Original Article

Treatment of Perforated Appendicitis

Comparison of Wound Infection And Hospital Stay Between Primary Closure And Delayed Primary Closure In Patients With Perforated Appendicitis

Muhammad Tanvir Iqbal[1], Amna Shahab[2] and Muhammad Aqil Razzaq[3]

ABSTRACT

Objective: To compare the outcomes of primary closure and delayed primary closure in term of wound infection and hospital stay in patients treated perforated appendicitis.

Study Design: Comparative study.

Place and Duration of Study: This study was conducted at the Department of General Surgery, Bhatti International Teaching Hospital and Central Park Hospital, Lahore from September 2017 to August 2018.

Materials and Methods: Eighty patients of both genders with ages >15 years with clinical suspicion of perforated appendicitis which was later confirmed peroperatively were included in this study after written consent. Patients were randomly divided into two groups and were scheduled for conventional appendectomy. Group I consist of 40 patients in which wound was closed primarily at the time of surgery. Group II consist of 40 patients and underwent delayed primary closure on 3rd post-operative day. Outcomes such as wound infection and hospital stay were analyzed.

Results: In Group I 21 (52.5%) were males and 19 (47.5%) were females with mean age 35.21±9.80 years while in Group B 23 (57.5%) were males and 42.5% were females with mean age 36.25±10.45 years. Wound infection was found in 18(22.5%) patients. 14 patients in Group-Ias compared to 4 patients in Group II (delayed primary closure). Patients with primary closure had less hospital stay as compared to patients with delayed primary closure 5.35±1.02 vs 7.65±1.15 days p-value 0.002.

Conclusion: Patients treated with primary closure had high rate of wound infection as compared to delayed primary closure and patients with primary closure had less hospital stay as compared to patients with delayed primary closure.

Key Words: Perforated appendicitis, Primary closure, Delayed primary closure, Wound infection, Hospital stay

Citation of article: Iqbal MT, Shahab A, Razzqa MA. Comparison of Wound Infection And Hospital Stay Between Primary Closure and Delayed Primary Closure in Patients with Perforated Appendicitis. Med Forum 2019;30(10): 106-108.

INTRODUCTION

One of the commonest reason of emergency abdominal surgery is acute appendicitis. It is more common in males with a male to female ratio of 1.3:1. The incidence of appendicitis is at its peak in early childhood.[1]

[1.] Department of Surgery, Rashid Latif Medical College Lahore.

[2] Department of General Surgery, CMH Medical College Lahore.

[3.] Department of General Surgery, Central Park Medical College, Lahore.

Correspondence: Dr. Muhammad Tanvir Iqbal, Assistant Professor of Surgery Unit-2, Rashid Latif Medical College Lahore

Contact No: 0322 4444344

Email: tanviria@gmail.com

Received: September, 2019

Accepted: September 2019

Printed: October, 2019

Thereafter it decreases with age. Perforated appendix tends to occur more in males and also at extremes of ages.[2]

Luminal obstruction is the main causative factor in the perforation of appendix whereas fecoliths are implicated in about 90% of the cases.[3,4] There are many contributing factors, the most important being the late presentation of the patients.[5] Among the many postoperative complications wound infection is the most common and its incidence substantially increases with the severity of the appendicitis treated, particularly after emergency appendectomy for perforated appendicitis.[6,7]

The method of skin closure is an important factor influencing post-operative wound infection. Two commonly used methods are delayed primary closure (DPC) and primary closure (PC) however there is no consensus as to the optimal method. Management of contaminated wounds by keeping them open has been practiced for centuries.[8] Bhangu et al[10] advocate the primary closure of all appendectomy wounds under good antibiotic cover, despite data suggestingthat

contaminated wounds have a higher rate of wound infection.

The present study was conducted to examine the outcomes of primary closure and delayed primary closure in terms of wound infection and duration of hospital stay in patients with perforated appendicitis undergoing appendectomy.

