International Surgery Journal
Abdelrahman TM et al. Int Surg J. 2017 Jun;4(6):1850-1855
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20172389

Original Research Article

A survey of management of appendiceal mass among surgeons: what is best practice?

Tamer M. Abdelrahman[1,2]*, Majed A. Mourgi[1], Rehab A. Karam[3], Faris Sharaf Alfaar[4], Ayman Mohammed Alosaimi[4], Saif Mohammed Alasiri[4]

[1]Department of Surgery, College of Medicine, Al Taif University, Kingdom of Saudi Arabia
[2]General Organization for Teaching Hospitals and Institutes, Egypt
[3]Department of Biochemistry, College of Medicine, Al Taif University, Kingdom of Saudi Arabia
[4]Department of Medicine, College of Medicine, Taif University, Kingdom of Saudi Arabia

Received: 25 March 2017
Accepted: 20 April 2017

***Correspondence:**
Dr. Tamer M. Abdelrahman,
E-mail: drtamer17@yahoo.com

ABSTRACT

Background: An appendix mass is the result of a walled-off perforation of the appendix which localizes, resulting in a mass and it is encountered in up to 7% of patients presenting with acute appendicitis. The management of such problem is controversial. Immediate appendectomy may be technically demanding. Traditionally, management of these patients is conservative followed by interval appendectomy to prevent recurrence. However, the need for interval appendectomy has recently been questioned due to relatively small risk of recurrence. Also, there is still debate on adopting conservative management regarding the recurrence rate, the complication rate of interval appendectomy, and the potential for underlying malignancy. Our aim was to assess the preferred approach and current practice for management of acute appendix mass among surgeons in Al Taif Saudi Arabia.
Methods: A questionnaire for the practice of surgeons in dealing with appendicular mass was designed and distributed to 21 consultants and 45 specialists.
Results: 14.3% of consultant and 53.3% of specialist practiced the conservative management without routine interval appendectomy. Also, 14.3% and 26.7% of them respectively preferred immediate appendectomy while 71.4% of consultants and 20.0% of specialists did routine interval appendectomy. Most of the surgeons prefer to adopt the open method in immediate appendectomy while laparoscopic approach is the main adopting procedure for interval appendectomy. 57% of consultants stated risk of recurrence as the reason for performing interval appendectomy while, 53.4% of specialists would perform it to out-ruling neoplasm.
Conclusions: Surgeons prefer to carry conservative approach with an interval appendectomy in management of appendix mass and laparoscopic approach for interval appendectomy. However immediate appendectomy and conservative management without interval appendectomy was preferred in other studies, which increase the necessity for national guidelines to be considered for management of this clinical condition.

Keywords: Appendicitis, Appendix mass, Conservative treatment, Interval appendectomy

INTRODUCTION

Acute appendicitis is one of the most common causes of acute abdomen, which may be complicated or uncomplicated. Sometimes the acute inflammation of the appendix may be enclosed by the patient's own defense mechanisms and form an inflammatory phlegmon.[1] Complicated appendicitis was used to describe a palpable appendiceal mass, phlegmon, or a localized abscess. A phlegmon is an inflammatory tumor consisting of the inflamed appendix, with the greater omentum and adjacent viscera.[2]

The incidence of Appendiceal mass is 2-7% of acute appendicitis cases, this incidence may increase with the recent trend of antibiotics use alone in the management of acute appendicitis. Even though antibiotics have been shown to be effective as an only treatment for patients with uncomplicated appendicitis.[3] This associated with treatment failures in up to 50% of patients and undergo surgery within 48 h, and the risk of recurrence reach 23% within one year, which can lead to an increased risk for complicated appendicitis and appendix mass.[4] Higher probability of appendix perforation considered in patients with delayed presentation, duration of symptom more than 3 days, temperature >38.8ºC on admission and is more common in children aged <5 years and patients >55 years.[5] The confirmed diagnosis of appendiceal mass can be done clinically where a palpable mass, or by imaging; CT, US or during abdominal exploration.[6]

