

COMPARISON OF FREQUENCY OF WOUND DEHISCENCE IN CASES OF EXPLORATORY LAPAROTOMY CLOSED BY INTERRUPTED VERSUS CONTINUOUS SUTURE TECHNIQUE FOLLOWING TYPHOID ILEAL PERFORATION AT A TERTIARY CARE HOSPITAL, KARACHI

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ABSTRACT

Objective: To compare the rate of wound dehiscence in exploratory laparotomy wounds sealed with interrupted versus continuous suture technique after typhoid ileal perforation in a tertiary care hospital in Karachi.

Study Design: Prospective comparative study.

Place and Duration of Study: Department of General Surgery, Jinnah Postgraduate Medical Centre (JPMC), Karachi, from December 2025 to June 2026.

Methodology: A total population of 144 patients aged 30 to 80 years undergoing laparotomy exploratory surgery due to typhoid ileal perforation were involved. The patients were separated into two equal groups (n=72 each). Group A was fascial closed with interrupted Smead-Jones technique using Prolene 1 whereas Group B was continued to be fascially closed with Prolene 1. The patients were monitored within eight days of postoperative to determine the presence of wound dehiscence as postoperative abdominal musculoaponeurotic layers separation verified by clinical evaluation. The SPSS version 26 was used in the analysis of data. The Chi-square test was used to compare the results of the two groups and p-value ≤ 0.05 was defined to be significant.

Results: In the interrupted group, wound dehiscence was observed in 15 (20.8%) patients out of 144, whereas in the continuous group, it was observed in 6 (8.3%) patients. The value was statistically significant ($p = 0.031$). The odds ratio of wound dehiscence was found to be 2.91 times greater in patients who experienced interrupted closure than in those who experienced continuous closure (OR = 2.91; 95% CI: 1.087.83).

Conclusion: The frequency of wound dehiscence in patients who were subjected to laparotomy on the grounds of typhoid ileal perforation was significantly lower when using continuous fascial closure technique than when using interrupted closure technique. Continuous closure could provide better wound integrity and minimized post-operative morbidity in emergency abdominal operations in our environment.

KEYWORDS: Typhoid ileal perforation, Wound dehiscence, Interrupted sutures, Continuous sutures, Laparotomy.

INTRODUCTION

Typhoid fever is a major public health issue in developing nations, especially in South Asia, where lack of proper sanitation and access to the clean drinking water leads to its constant spread (1). Typhoid ileal perforation remains an urgent surgical complication that is closely linked with a significant level of morbidity and mortality despite the development of antimicrobial therapy (2). The recent epidemiological studies conducted in Pakistan show that even in the tertiary care, complicated cases of enteric fever that require surgical intervention are still prevalent (3). The most common location of involvement is the terminal ileum because of Peyer patch necrosis that could result into perforation and generalized peritonitis (4). In case of perforation, emergency exploratory laparotomy is still the standard treatment. The midline abdominal incision is the most favored due to the fact that it offers quick access and sufficient exposure during emergencies (5). Nevertheless, the wound-related complications after surgery have a great

impact on the recovery of patients and the general performance of the surgery (6). One of the most severe early postoperative complications is wound dehiscence (partial or complete discontinuity of the abdominal musculoaponeurotic layers in the absence of complete healing) (7). It is linked to the long hospitalization, high health care expenses, the risk of evisceration, and re-operation (8). The incidence is reported to be between 5% and 24% after emergency laparotomy especially in contaminated operations like bowel perforation with peritonitis (9). Several patient-related variables such as diabetes mellitus, malnutrition, anemia, obesity, smoking, and systemic sepsis compromise collagen production and tensile strength of the wound, which puts a person at risk of fascial disruption (10). Besides systemic factors, technical elements of fascial closure are very important in preventing wound integrity. The continuous mass closure technique is prevalent because of reduced time of operation and even tension on the length of the incision, with the interrupted closure method providing the ability to control tension individually but potentially producing local points of stress. Even though a number of studies have compared these methods, the outcomes have been inconsistent with one another, more so emergency contaminated environment. Considering that we still have to bear the burden of typhoid ileal perforation in our population and there is no unanimity on the best method of fascial closure, there is a necessity of locally produced evidence to inform surgical practice. This prospective comparative study was hence done to compare the incidence of wound dehiscence between interrupted suture methods and continuous suture methods in patients subjected to exploratory laparotomy in a tertiary care hospital in Karachi.

