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INTERVAL APPENDICECTOMY – ANTIBIOTICS VS NO ANTIBIOTICS POST OPERATIVELY FOR PREVENTION OF WOUND INFECTION

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Abstract

Background– Acute appendicitis is the most common cause of acute abdomen presenting in emergency. An undertreated case may present later on as an appendicular lump. The treatment approach for an appendicular lump is conservative followed by interval appendicectomy. Our study aims to find out the outcome after interval appendicectomy in patients receiving antibiotics as compared to placebo.

Materials and methods– an RCT involving 60 patients who underwent interval appendicectomy, were divided into two groups, one receiving antibiotic and the other receiving no antibiotics. The study was conducted in the dept. of General Surgery, VIMSAR, Burla from Feb 2013 to January 2015.

Results-The majority of patients in the study were males (66.6%) and 33.3% were females, bringing the male to female ratio 2:1. Among the total 60 cases, in 66.6% from group 1 (treated with antibiotics) and in 83.33% from group 2 (without antibiotics coverage) the incision was Gridiron; Rutherford Morrison incision was given in 16.66% from group 1 and 10% from group 2. While doing the surgery, technical difficulty in mobilization of appendix came across in 33% among group 1 and 40% in group 2. 23.33% from group 1 and 33.33% from group 2 developed the symptoms like pain or/and fever on post-operative day 2 while 6.66% and 3.33% from each group developed their symptoms on day 3 and 4 respectively. However, there was no symptoms after day 4. Surgical site infection occurred in 20% among the placebo group and only 6.66% in antibiotic group. Among the 20%, 13.33% of group 2 had superficial surgical site infection and 6.66% had deep skin infection.

Conclusion – The study showed that, the incidence of surgical site infection was more among the group in which antibiotic treatment was not given. It also depends upon the early surgical intervention, surgical techniques and post-operative care.

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Keywords – Acute appendicitis, Appendicular lump, Antibiotics, Interval appendicectomy, wound infection.

Introduction – Acute appendicitis is the most common cause of acute abdomen (1). Appendicectomy is the definite treatment for any severity of appendicitis and is one of the commonest performed surgeries in emergency. Acute appendicitis refers to a distinct entity pathologically characterized by acute transmural inflammation of the appendix. Appendicectomy is preferred within hours of acute attack, thereby life is saved, complications are avoided and loss of working man hours is minimized.

Previously, it was thought that a simple appendicitis could progress towards a complex one over time, but more recent data suggests that both entities represent distinct types of inflammation. 25-30% of all patients presenting with appendicitis have a complex appendicitis which is associated with increased risk of post-operative infections and complications.

Appendicular lump develops due to late presentation (several days to weeks) after onset of acute appendicitis. While surgery is the mainstay of treatment in a patient with acute appendicitis, in those with appendicular lump, a conservative approach is beneficial in about 90% of patients. This approach is based on the premise that the inflammatory process is already localized and that inadvertent surgery is difficult as it may be impossible to find out the appendix. In a stable patient with appendicular lump, the standard treatment is the conservative Ochsner-Sherren regimen. It encompasses monitoring of the pulse rate, temp., every 4 hourlies, measuring the size of the lump and administration of broad-spectrum antibiotics. A rising temperature, pulse rate, increasing lump size and pain are the criteria to stop conservative management.

However, a quarter of patients initially treated conservatively will require surgery within a year for “recurrent appendicitis”. Thus, comes the need of “interval appendicectomy”. The rationale behind interval appendicectomy is the potential for development of recurrent appendicitis and the subsequent complications associated with it like perforation. Some investigators also report that interval appendicectomy can help reveal unexpected neoplastic changes especially in adults.

Despite improved asepsis and surgical techniques, post-operative complications such as wound infection and intraabdominal abscess still account for significant morbidity [2]. Use of prophylactic antibiotics is recommended in patients in whom appendicectomy is planned. Post-operative antibiotics may be unnecessary in unruptured appendix (uncomplicated appendicitis) but due to fear of developing SSI and sepsis, post-operative antibiotics are routinely administered. This is associated with not only increased cost of treatment but also emergence of drug resistant bacteria.

