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RESEARCH ARTICLE

EVALUATION OF SUBCUTANEOUS NEGATIVE PRESSURE DRAIN PLACEMENT FOLLOWING EMERGENCY LAPAROTOMY- A HOSPITAL BASED OBSERVATIONAL STUDY.

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ABSTRACT

Introduction-Placement of negative suction drain in subcutaneous plane in emergency laparotomy has been shown to drastically reduce incidence of infection by many mechanisms like evacuation of seroma, evacuation of infected content thereby decreasing bacterial load which results in improved healing better wound management and decreased morbidity and hospital stay. **Materials and methods-**This was a tertiary hospital based observational study carried in the department of general surgery government medical college Srinagar Kashmir, over a period of two years from august 2017 to august 2019 entitling 100 patients who underwent emergency midline laparotomies for purulent peritonitis. **Results-** mean age in group A was 32.7 and mean age in group B was 35.2, males were predominate both groups, In both the groups the underlying pathology was mostly perforated appendix or duodenal perforations which contributes to almost half of the patients, . development of post-operative surgical site infection were less common in vacuum assisted group which was 7% incomparison to other group which has 42%,mean duration of hospital stay in group A was 11.2 days and in Group B it was 7.8 days. **Conclusion-**placement of subcutaneous negative pressure drain not only improves better management of contaminated-dirty wounds better and also ensures early recovery.

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INTRODUCTION

Surgical site infections are not only associated with increased morbidity but also leads to significant mortality and increased care cost, which is characterized by a breach of mechanical or anatomic defense mechanism (Leaper, 2004). The most common infectious complications following postoperative period is superficial wound infection occurring within first week of surgery (Kujath, 2010). Different approaches and methods have been proposed to limit the incidence of post-operative infections like hand washing, skin preparation, prophylactic antibiotics and minimizing skin shaving and all have been universally followed (Diana et al., 2011). Placement of negative suction drain in subcutaneous plane in emergency laparotomy has been shown to drastically reduce incidence of infection by many mechanisms like evacuation of seroma, evacuation of infected content thereby decreasing bacterial load which results in improved healing better wound management and decreased morbidity and hospital stay (Sadoshima, 1993; Vandenburgh, 1992).

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MATERIALS AND METHODS

This was a tertiary hospital based observational study carried in the department of general surgery government medical college Srinagar Kashmir, over a period of two yearsfrom august 2017 to august 2019 including 100 patients who underwent emergency midline laparotomies for purulent peritonitis. This study includes all patients above 19 years with operative evidence of purulent peritonitis operated in emergency operation theatre via midline laparotomy. The patients who are excluded from this study are immunocompromised, age less than 20 and greater or equal to 60 years, re-exploratory emergency surgery. In this study we divided patients into two categories where group A which includes first 50 patients who underwent primary closure of abdomen without negative suction drain, the group B included other 50 patients who were subjected to negative suction drain.

Diagnostic work-up- All patients were thoroughly clinically examined and subjected to all baseline investigations(complete hemogram, kidney function, liver functions tests, x-ray chest and abdomen, viral serology, bleeding and clotting time etc)

and radiological investigations ultrasonography abdomen and pelvis and CECT abdomen and pelvis.

Aims and objectives

Aim of this study is to evaluate the effectiveness of negative suction drain in the management of emergency laparotomy wounds.

Following parameters are studied in this study

- Age distribution
- Sex distribution
- cause of purulent peritonitis
- Post-operative surgical site infection.
- Hospital stay

RESULTS

Age distribution

Group A.

This groupof 50 patientsincludes who were subjected to primary closure of abdomen,most of these patients were belonging to age group of 19-28 and 29-38 with mean age of32.7

Table 1a showing age distribution in primary closure of abdomen

Age groups	Number of patients
20-29	13
30-39	18
40-49	10
50-59	9

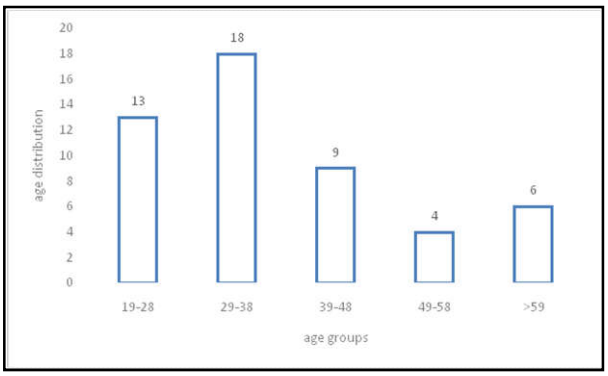

Figure 1a. showing age distribution in primary closure of abdomen

GROUP B

This group of 50 patients includes who were subjected to negative suction drain of wound, most of these patients also in this group were belonging to age group of 20-29 and 30-39 with mean age of 35.2

