

# Non-closure of Peritoneum in Abdominal Hysterectomy

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## ABSTRACT

**Objective:** To assess that non-closure of visceral and parietal peritoneum during abdominal hysterectomy is not associated with increased intra-operative or immediate post-operative complication.

**Study design:** 104 women undergone elective hysterectomy by abdominal route for a benign disease were randomized to either closure of the visceral and parietal peritoneum with absorbable suture or no peritoneal closure.

**Setting:** Department of Obstetrics & Gynaecology in a Private General Hospital in Dhaka, Bangladesh.

**Main outcome measures:** No detrimental effect in the immediate post-operative recovery period, length of postoperative hospital stay. Pain, assessed by requirement of postoperative analgesics, post-operative bowel function and febrile morbidity and time taken for operation were other outcomes. Requirement of suture material was also considered.

**Results:** 50 women were recruited for the non-closure group and another 54 women to the closure group. There were no demographic differences between the groups and no differences in the methods of anaesthesia or use of different postoperative narcotic analgesia. The mean length of hospital stay was 5.08 (SD±0.55) days for the non-closure group and 5.11 (SD±0.92) days for the closure group. The incidences of pyrexia and wound infection were similar. There were no differences in the number of patients requiring parenteral narcotic number of analgesic doses and suture material was also lesser in number. The average operating time was shorter for open than for closure group (10 mins). There were no statistical differences observed with respect to pelvic abscess and ileus.

**Conclusion:** Non-closure of the visceral and parietal peritoneum at abdominal hysterectomy appeared to have no adverse effects on immediate postoperative recovery. It decreased intra-operative suture material number, postoperative analgesic requirements and allows a simplified and shorter surgical method.

## INTRODUCTION

Hysterectomy is the most common major gynaecological surgical procedure performed in our country. Recent advancement in operative techniques, the development of alternative therapies, the reevaluation of indications, and the re-assessment of health care expenditures and cost benefit analysis are

likely to lead changes in the thinking regarding the procedure.

The common and traditional procedure performed is in closing the abdomen, as well as that of the visceral peritoneum and parietal peritoneum separately from the other layers. A common perception is that it prevents adhesions. Even in general surgery literature review, it has been found that re-approximation is not only unnecessary for wound healing and strength but may actually delay healing and promote adhesion formation.<sup>1,2</sup> There are also different views and also animal experiments support this technique.

Leiomyomas and dysfunctional uterine bleeding accounts for majority of abdominal hysterectomies. Other indications include adnexal diseases, such as endometriosis or pelvic inflammatory diseases.

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Peritoneal and vascular injury produced by any suture may be a major cause of adhesions induction and routine closure of the peritoneum may be abandoned. A randomized controlled study was conducted to assess that non-closure of the visceral and parietal peritoneum conducted at abdominal hysterectomy is not associated with increased intra-peritoneal or immediate postoperative complications.

## Materials and Methods

This investigation was performed in 104 women undergoing elective abdominal hysterectomy between January 2000 to December 2001 in Obstetrics and Gynaecological Department in a private general hospital, Dhaka for benign diseases and they were randomized to one of the two categories. The random number was drawn with the help of random number table. A system of sealed envelopes containing treatment allocation was used. The envelopes were opened in the operation theatre at the start of operation. The control group undergoing hysterectomy with active closure of both visceral and parietal peritoneum using continuous running delayed absorbable suture (Ethicon O catgut). The study group consisted of patients undergoing the same surgical procedure but without closure of both peritoneum. Fifty four women were randomized to control group and 50 were taken in study group.

Abdominal hysterectomies were performed through Cohen's or a transverse incision. The safety of the total hysterectomy is increased by the use of an intrafascial technique.

The vault was closed with catgut No.1. Ethicon, and rectus sheath was repaired with Dexon O. In all cases skin was sutured by subcutaneous stitches with proline 3-0. In the closure group, peritoneum was approximated with O catgut ethicon.

Prophylactic antibiotic was used as a routine practice. Hysterectomies were performed by consultants working in that department.

Anaesthesia given was spinal in all cases. Immediate post-operative pethidine was given to all cases. The patients were managed in the usual post-operative manner. All medications were administered as per requirement. Besides pethidine the analgesic used was voltaren (NSAID) suppositories as required. The day of operation was considered as day 0. Women

stayed in postoperative ward for the 1<sup>st</sup> 24 hours and were then transferred to respective rooms. The treatment group was not disclosed to nursing or medical staff and not even to the patient. In the absence of complications, patients were discharged from the clinic on 5<sup>th</sup> post operative day.

During the study period the records of the patient demographics duration of surgery, post operative complications (fever (temperature >38% C in hospital), urinary tract infection, ileus the presence of purulent discharge from incision, number of post operative hospitalized days, wound hematoma, pelvic abscess, wound dehiscence and number of suture materials were reviewed.

Statistical analyses were conducted with the statistical package for social science (SPSS) and results were presented as means  $\pm$  standard deviations (SD), group were compared by student 't' test where appropriate. Analysis of data was performed with use of unpaired 't' test for continuous variables. Differences are considered statistically significant if  $P < 0.05$ .

## Results

Between January 2000 and December 2001, 104 women were recruited in Obstetrics and Gynaecological Department in a private general hospital, Dhaka 50 women were allocated to the study group and another 54 women to the control group.

### Patient demographics, values are shown as means (SD) or n(%) as appropriate

Table-1 represents the patient demographic and Anaesthetic data, The experimental and control group were similar with respect to age, parity and indications for operations and mode of anaesthesia.

The mean post-operative hospital stay was 5.08 ( $\pm 0.55$ ) days for the women in the experimental group and 5.11 (0.92) days in the control group.

