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Original Research Article

A comparative study of laparotomy closure in peritonitis with and without intraabdominal drainage

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ABSTRACT

Background: Purpose of this study was to investigate whether the use of abdominal drainage after laparotomy for peritonitis can prevent or significantly reduce post-operative complications such as intra-peritoneal abscess formation or wound infection.
Methods: A prospective randomized study was done of one hundred and one (101) cases who underwent emergency laparotomy at General Hospital Palanpur and Sushrut Surgical Hospital, Palanpur. After completion of operation for peritonitis peritoneal cavity was either drained or not drained. Drained group of cases was termed as group A and non-drained group of cases was termed as group B. Parameters noted in group A were daily drain output, character and culture sensitivity of the fluid. Surgical outcomes in form of hospital stay and postoperative complications like wound infection, wound dehiscence, residual abscess within month of operation were compared between two groups.
Results: Significant difference was observed between drained group and non-drained groups in terms of length of hospital stay, wound infection, wound dehiscence, residual abscess and overall postoperative complication
Conclusions: From the present study we deduce that prophylactic abdominal drain in each case is unnecessary, as it stops functioning latest by 72 hours if not draining. On the contrary it invites infection from outside. This may delay convalescence. Drain should be kept when leak from suture line is anticipated or when there is lot of necrotic tissue within peritoneal cavity, and kept till it functions; otherwise it should be removed earliest.

Keywords: Peritonitis, Intra-peritoneal drainage, Intra-peritoneal abscess, Perforation, Stomach, Duodenum, Appendix

INTRODUCTION

Peritonitis is a surgical emergency of first magnitude that requires urgent surgical intervention.[1-3] The conditions that require urgent laparotomy include peritonitis secondary to perforation of abdominal viscous viz. Stomach, duodenum, appendix, gallbladder, colon etc. or penetrating abdominal injuries. These patients are more prone to develop post-operative complications such as peritoneal abscess or wound infection for which a surgical re-intervention may be required.[4-9] Though practiced by many surgeons, the role of the intra-peritoneal drainage to minimize post-operative complications and reducing morbidity and mortality is not clear and remains a much debatable subject.

Unnecessary use of drainage of abdominal cavity is associated with many complications like blockage, adhesions and intestinal obstruction.

Aims and objectives

Therefore, this study was undertaken to investigate whether the use of intra-peritoneal drainage after

laparotomy can prevent or significantly reduce post-operative complications such as intra-peritoneal abscess formation, wound infection and therefore reduce hospital stay and stress and discomfort to the patient. The aim of the study was to determine evidence-based value of prophylactic drainage of abdominal cavity in cases of peritonitis.

METHODS

A prospective randomized study was done of one hundred and one (101) cases who underwent emergency laparotomy at General Hospital Palanpur and Sushrut Surgical Hospital, Palanpur, from November 2017-November 2020. The primary cause of peritonitis requiring urgent laparotomy were peptic ulcer perforation, appendicular perforation, traumatic and non-traumatic perforation of small and large bowel. Patients were taken for laparotomy after proper resuscitation and investigations. After completion of operation peritoneal cavity was either drained (Group A) or not drained (Group B), according to operator's preference.[10-16] In "Group A" tube drain (28 Fr) was passed through separate stab wound and connected to a sterile beg. Daily drain output and character of fluid were noted in "Group A". Culture sensitivity of drain fluid was done. All patients with peritonitis included in study except patients with multiple system involvement or with unrelated complications were excluded from study. Surgical outcome and postoperative complications within 30 days of operation were noted and compared between two groups. The study protocol was approved by institutional ethics committee human.

Statistical analysis

Data was analyzed manually and using Statistical package for social sciences (SPSS), version 20 (SPSS Inc., Chicago, IL). Chi-square test was used to calculate p-value and for the comparison of categorical variables and presented as percentage.

RESULTS

Both the groups were comparable in terms of mean age (35.5 versus 31.5 years). Total number of patients included in "Group A" were 64, while in "Group B" total number of patients were 37. In group 'A' there were 43 males and 21 females while in Group 'B' there were 25 males and 12 females. Out of 101 patients, 68 (67.33) were male and 33(32.67) are female, thus male high proportion is seen in the present study. Incidence of wound infection (37.5% versus 24.3%) (p=0.18) and wound dehiscence 18(5.9 versus 2.7) (p=0.75) was also higher in Group ''A" as compared to the other group. One incidence of residual intra-peritoneal abscess occurred in Group ''A", while there was none in Group ''B" (2.9% versus 0) (p=0.73).

