ORIGINAL ARTICLE

Non-Closure of Peritoneum Leads to Reduced used of Analgesics and Less Post-Operative Pain as Compared to the Closure of Peritoneum in Appendectomy

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ABSTRACT

Objective: To compare the post-operative use of analgesics in closure and non-closure of peritoneum in appendectomy.

Material and Methods: One hundred patients undergoing an appendectomy divided in two groups, each group having fifty patients were analyzed in this study. The patients were randomly allocated in two groups; group A (appendectomy with peritoneum closed) and group B (appendectomy with peritoneum not closed) using a random number. After the procedure the patients were assessed for the use of analgesics required. Personal, preoperative and postoperative clinical information of all the patients were recorded and assessed using SPSS version 12

Results: The number of complaints and doses of analgesia in both groups were compared. Statistically the significant difference was noted only between number of complaints in group A and Group B ($P<0.05$).

Conclusion: The appendectomy with minimal tissue handling enables an early recovery, less need for analgesics.

Key words: Analgesics, appendectomy

INTRODUCTION

The year 1986 was the 250th anniversary of the first successful removal of appendix (appendectomy) and the 100th anniversary of the word of appendicitis being used in the surgical literature. It was the Reginald Fitz who presented a first paper on vermiform appendix in 1886 and McBurney described the clinical manifestations of acute appendicitis. Appendicitis is more common in teens and equal in both sexes[1].

Appendicitis is a common surgical emergency and appendectomy is a common abdominal surgical procedure[2,3]. In United States of America incidence of appendicitis is 250000 per year, with 70-80% occurring in patients less than 30 years of age. The overall mortality is less than 1% but more in cases of perforations and in elderly cases[4]. The importance of specific elements in clinical diagnosis of appendicitis is controversial and appendicitis continues to present challenges for surgeons even today[5,6].

The diagnosis of acute appendicitis could be frequently wrong even in experienced hands leading to negative appendectomies. The diagnosis usually depends on clinical history, physical examination and leukocytosis. Atypical presentations are not uncommon as many inflammatory and non-inflammatory conditions may mimic the presentation of acute appendicitis. This is especially seen in teen age, extremes of age and in females. These and other factors resulted in 15-30% negative explorations. The reported morbidity with negative appendicectomy is 5-15%[7].

When radiological techniques such as ultrasonography, CT scan and radio-nucleotide scan are included the diagnostic accuracy does not reach up to 90%[8].

Following an appendectomy, it has been standard practice to stitch the peritoneum closed. It has been suggested that peritoneal adhesions may be more likely when the peritoneum is closed, possibly as a result of reaction to the suture material and tissue ischemia[9].

Prior animal experiments and general surgery reports have shown that suture peritonealisation tends to cause tissue ischemia, necrosis, inflammation, and foreign body reactions to suture material. These factors may slow down the healing process and are considered important precursors of adhesion formation. Peritoneum is a mesothelial organ. In contrast to epidermal repair, where healing occurs gradually from wound borders, peritoneum heals simultaneously throughout the wound because mesothelial cells initiate multiple sites of repair[9]. If the peritoneum is left open, experimental studies have shown that a spontaneous reperitonealisation will appear within 48-72 hours after injuring the peritoneum with complete healing after five to six days[10].

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Closing the pelvic and peri-aortic peritoneum did not effect morbidity, but leaving the pelvic and peri-aortic peritoneum open significantly decreased the adhesion formation[9].

Tissue ischemia, mechanical or thermal trauma, infection, radiation injury, and foreign body reaction predisposes to adhesion formation. The peritoneal injury underlying these noxious stimuli evokes a serosanguineous inflammatory reaction that leads to fibrin deposition and early formation of adhesions.[10] This increases the tissue reaction locally and increases the requirement of analgesics[11,12].

Precise operative technique with avoidance of serosal trauma will decrease the post-operative requirement of analgesics. Ischemic tissue trauma caused by crushing, diathermy, and mass ligation should be minimized.

Closure of peritoneum at lower abdominal surgery that may be an appendectomy have not any additional advantage, rather is associated with more complications. Moreover, non-closure of peritoneum at lower abdominal surgery and appendectomy is associated with reduced use of analgesics and shorter hospital stay.[13]

The current study focussed on the comparison between closure and non-closure of peritoneum in appendectomy regarding post-operative use of analgesic. This may help to encourage the wider use of non-closure procedure for appendectomy for better prognosis.

METHODOLOGY

This was an Interventional study and was conducted in the Surgical Department, Unit IV, Services Hospital, Lahore with a duration Six month. One hundred patients undergoing an appendectomy divided in two groups, each group having fifty patients. The sampling was done by Non-probability purposive sampling. The study group was from both genders and from 10-50 years of age. The patients who were not included in the study group were with gangrenous and perforated appendix and with co-morbidity i.e., diabetes, ischemic heart disease, tuberculosis. Data was collected from the patients presenting in the Emergency Department of Services Hospital, Lahore with pain right iliac fossa and operated for acute appendicitis. Informed written consent was taken from the patients. All the operations were performed in the same environment using the same infrastructure. The patients were randomly allocated in two groups; group A (appendectomy with peritoneum closed) and group B (appendectomy with peritoneum not closed) using a random number. After the procedure the patients were assessed for the use of analgesics required and the post-operative pain.

