the peritoneum should be closed or not.^[4,5] Despite the fact that non-closure of the peritoneum does not restore the integrity of the abdominal anatomy, many researchers and medical professionals have argued that it has more benefits and should be advised.^[5] However, it is challenging to make informed decisions on whether or not to seal the peritoneum due to the small number of women in a few RCTs that focus on long-term outcomes following caesarean surgery. Chronic pelvic discomfort, abdominal adhesion-related secondary infertility, and abdominal adhesion-related secondary infertility following prior caesarean section are only a few long-term problems that have substantial repercussions, significant morbidity, and high healthcare expenditures.^[6,7,8] Closing the peritoneum has

historically been done to restore anatomy and lower hazards such infection, wound dehiscence, and adhesion development.^[9] Adhesion bands, particularly after appendectomy and gynecological surgery, are among the most frequent side effects of abdominal and pelvic surgery.^[10] Ischemia, necrosis and inflammation of the surgically removed tissues, as well as a foreign body reaction to the suture materials, are the main reasons of adhesion bands in these surgeries.^[11,12] One of the most frequent reasons of chronic pelvic discomfort and referrals to gynecologists is ischemia in the operated tissues, and treating it is expensive for healthcare providers.^[13,14] Particularly in relation to adhesion development, long-term repercussions might result in severe morbidity and expensive medical treatment.^[15,16] The closure of the peritoneum following a caesarean section appears to be supported by recent research looking at adhesion development after repeat CS.^[17,18] 5.7% of women who had caesarean sections over a ten-year period required re-admission for treatment of adhesion issues.^[19] Adhesions are another important root cause of secondary female infertility.^[20] There are very few studies about the importance of parietal peritoneum layer closure to prevent severe adhesion in repeat caesarean section. Thus, this study aims to assess the necessity of parietal peritoneum layer closure to prevent severe adhesion in repeat caesarean section.

Objectives

To assess the necessity of parietal peritoneum layer closure to prevent severe adhesion in repeat caesarean section.

MATERIAL AND METHODS

This cross-sectional study was conducted in department of obstetrics and gynaecology, Care Medical College Hospital, Dhaka, Bangladesh from 2020 to 2022. Total 100 pregnant women were included in this study. These patients were divided into two groups where each groups contained 50 pregnant women. Here the two groups are parietal peritoneum layer closure and of parietal peritoneum layer non-closure. Consent of the patients and guardians were taken before collecting data. After collection of data, all data were checked and cleaned. After cleaning, the data were entered into computer and statistical analysis of the results being obtained by using windows-based computer software devised with Statistical Packages for Social Sciences version 22. After compilation, data were presented in the form of tables, figures and charts, as necessary. Numerical variables were expressed as mean and standard deviation, whereas categorical variables were count with percentage.

Inclusion Criteria

- All age group of pregnant women

Exclusion Criteria

- Patients transferred to another hospital
- Patients who did not give consent

RESULTS

[Table 1] shows the demographical characteristics of the study people. Mean age of the pregnant women was 28.6 years (SD±4.50 years) in parietal peritoneum layer closure group and 30.4 years (SD±4.91 years) in parietal peritoneum layer non-closure group. Mean BMI

was 30.6 kg/m² (SD±4.42 kg/m²) in parietal peritoneum layer closure group and 30.7 kg/m² (SD±5.4 kg/m²) in parietal peritoneum layer non-closure group. Mean gravidity was 3.9 (SD±1.5) in parietal peritoneum layer closure group and 3.5 (SD±1.6) in parietal peritoneum layer non-closure group. Mean parity was 2.6 (SD±1.6) in parietal peritoneum layer closure group and 2.5 (SD±1.7) in parietal peritoneum layer non-closure group. Mean gestational age was 38.2 weeks (SD±0.78 weeks) in parietal peritoneum layer closure group and 38.8 weeks (SD±0.88 weeks) in parietal peritoneum layer non-closure group. Table II shows the indications and comorbidities for cesarean section. The commonest indication was short inter delivery interval. 58% pregnant women in parietal peritoneum layer closure group and 60% in parietal peritoneum layer non-closure group had short inter delivery interval. The commonest comorbidity was hypertension in both groups (22% and 20%). Table III shows the post operative characteristics. Mean temperature was 100.5° f (SD±0.21° f) in parietal peritoneum layer closure group and 100.8° f (SD±0.23° f) in parietal peritoneum layer non-closure group. Mean hemoglobin concentration was 9.9 g/dL (SD±0.33 g/dL) in parietal peritoneum layer closure group and 10.0 g/dL (SD±0.34 g/dL) in parietal peritoneum layer non-closure group. Mean operating time was 35.6 minutes (SD±8.93 minutes) in parietal peritoneum layer closure group and 32.4 minutes (SD±9.50 minutes) in parietal peritoneum layer non-closure group. Mean hospital stay was 4.2 days (SD±1.01 days) in parietal peritoneum layer closure group and 4.8 days (SD±1.02 days) in parietal peritoneum layer non-closure group. Figure 1 demonstrate the adhesion rate after cesarean section. The

