



## Experience of Laparoscopic Appendicectomy in a Specialist Training Centre (HKL)

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### Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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### ABSTRACT

Appendicitis has always been one of the most common causes of surgical abdomen. With technological advancements, laparoscopic approach for surgical intervention has been suggested by many centres and multiple studies have shown its advantages over open appendicectomy. However laparoscopic appendicectomy has only begun to be more commonly used in our centre over the past 2 years, This is the experience we had with Laparoscopic appendicectomy in our centre.

*Keywords: Appendicitis; Malaysia; open.*

### 1. INTRODUCTION

Appendicitis is the most common cause of surgical abdomen from all age groups [1]. It most commonly occurs at the second and third decade

of life. Previously open appendicectomy has been the gold standard for the treatment of acute appendicitis, however with technological advancements; it shows laparoscopic approach is more superior and efficient. Minimally invasive

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surgery results in less post-operative pain, shorter hospital stay and faster recovery. Multiple retrospective studies have been done with varying results; with some stating that laparoscopic approach is superior and more efficient [2,3]. Whereas other studies have shown there is no significant difference between the two [4,5,6]. In our centre the main surgical approach has been open appendicectomy, whereas laparoscopic approach was rarely done before 2019.

We present a 2-year single centre experience of laparoscopic appendicectomy and the clinical outcomes (length of stay, operating times and postoperative complications) when compared with open appendicectomy.

## 2. METHODS

### 2.1 Patients

A retrospective study of patients admitted to Hospital Kuala Lumpur between January 2019 to October 2020 with the diagnosis of appendicitis. The decision for the type of operation was based upon the surgical team's preference and experience.

We analyzed a total of 453 patients. The patients were divided into 2 groups: Open appendicectomy (OA) and Laparoscopic appendicectomy (LA). The collected clinical Data included Operation time, intraoperative findings (acute or perforated) and postoperative complications. The patients were diagnosed clinically by history and clinical examination, and in patients where a clinical diagnosis could not be concluded, imaging studies (e.g USG or CT scan) were done.

All specimens were sent for histopathology to confirm the diagnosis.

Patients were discharged once they were tolerating regular diet, had good pain control and afebrile.

All patients particulars were undisclosed during the analysis of this study.

### 2.2 Statistical Analysis

Categorical data was presented as frequencies and percentage. Comparisons between the 2 groups were made. Cases whereby laparoscopic approach was converted to open appendicectomy were included.

## 3. RESULTS

Out of the 453 patients, 323 had undergone open appendicectomy and 130 had undergone laparoscopic appendicectomy. The training hospital has just begun to regularly practice laparoscopic approach, therefore the results were further broken down into their respective years (2019 and 2020) (diagram 1).

For the year 2020, our conversion from laparoscopic to open appendicectomy was done for the intention to treat and to reduce the morbidity of the patient.

