

# INTERVAL APPENDICECTOMY VS CONSERVATIVE MANAGEMENT WITH FOLLOW UP IN APPENDICEAL MASS: A PROSPECTIVE OBSERVATIONAL STUDY IN A TERTIARY CARE HOSPITAL OF EASTERN INDIA

Dr. Bidyapati Acharya<sup>1</sup>, Dr. Pratyush Kashyap Panda<sup>2</sup>, Dr. Sumit Ranjan Samal<sup>3</sup>,  
Dr. Rupashree Sahoo<sup>4</sup>, Dr. Chinmay Samantaray<sup>5</sup>

<sup>1</sup>Asst. Prof. Dept. Of General Surgery, SCBMCH, Cuttack.

<sup>2</sup>Senior Resident, Dept. Of General Surgery, SCBMCH, Cuttack.

<sup>3</sup>Junior Resident, Dept. Of General Surgery, SCBMCH, Cuttack.

<sup>4</sup>Junior Resident, Dept. Of General Surgery, SCBMCH, Cuttack.

<sup>5</sup>Junior Resident, Dept. Of General Surgery, MKCG MCH, Berhampur.

Corresponding author\*

**Dr Sumit Ranjan Samal: Junior Resident Dept. of Surgery SCB Medical College, Cuttack-753007, Odisha, IND.**

Mob: 7873563345:

Email: [sumitsamal1996@gmail.com](mailto:sumitsamal1996@gmail.com)

## ABSTRACT:

**Background:** Acute appendicitis is the most common surgical emergency which may be complicated by development of an appendiceal mass. An appendiceal mass varies from phlegmon to abscess and develops in 2-6% of cases following acute appendicitis. Three modes of management are practiced 1.immediate appendectomy before resolution of mass 2.Conservative management with interval appendectomy 3.Entirely conservative approach without interval appendectomy with regular follow up. Ochsner Sherren regimen is followed for conservative management of appendiceal mass.

**Aim of the Study:** To study that outcome of appendicular mass patients on conservative management followed by interval appendectomy (Group 1) against conservative management alone with regular follow up (Group 2).To evaluate that risks of interval appendectomy.

**Materials and Methods:** Prospective observational study was conducted for 50 patients admitted with acute appendicitis during the study period from March 2021 to October 2022. All the patients were subjected to detailed clinical examination, laboratory investigations and radiological imaging with their consent.

**Results:** The mean age group was similar in both groups (26 to 50yrs), so there was no statistical significance. Males were more affected than females. In conservatively managed group 2 patients developed complications and the other group 9 patients developed complications. Among 25 patients in 1<sup>st</sup> group 4 got recurrent appendicitis and in interval appendectomy 9 patients got recurrent appendicitis. In the 1<sup>st</sup> group 22 patients stayed in hospital for <5 days and 3 patients 5-10 days. In the 2<sup>nd</sup> group 9 patients stayed in hospital for < 5 days,13 patients for 5-10 days and 3 patients for >10days. The P value was significant in this group.

**Conclusion:** Early appendectomy is the treatment of choice in acute appendicitis.

In the management of appendiceal mass following conservative management, interval appendectomy vs conservative management alone with regular follow up is still debatable.

Recent studies in literature are mostly not in favour of routine interval appendectomy following conservative management.

In this study the complication rate, duration of hospital stays more in interval appendectomy group so we conclude it is better to go for conservative management with regular follow up and intervene when recurrence occurs in case of appendiceal mass.

**KEY WORDS:** Appendicitis ,Appendicular Mass

## INTRODUCTION:

Acute appendicitis is that most common surgical emergency which maybe complicated by development of an appendiceal mass. That appendiceal mass is formed around that perforated appendix & it consists of inflammatory mass of inflamed appendix, adjacent viscera & greater omentum.

