

# Wound Infection and Length of Hospital Stay with and Without Placement of Drain in Patients With Complicated Appendicitis

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## ABSTRACT

**Objective** To compare the outcome, in terms of wound infection and length of hospital stay, with and without drain placement in patients with complicated appendicitis.

**Study design** Randomised controlled trial.

**Place & Duration of study** Department of General Surgery, Jinnah Postgraduate Medical Centre Karachi, from August 2015 to February 2016.

**Methodology** A total of 60 patients with complicated appendicitis were included in this study. Patients were randomly allocated into two groups and had placement of drain or no drain. Final outcome was measured in terms of wound infection and hospital stay at the end of 5th postoperative day. Chi square test was used for analysis.

**Results** There were 42 (70%) male and 18 (30%) female patients. The mean age of the study subjects was  $25.63 \pm 4.13$  year. Rate of wound infection and hospital stay (>4) were significantly high in patients where intraoperative drain placement was done ( $p=0.008$  and  $p=0.005$  respectively).

**Conclusions** Routine placement of the drain after complicated appendicitis is not indicated. Drain placement was associated with increased morbidity.

**Key words** Acute appendicitis, Wound infection, Drain- surgical.

## INTRODUCTION:

Acute appendicitis remains the commonest surgical emergency presenting to a general surgical unit.<sup>1</sup> Appendicitis, defined as inflammation of appendix, has many clinical presentations ranging from simple appendicitis to perforated and gangrenous ones where complications and postoperative recovery remain challenging.<sup>1</sup> If acute appendicitis is left untreated, it will eventually perforate leading to serious complications.<sup>2</sup> Patients with perforated

appendicitis usually have severe symptoms and may require preoperative resuscitation.<sup>3</sup>

Worldwide studies have concluded that perforated appendicitis can be managed with percutaneous drainage of pus only however, leaving behind a perforated appendix is again questionable.<sup>3</sup> Wound infection rate following appendectomy for complicated appendicitis is reported as between 15-20%.<sup>1,2</sup> Placement of drain in these cases still remains controversial. According to a study, rate of intra abdominal collection was 10.74% in patients with complicated appendicitis without drain placement.<sup>4</sup> Similarly hospital stay was also different in reported series with and without drains. This study aimed at finding out the difference about placement and no placement of drains in our setup in patients with complicated appendicitis.

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**METHODOLOGY:**

This was a randomized controlled trial carried out at the Department of General Surgery, Jinnah Postgraduate Medical Center Karachi from August 2015 to February 2016 were included. All patients with complicated appendicitis (perforated appendix, gangrenous appendix, or puss formation) of both gender, between 18 year to 35 year were enrolled in this study. Patients with acute non complicated inflamed appendix or patients with alternate peroperative diagnosis were excluded.

Patients meeting the inclusion criteria were registered from emergency room. The purpose and procedure of the study was explained to the patients along with written consent. Data of the patients were recorded on a predesigned form. Patients diagnosed with complicated appendicitis were randomized into two groups, drain placement group and no drain group, by using sealed opaque envelopes method. Intravenous hydration along with antibiotics started in ER. Baseline investigations were sent. All underwent operation. Post operatively patients were followed in the ward and final outcome in terms of duration of hospital stay and wound infection was noted at the end of 5th postoperative day.

Data was entered into SPSS version 16. Chi square test was applied and significance level was set at < 0.05.

**RESULTS:**

A total of 60 patients with complicated appendicitis were included in this study. Patients were randomly divided into two groups. Thirty patients were in drain placement group and 30 in no drain group. The mean age of the patients was 25.63±4.13 year. Out of 60 patients, 70% were male and 30% female. Rate of wound infection was significantly high in patients where intraoperative drains were placed as compared to those where no drain was kept (56.67% vs. 23.33% - p=0.008). Similarly hospital stay (>4 days) was also high in drain placement cases as compared to no drain group (66.67% vs. 13.33% p=0.0005). These are shown in figures I and II.

