Research Article

# A study comparing non-closure and closure of visceral and parietal peritonium during caesarean section

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## Abstract

**Objectives:** To find out the short term morbidity of non-closure of the visceral and parietal peritonium during caesarean section compared to suturing of visceral and parietal peritonium. **Method:** A prospective study of two hundred women undergoing caesarean section was done. Perioperative, intraoperative and postoperative details were observed. **Results:** Operating time, anaesthesia time and time of ambulation were significantly shorter in non-closure group. There was less postoperative pain, analgesic requirement and febrile requirement in non-closure group. However, it was not statistically significant. **Conclusion:**Non-closing the visceral and parietal peritonium at caesarean is associated with lesser operating time, decreased febrial morbitity and lesser need for postoperative analgesic. Hence, routine closure of peritoneum at caesarean can be avoided.

**Keywords:** peritoneal closure, caesarean section, postoperative morbidity.

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Received Date: 03/12/2018 Accepted Date: 15/01/2019

Access this article online

Quick Response Code:

Website: www.statperson.com

Volume 9
Issue 1

## INTRODUCTION

Caesarean section is most certainly one of the oldest operations in surgery. Over the years, there is little information relating to the optimum operative technique for this method of delivery. Traditionally, suturing of the visceral and parietal peritoneum at caesarean section has been widely accepted, despite the lack of evidence establishing its benefits. There is a belief that closure of peritoneum can prevent adhesions. On the contrary, theoretical consideration and animal experiments support the opposite view. Suture peritonization tends to cause ischemia, necrosis, inflammation and foreign body reactions to the suture material. On the other hand, clean incision of the peritoneal surface without suturing the cut edges provides more rapid peritoneal repair, leading to less postoperative pain, fever, lesser risk of ileus and better wound healing. The present study aims to assess the short-term morbidity, to evaluate whether non-closure of the visceral and parietal peritoneum has benefits over routine closure, with regards to the intraoperative and early postoperative course.

## MATERIALS AND METHOD

This is observational study to determine the short term clinical outcome of non-closure in comparison with closure of visceral and parietal peritoneum at caesarean delivery. It was carried out in the Department of Obstetrics and Gynecology B.V.D.U.M.C.H., Sangli. Two hundred women undergoing emergency or elective lower segment caesarean section were taken for the study. Exclusion criteria were history of previous lower abdominal surgery, severe anaemia, presence of pelvic infection and adhesions, morbid obesity and foul smelling vaginal discharge. After detailed history, examination and investigations, informed written consent was obtained from each patient for participation in the study. All the women underwent lower segment caesarean section through a pfannenstiel incision. Uterus was closed with continuous number 1 polyglactin. In the control group,

How to cite this article: Supriya Waydande, Vidya Jdhav, U T Bhosle. A study comparing non-closure and closure of visceral and parietal peritonium during caesarean section. *International Journal of Recent Trends in Science and Technology* January to December 2019; 9(1): 10-12 http://www.statperson.com

both the layers of peritoneum were sutured with continuous 1-0 chromic catgut. Rectus sheath was closed with a continuous number 1 polyglactin. The skin was approximated with continuous subcuticular number 2-0 ethilon. Study group had similar procedure of caesarean section but without reapproximation of visceral and parietal peritoneum. Injection Amoxicillin and cloxacillin 1gm bid was given preoperatively, by intravenous route in elective cases, whereas in the emergency group, intravenous injection Ampicillint Cloxacillin 1gm bid, injection metromidazole 400mg 8$^{th}$ hourly. Injectable antibiotics were given for the first two days of surgery and oral antibiotics for the next five days. After the operation, all patients were managed in the same postoperative ward. In the absence of complications, patients were discharged on the eighth postoperative day. The outcome measures noted were anaesthesia time, operating time, postoperative pain, duration of ileus, time of ambulation, febrile morbidity, endometritis, cystitis, wound infection and length of the hospital stay. Analgesic injection Diclofenac sodium 75mg intramuscularly, were given 12 hourly, in the first 24 hours of surgery and then as needed. Analgesics were changed over to oral on the second postoperative day. Postoperative pain was assessed by 10cm visual analog scale – VAS (no pain=0), worst pain ever=10) at 24 hours after surgery and daily till the time of discharge. Women were asked to indicate average intensity of pain they had experienced during the last 24 hours. Oral alimentation was reintroduced once bowel sounds were returned. Febrile morbidity was defined as temperature more than 38º C on two occasions at least twelve hours apart, excluding the first postoperative day. Endometritis was diagnosed if uterine tenderness, vaginal discharge and fever were present. Cystitis was diagnosed by positive urine culture growth or more than 1, 00,000 colonies per ml of a single species of bacteria in the urine. Wound infection was diagnosed when there was serous or purulent discharge from the skin incision with erythema and induration, with or without fever. Significance of difference, if any, in the observations made of variables studied in control / Study groups, in numbers or averages, was determined using Chisquare (X2) or student t–test, as applicable.