Our study aims to investigate whether there is any role of antibiotics in minimizing complications in patients undergoing interval appendicectomy after treatment with antibiotics for the initial attack of appendicitis.

Aim – Primary - To study the role of antibiotics on the incidence of wound infection in patients undergoing interval appendicectomy as compared to taking no antibiotics.

Secondary – To find out the demographic variables (gender, age) and the duration of hospital stay associated with it.

Materials& Methods –

Study design– Randomized Controlled Trial

Sampling – Simple random sampling

Study period – 24 months; February 2013 to January 2015

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Place of study– Dept. of General Surgery, VIMSAR, Burla.

IEC no – 16/13 of the institutional ethics committee, VIMSAR, Burla

Sourceof data – Patients admitted to the dept of general surgery, VIMSAR, Burla

Inclusion criteria – The following criteria were set for including participants for the study -

1. Patients diagnosed with appendicular lump earlier
2. Age group 1-70 years
3. Patients who had informed consent

Exclusion Criteria –

1. Patients with medical illness like diabetes mellitus, severe anaemia, tuberculosis, coronary artery diseases.

Clinical Diagnosis after thorough history taking and examination was tried to be achieved in the preoperative period. In female patients, gynaecological conditions mimicking appendicular lump/ acute appendicitis were ruled out. Blood investigations and radiography of the abdomen was done along with USG scan

A total of 60 patients, who had come for interval appendicectomy, were taken and randomly divided into 2 groups with 30 patients in each group. One of the groups (Group 1) received broad spectrum antibiotics after appendicectomy. The other group (Group 2) received no antibiotics.

After taking proper consent, patients were planned for interval appendicectomy. Prophylactic I.V. ceftriaxone 1g , was administered 30 minutes before skin incision in all the cases. Open appendectomy was done in all the cases.

Operative procedure – McBurney's gridiron incision was chosen for interval appendicectomy. However, in difficult cases, either a Rutherford Morrison incision was made or a lower midline. Peritoneal lavage with Normal saline was done in cases with localized collections. Wound was irrigated with Normal saline and Povidone Iodine to skin closure.

Post-operative – wounds were inspected on POD 2, i.e. after 48 hours and then on every alternate day till the removal of sutures.

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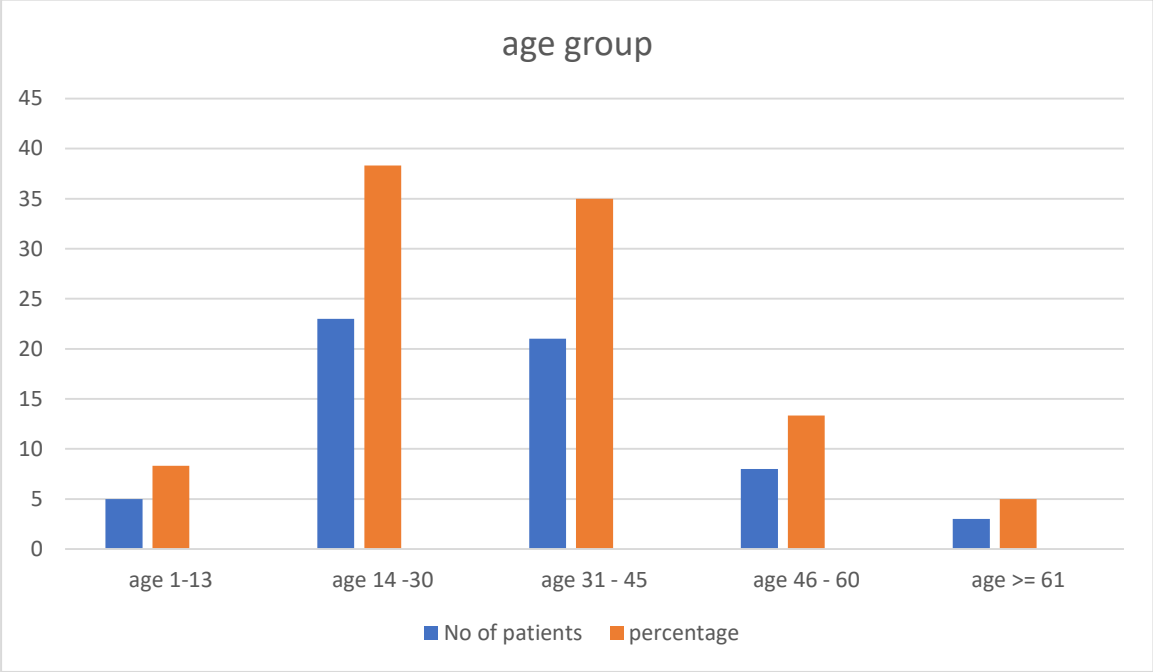
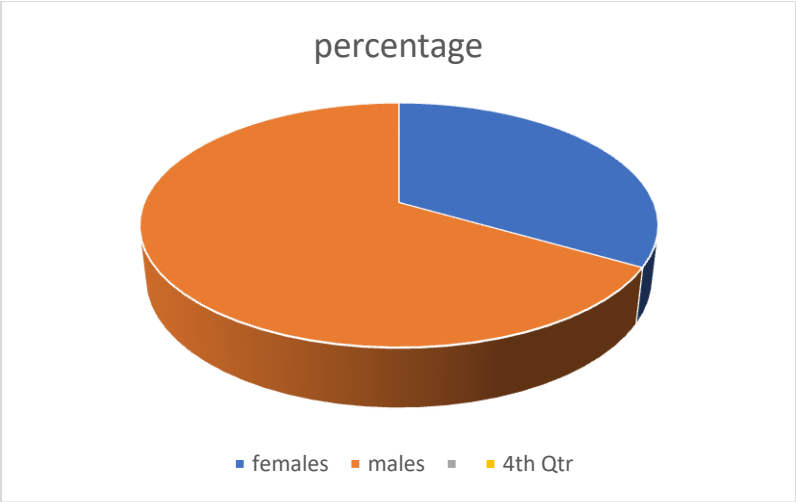
Observation –

