

# Peritoneal Closure Versus Non Closure at Cesarean Section

Mayyadah H. Mahdi<sup>1</sup>, Iftikar Hamzah<sup>1</sup>, Huda Khalid<sup>1</sup>

## ABSTRACT

**Introduction:** It is unclear when the concept of peritoneal closure became incorporated into the practice of surgery. Ambrose pure (1517-1590) and William Halsted (1852-1922), among other leading surgeon recommended closure of the abdominal wall in layers, without citing previous studies or clinical trial. Thus it appears that peritoneal closure has been routinely performed and thought on the basis of clinical impression. Study objective was to assess the operative benefit and problem of peritoneal non closure at Cesarean Section.

**Material and methods:** 80 women were recruited in this study which is a randomized controlled study of women undergoing CS carried out in Maternity and Pediatric teaching hospital in Najaf which is a tertiary level referral center including period between the first of Dec.2001 to 30<sup>th</sup> of Oct.2002. They were randomized to one of 2 groups 40 to peritoneal closure and 40 to non-closure of peritoneum each group consist of 20 prim gravida and 20 multiparous women. Group A after closure of the uterus the usual manner, the parietal and visceral peritoneum was closed. Abdominal wall is closed in layer as standard practice. Group B the procedure is as for group A except the both the parietal and visceral peritoneum is left unsutured. Abdominal wall closed in ordinary manner.

**Result:** The duration of CS performed using non closure was much shorter than these performed by the slandered technique. There is no significant drop in Hb, length of stay in hospital, blood transfusion, post-operative wound infection and wound dehiscence between the two groups. Post pyrexia and ileus was higher in closure than non-closure group but the difference was statistically non-significant. Less anesthetic complication and cost.

**Conclusion:** Our study confirm that there are no advantages in suturing the peritoneum in terms of blood loss, blood transfusion. post-operative pyrexia, wound infection and dehiscence.

**Keywords:** Peritoneal, Closure and Cesarean Section.

## INTRODUCTION

Peritoneal closure is a major abdominal operation. Each actually involve series of separate incisions in the mother. The skin, underlying muscle and abdomen are opened first and then uterus is opened allowing the removal of infant.<sup>1,2</sup> This definition does not include removal of a fetus from the abdominal cavity in the cases of the rupture of the uterus or in the case of 'an abdominal pregnancy.'<sup>2</sup> During the course of laparotomy, regardless type of lower abdominal incision used, blood, fibrin and tissue product from the region of the rectus muscles and anterior abdominal wall gain access to the pelvis. Draping the edges of the incision with a lap sponge or towel prior to placing the self-retaining retractor will prevent run- down of these adhesiogenic substances during the course of the operation but if the peritoneum is not

closed at the termination of the procedure, ingress of these substances will likely occurs in the first few post-operative hours, until spontaneous scaling of the peritoneum occurs.

Therefore in the interest of minimizing peritubal adhesions. We loosely close the peritoneum with fine (3.0) non-reactive absorbable suture in all infertility patient- and those patients in whom preservation of childbearing potential is desirable. Those surgical decision is empiric based on assumption. Immediately after C/S the upper fundus and adnexa are abdominal organs; thus any run down into the pelvis would not likely affect the Fallopian tubes and ovaries for a substantial length of time under ordinary circumstances.<sup>3</sup> Caesarean section is the most common major surgical procedure. and even a small decrease in post-operative complications would have a major impact on morbidity and would influence technique for peritoneal closure.<sup>4</sup>

There is evidence that if peritoneum left un-sutured, peritoneal defect will have mesothelial integrity within 48 hours and then will be no Fibrosis or scar formation In five days.<sup>2</sup> It was associated with more rapid healing. The absence of suture materials and the reduced tissue handling is thought to contribute to a less adhesion formation.

Study aimed at assessment of the operative benefit and problem of peritoneal non closure at Cesarean Section.

## MATERIAL AND METHODS

A randomized controlled study of women undergoing CS was carried out in Maternity and Pediatric teaching hospital in Najaf which is a tertiary level referral center including period between the first of Dec.2001 and 30<sup>th</sup> of Oct. 2002. 80 women were recruited from the labor ward. They were randomized to one of 2 groups 40 to peritoneal closure and 40 to non-closure of the peritoneum each group consist of 20 prim gravida and 20 multiparous women.

All women had primary CS and no previous laparotomy and all done by the same persons. Group A after closure of the uterus the usual manner, the parietal and visceral peritoneum was closed using 1.0 chromic cut gut suture. Abdominal wall is closed in layer as standard practice.