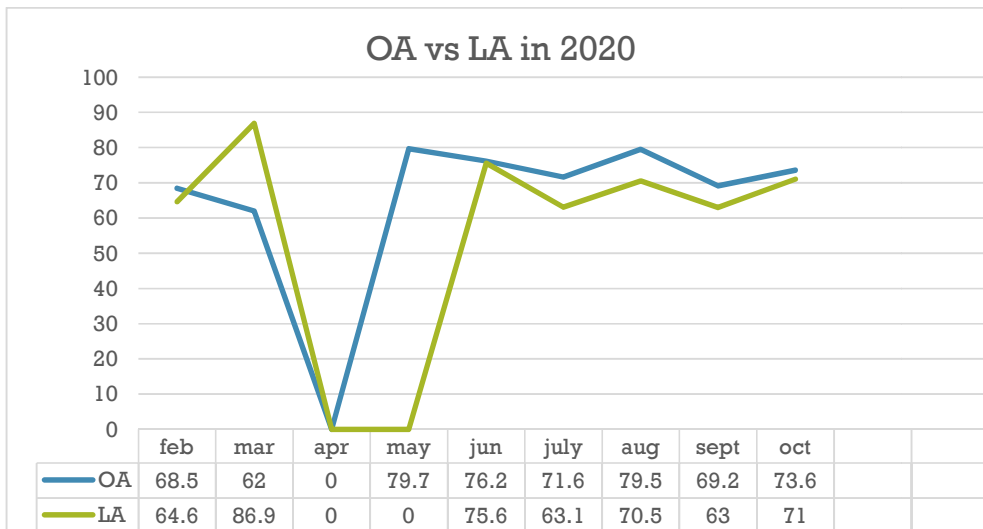
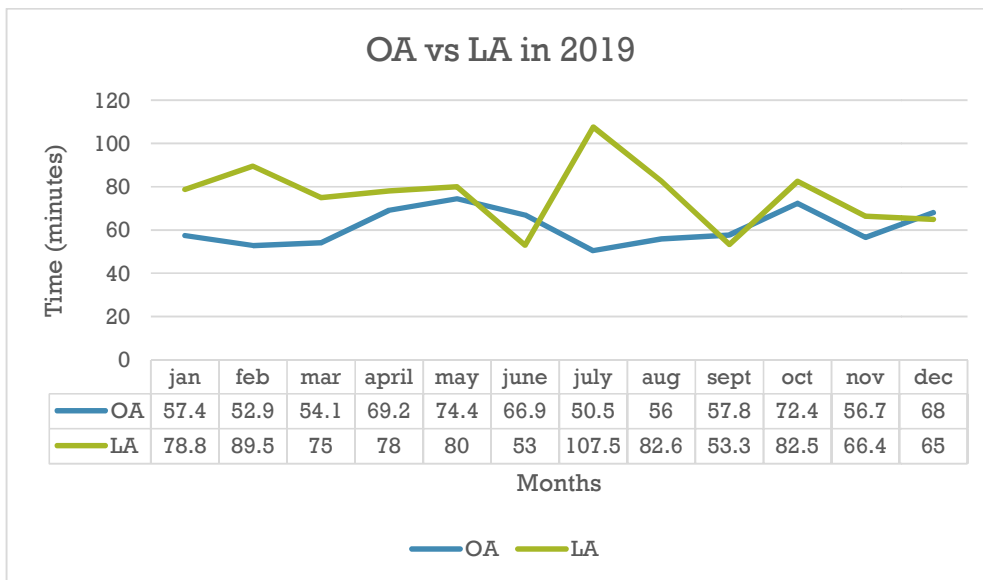
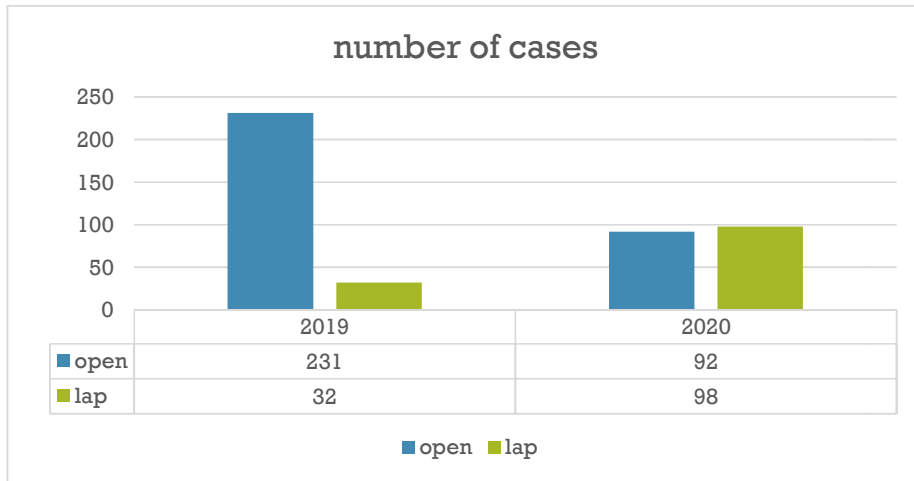
Most of our complications were of Clavien Dindo Class I and class II which required a prolonged prescription of antibiotics. The rates of post-operative complications when compared from 2019 to 2020 for laparoscopic appendicectomy reduced from 9.4% to 1%. From the data we collected the surgical site infections were wound dehiscence, there were no findings of incisional hernias, fistulas or abscess formations. All the patients with surgical site infections did not require re-exploration; including the patient with collections, as it was minimal. The treatment for the complications were dressing of the surgical site infection and at most required prolonged antibiotics to be completed for 2 weeks.