**DISCUSSION:**

Despite the routine use of prophylactic antibiotics that target both aerobic and anaerobic organisms, infection of the operative incision is the most common cause of morbidity after appendectomy.<sup>5</sup> In patients with non-perforated appendicitis the incidence of wound infection is <10%.<sup>7, 8</sup> Wound infection increases with perforated appendicitis to 15% to 20% and is highest with diffuse peritonitis, up to 35%.<sup>6</sup> There is enough evidence to discourage the use of prophylactic drains in different areas of

gastrointestinal surgery but not in cases of complicated appendicitis.<sup>9</sup> Drainage following simple acute appendicitis has been assessed by few randomized trials where it was not recommended.<sup>10, 11</sup>

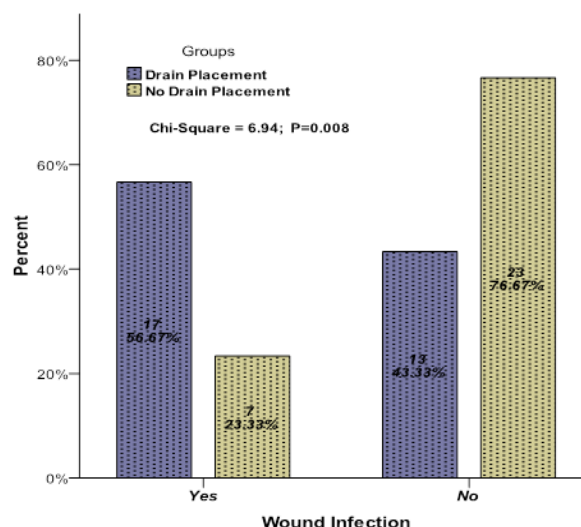


Fig I: Comparison of Wound Infection Between Groups

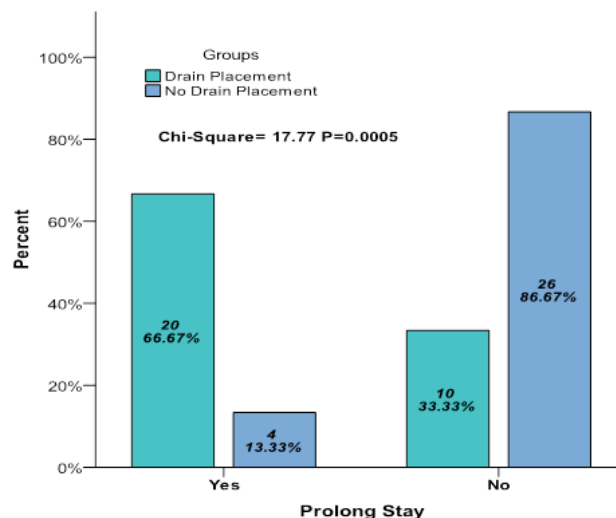


Fig II: Comparison of Hospital Stay Between the Groups

The frequency of wound infection in this study was more in the drainage group (56.6%) than the non-drainage group (23.33%) which was also reported by Ezer et al.<sup>12</sup> Similar findings were also reported by Narci A et al.<sup>13</sup> In their study 28.4% patients in the drainage group and 16.2% in the non-drainage group had wound infection. Two randomized controlled trials investigated the value of prophylactic drainage after open appendicectomy for acute/simple appendicitis.<sup>11,14</sup> A study reported significantly higher wound infection rate in drain placement group with acute/simple appendicitis whereas another study

found similar wound and intra-abdominal infection rates in drained and non-drained groups.<sup>11</sup> Launay-Savary MV et al recommended that there is no place for prophylactic drain in appendicitis.<sup>14</sup> Peroviæ Z et al also had same conclusion.<sup>15</sup> All the results from literature search are comparable to ours.

