ORIGINAL PROF-803

APPENDICECTOMY;
NON-INVAGINATION VS. INVAGINATION OF APPENDICULAR STUMP

GP/CAPT NAEEM SHAHID,
MBBS, FCPS
Department of Surgery,
PAC Hospital Kamra.

DR. KHALID IBRAHIM,
MBBS, FCPS
Department of Surgery,
PAC Hospital Kamra.

ABSTRACT... lnaeemsurg@hotmail.com **Objectives:** To find out the benefits of invagination of stump during appendicitis.(2) Acute appendicitis is the most common abdominal emergency requiring emergency surgery. **Design:** A prospective randomized clinical trial .**Period:** From Oct 2003 to Mar 2004 **Setting:** PAC Hospital Kamra, **Patients & Methods:** A prospective randomized study including 200 patients undergoing appendicectomy was carried out to see any advantage of invagination of appendicular stump. **Results:** A total of 200 operated cases of acute appendicitis were divided in two groups of 100 cases each. In Group A, there were 59 males and 41 females. The youngest patient was 5 years old while the eldest was 63 years old. Maximum patients belonged to 2nd and 3rd decade . In Group B, there were 63 males and 37 females . The youngest patient was 5 years old while the eldest was 57 years old. Maximum patients belonged to 2nd and 3rd decade. **Conclusion** It was seen that there was no added benefit of invagination of appendicular stump, rather it took more operative time, and at times, it was hazardous to do so.

Key words: Appendicitis, Operative technique, Comparison

INTRODUCTION

Acute appendicitis remains the most common acute condition requiring acute abdominal surgery. First successful appendicectomy was performed in 1736. Appendicectomy was later described as a standard procedure by Charles McBurney[1]. Since then, acute appendicitis remain the most common condition requiring acute abdominal surgery. Obstruction of the lumen of the appendix is the principal cause, which may be due to lymphoid hypertrophy, fecolith, kinking or intestinal worms[2]. Both open and laparoscopy appendicectomy are being practiced[3], but operating surgeon at times can not decide whether to invaginate the appendicular stump or not, and, moreover either procedure carry any advantage or not. To answer these questions, a prospective randomized study was done to compare two conventional appendicectomy techniques.

PATIENTS & METHODS

The study was designed as a prospective randomized clinical trial. Two hundred male and female patients of all ages operated for acute appendicitis from Oct 2003 to Mar, 2004 in PAC Hospital Kamra, were included in the study. These patients were randomly divided in two equal groups. Appendicular stump of patients of Group A were invaginated in the caecal wall, while appendicular stump of patients of Group B were left as such. Cases of incidental appendicectomy, perforated appendicitis,

appendicular mass and abscess were not included in this study. Detailed history regarding duration, onset, severity and shifting of abdominal pain was taken. Associated symptoms like nausea, vomiting, fever, any urinary or bowel disturbance were also recorded. Past history of any such attacks was also taken. Thorough systemic clinical examination was conducted.

Diagnosis was based on tenderness and guarding in right lower quadrant of abdomen. Blood complete picture and urine routine examination were done in every patient. Total and differential leucocytes count, and any urinary RBCs / Pus cells were also recorded. After proper preparation, all the patients were operated under general anesthesia. Abdomen was opened by a transverse incision over the McBurnney's point. Location, size and nature of appendix were noted in each patient. After ligation of appendicular vessels, mesoappendix was divided. Appendix was completely mobilized; its base was crushed with haemostat and ligated with chromic catgut No. 1. A haemostat was applied close to ligature and appendix was divided with scalpel and removed.

Appendicular stump of patients of Group A were invaginated in the caecum with a Z-stich using 2/0 chromic catgut on an atraumatic needle applied 1 cm away from the appendix. On the other hand, appendicular stump of patients of Group B were left as such. Abdomen was closed in layers. None of the patient required drainage of abdominal cavity. Operative time was recorded in each case. It was taken from the start of incision to last skin suture. Every patient was given only three doses of intravenous injection gentamicin, first dose being the pre-operative one. Injection diclofenac sodium 50 mg deep intramuscular was given bid on first day only. Post-operative vomiting and fever, if any, were noted. Oral fluids were started after 18 to 24 hours, once flatus was passed and bowel sounds were audible. Operative site was examined on second and seventh post –operative day for any sign of infection, which was recorded. Skin sutures were removed on seventh post–operative day.