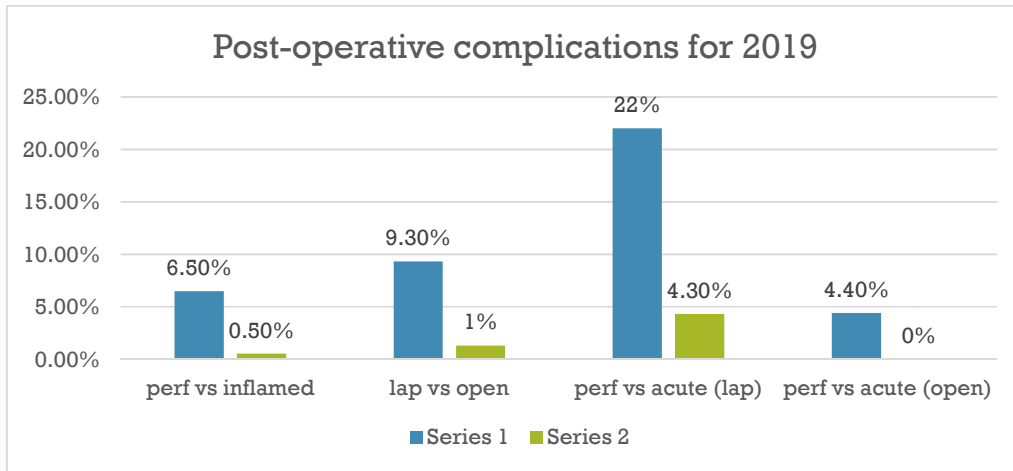
## 4. DISCUSSION

Appendicitis is the most common intraabdominal condition requiring urgent surgical intervention. Open appendicectomy is still considered the standard of treatment despite the technological advancement and introduction of laparoscopic appendicectomy. Multiple studies have been done which support the use of laparoscopic surgery for better clinical outcomes, whereas others have shown there is no significant advantage of laparoscopic approach as compared to open.

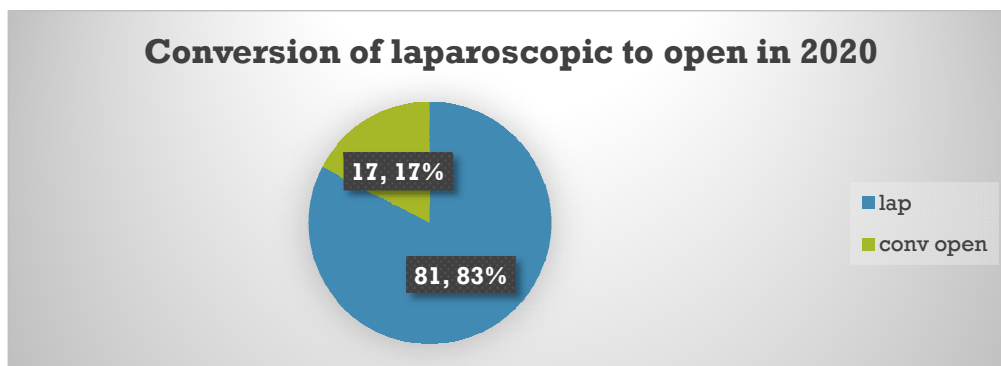
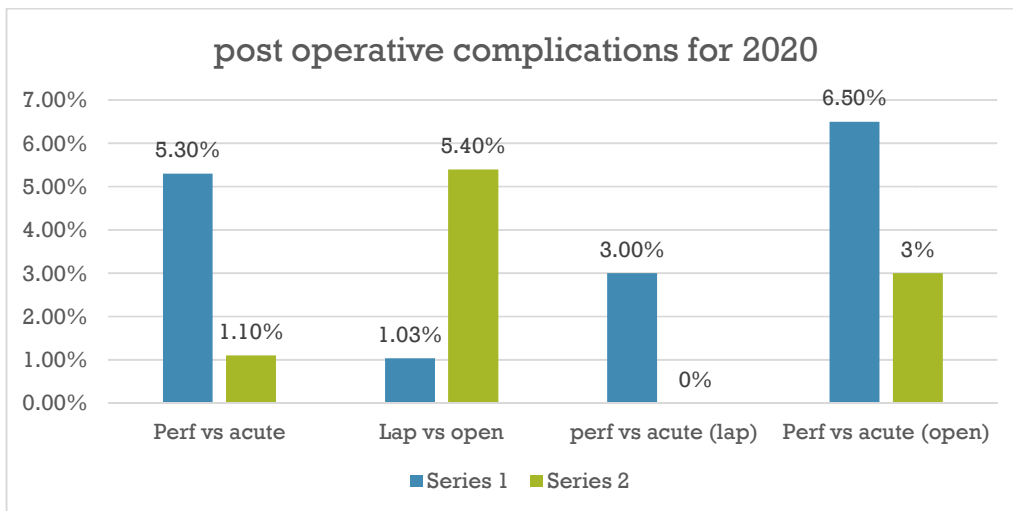
The post-operative complications were higher in those with a perforated appendix as compared to open, regardless of the technique used. And no mortalities were recorded.

