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General Surgery

ROLE OF SUBCUTANEOUS TOPICAL NEGATIVE SUCTION DRAIN IN PREVENTION OF SURGICAL SITE INFECTION IN ABDOMINAL SURGERIES

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ABSTRACT **INTRODUCTION :** Even with the advancement in sterilization techniques and asepsis and knowledge in terms of wound healing surgical site infections are still considered to be a very huge problem for general surgeons since it is responsible for creating high levels of discomfort for the sufferers and it extends the level of morbidity as well as mortality which further adds to the financial burden of the health system. Factors responsible for wound dehiscence are – type of wound, Forms of incision, Forms of closure, Anemia, Hypoproteinemia, wound infection, Increased level of pressure in the intra-abdominal region, Methods of operation, Deficiency of ascorbic acid, Age of the patients, Duration of the surgery, Shaving across the site of operation before surgery, Obesity and diabetes which are treated as the comorbidities. The primary objective of the closed suction drainage in terms of the established surgical site of the wound collection is to facilitate the evacuation of such collection along with the aim of giving comfort to the patient besides decreasing the morbidity level of the patient as well as the length of the hospitalization. **OBJECTIVES:** To compare and study the role of Subcutaneous Topical Negative Suction Drain and conventional method (without drain) in prevention of Surgical Site Infection (SSI), Wound Dehiscence, Reduction of postoperative hospital stay in emergency and elective abdominal surgeries. **METHODOLOGY :** A randomized control trial done for a period of 18 months on patients undergoing open abdominal surgeries at TMMC&RC from the date it gets approved from the ethical committee. **CONCLUSION :** From the study we can come to a conclusion that negative suction drain can provide some reduction in terms of surgical site infections.

KEYWORDS :

INTRODUCTION :

Surgical site infection is termed as the postoperative wound infection that can be defined as the infection within 30 days post surgery when no prosthetic used or up to 1 year when the prosthetic is used. Surgical site infections are still considered to be a very huge problem for surgeons since it is responsible for creating morbidity and mortality[1].

One of the basic reason for surgical site infection or dehiscence is the blood getting collected along with the serous fluids that can become infected and cause infection or dehiscence which can further lead to incisional hernia

Even though there have been several advancements in the field of surgery as well as the growth of the knowledge in terms of wound healing, that dehiscence of the abdominal wounds has still been stated as a very important problem. The incidence of the disease was reported from 0.36% to 5.8% and the rate of mortality was changing from 11% to 38%. The infections of the surgical site have been noticed to get composed till 20% across all the infections associated with healthcare. It has been observed that around 5% of the cases undergoing a surgical procedure tends to develop the surgical site infection.[2]

The drainage from the subcutaneous topical negative suction has also been observed in decreasing the incidence of the surgical site infection along with the wound dehiscence by draining the infective material and promotes the healing of wound.[3]

The primary objective of the closed suction drainage is to evacuate the collection in wound reducing the chances of surgical site infection and days of hospitalization.

MATERIALS AND METHODS :

Source of data: Patients admitted to undergo open abdominal surgeries, both emergency and routine in TMMC&RC.
Study type: Randomized Control Trial
Period of study : 18 months
Total number of participants including cases and controls : 60

INCLUSION CRITERIA:

1. Patients of both gender.
2. Alternate patients (odd even).
3. Patients of age >18 years of age to < 75 years of age.
4. Those patients undergoing abdominal surgeries.

EXCLUSION CRITERIA:

1. Patients not willing for the procedure.
2. Patients with, Diabetes mellitus, hypertension, renal diseases and any comorbidities.
3. Where surgery is not possible.

METHODOLOGY :

CRC and IEC approval taken and subject included in study satisfying inclusion criteria after getting written and informed consent.

Assessment of patients done in post operative period for two weeks while being admitted and post discharge. All the patients with drains placed were assessed on the basis of time the drain was in situ and the collection in drain in 24 hours with correlation to post operative surgical site infection or dehiscence. All the data was collected and analysed.

RESULT :

All analysis was performed using SPSS version 20. Mean and standard deviation were calculated for quantitative data and frequency & percentages were calculated for qualitative data. The Chi- square test or Fisher's Exact Test were used to find the association between categorical variables and to compare the Mean we use One-Way ANOVA Test and Independent t-Test. The level of significance was considered as < 0.05 or 5%.