adhesion rate was 12% in parietal peritoneum layer closure group and 28% in parietal peritoneum layer non-closure group. Table IV shows the Location of adhesion. The parietal peritoneum layer closure group had adhesion

commonly in fascia to uterus (4%) and omentum to uterus (4%). The parietal peritoneum layer non-closure group had adhesion commonly in omentum to fascia (12%).

Table 1: Demographical characteristics of the study people. (n=100)

Characteristics	Closure (n=50)	Non-closure (n=50)
	Mean±SD	Mean±SD
Age (Years)	28.6±4.50	30.4±4.91
BMI (kg/m ²)	30.6±4.42	30.7±5.4
Gravidity	3.9±1.5	3.5±1.6
Parity	2.6±1.6	2.5±1.7
Gestational age (Weeks)	38.2±0.78	38.8±0.88

Table 2: Indications and comorbidities for cesarean section. (n=100).

Characteristics		Closure		Non-closure	
		n	%	n	%
Indications	Short inter delivery interval	29	58	30	60
	BX presentation	7	14	5	10
	Fetal distress	8	16	6	12
	Dysfunction of labor	11	22	10	20
	Preterm Labour	2	4	1	2
	At Request	23	46	25	50
	Others	20	40	23	46
Comorbidities	Diabetes	8	16	6	12
	Hypertension	11	22	10	20
	Chorioamnionitis	4	8	2	4
	Others	11	22	13	26
	None	16	32	19	38

Table 3: Post operative characteristics. (n=100).

Characteristics	Closure (n=50)	Non-closure (n=50)
	Mean±SD	Mean±SD
Temperature (F)	100.5±0.21	100.8±0.23
Hemoglobin concentration (g/dL)	9.9±0.33	10.0±0.34
Operating time (minute)	35.6±8.93	32.4±9.50
Hospital stay (Days)	4.2±1.01	4.8±1.02

Table 4: Location of adhesion. (n=100)

Adhesion location	Closure		Non-closure	
	n	%	n	%
Fascia to uterus	2	4	4	8
Omentum to uterus	2	4	3	6
Omentum to fascia	1	2	6	12
Bowel	1	2	1	2
None	44	88	36	72

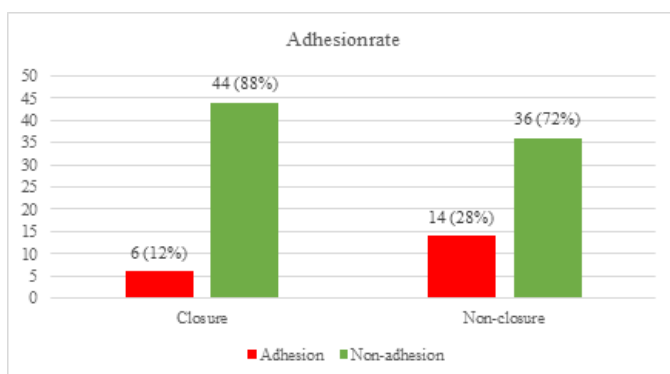


Figure 1: Adhesion rate after cesarean section. (n=100)

DISCUSSION

In this current study, total 100 pregnant women were included. Then they were divided into two groups where each groups contained 50 pregnant women. Here the two groups are parietal peritoneum layer closure and of parietal peritoneum layer non-closure. In this study, mean age of the pregnant women was 28.6 years (SD±4.50 years) in parietal peritoneum layer closure group and 30.4 years (SD±4.91 years) in parietal peritoneum layer non-closure group. Similar results found in the study of Kiykac Altinbas S. et al,^[21] where mean age was 27.9 years (SD±5.17 years) in closure group and 30.1 years (SD± 5.92 years) in non-closure group. Mean BMI was 30.6 kg/m² (SD±4.42 kg/m²) in parietal peritoneum layer closure group and 30.7 kg/m² (SD±5.4 kg/m²)

