

## **Outcome of Delaying Appendectomy More Than 12 Hours**

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**Objective:** To assess the outcome of delaying appendectomy more than twelve hours.

**Design:** Retrospective study.

**Setting:** Herra General Hospital, Makkah.

**Method:** Two hundred and forty-five positive pathological report of acute appendicitis from 10<sup>th</sup> February to 6<sup>th</sup> April 2008 were reviewed. The patients were divided into two groups. The early group comprised of patients who had undergone appendectomies within 12 hours of hospital admission. The late group comprised patients who had undergone appendectomies after more than 12 hours of admission. The measure of outcomes, length of stay, operative time, rate of perforation and complications were analyzed.

**Result:** From 10<sup>th</sup> February to 6<sup>th</sup> April 2008, 245 cases of appendectomy were included in the present study, 142 males and 103 females. Their age ranged from 6 to 71 years, an average of  $20.59 \pm 9.89$  years and a median of 18 years. Two hundred patients were in the early group (operated within 12 hours of admission) and 45 patients were in late group (operated after 12 hours of admission). We found that there is no difference in age, sex, operative time, rate of perforation and early or late postoperative complications.

**Conclusion:** This study shows that in simple uncomplicated acute appendicitis, delaying appendectomies for more than 12 hours after hospital admission does not affect the outcome.

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Acute appendicitis is the most common general surgical condition, patient may present to the emergency room any time during the day or night; it may occur during the night when the surgical personnel and operating room staff are limited. If operating room and the personnel are working for 24 hours, it would be easy to deal with emergency appendicitis at any time. It is difficult for small hospital when the on-call team had to deal with emergencies at night, which might disrupt the regular operating room schedule.

The management of acute appendicitis varies, some studies suggest expeditious surgery and others may question the necessity of appendectomy<sup>1-3</sup>.

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The author supports the school of appendectomy whether delayed or immediate and how much delay could be entertained till the time is convenient for the operating room staff and schedule.

The aim of the study was to see if appendectomy operations can be minimized during night calls, by delaying the operation up to 12 hours without any complication to the patients.

## **METHOD**

Two hundred and forty-five patients had positive pathological report of acute appendicitis from 10<sup>th</sup> February to 6<sup>th</sup> April 2008 were reviewed, The patients were divided into two groups. The early group comprised of patients who had undergone appendectomies within 12 hours of hospital admission. The late group comprised of patients who had undergone appendectomies after more than 12 hours of admission. Herra General Hospital does not admit children; therefore, all patient population in this study were over 12 years old.

### **The Following Outcome Measures were Assessed:**

- Length of stay
- Operative time
- Rate of perforation
- Complications

## **RESULT**

From 10<sup>th</sup> February to 6<sup>th</sup> April 2008, 245 cases of appendectomy were included in the present study. The criteria of inclusion is positive pathological report of inflamed appendix; 142 males and 103 females. Their age ranged from 6 to 71 years with an average of  $20.59 \pm 9.89$  years and a median of 18 years. Two hundred patients were in the early group (operated within 12 hours of admission) and 45 patients in the late group (operated after 12 hours of admission). The early group (200) were operated within an average period of  $6.16 \pm 2.85$  hours from admission. The late group (45) were operated within an average period of  $21.22 \pm 8.96$  hours from admission.

### **Personal Characteristics and Preoperative Data of Early and Late Groups (Table 1)**

Both groups were comparable in terms of age and sex ( $P < 0.05$ ). Similarly, no significant differences were found between both groups regarding preoperative white blood cell count and preoperative temperature.

**Table 1: Demographic and Preoperative Data of the Study Groups**

Characteristics	Early Group (n=200)	Late Group (n=45)	P value
Age in Years: (mean $\pm$ SD)	20.31 $\pm$ 8.68	21.87 $\pm$ 14.01	t=0.959, P=0.338
Temperature on arrival in °C (mean $\pm$ SD)	37.44 $\pm$ 0.625	37.29 $\pm$ 0.59	t=1.431, P=0.154
WBC count (mean $\pm$ SD)	12.37 $\pm$ 5.18	12.29 $\pm$ 5.56	t=0.951, P=0.925
Males	121 (60.5%)	21 (46.6%)	$\chi^2=2.885$ , P=0.0.89
Females	79 (39.5%)	24 (53.4%)	
Time from admission till operation in hours (mean $\pm$ SD)	6.16 $\pm$ 2.85	21.22 $\pm$ 8.96	t=21.15, P=0.0001*

\* Significant (P<0.05)

### Operative Data of Early and Late Groups (Table 2)

The average operative duration in the early group was 48.20  $\pm$  20.77 minutes compared to 53.22 $\pm$ 29.94 minutes in the late group. The difference was not statistically significant (t=1.342, P=0.181).