An appendiceal mass varies from phlegmon to abscess & it develops in 2% to 6% of cases following acute appendicitis. Appendiceal mass more commonly seen in elderly males. For decades it have been conflicting opinions in that appendiceal mass management. Three modes of management practiced now are (1) immediate appendectomy before resolution of that mass, (2) conservative management with interval appendectomy in 6to 8 weeks. (3) An entirely conservative approach without interval appendectomy with regular follow up Conservative management for appendicular

mass initially as described by Oschner has so far been followed routinely by surgeons worldwide. Oschner-Sherren regime includes hospitalization, bowel rest, broad spectrum antibiotics, hydration & percutaneous drainage of abscess until that mass gets resolved.

Traditionally following conservative management of appendicular mass interval appendectomy (6-8weeks later) is done. Surgeons suggesting interval appendectomy claim that recurrence of appendicitis is more common & by doing interval appendectomy that underlying pathology like crohn's disease, mucocele or malignancy can be dealt with in time.

That need for interval appendectomy after successful conservative treatment has recently been questioned & increasing number of studies on this aspect are pouring in. That advocates of conservative management alone with prolonged follow up without interval appendectomy, substantiate that rate of recurrent appendicitis is low (6-20%) & point out that even that potential recurrences have mild clinical course. More over complications include wound & intra-abdominal sepsis, adhesive small bowel obstruction.

Immediate appendectomy following resolution of mass may look like easily feasible, safe, cost effective allowing early diagnosis & treatment of unexpected pathology. However, it has higher complication rate 36% leading to dissemination of infection, intestinal fistula formation with misdiagnosed of cancer may end up in right hemicolectomy. Sometimes a malignant mass may be mistakenly under treated by appendectomy. Because of complication of this method, it is not practiced nowadays unless there is no response to conservative treatment.

Hence I have restricted our study in that management of appendiceal mass to Prospective comparative study on conservative management followed by interval appendectomy against conservative management alone with regular follow up.

## **AIMS AND OBJECTIVES:**

Objectives of the study were-

- To study that outcome of appendicular mass patients on conservative management followed by interval appendectomy against conservativemanagement alone with regular follow up..
- To evaluate that risks of interval appendectomy.

## **MATERIALS AND METHODS:**

**STUDY TYPE:** Prospective observational study

**TIME PERIOD OF STUDY:** March 2021 to October 2022

**PLACE OF STUDY:** Department of General surgery S.C.B medical college & Hospital, Cuttack

**SOURCE OF DATA:** Patients admitted with clinical diagnosis of appendicular mass under the Department of Surgery, S.C.B medical college & Hospital, Cuttack

## **INCLUSION CRITERIA:**

- All patients with clinical findings & investigation report in favour of appendiceal mass were included
- All age group from 13 to 70 years

## **EXCLUSION CRITERIA:**

- Patients less than 13 years of age & more than 70 years of age.
- Patients with generalised peritonitis were excluded.
- Non cooperative patients for regular follow up.
- Patients with comorbidities like diabetes mellitus, end stage liver disease, immunocompromised state

**SAMPLE SIZE:** A total of 50 patients with clinical diagnosis of appendiceal mass were studied

## **STATISTICAL ANALYSIS:**

Independent t test was used to examine differences in age; Fischer's exact test for sex; and chi square test for etiology were used.

Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were calculated. A "p" value of less than 0.05 was considered to be statistically significant. Data analysis was performed using SPSS software.

Data was analyzed statistically using WILCOXON SIGN RANK TEST and FISHERS EXACT TEST by SPSS version 17.

Comparative charts were made and the data was analyzed.

**ETHICAL ISSUE:**

The present study was approved by the Ethics Committee of the S C B Medical College Cuttack vide IEC No. 804 dated 04/06/2021 as per the principles of Helsinki Declaration.

**PROCEDURE**

Based on the selection criteria, patients are admitted with diagnosis of appendicular mass under Department of Surgery, Scb medical college and hospital, Cuttack, Odisha.

The nature of the study is to be explained to the patients. The patients are to be included in this study after getting written informed consent. History & clinical examination will be done for all & recorded in the proforma.