in parietal peritoneum layer non-closure group. In the study of Kiykac Altinbas S. et al,^[21] mean BMI was 30.4 kg/m² (SD±4.42 kg/m²) in closure group and 30.02 kg/m² (SD± 5.12 kg/m²) in non-closure group which is similar to our study. Mean gravidity was 3.9 (SD±1.5) in parietal peritoneum layer closure group and 3.5 (SD±1.6) in parietal peritoneum layer non-closure group. Mean parity was 2.6 (SD±1.6) in parietal peritoneum layer closure group and 2.5 (SD±1.7) in parietal peritoneum layer non-closure group. Mean gestational age was 38.2 weeks (SD±0.78 weeks) in parietal peritoneum layer closure group and 38.8 weeks (SD±0.88 weeks) in parietal peritoneum layer non-closure group. In the study of Pietrantonio M. et al,^[22] mean gestational age was 38.3 weeks (SD±0.3 weeks) in both groups. In this study, the commonest indication was short inter delivery interval. 58% pregnant women in parietal peritoneum layer closure group and 60% in parietal peritoneum layer non-closure group had short inter delivery interval. In the study of Aravinda K. et al,^[23] among 130 pregnant women 28 had short inter delivery interval which is similar to our study. The commonest comorbidity was hypertension in both groups (22% and 20%). In the study of Pietrantonio M. et al,^[22] the commonest complication was also hypertension in both groups (19.8% and 13.4%). Mean temperature was 100.5° f (SD±0.21° f) in

parietal peritoneum layer closure group and 100.8° f (SD±0.23° f) in parietal peritoneum layer non-closure group. Mean hemoglobin concentration was 9.9 g/dL (SD±0.33 g/dL) in parietal peritoneum layer closure group and 10.0 g/dL (SD±0.34 g/dL) in parietal peritoneum layer non-closure group. Mean operating time was 35.6 minutes (SD±8.93 minutes) in parietal peritoneum layer closure group and 32.4 minutes (SD±9.50 minutes) in parietal peritoneum layer non-closure group. In a study of Kiykac Altinbas S. et al,^[21] mean operating time was 30.8 minutes (SD±7.63 minutes) in closure group and 31.6 minutes (SD±10.38 minutes) in non-closure group. Which indicates that, operating time was higher in closure group. Mean hospital stay was 4.2 days (SD±1.01 days) in parietal peritoneum layer closure group and 4.8 days (SD±1.02 days) in parietal peritoneum layer non-closure group. Thus, hospital stay was higher in non-closure group. Pietrantonio M. et al,^[22] found that mean hospital stay was 4.5 days (SD±0.1 days) in closed group and 4.8 days (SD±0.1 days) which is similar to our current study. In this study, adhesion rate was 12% in parietal peritoneum layer closure group and 28% in parietal peritoneum layer non-closure group. Therefore, parietal peritoneum layer non-closure group had higher adhesion rate compared to parietal peritoneum layer closure group. Zareian Z. et al,^[24] found that among 45 cases, seven cases of adhesions were diagnosed during subsequent cesarean section among 13 patients (54%) with peritoneal non-closure, of which two cases had a severe degree of adhesion. In comparison, 3 out of 18 women with peritoneal closure

(relative risk: 3.2; 95% confidence interval: 1.0–10.2) had developed adhesions (15%), which were of a mild degree. There was a statistically significant difference between the two groups ($p = 0.05$). The parietal peritoneum layer closure group had adhesion commonly in fascia to uterus (4%) and omentum to uterus (4%). The parietal peritoneum layer non-closure group had adhesion commonly in omentum to fascia (12%). The study of Lyell DJ et al,^[25] significantly higher adhesion was seen in fascia and uterus in both groups (12% and 27%).

Limitations of the study

In our study, there was small sample size and absence of control for comparison. Study population was selected from one center in Dhaka city, so may not represent wider population. The study was conducted at a short period of time. The sampling was retrospective and there was no random allocation, so there is risk of selection bias.

CONCLUSIONS

Closure of the parietal peritoneum layer in caesarean section resulted in less adhesion formation. Thus, it is necessity to perform parietal peritoneum layer closure to prevent severe adhesion in repeat caesarean section. The operation time in parietal peritoneum layer closure group is more than non-closure group. But the hospital stay was less in closure group. Further studies with larger is needed to have better understanding of the importance of parietal peritoneum layer closure.



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