Data were entered in the SPSS version 12. The two groups were compared for outcome variables which are analgesic requirement (number of time patient's complained of pain and dose of analgesics). For analgesic requirement, t-test was used for comparison. P≤0.05 was considered significant.

RESULTS

A total number of hundred patients were admitted in Surgical Emergency Department, Services Hospital, Lahore with the signs and symptoms of acute appendicitis and were diagnosed by clinical examination who underwent emergency appendectomy. They were divided in two equal groups e.g. group A (appendectomy with peritoneum closed) and group B (appendectomy with peritoneum not closed). Out of which 27 (54%) were females in group A while 25 (50%) were females in group B and remaining 23 (46%) were males patients in group A and 25 (50%) were males in group B. The females were predominating the male patients (Table 1).

Table 1: Distribution of cases by gender (n=100)

Gender	Frequency (Group A)	Frequency(Group A)
Male	23(46%)	25(50%)
Female	27(54%)	25(50%)

Female to male ratio 1.17:1 1:1

Table 2: Distribution of cases by ages(n=100)

Age	Frequency (Group A)	Frequency(Group A)
10-20	31(62%)	24(48%)
21-30	12(24%)	18(36%)
31-40	4(8%)	5(10%)
41-50	1(2%)	3(6%)

Mean±SD: 20.64±7.39 22.34±8.85, P value P<0.05

It has been observed that most of the patients fall in age group 10-20 years, there were 31 patients (62%) out of 50 patients in group A and 24 patients (48%) in group B. Second most common age was 21-30 years, there were 12 patients (24%) in group A and 18 patients (36%) in group B. Statistically the significant difference was observed P<0.05 (Table 2).

The number of complaints and doses of analgesia in both groups were documented in table 3. Statistically the significant difference was noted between number of complaints in group A and Group B (P<0.05). When compared the doses of analgesics of group A and B, the difference was statistically not significant (P>0.05).

Table 3: No of complaints and doses of analgesia(n=100)

	Group A	Group B	P value
No. of complaints	2.56±1.86	1.84±1.82	P<0.05
Doses of analgesics	2.58±1.83	2.06±1.78	P>0.06

DISCUSSION

Appendicitis is one of the most common intra-abdominal diseases encountered the solution to which is a simple operation[46] although abdominal surgeons have been encountering appendicitis for more than 100 years its diagnosis remains elusive recent studies rate negative appendectomy range 9-40%[14].

In our study there were 46% male in group A and 50% in group B, and 54% females in group A and 50% in group B. The same results were obtained in the study of Perez et al[4] in which 53% males and 47% females respectively which are nearly comparable[15].

In our study age of patients was 10-50 years. 62% of patients belonged to 10-20 years in group A and 48% in group B which is comparable to the study of Jehangir et al[3] in which mean age of patients was 20 years[16].

Nonclosure of the peritoneum at radical abdominal hysterectomy and node dissection is not hazardous and is not associated with an increased incidence of infection- or adhesion-related complications[17].

Closing the pelvic and periaortic peritoneum did not affect morbidity, but leaving the pelvic and periaortic peritoneum open significantly decreased the adhesion formation and post-oparative pain[18].

Closure of visceral and parietal peritoneum has no benefit over non-closure of visceral peritoneum at LSCS. There was improved short-term postoperative outcome if the peritoneum was not closed. Long-term studies following caesarean section are limited, but data from other surgical procedures are reassuring. There is at present no evidence to justify the time taken and cost of peritoneal closure[19].

The analgesia requirements assessed by visual and verbal scale, oral analgesia used after 24 hours postoperatively for four days and postoperative satisfaction assessed verbally, shorter surgical time length of postoperative hospital stay, reestablishment of intestinal motility were the main out come measures. Non-closure of both visceral and parietal peritoneum at the caesarean section produces a significant reduction in the postoperative use of analgesia and shorter hospital stay postoperatively[20].

The incidence of febrile morbidity and analgesic requirement was greater in closure group. Closure of peritoneum at lower segment caesarean section doesn`t offer any additional advantage, rather is associated with more complications. Closure of the peritoneum should be abandoned at caesarean section[21].

Our findings may be explained by the unique nature of the peritoneum. Unlike other tissues, the peritoneum does not require apposition of tissue edges for closure[22,23].

Non-closure of the visceral and parietal peritoneum at lower segment caesarean section is associated with fewer postoperative complications, is more cost effective and is simpler than the traditional operative technique of closing both peritoneal layers[24].

Non-closure of the peritoneum at caesarean delivery appears to have no adverse effect on postoperative recovery, it also decreases the number of analgesic doses and shortens the operating time and may be more desirable in achieving a next pregnancy. The present study demonstrated that surgical peritoneal closure resulted in more advanced adhesion formation. The practice of non-closure of the peritoneum should be performed at caesarean.[25]

CONCLUSION

Non-closure of the peritoneum at appendectomy appears to have no adverse effect on postoperative recovery. It also decreases the number of analgesic doses and shortens the operating time. The present study demonstrated that surgical peritoneal closure resulted in more use of analgesics and pain. The practice of non-closure of the peritoneum should be performed at appendectomy.

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