Original Article

Compare the Laparoscopic versus Open Appendectomy in Al-Diwaniyah Teaching Hospital

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ABSTRACT

Objective: To compare the outcomes of laparoscopic appendectomy (LA) and open appendectomy (OA) in patients with acute appendicitis at Al-Diwaniyah Teaching Hospital.

Study Design: Prospective study

Place and Duration of Study: This study was conducted at the AL-Diwaniyah Teaching Hospital, Al-Diwaniyah City Iraq from 1st May 2021 to 30th April 2022.

Methods: One hundred patients with a clinical diagnosis of appendicitis were chosen. They were divided in two groups; group A treated with laparoscopic appendectomy and group B managed with open appendectomy.

Results: The average operative time was 45min in group Abetween 30 to 60 minutes while in group B, the average was 25min.Regarding the complicationspostoperatively, were mainly observed in group B as compared to group A. Paralytic ileus was 2 (4%) in group A.

Conclusion: Laparoscopic appendicectomy is regarding as a safe and effective technique with lower postoperative pain, less hospital stay then less cost, quicker recovery and best looking scar than in classical Open appendectomy.

Key Words: Laparoscopic appendectomy, Open appendectomy, Appendicitis

Citation of article: Handooz AAH, Abdalsahib AF, Jabaz DF. Compare the Laparoscopic versus Open Appendectomy in Al-Diwaniyah Teaching Hospital. Med Forum 2025;36(1):28-32. doi:10.60110/ medforum.360106.

INTRODUCTION

Acute appendicitis (AA) is mainly diagnosed clinically. The first appendectomy in the history was done in New York in 1886, and since that time, appendectomy was regarded as the commonest emergency surgery. Early and proper appendectomy has considered as the gold standard treatment for AA because of the highly risk of developmentof seriouscomplications.[1]

Appendicitis is regarded as the main emergency case in surgerythat accounts about of 7-10% and is regarded as the major occurrence in child and adolescentages,with age range from 10 to 30 years, and majority of patient need surgical intervention with appendicectomy to prevent possibility of perforation of the appendix.[2] The classical l surgical incision in open appendicectomy OA includes a minorwound (about 4-6 cm) in the lower right segment of the abdominal wall, called a grid iron incision.

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Received: January, 2024
Reviewed: February-March, 2024
Accepted: November, 2024

Other approaches may include laparoscopic method (laparoscopic appendicectomy), which perform in most cases with 3minute incisions (each about 1.5 cm). Then surgeoninserts probesfor a camera and specialized laparoscopic toolswithin the abdominal cavity after inflation with CQ2 gas and excised the appendix as in the open traditional surgery.[3]

Open surgical appendectomy is a smooth and mostlyusedprocedure for cases of acute appendicitis in the last years, but from about 15 yearsago, laparoscopic appendectomy is becoming more popular, in spite of it is not as famous as laparoscopic cholecystectomy.[4]The first laparscopic appendicectomy was performed by a German gynecologist surgeon Semma in 1983. Laparscopyin cases of suspected appendicitis are regarded as a safe and effective procedure.[1,4]

Using the laparoscopy gives a great assessment and large operative field of the peritoneumspace more than that in the classic grid-iron incision. The technique gives a good vision that resulted in full assessment of the para-colic areas and the pelvisorgans that is not easy to be performwith the OA.[5]

Inspite that traditional appendectomy has low risk of complications with low risk of complications and death, the laparoscopy has less invasive approach with bestbenefits in the postoperative period like small wound size and low risk of infection, less postoperative pain, and less postoperative recovery time result in less hospital cost, with other additional benefit mainly for femalescases as it enhances the diagnosisassessment

and lowering the after operationpelvic adhesionthat may end with infertility problems in addition to better aesthetic results.[6] It has been done to make comparison of OA with LA, but the benefit of laparoscopy in appendectomy is underdiscussion till now.