Appendiceal mass is found more often if CT or US used in the diagnosis 14.2% than in those based on clinical examination 5.1%. It is also more common in children 8.8% than in adults 4.8%. The risk of perforation is higher in men than women. So, diagnostic imaging should be used in patients with a long symptoms duration, children and if there is a palpable mass clinically.[7] The appendiceal mass can be managed by one of the following methods: immediate surgery, conservative management with interval surgery and totally conservative management.[8]

Emergency appendectomy may be technically demanding as there is a distortion of the anatomy and difficult closure of the appendiceal stump due to tissues inflammation. In this situation, the operation could be finished with resection of the colon.[9] The gold standard management is conservative management followed by interval appendectomy, but recently the need for interval appendectomy after a successful nonsurgical management has been questioned as the risk of recurrence is relatively small.[10] After successful conservative treatment, in some cases the correct diagnosis is uncertain and underlying diagnosis of Crohn's disease or cancer which can be present may be delayed.[11] Two studies from the UK and Ireland found significant variation in surgeon preferences amongst surgical consultants and specialists in the management opinion of appendix mass.[12] They conclude that there is a significant need for clear protocols to improve practice.

There are no clear protocols or set of guidelines in the international literature pertaining to the optimal care of these patients. So, In this study; we try to assess variation in management of the condition of acute appendix mass among surgeons and to determine the preferred approach taken to the management of the acute appendix mass by both specialist and consultant surgeons.

METHODS

A questionnaire for the practice of surgeons in dealing with appendicular mass was designed and distributed to consultant surgeons and specialist registrars in an attempt to determine how the appendix mass is currently being managed in in Al Taif Saudi Arabia. The survey included nineteen questions, the first 2 questions are demographic about surgeon's position and years of experience and the remaining questions are about their knowledge and the current practice regarding management of the appendix mass.

The questionnaire asked specifically about the post-acute care of patients with an appendiceal mass. The questionnaire also explored whether the surgeons perform interval appendectomy in patients, their reasons for doing so, the timing of appendectomy, the preferred method (laparoscopic or open), and the age at which they would institute further investigations. The research protocol was approved by Taif University ethical committee. Data collected were entered onto an electronic database and presented in tables.

RESULTS

A total of 66 surgeons were surveyed (21 consultants and 45 specialists). The surgeons included in the study were from different hospitals in Al Taif, KSA. Results were analyzed according to doctor position (all the consultants had an experience more than 10 years while 46.7% of the specialists included in the study had experience more than 10 years and 40.0% had experience 5-10 years). When asking about the incidence of appendicular mass, 40 % of all surgeons thought that the appendicular mass is relatively common, while 60% stated that it is uncommon.

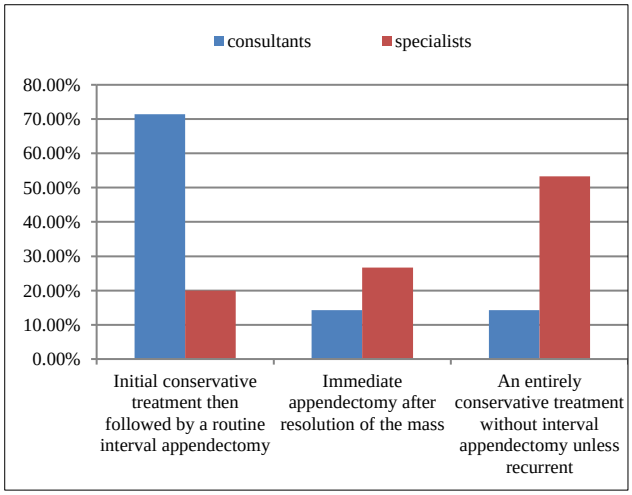

Figure 1: Preferable management of appendicular mass.

