

Is Elective Interval Appendicectomy after Successful Initial Conservative Management of Appendicular Mass Necessary?

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ABSTRACT

Background The traditional management of appendicular mass is an initial conservative treatment followed by interval appendectomy. Recently interval appendicectomy has been questioned.

Objective: The purpose of this study was to clarify the need and the role of interval appendicectomy after successful initial conservative treatment.

Method: This is a prospective study conducted in a major hospital in Basra from April 2006 to September 2010, included 65 patients with appendicular mass which subsequently proved postinflammatory (phlegmonous) changes of the appendix were treated conservatively.

Results: Routine interval appendicectomy was not performed and needed after successful treatment in the majority of the patients (84.6%). Four patients (6.1%) developed abscess formation and operation was necessary to drain the abscess. Four patients were readmitted with recurrent appendicitis after 2 months.

During the 2 years follow up period another 2 patients presented with recurrent symptoms of acute appendicitis and appendectomy were arranged. The recurrence rate after successful conservative treatment was 10%.

Conclusion routine interval appendectomy after initial successful conservative treatment is of questionable benefit and needs further assessment.

Keywords: appendicitis, appendix phlegmon, appendicular mass, interval appendicectomy

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Acute appendicitis is most common acute surgical emergency and it has 6 types: 1-catarrhalis appendicitis; slightly red 2-phlegmonous: moderate inflammation and ischemia 3-gangrenous :(partial) necrosis 4-perforated 5-appendicular mass 6-appendicular abscess¹.

Appendicular mass is a common surgical entity, found in 2-6% of patients presenting with acute appendicitis². It forms a spectrum of diseases ranging from an inflamed appendix, walled off by the omentum (an appendicular phlegmon), to a large collection of pus surrounded by adherent and inflamed omentum (an appendicular abscess)^{3,4}.

Management of an appendicular mass is controversial and may be treated in several ways⁵. The three most commonly used methods for treating appendicular mass are: first method include initial conservative treatment followed by interval appendicectomy six to eight weeks later. Second: appendicectomy as soon as appendicular mass resolved using conservative measures. Third include conservative treatment alone^{5,6,7}.

The traditional and classical management of appendicular mass which is adopted by most surgeons has been initial conservative approach with broad-spectrum antibiotics and intravenous fluid until the inflammatory mass resolves, the patient is then offered interval appendicectomy weeks later after the mass had resolved^{7,8}.

More recently, the need for interval appendicectomy has been questioned by a number of surgeons adopting an entirely conservative approach without interval appendicectomy^{9,10,11}.

Advocates of interval appendicectomy described the advantage of avoiding recurrence of symptoms and misdiagnosis of an interval appendicectomy mass^{11,12}. They suggest that interval appendicectomy is less hazardous and challenging operation, compared with immediate appendicectomy during the initial admission¹². Proponents of an entirely non-operative approach

suggest that appendicectomy, whether interval or immediate is unnecessary, especially in a symptomatic patients following successful initial conservative treatment¹³.

The mentioned three methods described above for treatment of appendicular mass have gained universal acceptance^{14,15,16}, however no randomized trial has been conducted to find the best option. There is still much controversy surrounding whether interval appendicectomy is appropriate for adult with appendicular mass or abscess^{10,17}. The main controversy centers on the recurrence rate, the complications rate of interval appendicectomy and the potentials for misdiagnosis of other pathology such as underlying malignancy, ileocaecal TB, and Crohn's disease^{18,19,20}.

The aim of the study was planned to evaluate the justification for conservative treatment of appendicular mass without interval appendicectomy after initial successful conservative treatment.

Methods. This is a prospective and descriptive study was conducted at the department of surgery in one major hospital in Basrah- Iraq. It includes 68 patients who presented with a mass in right iliac fossa for the period from April 2006 to September 2010.

Three patients were excluded from the study owing to another diagnosis of appendicular mass including caecal tumor (1 patient), terminal ileum TB. (1 patient) and one case proved to be a case of non Hodgkin lymphoma presented with enlarged lymph node in right iliac fossa. Clinical data of every patient was obtained, base line investigations were done including full blood count, urinalysis, and pregnancy test. For a female patients and ultrasonic examination were performed for all patients. CT scan of abdomen was done in few specs cases. Patient with proved appendicular mass were put on a conservative management which include: nil by mouth, antibiotic including Metronidazol 500 mg/8hr.i.v. and cefuroxime lg/12hr.i.v, monitoring of vital signs by a chart including pulse, and temperature record, marking of the mass by

serial clinical exam and/or u/s examination to see the response of the mass to conservative treatment.