1. Age group of patients – the peak incidence of interval appendicectomy was observed in the age group 14-30yrs.



2. Sex distribution of patients – The majority of patients in the study belonged to the age group 14-30 years of which 66.6 % were males and 33.3% were females, bringing the male to female ratio 2:1.



3. Type of incision – Among the total 60 cases, in 66.6% from group 1 (treated with antibiotics) and in 83.33% from group 2 (without antibiotics) the incision was Gridiron, Rutherford Morrison incision was given in 16.66% from group 1 and 10% from group 2. The incision of choice was right lower paramedian in 16.66% from group 1 and 6.66% from group 2. In patients presenting with features of SAIO, a right paramedian incision was preferred.

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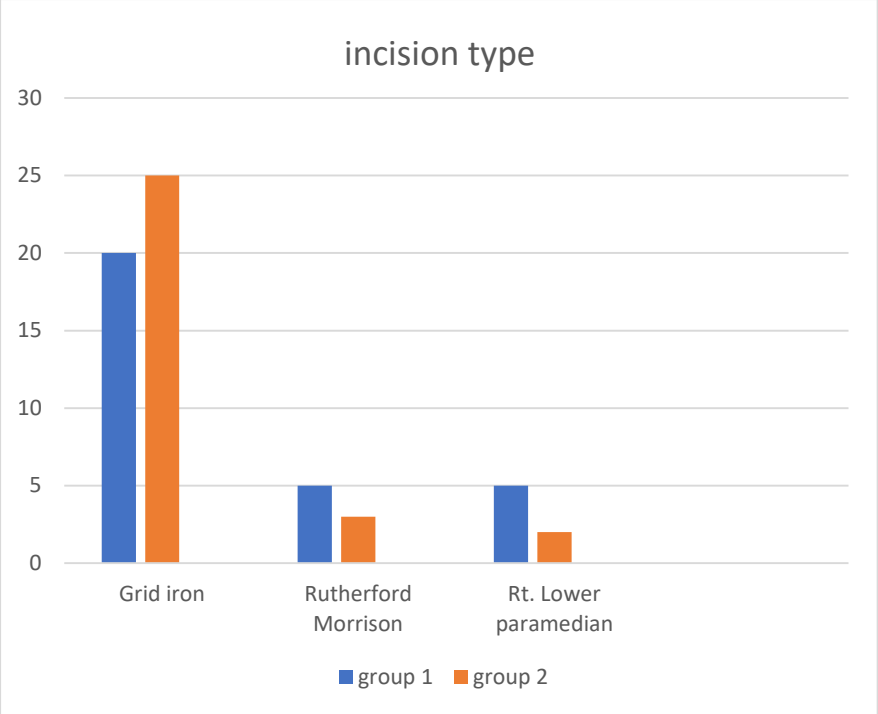
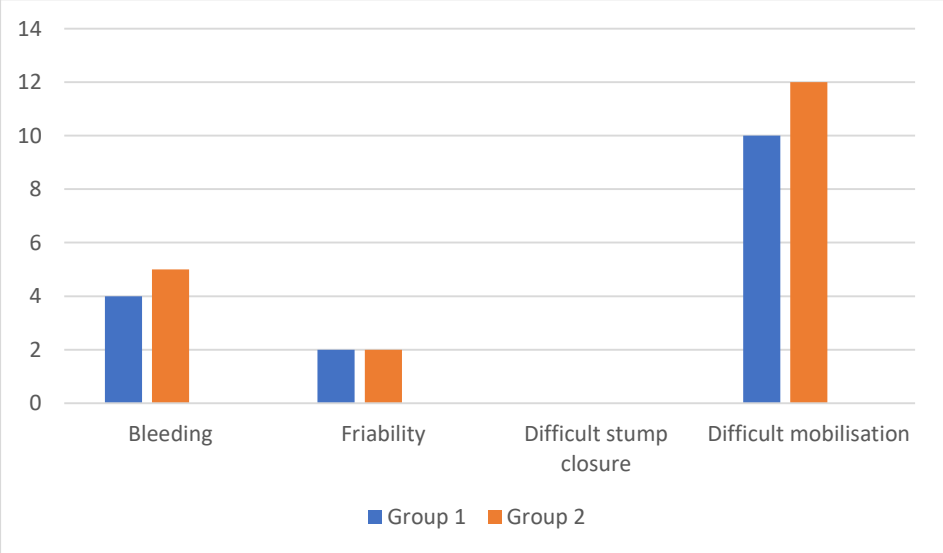


4. Intra op challenges and complications –most common challenge during interval appendicectomy in both groups was difficulty in mobilization of appendix due to adhesions.



5. Immediate post op complications – post op pain & fever were mostly seen after POD-2, slightly more in the group receiving no antibiotics. We tried to see the post-operative day at which the patients developed pain and or fever. 23.33% from group 1 and 33.33% from group 2 developed the symptoms like pain or/and fever on post-operative day 2 while 6.66% and 3.33% from each group developed their symptoms on day 3 and 4 respectively. However, there was no symptoms after day 4.