MATERIALS AND METHODS

This comparative study was conducted in the Department of General Surgery, Bhatti International Teaching Hospital and Central Park Hospital, Lahore from 1st September 2017 to 31st August 2018. In this study total 80 patients of both genders with clinical suspicion of perforated appendicitis which was later confirmed peroperatively were included after written consent. Patients less than 15 years of age, cirrhotic and diabetic, and pregnant women were excluded. Patients were randomly allocated into two groups. All the patients received conventional appendectomy under general anesthesia. A standard dose of antibiotic was given intravenously preoperatively and continued for 3 days postoperatively. Group I of 40 patients was the Primary Closure group in which external oblique was closed by continuous vicryl 1. Wound was washed with normal saline and skin closed with interrupted prolene stitches. Group II of 40 patients was delayed primary closure group in which skin was left open. Daily dressing was done till the 3rd postoperative day and skin closed. Appendectomy wound in all patients was examined daily and noted particularly on 3rd, 5th and 7th postoperative day for development of infection. Wound infection was managed by antibiotics, dressings and removal of stitches as the need may be. Outcomes measures were wound infection and hospital stay. Data was analyzed by SPSS 21.0. Chi square test and student t' test was used to compare the findings among both groups. Consider p-value <0.05 as statistically significant.

RESULTS

Table No.1: Age and gender-wise distribution among both groups (n=80)

Variable	Group I	Group II	P value
Mean age	35.21±9.80	36.25±10.45	>0.05
Gender			
Male	21 (52.5%)	23 (57.5%)	>0.05
Female	19 (47.5%)	17 (42.5%)	>0.05

In Group I 21 (52.5%) were males and 19 (47.5%) Females with mean age 35.21±9.80 years while in Group II 23 (57.5%) were males and 17 (42.5%) females with mean age 36.25±10.45 years (Table 1). Post-operatively wound infection was found in 18 (22.5%) patients while 62 (77.5%) patients did not develop wound infection. 14 (35%) patients in Group I as compared to 4 (10%) patients in Group II (delayed primary closure) had infection of wound (Table 2).

Patients with primary closure generally had less hospital stay as compared to patients with delayed primary closure 5.35±1.02 vs 7.65±1.15 days p-value 0.002. Development of wound infection prolonged the hospital in both groups (Table 3).

Table No.2: Comparison of wound infection among both groups (n=80)

Wound infection	Group I	Group II	Total
Yes	14 (35%)	4 (10%)	18 (22.5%)
No	26 (65%)	36 (90%)	62 (77.5%)

P-value 0.001

Table No.3: Comparison of hospital stay

Hospital stay (days)	Group I	Group II	P value
	5.35+1.02	7.65+1.15	0.002

DISCUSSION

Acute appendicitis is an extremely common surgical emergency and appendectomy is the most performed surgical procedure all over the world.[11] Wound infection is a common complication occurring after appendectomy and the type of wound closure influences its occurrence to a considerable extent. We conducted this study to evaluate the outcomes in terms of wound infection and hospital stay of primary closure and delayed primary closure after appendectomy in patients with perforated appendicitis. In this study 80 patients of perforated appendicitis who underwent appendectomy were included. The patients were randomly allocated into two equal groups, Group I underwent Primary Closure and Group II Delayed Primary Closure of the wound. 55% patients were male while 45% patients were female with mean age 36.01±11.65 years. These results were similar to many other studies in which male patients was higher in number as compared to female.[12,13] Abou-Nukta et al[14] have reported a high population of female patients.

In the present study, we found that 18 (22.5%) patients developed wound infection on 5thpost-operative day. Patients who received primary closure were more prone to wound infection 35% as compared to delayed primary closure group 10%. A study conducted by Ali et al[15] reported that patients who received primary closure after appendectomy had higher rate of wound infection 36.67% as compared to patients who received delayed primary closure 6.67%. Chiang et al[16] demonstrated that primary closure was associated with low infection rates following appendectomy for perforated appendicitis.

In our study, we observed that patients with primary closure had shorter hospital stay as compared to patients with delayed primary closure 5.35±1.02 vs 7.65±1.15 days (p-value 0.002). In comparison to the other study length of hospital stay was 2.30±0.51 and 3.94±0.84 days in primary closure and delayed primary closure patients after appendectomy.[17]

Meka and Anasuri[18] reported a low infection rate in delayed primary closure 2.9% versus primary closure 38.9% which is comparable with our study. However in contrast to our study the hospital stay was shorter in DPC versus PC.