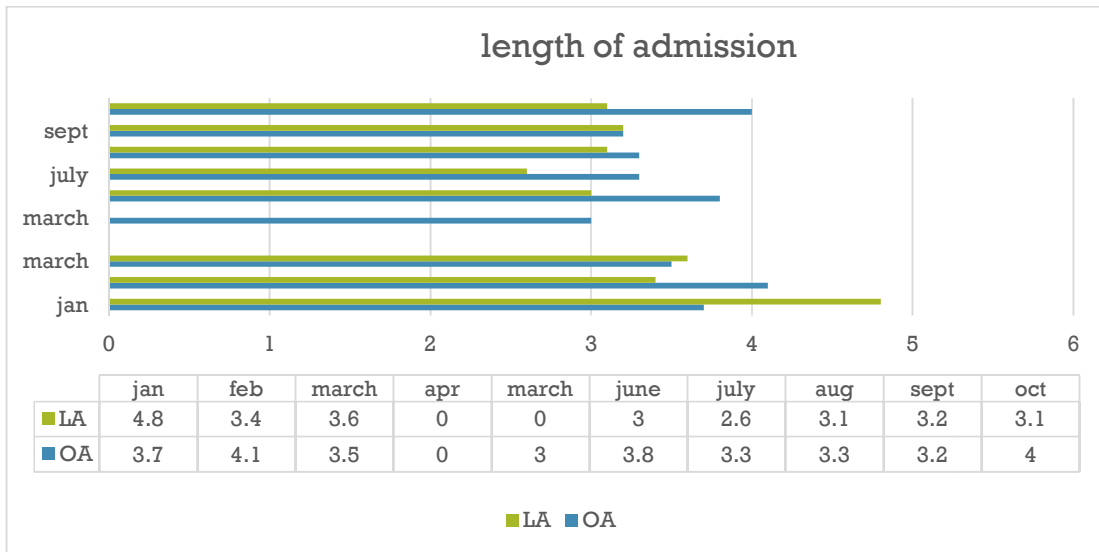
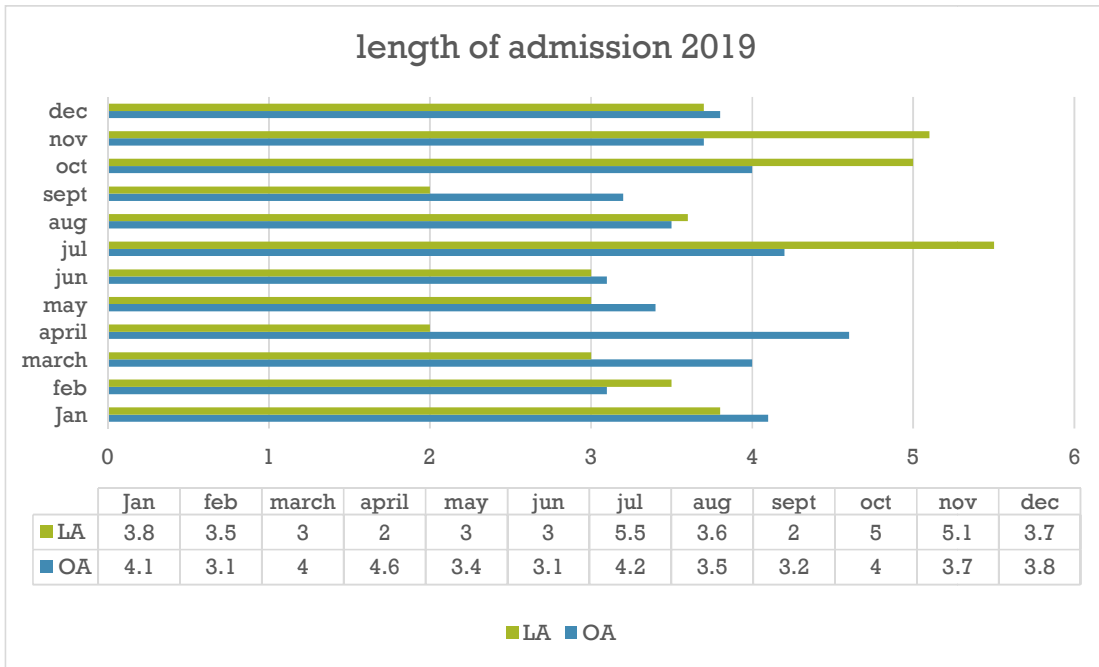
The limitation of this study was the length of admission, the amounts of analgesics used and the number of days. Even though our data shows the average length of admission is between 3-5 days for both laparoscopic and open appendicectomy, however we did not analyze the number of days from post-operation until discharge., which other studies have shown is between 1-2 days.





