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Original Research Article

A comparative study of early versus interval appendicectomy in cases of appendiceal mass

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Abstract: Appendicular mass is a common complication of acute appendicitis if treatment is delayed. The traditional treatment is conservative one followed by interval appendectomy, nowadays early surgical exploration of the appendicular mass can be done with satisfactory results. This study aims to:1- Compare early exploration versus Interval Appendectomy for Appendicular mass; 2. To identify and compare the morbidity associated with early and interval appendectomy. A Prospective study was conducted from December 2014 to Nov 2015 at Basaveshwara teaching and general Hospital, Gulbarga. Total of 50 patients, both sexes with symptoms and signs consistent with appendicular mass were included. They were divided into group I (Early exploration) and group II (Interval appendectomy) each containing 25 patients. There was a peak incidence of acute appendicitis in 2nd and 3rd decades of life. Male to female ratio was 2.8:1. All patients in-group I had mass formation, 88% patients in-group II had recurring symptoms. Operative problems were more pronounced in-group I showing statistical significance. The complications though it was noted only in-group I did not show any statistical significance. There was a significant less duration of hospital stay in-group I as compared to group II. The observations and outcome in this study are comparable and correspond with other studies done in this regard. The following conclusion can be drawn from this study: Early surgical exploration of appendicular mass is safe and cost effective with no significant difference in rate of complications and patient compliance is better.
Keywords: Appendicular mass; Early Exploration; Interval appendectomy

INTRODUCTION

Acute appendicitis is the commonest cause of "Acute Surgical Abdomen [1]. It is the most common condition as an indication for emergency abdominal surgery in Basaveshwara Teaching and General Hospital, Gulbarga, Although Fitz first definitively described acute appendicitis and its operative treatment in 1886, and early diagnosis continues to present difficulties till now [2].

The acute appendicitis not presented early to clinicians or due to delay in diagnosis, on the third day (rarely sooner), a tender mass can frequently be felt in the right iliac fossa [2, 3].

Perforation and abscess formation are rare in the beginning. After 48hrs of onset of symptoms it may be as high as 80%[2]. Occasionally a walled off perforated appendix will form an inflammatory mass. Usually there is history of 4 or 5 days of pain abdomen [1]. This condition probably is being seen less commonly now as a result of improved health education [1]. In various series, the incidence of appendicular mass ranges from 2% to 6% of cases of acute appendicitis [4].

Pathologically it may present as a spectrum ranging from phlegm on to abscess, failure to diagnose properly may lead to spread of infection and lead to lethal peritonitis. Timely surgical intervention and proper, judicious use of antibiotic drugs may reduce morbidity & mortality.

The patient may present with history of pain abdomen first, felt around umbilicus and radiates to the right iliac fossa [3]. A tender mass can frequently be felt in the right iliac fossa beneath some rigidity of the overlying musculature, other quadrants of the abdomen being free from rigidity or tenderness [3].

The mass, which at this time is not yet an appendicular abscess is composed mainly of the greater omentum, edematous caecal wall and edematous portion of the small intestine, in its midst is a perforated or otherwise inflamed vermiform appendix [1]. By fourth or fifth day the mass becomes more circumscribed. As rigidity passes off its periphery can

be defined clearly [3].

During the ensuing days (5 to 10th day) the swelling either becomes larger and an appendix abscess results or it becomes smaller and subsides slowly as inflammation subsides.

However all surgeons are not unanimous regarding the management of appendix mass, many surgeons use non-operative and expectant method, originally proposed by Oschner and Sherren. Some believe that the interval appendectomy is superfluous procedure, where as others suggest that mass be treated with appendectomy. When appendicular abscess with signs of toxemia are present, incision and drainage is performed. In either case the appendix can be removed after a quite interval of usually 6-8wks. The morbidity and mortality rates in appendicitis are greatly increased when gangrenous perforation causes peritonitis & wound infection following surgery. Therefore it is obvious that aim of surgeon must be to prevent mortality and morbidity by early diagnosis and performing appendectomy before perforation or gangrene has occurred or late complications like abscess has formed.

AIMS AND OBJECTIVES

1. A comparison of Early Exploration versus Interval Appendicectomy in management of appendicular mass.
2. To identify and compare the morbidity associated with early and interval appendectomy.