MATERIAL AND METHOD

The proposed comparative study is a prospective study to be carried out in the Department of Surgery, Jinnah Postgraduate Medical Centre (JPMC), Karachi, between December 2025 to June 2026. The study included 144 patients aged 30-80 years who were undergoing exploratory laparotomy to repair typhoid ileal perforation. The sample size of 144 patients was 72 patients in each group calculated by using the WHO sample size calculator by considering anticipated wound dehiscence rates in local studies with a confidence level of 90% and power of 80%. Patients who had a positive diagnosis of typhoid ileal perforation on the basis of clinical presentation and radiological findings of the free gas under the diaphragm were included. Patients having a history of malignancy, who received radiotherapy, intestinal obstruction, major systemic diseases, like congestive cardiac failure, chronic liver disease, chronic kidney disease, chronic obstructions pulmonary disease, asthma, those who had a previous myocardial infarction or stroke, postoperative status, and patients discharge against the medical advice were excluded.

The patients were split into 2 groups of equal numbers (72 patients each). Group A had fascial closure done by using interrupted Smead-Jones technique with Prolene 1 at the time of surgery but in Group B, fascial closure was done with use of continuous mass closure technique which utilized Prolene 1. All the operations were made through consultant surgeons or under their supervision in accordance to standard operative procedures.

Demographic data such as age, gender and residence was noted. The clinical variables such as ASA score, duration of operation, hospital stay, and comorbidities such as diabetes mellitus, hypertension, obesity, and smoking status were recorded. The wound dehiscence development was followed on eight postoperative days. The event of wound dehiscence was considered as the presence of the abdominal musculoaponeurotic layers that had been separated postoperative and had been verified to release serosanguinous discharge when assessed through clinical examination. The SPSS version 26 was used to analyze data. Mean and standard deviation were used to measure quantitative variables whereas frequency and percentage were used to measure qualitative variables. Those who used the Chisquare test were used to compare wound dehiscence between the two groups. Calculation of odds ratio was done with 95 percent confidence interval and p-value of less than 0.05 was taken as statistically significant.

RESULTS

The study involved 144 patients undergoing exploratory laparotomy due to typhoid ileal perforation, 72 patients in each group. The average age of the patients in the interrupted closure group was 48.6 years $\pm$ 11.2 years and in the continuous closure group 47.9 years $\pm$ 10.8 years. In both groups, male dominance was noted (63.9% vs. 68.1%). The baseline variables such as age, gender distribution, ASA score, comorbidities, length of surgery, and length of hospital stay were similar to the two groups ($p > 0.05$) (Table I).

In the interrupted suture group, wound dehiscence occurred in 15 (20.8%) patients and in the continuous suture group, it occurred in 6 (8.3%) patients. Their difference was statistically significant ($p = 0.031$) (Table II). It was found that patients undergoing interrupted closure were much more likely to develop wound dehiscence than patients undergoing continuous closure (OR = 2.91; 95% CI: 1.08–7.83).

Table I: Baseline Characteristics of Patients (n = 144)

Variable	Interrupted Group (n=72)	Continuous Group (n=72)	p-value
Age (years), Mean $\pm$ SD	48.6 $\pm$ 11.2	47.9 $\pm$ 10.8	0.72

Gender			0.58
Male	46 (63.9%)	49 (68.1%)	
Female	26 (36.1%)	23 (31.9%)	
ASA Score			0.62
I	41 (56.9%)	38 (52.8%)	
II	31 (43.1%)	34 (47.2%)	
Diabetes Mellitus	18 (25.0%)	20 (27.8%)	0.70
Hypertension	22 (30.6%)	24 (33.3%)	0.72
Obesity	15 (20.8%)	17 (23.6%)	0.68
Duration of Surgery (hours), Mean $\pm$ SD	2.1 $\pm$ 0.4	2.2 $\pm$ 0.5	0.39
Hospital Stay (days), Mean $\pm$ SD	9.4 $\pm$ 2.3	8.6 $\pm$ 1.9	0.08