**Table 1**

**Patient characteristics, type of anesthesia and cesarian**

| | Non-closure n-100 | Closure n=100 | Statistical Significance |
|---|---|---|---|
| Age(years) Mean±SD | 24.5±4.4 | 23.7±3.7 | t=1.3,p=0.2 Not significant |
| Parity Mean±SD | 0.6±1.1 | 0.5±1.1 | t=0.4,p=0.6 Not significant |
| Gestational age Mean±SD | 37.5±2.3 | 37.6±2.0 | t=0.3,p=0.6 Not significant |
| Anaesthesia General | 19 | 20 | $X^2$=0.4,p=0.5 |
| Spinal | 81 | 80 | Not significant |
| Elective | 13 | 9 | $X^2$=0.1,p=0.8 |
| Emergency | 87 | 89 | Not significant |

**Table 2**

| Parameter | Non-closure n=100 | Closure n=100 | Statistical significance |
|---|---|---|---|
| Operative time Minutes mean±SD | 32±4.9 | 43.24±4.61 | t=16.74,p<0.0001 significant |
| Anesthesia time Minutes mean±SD | 42.8±5.03 | 53.09±4.67 | t=16.06,p<0.0001 significant |
| Total Pain score Mean±SD | 35.58±3.30 | 36.56±3.91 | t=1.83,p=0.06 |
| Febrile morbidity(no. of patients) | 12 | 16 | $X^2$=0.004,p=0.57 |
| Time of oral intake (days)Mean±SD | 1.34±0.47 | 1.61±0.49 | t=1.30,p=0.19 significant |
| Time of ambulation(days)Mean±SD | 1.39±0.51 | 2.28±0.56 | t=11.22,p<0.0001 significant |
| Wound infection(no. of patients) | 5 | 7 | $X^2$=0.35,p=0.55 Not significant |
| Hospital stay(days)Mean±SD | 8.17±0.75 | 8.29±1.00 | t=1.10,p=0.27 Not significant |

## RESULTS

Among the 200 women enrolled in the study, 100 study groups had non-closure, while 100 control groups had closure of visceral and parietal peritoneum at caesarean section. Mean age, parity, gestational age, anaesthesia data, elective or emergency cesarean data, were comparable in both the groups (Table 1). The outcome data is shown in Table 2. The average duration of operation and anesthesia were less by 11.2 minutes and 10.2 minutes respectively in the Study group. Women in study group requiring additional analgesics, either oral or parenteral, were less than that in the control group. 23 from study group and 27 control group required additional dose of analgesic. However, the difference was not significant. Mean total pain score in the study group was less as compared to that in control group. Time of oral intake and ambulation was less in study group than in control group. The febrile morbidity was high in control group as compared to that in the study group; however it was not statistically significant. Cystitis was found in

three from study group and five from control group. Five from study group had wound infection as compared to seven in control group. The mean hospital stay in study group was 8.17 days as compared to 8.29 days in control group. Five from study group in and seven in control group stayed in the hospital for more than eight days because of wound infection.

## DISCUSSION

Traditional surgical training has always dictated the closure of the visceral and parietal peritoneum, without proper evidence. But simplified surgical technique of non-closure of peritoneum, requiring less foreign material is beneficial to the patient. Histological studies in animals have revealed that the peritoneum regenerates denovo and not from the cut edge of the defect as in skin wounds because the entire surface becomes mesothelialized simultaneously. Therefore peritoneal defects even large when left undisturbed demonstrate mesothelial integrity by 48 hours and complete indistinguishable healing by five days. Leaving the peritoneum open for the debris to be digested by the activity of peritoneal macrophages might be beneficial. Irrespective of the factors influencing the surgical time, in the study, there was a significant reduction in the average operating time of 11.2 minutes in the study group. This finding is consistent with those of other studies who have reported shorter operative time in these groups of patients. However, in the present study, surgical time was more than 10 minutes shorter, probably because both visceral and parietal peritoneum were left unsutured; where as Pietrantoni *et al*, left only parietal peritoneum open and Nagele *et al*, left only visceral peritoneum open. The decrease in operative time reduced the duration of anaesthesia 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. Non-closure of the peritoneum might reduce the intensity of postoperative pain 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*, Hojberg *et al*, and others**,** found reduced usage of oral analgesics in the study group. Present study did not show statistically significant difference in the pain medication requirements in the two groups. The mean pain score was less in study group and similar finding was also reported by Rafique *et al*. Grundsell, 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, which was statistically significant and was comparable with the findings of Hull and Nagele *et al*.

## CONCLUSION

Available evidence suggests that leaving the peritoneum unsutured is not likely to be hazardous in the short term and may be of benefit

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Source of Support: None Declared
Conflict of Interest: None Declared