

Primary Closure Versus Delayed Primary Closure in Perforated Appendix: A Comparative Study

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ABSTRACT

Introduction: The elimination of unpleasant and time-consuming dressing changes, as well as the potential reduction in overall hospital costs, are potential benefits of primary closure. Recent studies suggest that perforated appendicitis may usually be principally closed without an increase in the wound infection rate compared to delayed primary closure, suggesting that the disagreement surrounding the best ways of wound management has died down.

Objective: Studying the efficacy of primary versus delayed primary closure for appendectomy in patients with perforations

Study design: Ayyub Teaching Hospital Abbottabad and Timergara Teaching Hospital Dir Lower. Study duration from January 2021 to June 2021.

Material and Methods: Perforated appendix patients undergoing appendectomy between the ages of 18 and 45 were included. When an appendectomy was performed, the appendicular stump was not invaginated as is sometimes done nowadays. Interrupted 2/0 vicryl was used to stand in for muscles. Within the PC group, the external oblique was stitched shut with a continuous vicryl 0 suture. Using only regular saline, the wound washed and disinfected. For patients having delayed primary closure, dressing changes occurred daily; in the case of infection dressing changes occurred twice daily until the wound was closed. After the third postoperative day or once the infection had subsided in cases of infected wounds, the wound was closed after rejuvenating the edges. On the seventh postoperative day patients were evaluated for wound infection and length of hospital stay using the operational definition of success.

Results: The patients' mean age was 37.3 ± 610.49 years. The average number of days someone spent in the hospital was 7.38 (1.25). Women made up 37 (or 61.70%) of the total, while men accounted for 23 (or 38.30%). Thirteen patients, or 21.70 percent, had an infected wound. Wound infections occurred in 11 patients in Group-A (the primary closure group) but only 2 patients in Group-B (the delayed closure group) (delayed primary closure). When comparing the rate of wound infection in groups B and A, a statistically significant difference was discovered ($p=0.005$). Hospitalization time was shorter for those in group A (6.24 ± 0.47 days) compared to those in group B (8.53 ± 0.51 days); $p 0.001$.

Conclusion: Patients with a perforated appendix benefit more with primary closure than from delayed primary closure.

Keywords: Primary closure, delayed primary closure, and a perforated appendix

INTRODUCTION

One of the most prevalent reasons for urgent abdominal surgery is acute appendicitis. Appendicitis is most common in young children [1]. Thereafter, it declines as one gets older. There are 1.30 men for every woman. Perforated appendix occurs more frequently in males and in those on either extremity of the age spectrum [2]. Appendix perforation is typically brought on by something that blocks off the appendix's lumen [3]. An estimated 90 percent of appendix perforations can be traced back to fecoliths [4,5]. Perforation of the appendix can be caused by a variety of circumstances. The most crucial component is the patients' delayed presentation after the beginning of symptoms [6]. Most appendectomy-related wound infections happen during emergency appendectomy for perforated appendicitis [7-8], and the risk of infection increases significantly with the severity of the appendicitis being treated. The technique used to close the incision after surgery has been linked to an increased risk of infection. There is no agreement on whether delayed primary closure (DPC) or primary closure (PC) is preferable. Infected wounds can be treated well with open-wound treatment [9]. While one retrospective study found that delayed primary closure could considerably reduce the wound infection rate compared to PC in the therapy of perforated appendix wounds, a randomised controlled trial found no such benefit for delayed primary closure. After surgery, a wound infection is most commonly caused by bacterial contamination of the wound. The majority of the species at the end of the chain are bacteria found in the colon [10]. Some groups have recently released revised recommendations for selecting effective prophylactic antibiotics for abdominal surgery. Despite evidence demonstrating that contaminated wounds have a greater likelihood of wound infection [11], some writers argue for perioperative antibiotic treatment that permits primary closure of all

appendectomy wounds. Surgeons have pushed for this method since it has been linked to a lower risk of infection, less need for frequent and unpleasant dressing changes, and lower overall healthcare costs [9–14]. Inadequate evaluation of unfavourable outcomes has led to the inclusion of primary closure of appendicitis with perforation in the therapy algorithm. Yellin et al [15] recently performed delayed primary closure on all of their advanced appendicitis wounds and observed a wound infection rate of 4%. The purpose of this study is to evaluate outcomes for patients with a ruptured appendix after undergoing primary closure versus delayed primary closure.