Till now it has not regarded as the most popularprocedure for dealing withacute appendicitis as gall stone surgery. Debate still exists about the beneficial effect of laparoscopic appendicectomy as compared to a conventional open procedure. The majority of patients with appendices are treated by the open approach in the UK.[7]

Laparoscopic appendectomy is a delicate and safe procedure with lowrisk of complications; it is also a great training procedure in laparoscopic field and, with best experience, takes a shorter time thanin open procedure. In cases of negative appendectomieswhich are mostfrequent in fertile age women and can be accompanied with significant morbidity;therefore, laparoscopy has a diagnostic role here and, when the appendicitis is the cause, then appendix can be removed safely by laparoscopy.[8]

We applied this prospective study to make a comparisonbetween thefinalresults of open appendectomy and laparoscopic appendectomy regarding the pain in the postoperativeperiod, recovery and the need of analgesics, incidence of infection of the wound and hospital admission time, reflecting including early resume the normal work.[9]

METHODS

In thisreview was done in AL-Diwaniyah teaching hospital in Al-Diwaniyah city, from May 2021 to May 2022. One hundred Patients with a clinical diagnosis of appendicitis were chosen (60 male and 40 female) there afterdistributed as a group A (50 patients treated with lap.appendectomy LA and group B (50 patients managed with open appendectomy OA). Exclusion criteriathat applied in this study were including patientsless than 10 years, patients withfeatures of acute peritonitis, cases with asuspected right iliac fossa mass that may diagnosed as appendicular mass or abscess, and cases of laparoscopy that converted to open appendectomy.

All patients had detailed information regarding the study and the risk of conversion to open surgery in the group of laparoscopic procedure. The ages of patients in the study were range between 15–45 years old. Cases with suspicion presented with right lower abdominal pain or withpain around umbilicus that migrate to right iliac fossa within 24 hours. Painand nausea with or without anorexia, vomitingand elevated temperature in some cases were explained. On abdominal examination tenderness in the right lower abdomen withrebound tenderness and in some casesa cough impulse and Rovsings sign, mild increase in temperaturelower than 38 C. Regarding laboratory tests, leukocytosis in most cases more than 10^4 cells/ml, and general urine examination and chest x-ray were performedin all cases. Regarding ultrasound studyof the abdomen mainly needed in femalesin order to excludeother diagnosis thatgiven a picture similar toacute appendicitis. Prophylactic antibiotic were given to all patients by using ceftriaxone (1000 mgtwice daily) and metronidazole vial. Cases of OA weredone by a classical McBurneys approach.

In LA cases, using the typical technique by three ports which includes two 10 mm ports (umbilical and right lower abdomen) and one 5mm (left iliac fossa) ports were used. Post insufflation of peritoneumwith CO2, the intra-abdominalspace was examined to allocate the appendix and exclude other differential pathology. Divide the mesoappendix by using ligasure or bipolar cautery and appendix excised using endoclip and then appendix extrudedwith a laparoscopic bag. Close the wounds of port sites. Excised appendices were sent for histopathology.

Follow up postoperatively with checking bowel sounds at 6 hours interval, when positive, can allow a fluid diet to patient and then allowing patients going home.Time of operation from starting of anesthesia until discharge from the hospital started.Postoperative analgesia includes the numbersof intravenous or intramuscular injections needed. Thecomplications in the postoperative period whichmay be including respiratory, gastrointestinal, and vascular. In our study, all those creteria were calculated between Laparoscopic appendectomy and open appendectomy. The data was entered and analyzed through SPSS-25.

RESULTS

Average age in both groups was 15-45 years and 30 years is the mean age in both groups.Men to women ratio were not the same in both groups, in group A was (1.3:1) and(1.2:1)was in group B. there minor differences in age, sex in both groups which is no significant.Main clinical features are shiftinglower right abdominal pain and rebound tenderness; other characteristics include nausea, anorexia and mild fever, there were no significant dereferences in the two groups (Table 1). The average operative time was 45min in group Abetween 30 to 60 minutes while in group B, the average was 25minutes between 20 to 30minutes. It is clear that operative time was less in group B, the p value was $P < 0.001$ (Table 2).