<sup>1</sup>Consultant, Department of Obstetrics and Gynecology, Al Emam-Al Sadiq Hospital Babylon-Babylon Health Directorate, Babyl, Iraq.

**Corresponding author:** Dr. Mayyadah H. Mahdi, Consultant, Department of Obstetrics and Gynecology, Al Emam-Al Sadiq Hospital Babylon-Babylon Health Directorate, Babyl, Iraq.

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Group B the procedure is as for group A except the both the parietal and visceral peritoneum is left un sutured, and abdominal wall closed in ordinary manner.

All the operations were performed under general anesthesia, using the following:

The patient is placed in supine laterally tilted. Pre oxygenation is accomplished with 100%. Rapid sequence induction using thiopental then induction dose of depolarizing muscle relaxant succinylcholine.

For maintenance we used:

1. A volatile agent halothane.
2. Muscle relaxant of intermediate duration atracurium (non depolarizing).

3. Opioid after delivery of the baby or kefan as analgesics. All operations performed using pfannenstiel skin incision women undergoing CS have got pre operation sample of blood taken for hemoglobin estimation. Post-operative sample of blood were taken up after the CS to estimate the drop in Hb concentration which reflect blood loss. In both groups the following data were recorded.

1. Maternal age, parity, and gestational age in weeks.
2. The operating time for each CS "as recorded from the onset of skin incision till the completeness of skin repair.
3. POSI operating hospital stay.
4. Maternal post-operative complications were followed up during these hospitalization for development of the following complications:
  1. Thrombo embolism
  2. Post-operative pyrexia.
  3. Post-operative ileus.
  4. Post-operative wound infection.
  5. Post-operative wound dehiscence.

The collected data was entered into a database for statistical analysis by using T- test for numerical data using Chi-square for categorical data at level of significant  $\alpha = 0.05$ .

## RESULTS

During the study period 80 women underwent CS randomized to one of 2 groups.

**Group A:** 40 prim gravida patients, 20 of them of with peritoneal closure and 20 of them with non-closure as shown in table-1.

**Group B:** 40 multipara, 20 of them with peritoneal closure and 20 patients with non-closure as shown in table-2.

The duration of CS performed using non closure was much shorter than these performed by the slandered technique, the difference 6.65 in table 1 and 7.5 in table-2. The difference was statistically significant. There was no significant difference in the drop of Hb, length of stay in hospital, blood transfusion. Post-operative wound infection and wound dehiscence between the 2 groups.

Post pyrexia and ileus was higher in closure than non-closure group. But the difference was statistically non-significant. Cost analysis to determine possible saving in anesthetic drugs related to the duration of operation include.<sup>21</sup> O<sub>2</sub>

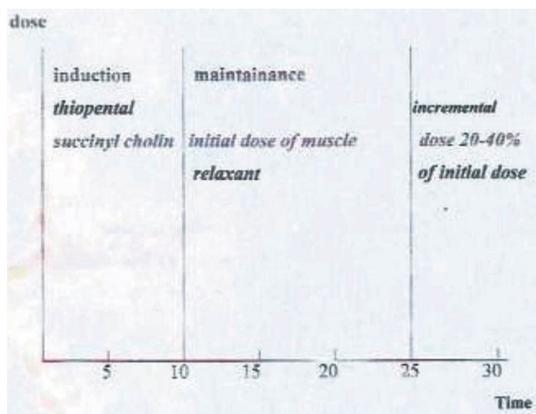


Figure-1: Show muscle relaxant related to the time of operation

	Non closure, N=20	Closure, N=20	
0.05 > p	22.6 +/- 1.87	29.25 +/- 2.613	Duration of operation in minutes
0.05 < p	0.5 +/- 0.214	0.5 +/- 0.214	Drop in HB
0.05 < p	2 +/- 0.22	2 +/- 0.22	Hospital stay
0.05 < p	0	1	Blood transfusion
0.05 < p	1	3	Pyrexia
0.05 < p	0	1	Ileus
-	0	0	Wound infection
-	0	0	Wound dehiscence

Table-1: Peritoneal closure versus non closure (Prim gravida, age range = 29, Gestational age=39 wks).