The diagnosis of appendicular mass was achieved mostly by CT imaging modalities in the practice of around 80% of consultants and specialists, while 14.3% of consultants diagnosed it clinically and 13.3% of the specialists diagnosed it by ultra-sonography. All consultants adopted a conservative approach initially rather than performing emergency surgery when asking them about their

management plan for such case, while 26.7% of the specialists prefer performance of emergency surgery. When asking surgeon about their management for appendicular mass; 85.7% of consultants and 66.7% of specialists tailored the management according to the patient state while 14.3% of consultants and 33.3% of specialists did routine care for all patients. 14.3% of consultant practiced the conservative without routine interval appendectomy also, 14.3% of them preferred immediate appendectomy after resolution of the mass and 71.4% of them did routine interval on their practice.

Table 1: Conservative management.

The question	Answer	Consultants	Specialists
The duration of conservative treatment till complete symptoms relief from your experience?	≤10 days	28.6%	46.7%
	10-15 days	42.9%	33.3%
	>15 days	28.6%	20.0%
The duration you need to do interval appendectomy after successful conservative management?	<6 week	0.0%	6.7%
	6-8 weeks	85.8%	70.0%
	>12 weeks	14.3%	23.3%
The antibiotic you prefer to use for conservative treatment is combination of?	3rd generation cephalosporin + anti-anaerobes	100.0%	60.0%
	Quinolone + anti-anaerobes	0.0%	20.0%
	Another regimen	0.0%	20.0%
The rate of failure of conservative treatment you found	Common condition	14.3%	6.7%
	Relatively common	14.3%	40.0%
	Uncommon	71.4%	53.3%

In contrast 53.3% of specialist practiced the conservative without routine interval appendectomy also, 26.7% of them preferred immediate appendectomy after resolution of the mass and 20.0% of them did routine interval on their practice as shown in Figure 1. The majority of respondents favored interval appendectomy at six weeks after a period of successful conservative management. The rate of failure of conservative treatment was found to be uncommon in 71.4% of our consultants and 53.3% of our specialists (Table 1).

57% of consultants stated risk of recurrence as the reason for performing interval appendectomy while 53.4% of specialists would perform it to acquire histological analysis with the aim of out-ruling either appendiceal or caecal neoplasm (Table 2).

Table 2: The reason for performing interval appendectomy.

The reason for performing interval appendectomy?	Consultants	Specialists
Out-ruling appendicular or caecal neoplasm.	14.3%	53.4%
Risk of recurrence	57.1%	40.0%
As a routine	28.6%	6.7%

There was marked agreement amongst the surgeons on how best to perform an emergency appendectomy in the context of an appendix mass where 71.4% of consultant and 80% of specialists preferring to adopt the conventional open method and the remaining preferring a laparoscopic approach. A majority of surgeons preferred laparoscopic rather than open approach for interval appendectomy (Table 3). 71.4% of the consultants and 86.7% of the specialists found that the rate of recurrent cases after conservative management is low rate that does not necessitate appendectomy as a routine, while the remaining find the rate is high rate that better to do appendectomy.

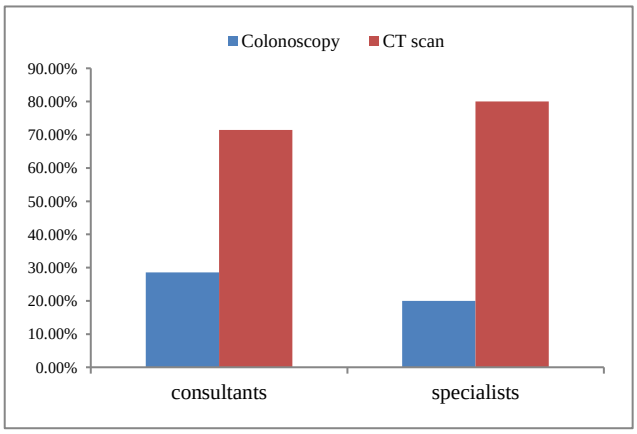

Figure 2: First line follow-up investigation following conservative management.

