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## ORIGINAL ARTICLE

# EARLY COMPLICATION AND RE-ADMISSION AFTER LAPAROSCOPIC AND OPEN APPENDECTOMY

***Ali Al Wadan, Jamila Al Senebani, Ahmed Al Ahnoomi, Azan Al Saadi***
Kwaite University Hospital, Sana'a, Yemen

Correspondence to: Azan Al Saadi, Email: azanalsaadi@gmail.com

### Abstract

**Aim:** There are minimal data available that compares the rate of wound infection, and re-admission after discharge of patients who undergone either laparoscopic appendectomy (LA) or open appendectomy (OA).

**Methods:** We reviewed retrospectively 235 consecutive cases of patients who underwent laparoscopic and 250 patient who had open appendectomy from January 2004 to March 2009 in the university hospital. Main outcome measures included post operative wound infection that necessitated draining of the wound or re-admission for intra-abdominal collection, paralytic ileus or intestinal obstruction.

**Results:** There were 9 patients in the open appendectomy group who were re-admitted to the hospital with wound infection and were managed by drainage of the wound , while in the Laparoscopic group there was no re admission due to infection.

**Conclusion:** LA is associated with no wound infection which necessitate re-admission or surgery. The length of hospital stay is the same if the wound infection is excluded from the open method. LA has lesser rate of wound infection and re-admission of patients. We recommend that LA to be the first choice offered for all patient with acute appendicitis.

**Keywords:** Appendicitis, Laparoscopy Appendectomy (LA), Open Appendectomy (OA), Re-admission, Wound infection.

## INTRODUCTION

Appendectomy is one of the most frequent abdominal operation.[1] The advantage of Laparoscopic surgery are well known, especially regarding the postoperative pain hospital stay, wound infection and cosmetic appearance .

The LA had its own limitation which include technical difficulty, non availability of equipment all the time, longer duration of operation and higher expense of the procedure as a whole.

There has been recent studies which delineated the advantages of LA to include shorter recovery times and less wound infections. Additionally, laparoscopy advocators state that; it may benefit certain populations such as those with unclear diagnosis, female, elderly, and obese patients and on the other hand , OA have been associated with fewer intra-abdominal infections and lower institutional cost.

This is a retrospective study and the aim of this study was to compare the rate of wound infection and re-admission in patient who underwent LA and those who had OA.

## PATIENTS AND METHODS

We retrospectively reviewed the records of 235 consecutive patients who underwent Laparoscopic appendectomy (LA) from January 2004 to March 2009 at the Kwaity university Hospital. We also reviewed retrospectively the files of 250 patients who had open appendectomy in the same period. We recorded the surgical procedure performed, the postoperative wound infection and its site and the presence of any bowel related complications such paralytic ileus or intestinal obstruction if present . Re-admission related to the surgical procedure was also recorded. Wound complications were defined as infections that required intervention, or re-admission to the hospital for management. All patients who were converted from LA to OA were excluded from the study.

All our patient received routine antibiotic of 1 gm Ceftriaxone plus 500 mg Flagyle if simple appendex was anticipated, the dose was adjusted for paediatric age group. In complicated cases or in patient where their clinical condition indicated perforated appendex or peritonitis, Piperacillin/tazobactam and Amikacin were used. All procedures were done under general anaesthesia (both OA and LA). The systemic antibiotic is administered for one day for simple appendicitis extended to five days for complicated cases. In perforated appendex and peritonitis the peritoneal cavity was irrigated thoroughly with warm normal saline.

The Laparoscopic Appendectomy was performed via three ports one 10mm (Umblical) for the camera and two 5mm working ports one on each side of the umblical port, the left port at slightly lower level than the umblical and the right port at slightly higher level than the umblical port. In all our LA cases we introduced the umblical port by open procedure.

The abdominal cavity is examined properly and thoroughly, and any fluid collection was sucked. After identifying the appendex Babcock grasper was used to hold the appendex gently and with UltraCision forcep the mesoappendex was separated from the appendex with almost negligible bleeding. Two Vicryl loop sutures (2/0) were used to secure the appendex stump.

The use of intra-peritoneal drain was dictated by the presence of perforated or gangrenous appendicitis as well as the presence of abscess or excessive ooze. The appendex was removed through the 10mm umblical port after replacing the 10mm scope by 5mm scope inserted through one of the side port for viewing. The result of the histopathlogy of the appendex was not included in our study.

## RESULTS

Laparoscopic Appendectomy was performed on 235 patient 82.9 were male and 16.7 were female (M:F ratio of 4:1) this is due to the majority male worker population who comes to the capital city for work. The age distribution in the LA ranged from 8-53, years (median 25 years) (Fig. 1). While in the open group the age range was 4-55, with almost similar distribution. There were 3 pregnant patients in LA and 4 in the open group (3). There was no pregnancy complication related to the laparoscopic procedure. All age groups including paediatric were managed by conventional instrument and were operated by a general surgeon on similar basis.

There was no Intra-abdominal abscesses in both groups, there was one patient with missed fecolith in the LA group for which the patient was followed up with CT scan, study with no consequences. Wound infection was found in 14 (5.6%) patients in the open group, nine wound infection were after discharge of the patients from the hospital, six of them needed emergency re-admission and drainage of the wound. All were given systemic antibiotic after obtaining swab. One of the patient who underwent drainage stayed for two weeks in the hospital.

