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## The role of normal saline irrigation versus povidon iodine of surgical wound in decreasing the rate of surgical site infection in perforated appendicitis

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### Abstract

**Background:** Surgical site infection is most common complication after appendectomy especially in patients with perforated appendicitis.

**Aim:** To assess the role of irrigation of the surgical wound with normal saline in comparison with povidon iodine soaking on the rate of surgical site infection after appendectomy for perforated appendicitis.

**Methods:** This is a prospective randomized study which was carried out in department of surgery at baquba teaching hospital for 116 patients with perforated appendicitis operated on. The study took one year (April 1-2013 to march 31-2014). The patients were divided into two groups:

Group A: Surgical wounds washed with normal saline.

Group B: Surgical wound washed with povidon iodine.

**Results:** This study have found that 9(15.5%) out of 58 patients developed surgical site infection in group A and 20(34.4%) out of 58 patients develop surgical site infection in group B(p value=0.0320), suggesting that the normal saline is more effective than povidon iodine stacking for surgical site infection of perforated appendicitis with statistically significant results.

**Conclusions:** The syringe pressure irrigation of the surgical wound with normal saline after appendectomy contributes significantly in decreasing the incidence of postoperative surgical site infection in perforated appendicitis.

**Keywords:** Normal saline, povidon iodine, perforated appendicitis, surgical site infection

### Introduction

Acute appendicitis is one of the most common diseases presenting to the emergency department and surgical words. Male-female ratio is 1.3:1. The rate of perforated appendix is more in male and at age of extremities [1]. Early surgical intervention is the treatment of choice for acute appendicitis to avoid perforation, accepting negative laparotomy rate of about 15-20 % [2]. The overall risk of perforated appendicitis is 25,8%. Children less than 5 years age and patients over 65 year have higher rates of perforation (45% &51% respectively) [3]. Obstruction of the lumen of the appendix is main cause of perforation of appendix. The main cause for the obstruction of the lumen of appendix is considered fecolith [4]. Many factors increase the rate of perforation of appendix as late presentation of the patient. Although the mortality of perforated appendicitis decreased due to better preoperative care, operative and postoperative management, but the morbidity from perforated appendicitis is still high. In gangrenous appendicitis, morbidity increases four to five times [5]. The delay in diagnosis has been reported as a contributing to the increased incidence of postoperative wound infection. However the degree of operative contamination is one of the most important risk factors for postoperative wound infection following appendectomy. Surgical site infection is an infection that occurs following a surgical intervention. The center for disease control and prevention consider surgical site infection to include:

- 1. Incisional surgical site infection:** Divided into superficial and deep, depending on whether infection is limited to the skin and subcutaneous tissue only or extends into the deeper tissue such as fascia and muscle of body wall.
- 2. Organ space infection:** Infection occurs within the operative field other than where the tissues of the body wall was incised.

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General measures to decrease surgical infection were sorted out into measures that control the patients postoperative risk factors and measures that approach the perioperative treatment of the patient [6]. Wound irrigation is still controversial as a method for the reduction of the risk of the surgical site infection. There is little evidence that suggest that low pressure washing of an incision with saline reduce the risk of surgical site infection [7], but high pressure may, pulse irrigation may be of benefit [8].

### Patients and Methods

This is a prospective randomized study which was carried out in the ward of surgery at Baquba teaching hospital for 116 patients. The study took one year (1 April to 31 March, 2014).

### Inclusion criteria

All patients of both genders admitted to emergency department with acute appendicitis assisted by laboratory and u/s examination, and confirmed during operation as perforated acute appendicitis.

### Exclusion criteria

Patients allergic to metronidazole or cephalosporin, pregnant women, immune compromised patients and those with incisions other than grid iron incision.

### Results

**Table 1:** Age distribution of patients

Age groups (year)	Group A %	Group A No.	Group B %	Group B No.	Total %
15-25	34.4	40	26	30	60.4
26-35	8.5	10	16.2	19	24.7
36-45	4	5	4	5	8
46-55	2.1	2	1.5	2	3.6
56-65	1	1	2.3	2	3.3
total	50	58	50	58	100

**Table 2:** Gender distribution of selected patients

Gender	Group A no.	Group A %	Group B no.	Group B %	Total no.	Total %
Male	41	36	35	29.5	76	65.5
Female	14	12	26	22.5	40	34.5
Total	55	48	61	52	116	100

**Table 3:** Number of cases and incidence of infection

Groups	No. of Cases	No. of Infection	%of Infection
A	58	9	15.5
B	58	20	34.4
total	116	29	25

### Discussion

Surgical wound irrigation remain controversial as a way of lowering the risk of surgical site infection. There is little evidence to suggest that low pressure washing of an incision with normal saline reduces the risk of SSI [7], but high pressure may be of benefit [8]. The accuracy of this test increases with the increasing severity of inflammation; to improve the sensitivity and specificity surgeons have tried sequential leukocyte count and neutrophil: lymphocytic ratio and recently attention has been focused on other inflammatory markers which can be raised in appendicitis [9]. Nezar Al-mahfooz *et al.* showed the rate of SSI in appendectomy wound is significantly reduced after high pressure syringe irrigation of wound by normal saline in comparison with other groups [10].

### Conclusion

The syringe pressure irrigation of the surgical wound with

### Intervention

All the enrolled patients had signed the required informed consents, and then had detailed clinical history and examination, laboratory investigations and u/s. The patients had surgeries and perforated appendix was confirmed, after appendectomy the wound was closed primarily in all patients and the patients were classified into two groups (A, B). for group-A, the wound had irrigated with 50 ml normal saline for muscle layers and 50 ml for external oblique apponeurosis using 50 ml syringe. For group B, the wound was soaked with povidon iodine for muscle layers and for external oblique apponeurosis layer. Prophylactic antibiotic (single dose of ceftriaxone 1 gm and metronidazole 500 mg intravenously infused and therapeutic antibiotic (ceftriaxone 1 gm daily and metronidazole 500 mg three times a day for 3 days, followed by cefixime cap 400 mg once daily and metronidazole tablet three times daily for seven days) were administered to all patients in this study. Postoperatively all the patients were followed for one month duration for development of surgical site infection.

### Statistical analysis

P value by statistical software known as Medcalc at P equaling to or less than 0.05 the results were considered as significant.

normal saline after appendectomy contributes significantly to lower the incidence of postoperative SSI in perforated appendicitis.

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