When asked about the most suitable surveillance investigation following purely conservative management of the appendix mass, two third of our respondents favored

CT scan as first line follow-up investigation and the remaining one third preferred colonoscopy as shown in Figure 2. Approximately, two third of surgeons 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 generalized peritonitis and CT findings of appendix abscess) (Table 4).

Table 3: The prefer approach for immediate and interval appendectomy.

The approach you prefer		Consultants	Specialists
For immediate appendectomy	Laparoscopic appendectomy	28.6%	20.0%
	Open appendectomy	71.4%	80%
For interval appendectomy	Laparoscopic appendectomy	71.4%	63.3%
	Open appendectomy	28.6%	36.7%

Table 4: Abandon of conservative management.

You willingness to abandon conservative management in selected circumstances if ?	Consultants	Specialists
Failure of intravenous antibiotics	0.0%	6.7%
Persistent pyrexia	0.0%	0.0%
Signs of generalized peritonitis	14.3%	6.7%
CT finding of appendix abscess	14.3%	6.7%
All of the above	71.4%	80.0%

Table 5: Management of appendicular mass in patient >40.

Did you accept conservative management in patient >40 years?	Consultants	Specialists
Yes	42.9%	6.7%
No	57.2%	93.3%

When surgeons asked: did you accept conservative management of appendicular mass in patient >40 years? Most of specialists and only around half of consultants refuse it (Table 5).

DISCUSSION

Appendiceal mass is a common surgical condition, but there is no universal standard guidelines for its management so there is wide variation in surgeons opinion in how to deal with it. In the absence of such randomized controlled trial data, the true "best practice" cannot be established. Moreover, it is not possible to undertake randomized trials for every aspect of surgical management. In the case of interval appendicectomy, surgeons rely on their own experience or available reviews and studies.[13]

The "classical" management of Appendiceal mass is conservative followed by interval appendicectomy, however many advocate immediate appendectomy, and a more modern approach is purely conservative that aims to avoid appendectomy.[14] So, we tried to assess our surgeon's experience in management of such condition in Saudi Arabia. About quarter of our specialists preferred Performance of emergency surgery when asking them about their management plan for such case, while all our consultants did not prefer it. The diagnosis of the patients with suspected appendiceal mass, confirmed by Computed tomography scans. So, the surgeon can choose appropriate treatment methods according to the clinical symptoms with the imaging investigation.[15] In present study, around 80% of consultants and specialists diagnosed appendicular mass by CT imaging modalities in their practice. Primary operation has the advantage of relatively shorter hospital stay and may be beneficial in exclusion of other pathologies. However, to exclude other pathologies; meticulous clinical and imaging evaluation and response of the patients to conservative management with strict follow-up may also be beneficial.[16] The disadvantage of immediate appendectomy is the high rate of complications as various reports on immediate operative management suggest a high incidence of complications; wound sepsis, residual abscess and wound dehiscence.[17] In present study 14.3% of consultant and 26.7% of specialist preferred practicing the immediate appendectomy

In the present series, a vast majority (71.4%) of consultants surveyed were in favor of conservative management and interval appendectomy, in contrast only 20% of specialists did routine interval appendectomy on their practice. In several recent studies, the benefit of interval appendectomy has been questioned. The argument is that therapeutic gain, such as avoidance of recurrences, and

identification of underling malignant or potentially malignant lesions, is minimal.[18] In present study, 57% of consultants and 40% of specialists stated risk of recurrence as the reason for performing interval appendectomy while 53.4% of specialists and 14.3% of consultants would perform it to acquire histological analysis with the aim of out-ruling either appendiceal or caecal neoplasm. The remaining of respondents performed it as a routine.