MATERIALS AND METHODS

Within the field of surgery, a randomised controlled experiment has been conducted. All inpatients who were hospitalised between January 2021 to June 2021, are considered part of the sample. There were 60 patients with perforated appendix, and they were split evenly into two groups of 30. Non-probabilistic sequential sampling was the method we used. We included both male and female patients between the ages of 18 and 50 who were diagnosed with perforated appendix and scheduled for appendectomy. Pregnant women, individuals with an appendicular mass, and those who did not give consent were all excluded from the study. Patients with preexisting conditions such as diabetes or liver cirrhosis are also not eligible for laparoscopic appendicectomy. Patients were randomly assigned to one of two groups. Surgeon with more than 3 years of experience after fellowship. It should be noted that the appendicular stump was not buried during any of the standard appendectomy procedures. Interrupted 2/0 vicryl was used to represent muscles approximating their structure. The external oblique in the PC group was closed with a continuous suture of 0 vicryl. Regular saline was used to

cleanse the wound. Patients receiving delayed primary closure had their dressings changed once a day, and twice a day if necessary due to infection, up until the wound was closed. On day three after surgery, or once infection had cleared up in infected wounds, sutures were placed to close the wound. On day seven following surgery, patients were evaluated for wound infection and length of hospital stay to determine the final outcome. The researcher recorded this data and the patient's demographics in the proforma (see annexure). SPSS version 21.0 for Windows was used to analyse the data. Averages and standard deviations were provided for quantitative data such as age and length of hospital stay. Gender, wound infection, and length of hospitalisation were each analysed for frequency and percentages. The chi-square test was used to compare the rates of wound infection between the two groups, and the unpaired t test was used to compare the hospitals; a value of $p < 0.05$ was considered statistically significant. Stratification was used to account for potential confounding factors such as age, gender, and body mass index; the chi-square test was used to analyse infection rates; and the t-test was used to analyse hospital stays.

RESULTS

There were 23 men (38.30%) and 37 women (61.70%). Thirteen (21.7%) patients had wound infections, as seen in Figure 1. Infection occurred in 11 patients in group-A (primary closure) but only 2 patients in group-B (secondary closure), as shown in Figure 2. A p-value of 0.005 indicates statistical significance. There was a statistically significant difference between the two groups (6.24 ± 0.47 days for group-A versus 8.53 ± 0.51 days for group-B; $p < 0.001$).

Table-1: As shown in patient ages (60)

Characteristics	Mean/standard deviation	Minimum	Maximum
Age of patient	39.36± 12.49	18	50

Table-2: Wound infection comparisons within the same group (60)

Group	Yes	No	Total	P value
Group A	12 (37.8)	20 (64.4)	30 (100)	0.05
Group B	3 (7.2)	29 (94.5)	30 (100)	
Total	15 (23.5)	49 (80.4)	60 (100)	

Table-3: Within-group comparison of hospital stays

Group	N	Mean	P value	95%CI
Primary closure	30	7.24 ±0.47		
Delayed primary closure	30	9.54 ±0.49	0.001	-3.52 to -3.02

DISCUSSION

The most common complication following an appendectomy is infection of the surgical wound, which can increase the patient's discomfort, lengthen their recovery time in the hospital, diminish the cosmetic results of the procedure, and drive up the cost of the operation. Deferred primary closure (DPC), which entails packing an open wound for 4–5 days before closing it, and primary closure (PC) are two common wound management techniques used after an appendectomy [15]. It is generally known that once appendiceal perforation has occurred, the rates of complications associated with wound infection can climb to 15%-25% [16]. Perforated appendix wounds have historically been treated with DPC to reduce postoperative infection risk. To far, however, no big randomised trial has shown that DPC is superior to primary closure for preventing wound infections after appendectomy. While PC has been shown to have a minimal risk of infection in patients with perforated appendicitis, clinical investigations conducted in the 1990s found otherwise [17]. Many recent research, including meta-analyses, have concluded that patients with complex appendicitis who undergo appendectomy have no greater risk of wound infection after primary closure. Perforated appendicitis patients who underwent delayed primary closure had a 4.2% wound infection rate, compared to 43.9% in the primary closure group, as

reported by Chiang et al. [18] in 2006. Faster wound healing after primary closure means less need for painful and time-consuming dressing changes, less money spent in the hospital, and less time spent there. Recent studies suggest that perforated appendicitis may usually be principally closed without an increase in the wound infection rate compared to delayed primary closure, suggesting that the best methods of wound management are still up for debate. The average length of hospitalisation in this analysis was 7.381.25 days. Thirteen individuals (21.70 percent) were discovered to have wound infections. Total of 11 in Group A and 2 in Group B. Group A had a shorter hospital stay (6.24 ± 0.47 days) and a lower incidence of wound infection ($p = 0.005$) than group B (8.53 ± 0.51 days). Results from this study are helpful in considering DPC as a potential strategy for lowering post-appendectomy wound infection rates [20].

CONCLUSION

There is a difference in Primary closure verses delayed primary closure in patients with ruptured appendix

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