Table 1b. Showing age distribution in negative suction drainage of wound

Age groups	Number of patients
20-29	16
30-39	15
40-49	10
50-59	9

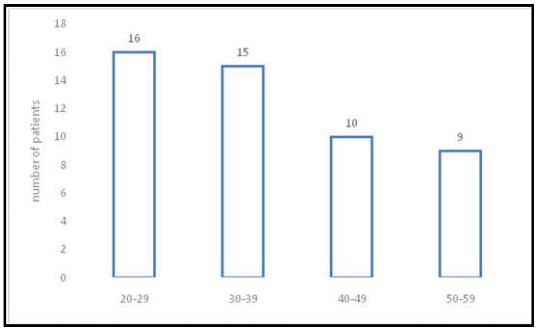

Figure 1b. Showing age distribution in negative suction drainage of wound

Sex distribution

GROUP A

In this group of 50 patients most of the patients were males with male female ratio of 1:1.3

Table 2a showing sex distribution

Sex distribution	Number of patients
Males	28
females	22

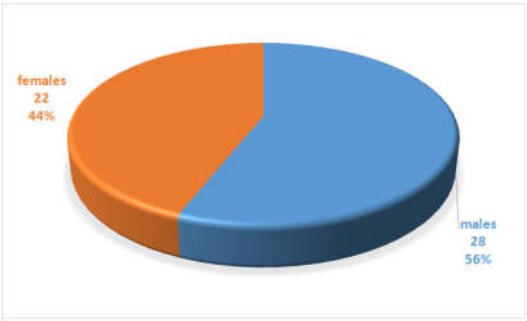

Figure 2a showing sex distribution

GROUP B

In this group the males were are the most frequent with male female ratio of 1:1.6

Table 2b showing sex distribution

Sex distribution	Number of patients
males	31
females	19

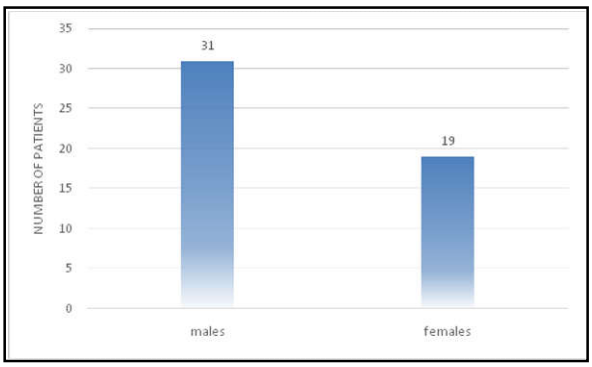

Figure 2b showing sex distribution

Cause of purulent peritonitis

GROUP A

In this of 50 patients with purulent peritonitis we found the pathological organ involved was mostly perforated duodenal ulcer followed by perforated appendix as shown in table and figure 3a.

Table 3a showing cause of purulent peritonitis in primary closure group

Cause of purulent peritonitis	Number of patients
perforated appendix	13
Duodenal perforation	17
Gut obstruction with gangrene	12
Ruptured liver abscess	4
Tubercular peritonitis	3
Blunt trauma	1

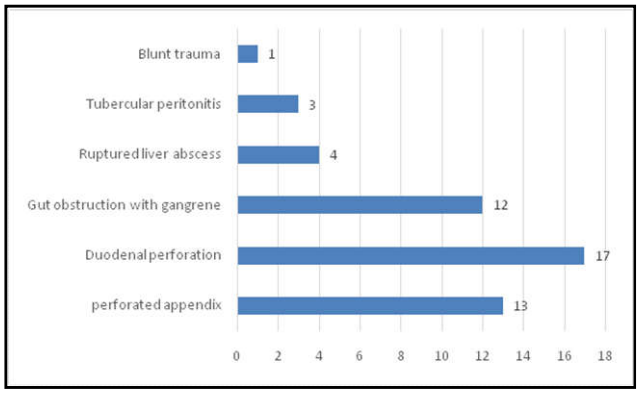

Figure 3a. Showing cause of purulent peritonitis in primary closure group

GROUP B

In this group of 50 patients with purulent peritonitis we almost found same observations as in the group A, the pathological organ involved was mostly perforated duodenal ulcer followed by perforated appendix as shown in table and figure 3b.