That following tests are carried out on admission:

- Routine blood investigations (Complete blood count, platelet count, reticulocyte count).
- serum electrolytes.
- Blood sugar,
- serum urea & creatinine
- Serum Bilirubin (Total & Direct bilirubin). Liver Function Tests
- XRAY CHEST
- ECG
- USG ABDOMEN & PELVIS
- CECT ABDOMEN & PELVIS
- VIRAL MARKERS
- Urine analysis (routine & microscopy).

Initially all will be treated conservatively as described by Oschner & Sherren regimen.

After successful management of appendiceal mass patients, In

**Group I** : patients were advised to come periodically for review or as soon as any recurrence of symptoms appear. Patients with recurrence are to be admitted and appendectomy done either by open or laparoscopic procedure. Patients who did not turn up for review were closely followed up by telephonic conversation and their complaints if any present were recorded.

**Group 2:** patients were advised to come for interval appendectomy in 6 to 8 weeks. On their readmission they were performed appendectomy either by open or laparoscopic procedure. All were followed up for minimum 3 months for any complication and to assess prognosis.

**Photograph 1: Acute Appendicitis**

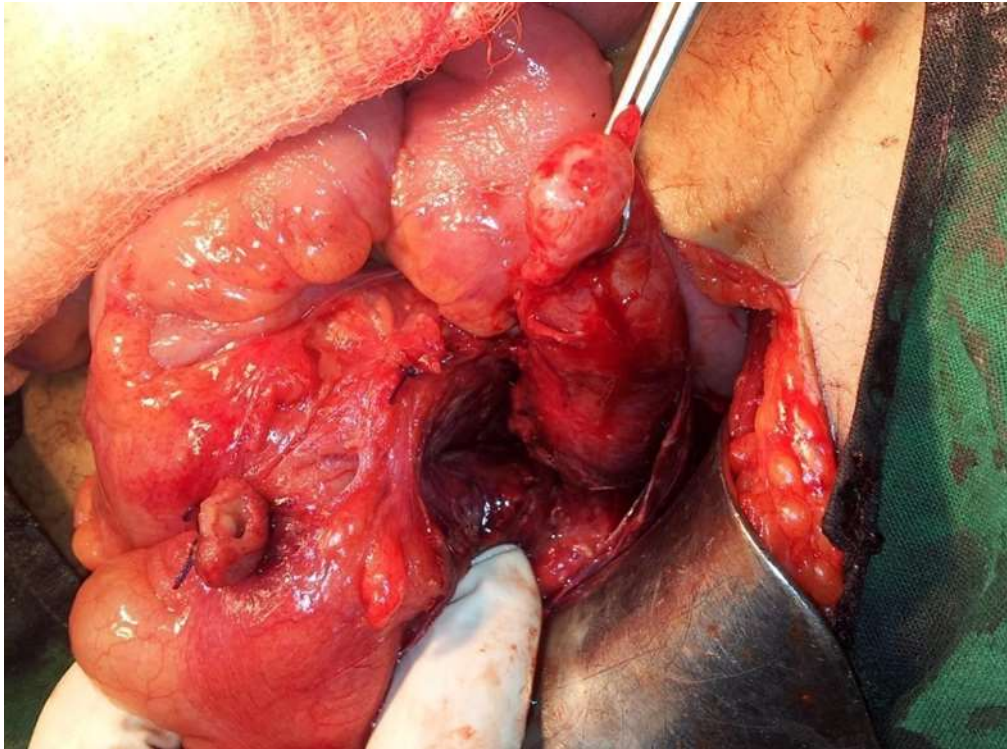


**Photograph 2. Acute appendicitis (meso appendix being ligated)**



**Photograph 3: Inflamed Appendix with Faecolith**





Photograph 4: Appendicular perforation (ligated & cut)

