

A Review of Acute Appendicitis seen in the Taiping District Hospital from July to December 1990

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Summary

In a retrospective study, 455 people were found to have been admitted to the Surgical Unit of the Taiping District Hospital, suspected of acute appendicitis in the study period from 1 July to 31 December 1990. However, only 147 (32.3%) were clinically confirmed to have appendicitis and underwent appendectomy. Out of these, 120 (81.6%) cases were subjected to detailed analysis.

The study showed that the commonest age group affected was the 10 to 20 year old. Males were slightly more often affected but there seemed to be an equal distribution among the major races. The diagnostic accuracy, that is the operated cases that were actually acute appendicitis, was 92.5%. The perforation rate was 31.5%. Fifty-five percent of patients developed some post-operative complications, of which the commonest was fever.

Key words: Acute appendicitis, appendectomy, retrospective study, demographic data, diagnostic accuracy, perforation rate, post-operative complication.

Introduction

Surgery today has reduced acute appendicitis to a disease with hardly any mortality. Morbidity can be as little as 2 days stay in hospital, inclusive of surgery, followed by about 1 or 2 weeks recuperation. But with perforated appendicitis, hospital stay may be over a week and recuperation longer. The challenge of management of acute appendicitis, therefore, is to minimise morbidity with prompt treatment. An overenthusiastic approach to surgery though, will produce operative morbidity for patients who do not require an appendectomy. Optimal treatment requires aiming for early diagnostic accuracy without missing the diagnosis until perforation has occurred. Till today, there does not seem to be any more accurate means of diagnosis besides the clinical features obtained at interview and examination. We describe here the experience of treating acute appendicitis in the Taiping District Hospital.

The Taiping District Hospital has a busy surgical unit with about 7,000 admissions a year. The decision for surgery in appendicitis is mainly in the hands of house officers and medical officers with, on average, 1 year very

intensive experience. In an attempt to gauge the overall performance of all doctors in the unit, a retrospective review of 6 months experience was undertaken. We have tried to develop an index to measure parameters that will roughly reflect how close we can get to optimum management.

Materials and Methods

A retrospective search was done for all patients admitted to the surgical wards with acute appendicitis for the period from 1 July to 31 December 1990, by going through the ward admission record book. Admission diagnoses by the Accident and Emergency doctors that were counted included, 'acute appendicitis', 'query or possibly appendicitis' and 'abdominal colic'. Diagnoses such as renal colic and acute gastritis were excluded. A study was then made of all patients who had an appendicectomy by tracing them from the operation records. The inpatients notes of these patients were obtained for study. However, out of 147 patients who had appendicectomies, only the notes of 120 were found. Records from the pathology laboratory were searched to correlate histological findings.

Results

In the 6 months, out of 4,401 patients admitted to the surgical wards, 455 (10.3%) cases were suspected appendicitis. Of these, 32.3% or 147 underwent appendicectomy. The remaining 308 were discharged with other diagnoses. Table I shows the accuracy of the admitting doctors' diagnoses. Those labelled acute appendicitis had a 42% chance of being confirmed clinically in the ward and operated upon. 20.5% of those where acute appendicitis was queried had surgery and only 10.3% with abdominal colic and other diagnoses were operated upon.

Table I
Patients who had appendicectomy according to their admission diagnoses

Diagnosis	Operated on	No operation	Total
Acute appendicitis	112	155	267
? Appendicitis	32	124	156
Abdominal colic	3	29	33
Total	147	308	455

Fig 1 shows the age distribution of patients who had appendicectomy. The commonest age group was that of those between 10 and 19 years old. The youngest patient was 3 years old while the oldest patient was 69 years old. In the sex distribution of acute appendicitis, there were 87 (61.3%) males compared to 55 (38.7%) females. This represented a male:female ratio of 1:6. The racial distribution of acute appendicitis paralleled that of the hospital population of Taiping (Table II). However, the admission/population index of Indians, for all diseases, was highest among the races. As other local studies show, Indians usually have a higher hospitalisation rate.

The operative finding of 120 patients available for analysis is shown in Table III. In 38 (31.7%) cases, the appendix was found perforated. Gangrenous appendices were seen in 13 (10.3%) cases, while 60 (50%) cases were found to have inflamed appendices. In the remaining 9 (7.5%) cases, the appendix was normal. In 3 of these 9, there was a gynaecological problem (1 tubal pregnancy and 2 ovarian cysts). There was 1 case each of typhoid and a haematoma of the transverse colon.