MATERIALS AND METHODS

The study is done in 50 patients with appendicular mass who presented to SURGERY OPD/ EMERGENCY, at Basaveshwar Teaching and General Hospital, Gulbarga, from December 2014 to November 2015. Our study is a clinical, prospective and comparative study conducted during the period of December 2014 to November 2015.

Method of Collection of Data

The study is done after obtaining a detailed history, complete general physical examination and systemic examination. The patients are subjected to relevant investigations like Hb, TC, DC, urea, creatinine, serum electrolytes, urine routine, USG abdomen and HPE of the operative specimen.

All investigations and surgical procedures were carried out with proper informed written consent as appropriately. The data regarding patient particulars, diagnosis, investigations, and surgical procedures is collected in a specially designed case recording form and transferred to a master chart subjected to statistical methods like mean, standard deviation, proportion, percentage calculation and Fisher exact and t test are used.

Inclusion Criteria:

1. All cases of Appendicular Mass diagnosed clinically and radiologically in the study period between December 2014 to November 2015
2. Age 14 years and above.

Exclusion Criteria:

1. Acute appendicitis with no mass.
2. Signs and symptoms suggestive of appendicular perforation.
3. Patients unfit for surgery.
4. Patients not willing for surgery.

MODE OF STUDY:

This prospective study was conducted at Basaveswara teaching and general hospital Gulbarga. A total of fifty patients were included thorough history and clinical examination was made. Complete blood count; urine analysis; urea and electrolytes; plain x-ray abdomen; and ultrasonography of abdomen and other investigations as per need of the patient were done. The patients were divided in two groups, each containing twenty five.

In group I

In group I early surgical exploration was done within 24 hrs of admission. Pre-operative preparation was done by keeping the patients nil orally, giving adequate parenteral fluids to maintain fluid and electrolyte balance, antibiotics and analgesics. Drains were kept in a few cases which were removed after 48hrs and sutures were removed on the 8th - 10th post-operative day. Most of the operated patients had uneventful recovery. Post-operative period was monitored; intake output charts and vital charts were maintained.

In group II

Conservative approach with Oschner Sherren Regime was adopted followed by interval appendectomy 6-8 weeks later. Patients in both study groups were discharged as soon as possible and duration of stay was noted. There was no mortality noted in either group.

The patients were followed up for a variable period of time.A full record of all the patients was maintained on the proforma designed for this purpose.

OBSERVATION AND RESULTS

In our study, 50 cases of appendicular mass who attended surgical emergency/ outpatient were selected between Dec 2012 to Nov 2014 and were divided into two groups, Group I- EARLY and Group II- INTERVAL, each containing twenty five.

Table 1: Age Wise Distribution of Study Subjects

Age in yrs.	GROUP I N (%)	GROUP II N (%)	Total
14-25	9 (36)	10 (40)	19
26-35	5 (20)	6 (24)	11
36-45	4 (16)	8 (32)	12
46-55	5 (20)	1 (4)	6
56-65	2 (8)	0	2
Total	**25 (100)**	**25 (100)**	**50**

In our study of 50 cases, the patients were divided into two groups. In group I the mean age of study subjects was 35.12 years ranging from 14 to 65 and majority of patients (36%) belonged to age group of 14-25 years. In group II the mean age of study subjects was 29.5 years ranging from 14 to 46 and majority of patients (40%) belonged to age group of 14-25 years.

