Appendix mass: do we know how to treat it?

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ABSTRACT

INTRODUCTION The traditional management of appendiceal mass has been an initial conservative approach followed by interval appendicectomy. More recently, the necessity of interval appendicectomy has been questioned by a growing amount of evidence in the surgical literature. The aim of this study was to review the available scientific evidence and to determine how appendiceal masses are currently being managed in the Mid-Trent region by general surgeons.

PATIENTS & METHODS A literature search using Medline, Embase, Cinahl, HMIC and Biosis was carried out. A personal or telephonic survey of all consultants and specialist registrars working in general surgery in the Mid-Trent region (n = 67) was conducted recording their management protocol of 3 different clinical scenarios – a 14-year-old boy, a 29-year-old female and a 68-year-old male. Responses of the questionnaire were entered to a database in Microsoft Access 2000 and analysed.

RESULTS The results showed that there was difference of opinion on the management of appendix mass in either scenario. Appendectomy (interval or emergency) is still practised by 75% of general surgeons in the Mid-Trent region and less than 25% manage asymptomatic appendix mass without interval appendectomy. Additionally, specialist registrars appear more likely not to offer patients interval appendicectomy after successful conservative management ($P < 0.05$).

CONCLUSIONS At present, there is no agreed consensus on the management of appendiceal mass. There is a need to develop a protocol for the management of this common problem.

KEYWORDS

Appendiceal mass – Management – Audit

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Appendix mass is the result of a walled-off perforation of the appendix which localises, resulting in a mass. This walled-off perforation varies in nature from a simple inflammatory mass (an appendiceal phlegmon) to a pus-containing collection (an appendiceal abscess).¹ The management of appendiceal abscess in a systemically unwell patient is generally accepted as percutaneous drainage of the collection or open appendicectomy.^{2,3}

However, the management of a systemically well patient with an appendiceal phlegmon is more controversial. Management is either operative or conservative. Advocates of operative initial appendicectomy report the advantages of immediately excluding other masquerading conditions, as well as providing a definitive treatment at the initial admission.⁴ Others propose initially conservative management, reporting that the majority of a patient's symptoms will resolve spontaneously, therefore avoiding a potentially hazardous operation during the initial admission.

Of those initially managing appendiceal mass conservatively, some propose elective interval appendicectomy once the mass

has resolved.⁵ This has the advantages of a less hazardous appendicectomy, prevention of any future recurrence of appendicitis and ruling out other conditions. Others manage appendiceal mass conservatively and do not perform interval appendicectomy, instead following patients up in out-patient clinic to exclude other conditions and the recurrence of symptoms.⁶

Conservative management with interval appendicectomy has traditionally remained the gold standard surgical management. More recently, however, purely conservative management with out-patient follow-up has become more favoured in the surgical literature.^{1,6–10} This approach spares the majority of patients presenting with appendiceal mass an operation, with the associated potential morbidity.

There is no available evidence to determine how common the different approaches to appendiceal mass management are in UK practice. The aim of this study was to determine how appendiceal masses are currently managed in the Mid-Trent region.

Patients & Methods

All consultants ($n = 37$) and specialist registrars in general surgery ($n = 30$; total, $n = 67$) working in the Mid-Trent region were contacted either in person or by telephone. Paediatric surgeons were not included in the study. They were asked about their practice of treating three different patient scenarios.

Scenario 1

A systemically well, 14-year-old boy presenting with a 6-day history of a tender right iliac fossa (RIF) mass. Ultrasound scan shows an inflammatory mass. Data for the management protocol were recorded.

Scenario 2

A systemically well, 68-year-old man presenting with a 9-day history of a tender RIF mass. Ultrasound scan shows an inflammatory mass. Data for management protocol and any further investigations that the respondent would normally request were collected.

Scenario 3

A 29-year-old female presenting with an 8-day history of a tender RIF mass with a negative pregnancy test. Her

ultrasound scan shows an inflammatory mass, the organ of origin being uncertain. A gynaecology opinion was non-specific. Further management protocol was noted.