The recurrence rate of appendiceal pathology after conservative management was about 3-25% and mainly associated with an appendicolith. The majorities of recurrences occur within 6 months, characterized in most cases by a milder course than the primary attack.[19] The complication rate following interval appendectomy varies from 8% to 23%; include wound infection (15.0%), pelvic abscess (5.0%), and aspiration pneumonia (1.5%). The complication rate is a consideration to be balanced against the recurrence rate. These results do not motivate routine elective interval appendectomy after successful nonsurgical treatment.[20] Refusal of a large number of patients for readmission for operation once their acute illness resolved is one of the disadvantages against the initial conservative management.[17]

The literature review shows that at least 75%-90% of routine interval appendicectomies in adults are unnecessary. It would be reasonable and safer; to replace routine interval appendectomy with adequate follow-up of symptoms and appropriate investigation as malignancy can be missed. 6 71.4% of our consultants and 86.7% of the specialists found that the rate of recurrent cases after conservative management is low rate that does not necessitate appendectomy as a routine. “Routine” interval appendectomy should not necessarily be a strict policy and each case should be judged individually. We would support routine interval appendectomy only in the context of persistent right iliac fossa pain, recurrence, mass persistent beyond two weeks and patients who desire for the “diseased” appendix to be removed.[14]

When treating appendix mass with antibiotic there are no specific guidelines, and the recommendation are intravenous antibiotics according to local guidelines for intra-abdominal infection/sepsis, until the patient significantly improves. Antibiotic therapy should tailor according to blood culture results.[14] According to our experience, all consultants preferred to use a combination of; third generation cephalosporin + anti-anaerobes (metronidazole or clindamycin) for conservative treatment, while only 60% of the specialists prefer this combination.

In present study, conservative management was well trusted in 71.4% of consultants and thought to be effective and rarely failed. While only half of the specialist thought that. Failure of antibiotics to improve the condition or presence of 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.[21] However, two third of our surgeons, 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 generalized peritonitis and CT findings of appendix abscess).

When our surgeons were asked about accepting conservative management of appendicular mass in patient >40 years, most of specialists and only around half of consultants refuse it. According to Forsyth J, et al 14 surgeons should be very cautious if patients had atypical features or aged over 40. In those case a big importance to identify underlying malignancy or Crohn's disease. In such instances it is recommended to further investigate such patients appropriately with CT/colonoscopy. Colonic investigation should be a consideration when cecal malignancy is possible regardless of whether interval appendectomy is performed.[14] When we asked about the most suitable surveillance investigation following purely conservative management of the appendix mass, two third of our respondents favored CT scan as first line follow-up investigation and the remaining one third preferred colonoscopy.

Forsyth J et al stated that the main reasons to further interval investigations: to assess the response to the conservative management, to a found a persistent faecolith, and to rule out other underling diagnoses.[14] Further investigation must be performed after 4-6 weeks. For pediatric patients, the most appropriate initial imaging is ultra-sonography; ultrasound or CT in younger adults and in adults over 40 CT followed by colonoscopy. In this scenario, laparoscopic intervention was favored by the majority of our surgeons rather than the open approach for interval appendectomy. Pokala et al. found that the technique of laparoscopic interval appendectomy decreased the rate of complication and the length of hospital stay.[20]

CONCLUSION

We tried in this work to highlight the vast diversity regarding surgeon’s management for appedicular mass. Our surgeons prefer to carry conservative approach with an interval appendectomy in management of appendix mass and laparoscopic approach for interval appendectomy. However immediate appendectomy and conservative management without interval appendectomy was preferred in other studies, which increase the necessity for national guidelines to be considered for management of this clinical condition. Also, carrying out prospective research concerning comparison of emergency surgery and conservative treatment without interval surgery could help to establish these guidelines.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not Required