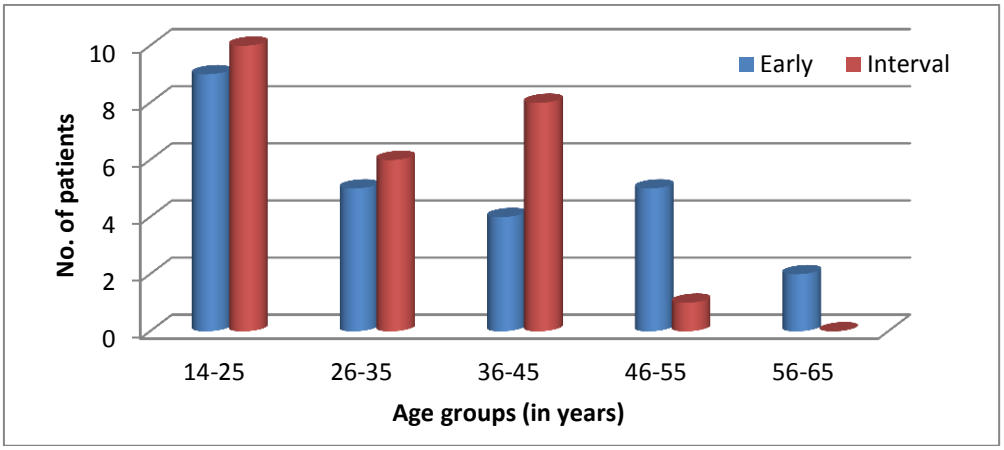

Fig 1: Age wise distribution of study subjects

Table 2: Sex Wise Distribution of Study Subjects

Sex	Group I N (%)	Group II N (%)	Total
Male	18 (72)	19 (76)	37
Female	7 (28)	6 (24)	13
Total	**25 (100)**	**25 (100)**	**50**

In our study there was male preponderance 18/25 (72%) with male to female ratio of 2.6:1 in-group I. There was male preponderance 19/25 (76%) with male to female ratio of 3:1 in-group II also.

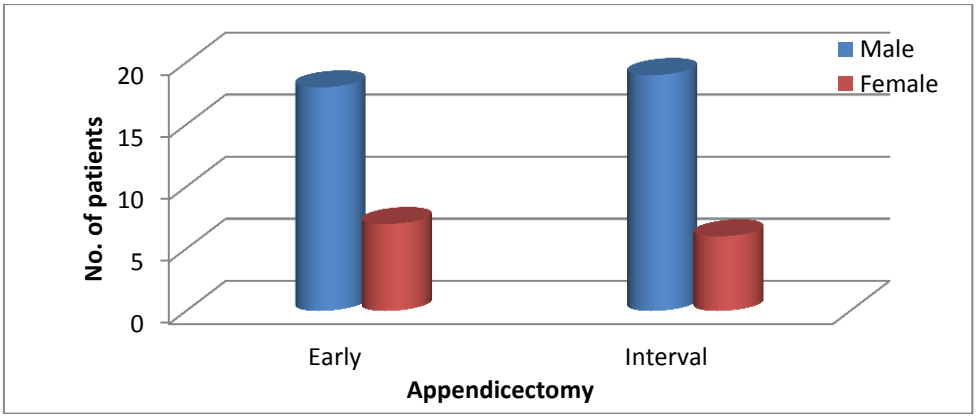

Fig 2: sex wise distribution of study subjects

Table 3: Comparison in Duration of Symptoms

Duration in days	GROUP I N (%)	GROUP II N (%)	Total
0-2	0	21 (84)	21
3-5	16 (64)	4 (16)	20
6-8	9 (36)	0	9
Total	**25 (100)**	**25 (100)**	**50**

In our study majority of patient's in-group I (64%) presented between 3-5 days of onset of symptoms. With mean being 5 days and ranging between 3 to 7 days.

In-group II majority of patients were readmitted (88%) with symptoms at the end of 6 weeks. 81.8% between 1-2 days of onset of symptoms, with mean of 1.76 days and ranging from 1 to 5 days.