Table 1

	Category	No. of Cases	Percentage
Drain placed (y/n)	Yes	30	100.0
Dehiscence (y/n)	No	42	70.0
	Yes	18	30.0
Condition of wound on discharge	Dehiscence	18	30.0
	Healed	42	70.0
	Total	60	100.0

Represent the frequency distribution of Variables.

Table 1 shows the frequency distribution of Variables, where in Drain placed (y/n) 30 subjects were found in Yes i.e. 100.0%, in Dehiscence (y/n) 42 subjects were found in No i.e. 70.0% and 18 subjects were found in Yes i.e. 30.0% and in Condition of wound on discharge 18 subjects were found in Dehiscence i.e. 30.0% and 42 subjects were found in Healed i.e. 70.0%

Table 2

Dehiscence	Group		P-Value
	Case	Control	
No	25(59.5)	17(40.5)	0.024
Yes	5(27.8)	13(72.2)	
Total	30(50)	30(50)	

To find the Association between dehiscence (y/n) and Group, we used Chi-Square Test

Table 2 shows the Association between dehiscence (y/n) and Group, The Association were found statistically significant as the P-value is < 0.05

Table 3

Condition of wound on discharge	Group		P-Value
	Case	Control	
Dehiscence	5(27.8)	13(72.2)	0.0241
Healed	25(59.5)	17(40.5)	
Total	30(50)	30(50)	

To find the Association between condition of wound on discharge and Group, we used Chi-Square Test Table 3 shows the Association between condition of wound on discharge and Group, The Association were found statistically significant as the P-value is < 0.05.

DISCUSSION:

The patients happen to be divided into two groups where the first group or Group A includes the cases who have undergone abdominal surgeries and will also be having a subcutaneous topical negative suction drain that would be placed subcutaneously. Whereas, in the other group that is group B the patients without any drain have been placed. Through the SPSS version of 20, the analysis has been performed. For carrying out the association between the variables of different categories, Fisher's Exact Test and to compare the mean values independent T - test along with the one-way ANOVA Test was being carried out where values less than 0.05 was being considered as the level of significance.

The mean age interval in the study shows that it has been 37.3 along with the standard deviation of 13.8 where the minimum number is 65 and the maximum number is 14.

Moving on to the dehiscence category it has observed that dehiscence was not present in 70% of the cases and was present in 30% of the cases. While starting the condition of the wound at the time of discharge, the majority of the wound got healed for the subjects which included 42 cases and for 18 of the cases the wound was not healed yet. After this association between the is interval to that of the groups were noticed which result it that a statistical insignificant Association was found between them since the P value was 0.56 and it was higher than 0.05. Such similar results have also been observed by the researchers Wilson et al., who were unable to find any statistically significant Association between the age groups of their study to the treatment group since their P value came as 0.72.4

While observing the association in regards to the presence or absence of the dehiscence among the study cases and the control group, it was observed to be present across 5 cases from study and 13 cases from the control group. On the other hand it was not observed in 25 cases from the study group and 17 cases from the control group. The p value was noticed to be 0.024 that was significant statistically since the value came up to be less than 0.05. However, researchers like Cantero et al., were unable to observe any such Association in regards to the dehiscence and the groups.[5]

Finally, when the association between the groups was being noted down in regards to the condition of the wound at the time of discharge, it was consistently observed that 0. 0241 that can be regarded as a statistically significant Association as the P value came as less than 0.05. Similarly, Li et al., found a statistical significant Association between the groups of dehiscence and healed.6

Even after having to work with a limited number of cases within a time bound period the observations made by us have been true in all senses that have tried to cover all the important areas as well.

CONCLUSION:

From the findings we can come to the conclusion that the negative suction drain can provide some protection and reduction of incisional SSI. It was also observed that on following the proper guidelines of the negative suction drain the infections rate can be brought down. Thus, it can be concluded that the application of the negative pressure wound therapy to prevent the SSI is an effective tool to reduce the postoperative wound infection along with the complications. It can be considered as a better option mainly in the cases which have a higher chance of infection.

SUMMARY:

From the findings the following points can be summarized:

- The healing of the wound was noticed to be there in 70% and the dehiscence was in 30% of the cases. Additionally, Association was found between the condition of wound on discharge to that with the groups that can be counted as statistically significant.
- No significant Association is noticed between the age interval to that with the groups.
- No significant Association was noticed between the gender of the study subjects to that with the groups.
- The association between the procedure to that with the groups also came as statistically insignificant.
- In regards to the group and diagnosis, the association was significant.
- Finally, a statistically significant Association got observed among the groups to that with the dehiscence.

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