

## Interval Appendectomy: Surgical and Pathological Basis

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### SUMMARY:

#### BACKGROUND:

The treatment of appendiceal mass is controversial. For patients initially treated conservatively with antibiotics with or without drainage, the role of interval appendectomy is an area of considerable debate.

#### AIM :

To evaluate the indications of interval appendectomy in patients presented with appendicular mass in correlation with post operative histopathological results.

#### PATIENTS & METHODS:

This is a prospective study of 97 cases with the diagnosis of appendicular mass admitted and treated conservatively in Baghdad Teaching Hospital during the period from December 2002 to December 2006 then scheduled for interval appendectomy. Histopathology of the appendix examined and correlation of the result with certain clinical characteristic of the patients .

#### RESULTS :

The prevalent age group was 30-39 years (39%) and male to female ratio was 2.8:1. Postoperative histopathological features of the excised specimens showed that 85/97 (88%) of patients had chronically fibrosed appendix with obliterated lumen. The remaining 12/97 ( 12%) of patients were having inflamed appendices. There was a clear correlation the age of patient above 40 years (41%) and initial clinical response (94%) with the histopathologic support for appendectomy .

#### CONCLUSION:

Interval appendectomy was mandatory in the following groups of patients:

Patients  $\geq$  40 years old.

Patients with poor initial response to conservative treatment.

Patients with recurrent symptoms.

Patients with WBC count  $\geq$  12000 cell/cc.

**KEYWORDS:** Appendicular mass , interval appendectomy

### INTRODUCTION:

The vermiform appendix is considered by most to be a vestigial organ, its importance in surgery due only to its propensity for inflammation that results in the clinical condition known as acute appendicitis <sup>(1)</sup>.

The phlegmon is an inflammatory mass that consists of the inflamed locally perforated appendix together with the caecum and usually a loop of ileum matted together. The appendicular mass is palpated at the right lower quadrant usually after 5-7 days from the initial attack of appendicitis <sup>(2)</sup>.

The line of management is based on conservative treatment by the Ochsner – Sherren regimen which involve careful record of the patients' vital signs (pulse and temperature every 4 hours), fluid balance,

and regular abdominal examination with marking, if possible, of the mass limits using skin pencil. Improvement in clinical and imaging by Ultra sound basis with antibiotic therapy was reported regularly. Resolution usually occurs in 90% of cases within 24-48 hours. <sup>(1)</sup> Interval appendectomy performed at least 6 weeks following the acute event has been classically recommended for all patients <sup>(3, 4, 5)</sup>

#### PATIENTS AND METHODS:

In this prospective review of 97 patients with appendicular mass; the patients admitted to the surgical wards in Baghdad teaching hospital during the period from December 2006. They were treated conservatively then discharged and scheduled for interval appendectomy after 8 weeks.

Readmission and surgery before that appointment was necessary in some patients who developed clinical indication that necessitates readmission; the

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rest of patients were operated upon as routine interval appendectomy.

Postoperatively, all of the excised specimens were examined to show the presence or absence of the histopathological support for the diagnosis.

Certain preoperative patients' criteria were correlated with the presence or absence of the histopathological support for the diagnosis (namely age, initial clinical response being good if there is improvement in the patient clinical condition after 48 hours of conservative treatment, readmission state, and WBC count).

Regarding their age, the patients were grouped in 10 years cohorts, and the data were statistically analyzed and shown in the form of tables and figures.

### RESULTS:

In regard to the age distribution of our sample of patients, table (1) showed that 38/97 patients (39%) of cases were in the (30-39 years) age group with a mean age of 30.6 years.

Concerning the gender distribution, figure (1) illustrated that 70/97 patients (72%) were males and the remaining 27/97 patients (28%) were females with male to female ratio of 2.8:1

In respect to the postoperative histopathological features of the excised specimens, table (2) showed that 85/97 patients (88%) of patients had chronically fibrosed appendix with obliterated lumen. The remaining 12/97 patients (12%) of patients were having inflamed appendices.