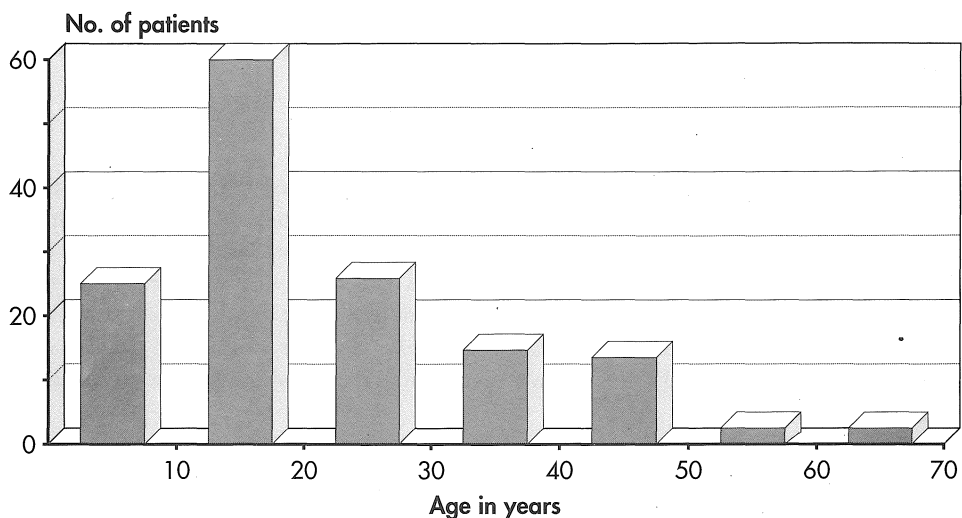


Fig 1: Age distribution of patients with appendicitis.

Table II
Racial distribution of acute appendicitis and the local hospital and general population

Race	Patients with appendicitis	Total hospital admissions	Population of Taiping
Malays	53.5%	58.6%	53.1%
Chinese	26.8%	19.3%	37.0%
Indians	19.7%	21.3%	9.9%

Table III
Comparison of rates of normal and perforated appendices and the A (index) in several studies

Author	Year	No of patients	Rate of appendices		A(index)
			Normal	Perforated	
Law <i>et al</i>	1976	216	11	29	0.775
Gilmore <i>et al</i>	1975	444	22	10	0.538
Bery and Malt	1984	307	18	28	0.902
Jess <i>et al</i>	1981	202	30	16	0.886
Lee and Teoh	1987	710	19	18	0.679
Present study	1990	120	7	32	0.759

Out of these 120 operated cases, only 41 (34.2%) appendix specimens were sent for histopathology examinations. Most of them showed evidence of inflammation (65.8%) and perforation (22.0%). The rest (12.2%) were normal. There was no other unusual pathology, such as carcinoid or worm infestation, seen.

The post-operative complications are shown in Fig 2. Sixty-six (55%) patients had some complication. Most (45%) common was fever, which was defined as a temperature of more than 37°C which occurred on or after the second day after operation. 11.7% had wound infection. The length of post-operative stay was 2 days at the shortest and 30 days at the longest. The most common duration of post-operative stay was 4 days, and the mean was 6 days.

