

A STUDY OF SUBCUTANEOUS NEGATIVE PRESSURE CLOSURE VERSUS SIMPLE CLOSURE IN LAPAROTOMY WOUND OF ILEAL PERFORATION

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ABSTRACT

Background: Ileal perforation is a surgical emergency. It has very high morbidity and also mortality. As patients are commonly presented with peritonitis and fecal contamination, wound infection rate is very high. Wound infection is major issue in such condition, where related complications are frequently seen. If wound infection is controlled then many complication related to it could be prevented. And it finally affects the morbidity of patient.

Aims & Objective: To compare a role of negative pressure closure versus simple closure of laparotomy wound in ileal perforation.

Material and Methods: 60 cases, in period of Nov 2012 to June 2013 at SMIMER hospital, Surat presented with ileal perforation were included in the study. After a surgical treatment of all cases, they were divided in two groups. One group A was closed with Negative pressure closure (By putting subcutaneous Negative Suction Drain) at the time of laparotomy wound closure and other group B with simple closure. And the outcome compared in the form of wound infection, hospital stay, second surgery and morbidity. Total 10 cases were expired within 3 day after surgery, excluded from study (6 from group A and 4 from group B).

Results: In study average rate of wound infection (SSI-Surgical Site Infection) was 25% (8/24) in group A and 57.7% (15/26) in group B. Average hospital stay for group A was 12 day and 18 day for group B. Second surgery needed in 4 cases in group A and for 8 cases in group B. Second surgery was in form of secondary suturing of wound or wound dehiscence and burst abdomen repair. Mortality in group A was 6 and in group B was 4 but it was not related to SSI because all death occurred within 3 days after surgery mainly due delay presentation and to poor general condition pre-operatively. Overall morbidity was less with Negative pressure closure in compare to simple closure and it highly affects the morbidity and somehow mortality also.

Conclusion: One of the common complications of typhoid is typhoid ulcer and perforation. There is more chance of wound infection in such laparotomy wound because of highly contamination of the peritoneal fluid with fecal material. Such wound constantly leads to serous discharge and bacterial colonization. But negative pressure closure removes that collection and avoids wound infection. And it helps in reducing hospital stay and morbidity.

Key-Words: Ileal Perforation; Romo-Vac Drain; Tagaderm/Flexiplax

Introduction

Typhoid or enteric fever is frequently seen in endemic areas. Typhoid ileal perforation is one of the most lethal complications of typhoid fever, causing high morbidity and mortality.^[1,2] Generally the presentation in these cases is delayed. All surgeons manage it surgically with perforation repair and thorough peritoneal lavage, but the postoperative course is still characterized by serious life-threatening complications.^[3,4] Identification of these complications and minimizing their incidence will significantly improve the outcome.^[4,5] Due to heavy contamination of fecal material and peritoneal exudates, even after surgical management of typhoid perforation, the resulting abdominal wounds are regarded as dirty.^[6] This dirty wound is more prone to infection during healing and more chances of wound related complication. Various methods were tried by people but not much succeeded. Our aim for this study is to evaluate how we can minimize this wound complication. And how can be reduced the mortality and morbidity related to enteric perforation.

Materials and Methods

This study includes 60 cases, in period of Jan 2011 to Aug 2012 at Surgery department SMIMER hospital, Surat presented with visceral perforation. During exploratory laparotomy cases showed finding of ileal perforation were included in study. After a primary surgical treatment of all cases, at the time of wound closure they were divided in two groups. One group A closed with Negative pressure closure (By putting subcutaneous Negative pressure Drain) and other group B with standard simple closure without any drain. Total 10 cases were expired within 3 day of surgery, excluded from study (6 from group A and 4 from group B). After closure of peritoneum and rectus sheath, In group A patients a negative pressure drain put in subcutaneous plane (Romo-vac drain, size 16) and wound closed with polyamide monofilament 2-0 suture (Ethilon 2-0). In group B patient wound closed directly with polyamide monofilament 2-0 suture (Ethilon 2-0). And wound dressed up with dynaplast sticking dressing (In case of leakage or loss of negative pressure Tagaderm/Flexiplax waterproof dressing used). The

wounds were routinely inspected on the fifth postoperative days for any evidence of SSI. SSI was defined as “a break in the skin or mucous membrane due to surgery, which is discharging pus” as adopted by the National Research Council of the United States of America.^[7] In the event of such infection, some sutures were removed to allow free drainage of the purulent wound discharge, followed by daily wound dressing (in both group) and in group A patient with clean wound drain removed on 7th post-operative day. And skin stich removed on 10th post-operative day. The data were studied in term of wound infection, hospital stay, second surgery and morbidity.