Table 3b. Showing cause of purulent peritonitis in vacuum assisted group

Cause of purulent peritonitis	Number of patients
perforated appendix	18
Duodenal perforation	12
Gut obstruction with gangrene	9
Tubercular peritonitis	4
Typhoid perforation	3
Blunt trauma	2
Ruptured liver abscess	2

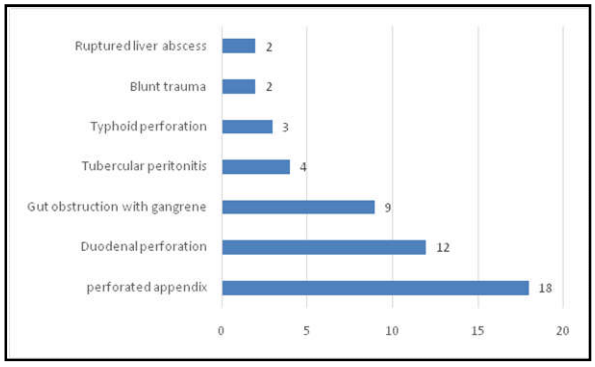

Figure 3b showing cause of purulent peritonitis in vacuum assisted group

Post-operative surgical site infection

Patients in group with no vacuum assisted drainage were observed to have more propensity to develop post-operative surgical site infection than those patients who were having vacuum assisted drainage. In group A itwas present in 42% of patients and in group B it was present in 7% of patients which is statistically significant with P value of <0.005

Table 4. Showing post-operative surgical site infection

Surgical site infection	Group A	Group B
Absent	29(58%)	43(86%)
Present	21(42%)	7(14%)

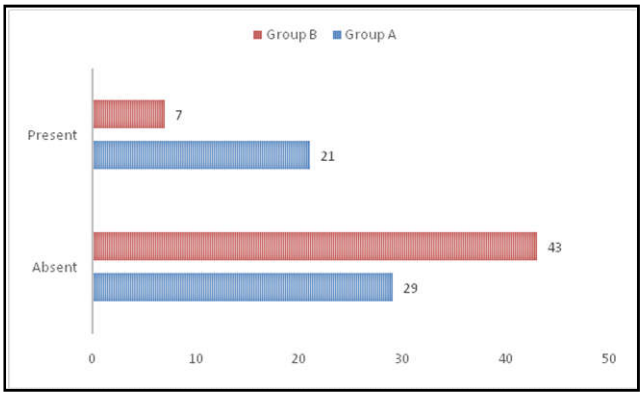

Figure 4 Showing post-operative surgical site infection

Hospital Stay

Hospital stay in days were calculated from the day of surgery till full recovery. The mean duration of hospital stay in group A was higher than Group B as its obvious from above table the group A patients have longer course of recovery till the infected surgical wound recovers. The mean duration of hospital stay in group A was 11.2 days and in Group B it was 7.8 days which is statistiscally significant with P value < 0.005.

DISCUSSION

Purulent peritonitis is classified as class IV wounds these wounds are highly suspected to get surgical site infection in the post-operative period, various modalities were proposed to reduce these infections like hyperbaric oxygen therapy, prophylactic antibiotics and the use of drains so as to reduce these infections in post-operative period (Mangram, 1994; Chowdri, 2007). Idea of placement of subcutaneous drain is to obliterate dead space which is avascular leading to seroma formation subsequently increasing the chances of infection, closed negative suction drain not only prevents the formation of seroma but also helps in apposition of skin and subcutaneous tissues (Anderson, 2009). In our study the mean age in both the groups were 32.7 and 35.2 respectively (figure and table-1)which is similar as seen by *Thrishuli PB et al.* (2018) who had mean age was 39 years in group A and 45.3 years in group B. in both the groups males were predominate (table and figure-2). This result was similar to a study by YagneshVaghani(10) who reported 38% females and 62% males. In both the groups the underlying pathology was mostly perforated appendix or duodenal perforations which contributes to almost half of the patients (table and figure-3),

similar results were encountered by Dr.v.t. Arasu(11) in which they found that cause of emergency laparotomy were duodenal perforation in 40 % of patients, appendicular abscess 13% and intestinal obstruction 13% . Patients in group with no vacuum assisted drainage were observed to have more propensity to develop post-operative surgical site infection than those patients who were having vacuum assisted drainage. In group A it was present in 42% of patients and in group B it was present in 7% of patients (table and figure-4), similar results were seen by Rakesh Kagita (12)who found 5(12%) patients in drain group (among 40 patients) and 25(69%) patients in no drain group (among 36 patients) had incisional Surgical site infection, Fujii T et al (13) also found that incidence of surgical site infections after placement of drain was 14% and without drain was 38%. In our study mean duration of hospital stay in group A was 11.2 days and in Group B it was 7.8 days which is in concordance with Kim et al in there study foundhospital stay of 8 days in the group with drain and 11 days in the group without drain.

CONCLUSION

From this study it's obvious that placement of subcutaneous negative pressure drain not only improves better management of contaminated-dirty wounds better and also ensures early recovery by drainage of contaminated subcutaneous fluid collections which could lead to surgical site infection. So it's a simpler and technically feasible method which ought to be utilized in emergency surgical procedures.

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