Regarding to the correlation between the age of the patients and the presence of supportive pathological evidence for appendectomy (inflamed appendix) or the absence of such support (chronic fibrosed appendix with obliterated lumen), table (3) showed that (5/12, 41%) of patients  $\geq 40$  years have histopathological support for appendectomy, the rest of them (7/12, 59%) had no supportive pathological result. Those below 40 manifested pathological support in 7 of them (7/85, 8%), the remaining (78/85, 92%) had no supportive pathological evidence. This gave an Odd's ratio of 15.

Considering the relation between the initial clinical response of the mass with the pathological support for appendectomy, table (4) clarified that pathological evidence was found in (5/87, 6%) of those with good initial response and in (7/10, 70%) of those who had poor initial response.

The remaining of both groups had no pathological evidence. This gave an Odd's ratio of 38.

Table (5) established the relation between the readmission state [being clinically indicated because

of recurrent right iliac fossa pain and tenderness or because of the persistence of the mass long after resolution of signs and symptoms or being routine interval appendectomy] and the pathological support showing that (9/12, 75%) of those who had clinical state that necessitate surgical intervention have had pathological support

while this was evident only in (3/85, 4%) of patients who undergone surgery as interval appendectomy. This gave an Odd's ratio of 82.

In regard to the correlation between white blood cell count and the pathological support for appendectomy, table (6) showed that (8/14, 57%) of those who had white blood cell count  $\geq 12000/\text{cc}$  manifested pathological support while the pathological evidence was present only in (4/83, 5%) of those who had white blood cell count less than 12000/cc. this gave an Odd's ratio of 26.

Concerning the complications faced during our study period, table (7) showed that the highest complication rate was in form of wound infection (5/97, 5%), the least was small bowel injury and fecal ileal fistula each of them in a percentage of (1/97, 1%).

### DISCUSSION:

In this prospective review of 97 patients with the initial presentation of appendicular mass treated conservatively and then scheduled for interval appendectomy, most of the patients were found in the 30-39 years age group (39%) with a mean age of 30.6 years. This result is in accord with that of: Schein M et al <sup>(6)</sup>: who found a mean age of 30 years.

In respect to gender distribution, we have noticed that (70/97, 72%) of patients were males, the rest of them (27/97, 28%) were females. This gives a ratio of 2.8:1. The result concedes with that of Holmes K et al <sup>(7)</sup>: who also noticed a male preponderance of 3:1.

Regarding the correlation between the age of the patients and the presence or absence of the pathological support for appendectomy, we have found that patients with age of 40 years and older were 15 times more liable to have an underlying pathological support. This result goes with that of Jensen HE et al <sup>(8)</sup>: who advocated interval appendectomy in patients  $\geq 40$  years old.

Considering the association between the clinical response of the appendicular mass to the conservative management and the final pathological result, patients with poor initial response were at 38 times risk to have an underlying pathology in a comparison to patients with good initial response. This result is in agreement with that of Kaminski A et al <sup>(9)</sup> who also

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concluded that interval appendectomy after initial successful non operative treatment is not justified. Ein SH and Shandling B <sup>(10)</sup>: who found that routine interval appendectomy is unnecessary after resolution of an appendicular mass following conservative management.

Concerning the histopathological features of the excised specimens, they were supportive for the necessity of surgery in (12/97, 12%) of patients with inflamed appendices. The remaining (85/97, 88%) had chronic fibrosed appendix with an obliterated lumen that will not herald a future possibility of obstruction and eventually the recurrence of appendicitis. This result is in agreement with that of Gahukamble DB <sup>(11)</sup> who also found that interval appendectomy is not justified in patients with their appendices have obliterated lumen. Hung Wenlai et al <sup>(12)</sup>: who found that interval appendectomy benefited less than 20% of patients with appendicular mass.

