ORIGINAL ARTICLE

Laparoscopic appendectomy-comparison with open appendectomy with respect to surgical site infection

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Received:
4th February 2016

Accepted:
21st December 2016

Abstract

Background: Open appendectomy has been the standard surgical treatment since the last century. Laparoscopic surgery is now a well-established and advanced method of performing general surgical procedures. Laparoscopic appendectomy has not been adapted as the gold standard procedure for appendectomy. There are many issues still lingering with establishing the superiority of laparoscopic over open appendectomy. This study was done to compare the two procedures with respect to surgical site infection so that it may aid in the decision regarding the adaptation of a particular procedure for use in our country.

Patients and Methods: This was a Retrospective study conducted in the department of General Surgery, Liaquat National Hospital, Karachi, Pakistan for 1 year between Jan 2015-Dec 2015. Patients were recruited via convenient sampling and the study approved by the hospital ethical review committee. Patients were assessed for acute appendicitis and were divided into two groups based on open and laparoscopic appendectomies. Patient's clinical files and records were retrieved and assessed and data was entered into a study proforma and analyzed using SPSS software.

Results: A total of 156 patients out of 176 were included 108 were male and 48 were females making a percentage of 69% in males and 31% in females. There were 90 laparoscopic and 66 open procedures. Of the total 90 cases in laparoscopic appendectomies 11 (12.2%) had superficial surgical site infection (SSSI), while in the open group 10 (15.1%) developed superficial surgical site infection. The comparative analysis showing p-value was of 0.48 which was statistically insignificant. A total of 02 (2.2%) patients in the laparoscopic group developed organ space infection and were managed by pig tail drainage showed p-value of <0.05 which was statistically significant. In the open group no patients developed organ space infection.

Conclu sion: Laparoscopic appendectomy is not associated with lower surgical site infections ascompared to open appendectomy but the severity of disease is the factor for increased organ space infection.

Keywords: laparoscopic appendectomy, surgical site infection, organ space infection

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Introduction:

Appendicitis was first recognized as a disease entity in sixteenth century and was called-perityphliis. McBurney in 1889 described the clinical features of acute appendicitis. Open appendectomy has been the standard surgical treatment since the last century. In 1983, a German gynecologist Semm performed the first laparoscopic appendectomy.[1] Laparoscopic surgery is now a well-established and advanced method of performing general surgical procedures. A lot of controversy still surrounds the gold standard procedure for appendectomy. Unlike Cholecystectomy which is routinely performed through a laparoscopic approach, there is still an ongoing debate as to the performance of appendectomy through laparoscopic approach.[2] Appendectomy is one of the most commonly performed procedures after cholecystectomy. More than 50 studies have been done comparing these two

procedures.

Laparoscopic appendectomy is associated with a lower surgical site infection rate,[3] however there are contradicting studies as well.[4] Laparoscopic appendectomy is associated with a 12.5% SSI rate as compared to a rate of 15% in open appendectomy. However, the risk of organ space infection in laparoscopic appendectomy is at 0.4% for low risk and 12.3% for high risk patients as compared to a rate of 0.3% in low risk and 8.9% in high risk open appendectomy.[5] The difference is statistically significant. Laparoscopic appendectomy is related with a shorter hospital stay though the cost of laparoscopic appendectomy is higher than that of open appendectomy. Post-operative pain is less and return to normal activity takes almost equal time in both the procedures.[6] There is a dearth of local studies. This study is being planned to compare the two procedures with respect to surgical site infection so that it may aid in the decision regarding the adaptation of a particular procedure for use in our country. We therefore aim to compare rates of surgical site infection in laparoscopic and open appendectomy.

Patient and Methods:

This was a retrospective study conducted between Jan-Dec 2015 at department of General Surgery Liaquat National Hospital, Karachi, Pakistan. The study was approved by the Liaquat national hospital and medical college ethical review committee and written informed consent was obtained from all subjects. All patients received routine and standard care process. Patient confidentiality was maintained. Patients were studied through convenience sampling following the inclusion and exclusion criteria below. Demographic data was taken from case file and filled in the proforma attached at the end, by the primary investigator. Follow up with regard to surgical site infection was sought from the list of morbidities as kept and maintained in a month wise order in the department as part of departmental audit. Pathology report was compared for the confirmation of final diagnosis. Patients were divided into 2 groups based upon Laparoscopic and open appendectomy. Final outcome with regards to surgical site infection was analyzed and compared accordingly using the SPSS version 18 software.