Five patient of the OA group the wound infection was diagnosed prior to discharging the patients from the hospital. There was one very mild wound infection in the LA (0.4%) ($p<0.05$), who was managed in the outpatient clinic. Postoperative ileus occurred with frequencies of 2% in the LA group and 6% in the OA group ($p>0.05$). Bleeding occurred in one patient due to trocar injury which required laparotomy 2 days later. ($P>0.05$).

## DISCUSSION

Despite the success of conventional appendectomy, there is still the problem of wound infection and length of hospital stay. This is consistent with previous publications. Wound infections though may not be serious complications but represent a major problem to the patients quality of life. Earlier studies which compared OA and LA did not demonstrate the superiority of either procedures.[4] In our study, laparoscopic appendectomy significantly improved the postoperative wound infection rate. There was only one mild wound infection in the laparoscopic group managed in outpatient clinic , whereas in open group the infection rate was about 5.6% of this about half of them needed re-admission and systemic antibiotic this is consistent with other publications.[5-8]

Some previous studies concluded that LA were associated with a slightly higher rate of intra-abdominal infection.[9] Our result and more recent publication demonstrated that it is actually has a better outcome in more complicated appendex.[10] The reason behind this improvement might be due to a better manipulation of the peritoneal cavity laparoscopically due to the increasing laparoscopic experience and also to the use of antibiotic which clearly demonstrated the decline in postoperative infection rate.[11-13]

All complications were managed either conservatively

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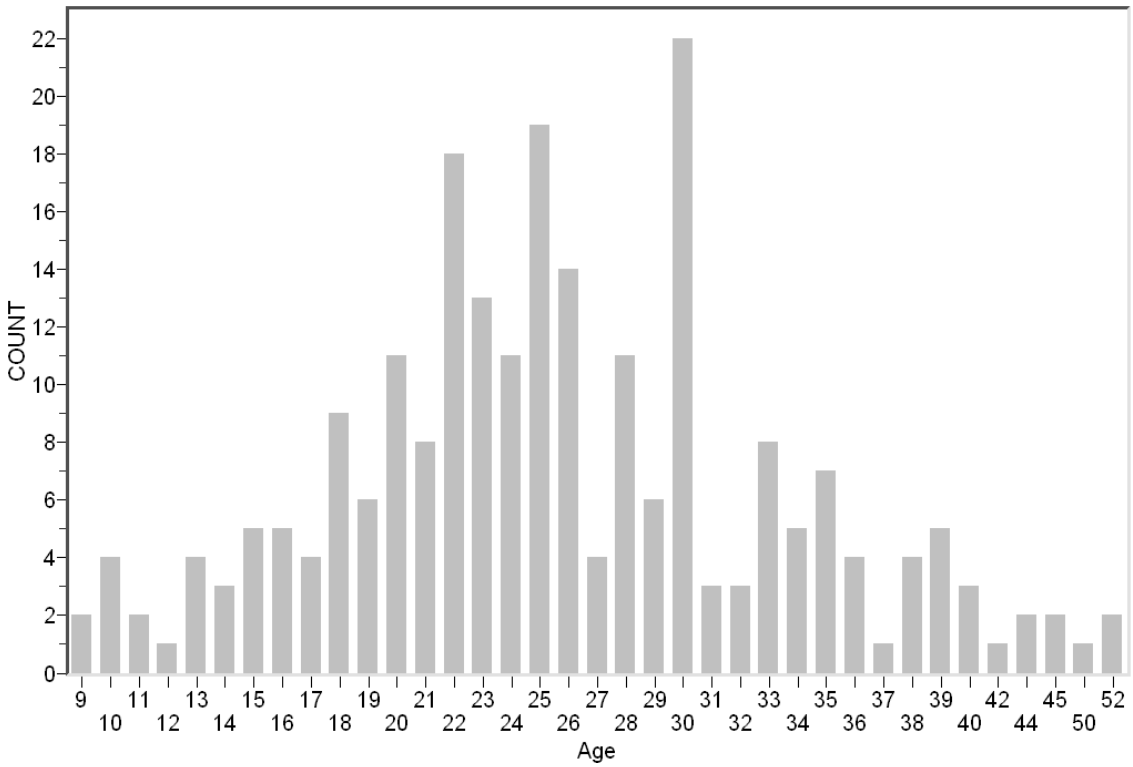


***Fig 1. Age distribution.***

cases of paralytic ileus or intestinal obstruction, or simple drainage of the wound where indicated, there was no mortality in either group.

Despite the reduction in wound infection and re-admission rate offered by laparoscopy, increased cost is often the reason behind the attraction of open appendectomy. The cost effectiveness need to be measured in times of hospital stay, re-admission and cosmoses.

Eight percent of our patient in LA were in pediatric age group and none of them developed wound infection, different studies in pediatrics has shown that LA was similar if not superior to OA when the 30 days postoperative complication was compared.[14,15]

Two of our wound infections in the OA were pregnant in the 2nd and third trimester. Laparoscopy is first choice to laparotomy for difficult and complicated cases it gives access to the abdominal cavity.[14] LA is safe alternative to conventional open appendectomy, leading to early ambulation, decreased hospital stay, and better exploration of abdominal cavity.

In conclusions our study demonstrated that laparoscopic appendectomy is feasible and safe. It is associated with less postoperative wound infection and paralytic ileus, when compared with patients who had open appendectomy. It has less re-admission of patient to the hospital for the management of the wound infection.

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