**OBSERVATIONS:**

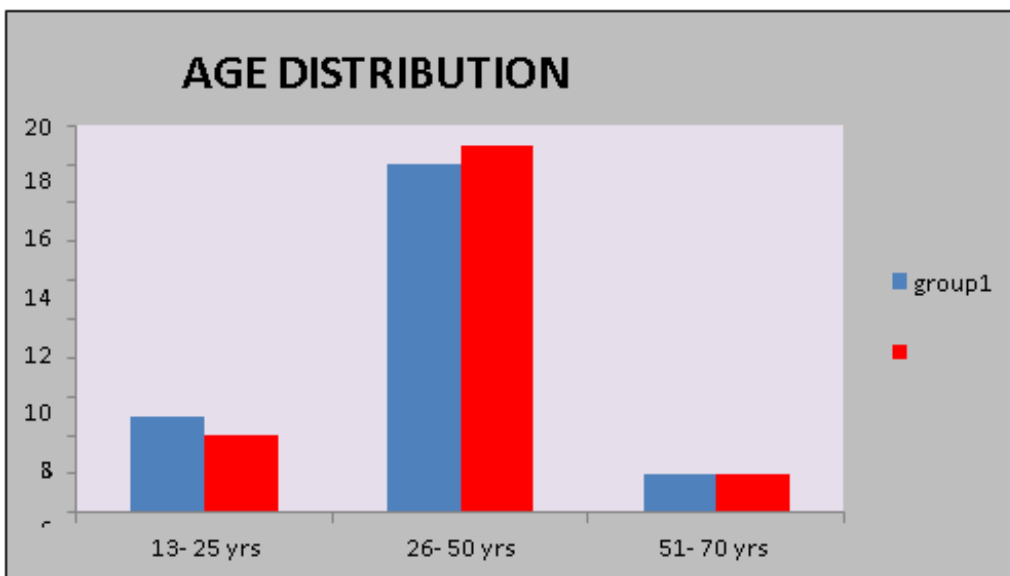
Outcome of our study are shown in the tables attached. The age and sex distribution in each group are as follows.

**GROUP 1 – CONSERVATIVE MANAGEMENT , GROUP 2-**

**INTERVAL APPENDICECTOMY**

**1.AGE DISTRIBUTION:**

| Age      | GROUP 1(CONSERVATIVE MANAGEMENT) | GROUP 2 (INTERVAL APPENDICECTOMY) | % total |
|----------|----------------------------------|-----------------------------------|---------|
| 13 to 25 | 5                                | 4                                 | 18%     |
| 26 to 50 | 18                               | 19                                | 74%     |
|          |                                  |                                   |         |



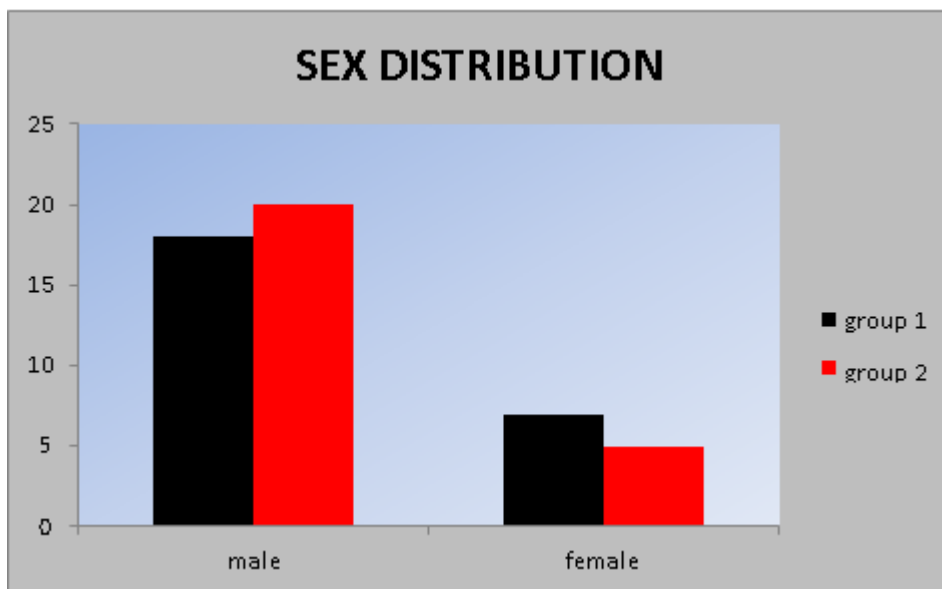
| Age            | Group                   |                                     | Total |
|----------------|-------------------------|-------------------------------------|-------|
|                | Group 1<br>Conservative | Group 2<br>Interval appendicectomy) |       |
| 13 to 25       | 5                       | 4                                   | 9     |
| 26 to 50       | 18                      | 19                                  | 37    |
| 51 to 70       | 2                       | 2                                   | 4     |
| Total          | 25                      | 25                                  |       |
| <b>P VALUE</b> |                         | <b>0.834 NOT SIGNIFICANT</b>        |       |