There were 2 (1.81) women from non-closure group and 2(2%) women from the closure group who were hospitalized for 10 days.

The operative pain between the groups measured by the use of analgesics was significant. The peritonised group of patients consumed more analgesics.

**Table-1: Patient demographics, values are shown as means (SD) or n(%) as appropriate**

Patient	Closure	Non closure (50)
Age (years)	48.37 (2.55)	48.36 (2.27)
Parity	3.3 (1.28)	3.22 (1.19)
Anaesthesia		
Spinal	92.6%	94%
GA	7.4%	6%

**Table-2: Patient demographics, values are shown as means (SD) or n(%) as appropriate**

Indications n (%)	Peritonized	Non-peritonized (50)
Leiomyoma	15(27.78%)	13 (26%)
Dysfunctional uterine bleeding (DUB)	15 (27.28%)	16 (32%)
Endometriosis	7 (12.96%)	6 (12%)
Pelvic Inflammatory Disease (PID)	15 (27.78%)	14 (28%)
Ovarian tumour	2(3.7%)	1 (2%)

There was no difference between the groups with regards to oral feeding and solid diets. No bowel stimulants like suppositories or enema were used in both groups.

Of 104 patients with non-peritonisation, 22 developed pyrexia (>38°C).

**Table-3: Outcome data in terms of operation and post-operative course**

Indications	Control (closure) N=54	Study (Non-closure) n=54	Statistical significance
a. Post operation hospitalization Mean (SD)	5.11(0.92)	5.08(0.55)	P= >0.1
b. Operation time (mins)	61.3(7.53)	50.7(7.48)	P= <0.001
c. Analgesic requirement (Voltaren suppositories stick)	3.72 (1.82)	1.16 (1.55)	P= <0.001
d. Pyrexia	15 (27.8%)	7 (14%)	
e. Urinary tract infection (UTI)	10 (18.5%)	8 (16%)	
f. Wound infection	4 (7.4%)	5 (10%)	
g. Pelvic infection	3 (5.55%)	1 (2%)	
h. Pelvic abscess	1 (1.85%)	0	

Among all patients undergoing surgery, eighteen developed urinary tract infection, nine developed wound infection, four developed pelvic haematocoele and one developed pelvic abscess.

In addition - two patients developed intestinal obstruction, one due to adhesion on raw area over vault and another adhesion on an haematoma over vault.

Women in non-peritonised group had a shorter operation time than peritonised group. Meantime 50.7 (7.48) mins versus 61.3 (7.53) mins [P=<0.001]. Time recorded was from skin incision to last stitch of skin closure.

Regarding postoperative hospitalization women in the peritonised group stayed about 5.11 (0.92) days and non peritonised group for about 5.08 (0.55) days. This was not statistically significant (P>0.1).

## Discussion

In laparotomy, peritoneal wound showed mesothelial activity by 48 hours and complete indistinguishable healing by 5 days without scarring if left undisturbed.<sup>2</sup> Mesothelial healing is a local event. Initially, macrophages occupy the surface of a wound on this injured visceral and parietal layer, which mesothelial proliferation proceeds at the edge of the wound and the opposing parietal surface. Fibrin is formed on the wound surface within 24 hours, even in the absence of much bleeding.<sup>4</sup>

Traditional training of this operation procedure always dictated the closure of both parietal and visceral peritoneum. The reason behind it is to re-establish normal anatomic relationship, to prevent adhesion formation between the intestines or uterus and fascia, to make fascial closure easier.<sup>1</sup> Reapproximation of peritoneal edges result in increased tissue ischemia and necrosis and foreign body tissue reactions, and may lead to increased adhesion formation at the sites of reperitonealization.<sup>2</sup>

There is evidence that simplified surgical techniques requiring less foreign materials are beneficial to the patient.

In our study of abdominal hysterectomy cases, there were no significant differences in increase in febrile morbidity, antibiotic usage, length of hospital stay or return of bowel function between closure and non-closure group. Moreover, number of suture material used in non-closure group were lesser than closure group. Here the control group required more analgesics.

The most common cause of intraperitoneal adhesion is previous surgery.<sup>4</sup> Adhesion formation is also related to suture material, tissue devascularisation, ischemia, infection, amount of manipulation, and degree of aseptic technique.

A review of the experimental studies indicates that

when visceral and parietal peritoneum is left open, the denuded serosal defects tends to heal spontaneously. Adhesions are caused by ischemia, infection and inflammation rather than by open surface. Other studies also confirmed that non-closure of the peritoneum after gynaecological surgery did not increase adhesion as found in second look laparoscopy or laparotomy.<sup>5</sup>

The decrease in the operation time with non-closure of the peritoneum was associated with less anaesthesia time and wound exposed to the environmental contaminants. The difference of 10 minutes in operation time between two groups is statistically significant. The benefits here include decreased anaesthesia, operation room cost, personal time and expense and suture costs.

The length of hospital stay is an objective measure of short term morbidity after abdominal hysterectomy. This main outcome was similar between two groups, closure 5.11 (0.92) and non-closure 5.08 (0.55). the proportions by women remaining in hospital longer were slightly more in closure groups.

If bladder flap is kept open, less adhesion will be formed, bladder discomfort may be decreased and subsequent adhesions even with ovaries are also reduced.

## Conclusion

Our data support the following conclusions regarding non-closure of the visceral and parietal peritoneum at the time of operation

- 1) It appears to have no serious detrimental effects in the immediate post-operative recovery period.
- 2) It significantly reduces the requirement for analgesics.
- 3) It reduces number of suture materials.
- 4) It also provides a simplified surgical technique with less operating time.

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