

## Drain or Not to Drain in Appendectomy for Perforated Appendicitis

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### ABSTRACT:

#### BACKGROUND:

Acute appendicitis is the most common surgical cause of acute abdomen necessitating surgical intervention. Prophylactic drainage is commonly used in surgical practice, as in acute perforated appendicitis.

#### OBJECTIVE:

To evaluate the advantages & disadvantages of the prophylactic drainage after appendectomy for acute perforated appendicitis.

#### METHODS:

Eighty four patients of acute perforated appendicitis were enrolled in this prospective comparative study done in Al-Kindy Teaching Hospital from October 2009 to March 2011. They were divided into two groups; 46 patients (54.76%) drainage group & 38 patients (46.24%) non-drainage group. Hospital stay time & postoperative wound infection were assessed in both groups. Statistical analysis using Minitab software version 14 to calculate the P value was done.

#### RESULTS:

Patients' age ranged from 6-50 years (mean  $27 \pm 12$ ), male:female ratio was 2.6:1. The incidence of perforation in acute appendicitis was 15.9% irrelevant to age or sex. Mean hospital stay time was 36 hours in the non-drainage group & mean of  $58 \pm 4$  in the drained group. Wound infection was 39.13% in the drainage group & 36.84% in the non-drainage group, with a P value was  $>0.05$ .

#### CONCLUSION:

postoperative wound infection & hospital stay were less in the non-drainage group for this prophylactic drainage should be reconsidered.

**KEYWORDS:** acute perforated appendicitis, -peritoneal drainage, -appendectomy.

### INTRODUCTION:

Appendicitis is the most common cause of acute abdominal pain requiring surgical intervention. The cause of appendicitis is unclear and the mechanism of pathogenesis continues to be debated. Despite improved asepsis and surgical techniques, postoperative complications, such as wound infection and intra-abdominal abscess, still account for a significant morbidity. Several studies implicate that postoperative infections are reduced by administration of antimicrobial regimes<sup>(1)</sup>.

During the last 2 centuries, surgeons used drains for prophylactic purposes, prophylactic drains have been employed to remove intra-peritoneal collections such as ascites, blood, bile, chyle, and pancreatic or intestinal juice; these collections

might become potentially infected or are, in the case of bile and pancreatic juice, toxic for adjacent tissue, another potential function of prophylactic drains is their signal function to detect early complications, such as postoperative hemorrhage and leakage of enteric suture lines<sup>(2)</sup>.

Abdominal prophylactic drainage in digestive surgery was considered until recently as a dogma. But randomised controlled trials have questioned the routine use of abdominal drain in elective surgery<sup>(3)</sup>. The value of prophylactic drainage after appendectomy might be different in the gangrenous and perforated form<sup>(4)</sup>.

### PATIENTS AND METHODS:

A prospective comparative study of 84 patients of perforated acute appendicitis was conducted in Al-Kindy Teaching Hospital from October 2009 to March 2011. Five hundred twenty eight

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patients were diagnosed & operated upon as cases of suspected acute appendicitis by history & clinical examination with general urine examination & white blood cell count were done to aid the clinical impression.

An inclusion criterion includes any patient with right iliac fossa pain & tenderness of any age group & sex, while the exclusion criteria were:

1. Associated pregnancy.
2. Medical diseases &/or medications which could interfere with the immune competency of the patient like diabetes mellitus or steroid use.
3. Laparotomies done for cases of acute abdomen in which appendicitis was found to be the cause.

We included perforated appendicitis only and other types of simple or complicated appendicitis (appendicular mass, appendicular abscess, gangrenous appendicitis) were not included in this study.

All patients were given preoperatively intravenous ceftriaxone & metronidazole which continued till stitch removal.

Some of the patients had pelvic tube drainage (drained group) while others only had peritoneal mopping without drainage (non-drained group). All specimens were sent for histopathological examination. All patients were kept on nothing per orum, received intravenous fluid therapy postoperatively until the return of bowel peristalsis, analgesics were given as needed by the patient. Drains were removed after 48-72 hours postoperative when the drained fluid is serous and less than 50 ml. /24hour.

Hospital stays for both groups were recorded. Follow up was on the 6<sup>th</sup> postoperative day as an outpatient at which any clinical feature of wound infection was seen including pain at the site of the wound, fever, redness at wound, oedema & tenderness; the wounds were treated by daily

dressing as an outpatient. Stitches were scheduled for removal on the 10<sup>th</sup> postoperative day. Cases of wounds infections for both groups were recorded. Ultrasonography examinations were done to patients who developed wound infection to exclude any intra-peritoneal collections. The patients were followed up to one month postoperatively.