Forty-four percent (88 cases) of the early group were operated using the “Lanz” type of incision compared to 40.0% (18 cases) in the late group. The difference was not statistically significant (Z=0.489, P=0.312). Similarly, no significant difference was found between both groups regarding “Grid-Iron” and “Mid-Line” incisions.

No significant difference was found between both groups regarding the operator, whether a consultant, a specialists or a senior Resident.

**Table 2: Operative Data of the Study Groups**

Characteristics	Early Group (n=200)	Late Group (n=45)	P value
OR Duration in minutes (mean $\pm$ SD)	48.20 $\pm$ 20.77	53.22 $\pm$ 29.94	t=1.342, P=0.181
<b>Type of Incision</b>			
Lanz	88 (44.0%)	18 (40.0%)	Z=0.489, P=0.312
Grid Iron	108 (54.0%)	27 (60.0%)	Z=0.731, P=0.767
Mid Line	4 (2.0%)	0 (0.0%)	Z=0.956, P=0.169
<b>Operator</b>			
Consultant	14 (7.0%)	6 (13.3%)	Z=1.411, P=0.919
Specialists	158 (79.0%)	34 (65.6%)	Z=0.501, P=0.305
Senior Resident	28 (14.0%)	5 (11.1%)	Z=0.513, P=0.304

\* Significant (P<0.05)

### Postoperative Data of Early and Late Groups (Table 3)

Eighty-five cases (42.5%) of the early group were found to have “Catarrhal” histopathological type of appendicitis compared to 21 (46.7%) in the late group. The difference was not statistically significant (Z=0.509, P=0.695). Similarly, no significant difference was found between both groups regarding “Suppurative” and “Perforated” types. On the other hand, significant (Z=1.685, P=0.046) preponderance of “Gangrenous” type among early cases (12, 6.0%) compared to late cases (0%) was found.

No significant difference was found between both groups regarding postoperative complications, such as, wound infections, abdominal collection and hematoma.

## The Use of Antibiotic in Early and Late Groups

It was found that each surgeon had his own preference of antibiotics which he used in both groups.

**Table 3: Postoperative Data of the Study Groups**

Characteristics	Early Group (n=200)	Late Group (n=45)	<i>P value</i>
<b>Histopathology</b>			
Catarrhal	85 (42.5%)	21 (46.7%)	Z=0.509, P=0.695
Suppurative	92 (46.0%)	19 (42.2%)	Z=0.461, P=0.323
Perforated	11 (5.5%)	5 (11.1%)	Z=1.376, P=0.916
Gangrenous	12 (6.0%)	0 (0.0%)	Z=1.685, P=0.046*
<b>Postoperative Complications</b>			
Wound infection	2 (1.0%)	1 (2.2%)	Z=0.674, P=0.749
Abdominal collection	1 (0.5%)	0 (0.0%)	Z=0.457, P=0.317
<b>Outpatient Complications</b>			
Wound Infection	3 (1.5%)	1 (2.2%)	Z=0.345, P=0.635
Hematoma	1 (0.5%)	0 (0.0%)	Z=0.457, P=0.317

\* Significant ( $P < 0.05$ )

## DISCUSSION

The uncomplicated acute diverticulitis in a stable patient is initially treated with hydration and antibiotics; appendicitis may be treated in similar fashion. In addition, conservative management with interval appendectomy for localized perforation in children has become common that the current debate is whether or not the appendectomy eventually needs to be performed<sup>1,2</sup>.

Varadan et al compared the efficacy of antibiotic therapy alone with surgery in patient over 18 years of age with suspected acute appendicitis, he questioned the gold standard treatment of appendectomy for appendicitis<sup>4</sup>. Mason has reached the same conclusion in his study, other studies in pediatric rather than adult population, have shown no statistically significant difference in morbidity, perforation rate, or cost attributed to in-hospital delays in appendectomy<sup>5-8</sup>.

The length of stay, operating time, perforation rate and complication, in this study, were similar to other studies<sup>8-13</sup>. However some of the previous studies suggested that appendectomy may not be necessary which I may disagree with, appendectomy can be delayed for some time but ultimately it has to be performed<sup>9-13</sup>.

Providing the diagnosis is made, we suggest that the patient should receive the appropriate care for optimum pain management, starting intravenous fluid and commencement of antibiotic therapy. We do not recommend a delay of a complicated acute appendicitis even though some studies have suggested that<sup>1,2,6-8</sup>. If there is any risk of peritonitis the operation should be performed immediately.

## CONCLUSION

**In selected patients delaying appendectomies for more than 12 hours after hospital admission does not increase the rate of complication nor it interferes with the outcome. It preserves the continuity of the operating room schedule and rationalize the use of the operating room staff during night.**

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