The Egyptian Journal of Hospital Medicine (October 2017) Vol. 69 (4), Page 2245-2249

Wound Treatment in Relation to Surgical Site Infections

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ABSTRACT

Background: Surgical wounds heal by essential purpose in all the elective and emergency surgical processes. Current practice is to place dressing over the closed wound before the patient leaves the sterile environment of the operating theatre. Dressing is a material used to protect a wound and help its healing. On the other hand, to leave wound open in direct contact to environment following any procedure by only applying some ointment on it, the purported open wound treatment is yet debatable one. In the current study we have compared open wound treatment versus occlusive dressings in elective surgical cases with respect to surgical site infections. **Materials and Methods:** The current study was directed on 50 patients experienced for elective general surgery. Patients were divided randomly in to two equal groups each containing of 25 patients. In Group 1, patients had occlusive dressing till removal of stitches and in Group 2, patients wounds were retained exposed to environment after the surgical procedure. **The study was done after approval of ethical board of King Abdulaziz university**.

Results: In the current study, we perceived total 7% of postoperative wounds were infected of all the clean and clean contaminated wounds we studied. In Group 1, patients had occlusive dressing and these patients had 8% infection rate whereas in Group 2 patients, wounds were kept exposed to the environment and these patients had 6% infection rate. **Conclusion:** It is thus, concluded that in the elective surgical cases there was no damage in leaving the wounds open postoperatively. This process not only supports in arresting the infective pathology at a reduced stage but likewise saves surgeon's time and patient's cash.

Keywords: Surgical site infection, Dressing, Infection, Surgical wound.

INTRODUCTION

Infection at or near surgical notches within 30 days of an operative procedure, called surgical site infection, adds considerably to surgical morbidity and mortality every year. Surgical site infection (SSI) represents for 15% of every single nosocomial disease and, amid surgical patients, signifies the most widely recognized nosocomial infection [1]. SSIs are allied not only with increased morbidity but also with considerable mortality. In a study, 77% of the deaths of surgical patients were allied to surgical wound infection [2]. **Kirkland *et al***. considered a comparative danger of death of 2.2 attributable to SSIs, in contrast with corresponding surgical patients without infection.Surgical wounds heal by essential expectation in all the optional and emergency surgical procedures[3].

Current practice is to put dressing over the closed wound before the patient leaves the sterile condition of the operating place. The purpose of the dressing is to avert wound infection. It had been and is the practice in most of the hospitals to frequently dress surgical wound until stitches are removed. This practice take on that the risk of Surgical Site Infections is diminished by giving an obstruction to ecological pollution. In addition, dressing's aids to manage wound exudates, protects wounds and their staples or sutures, and reduces patients' anxiety by concealing the wound[4, 5]. Techniques for dressing ranges from the injury being totally secured by glue plaster to sterile bandage. Dressing is a material connected to secure an injury and it favours wound recuperating. That may be to leave twisted open in guide contact to condition following any system by simply applying some balm on it, the purported open injury treatment is as yet questionable one.In spite of the fact that reviews in the past have exhibited the safety of the exposure of surgical wounds [6, 7], however, there are examines which didn't bolster this practice [8, 9, 10]. It is as yet regular practice to dress injuries postoperatively, a system which includes the cost in the two materials and nursing time. Subsequently, it is essential to survey whether wound dressings have a potential part in diminishing the danger of SSI. Such data can illuminate designation of assets to medications. In the present

Received: 9 / 8 /2017
Accepted:18 /8 /2017
DOI : 10.12816/0041524

investigation, we have analysed open wound treatment versus occlusive dressings in elective surgical cases as for surgical site infections in 50 patients conceded for elective surgery.

