Short- term Effect of Closure Versus Non-closure of Peritoneum at Cesarean section

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Abstract: Background*:* Cesarean Section (CS) is one of the most frequently performed surgical procedures worldwide. The complications following cesarean section include fever, wound infection, postoperative pain, postoperative distention and bleeding which don't commonly occur in normal vaginal delivery. Suturing the peritoneal layers at CS may or may not confer benefit, hence the need to evaluate whether this step should be omitted or not. *Objectives:* The objective of this study is to assess the short term morbidity of closure versus non closure of peritoneum at CS. *Patients and methods:* A prospective randomized controlled trial of 80 cases undergoing elective cesarean section was done randomized into closure and non closure groups. Preoperative, Intraoperative and postoperative details were recorded.*Results:* Operative time, postoperative pain, postoperative distention and wound infection are significantly lower in the non closure group. Febrile morbidity and hemoglobin level were similar in both groups. *Conclusion*: non closure of both visceral and parietal peritoneum at CS is associated with less operative time and less postoperative pain and distention and wound infection hence routine closure of peritoneum at CS can be avoided.

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1. Introduction

Caesarean section is one of the most commonly undertaken operation worldwide and accounts for up to 60% of deliveries in some countries *(1).*

In general rates around the world are from5% to 20%of all deliveries *(2).*

Traditionally suturing of visceral and parietal peritoneum has been wildly accepted, despite lack of evidence establishing its benefit (3).

There benefit that closure of peritoneum can prevent adhesions.

On the contrary theoretical consideration and animal experiments support the opposite view (4,5,6).

The present study was developed in order to study the short term outcomes of closure versus non–closure of peritoneum at cesarean section (primary and repeated section), and to compare postoperative morbidity of cited techniques.

2. Patients and method

An informed written consent was obtained from participant. Eighty patients with age range from 18 to 40 years were recruited from in ward at obstetrics and gynecology department at Menoufia university.

They are randomized to one of two groups by number enveloped technique. Forty to peritoneal closure and forty to peritoneal non closure.

Patients divided into two groups

- Group I (Control) 40 patients with closure of both visceral and parietal peritoneum (30 patients with repeated cesarean section (IA) and 10 patients with primary cesarean section (IB).
- Group II (Study) 40 patients with non closure of both visceral and parietal peritoneum, (30 patients with repeated cesarean section (IIA) and 10 patients with primary cesarean section (IIB).

The study was approved by the Local Ethics Committee of Deputy of Research of Menoufyia University, With exclusion of patients with previous surgical lower abdominal operations other than CS, febrile morbidity prior to the operation defined as temperature above 38'c, sensory or motor deficit affecting the abdomen or the lower limbs, debilitating disease affecting wound healing (diabetes mellitus), premature rupture of membrane, preoperative bleeding and patients known to have bowel irritability.

After detailed history, examination and investigation all patients received spinal anesthesia and were operated by the same surgeon. A transverse incision was employed in all the cases. In the control group, both the visceral and parietal peritoneum were closed with continuous vicryl 2/0, whereas in the study group both peritoneal layers were left unsutured. The time of skin incision and surgery end time were recorded.

All the patients were subjected to the follow up within the 1st 24 hours every 6 hours during postoperative stay in the hospital to be followed up with emphases on degree of pain using 10 cm visual analogue scale, post operative distension,temperature,

regain of bowel functions assessed by auscultation of intestinal sounds, passage of flatus and Hemoglobin and hematocrit levels of all patients were assessed prior and 12 hours following the operation.

2. Results

Eighty women undergoing elective CS under spinal anesthesia were randomly allocated in two equal groups, closure or non-closure. No significant differences were noted between the study groups with respect to age, parity, gestational age and reasons for CS (*Table 1*). Operative time was significantly shorter (5.8 minutes) in the non-closure group as compared with the closure group P value (0.01) (*Table 2*). In our study there was significant statistical difference regarding operative time between repeated section groups, as the operative time was shorter (5.1 minutes) in the non-closure group than the closure group P value (0.01). Febrile condition was recorded this difference was not significant P value (0.41). There were cases of wound infection in both of the two groups of the study P value (0.2). Moreover, there was no statistically significant difference between groups regarding surgical bleeding. None of the patients needed blood transfusions or a return to the operating theatre for any further surgery. Patients in the study group demonstrated lower pain scores ($P = 0.01$) and used significantly less analgesics when compared with the control group (*Table 2*).there were significant differences in postoperative distention between both group,control group more liable to distention and have longer time to regain intestinal motility. In our study there were significantly statistical differences between primary section closure and non closure group regarding postoperative pain with p value (0.01) and high significantly statistical differences regarding operative time with p value (0.001) table(3).

Also in our study there were significantly statistical differences between repeated CS closure and non closure groups regarding operative time, postoperative pain,postoperative distention, wound infection and hospital stay in days table(4)

Table (1): General characteristics of the studied group:

Parameter	Non-closure		Closure	
Age :Mean	28.2		28.6	
Standard deviation	4.9		4.4	
range	18		21	
Parity :Mean	2.1		1.8	
Standard deviation	1.4		1.3	
range	5		4	
Gravidity: Mean	3.1		2.8	
Standard deviation	1.3		1.2	
range	5		4	
Previous section: Mean	1.6		1.5	
Standard deviation	1.2		1.1	
range	5		3	
Indication for CS:	No	%	No	%
previous C.S	30	75	30	75
CPD	2	5	0	0
Patient request	2	5	1	2.5
Breech	3	7.5	5	12.5
Fetal macrosomia	1	2.5	0	0
Triplet	0	0	2	5
Genitourinary fistula	1	2.5	0	0
Placenta previa	1	2.5	2	5