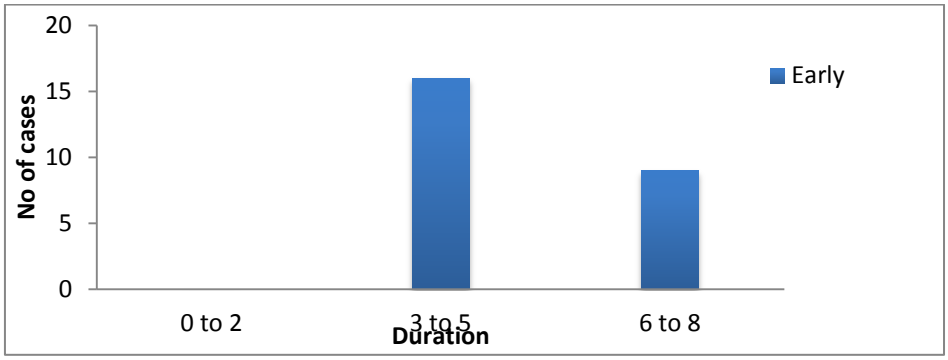

Fig 2: comparison in duration of symptoms

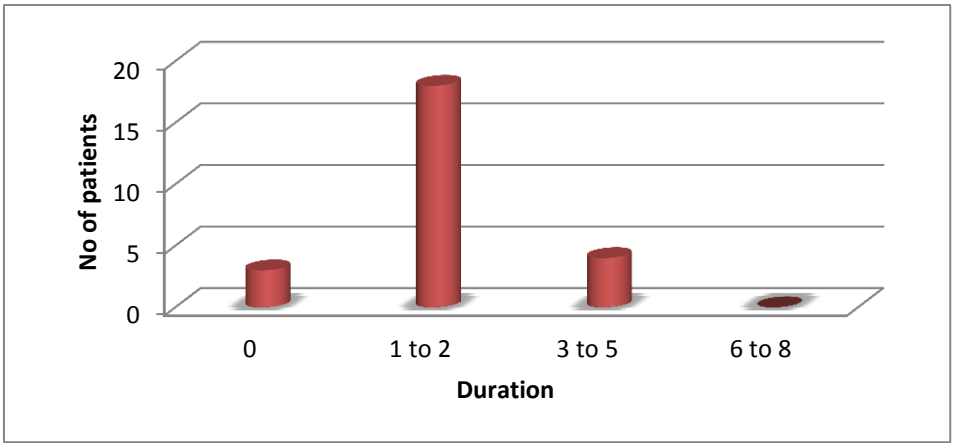

Fig 4: comparison in duration of symptoms

Table 4: Comparison in operative findings

Operative findings	Group I n	Group II n
Mass	25	0
Gangrenous Appendix	10	0
Perforated Appendix	14	1
Inflamed Appendix	1	12
Adhesions	10	14
Loculated Pus	10	0

In group I, the operative finding in majority (100%, p = .000) of the patients was mass, 14/25 (56%, p =.000)) had perforated appendix, 10/25 (40%, p =.000) had a gangrenous appendix, adhesions and loculated pus was noted in 10 patients each. In group II the operative finding in majority (56%, p=.258) of the patients was adhesions, 12 (48%, p=.000) had inflamed appendix during interval appendicectomy and 1 patient had a perforated appendix.

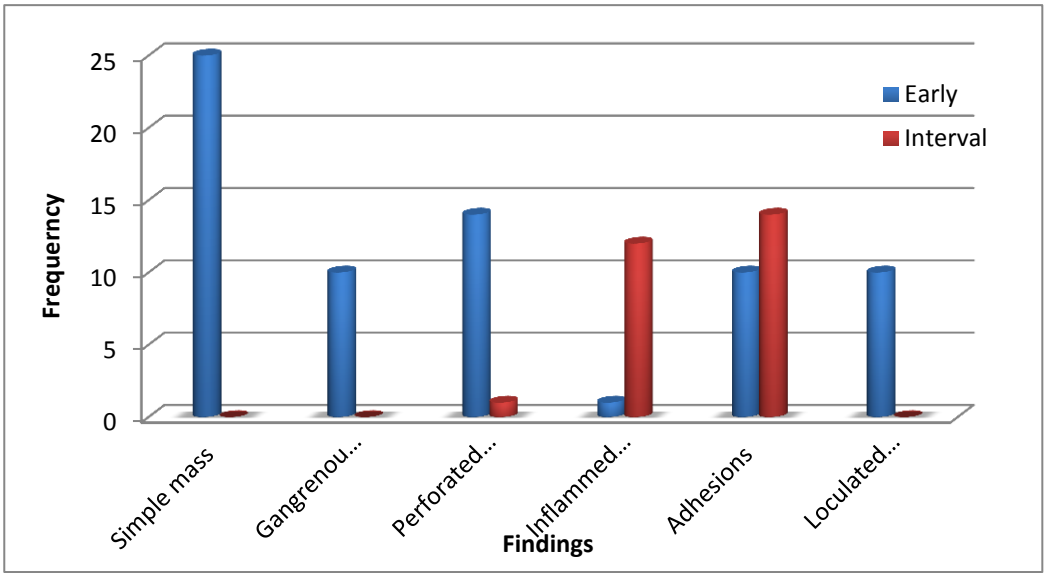

Fig 5: comparison in operative findings

Table 5: Comparison in Operative Problems

Operative Problems	Group I n (%)	Group II n (%)
Extension of Incision	16 (64)	1 (4)
Difficulty in localization of appendix	16 (64)	3 (12)
Difficulty in adhesiolysis	7 (28)	10 (40)
Bowel Trauma	5 (20)	1 (4)
Bleeding	8 (32)	1 (4)

In our study, the major 16/25 (64%, p=.000) operative problem in group I patients was difficulty in localization of appendix and extension of incision. Excessive bleeding was noted 8/25 (32%, p=.01).The major 10/25 (40%,p=.37) operative problem in group II patients was difficulty in adhesiolysis.