In all the scenarios, appendicular masses were assumed to resolve after conservative management and becoming asymptomatic.

Responses to the question of interval appendicectomy were also noted. Responses for these scenarios were then entered in a database (Microsoft Access 2000) and analysed.

Results

Scenario 1 (14-year-old boy)

Of all respondents, 19.5% would have managed the boy with an emergency operation, 67% would have managed him according to the 'classical' protocol of conservative management with interval appendicectomy. The average delay for interval appendicectomy from resolution of the mass in those respondents who opted for interval appendicectomy was 9.1 weeks (range, 4–12 weeks) from resolution of symptoms. Only 13.5% favoured conservative management without further surgery. Responses from consultants and registrars were almost identical. Results are summarised in Table 1 and Figure 1.

Table 1 The management protocol in a 14-year-old-boy

Management	Consultants ($n = 37$)	SpRs ($n = 30$)	Total ($n = 67$)
Emergency appendicectomy	19% ($n = 7$)	20% ($n = 6$)	19.5% ($n = 13$)
Conservative management with interval appendicectomy	67.5% ($n = 25$)	66.7% ($n = 20$)	67% ($n = 45$)
Conservative management without interval appendicectomy	13.5% ($n = 5$)	13.3% ($n = 4$)	13.5% ($n = 9$)

Scenario 2 (68-year-old male)

In this scenario, 13% would have managed the patient with an open appendicectomy without any further investigations and 87% opted to perform further investigations to establish the nature of the mass. It was assumed that these investigations did not pick up any other condition and the mass resolved with the conservative approach.

Of those initially managing this patient conservatively, 72% and 50% of consultants and SpRs, respectively, went on to offer interval appendicectomy. The average delay for interval appendicectomy from resolution of the mass was 8.47 weeks for consultants (range, 4–12 weeks) and 8.9 weeks for SpRs (range, 6–12 weeks) from resolution of symptoms.

Table 2 Management protocol in a 68-year-old man

Management	Consultants (n = 37)	SpRs (n = 30)	Total (n = 67)
Operative management without further investigations	13% (n = 5)	13% (n = 4)	13% (n = 9)
Further investigations	87% (n = 32)	87% (n = 26)	87% (n = 58)
Management after investigations	Consultants (n = 32)	SpRs (n = 26)	Total (n = 58)
Conservative management with interval appendicectomy	72% (n = 23)	50% (n = 13)	62% (n = 36)
Conservative management with out-patient follow-up	28% (n = 9)	50% (n = 13)	38% (n = 22)

Table 3 Investigations requested by respondents in scenario 2

Investigation	Consultants	SpRs	Total
CT scan	35% (n = 15)	48% (n = 14)	40% (n = 29)
Barium enema	56% (n = 24)	38% (n = 11)	49% (n = 35)
Colonoscopy	9% (n = 4)	14% (n = 4)	11% (n = 8)

Respondents were allowed more than one investigation. Those initially managing operatively would not request further investigations.

Of consultants and SpRs, 28% and 50%, respectively, opted not to perform interval appendicectomy, assuming that the additional investigations did not show an alternative diagnosis. Here there was a significant difference between consultant and SpR management ($P < 0.05$). Results are summarised in Tables 2 and 3 and in Figure 2.

Scenario 3 (29-year-old female)

Of those questioned, 12% would have managed this patient with emergency appendicectomy with no difference between consultants and SpRs. In addition, 31% would have performed diagnostic laparoscopy with the removal of appendix (if inflamed) with no difference between consultants and SpRs. Finally, 40% opted for conservative treatment leading to interval appendicectomy. The average delay for interval appendicectomy from resolution of the mass in those respondents who opted for interval appendicectomy was 8.2 weeks (range, 4–12 weeks) from resolution of symptoms.

The percentage of respondents managing this patient non-operatively with out-patient follow-up once the mass resolved was 17%, the smallest percentage of all the scenarios.

Break-down of responses from consultants and registrars were almost identical without any significant difference in their management protocol (Table 4; Fig. 3).