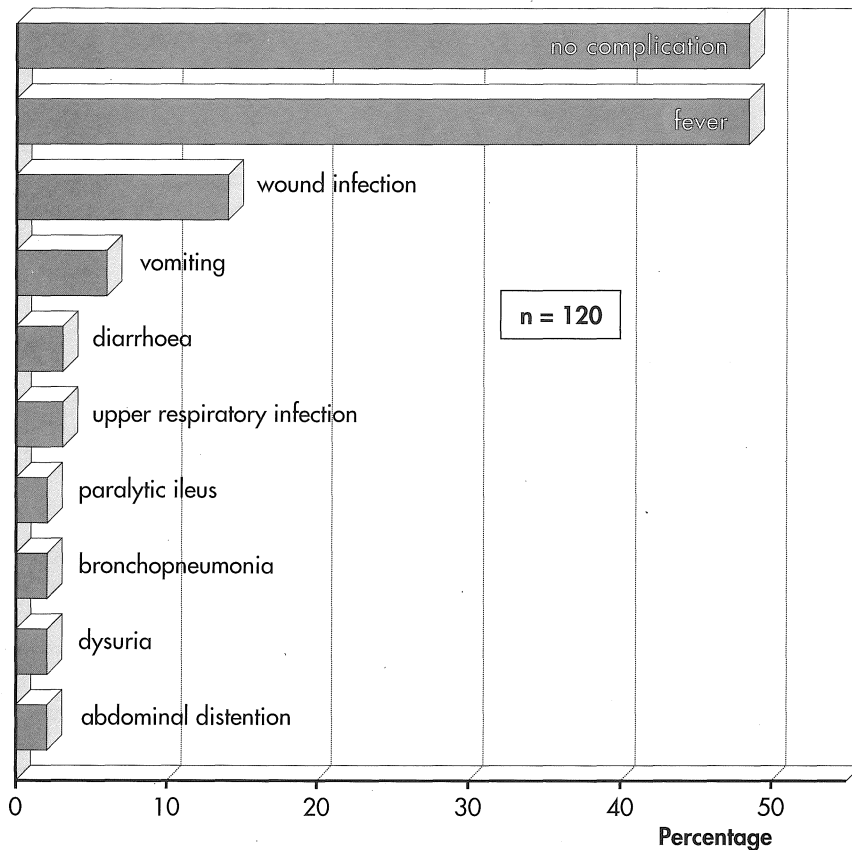


Fig 2: Post-operative complications following appendicectomy.

Discussion

Acute appendicitis is the commonest acute abdominal emergency in this country. In Taiping District Hospital, it was the cause of 10.3% of all admissions to the surgical wards. It is not possible, though, from the data, to estimate the incidence of the disease in the local population. The population of the district and adjacent areas of other districts served by the hospital is about 500,000.

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Clinical experience shows that there is a see-saw effect with rates of perforated appendices and normal appendices obtained at operation. When rates of normal appendices removed are low, perforated appendices are high, and vice-versa. The corresponding rates from a few studies are shown in Table III. Of course, good clinical acumen would lower both rates but only to a small degree, as many present in hospital with already perforated appendicitis. Laboratory investigations are unhelpful.

To measure optimal surgical management, the most objective parameters one can use to calculate an index are the operation findings. A useful optimal appendectomy index is given by the expression:

$$A(\text{index}) = A(n) + 2A(p)$$

$$A(a) = A(p)$$

where

$$A(n) = \text{rate of normal appendices}$$

$$A(p) = \text{rate of perforated appendices}$$

$$A(a) = \text{rate of acute appendices}$$

Perforated appendices are given a double weight on the basis of a rough guess of the price they add to morbidity and economic cost of a long post-operative stay. Normal appendices are excluded from the denominator and thus carry more than half the value of perforated appendices, especially when the rate of normal appendices is high. Examples of the optimal appendectomy index, $A(\text{index})$, based on this study and a few others are given in Table III.

Normal appendices in this retrospective study was based on the surgeon's judgement. This may underestimate the true rate, as normal appendices may be labelled 'mildly inflamed'. This was the case in 2 of the 41 appendix specimens sent for histology. They were said to be mildly inflamed clinically (during operation), but were reported as normal histologically. Converse to this, to base the definition of a normal appendix on histology could also underestimate the true rate of normal appendices, as the presence of a few inflammatory cells which are clinically insignificant may lead to such appendices being classed as inflamed.

Measuring post-operative complications and the length of post-operative stay gives us an objective measure of morbidity. This is important, especially in the economic setting. The actual financial cost can be calculated from the data. They are, however, actually factors of perforated appendicitis rather than of entire optimal management. They could be included into a more complex index as a factor modifying the score for perforated appendices, but adding unnecessary complication. Furthermore, length of post-operative stay is a subjective factor which depends on the cost of hospital stay in each particular hospital and also on 'bed occupancy pressure'.

The appendectomy index for our study is in the middle range compared with a random selection of other studies. But the information of practical importance is the perforation rate, which is high. Audit begins with awareness. In conclusion, this study has revealed some demographic features of acute appendicitis in our locality as well as highlighted factors that could be useful in auditing clinical judgement.

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