The mean age group was similar in both groups (26 TO 50 yrs).

There was no statistical significance.

**SEX DISTRIBUTION.**

| SEX    | GROUP 1<br>(conservative ) | GROUP 2<br>Interval appendicectomy | % TOTAL |
|--------|----------------------------|------------------------------------|---------|
| MALE   | 18                         | 20                                 | 76%     |
| FEMALE | 7                          | 5                                  | 24%     |

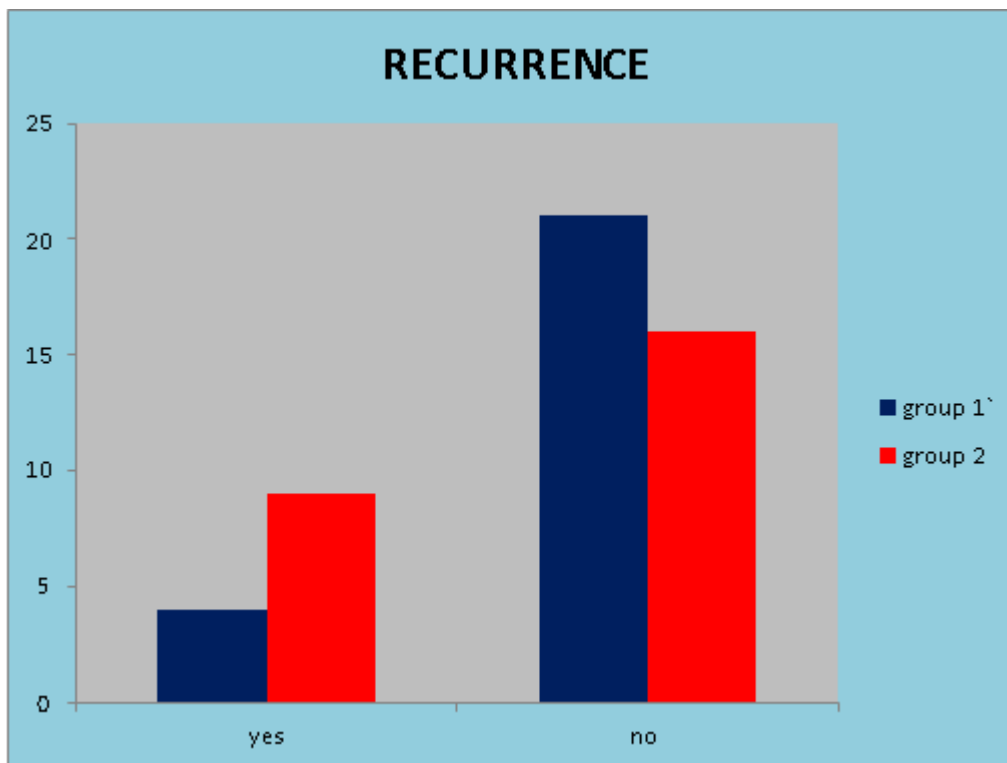


In the CONSERVATIVELY MANAGED group among 25 patients 18 were male 7 were female . In INTERVAL APPENDICECTOMY group 20 were male patients and 5 were females . There was no statistical significance among sex in both groups . MALES were affected more than females.