Discussion

Three scenarios were written to determine how different factors affected the respondent's management of an uncomplicated appendix mass that became asymptomatic with conservative management.

The 14-year-old boy represents the most straight-forward scenario with the least complicating factors – alternative diagnoses were unlikely and the implications of operative management are relatively small. Only 13.5% of the respondents will not perform an interval appendectomy. This non-operative approach has become increasingly favoured in the literature over the past decade with its proponents reporting a high effectiveness of initial conservative management^{2,11} and a low incidence of life-time recurrence (10–20%) once the mass has resolved.¹ Therefore, potentially 80–90% of such patients could be spared an operation and the associated potential morbidity. It is clear that the majority of those questioned in this survey do not currently favour this approach.

The 68-year-old male scenario was included to see how the possibility of an alternative diagnosis such as gastrointestinal malignancy would affect the management. The published incidence of other pathologies masquerading as an appendix mass

Table 1 The management protocol in a 29-year-old female

Management	Consultants (n = 37)	SpRs (n = 30)	Total (n = 67)
Emergency open appendicectomy	13.5% (n = 5)	10% (n = 3)	12% (n = 8)
Diagnostic laparoscopy and appendicectomy	30% (n = 11)	33.3% (n = 10)	31% (n = 21)
Conservative management with interval appendicectomy	43% (n = 16)	36.7% (n = 11)	40% (n = 27)
Conservative management without interval appendicectomy	13.5% (n = 5)	20% (n = 6)	17% (n = 11)

varies from 0–12%.¹² Clearly, the exact incidence will depend on the age of patients and the level of investigations available in each centre. Respondents in this study were conservative in their management, with 87% favouring initial conservative approach with further investigations. This is likely to be due to surgeons wanting to exclude alternative pathologies before operative intervention. However, there emerged a controversy about interval appendicectomy between consultants and SpRs, with half of the SpRs not opting for elective removal of appendix as compared to one-quarter of consultant ($P < 0.05$).

The 29-year-old female scenario was included to see how the possibility of alternative gynaecological pathology as well as the implications of abdominal surgery in a woman of child-bearing age affected the respondent's management. Respondents opted more for an operative approach than in the other scenarios. Overall, 43% opted for an early operation presumably feeling that the possible surgical complications of infertility, *etc.* were outweighed by the advantage of excluding gynaecological pathologies and managing an appendix mass on the initial admission. This suggests the majority felt that in a woman of child-bearing age an appendiceal mass should be treated surgically, either immediately or electively, to prevent continuing intra-abdominal inflammation.

Whilst this approach is not the approach suggested in the more recent literature, none of these studies look at appendix mass in different sub-groups of patients. The management of appendix mass in a woman of child-bearing age has not been specifically addressed in the literature and raises a difficult problem – to operate with the associated risks such as infertility, or to observe and risk further and future recurrences with associated inflammation. It would seem the majority of surgeons questioned here felt operative management to be the most appropriate choice.

Interestingly, consultant management of this scenario was somewhat different to SpR management with conservative management and out-patient follow-up being more common with trainees, without reaching statistical significance. Whether this represents less experience and more caution by the surgical trainees or basing their practice on the more recent literature is unclear.

Conclusions

- (i) 'Classical' management of appendiceal mass remains the commonest practice in the mid-Trent region.
- (ii) In patients where other gastrointestinal conditions are of concern, the majority of surgeons were more likely

to manage initially conservatively with further investigations before offering interval appendicectomy. However, compared to the other scenarios, respondents were more likely to manage patients conservatively and not perform interval appendicectomy, especially the surgical trainees.

- (iii) Appendix mass in women of child-bearing age raises an interesting dilemma on whether to operate or manage conservatively. In the absence of any evidence in the literature, it seems the majority of surgeons managed this dilemma operatively with an even split between those operating immediately and those operating electively.
- (iv) There is no available protocol for this common problem due to lack of enough evidence in the medical literature. A multicentre trial is required to reach a consensus on the management.

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