It is reported that there is a tendency on the part of the treating physician to continue the parental antibiotics and analgesics longer in the drainage cohort than in the non-drainage group this leads to delay in discharge of the patients.<sup>17</sup> Patients also feel ill while drains are in place. Furthermore the postoperative care of the patients with the drain as compared to those without drain is troublesome, requiring increased work and manpower for the hospital.

#### CONCLUSIONS:

In this study wound infection was lower in the non-drainage group similarly hospital stay as compared to drainage group was also short. The routine placement of the drain after appendectomy is not indicated regardless of the severity of the appendicitis. It not only increases the morbidity, but is also not a cost effective method.

#### REFERENCES:

1. Al-Shahwanay IW, Handoosh LN, Rassam R, Al-Qadhi A. Drain or not to drain in appendectomy for perforated appendicitis. *Iraq Postgrad Med J.* 2012;:349-52.
2. Jani PG, Nyaga PN. Peritoneal drains in perforated appendicitis without peritonitis. *Afr J Surg.* 2011;62-71.
3. Bahar MM, Jangjoo A, Amouzesi A. Wound infection incidence in patients with simple and gangrenous or perforated appendicitis. *Arch Iranian Med.* 2010;13:13-6.
4. Rather SA, Bari S, Malik AA, Khan A. Drainage vs no drainage in secondary peritonitis with sepsis following complicated appendicitis in adults in the modern era of antibiotics. *World J Gastrointest Surg.* 2013;27:300-5.
5. Cohn SM, Giannotti G, Ong AW. Prospective randomized trial of two wound management strategies for dirty abdominal wounds. *Ann Surg.* 2001;233:409-13.
6. McGreevy JM, Finlayson SR, Alvarado R,

- Laycock WS, Birkmeyer CM, Birkmeyer JD. Laparoscopy may be lowering the threshold to operate on patients with suspected appendicitis. *Surg Endosc.* 2002;16: 1046-9.
7. Khamash MR, Ayyash K. Wound infection in primary versus delayed primary wound closure in cases of perforated and gangrenous appendicitis. *Saudi Med J.* 1994;15:408-10.
8. Meakins JL. Innovation in surgery: the roles of evidence. *Am J Surg.* 2002;183:399-405.
9. Magarey CJ, Chant AD, Rickford CR, Magarey JR. Clinical trial of the effects of drainage and antibiotics after appendectomy. *Br J Surg.* 1971;58:855-6.
10. Stone HH, Hooper CA, Millikan WJ. Abdominal drainage following appendectomy and cholecystectomy. *Ann Surg.* 1978;187:606-12.
11. Al-Shahwany IW, Al-Qadhi A. Drains in perforated appendicitis. *Iraq Postgraduate Med J.* 2012;11:12.
12. Narcý A, Karaman I, Karaman A. Is peritoneal drainage necessary in childhood perforated appendicitis?—A comparative study. *J Pediatr Surg.* 2007;42:1864-8.
13. Urbach DR, Kennedy ED, Cohen MM. Colon and rectal anastomoses do not require routine drainage: a systematic review and meta-analysis. *Ann Surg.* 1999;229:174-80.
14. Launay-Savary MV, Slim K. Evidence-based analysis of prophylactic abdominal drainage. *Ann Chir.* 2006;131:302-5.
15. Peroviæ Z. Drainage of the abdominal cavity and complications in perforating appendicitis in children. *Med Pregl.* 2000;53:193-6.
16. Dandapat MC, Panda C. A perforated appendix: should we drain? *J Indian Med Assoc.* 1992;90:147-8.
17. Memon MA, Memon MI, Donohue JH. Abdominal drains: a brief historical review. *Ir Med J.* 2001;94:164–6.

Author's Contributions:

Ghansham	Data analysis.
Sana Ejaz	Data analysis, manuscript writing
Zeeshan Hyder	Data collection
Waryam	Data collection.
Sagheer Hussain Shah	Data analysis

Conflict of Interest:

The authors declare that they have no conflict of interest.

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