Statistical analysis was done by calculating the P value using Minitab software version 14.

A P value <0.05 was considered statistically significant.

### RESULTS:

In this study 84 patients were enrolled, of those 62(73.8%) were males & 22(26.2%) were females with male to female ratio 2.8:1.

Age range was 6-50 years (mean 27±12), the highest incidence was in the age group 21-30 years.

The rate of perforated appendicitis was 15.9% irrelevant to age or sex.

Forty six (54.76%) patients out of the 84 patients had been drained at operation while 38(45.24%) patients the wound was closed without drainage.

The drained group had mean hospital stay of 58 hours ±4 while the non-drainage group had 36 hours hospital stay as shown in table III with a P value < 0.05 which is statistically significant.

The drained group showed postoperative wound infection in 18(39.13%) patients while the non drained group showed wound infection in 14(36.84%) patients as shown in table IV with a P value >0.05 for both; wound infection & no wound infection groups; which is statistically insignificant.

All patients with wound infection showed no intra-peritoneal collection neither by clinical nor by ultrasonographic examination. No patients in this study developed faecal fistula postoperatively. No mortalities were recorded in this study.

**Table I: Sex distribution of acute perforated appendicitis.**

Sex	no. of patients (%)
Male	62(73.8%)
Female	22(26.2%)
Total	84(100%)

**Table II: Age distribution of acute perforated appendicitis.**

Age groups	No. of patients
≤ 10 years	4
11-20 years	19
21-30 years	33
31-40 years	14
> 40 years	14
Total	84

**Table III: Hospital stay in drained & non-drained groups.**

Groups	Mean Hospital Stay
Drainage Group	58 Hours
Non-Drainage Group	36 Hours

**Table IV: Incidence of wound infection in drained & non drained groups.**

Groups	Wound Infection	No Wound Infection	total
Drainage Group	18(39.13%)	28(60.87%)	46(100%)
Non-Drainage Group	14(36.84%)	24(63.16%)	38(100%)
Total	32(38.1%)	52(61.9%)	84(100%)
P value	>0.05	>0.05	

**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>(6,7,8)</sup>. Wound infection increases with perforated appendicitis to 15% to 20% and is highest with diffuse peritonitis (35%)<sup>(6)</sup>. Many studies in the 1980s and 1990s have reported low rates of infection using primary closure, suggesting that such management might be safely and successfully used<sup>(9)</sup>. In the pediatric as well as adult populations several trials have concluded that primary closure of all incisions is indicated<sup>(10)</sup>.

The incidence of perforated acute appendicitis in this study was 15.9% which is less than 19% shown by Hartwig Körner et al<sup>(11)</sup>. The incidence of perforated appendicitis was more in males than in females (table I) & it was more in the 2<sup>nd</sup> and 3<sup>rd</sup> decades of life. This was in contradistinction to Körner H. et al<sup>(11)</sup> which showed same incidence through age & sex.

The hospital stay in this study was 36 hours in the non-drainage group & the mean hospital stay was 58 hours for the drainage group (P value<0.05), this was less than Adnan Narci et al<sup>(12)</sup> which showed mean hospital stay of 10.2 days for drainage group Vs 8.3 days for non-drainage group.

The incidence of wound infection in this study was more in the drainage group 39.13% than the non-drainage group 36.84% which was also shown by Ezer et al<sup>(13)</sup>, the same was shown by Adnan Narci et al<sup>(12)</sup> of 28.4% in the drainage group & 16.2% in the non-drainage group although both were lower than this study. Launay-Savary MV et al<sup>(14)</sup> recommended for no place for prophylactic drainage in appendectomised patients. Perović Z. et al<sup>(15)</sup> again showed the same conclusion although their discrepancy in the result were higher. Same conclusion was found by Dantapat et al<sup>(16)</sup>, Greenall et al<sup>(17)</sup>, and Stone et al<sup>(18)</sup>. All their results were comparable to ours and they reached the same goal in not recommending prophylactic drainage in perforated appendectomy. All the studies are tabulated in table V.

**Table V: Comparison of wound infection percentage to other studies**

wound infection	this study	ezer a et al 2010	adnan narci et al 2007	perović z. et al 2000	dantapat et al 1992	greenall et al 1978	stone et al 1978
drainage group	39.13	↑	28.4	66	55	↑	43
non-drainage group	36.84	↓	16.2	19	50	↓	29

**CONCLUSION:**

In this study wound infection was lower in the non-drainage group as well as the hospital stay compared to drainage group; for that the prophylactic drainage should be reconsidered.

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