Management of the Acute Appendix Mass: A Survey of Surgical Practice

Abstract:
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Management of the appendix mass is controversial with no consensus in the literature. Traditionally, the approach has been conservative followed by interval appendicectomy. A survey was distributed to 117 surgeons (100 consultants and 17 final year specialist registrars) to determine how the appendix mass is currently treated in Ireland. In total, 70 surgeons responded. 51 (73%) adopt a conservative approach initially. 48 (68%) favoured interval appendicectomy at six weeks after a period of successful conservative management. 34 (49%) gave risk of recurrence as the reason for performing interval appendicectomy and 16 (22%) would perform interval appendicectomy in order to obtain histological analysis to rule out caecal appendiceal neoplasm. 44 (63%) opted for a laparoscopic rather than an open approach for interval appendicectomy. No consensus exists in Ireland for management of the appendix mass presenting acutely. The present series demonstrates a trend towards conservative approach initially followed by interval appendicectomy.

Introduction
Acute appendicitis remains the most common surgical emergency. Between 2 and 10% of cases of appendicitis are complicated by the formation of an appendix mass. These masses include a spectrum of clinical presentations superseded by pathological processes ranging from localised collections of pus (peri-appendicular abscesses) to inflamed appendices which have become adherent to the omentum and surrounding viscera to form a phlegmon. While the management of the appendix mass in the older patient concerns the involvement of the caecum or the right colon masquerading as appendicitis in the older patient. Concerning the management of the appendix mass in the Irish setting, the decision was taken to perform a literature search in order to ascertain current best practice. To date, no studies have been published exploring surgeon preference for emergency or interval appendicectomy. There are, however, concerns associated with this management strategy, perhaps most importantly concerning the problem of missing neoplastic process in the caecum or the right colon masquerading as appendicitis. 34/70 (49%) stated risk of recurrence as the reason for performing interval appendicectomy. Likewise the majority 48/70 (68%) of respondents favoured interval appendicectomy at six weeks after a period of successful conservative management. 34/70 (49%) stated risk of recurrence as the reason for performing interval appendicectomy and 16/70 (22%) would perform interval appendicectomy in order to obtain histological analysis to rule out caecal appendiceal neoplasm. 44 (63%) opted for a laparoscopic rather than an open approach for interval appendicectomy.

Methods
A questionnaire was constructed and distributed to 117 surgeons (100 consultants and 17 final year specialist registrars). An internet based survey forum was utilised as a means of distributing the questionnaire and collecting completed copies. The survey included eleven questions designed to establish the respondents level of seniority, type of hospital in which they worked and current practice regarding management of the appendix mass. The questionnaire explored surgeon preference for emergency or interval operation, open versus laparoscopic intervention and timing of interval procedure. The response options were categorical and each question had between two and seven answers. Responses were entered onto an electronic database and tabulated in percentage and absolute terms. In brief, having ascertained the grade of the responding doctor, the questions enquired as to preference for emergency intervention or conservative management of appendix mass, course of action on palpation of a mass in the anaesthetized patient, whether interval appendicectomy is routinely performed and, if so, timing of same and preference for laparoscopic or open appendicectomy at the index or interval operation.

Results
A total of 117 surgeons were surveyed (100 consultants and 17 specialist registrars in the final year of formal training). The overall response rate was 60%. Of the 100 consultants surveyed 57 (57%) responded. 13 of 17 specialist registrars responded giving a response rate of 76%. Results were analysed according to grade of doctor and no significant difference was demonstrated (results not shown). For this reason, analysis was performed for all responses as a combined group. The highest concordance amongst surgeons was shown regarding the method of managing the appendix mass. 51/70 (73%) deemed it prudent to adopt a conservative approach initially rather than performance of emergency appendicectomy. Likewise the majority 48/70 (69%) of respondents favoured interval appendicectomy at six weeks after a period of successful conservative management. 34/70 (49%) stated risk of recurrence as the reason for performing interval appendicectomy and 16/70 (22%) would perform interval appendicectomy to acquire histological analysis with the aim of out-ruling either appendiceal or caecal neoplasm. A majority (44/70 (63%)) opted for laparoscopic rather than open approach for interval appendicectomy.

There was marked disagreement amongst respondents on how best to perform an emergency appendicectomy in the context of an appendicular mass – 51/70 (73%) preferring to adopt the conventional open method and the remaining 29 (41%) preferring a laparoscopic approach. When asked about the most suitable surveillance investigation following purely conservative management of the appendix mass, the population surveyed favoured colonoscopy 19 (27%) and CT scan 18/70 (26%) as first line follow-up investigation. All surgeons surveyed (70/70) reported a willingness to abandon conservative management in selected circumstances if the clinical condition of the patient necessitated this (failure of intravenous antibiotics, persistent pyrexia, signs of generalised peritonitis and CT findings of appendix abscess).

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A pictorial summary of results is provided in figures 1, 2 and 3.