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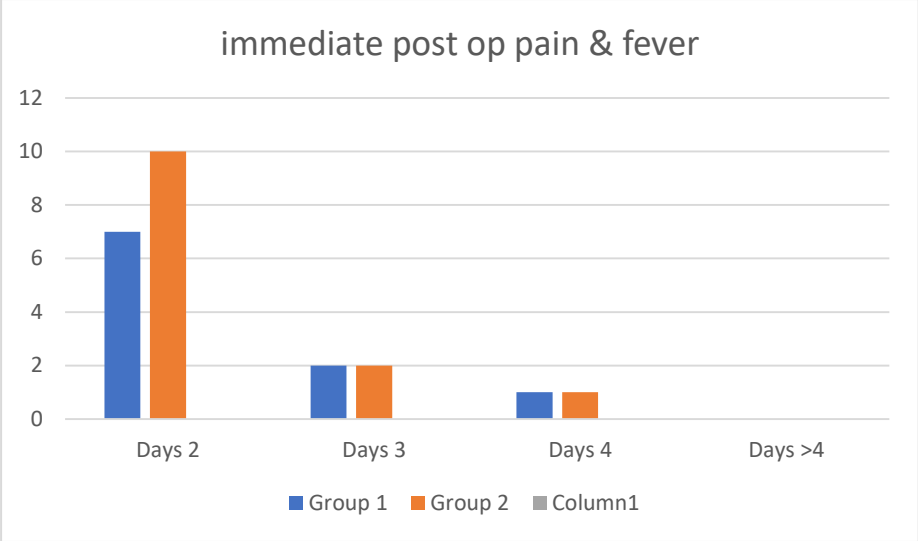
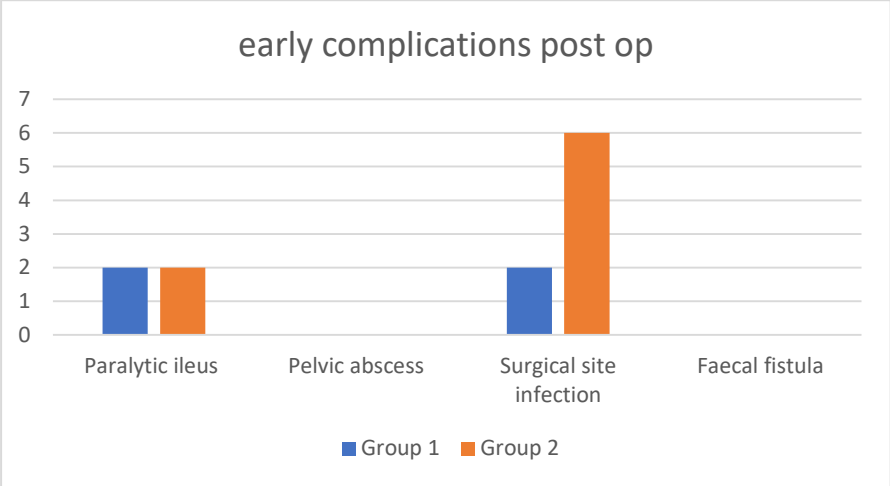
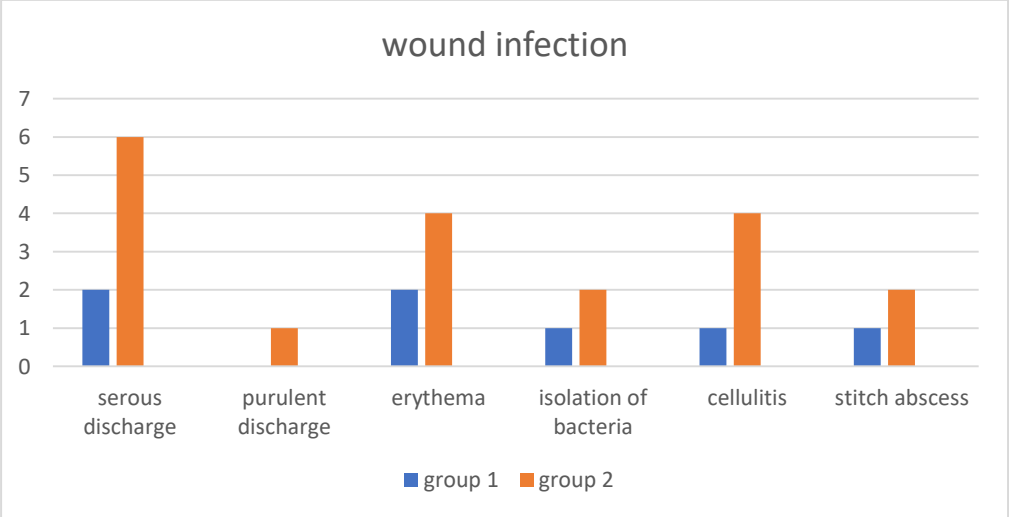


6. Early post op complications –Surgical site infection was at 20% in group 2, compared to 6.66% in group 1. Early complications like paralytic ileus was found in each group equally, i.e. 6.66%.



7. Comparison of wound infection at wound site – incidence of discharge from wound site, cellulitis and stitch abscess were more common in the group receiving no antibiotics.



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	Group 1	Group 2
Superficial skin infection	2	4
Deep skin infection	0	2

Duration of hospitalization from the day of surgery –

No. of days	Group 1	Group 2
8	20	8
9	4	12
10	0	2
11	0	2
12-15	2	6

Discussion–

Non judicious use of antibiotics is a risk factor for the emergence of antibiotic resistant bacteria. An inadequate dose of antibiotics may lead to wound infection, whereas prolonged use of antibiotics can cause antibiotic resistance. Thus, the operating surgeon must take a rational decision on the use of antibiotics.