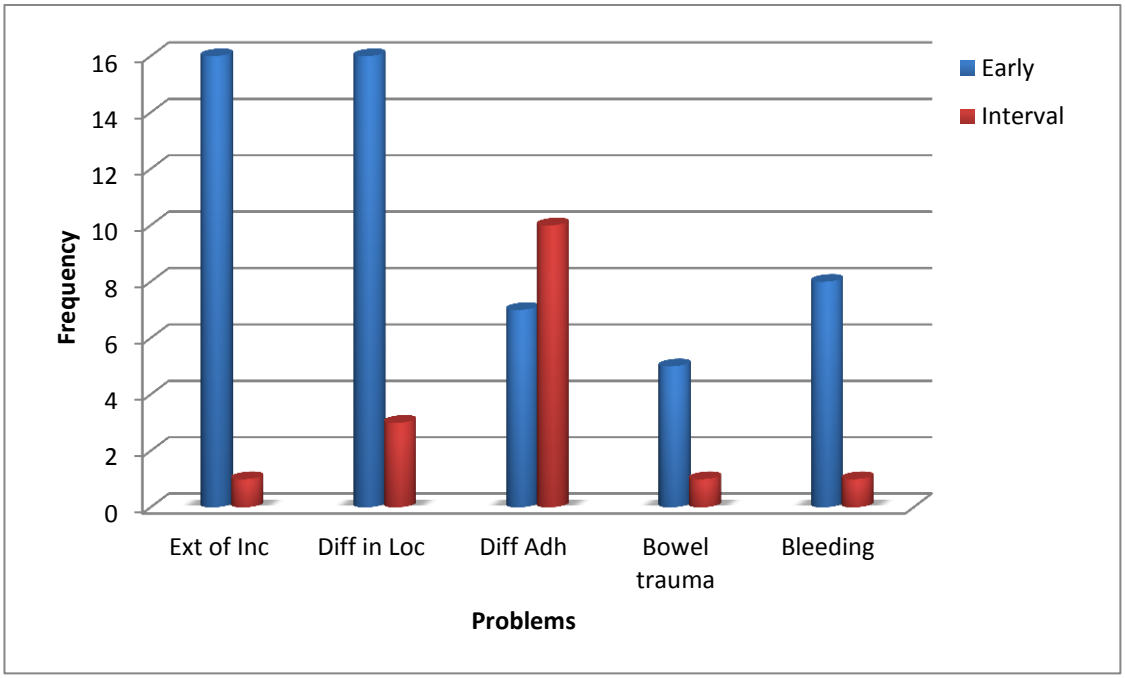

Fig 6: Comparison in operative problems

Table 6: Comparison of Complications

Complications	Group I n (%)	Group II n (%)
Wound infection	4 (16)	0
Hematoma	0	0
Delayed Bowel recovery	1 (4)	0
Fecal fistula	0	0
Chest Complications	0	0
Adhesive intestinal obstruction Total	0	0

In our study, complications were noted only in-group I, the major 4/25 (16%) complication was wound infection and 1/25 (4%) had delayed bowel recovery. The variables are neither collectively nor independently significant (p=.062).