Patients who responded to conservative treatment were sent home and followed for 2 years period, while the patients who did not respond to conservative treatment and abscess formation was confirmed clinically were treated with open drainage under general anesthesia and discharged and followed up for two years also with same group of patient who responded to conservative treatment only. Patient who had recurrent attack in the follow up were offered appendicectomy

Results. Total number of patients included in this study was 68 patients presented with clinical picture of acute appendicitis with presence of right iliac fossa mass. Three patients were excluded because of diagnosis other than appendicular mass. Age distribution was between 14 and 45 years with mean age of 28.6. Female to male ratio was 3:2. Complete resolution of appendicular mass following conservative management occur in 55 of patients (84.6%) ,abscess formation occurred only in 4 patients (6.1%), this abscess formation was diagnosed in these few cases by both clinical examination and confirmed by ultra sound. C.T scan of abdomen was needed for only one patient to confirm the diagnosis of an appendicular abscess. These abscesses are drained by open surgery under general anesthesia. All these patients made complete recovery and

improved clinically after draining of the abscess. Interval appendicectomy was done for 4 patients who developed recurrent symptoms of appendicitis within 2 months after initial successful conservative management. During the whole 2 years period of follow up, recurrent symptoms of appendicitis occurred in 2 patients only, and the clinical course was mild. Appendicectomy was arranged for these patients.

Discussion. An appendicular mass is one of the common complications seen in patients presenting a few days late after the onset of acute appendicitis. There is no consensus on the optimum treatment of this potentially dangerous condition. The ideal treatment of acute appendicitis is considered to be appendicectomy failing which a number of complications, including an appendicular mass, usually result^{19,20}. This usually follows a late presentation or failure of diagnosis at presentation. Delayed diagnosis changes the uncomplicated simple acute appendicitis into complicated appendicitis²¹. Appendicular mass ranges from a phlegmon to an abscess formation and is usually palpable as a tender mass in the right iliac fossa^{22,23}. The mass poses a dilemma to the surgeon as to the optimum treatment since there is more than one school of thought and different modes of treatment are suggested.