Out of 64 cases of Group "A" 25 % had no drainage, 65% had minimal drainage (<50 ml/day). Culture of the drain was positive in 15.6% of Group "A". However, overall postoperative complications (50 % versus 25.5 %) were higher in "Group A" (p=0.04).

Table 1: Age wise distribution.

Age in years	Drained group A	Non drained Group B
Up to 12	03	01
12-20	09	11
21-30	13	08
31-40	16	06
41-50	15	08
Above 50	08	03
Total	64	37

Table 2: Gender wise distribution of patients.

Gender	Drained Group A	Non Drained Group B	Total Group A+B	%
Male	43	25	68	67.33
Female	21	12	33	32.67
Total	64	37	101	100

Table 3: Primary cause of laparotomy and associated complications.

Diagnosis	Group A					Group B				
	Total	**W. I.**	**W.D.**	**IPA**	**Other**	**Total**	**W. I.**	**W.D.**	**IPA**	**Other**
Peptic perforation	24	5	1	0		12	2	0	0	
Enteric perforation	19	8	2	0		10	3	1	0	
Appendicular perforation	5	2	0	0		8	1	0	0	
Traumatic perforation	9	4	0	1	1 FF	0	0	0	0	
Others	7	5	1	1	1 BL	7	3	0	0	1SIO
Total	64	24	4	2	2	37	9	1	0	1

Table 4: Complications.

Complications	Group A	Group B
Wound infection	24	9
Wound dehiscence	4	1
Intra-peritoneal abscess	2	0
Biliary leak	1	0
Fecal fistula	1	0
Sub-acute int. obstruction	0	1
Total	32 (50%)	11 (30%)

Table 5: Drainage: amount: culture.

Drainage Fluid Amount	No. of patients	Drainage fluid culture organisms detected	Drainage fluid culture organisms not detected	Bile pigments
Nil	16	-	-	-
Min	41	7	34	-
Significant<50 cc/48 hrs	7	3	2	2
Total	64	10	36	2

A significant difference was also observed in length of hospital stay between both the groups. It was higher in "Group A" as compared to "Group B" (13.1 days versus 10.5 days respectively).

DISCUSSION

In our study complication rate in the drained group was higher than then in non- drained group, which is comparable to observations made by otherworkers.[17-23] In our series, length of hospital stay (13.1 versus 10.5), was higher than the study done by Khan et all (9±4 versus 5±3.4 days) but in both the series length of hospital stay was higher in the drained group. Wound infection rate in our series (37.5% versus 24.3%) was comparable to the study done by Khan et al (40.0% versus 12.5%). Also, the findings were similar in both the series in terms of overall postoperative complications, present series (50 % versus 29.7%), Khan et al (35.85% versus 16.11%). The higher incidence of complications in the drained group seems to be due to the fact that most of the drains get blocked because of clot, thick secretion or omentum, thereby failing the purpose itself of the drain and stop functioning after 72 hours. On the contrary it invites infection from outside. This may delay convalescence and increase the hospital stay. In our series drain was useless in 90% of the cases and resulted in higher incidence of complications and increased hospital stay.

Limitations of study

In our study laparotomy closure in peritonitis, after completion of operation peritoneal cavity was either drained or not drained according to operator's preference which may affect studies outcome. Large number of cases with multi-centric trial needs to further clarify the issue.

CONCLUSION

Based on these results, present study suggests that prophylactic drainage of peritoneal cavity after gastrointestinal surgery is not necessary, as it does not offer additional benefits for the patients undergoing laparotomy for peritonitis Moreover, it increases operative duration, length of hospital stay and surgical site infection. Culture of the drain was positive in 15.6% of Group "A". but these patients did not develop any major complication later, while one patient whose drain culture did not grow any organism on culture developed major complication like intra -abdominal abscess on 5th post-operative day. Thus, it is difficult to arrive at any conclusion regarding importance of culture and sensitivity of drain fluid in few positive cases only. Intra-abdominal abscess has occurred in spite of drainage in "Group A". While, in "Group B" (non-drained) patients, if collection occurs later on, Ultrasonography guided per cutaneous drainage, culture and sensitivity and appropriate treatment is possible. Alternatively, not draining the peritoneal cavity decreases peritoneal sepsis as it eliminates track infection and increases chances of early ambulation. Drain should be kept when leak from suture line is anticipated or there is lot of necrotic tissue within peritoneal cavity, and kept till it functions otherwise it should be removed at the earliest. Considering all this facts Lawson Taits maxim "when in doubt drain" should be revised when in doubt don't drain.

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