CONCLUSION

Wound infection after appendectomy is one of the major complications that increase the length of hospital stay and treatment cost. We concluded from this study that patients treated with primary closure had high rate of wound infection as compared to delayed primary closure and patients with primary closure had shorter hospital stay as compared to patients with delayed primary closure**..**

Author's Contribution:

Concept & Design of Study:	Muhammad Tanvir Iqbal
Drafting:	Amna Shahab,
Data Analysis:	Muhammad Aqil Razzaq
Revisiting Critically:	Muhammad Tanvir Iqbal Amna Shahab
Final Approval of version:	Muhammad Tanvir Iqbal

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Khattak S, Aslam S, Kamal A. Acute Appendicitis: An audit of 663 cases. Gomal J Med Sci 2010; 8(2):209-11.
2. Baloch I, Bhatt IY, Abro H. Complications of acute appendicitis: a review of 120 cases. Pak J Med Res 2009;48(4):91-3.
3. Ng CP, Chiu HS, Chung CH. Significance of appendicoliths in abdominal pain. J Emerg Med 2003; 24: 459-61.
4. Wightman JR. Foreign body induced appendicitis. S D J Med 2004; 57: 137.
5. Khan KI, Mahmood S, Akmal M, Waqas A. Comparison of rate of surgical wound infection, length of hospital stay and patient convenience in complicated appendicitis between primary closure and delayed primary closure. Age 2012;35 (14.55):31-8.
6. Ozguner IF, Buyukayavuz BI, Savas MC. The infl uence of delay on perforation in childhood appendicitis. a retrospective analysis of 58 cases. Saudi Med J 2004;25: 1232-6.
7. Mehrabi Bahar M, Jangjoo A, Amouzeshi A, Kavianifar K.. Wound infection incidence in patients with simple and gangrenous or perforated appendicitis. Arch Iran Med 2010; 13(1): 13-6.
8. Andersen BR, Kallehave FL, Andersen HK. Antibiotics versus placebo for prevention of postoperative infection after appendicectomy. Cochrane Database Syst Rev 2005; 3: CD001439.
9. Sookpotarom P, Khampiwmar W, Term wattanaphakdee T. Vigorous wound irrigation followed by subcuticular skin closure in children with perforated appendicitis. J Med Assoc Thai 2010; 93(3): 318-23..
10. Bhangu A, Singh P, Lundy J, Bowley DM. Systemic review and meta-analysis of randomized clinical trials comparing primary vs delayed primary skin closure in contaminated and dirty abdominal incisions. JAMA Surg 2013;148(8): 779-86.
11. Siribumrungwong B, Noorit P, Wilasrusmee C, Thakkinstian A. A systematic review and meta-analysis of randomised controlled trials of delayed primary wound closure in contaminated abdominal wounds. World J Emerg Surg 2014; 9(1):49.
12. Misteli H, Kalbermatten D, Settelen C. Simple and complicated surgical wounds. Ther Umsch 2012;69:23–7.
13. Mawalla B, Mshana SE, Chalya PL, Imirzalioglu C, Mahalu W. Predictors of surgical site infections among patients undergoing major surgery at Bugando Medical Centre in Northwestern Tanzania. BMC Surg 2011;11(1):21.
14. Abou-Nukta F, Bakhos C, Arroyo K, Koo Y, Martin J, Reinhold R, et al. Eff ects of delaying appendectomy for acute appendicitis for 12 to 24 hours. Arch Surg 2006;141:504-7.
15. Ali MA, Asjad BZ, Perveen S, Nehal Z, Rajput BK. Primary closure versus delayed primary closure in perforated appendix: Pak J Surg 2019; 35(2): 94-7.
16. Chiang RA, Chen SL, Tsai YC. Delayed primary closure versus primary closure for wound management in perforated appendicitis: a prospective randomized controlled trial. J Chin Med Assoc 2012;75:156e9.
17. Towfigh S, Clarke T, Yacoub W, Pooli AH, Mason RJ, Katkhouda N, et al. Significant reduction of wound infections with daily probing of contaminated wounds: a prospective randomized clinical trial. Arch Surg 2011;146:448–52.
18. Meka M, Anasuri B. Comparison of superficial site infection between delayed primary and primary wound closures in ruptured appendicitis. Int Surg J 2018; 5(4):1354-7.