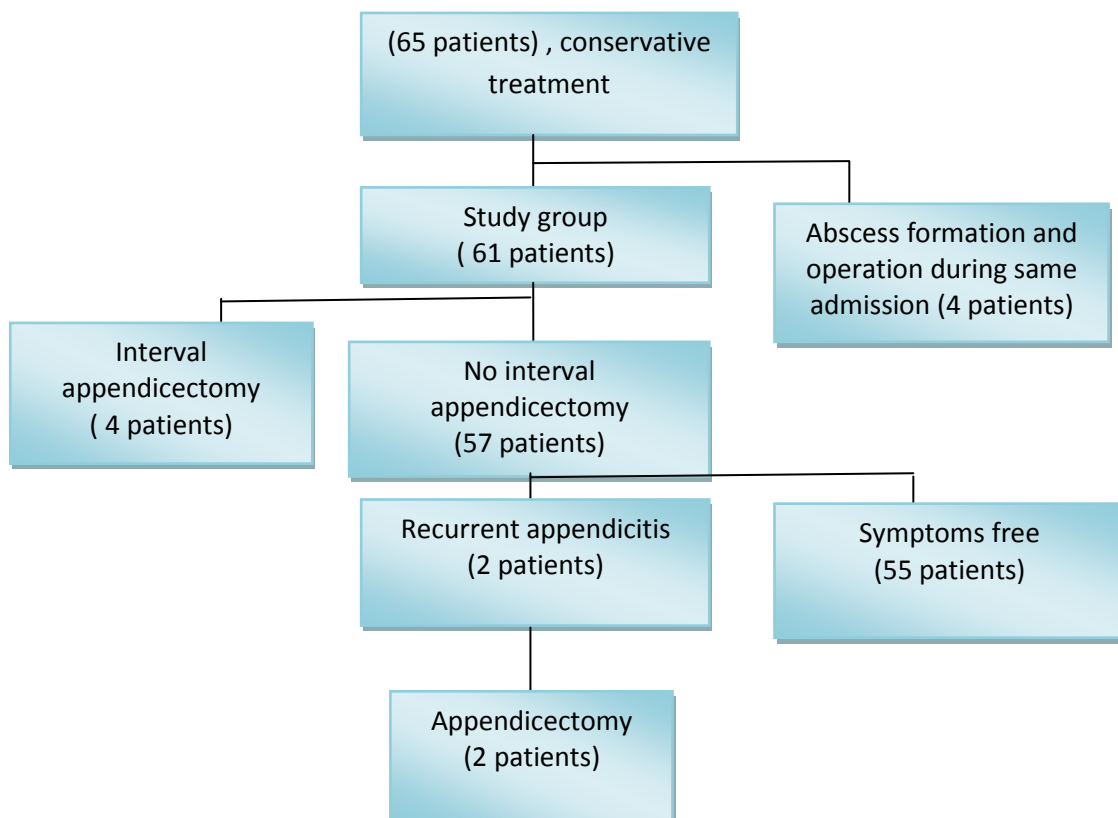


Table1: Published data on recurrence rate of acute appendicitis symptoms after conservative treatment of an appendicular mass.

Author	No. of patients	Recurrence rate (%)
Hoffman ¹	207	10.6
Hoffman ²	44	20.5
Bagip ³	34	8
Lewin ⁴	32	3
Marya ⁵	26 ¹	15
Foran ⁶	26	14

Table 2: Studies against interval appendectomy.

Authors	Year	Patients treated without interval appendectomy	Mean follow up (year)	Recurrence
Adalla et al	1996	30	1.3	2
Dixon et al	2003	237	Not recorded	32
Erylmaz et al	2004	24	2.9	3
Kumar et al	2004	20	2.9	2
Kaminski et al	2005	864	4	39
Lai et al	2006	94	2.75	24
Tekin et al	2008	89	3	13
Yousif et al	2010	51	Not recorded	9

The management of appendicitis has traditionally involved a purely surgical approach: however, in the setting of appendicitis presenting with appendiceal mass, initial non Operative (conservative) management has been shown to be safe and effective^{24, 25}. Controversy exists regarding then necessity for an interval appendectomy following initial non operative management of appendicitis²⁶.

Oschner (1901) proposed conservative management for the appendicular mass since the beginning of 20th century^{14, 27, 28}. This approach involved the administration of intravenous fluid and paraental antibiotics while keeping the patient nil by mouth. The aim of this approach is to achieve resolution of the mass and the symptoms of the patient. This modality of treatment has been found effective in the majority of patients²⁸.

We follow the same regimen in our study and majority of our patients responded completely to conservative treatment only (56 patients, 86.1%) and no recurrence of symptoms occurs in these patient, which is comparable to Safirulah et al¹⁵ study in which 88% of patients responded to conservative treatment and also similar to Adallq study in which 875 responded but lower than kumar et al, when the response was 95%^{3, 29}.

Abscess formation was noted in 4 patients only (6.1%). These abscesses were suspected by careful clinical monitoring and confirmed by ultrasonic examination and C.T. Scan needed for one patient only. And were drained

by open surgery under general anesthesia and no recurrence of symptoms was noted. Jeffeny et al¹⁶ showed in their study that, abscess formation was found in 7.5% of cases and the abscess drained by radiological guided percutaneous method under local anesthesia they noted recurrence of abscess in 2 cases and success rate was 90%. In study done by yamini et al³¹ found a success rate of 97% with conservative treatment associated with percutaneously draining of appendicular abscess.

In our study, we followed all patients who responded to conservative treatment including those who developed abscess and drained for 2 years period for any recurrence of symptoms. Only 6 patients (9.2%) had developed recurrent attack within the first year of follow up and symptoms were mild. Appendicectomy were done to these cases. They had a rapid recovery and uneventful postoperative period. So the rate of recurrence of symptoms after initial conservative treatment in our study was 10%. Several similar study shows that the range of recurrent appendicitis after successful initial conservative treatment is (0-20% with mean incidence of 13.7% and most recurrence occurred within the first year and the clinical course is usually mild^{17, 29}. Data from our study and other similar available studies^{28, 29} emphasized that, the role of interval appendicectomy is not important and the recurrence rate of appendicitis pathology if the appendicectomy is not performed is central to the debate over the use of routine interval appendicectomy is a

consideration to be balance against the recurrence rate, this complication rate varies from 8% to 23%³⁰.

The traditional management of appendicular mass involves performing interval appendicectomy follow resolution of the mass and symptoms, this approach dates to the beginning of the 20th century when Hoffman et al³¹ suggested elective interval appendicectomy following successful conservative management.

