



KEMENTERIAN KESIHATAN  
MALAYSIA

# Surgery by District Medical Officers: Retrospective Audit on Open Appendicectomy and Patient Outcomes in Serian Hospital, Sarawak in 2021

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## Introduction

While acute appendicitis is a common surgical emergency, till date, there is no study done in non-specialist district hospitals in Malaysia to audit the number of open appendicectomy done as well as related patient outcomes. This audit compares the number of open appendicectomy done in Serian Hospital, Sarawak from 2018 to 2021. It also reviews aims to review the open appendicectomy performed by medical officers in Serian Hospital in 2021 and patient outcomes. It also compares the number of open appendicectomy done from 2018 to 2021.

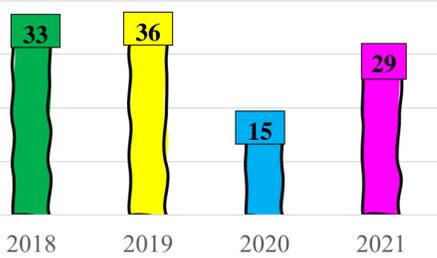
## Method

This is a single center descriptive retrospective audit examining data of one-year period from January to December 2021. All triages, medical and operative records of 2021 were reviewed. Patients of age 12 to 64 years old were included. Those with the diagnoses of 'possible/likely/to rule out acute appendicitis' and 'perforated appendicitis' were included. Meanwhile, diagnoses like 'acute abdomen' and 'needing abdominal reassessment' were excluded. The operative records on open appendicectomy from 2018 to 2021 were also tabulated.

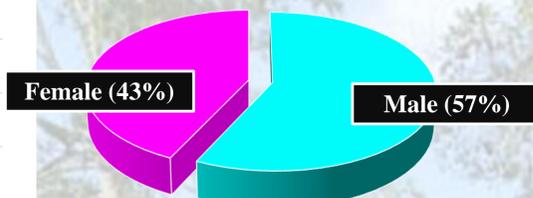
## Result

From 2018 to 2021, 112 open appendicectomies were performed in Serian Hospital. The number of open appendicectomies done sharply declined from 36 in 2019 to 15 in 2020. Meanwhile, 49 patients were diagnosed with acute appendicitis in 2021. Results are as tabulated. 41% patients were referred to tertiary centre, one of whom due to personal preference while the rest necessitated further specialist care due to their septic conditions or predicted operative challenges. Among the patients selected for surgical intervention locally, 14% required intraoperative referral due to challenging surgical field and diagnostic dilemma. Among patients who underwent successful open appendicectomy locally, histopathological reports show that majority had inflamed appendices, a quarter perforated and 1 negative appendicectomy. 2 patients developed post-operative complications.

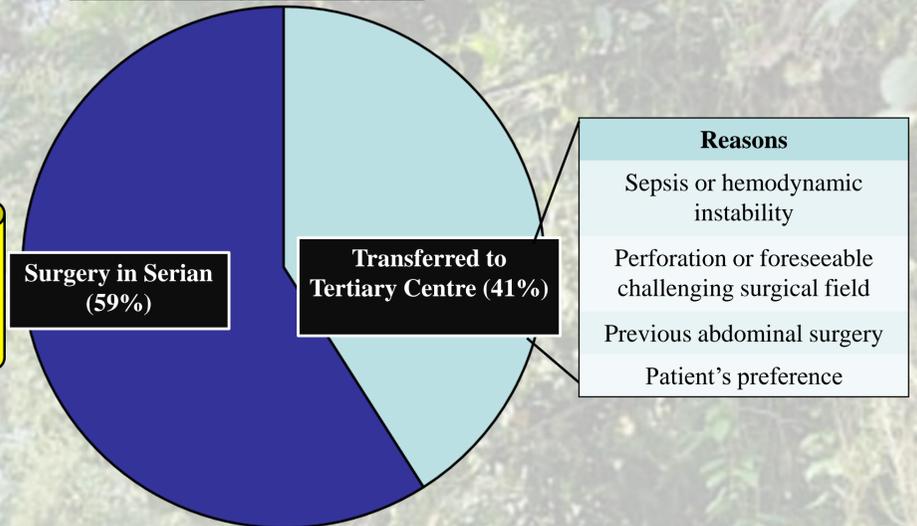
**Number of Open Appendicectomy in Serian Hospital 2018-2021**



**Gender of Patients with Acute Appendicitis in 2021**



**Location of Surgical Intervention**



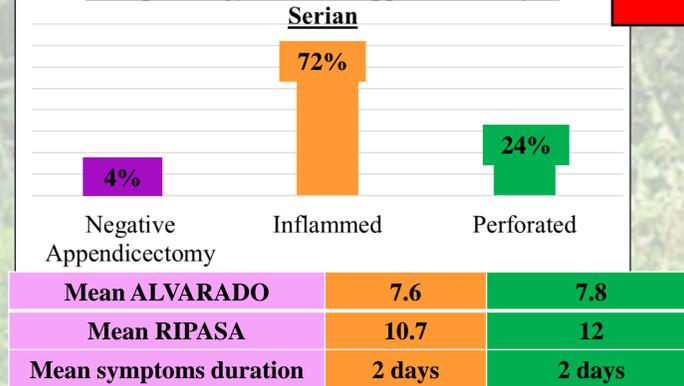
**ALL patients selected for surgery locally received surgical intervention within 24 hours after presentation**