**Discussion**

When a literature review was performed to assess national and international standards of management of the appendix mass in the acute setting, it was surprising to note the vast diversity in opinion regarding this very common surgical condition. There are wide variations in practice and, as a result, there is a disparity in the management of patients with acute appendicitis which has gone on to form an intra-peritoneal mass. Traditional dogma associated emergent open appendicectomy with appendiceal mass with an increased incidence of morbidity and mortality in the form of intra-peritoneal bleeding, wound infection and enterocutaneous fistula formation. It was also observed to have an unacceptably high risk of bowel resection, usually in the form of modified right hemicolectomy or ileo-caecectomy.

However, in recent times, with the advent of minimally invasive surgery, these opinions may be based on the assumption that laparoscopy in the setting of an appendix mass is technically demanding and dependent on surgeon experience. The worldwide laparoscopic learning curve improving dramatically, it may be that in experienced hands, emergent laparoscopic appendicectomy is a safe and reasonable management option. This course of action has not, however, to date received an acceptable consensus on the management of the appendix mass. More recently, a survey of 90 consultant surgeons from a single United Kingdom training region revealed that 53% of surgeons performed interval appendicectomy routinely at 6 weeks to 12 months, mainly because of concerns about recurrence.

In the present series, a vast majority of surgeons surveyed were in favour of conservative management and interval appendicectomy at a mean of 6 weeks after successful initial conservative management. In this scenario laparoscopic intervention wasfavoured. This is in keeping with much of the published literature without interval appendicectomy has been proposed in selected publications. While conservative management
without interval appendicectomy has been proposed in selected publications, 1. While conservative intervention was favouredit is questionable value in patients over the age of sixty, where the risk of alternative pathologies (caecal carcinoma, carcinoid tumour) must be excluded. The bulk of respondents in the present study favoured a conservative approach initially which is unsurprising since this has been the standard of care since 1901 when it was introduced by Ochsner in Chicago and repeated been shown to be both safe and effective. 2. Failure to respond to antibiotics or demonstrable abscess on CT was not sufficient to encourage the majority of surgeons in Ireland to intervene emergently. Most would persist with conservative treatment until overt signs of peritonitis are evident. The majority of surgeons would still perform an interval appendicectomy in assessing body of evidence that has recently been published to the contrary.

Whether or not the popularization of interventional radiology and minimally invasive techniques over the last decade has played a role in more conservative management has not yet been investigated. Diagnostic laparoscopy was a common surgical procedure before the improvement of both interventional and therapeutic radiology. Doubtless, this has a role to play in minimising interference, whether because of pre-operative CT scanning or radiological drainage of abscesses.

The present study is by no means exhaustive or prescriptive. It, like all studies has some clear limitations. An overall response rate of 60% was taken considered reasonable to allow conclusions to be drawn based on a representative selected sample of Irish surgeons. Data presented does not necessarily deliver any new evidence but rather attempts to highlight the diversity in management of the appendix mass in the Irish population and to draw the reader's attention to variation in opinion in a relatively small and homogenous population. It aims to alert the Irish surgical community to the need for guidelines to promote uniformity in management based on sound evidence base which should be standard procedure in the current age of widespread litigation. It calls for a population based study as, unfortunately while the appendix mass is a common problem, it may not be sufficiently so to lend itself to a randomised controlled trial. It was both unsurprising and reassuring that there was no difference in management delivered by consultants and those in the final year of training.

In conclusion, there is no clear consensus in the Irish setting regarding management of the acute appendix mass. There is a tendency to perform interval appendicectomy after an initial conservative period of management. However, this is at odds with current literature which favours conservative management without interval appendicectomy. This phenomenon is not particular to Ireland with a recent survey of English surgeons demonstrating that they too would perform an interval appendicectomy after successful conservative management. If an interval appendicectomy is to be performed then the method of choice for the majority of respondents is laparoscopic but there is no such consensus on approach in the emergency setting. There is an almost equal split in popularity of laparoscopic and open procedures performed then the method of choice for the majority of respondents is laparoscopic but there is no such consensus on approach in the emergency setting. There is an almost equal split in popularity of laparoscopic and open procedures performed then the method of choice for the majority of respondents is laparoscopic but there is no such consensus on approach in the emergency setting. There is an almost equal split in popularity of laparoscopic and open procedures performed then the method of choice for the majority of respondents is laparoscopic but there is no such consensus on approach in the emergency setting. There is an almost equal split in popularity of laparoscopic and open procedures performed then the method of choice for the majority of respondents is laparoscopic but there is no such consensus on approach in the emergency setting. There is an almost equal split in popularity of laparoscopic and open procedures performed then the method of choice for the majority of respondents is laparoscopic but there is no such consensus on approach in the emergency setting. There is an almost equal split in popularity of laparoscopic and open procedures performed then the method of choice for the majority of respondents is laparoscopic but there is no such consensus on approach in the emergency setting. There is an almost equal split in popularity of laparoscopic and open procedures performed.

**References**