Table(2): Comparison between closure and non closure group regarding analytical data

Parameter	Closure Group	Non Closure Group	Z	*P*
Postoperative pain after 12 hours	**No %**	**No. %**		
Mid.	9 18.4	40 81.6		
Moderate	28 100	0 0		
Sever	3 200	0 0	5.6	0.01
Duration of op in minutes	39.9±4.3	34.1±5.3	5.3	0.01
Hb level				
Pre	11.5±1.03	11.6±0.7	0.6	0.5(NS)
Post	11.1±0.8	11.4±0.8	1.4	0.2(NS)
Wound infection	14	4	7.2	0.007
Postoperative distention	21	8	9.1	0.002
Hospital stay in days	42.9±15.8	24.6±3.8	7.1	0.03
Fever	37.8±0.9	36.7±1.3		0.41(Ns)

Table (3) Comparison of primary cesarean section with closure and those with non-closure group.

Parameter	NonClosure group	Closure group	Z	*P* value
Postoperative pain **Mild** **Moderate** **Sever**	No. % 10 71.4 0 0 0 0	No. % 4 28.6 6 30 0 0	8.6	0.01
Postoperative distention	1	4	2.4	0.2(NS)
Postoperative fever	1	2	0.4	0.5(NS)
Wound infection	1	2	0.4	0.5(NS)
Hospital stay in days	26.4±7.6	36±12.6	2.1	0.05
HB **Pre** **Post**	 11.9±1 11.7±0.9	 11.4±1.3 10.7±1.4	 0.9 2	 0.4(NS) 0.06(NS)
Operation time	28±4.2	35.5±4.4	3.9	0.001

Table (4) Comparison of repeated cesarean section with closure and those with non-closure group

Parameter	Non Closure group	Closure group	Z	*P* value
Postoperative pain **Mild** **Moderate** **sever**	No. % 11 26.8 19 100 0 0	No. % 30 73.2 0 0 0 0	5.1	0.01
Postoperative distention	17	7	7	0.008
Postoperative fever	7	5	0.4	0.4(NS)
Wound infection	12	3	7.2	0.008
Hospital stay in days	45.2±16.3	24	7.1	0.02
HB **Pre** **Post**	 11.6 ±0.9 11.3±1	 11.6±0.7 11.3±0.7	 0.02 0.3	 0.9(NS) 0.7(NS)
Operation time(minutes)	41.3±3.2	36.2±3.9	5.6	0.02

3. Discussion

In our study, there was a significant reduction in the average operating time of 5.8 minutes in the study group and about 5.6 minutes in cases of repeated CS. This finding is consistent with those of other studies who have reported shorter operative time in these groups of patients **(3,8,18,19)**. However, in the present study, surgical time was more than 5.8 minutes shorter, probably because both visceral and parietal peritoneum were left unsutured; where as Pietrantoni *et al.* **(8)**, left only parietal peritoneum open and Nagele *et al.* **(5)**, left only visceral peritoneum open.

The decrease in operative time reduced the duration of anesthesia exposure and that of exposure of wound to the environmental contaminants. This is reflected in decreased incidence of febrile morbidity and has reproduced the observations made by other researchers (3, **8,9,18,19)**.

Non-closure of the peritoneum might reduce the intensity of postoperative pain in both primary and repeated cesarean section, due to less manipulation of parietal peritoneum, which is sensitive to pain. In addition, ooze or clots in the closed peritoneal space behind uterovesical fold could be the significant factor for postoperative pain in peritoneal closure groups.

Nagele *et al.* **(5)**, Hojberg *et al.* **(10)**, and others **(3,11,12,18),** found reduced usage of oral analgesics in the subjects. Present study show statistically significant difference in the pain score in the two groups. The mean pain score was less in study group and similar finding was also reported by Rafique *et al.* **(12)**.

Grundsell**(3)**, showed a decreased incidence of wound complications in the non-closure group. The present study showed decreased incidence of wound infection in the study group in cases of repeated CS groups, which was statistically significant and was comparable with the findings of Hull**(13)** and Nagele *et al.* **(5)**. Most cases respond to wound care and medical treatment only two cases in the control group require secondary suture.

In the present study, difference between pre- and post-operative hemoglobin level in both groups was not significant and neither set of cases required a blood transfusion. Malvasi *et al.* during the retrospective study of 2576 cases showed a significant increase of blood loss and transfusion in non-closure group (14).

On the other hand, Nabhan reported significantly lower hemoglobin levels between preoperative and postoperative cases in the non-closure group versus the standard technique group while the blood transfusion rates in the two groups was comparable (15). A randomized controlled trial by Galaal and Krolikowski showed that estimation blood loss and mean drop in hemoglobin were not statistically significant between closure and non-closure groups (16). Many factors may contribute to the discrepancy between the results of our study and Nabhan's and Galaal's studies on one side and Malvasi's study on the other side. Malvasi's study is a retrospective study with a large sample size; however, our study and others are clinical trials with low sample sizes. Larger trials maybe required to compare the effects of bleeding in two different methods of surgery as one of the major complications of CS.

In our study, there was significant difference between the two groups regarding less post operative distention and rapid regain of intestinal motility in the non closure group than control group. One study Iron *et al.* (17) found that bowel function took a slightly long time to retain to normal after closure of peritoneum compared to non closure. On the other hand in the study by whilst Hull and Varner **(13)** found no difference in the episodes of ilues or parial ilues in the closure or non closure group they observed that the bowel stimulants were more frequently used in the closure group.

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