MATERIALS AND METHODS

The current study was directed on 50 patients experienced for elective general surgery, from May 2016 to May 2017, over a period of one year. The minimum sample size for the current study was calculated using 11.1% as infection rate after referring the study by A Asnake. The sample size was calculated in such a method to preserve a power of 67%, supposing at least 90% decrease in the infection rate in the exposed group and with 5% level of significance for example, type-I error. It was calculated to be 25patients in each group. Thus, the total sample size was 50 (Figure 1). Patients were divided randomly into two equal groups each containing of 25 patients using computer generated random list. In group 1, patients had occlusive dressing till removal of stitches and in group 2, patients wounds were kept uncovered to environment after the surgical procedure. Nevertheless, the ditch sites were protected with sterile gauze dressing. Patients having age <10 years or >60 years, with history of systemic illnesses similar to diabetes, hypoprotenemia, coagulopathy, anaemia or patients who were Immunocompromised by reason of malignancy, Developed Immunodefficiency disease, patients on steroids or having burn wounds or ditch sites with excessive drainage were excluded from the study.

In every one of the cases point by point history, general physical examination and neighborhood examination was done and sort of technique performed were recorded. Characterization of surgical injury sullying was done in light of the idea of surgical strategy (Clean, Clean Contaminated, Contaminated, and Dirty). Surgical site swab from the site of gathered cut was taken just before preoperative readiness of the patient and sent for culture and affectability. Hairs at the entry point site were expelled just when their essence meddled with planned strategy. In the wake of taking swab, planning of the agent range was finished with povidine iodine arrangement. Umbilicus was cleaned independently in instances of stomach area. Organization of prophylactic 1g intravenous infusion of ceftriaxone was given quite recently preceding entry point for each situation and was rehashed following 6 hours of the surgical technique. Amid the surgical systems, push was given on insignificant and delicate tissue dealing with, a great haemostasis, destruction of every single dead space and every single aseptic safety measure. All skin wounds were shut with silk. After conclusion of the injury length of cut was measured and period of operation was recorded.