4 patients (14%) needed intraoperative referral due to

- challenging surgical field (75%)
- Diagnostic dilemma: gangrenous fallopian/small bowel (25%)

**Histopathology Result of Appendicectomy in Serian**



Mean ALVARADO	8.75
Mean RIPASA	12.3
Mean symptom duration	4.5 days

Mean ALVARADO	7.6	7.8
Mean RIPASA	10.7	12
Mean symptoms duration	2 days	2 days

## Discussion

Appendicectomy is an Essential Surgical Procedure listed by Disease Control Priorities.<sup>1</sup> As Serian Hospital in Sarawak is a district hospital without a resident surgeon, open appendicectomy can be performed by medical officers who are supervised or privileged for this procedure.

Reviewing the data from 2018-2021, There is a notable decline in the number of open appendicectomy performed in Serian Hospital. This may be attributed to the Covid Pandemic and the consequent Movement Control Order (MCO), a nationwide partial lockdown, which may have limited patient's mobility.<sup>2</sup>

Similar to other studies on acute appendicitis in Malaysia, there were slightly more males than females diagnosed with acute appendicitis in Serian Hospital in 2021.<sup>3</sup> As this hospital has no resident surgeon, 41% were referred to tertiary centre for specialist care due to reasons as stated above. Among patients selected for surgery locally, 4 patients required intraoperative referral to specialist, most of whom due to challenging surgical field. These patients had higher ALVARADO and RIPASA scores than patients who successfully underwent surgery in Serian Hospital. We believe that this issue can be reduced if a clear guideline can be established on the selection criteria in choosing suitable patients for surgery in non-specialist district centres.

In our study, patients with both inflamed and perforated appendicitis had similar mean ALVARADO score and duration of symptoms upon presentation. However, the group with perforated appendicitis had higher RIPASA score. This is in line with many studies that demonstrated RIPASA with a higher sensitivity in diagnosing acute appendicitis.<sup>4</sup> However, more studies are required to assess the relationship between RIPASA score and perforated appendicitis. It is important to note that in resource-constrained centre where computed tomography is not available, these scoring systems play a vital role in improving accuracy in diagnosis.

## Conclusion

Medical officers in district center are capable of performing open appendicectomy. However, suitability of patients to be operated in district hospital must be scrutinized to reduce the need of intraoperative referral. The Essential Surgical Care delivery requires improvement in district hospitals in Sarawak.<sup>5</sup> Suggested means of training include regular rotation of visiting surgical team from tertiary to district center and regular surgical education programs. More consideration can be placed on making laparoscopic surgery available in district hospital with surgeon's guidance.

## Citations

- Mock, C. N., Donkor, P., Gawande, A., Jamison, D. T., Kruk, M. E., & Debas, H. T. (2015). Essential surgery: key messages from Disease Control Priorities, 3rd edition. *Lancet*, 385(9983), 2209–2219. [https://doi.org/10.1016/s0140-6736\(15\)60091-5](https://doi.org/10.1016/s0140-6736(15)60091-5)
- Sukiman, H., Mohamad, A. M., Raduan, M. F. N., Yasim, M. N. A. M., & Lazim, M. I. M. (2021). Effect of the Movement Control Order on the incidence of complicated appendicitis during the COVID-19 pandemic: A cross-sectional study. *The Malaysian Journal of Medical Sciences: MJMS*, 28(5), 130–136. <https://doi.org/10.21315/mjms2021.28.5.13>
- Chua, M. W., Fazidah, Y., Khalijah, M. Y., Soñiah, Z. A., Hashami, B., & Lim, K. G. (1993). A review of acute appendicitis seen in the Taiping district hospital from July to December. *E-mjm.org*. [https://e-mjm.org/1993/v48n1/Acute\\_Appendicitis2.pdf](https://e-mjm.org/1993/v48n1/Acute_Appendicitis2.pdf)
- Frountzas, M., Stergios, K., Kopsini, D., Schizas, D., Kontzoglou, K., & Toutouzas, K. (2018). Alvarado or RIPASA score for diagnosis of acute appendicitis? A meta-analysis of randomized trials. *International Journal of Surgery (London, England)*, 56, 307–314. <https://doi.org/10.1016/j.ijssu.2018.07.003>
- Siow, S. L., Wahab, M. Y. A., Chuah, J. S., & Mahendran, H. A. (2022). Access to essential surgical care in district hospitals of Sarawak Malaysia: outcomes of an audit and the need for urgent attention. *ANZ Journal of Surgery*, 92(7–8), 1692–1699. <https://doi.org/10.1111/ans.17705>