| Complication over 2 years                  | Open appendicectomy (n) | Laparoscopic appendicectomy (n) |
|--|-------------------------|---------------------------------|
| Surgical site infecions (wound dehiscence) | 6                       | 7                               |
| Post-operative ileus                       | 1                       | 1                               |
| Post-operative collection                  | 1                       | 0                               |





During our initial year of laparoscopic appendectomy in 2019, operative cases were few and the learning curve was steep; this unfamiliarity is shown by the prolonged operating times and higher rates of post-operative complications.

The following year, our center became more aggressive and used laparoscopic appendectomy as our preferred approach. Our data has shown that with as the post-operative complications of laparoscopic approach had significantly improved during the 2<sup>nd</sup> year, as well

as, the operating times between open and laparoscopic approach having no significant difference. The cause for the changes of operating times throughout the study could be due to the fact of improved training and supervision during the operation, as well as the level of seniority of the operating surgeon.

## 5. CONCLUSION

In our 2 years of experience of laparoscopic appendectomy there has been little evidence to show superiority over open appendectomy.

However, in regards to our centre (Hospital Kuala Lumpur), there are multiple factors which contribute to the difficulty of proceeding purely with laparoscopic approach.

Firstly, the covid-19 pandemic greatly inhibited our services and the number of patients is reduced and have been outsourced to neighboring hospitals. If patients were positive for covid-19, they were either treated conservatively or with open appendectomy, as to reduce aerosol exposure Secondly, our emergency operating theatre availability is limited to only 1 to 2 rooms therefore with priority going to our more complex cases we are unable to proceed with operation early. Lastly, when considering to proceed with laparoscopic appendectomy the number of laparoscopic systems available to be used comes into consideration. In our centre (HKL) we have 4 systems, however if they are being used for other operations such as Laparoscopic colectomies, or cholecystectomies, then our approach will change as we do not want to further postpone the emergency operation.

## CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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