

A comparison of exposed with closed method of management of clean abdominal surgical wounds.

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One hundred and twenty consecutive patients undergoing abdominal surgery were randomly distributed to five groups. One group had their wounds exposed, two groups had occlusive dressings for 24 and 48 hours respectively. The remaining two groups respectively had non-occlusive dressings for 24 and 48 hours. The wounds were inspected for evidence of infection on the 3rd, 7th and 15th post-operative days. All discharging wounds were considered infected. The infection rate ranged between 8% and 11%. The corrected infection rate after excluding those cases with obvious contributing factors ranged from 4% to 7.4%. Exposed wounds had the lowest infection rate but the differences were not significant. The study confirmed that clean surgical wounds may be managed safely without dressing.

Introduction

The main objective of dressing wounds is to prevent wound infection. It had been the practice and remains the practice in some hospitals to repeatedly dress surgical wounds until stitches are removed. The method of dressing ranges from the totally occlusive one where the gauze is completely covered by adhesive plaster to the light gauze dressing one in which the gauze is

held in place by a few tape strips. While some health workers use aseptic technique using masks, sterile gloves and sterile instruments to dress wounds, others merely 'clean' the wounds with bare hands without gloves. While in some hospitals dressing carts are used, in others individually packed sterile dressing are utilized.

Following the surgical principles of skin preparation, haemostasis, gentle tissue handling and obliteration of dead space makes dressing a ritual in clean surgical wounds. Dunphy and Jackson¹ found post-operative wound coverage important in minimizing infection during the healing period while Lawrence and Jackson² reported that wound healing was not affected if dressing was omitted. Other studies have revealed that when dressings are modified or omitted from und wounds without drains, no harm results to the patient. Howells and Young³ and Law and Ellis⁴ confirmed that exposure of clean surgical wounds does not lead to any increased risk of wound infection but rather saves the health workers' time in addition to minimizing costs.

The aim of this study was to investigate and compare the outcome of management of clean abdominal wounds by open, occlusive and non-occlusive dressings.

Patients and methods

One hundred and twenty consecutive patients admitted for elective abdominal surgery were included in the study. Patients were randomly assigned to five groups according to the method that was to be used postoperatively for wound care. Preoperatively, the skin was cleaned with savlon, iodine and alcohol. At the end of the operation haemostasis was secured and any dead space present obliterated. Skin was closed with a subcuticular stitch using vicryl after which iodine was lightly applied over the wound. The lengths of the wounds were then measured and the duration of the operation recorded. Pre-operative antibiotics were given in cases of cholecystitis and large bowel surgery.

Post-operatively, patients' surgical wounds were managed as follows:

- Group I - complete exposure.
- Group II - non-occlusive dressing for 24 hours.
- Group III - occlusive dressing for 24 hours.
- Group IV - non-occlusive for 48 hours.
- Group V - occlusive dressings for 48 hours.

In cases of occlusive dressing, an adhesive plaster completely covered the dressings and for the non-occlusive dressing, an adhesive plaster was applied around the edges of the dressing. The wounds were inspected for evidence of infection on the 3rd, 7th and 15th postoperative days.

Results

Table 1 shows the age/sex distribution. The peak incidence was in the 35 - 44 years old group.

Females accounted for 59% of all patients. The commonest condition for which surgery was performed was cholelithiasis with or without complications. There were 23 cases of gastric outlet obstruction secondary to peptic ulcer disease and 15 cases of sigmoid volvulus (Table 2). The wound length ranged between 12.18 cm and 13.19 cm while the time of operation ranged from 59.7 to 70.6 minutes. Pre-operative antibiotics were given in cases requiring large bowel preparation and in acute cholecystitis.

There were 13 cases of wound sepsis (Table 3). The infection rate was lowest among group 1 patients whose surgical wounds were exposed. Seven of the infected cases were due to obvious contaminating factors such as leakage of bile and poorly prepared large bowel. The corrected percentage of infection rate after excluding those with contributory factors ranged between 4.0% and 7.4%. There was no significant difference in the infection rate in the five study groups.

Discussion

In this study, the major factors, which are known to contribute to increased risk of infection, were first excluded. The type of skin suture was subcuticular and the material used was vicryl. The length of the wounds ranged between 12.18 and 13.19 cms while the time taken for surgery was from 59.7 minutes to 70.6 minutes. In this study the wound length and the time taken for surgery did not significantly influence the rate of infection although it is known that both factors increase the possibility of wound contamination.

Table 1. Age and sex distribution of the 120 patients

Age (years)	15-24	25-34	35-44	45-54	55-64	>64	Total (%)
Male	1	8	15	10	10	5	49 (41)f
Female	2	18	28	12	7	4	71 (59)
Total	3	26	43	22	17	9	120 (100)

Table 2. Diagnosis of operative cases

Diagnosis	Group I	Group II	Group III	Group IV	Group V	Total
Cholelithiasis	12	11	13	11	10	57
Cholelithiasis + Cholecystitis or empyema GB	1	-	1	-	1	3
Cholelithiasis + Chr. cholecystitis	1	3	4	1	2	11
Cholelithiasis + choledocholithiasis	-	-	-	1	2	3
G.O.O. Post Peptic ulcer Disease	5	4	7	3	4	23
Sigmoid volvulus	4	2	2	1	6	15
Others*	2	-	2	2	2	8
Total	25	20	29	19	27	120

(Others* = 2 elective appendectomies, 3 hepatic masses, 1 ureteric stone, 1 hernia, 1 bile reflux.)

Table 3. Rate of infection in the five groups of patients

Group	Dressing Method used	Non-infected	Infected	Total
I	Exposed	23	2 (8.0%)	25
II	Non-occlusive - 24 Hours	17	3 (15.0%)	20
III	Occlusive - 24 Hours	26	3 (10.3%)	29
IV	Non-occlusive - 48 Hours	17	2 (10.5%)	19
V	Occlusive - 48 Hours	24	3 (11.1%)	27
IV	Total	107	13 (10.8%)	120

Both clean and clean contaminated cases were included in the cases studied. Other associated medical diseases, which might have contributed to the rate of wound infection, were recorded and these included diabetes and jaundice while bronchial asthma and ascites, which increase abdominal pressure, were noted. Cases of bronchial asthma were evenly distributed among the five different groups. There were 2 cases of non-insulin dependent diabetes mellitus, one in the exposed group second in the 24 hours occlusive dressing group.

The rate of wound sepsis varied from 8% to 11%, being lowest in the exposed group. When the figures were corrected after excluding the cases infected due to recognized contributory factors, the percentages dropped to 4% to 7.4%, the lowest still being in the exposed group. The findings in this study demonstrated that leaving the surgical wound open did not cause any increase in the rate of wound sepsis and may in fact have resulted in the reduction of wound infection.

Heifetz, Lawrence and Richards², in an experimental study, showed that the healing wound rapidly develops a coagulum of blood and fibrin within two hours of closure, which is impenetrable to bacteria. Hermann et al⁵ and

Howells and Young³ showed that exposed wounds are dry and accelerate coagulum formation. In contrast, occlusive dressing has been proved to cause sweating and keep the wound wet, which increases the wound infection by skin bacteria.

Since the exposure of wounds promotes a dry environment, there is an accelerated formation of the protective coagulum. The study has confirmed that keeping the wound exposed is not associated with any increase in wound infection. Clean surgical wounds can safely be managed without being dressed and when left exposed, they can at any time be easily inspected by the surgeon and have the added advantages of saving on the nurses' time and on the hospital costs, factors which are very important in the developing countries.

References

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