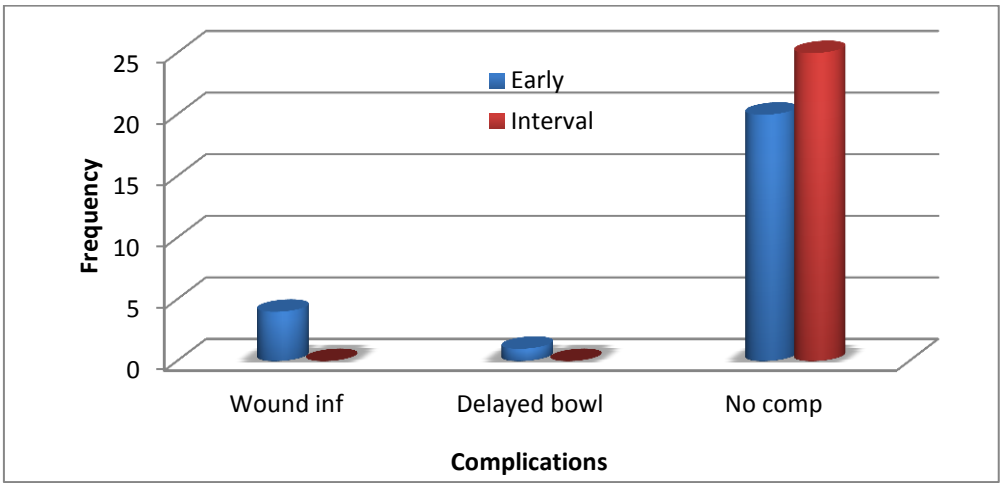

Fig 7: Comparison of Complications

Table 7: Post Operative Oral Feeds

GROUP	NUMBER	MEAN (days)
GROUP I	25	1.84
GROUP II	25	1.36

P value - .01

In our study the mean duration of post operative oral feeds for group I was 1.84 days and ranging from 1 to 3 days. In group II the mean duration of post operative oral feeds was 1.36 days and ranging from 1 to 3 days. The variables are statistically significant with p value being .01.

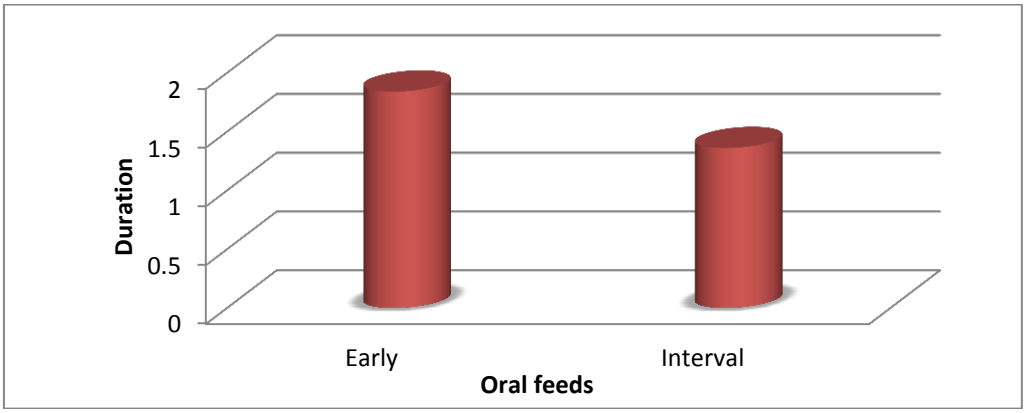

Fig 8: Post operative oral feeds

Table 8: Comparison in Duration of Hospital Stay

HOSPITAL STAY	GROUP I MEAN	GROUP II MEAN	P VALUE
POST OPERATIVE	6.84 days	3.68 days	.000
TOTAL	**7.16 days**	**11.40 days**	**.000**

In this study, the mean duration of post operative stay in-group I patients was 6.84 days which was significantly higher than that of group II (3.68 days and p value = .000).

The mean duration of total stay in group I patients was 7.16 days which was significantly lower than that of group II (11.4 days, p value = .000) considering two separate admissions in group II patients.