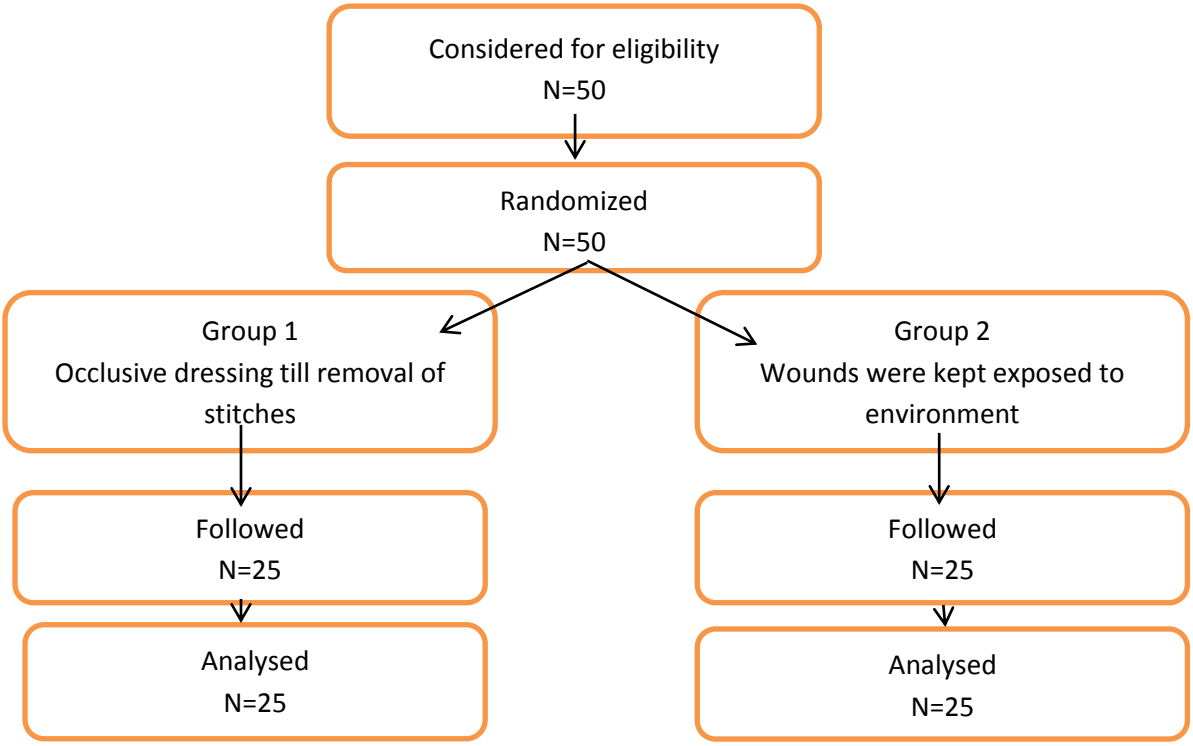

Figure 1: Participant flow chart for the study.

Table 1: Statistics of Group 1 and Group 2

	Group 1	**Group 2**	**p-value**
	N= 25	N= 25	
Age in years	38.7±12.9	42.2±14.8	0.784
Sex (Male/Female)	14/11	23/27	0.299
Clean/clean contaminated wounds	16/14	22/28	0.045
Duration of surgery (in minutes)	45.9±17.7	48.3±14.1	0.786
Length of incision (in centimetres)	5.9±3.2	6.3±2.5	0.580
Mean postoperative stay (in days)	4.8±2.8	4.4±2.7	0.511

Mean duration of all the operative procedures performed in the study was 51 minutes. However, group wise duration of all the operative procedures and its link with SSI is shown in Table 2.

Table 2: Incidence of SSI associated with the duration of procedure

Duration of procedure(minutes)	**No. of cases**		**No. of infected cases**	
Group	1	2	1	2
Up to 30	5	4	_	_
31-60	16	16	1	1
>60	4	5	1	1
Total	25	25	2	2

Table 3: Group wise incidence of SSI is shown

Surgical contamination	**No. of cases**		**No. of infected cases**		**%age**		**p-value**
Group	1	2	1	2	1	2	
Clean	16	11	1	_	6.3	_	0.14
Clean Contaminated	9	14	1	3	11%	10%	0.7
Contaminated	_	_	_	_	_	_	
Dirty	_	_	_	_	_	_	
Total	25	25	2	3	4	3	

Table 4: Shows SSI linked to postoperative stay

Post-operative stay (Days)	**No. of cases**		**No. of infected cases**	
Group	1	2	1	2
Up to 5	17	18	_	_
05-10	7	6	1	1
>10	1	1	1	1
Total	50	50	2	2

All the 50 patients observed in this study, the mean postoperative stay was 4.6 days. Mean postoperative stay in Group 1 was 4.8 days with standard deviation of 2.8 and mean postoperative stay in Group 2 was 4.4 days with standard deviation of 2.7. The statistical difference, in mean postoperative stay (days) in both groups was not significant (p-value= 0.511).

DISCUSSION

Verifiably, a dressing often not comprised a bit of material, now and again fabric, yet the cowdung, nectar and leaves have been utilized. Current dressings incorporate clothes, films, gels, froths, hydrocolloids, hydrogels and polysaccharide glues, granules and globules. Dressings can be impregnated with clean chemicals to avoid contaminations. In the current investigation we have thought about open injury treatment versus occlusive dressings in elective surgical cases as for surgical site contaminations. All injuries were partitioned in

to Clean and Clean Contaminated sorts on the premise of a broadly utilized definition portraying the defilement arrangement of surgical methods [12].