P	Non closure, N=20	Closure, N=20	
0.05 > p	23.3 +/- 0.72	30.8 +/- 2.8	Duration of operation in minutes
0.05 < p	0.59 +/- 0.35	0.57 +/- 0.39	Drop in Hb
0.05 < p	2 +/- 0.4	2.25 +/- 0.3	Hospital stay
0.05 < p	0	1	Blood transfusion
0.05 < p	1	3	Pyrexia
0.05 < p	0	1	Ileus
-	0	0	Wound infection
-	0	0	Wound dehiscence

Table-2: Peritoneal closure versus non closure (multiparous, Age range=29 years, Gestational age=39 wks).

consumption start (3-5) minutes before operation (pre-oxygenation) 10 full recovery from anesthesia In table-1. O<sub>2</sub> consumption for peritoneal closure 29.25 X 8 L/min= 234L  
O<sub>2</sub> consumption for non closure 22.6 x 8L min= 180.8 L  
We saved 53.2 L.

In table (2) O<sub>2</sub> consumption for closure group 30.8 x 8 l/min= 244.8l/min

O<sub>2</sub> consumption for non closure group 23.3 x 8 l/min= 186.4  
We saved 58.4L

In induction of anesthesia" for both closure +non closure rapid sequence of induction thiopental 500 mg then dose of depolarizing muscle relaxant which is succinyle Choline 1.5 mg/Kg which is of duration of action 3-5min. Maintenance of anesthesia by: Volatile anesthetic agent halothane +analgesic opioid after delivery of the baby + muscle relaxant (non depolarizing muscle relaxant. In table (1) f or halothane We need 0.5 cc/min, for closure - 0.5 x 29.25= 14.6 cc.

For non-closure = 0.5 x 22.6=1.3 cc

In table (2) halothan for closure = 0.5 x 30.8 = 15.4 cc,  
halothan for non closure = 0.5 x 23.1 = 11.65 cc

We saved 3.7cc for each operation.

For Atracrium duration of action 10-20 min. start from 5-10, Min. of intra-operation time and In case of closure we need the incremental dose which is 20-40% of the initial dose while no need for incremental dose. In non-closure because we are still with in the time of the initial dose.

Atracrim initial dose 0.5 mg. kg (30-50 rmg), incremental dose of Arracrim 0.1 mg/kg (10-20 mg) Pancuronium (pavilion). Initial dose 0.08 -0.12 mg/ kg (4-8 mg) incremental dose- (1 -2 mg) i.e. 25-50% from the initial dose.

## DISCUSSION

The closure of peritoneal defect even with minimally reactive suture material result in tissue ischemia, necrosis, inflammation increase tissue reaction in addition to increased tissue reaction and increase tissue handling, tissue trauma and increase the operative time in association with closure all resulted in increased post operative morbidity. Non closure appears to have few risks.<sup>5</sup> But the difference was statistically insignificant ( $P > 0.05$ ) and this may be attributed to the small sample size and this finding was not in agreement with Grundsell et al in there randomized controlled trial, reported that febrile morbidity' and wound infection were significantly lower in the non closure group ( $P < (0.001)$  and ( $P < 0.05$ ) respectively.

There are no advantages in suturing of the peritoneum in terms of blood loss and blood transfusion because in both we secure a good hemostasis and this confirmed the previous study of (Galal and Krolkowski).<sup>6</sup>

Every minute added to the time of surgery mean more cost and more hazard

- i The cost includes saving items of maintenance of anesthesia with shorting time including:- inhalational anesthetic agent like halothane O<sub>2</sub>
  - Opioid analgesic like fentanyl.
  - Long acting muscle' relaxant like pavilion.

The shorter operating time leads to more efficient use

of the theater time therefore reduces cost. This has confirmed both Pietruntoni M et al and Grundsell et al<sup>7,8</sup> who found that closure of the peritoneum during CS is not recommended as its not cost effectively.

- ii The unfavorable effect of prolonged anesthesia<sup>6</sup>

Patient related like accumulation of anesthetic agent in depots w with low subsequent elimination, development of shock, delay recovery, Post respiratory difficulty, effect on fluid and electrolyte balance, metabolic disturbance and higher injection rate. In the author's opinion the good fast surgeon obtains better results than the good slow surgeon. Staff related: higher possibility of exposure to needle prick and fatigue which may result in slow reaction time in an emergency and in ability to form judgment. Theater related like electrocution and higher hazard of fires and explosions  
In our study regarding the incidence of adhesion formation it needs a further follow up and further study.

## CONCLUSION

This study shows that non-closure of the peritoneum at cesarean section is associated with reduced operation lime which in turn reduces the anesthetic exposure. Cost and complication. It has further proven that non-closure of the peritoneum is not associated with increased morbidity.

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