Table II: Comparison of Wound Dehiscence Between Groups (n = 144)

Wound Dehiscence	Interrupted Group (n=72)	Continuous Group (n=72)	p-value
Yes	15 (20.8%)	6 (8.3%)	0.031
No	57 (79.2%)	66 (91.7%)	

DISCUSSION

Typhoid ileal perforation remains a major surgical challenge in low- and middle-income countries especially in emergency cases where affected patients often present with a generalized peritonitis and systemic depletion (11). One of the strongest early complications after exploratory laparotomy is postoperative wound dehiscence and it is a significant contributor to morbidity and extended hospital stay (12).

In the current research wound dehiscence was much more common in the interrupted closure group than in the continuous closure group. The current incidence rates are in line with the rates reported before in emergency contaminated laparotomies (13). In septic conditions, emergency abdominal surgery undermines tissue perfusion, enhances inflammatory mediators, and decreases collagen deposition, which can be the reason behind the lower rates of dehiscence in our research (14). The mechanical benefit of continuous mass closure can determine the mechanism of lowering dehiscence rates in our study. Continuous sutures evenly spread tensile forces throughout the incision and limits the concentration of focal stress at specific sites of individual stitches (15). The interrupted sutures, on the contrary, form various tension sites, which can enhance localized ischemia and wound healing under inflamed fascia. Also, it has fewer knots to be made, which lead to the continuity of closure, which helps to minimize foreign body reaction and possible bacterial colonization (16).

Emergency midline laparotomy; randomized comparative studies have suggested better wound outcomes with continuous mass closure with maintenance of right suture-to-wound length ratios (17). But other studies have proven no statistically significant difference between interrupted and continuous methods indicating that surgical experience, tissue manipulation, and intraoperative infection prevention also play a role (18). In these variations, it is clear that wound healing is multifactorial and is not completely reliant on suture pattern. Guideline recommendations and systematic reviews on the topic highlight that it is important to follow standardized methods of mass closure to reduce postoperative fascial disruption (19). Adequate bite distance, the proper suture material, and equal distribution of tension are all considered very important factors in wound integrity. In our research, standardization of operative procedures was carried out and was under the supervision of a consultant hence minimizing technical variations. The odds ratio calculated indicated that patients who experienced interrupted closure were almost three times more likely to develop wound dehiscence. The same associations have been documented in local surgical cohorts, especially in dirty abdominal surgeries (20). Constant suturing saves time during the operations and can lead to a better physiological state of the critically ill patient in emergency surgical operations (21). Diabetes mellitus, malnutrition, malnutrition, and systemic sepsis are patient-related factors known to have a strong relationship with impaired healing of wounds (22). Even though there were no baseline differences in the individual characteristics in the current study, there were unmeasured factors like nutritional deficiencies, and extent of intra-abdominal contamination, which could have affected individual healing effects. In practical terms, the minimization of wound dehiscence is of specific

significance in high-volume tertiary care hospitals where optimization and minimization of resources and hospital stay are essential (23). The implementation of the continuous mass closure method in emergency cases of laparotomies contamination can thus lead to better postoperative care and a decrease in surgical morbidity in that kind of health care facility.

LIMITATIONS

The research was carried out in one tertiary care setting, which can be considered a limitation of the results that can be applied in other healthcare settings. Even though significant comorbid conditions were noted, the issues like a detailed nutritional status, the severity of contamination in the abdominal cavity, and the grading of the postoperative infection were not quantified. The duration of follow-up was also short in early postoperative period and long-term complication like incisional hernia was not assessed. Also, the technical differences in the work of different surgeons, although reduced to the minimum under the control of the consultant, were not entirely removed.

CONCLUSION

The frequency of wound dehiscence was significantly lower in patients who received continuous fascial closure technique than in those who received interrupted closure during exploratory laparotomy to repair typhoid ileal perforation. The odds ratio of wound dehiscence being developed was almost three times more in patients of the interrupted closure group. Continuous mass closure might have an advantage in enhancing wound integrity and early postoperative outcomes in emergency contaminated abdominal operations. This technique implementation into similar high-risk settings can be used to minimize postoperative morbidity and streamline surgical care.

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