The disease rates noted in this examination were equivalent to the past investigations. Disease rates in the four surgical arrangements (Clean, Clean-Contaminated, Contaminated and Dirty injuries) have been examined widely however crafted by Cruse and Foord is a typically held a standard for contamination rates [13, 14]. Standard disease rates in their investigation were 1-2% or less for Clean injuries, 6-9% for Clean-Contaminated injuries, 13-20% for Contaminated injuries and around 40% for Dirty injuries. Distinction in each class is because of kind of surgery being performed [15]. Law and Ellis in their examination on non-debased elective surgical cases discovered postoperative 5.42% contamination rate in general instances of their investigation and they observed 7.07% injury disease rate in patients on whom dressings were done while in the patients whose injuries were uncovered, contamination rate was 1.88% [7]. Likewise, in another investigation on perfect and clean tainted elective surgical injuries, discovered 10.8% disease rate in all cases they considered. He revealed 13.09% contamination rate in patients whom dressings were done and 8.69% disease rate in patients who had their injury uncovered [8]. In display ponder we noticed that up to 7% of postoperative injuries were tainted of all the perfect and clean sullied wounds we examined. In Group 1, patients had occlusive dressing and these patients had 8% contamination rate while in Group 2 patients, wounds were kept presented to condition and these patients had 6% disease rate. A meta-investigation likewise demonstrated no distinction in surgical-site contamination rates between surgical injuries secured with various dressings and those left revealed [16]. Moreover, dressings might likewise increase hypoxia to the wounds and dressed wounds have shown reduced tensile strength when compared to undressed wounds [17].

These results specified that healing was not impaired by exposure of Clean and Clean Contaminated postoperative wounds. This may be because the wounds established a coagulum made up of blood and fibrin which did not permit the inoculated organisms to go deeper. In dressed wound, nevertheless, moist environment may delay coagulum formation and may permit organism to penetrate into wounds [7]. Mean duration of operative procedures in the current study was 51 minutes. The procedures which took longer time had more infection rates with maximum in procedures that took >60 minutes and no infection were found in any patient on whom the operative procedure took less than 30 minutes. Though we compare our two Groups of our study, procedures that took >60 minutes in both Groups had higher infection rates.

In the current study, the improved rate of infections in the procedures who took longer time is reinforced by many studies. It has been seen that the rate of wound infection increased for longer procedures, approximately doubling with every hour of the procedure [14]. The factors accountable for increase in infection during surgery having longer duration can be exposure of the wound to operation theatre environment for longer period, prolonged retraction and increased manipulation ensuing in local devitalisation of tissues that becomes more constructive for infection. Furthermore, there are increased chances of systemic offense by increased blood loss, which may cause reduced general resistance to infection. Furthermore, this current study conveys us about only the 50 patients and there are thousands of elective surgeries being done across the whole country, therefore, we can well imagine the amount of extra burden we are resounding both in terms of the money and time. Therefore, simply by changing practice of treating the postoperative wounds, from dressing to leaving them open and exposed to air, a lot money and time can be saved which could be used for some other purpose. Besides keeping the wound undressed likewise saving time of nursing.

On the premise of these perceptions, display consider unmistakably shows that there is no mischief in leaving the elective surgical injuries open and presented to the air after use of 5% povidine iodine on them, as treating these injuries by this strategy does not expand the rate of diseases rather, it is financially superior to dress them. One more factor which features the significance of leaving the injury open is that examination of the injury by the specialist is simple in this strategy prompting prior discovery of indications of contamination and different inconveniences with an opportunity to capture them at bring down stage as it were. However, being a little gathering monocentric think about is the real constraint of study. As wound recuperating is affected by different elements like general wellbeing or nutritious status of patient, stoutness, age, comorbid conditions and neighbourhood factors like site of surgery, kind of wellbeing focus and sort of guardian so an expansive gathering polycentric contemplate is expected to affirm the aftereffects of present examination.

CONCLUSION

It is therefore inferred that in the elective surgical cases there is no harm in leaving the wounds open postoperatively. These wounds can be better treated by leaving the injury presented to air by utilization of 5% povidine iodine arrangement day by day. This strategy not just supports in capturing the infective pathology at a lesser stage yet additionally spares specialist's opportunity and patient's cash.

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