A decision to perform appendicectomy can be reached clinically with the help of the **Alvaradoscoring system**.

FEATURE	POINTS
1. Migration of pain	1
2. Anorexia	1
3. Nausea/ vomiting	1
4. Tenderness	2
5. Rebound Tenderness	1
6. Elevated Temperature	1
7. Leucocytosis	2
8. Shift to left	1
Total	10

A score less than 4 is unlikely a case of appendicitis,
A score of 5-6 implies possible appendicitis,
A score of 7-18 implies probable appendicitis,
Score of 9 or more is very probable of appendicitis.

An acute appendicitis can further present as an appendicular lump or as an abscess. AAST classifies appendicitis into:
Grade 1 – Acutely inflamed appendix,
Grade 2 – Gangrenous intact appendix,
Grade 3 – 5 – Complicated cases.

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Our study was carried out in 60 consecutive cases of interval appendicectomy. These 60 cases were randomly categorized in to two groups of 30 patients each. Patients in Group 1 received antibiotics while those in group 2 received no antibiotics. The idea being to find out the outcome of wound managed by the two modalities, so that a conclusion may be drawn as to which treatment plan is better.

The age of the patients in group 1 & group 2 ranged from 11-70 yrs. The peak incidence for interval appendicectomy was in the age group 14-30 years. So, it is evident that the incidence of appendicitis is common in the 2nd and 3rd decades of life. In a study by Shrestha, R Et al. (2012) the mean age group was found to be 11-30 years[3]. A study by Korner,H et al found the incidence to be highest in the age group 13-40 years [4]. Further, a study by HP Lohar et al found the mean age group as 11-40 years [5]. These studies strengthen our findings.

Males were 2/3rd in both the groups while females were 1/3rd. This 2:1 ratio of males to females was similar with the observation by Garg et al. (1997). A ratio of 1.86:1 was reported by Satardey RS et al in 2018. [6][7]

All the patients were advised for interval appendicectomy after a period of 6-8 weeks from the initial attack of acute appendicitis. Recurrent attack was seen in 3 cases (5%) during follow up. Independent studies have reported a recurrence rate from 8-10%.
60% of patients came for interval appendicectomy. 40% failed to comply. In a study by Gahukamble et al, the attrition was 30% . The higher non-compliance in our study may be attributed to the rural population, with lower literacy rate. [8][9]

Regarding the decision of type of incision, good exposure without contaminating the peritoneal cavity was the priority. Wherever necessary, a Gridiron incision was converted to a muscle cutting Rutherford Morrison modification. In patients presenting with SAIO, a right paramedian incision was preferred.
Omentum was found adherent to the caecum & appendix in 10 cases of group 1 and 12 cases of group 2. Hence, mobilization of appendix was difficult in these cases. 4 cases, 2 belonging to each group presented with the challenge of friability. Bleeding was a problem with 9 cases in total, from both the groups because of friability and in cases where appendix was removed retrogradely due to inflammatory adhesions. This was consistent with finding of Kaya B & et al [10]. Minimum manipulation was done and haemostasis was achieved as much as possible.

Immediate post op complication in both the cases was pain & fever which got mostly relieved by POD-3.

In our study paralytic ileus and SSI were the observed early complications after interval appendicectomy. While paralytic ileus incidence was 6.6% in both the groups, SSI was at 20% in the group not receiving any antibiotics. Similar data were obtained by a study by Katsuno G , et al. [11] 6.6% in group 1 had superficial skin infection ,compared to 13.33% in group 2.

Patients mostly got discharged in 8-9 days and almost all by 12-15 days. A study by Kumar B et al in 2008 showed that the duration of hospital stay was 6 days[12]. This result was slightly better compared to our study.

Interval appendicectomy though recommended by various surgeons, it might not be feasible for a patient from a remote village to turn up for the same or he might come up with more

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serious complications like peritonitis and lump. Thus, the disease burden of our country increases.

Conclusion – It can be concluded after this study that wound infection can be reduced in patients undergoing interval appendicectomy by administration of perioperative broad-spectrum antibiotics.

Thus, the duration of hospital stay is reduced

Conflict of interest – none

Funding – No funding sources

Ethical Approval – The study was approved by institutional ethics committee. 16/13.

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