**RECURRENCE**

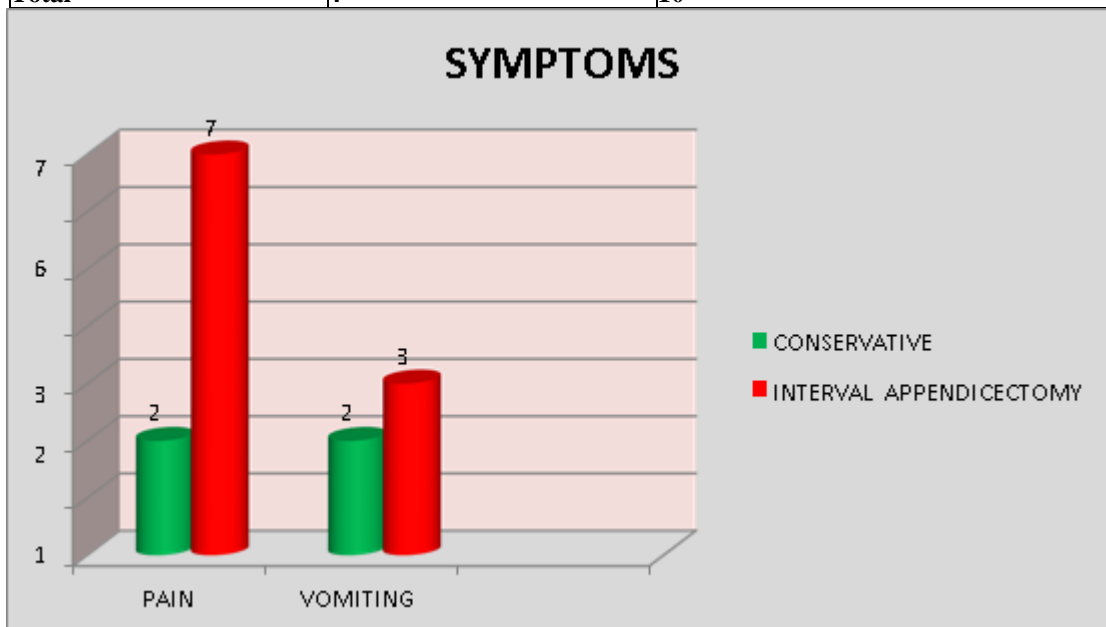
| Recurrence | GROUP 1      | GROUP 2                 |
|------------|--------------|-------------------------|
|            | conservative | Interval appendicectomy |
| yes        | 4            | 9                       |
| no         | 21           | 16                      |
| Total      | 25           | 25                      |

|            | GROUP 1 | GROUP II |
|------------|---------|----------|
| Recurrence | 4       | 9        |
| Total      | 25      | 25       |



In the CONSERVATIVELY MANAGED group among 25 patients 4 patients got recurrent appendicitis. In INTERVAL APPENDICECTOMY group 9 patients got recurrent appendicitis. There was no statistical significance among sex in both groups . MALES were affected more than females.  
 SYMPTOMATOLOGY

| Symptoms | Group 1 (Conservative) | Group 2 (Interval appendicectomy) |
|----------|------------------------|-----------------------------------|
| Pain     | 2                      | 7                                 |
| Vomiting | 2                      | 3                                 |
| Total    | 4                      | 10                                |