Inclusion Criteria:

- Patients above age of 12 years.
- Patients with clinical signs of appendicitis.
- Patients with positive ultrasound or computerized tomography (CT) scan findings of acute appendicitis.
- Perforated appendix.

Exclusion Criteria:

- Patients having appendicular lump.
- Patients having signs of generalized peritonitis.

Results:

A total of 156 patients were included in the study based on inclusion and exclusion criteria. 108 were male and 48 were females making a percentage of 69% in males and 31% in females (Figure 1). Out of the total 176 procedures, 90 laparoscopic procedures were compared to 66 open procedures, 20 were excluded. The mean age of patients was 29.3 with 14 being the lowest and 68 being the highest age encountered. 2 patients had diabetes mellitus, 1 had hypertension and rest of the 173 patient did not have any comorbidities. In both the groups' final diagnosis of appendicitis was consistent in all cases as per histopathology report. A cross referencing of Alvarado score was consistent with final diagnosis of appendicitis. Of the total 90 cases in laparoscopic appendectomies 11 (12.2%) developed surgical site infection, while in the open group 9 (15.1%) developed surgical site infection. Of all 11 surgical site infection in the laparoscopic group 2 (2.2%) required opening of stitches while the rest responded to antibiotic management. Of the 9 open appendectomy surgical site infection, 06 (9%) had to undergo suture removal while the rest were managed conserva-

tively. The comparative analysis showed p-value was of 0.48 which was statistically insignificant. A total of 02 (2.2%) patients in the laparoscopic group developed organ space infection and were managed by pig tail drainage showed p-value of <0.05 which was statistically significant. In the open group no patients developed organ space infection.

Discussion:

According to Tamjeed Gul et tal the percentage of males encountered as having appendicitis was higher than females and in our study the number of males and females was 108 and 48 respectively.[7]

The different studies have quoted different rates of surgical site infection in post appendectomy patients, the mean of which is 12.5% (LA) and 14%(OA) which is comparable to the surgical site infection rate in our population which is out of which 11.s5%(LA) and 15% (OA). Our study also showed that laparoscopic appendectomy is associated with higher rate of organ space infection but superficial surgical site infection (SSSI) were lower and less number of patients required any management.[8-16]

A lower rate of organ space infection was reported in the studies conducted in Korea and Pakistan but in our study the rate of organ space infection was far lower, which may suggest that further research is needed to look into the factors leading to organ space infection.[8-16] The pros of the study are that it touches an important area of concern and aims to shut-off different negative persona attached to laparoscopic appendectomy. It adds to the already available literature and provides impetus for further research on the subject.

The drawbacks of the study are that it is a retrospective analysis and the sample size is small. The factors associated with organ space infection (OSI) can be dealt in a separate study as the amount of fluid used for irrigation was not quantified. The histopathology in patients with organ space infection was consistent with gangrenous appendix; this along with less or over use of irrigation fluid during laparoscopic appendectomy can be the factor causing OSI. The duration of study is also only of one year which could be improved upon by taking the study as a prospective one.

Despite of these errors the study aims to bring forth the adaptability of laparoscopic appendectomy in third world countries as the procedure of choice and with the higher number of cases the cost associated with the procedure is bound to go down.

Conclusion:

Laparoscopic appendectomy is not associated with lower superficial site and organ space tinfections as compared to open appendectomy but the severity of disease is the factor for organ space infection.

List of abbreviations:

SSSI = superficial surgical site infection.

Consent:

Written informed consent was obtained from the patients for publication of this article. A copy of the written consent is available for review by the Editor-in-Chief of this journal. Approval obtained from Liaquat national hospital and medical college ethical review committee.

Competing Interest:

The authors declare that they have no competing interests.

Acknowledgement

We acknowledge all members of general surgery department, Liaquat national hospital and medical college, Karachi, Pakistan for their cooperation.

Conflict of interest: None

Funding source: None

Role and contribution of authors:

Dr Mirza Arshad Beg, Dr Abdul Rafay Qazi and Dr Salman Faridi were involved in conceptual-

ization and writing the synopsis.

Data gathering was done by Dr Mirza Arshad Beg, Dr Abdul Rafay Qazi and Dr Faisal Siddiqi.

Dr Salman Faridi and Dr Abdul Rafay Qazi were involved in the statistical analysis

Dr Faisal Siddiqi, Dr Mirza Arshad Beg and Dr Abdul Rafay Qazi tabulated the results and wrote the discussion

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