It is urged that interval appendicectomy is unnecessary after successful conservative management of an appendicular mass^{30, 31}. This approach can be applied in selected patients who do not develop recurrent symptoms. Conservative treatment alone will suffice in 80% of patients. The greatest risk of developing recurrent appendicitis after successful conservative management is during the first 6 months³², and there is a minimal chance of developing symptoms after 2 years. Interval appendicectomy is considered by some to be a difficult operation and sometimes the fibrotic appendix may not be found on operation^{30,33}. This has led to concept of a "wait and watch policy" after successful conservative management and has been found to be cost effective. The advocates of this approach may go as far as to propose that recurrent disease is also amenable to conservative treatment and is cost effective³³.

Recently, the value of interval appendicectomy has been revised and its justification has been questioned with the majority of surgeon advocating an entirely conservative management where possible³⁴. Advocates of a conservative approach without subsequent appendicectomy argue that only a small percentage (0-2%) of patients have recurrence³⁵, however this has not become popular mainly because of lack of evidence supporting it.

The principles reasons for justifying interval appendicectomy are to prevent recurrence of acute appendicitis to avoid misdiagnosis of an alternative pathology such as malignancy. Several studies have examined the microscopic changes in the interval appendicectomy specimen. Many specimens show chronic inflammatory changes (52%)³⁶ and acute inflammation (50%)¹⁷ however, this may be of little clinical importance in the asymptomatic patient. Appendicular malignancy is rare and may be missed if appendicectomy is not performed; however, it is likely that such patients will have either non resolving mass or early recurrence. Colonic malignancy is a more common concern, but interval appendicectomy is not a reliable method of detecting a caecal or colonic tumor.

Most of the studies regarding the role of interval appendicectomy provide good evidence, firstly: that risk of recurrent acute appendicitis following successful conservative management is low; secondly, in the minority of patients who symptoms recurred, this usually occur in the 1st year of initial attack and are usually with mild clinical course which can be managed by both operative and non operative approaches. Thirdly, there is no accurate method for predicting patients who are liable for recurrence^{37, 38}. For the few patients who develop recurrent disease, the hospital stay is shorter than for those treated with interval appendicectomy, so routine interval is not justified following initial successful-non operative Management of appendicitis³⁹.

In conclusion, the Initial conservative management is successful in the most of patients presenting with an appendicular mass. Routine interval appendicectomy after initial successful non operative management is not justified and should be abandoned. The indications for interval

appendectomy are to exclude other pathology, following recurrence of symptoms after conservative managements and if the patient is unwilling to take the low risk of recurrence. Appropriate investigations should be done if the appendix is not removed, provided the patient has access to surgical care if symptoms do recur; however this approach of not doing appendicectomy may not be acceptable to many surgeons and patients. Large randomized control study is needed to show the risk and benefit of conservative approach and to focus on the real need of interval appendicectomy in patient presenting with acute appendicular mass.

It would be reasonable and perhaps safer as other pathology such as malignancy can be missed at the appendicectomy, to replace routine interval appendicectomy with adequate follow up of symptoms performing appendicectomy only if symptoms recur or persist.

References:

1. Eriksson S, styrud J. interval appendicectomy: A retrospective study. *Eur J Surg* 1998; 164:771-4.
2. Nitecki S, Assalia A, Schein M. contemporary management of the appendiceal mass. *Br J. Surg* 1993; 80: 18-20.
3. Adalla SA. Appendiceal mass: interval appendicectomy should not be the rule *Br J Clin prac* 1996; 50: 168-9.
4. Kumar S, Jain S. Treatment of appendiceal mass: prospective, randomized clinical trial. *Indian J Gastroenterol* 2004; 23: 165-7.
5. Kaminski A, liu 11, Applebaum H, Lee SL, Haigh PI. Routine interval appendicectomy is not justified after initial non operative treatment of acute appendicitis. *Arch Surg* 2005; 140: 897-90.
6. SK oubp - Kristen sen E, Hvid I. The appendicular mass: Results of conservative management. *Ann Surg* 1982; 196:584-7.
7. Jordan J S, Kovalcik PJ, schwab CW. Appendicitis with a palpable mass. *Ann surg* 1981; 193:227-9.
8. Friedlle ML, Perez. Izquierdo M. Is there a role for interval appendicectomy in the management of acute appendicitis? *Ann surg* 2000; 66: 1158-62.
9. Thomas Dr. Conservative management of the appendix mass. *Surgery* 1973; 73: 677-80.
10. Ahmed I, Deakin D, porson S. Appendix mass: Do we know how to treat it? *Ann R. coll surg Engl* 2005; 87:191-5.
11. Oliak D, Yamini D, udoniMV, et al. initial non operative management of periappendiceal abscess. *Dis colon rectum* 2001; 44: 936-941.
12. Brown CV, Abrashim M, Muller M, Velmahos. G. Appendiceal abscess; immediate operation on percutaneously drainage? *Am surg.* 2003; 69:829-832.
13. Chen C, Botelho C, Cooper A, Hibberd P, parsons S. Current practice patterns in the treatment of perforated appendicitis. *J Am coll surg.* 2003, 196:212-221.
14. Oschner AJ. The cause of diffuse peritonitis complicating appendicitis and it's prevention *JAMA* 1901; 26: 1747.
15. Safirulla, MumtazKhan, Siddique Ahmed, Naeem Mwmmtaz. Conservative treatment of appendicular mass without interval appendicectomy, is it justified? *JP*:2007 vol 31 No. 01:55-59.
16. Jeffrey RB, Tolentino CS, Federic MP, laing FC. Percutaneously draining of periappendiceal abscess; review of 20 patients. *AMJ Roentgeral* 1987; 149: 59-62.
17. Foran B, Berne TV, Rosoffl. Management of the appendiceal mass. *Arch surg* 1978; 113: 1144-5.
18. Willem sen PJ, Hoorntije LF, Eddes EH, Ploeg RJ. The need for interval appendicectomy after resolution of an appendiceal mass questioned. *Dig surg* 2002; 19:216-20.
19. Verwaal VJ, Wobbes T, Goris RJA. Is there still a place for interval appendicectomy? *Dig Surg* 1993; 10:285-8.
20. Maryasks, Gary P, Singh M, Gupta AK, Singh Y. Is along delay necessary before appendicectomy after appendiceal