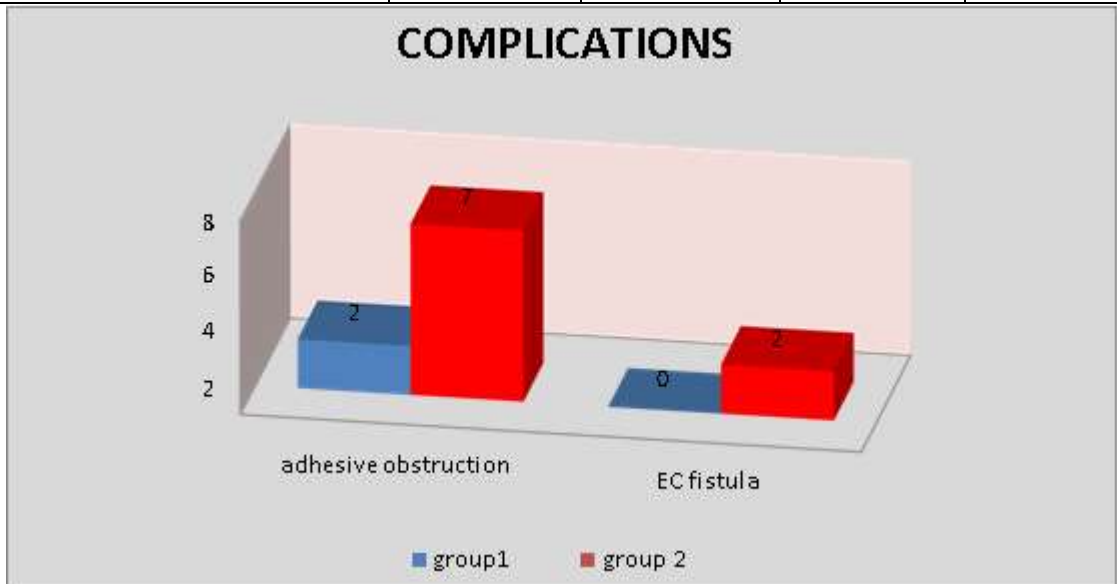


In the CONSERVATIVELY MANAGED group among 25 patients

4 patients developed symptoms of appendicitis. In INTERVAL APPENDICECTOMY group 10 patients developed symptoms of appendicitis.

COMPLICATIONS

| COMPLICATIONS        | Group I | %   | Group II | %   |
|----------------------|---------|-----|----------|-----|
| ADHESIVE OBSTRUCTION | 2       | 8%  | 7        | 28% |
| EC FISTULA           | 0       | Nil | 2        | 8%  |
| TOTAL                | 2       | 8%  | 9        | 36% |



In the CONSERVATIVELY MANAGED group among 25 patients 2 patients developed complications. In INTERVAL APPENDICECTOMY group 9 patients developed complications

DURATION OF HOSPITAL STAY

| Duration of hospital stay | Group 1 (Conservative) | Group 2 (Interval appendicectomy) |
|---------------------------|------------------------|-----------------------------------|
| Less than 5 days          | 22                     | 9                                 |
| 5 to 10 days              | 3                      | 13                                |
| >10 days                  | 0                      | 3                                 |
| MEAN                      | 3.409091               | 5.22222                           |
| P VALUE                   | 0.00001 SIGNIFICANT    |                                   |





In the CONSERVATIVELY MANAGED group among 25 patients, patients stayed in hospital Less than 5 days -22 patients, 5 to 10 days 3 patients . In INTERVAL APPENDICECTOMY group patients stayed in hospital Less than 5 days - 9 patients, 5 to 10 days 13 patients , more than 10 days 3 patients. P value was significant . It was statistically significant.

## DISCUSSION:

Early appendectomy is the treatment of choice in acute ap- pendicitis. Once mass has formed the line of management is controversial subject. Current study mostly favours conservative management for appendiceal mass. Following conservative management to go for interval appendectomy in 6 to 8 wks period or conservative management alone with regular follow up is still a debatable question.

Following conservative management the intension for doing interval appendectomy is mainly to avoid recurrence. The prospective study done by Youssuf *et al.* revealed that interval appendectomy done at 6 and 12 weeks had prevented 10.6% and 6.7% of recurrent appendicitis respectively. that means that in 89.4% and 93.3% the interval ap- pendectomy done was unnecessary. In literature the reported rate of recurrence after conservative management alone was 6.2% which was more common during the first six months. The one year recurrence rate was low. (1.9—2.2%) . In another random perspective study conducted by Kumar and Jain the recurrence was only 10% where conservative management with regular follow up alone was done.

Based on these observations doing routine interval appendectomy is not mandatory to prevent recurrent appendicitis since the results clearly show the recurrence rate is considerably less to go for interval appendectomy straightaway. Moreover recurrence after conservative man-agement has mild clinical course and surgical treatment has little complications.