REFERENCES

1. Tannoury J, Abboud B. Treatment options of inflammatory appendiceal masses in adults. World J Gastroenterol. 2013;19(25):3942-50.
2. Fitzmaurice J, McWilliams B, Hurreiz H, Epanomeritakis E. Antibiotics versus appendectomy in the management of acute appendicitis: a review of the current evidence. Can J Surg. 2011;54(5):307-14.
3. Salminen P, Paajanen H, Rautio T, Nordtrom P, Aarnio M, Rantanen T, et al. Antibiotic therapy vs. appendicectomy for treatment of uncomplicated acute appendicitis. The APPAC randomized clinical trial. JAMA. 2015;313(23):2340-8.
4. Sallinen V, Akl A, You J, Agarwal A, Shoucair S, Vandvik O, et al. Meta-analysis of antibiotics versus appendicectomy for non-perforated acute appendicitis. Br J Sur. 2016;103(6):656-67.
5. Sand M, Bechara G, Holland-Letz T, Sand D, Mehnert G, Mann B. Diagnostic value of hyperbilirubinemia as a predictive factor for appendiceal perforation in acute appendicitis. Am J Surg. 2009;198(2):193-8.
6. Andersson E, Petzold G. Nonsurgical treatment of appendiceal abscess or phlegmon: a systematic review and meta-analysis. Ann Surg. 2007;246(5): 741-8.
7. Paquette M, Zuckerman R, Finlayson R. Perforated appendicitis among rural and urban patients: implications of access to care. Ann Surg. 2011;253(3):534-8.
8. Simillis C, Symeonides P, Shorthouse J, Tekkis P. A metaanalysis comparing conservative treatment versus acute appendectomy for complicated appendicitis (abscess or phlegmon). Surgery. 2010;147(6):818-29.
9. Kaya B, Sana B, Eris C, Kutanis R. Immediate appendectomy for appendiceal mass. Ulus Travma Acil Cerrahi Derg. 2012;18(1):71-4.
10. Kumar S, Jain S. Treatment of appendiceal mass: prospective, randomized clinical trial. Indian J Gastroenterol. 204;23(5):165-7.
11. Meshikhes AW. Appendiceal mass: is interval appendectomy ‘‘something of the past’’? World J Gastroenterol. 2011;17(25):2977-80.
12. Ahmed I, Deakin D, Parsons L. Appendix mass: do we know how to treat it?. Ann R Coll Surg Engl. 2005;87(3):191-5.
13. Lorraine Corfield. Interval Appendicectomy after Appendiceal Mass or Abscess in Adults: What is “Best Practice”?. Surg Today. 2007;37(1):1-4.
14. Forsyth J, Lasithiotakis K, Peter M. The evolving management of the appendix mass in the era of laparoscopy and interventional radiology. The Surgeon. 2017;15(2):109-15.
15. Demetrashvili Z, Kenchadze G, Pipia I, Ekaladze E, Kamkamidze G. Management of Appendiceal Mass and Abscess. An 11-Year Experience. Int Surg. 2015;100(6):1021-5.
16. Assefa Z. Management of inflammatory appendiceal mass in Zewditu memorial hospital, Addis Ababa, ethiopia. Ethiop Med J. 2016;54(2):57-62.
17. Bahram MA. Evaluation of early surgical management of complicated appendicitis by appendicular mass. Int J Sur. 2011;9(1):101-3.
18. Tekin A, Kurtoglu C, Can I, Oztan S. Routine interval appendectomy is unnecessary after conservative treatment of appendiceal mass. Colorectal Dis. 2008; 10:465-8.
19. Varadhan KK, Neal KR, Lobo DN. Safety and efficacy of antibiotics compared with appendicectomy for treatment of uncomplicated acute appendicitis: meta-analysis of randomized controlled trials. BMJ 2012; 344: e2156.
20. Pokala N, Sadhasivam S, Kiran P, Parithivel V. Complicated appendicitis-is the laparoscopic approach appropriate? A comparative study with the open approach: outcome in a community hospital setting. Am Surg. 2007;73(8):737-42.
21. Irfan M, Hogan M, Gately R, Lowery J, Waldron R, Khan W, et al. Management of the acute appendix mass: a survey of surgical practice. Ir Med J. 2012;105(9):303-5.

Cite this article as: Abdelrahman TM, Mourgi MA, Karam RA, Alfaar FS, Alosaimi AM, Alasiri SM. A survey of management of appendiceal mass among surgeons:what is best practice?. Int Surg J 2017;4:1850-5.