Results

Number of patients included in the study was 60. Both group had 30 patients. Among this 10 patients expired within 3 days were excluded from study. Among the study patients 31 out of 50 (62%) were male and 19 (38%) were female. In term of SSI 8/24 showed SSI in group A (25%); while in group B it was 15/26 (57.7%). Mean hospital stay for group A patient was 12 ± 1.5 day and for group B patient was 18 ± 1.5 day. In group A 8 patient showed wound discharge (SSI), and they were started routine wound management in the form of daily dressing and wound cleaning. Among these patients with SSI (n=23) 11 treated conservatively (5 from group A, 6 from B), 3 treated for burst abdomen (all 3 from group B), 9 treated with secondary suturing (3 from group A, 6 from B).

Table-1: Post-Operative SSI

	Group A (n=24)	Group B (n=26)
SSI	08 (25%)	15 (57.7%)
No SSI	16 (75%)	11 (42.3%)

Table-2: Total Hospital Stays for Treatment

Days	Group A (n=24)	Group B (n=26)
<10	03	00
10-15	14	10
15-20	07	12
>20	00	03
Average Day	12 ± 1.5	18 ± 1.5

Table-3: Management of SSI Wound

Treatment	Group A (n=8)	Group B (n=15)	Total (n=23)
Conservative	05 (62.5%)	06 (40.0%)	9 (40.0%)
Burst Abdomen Mx.	00 (00.0%)	03 (20.0%)	3 (13.0%)
Secondary Suturing	03 (37.5%)	06 (40.0%)	11 (47.0%)

Discussion

The outcome of typhoid ileal perforation is poor. In delayed presented cases, it has mortality of 20 to 50% and more than 50% developing post-operative complications after laparotomy in most studies.^[4,7] The high mortality is a result of peritonitis and gram-negative septicaemia in the

postoperative period leading to multiple organ failure.^[4] These patients are usually anaemic and frequently having major fluid and electrolyte derangements in the preoperative period. Furthermore, infective complications such as wound infection, wound dehiscence, burst abdomen, entero-cutaneous fistula and postoperative pneumonia further worsen the situation.^[4,7]

The most common complication after laparotomy for typhoid ileal perforation is wound infection (SSI). This was observed in 46.0% of our patients, which is similar to other studies.^[7-9] Among this group had negative suction drain having 25% rate compare to other group of simple closure having 57.7%. People had tried various techniques in the past to reduce the incidence of wound infection including delayed primary closure of skin and subcutaneous tissue, allowing for free drainage of infected wound fluid.^[10,11] Cephalosporin and other potent anti-salmonellae antibiotics with metronidazole and gentamicin have changed these methods, and today, primary closure of the wound is widely practiced with good results.^[12] According to some data^[9,13] suture failure, commonly lead to wound dehiscence and anastomotic leakage, leads to intra-abdominal abscesses or enterocutaneous fistula. It invariably leads to higher mortality and prolonged hospital stay among survivors.^[4] In our study 23 patients (46%) experienced the SSI, were undergone for various procedure for further management. Among them, in group A 37.5% undergone for secondary suturing, 62.5% treated conservatively in respect to group B 40% having secondary suturing and 40% treated conservatively. Incidence of burst abdomen was 20% (3 cases) in group B compare to group A had no burst wound incidence.

Mortality rate was 20%. Average hospital stay was significantly reduced in group A with negative pressure drain, compare to simple wound closure. Average hospital stay for group A was 12 ± 1.5 day and for group B was 18 ± 1.5 day. Group A (negative pressure closure) having low SSI rate which directly impacts on average hospital stay and ultimately on patients morbidity.

Negative suction closure leads to constant drainage of serous fluid which is more prone to infection. Removal of this fluid minimizes the wound infection and wound related complications.

Conclusion

In conclusion, abdominal wounds following typhoid perforation, though classified as dirty, can be closed primarily with good healing outcomes. Aggressive wound

management, often involving multidisciplinary approach, will reduce the incidence of wound sepsis and its associated morbidity and costs. This study method having no impact on mortality but the data shows improved rate of recovery, less SSI and finally decreased morbidity in term of hospital stay. Better conclusion on studied method can be possible with some more clinical trials and larger amount of data.

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