The using of postoperative analgesia was assessed by calculation the number of analgesicinjections used postoperativelyat time of the hospital staying before discharge. More need for analgesia in group B than in group A, $p < 0.001$ which is significant (Table 3).

Return of normal bowelactivity was explained by the spontaneous passage of flatus and detection of bowel sounds;in cases of LA the range was 10 hours while in

OA group the range was 18 hours, the p<0.001,which is significant (Table 4).

About the initiation of oral fluids diet, it was about 14 hours in cases of group A LA while it was about and 22 hours after OA in group B. Regarding the duration of admission postoperatively,in group A the mean hospital staying was 24 hours, while in group B it was 2 days, p <0.001which is significant (Table 5).

Regarding postoperative complications, mainly observed in group B as compared to group A. Regarding paralytic ileus was 2 (4%) in group A ,and 5 (10%) in group While the wound infection was 15(16%) in group B and 3(6%) in group A.The chest infectionwas (zero) in group A and 1 (2%) in group B. Deep venous thrombosis (DVT) was (zero) in both groups. using intra-abdominal drain was in 3 cases in group A (6%) while in group B, in 17 case (34%). Mortality rate was zero in both groups which is of significant value p<0.001 (Table 6).

Table No. 1: Clinical features of acute appendicitis

Clinical feature	Group A		Group B	
	No.	%	No.	%
Shifting pain	35	70.0	33	66.0
Rebound tenderness	45	90.0	47	94.0
Anorexia	25	50.0	27	54.0
Nausea	15	30.0	13	26.0
Vomiting	10	20.0	11	22.0
Fever	5	10.0	6	12.0

Table No. 2: Comparison of duration of the operation

Time (minutes)	Group A		Group B	
	No.	%	No.	%
25	-	-	18	36.0
30	-	-	19	38.0
35	1	2.0	10	20.0
40	1	2.0	2	4.0
45	20	40.0	1	2.0
50	15	30.0	-	-
55	9	18.0	-	-
60	4	8.0	-	-

Table No. 3: Need for postoperative analgesic injection

No. of analgesic injection	Group A		Group B	
	No.	%	No.	%
1	30	60.0	50	100.0
2	5	10.0	30	60.0
3	1	2.0	25	50.0
4	-	-	10	20.0
>4	-	-	4	8.0

Table No. 4: Return of normal bowel movement

Bowel sounds (hour)	Group A		Group B	
	No.	%	No.	%
8	2	4.0	-	-
10	15	30.0	7	14.0
12	24	48.0	8	16.0
14	8	16.0	20	40.0
16	1	2.0	10	20.0
18	-	-	3	6.0
20	-	-	2	4.0

Table No. 5: Duration of postoperative hospital staying

Duration of hospital stay (hours)	Group A		Group B	
	No.	%	No.	%
8	2	4.0	-	-
12	2	4.0	1	2.0
24	40	80.0	10	20.0
48	6	12.0	35	70.0
72	-	-	4	8.0

Table No. 6: Postoperative complications rate

Complication	Group A		Group B	
	No.	%	No.	%
Paralytic ileus	2	4.0	5	10.0
Wound infection	3	6.0	15	30.0
Chest infection	-	-	1	2.0
DVT	-	-	-	-
Drain using	3	6.0	17	34.0
Mortality	-	-	-	-

DISCUSSION

Laparoscopic appendectomy has a progressive way to be a gold standard and approving its superiority over the open appendectomy (OA) and in spite of OA is the first choiceto deal with acute appendicitis and is hence the most common urgentsurgical operation performed, but with progression of minimally invasive techniques, LA had more attention worldwide. The first LA was reported in 1983 and from that time was considered accurate with high safety and low reported of complication rates around1.2%.

