

COMPARISON OF PRIMARY AND DELAYED PRIMARY CLOSURE IN DIRTY ABDOMINAL WOUNDS IN TERMS OF FREQUENCY OF SURGICAL SITE INFECTION

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ABSTRACT

Objective: Objective of this study was to compare primary and delayed primary wound closure for dirty abdominal wounds in terms of frequency of surgical site infection.

Study Design: Randomized Controlled Trial.

Place and Duration of Study: Combined Military Hospital, Multan. From 16 Sep 2010 to 15 Mar 2011.

Patients and Methods: A total of 110 patients were randomly divided into two groups of 55 patients each using random numbers table. Abdominal wounds of one group were closed primarily and of other group were subjected to delayed primary wound closure. The wounds were then checked for surgical site infection for seven post operative days.

Results: A higher frequency of surgical site infection was observed in primary closure group (27.3%) as compared to delayed primary closure group (9.1%) which was statistically significant ($p=0.013$).

Conclusion: Delayed primary closure is superior to primary closure in dirty abdominal wounds in terms of frequency of surgical site infection.

Keywords: Delayed primary closure, Dirty abdominal wounds, Primary closure, Surgical site infection.

INTRODUCTION

Following surgery of a perforated viscus, the resulting abdominal wounds are classified as dirty¹⁻³. Since dirty abdominal wounds are heavily contaminated by the commonly encountered feculent and peritoneal exudates, they are associated with a high rate of surgical site infection (SSI), presence or discharge of purulent material from the wound within seven post operative days¹⁻³. Of the many risk factors influencing postoperative wound infections, the method of skin closure has been implicated as an important factor¹. Delayed primary closure (DPC, closure of wound margins after three days of surgery) and primary closure (PC, closure of the wound margins at the time of surgery) are two commonly used methods. Delayed primary closure has long been advocated as the standard method of handling such wounds^{1,2}. Open

wounds allow free egress of purulent wound discharge resulting in decreased risk of bacterial colonization.

But even today, there is no consensus on the optimal method of wound closure in this class of wounds. Recent studies performed on dirty abdominal wound closure methods only showed no advantage to DPC in terms of decreased wound infection compared with PC^{4,5}. While some studies associate DPC with lower rates of SSI (42.5 % in primary closure versus 2.7% in delayed primary closure)⁶⁻⁸, some show that PC has low SSI rates (9.1% in PC group versus 27.3% in DPC group)^{4,9}.

The rationale of this study was to find an appropriate closure technique for dirty abdominal wounds that results in decreased frequency of wound infection post operatively, thus saving precious resources.

PATIENTS AND METHODS

These randomized controlled trials were carried out at CMH Multan from 16 sep 2010 to 15 Mar 2011. Patients meeting the inclusion

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criteria, were presenting with features of peritonitis with perforated viscus confirmed on

age between the two groups. p -value <0.05 was considered as significant.

Table: Comparison of two groups for frequency of surgical site infection (SSI) ($p=0.013$).

Surgical site infection (SSI)	Group A (n=55)	Group B (n=55)
Absent	40 (72.7%)	50 (90.9%)
Present	15 (27.3%)	05 (9.1%)

surgery between 15-60 years of age, in both genders. Patients with co-morbidities such as diabetes mellitus, ischemic heart disease, hypertension and compromised immune status and patients with previous abdominal surgeries were excluded from the study. A total of 110 patients were included in the study and they were randomly divided into two groups of 55 each by using random numbers table. After permission from the hospital ethical committee, informed consent was taken from all the patients. Hospital registration number, name, age, gender, address and phone number (optional) were noted. Group A underwent primary closure while group B underwent delayed primary closure of the wound by the same surgical team. Normal saline dressings were done in DPC group daily for three days and wound closed under local anesthesia on 4th post operative day whereas wound dressing of primarily closed wound was changed on 3rd post operative day. Patients were observed for development of SSI post operatively for seven days. Southampton grade was used to compare infection in both groups. Grade 0 was regarded as no infection and any grade more than 0 was accounted for the presence of infection. All the information were recorded on a specially designed proforma. It included demographic data of the patient and development of SSI along with features.

The data had been analyzed by SPSS version 12. Mean and standard deviation (SD) for the quantitative variable i.e. age was calculated. Frequency and percentages were presented for all the qualitative variables including gender and SSI. Chi-square test was used to compare the gender and frequency of SSI in two groups. Independent sample t-test was used to compare

RESULTS

Out of 110 patients in the study, group A comprising of 55 patients underwent primary closure and group B comprising of 55 patients had delayed primary closure for their abdominal incision. The age distribution ranged from 15-60 years in the study. Mean age in group A was 37.33 ± 14.792 years. Mean age in group B was 39.25 ± 12.801 years. Group A had 56.4% males and 43.6% females. Group B had 67.3% males and 32.7% females. Both the groups were comparable with respect to age ($p > 0.05$) and gender ($p > 0.05$). There were 27.3% ($n=15$) patients in Group A who developed SSI as compared with 9.1% ($n=5$) patient in group B, during the course of study. The groups had a statistically significant difference in the frequency of SSI ($p=0.013$).

DISCUSSION

The publication of studies as recently as 2009^{5,6} suggest that there is still some controversy regarding the best method wound closure in dirty abdominal wounds.

In this study we observed 27.3% (15 cases) of infection in the primary wound closure group in comparison to 9.1% (5 cases) in the delayed primary closure group. This is in accordance with a randomized trial including 60 patients comparing PC and DPC for dirty abdominal wound closure which reported increased frequencies of surgical site infection following PC (7.7% versus 23.5%)¹⁰. Another randomized trial also showed similar results^{6,9}. However, in one study no significant difference was found after comparing both methods of closure¹². We achieved less frequency of infection in the DPC group as compared with the PC group in our clinical trial.

Since world war-I, the use of DPC technique in dirty abdominal wound closure has been popularized which showed better results in terms of surgical site infection, duration of hospital stay and cost effectiveness. Since then, DPC has been practiced in most parts of the world for such type of wounds. But recently some studies have challenged this concept and showed that PC technique is as effective as the DPC rather better in some cases^{4,5}. A study showed that despite contamination of abdominal wound with feculent peritoneal material, primary wound healing occurred in about one fifth of the patients without any complications and infection developed in other wounds was only superficial¹⁵. Other studies also confirmed these results¹³. Although the above mentioned studies make PC an attractive option specially in paediatric age group, but our study supports significantly the DPC technique in dirty abdominal wounds.

CONCLUSION

On the basis of the results obtained in the study, it can be concluded that delayed primary closure is a better technique for dirty abdominal wound closure when compared with primary closure in early post operative period in terms of frequency of superficial surgical site infection.

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