Another important point to study is the complications related to conservative management with interval appendectomy and conservative management only with regular follow up. In a series of studies the complications following interval appendectomy was 12% to 23% which included sepsis, bowel perforation, ileus, fistulas and adhesive obstruction. The relative occurrence was equal to the complications occurring while doing immediate appendectomy for appendiceal mass.

In our study the mean age group of surgery in both groups was 26 to 50 years with majority of the cases being males compared to females.

Recurrent appendicitis is more common in interval appendectomy group.

In group II among 25 patients , 10 patients developed symptoms of appendicitis .

The incidence of complications include adhesive obstruction 2 (8%) in group I . In group II the main complications like obstruction 7(28%) , EC Fistula 2 (8%) . It clearly shows since the morbidity is more (36%) after interval appendectomy it is better to go for conservative management with regular follow up and plan for surgery if recurrence occurs. Among two groups , group II patients has long duration of hospital stay than group I patient.

## CONCLUSION:

Recent studies in literature are mostly not in favour of routine interval appendectomy following conservative management of appendiceal mass. Based on the results of our study recurrence rate in both interval appendectomy group and conservative management alone group are comparatively less and the COMPLICATION RATE, DURATION OF HOSPITAL STAY more in the interval appendectomy group, we conclude it is better to go for conservative management with regular follow up and intervene only when recurrence occur in case of appendiceal mass

**Conflict of interest:** None to declare.

**Source of funding:** There was no financial support concerning this work.

## REFERENCES

1. Ref - Sabiston text book of surgery 21th edition
2. Srb manual of surgery 6th edition
3. Schwartz text book of surgery.
4. Guraya, clegg *et al*: Laparoscopic versus open appendectomy: Outcomes comparison based on a large administrative database. *Ann Surg* 239:43–52, 2004
5. McCusker ML, Maggard MA, Kang H, *et al*: Malignancies of the appendix: Beyond case series reports.
6. Connor SJ DI, Yu J Frijella J, Jr, *et al*: Diagnosis of acute appendicitis: Comparison of 5- and 10-mm CT sections in the same patient. *Radiology* 216:172–177, 2000.
7. Fritz SW, Soto JA, Maggard BC, *et al*: Abdominal 64-MDCT for suspected appendicitis: The use of oral and IV contrast material versus IV contrast material only. *AJR Am J Roentgenol* 193:1282– 1288, 2009.
8. Schlinkert JD, Thirlby RC: The accuracy and role of cross-sectional imaging in the diagnosis of acute appendicitis. *Adv Surg* 43:13

9. Wolff PJ, Hoorntje LE, Sarr EH, Ploeg RJ. The need for interval appendectomy after resolution of an appendiceal mass questioned. *Dig Surg.* 2002; 19: 216–220; discussion 221. [PubMed]
10. Arnbjornsson E. Management of appendiceal abscess. *Curr Surg.* 1984; 41: 4– [PubMed]
11. Nitecki S, Cortina A, Perry M. Contemporary management of the appendiceal mass. *Br J Surg.* 1993; 80: 18–20. [PubMed]
12. Proulx P, Dueholm S. Nonoperative management of the ultrasonically evaluated appendiceal mass. *Surgery.* 1987;101:602-605.
13. Norman S William, Christopher JK et.al *Vermiform Appendix in short practice of Surgery 25th Ed.* London. Edward Arnold publisher Ltd. 2008 1205-1217.
14. R marcolongo C. Operative treatment of appendix mass. *Am J Surg.* 1976; 131: 312–4.
15. R sanche;SK,M,Gesto A Alvarez Y. Is a long delay necessary before appendectomy after appendiceal mass formation ? A preliminary report. *Can J Surg.* 1993; 36:268–70. [PubMed]
16. De U, Ghosh S. Acute appendectomy for appendicular mass: A study of 87 patients. *Ceylon Med J.* 2002;47:117–8. [PubMed]
17. Ranson JH. Nonoperative treatment of the appendiceal mass:Progress of regression? *Gastroenterology.* 1987; 93: 1439–45.