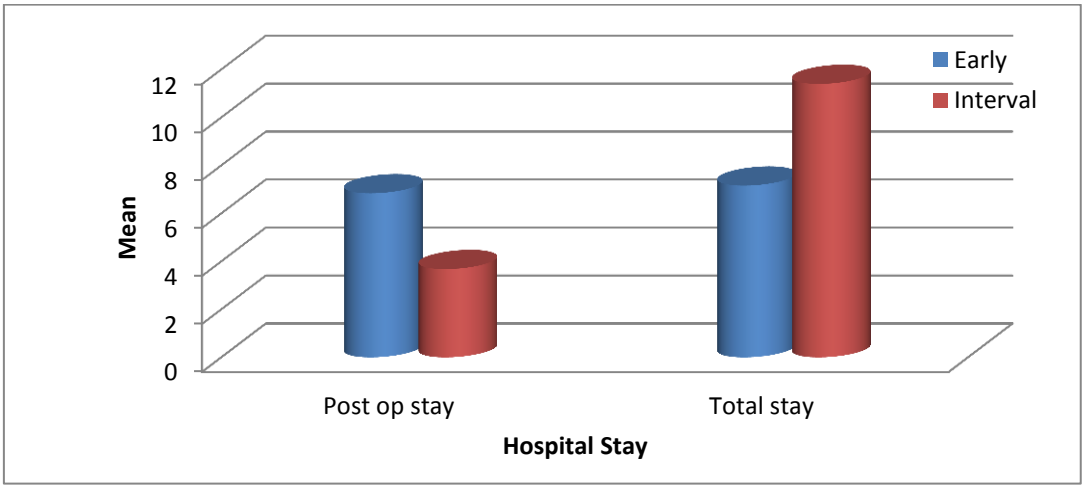

Fig 9: Comparison in duration of hospital stay

DISCUSSION

A total of 19 (38%) patients in this study were between 14 to 25 years of age. The next came between 36 to 45 years of age. These results are comparable with other studies where peak incidence of acute appendicitis was in second and third decades of age [5, 6]. The male to female ratio of 2.8:1 is also comparable with another study where males are more commonly affected [5]. 16 patient's in-group I had symptoms lasting for 3 to 5 days with a subsequent finding of mass on operative table, which is consistent with the literature. Appendicular mass was the most consistent finding 100% in group I, the cause for the mass formation was found to be gangrenous appendix in 10 (40%) of cases, perforated appendix in 14 (56%) [4]. In-group II 88% of patients had symptoms following initial conservative management. Inflamed appendix was noted in 12 (48%) patients and perforated appendix in 1 patient. The operative problems such as localization of appendix 16 (64%), extension of incision 16 (64%) and bleeding 8 (32%) are more pronounced and troublesome in-group I with p value being .000, .000, and .01 respectively, figures am consistent with other studies. Difficulty in adhesiolysis was the commonest operative problem encountered in-group II 10 (40%, p = .37) [7]. Post operative oral feeds were started between 1-3 days with mean being 1.84 in group I and 1.36 in group II showing statistical significance, p = .01. Though post operative complications like wound infection 4 (16%) and delayed bowel 1 (4%) movement were noted only in group I patients none of the variables were independently or collectively significant and finding of 16% wound infection is consistent with another study [7]. Fecal fistula the most dreaded complication was not noted in our study. Overall hospital stay of group II patients 11.4 days was significantly higher than that of group I 7.1 days, p= .000.

CONCLUSION

Appendicular mass is more common in males. Age of presentation of appendicular mass most commonly is 2nd and 3rd decade. Ultrasound is the investigation of choice in patients with appendicular mass. Though there were significant differences in the operative problems faced between the two lines of management studied here. There was no significant difference in the complications between the two groups with complications occurring in-group I patients. The total duration of hospital stay was significantly more in-group II patients than in-group I, hence increasing the economic burden on the patient.

Low morbidity, reduced hospital stay, low cost and patient compliance favor operative management of appendicular mass by experienced surgeons thus obviating the old practice of conservative

treatment followed by interval appendectomy.

SUMMARY

In our comparative study a total of 50 patients were studied ranging from 14 to 65 years of age who presented with appendicular mass.

The patients were subdivided into two groups, early group and Interval group based upon timing of surgery:

1. Early group- Same admission. Within 24 hrs of admission.
2. Interval group- 6 weeks following initial conservative treatment.

Parameters studied were comparison of operative findings, comparison of intraoperative problems faced, comparison between incidence of postoperative complications and duration of hospital stay. The study yielded significantly more operative findings and operative problems faced among group I patients compared to group II patients.

In spite of the above, the ultimate postoperative complications were not significant and that apart group II patients had a significantly longer duration of hospital stay compared to group I patients increasing the economic burden on patients. Hence this study favors Early appendectomy for appendicular mass as there is no significant postoperative morbidity with significantly shorter duration of hospital stay, thereby causing less financial to the patient and achieving early cure of the disease.

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