In respect to the readmission state and its relation with presence or absence of the pathological evidence, we have found that patients who were readmitted because of the development of a clinical state that necessitate surgery were 82 times more liable to have an underlying pathological evidence than those who were readmitted just for routine interval appendectomy. This result is in accordance

with that of Singh Y et al <sup>(13)</sup>, Adalla SA <sup>(14)</sup>, Eriksson S <sup>(15)</sup>, Kumor S <sup>(16)</sup> and Mazziotti MV et al <sup>(17)</sup>: who concluded that interval appendectomy is only necessary when symptoms recur.

Concerning the correlation between white blood cell count and the presence or absence of the pathological evidence of appendectomy, we have found that patients with WBC count of less than 12000 cells/cc are at risk of having an underlying pathological evidence that is 26 times less than the risk of patients having WBC count of 12000 cells/cc or more. This result concedes with that of Wilcox RT <sup>(18)</sup>, Silen W <sup>(19)</sup>, Nathanson LK <sup>(20)</sup>: who also found a similar association between WBC count and the need for surgery.

In regard to complications encountered during our study, the highest rate was wound infection (5/97, 5%). This figure is close to what was found by Willemsen PJ et al <sup>(21)</sup>: who conducted wound infection in a rate of 6%..

### CONCLUSION:

Interval appendectomy was mandatory in the following groups of patients:

Patients  $\geq 40$  years old.

Patients with poor initial response to conservative treatment.

Patients with recurrent symptoms.

Patients with WBC count  $\geq 12000$  cell/cc.

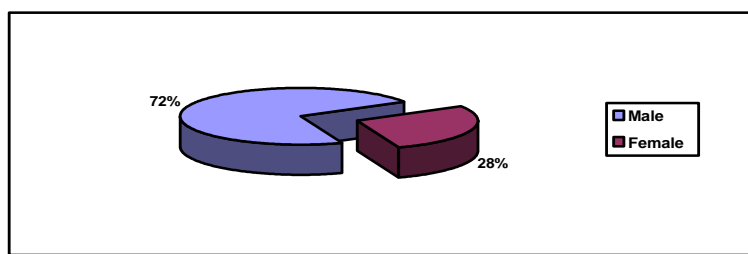


Figure (1): Gender distribution.

Table (1): Age group.

Age (years)	No.	%
< 20	19	20%
20-29	28	29%
30-39	38	39%
40-49	7	7%
$\geq 50$	5	5%
Total	97	100

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**Table (2): Postoperative Histopathological Features.**

Diagnosis	No.	%
Fibrosed appendix with obliterated lumen	85	88%
Inflamed appendix	12	12%
Total	97	100%

**Table (3): Correlation between age of the patients and the histopathological support for appendectomy.**

Age	No.	Pathological support				Odd's ratio
		Present		Absent		
		No.	%	No.	%	
≥ 40	12	5	41%	7	59%	15
< 40	85	7	8%	78	92%	
Total	97	12	12%	85	88%	

**Table (4): Association between histopathological support of appendectomy and the initial clinical response.**

Initial clinical response	No.	Histopathological support				Odd's ratio
		Present		Absent		
		No.	%	No.	%	
Good	87	5	6%	82	94%	38
Poor	10	7	70%	3	30%	
Total	97	12	12%	85	88%	

**Table (5): Relation between readmission state and the histopathological support for appendectomy.**

Readmission state	No.	Histopathological support				Odd's ratio
		Present		Absent		
		No.	%	No.	%	
Clinical indication	12	9	75%	3	25%	82
Routine interval appendectomy	85	3	4%	82	96%	
Total	97	12	12%	85	88%	

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**Table (6): The pathological support for appendectomy and WBC count.**

WBC count / cc	No.	Histopathological support				Odd's ratio
		Present		Absent		
		No.	%	No.	%	
≥ 12000	14	8	57%	6	43%	26
< 12000	83	4	5%	79	95%	
Total	97	12	12%	85	88%	

**Table (7): Complications.**

Complication	No.	%
Wound infection	5	5%
Ileus	2	2%
Small bowel injury	1	1%
Ileal fecal fistula	1	1%

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