- mass formation a preliminary report. *Can J Surg* 1993; 36: 268-70.
22. Sardar Ali, Rafique HM. Early exploration versus conservative management of appendicular mass. *Professional Med J* 2010; 17(2): 180-184.
 23. Deu, Ghosh S. Acute appendicectomy for appendicular mass: A study of 87 patients. *Ceylon Med J* 2002; 47: 117-8.
 24. Arnbjornsson E. Management of the appendiceal abscess. *Curr surg* 1984; 41:3-9.
 25. Meshikhes AW. Management of appendiceal mass: controversial issues revisited. *J Gastrointest Surg.* 2008; 12: 767-775.
 26. Ein SH, Shandling B. Is interval appendicectomy necessary after rupture of an appendicular mass? *J Pediatr. Surg* 1996; 31: 849-50.
 27. Garba ES, Ahmed A. Management of appendiceal mass. *Annal of African Medicine.* 2008; 7: 200-204.
 28. Runde man RL, Strawbridge HTG, Bloom HW. Carcinoma of the caecum presenting as acute appendicitis, case report and review of literature. *Canada Med Assoc. J* 1967; 96:1327.
 29. Bahram MA. Evaluation of early surgical management of complicated appendicitis by appendicular mass. *International Journal of Surgery.* 2011; 9: 101-103.
 30. Dixon MR, Haukoos JS, Park IU et al. An assessment of the severity of recurrent appendicitis. *AM J Surg* 2003; 186:718-722.
 31. Wesson DE. Treatment of appendicitis in children. *UpToDate* online 16.1, <http://www.uptodate.com> accessed 1 April 2008)
 32. Hoffman J. con temporary management of the appendiceal mass. *Br J Surg* 1993; 80: 1350.
 33. Kim JK, Ryoos S, Oh HK, Kim SJ, Shin R, Choe EK, Joening SY, Park KJ. Management of appendicitis with abscess or mass. *J Korean Soc Coloproctol* 2010; 26(5): 165-167.
 34. Hoff man J, Lindhard A, Jensen HE. Appendix mass: conservative management without interval appendicectomy. *AMJ Surg* 1984; 148: 379-82.
 35. Bagi , Dueholm S. Non operative management of the ultrasonically appendiceal mass. *Surg* 1987; 101: 602-5.
 36. Lewin J. Fenyog, Engstran L. Treatment of appendiceal abscess. *Acta chir Acan* 1988; 154:123-5.
 37. Muhammad Shoib Hniif, Tufail Hussain Tahir, Irfan Ali Sheikh, Muhammad Zaman Ranjha. Acute appendicitis: gaining time in mass casualty scenario. *Pak Armed Forces J Med* 2010; 26: 1747-1754.
 38. Bsfeler D. Recurrent appendicitis. Incidence and prophylaxis. *Arch Surg* 1994;89: 666-8.
 39. Yamin D, Vargus H, Bongard F, Klein S, Stamos MJ. Perforated appendicitis: is it truly surgical urgency? *Am Surg* 1998;64:970