Laparoscopic appendectomy gives a well exploration of the peritoneal cavity and can be examine totally more than as in the classical open appendectomy. This procedure permits a thorough and rapid inspection of total peritoneum, the paracolic regions and pelvic cavity which is difficult to be performed with open grid iron inscion.[10]

Many researchers regard emergency laparoscopy is a greatoption for the management of acute abdomen casesthat may be of benefit inlowering the costs and risk of complications andimprovingend results and more comfortable for patients.[11]

The diagnostic accuracy inlaparoscopic appendectomy is very good in patients with suspected appendicitis therefore it is highly recommended procedure. There are multiple studies that showing that laparoscopy regards a great diagnostic stoolthat reducesthe unnecessary appendectomies in fertile age female.[12]

A multiplenumbers of studies have been carried out in India that makes a comparison between open and lap. appendicectomy. In the majority of the reviews,the result was that LA preferable than OA. According to a manyreviews applied in Nawaz SharifHospital, Lahore in 2011, which showed that the time of operation was lowerin LA.This not as that in review where the operative time is more in LA as in our study we calculated the time of surgery from the time of insufflation of peritoneal cavity until the time of deflation. In this study, the mean operationduration was forty fiveminutes. In LA, while in OA is25 min. which was determinedbythe surgeon experience and the efficacy of the assistant team.[10,13]

Inourstudy the more operativeduration in laparoscopic appendicectomy may be resulted fromextra needs as preparing thelaparoscopic tools,gas inflation, ports insertion and a period for diagnostic laparoscopy.[14]

In other study that was done in 2002, Multan.it was also showed that LA,in spite of it is a new and expensive more coastyprocedure, was a great substitute for the OA as it had an additionalfeature that facilitate full visualization of abdominal cavity in young female patient when there suspicion about the diagnosis between other gynecological causes.

A study done by Al-Aubaidi[12] in Iraq at 2011 showed that the averageduration of operationin OA was nearly25 min lessthan in LA group. With the mean analgesic used postoperatively in laparoscopic patientswere 1.3; and regarding the complications afterthe procedure were few and detected more in OApatients. Staying of hospital was 24 hours in laparoscopic group. In other study performed by Pokalaet al[15] revealed that LA consumed a moretime, about (95.1±44.1 minutes) than OA which about (65.8±32.5 minutes).

About the need for analgesia in our study was less in group A about 1.5 doses and is near to the result in the study conducted by Kamalet al[10] was 1.4 doses.

In our series the risk of infection is similar in an other study, which showed that the risk of wound infections in cases of the laparoscopygroup was 8.4% compare to that in the OA group which was 24.5%.Gupta and Cliff[16] also reported that the risk of wound infections was much lesser in LA (15.4%) than in cases of OA (31%).Which may be explained bynoting that in laparoscopic appendectomy there is little touching of the bowel and other organ directly by the surgeon hands and instruments as comparison in OA. Also, the gut is rarely come intouch with the wound of the abdominal wall at the time of LA where the appendix is dealt with ininternally.

In our study theapproximate hospital stay in group A was 1 day and 2 days in group B and this result is a slightmore than that mentioned in a study by Kamal et al[10] and Yau et al[14] but is nearto the result showed in an other study. Pokalaet al[15] had also reported more hospital stay than our series and reported a clear difference regarding the hospital admission between groups of LA which was (4.34±4.84 days and, 7.31±9.35 days in the OA group.

The return of normal bowel movement and starting of fluid diets with return of normal activity following appendectomy is better in cases of LA than in OA in our study. And this also the findings in multiple other series .the minimally invasive procedures including (LA) by definition it must allow for a more quick recovery, less admission time, and quicker recovery time.[17-20]

CONCLUSION

Laparoscopic appendicectomy is regarding as a safe and effective technique with lower postoperative pain, less hospital stay then less cost, quicker recovery and bestlooking scar than in classical OA. Also there was less need for postoperative analgesic treatment, so it is characterized early mobility of patient and less risk of complications with early return to normal life.

Author's Contribution:

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

Source of Funding: None

Ethical Approval: No. 987/QM/Approval/006 Dated 09.01.2021

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