RESULTS

A total of 200 cases of acute appendicitis were operated. They were divided in two groups of 100 cases each.

In Group A, there were 59 males and 41 females. The youngest patient was 5 years old while the eldest was 63 years old. Maximum patients belonged to 2nd and 3rd decade. The age-wise distribution of patients is shown in Table I. Abdominal pain and nausea was a constant feature, while vomiting was present in 57% of patients. Only 14 patients had dysuria. 71 percent of patients had classical presentation of shifting abdominal pain. Nine patients presented with recurrent attacks. Minimum duration of symptoms was 2 hours, while maximum was 14 days. Minimum operating time was 10 minutes, while maximum was 41 minutes, mean being 16 minutes.

The maximum operating time was in a patient whose caecum along with appendix was lying in sub-hepatic position. Thirteen patients developed localized caecal haematoma while passing Z- suture to invert the appendicular stump. In eight patients caecum was edematous and it was difficult although possible to invaginate the appendicular stump. Three patients developed wound infection, all of them had gangrenous appendix with localized purulent peritoneal fluid.

In Group B, there were 63 males and 37 females. The youngest patient was 5 years old while the eldest was 57 years old. Maximum patients belonged to 2nd and 3rd decade. The age-wise distribution of patients is shown in Table I. Abdominal pain and nausea was a constant feature (100%), while vomiting was present in 66 % of patients. Only 12 patients had dysuria. Seventy-four percent of patients had classical presentation of shifting abdominal pain. Sixteen patients presented with recurrent attacks.

Minimum duration of symptoms was 4 hours, while maximum was 11 days. Minimum operating time was 9 minutes, while maximum was 30 minutes, mean being 14 minutes. The maximum operating time was in two patients whose appendix was in sub-hepatic

position. Two patients developed wound infection, both of them had purulent and friable appendix. The incidence of other complications is shown in Table II.

Table I Age Wise Distribution of Patients

Age in year	Group A	Group B
1-10	7	8
11-20	38	31
21-30	38	35
31-40	10	20
41-50	6	5
51-60	1	1
61-70	1	-

Table- II Post-operative Complications

Nature	Group A	Group B
Vomiting	23	21
Fever	17	19
Wound infection	3	2

In both the groups 40 % of patients had total leukocytes count less than 10,000/cmm. Commonest position of appendix was retro caecal (72 %). Length of the appendix varied from 3cm to 14cm, mean size was 6cm. Only two patients (1%) in this study were pregnant at the time of surgery.

DISCUSSION

Acute appendicitis remains the commonest abdominal emergency and it affects 6-10% of population[4]. It may occur at any age but is most common in persons between 20 and 40 years of age[5], as is observed in the present study. The diagnosis is most difficult in children under the age of 2 years and in the elderly patients[6]. Appendicitis is also the most common non-obstetric abdominal surgical emergency in pregnancy[7].

Anorexia and nausea were important symptoms in patients with appendicitis (100%). Vomiting was variable in frequency and intensity (61.2%). Tenderness and guarding in the right lower quadrant was the single most important finding in acute appendicitis, and was the main diagnostic indicator[8,9]. The degree of muscle guarding varied considerably. Rebound tenderness, direct and referred, depends upon the degree of involvement of the surface of the appendix and upon location of appendix. The customary laboratory tests of total and differential leukocytes count were of limited value, as was also shown in the study done by Khalid et al [10].

Urinalysis was usually normal in patients with appendicitis[11]. Ultrasonography has got almost 100 % diagnostic accuracy[12]. CT scan is more sensitive but is not cost effective[13]. Both these radiological modalities are helpful in children and elderly, who have atypical symptoms which can lead to delay in diagnosis. Appendicectomy remains the standard treatment of acute appendicitis, which is performed by both open and laparoscopic approaches[14]. Retrocaecal is the commonest position of the appendix; same was the case in my study (72%)[15].

Opinion is divided in literature over the value of invagination of appendicular stump with either a seromuscular purse-string suture or Z-stitch. Proponents of this procedure argue in favour of sound control of appendicular stump and less bacterial contamination of the peritoneal cavity[16,17]. On the other hand, opponents of appendicular invagination stress the potential hazard of: (i) injury/ damage to caecal blood supply, (ii) the procedure can be hazardous if the caecum is edematous/ friable[18], and (iii) the development of stump abscess[19,20]. In my study there was no difference in the recovery and outcome of patients belonging to either group.

Post-operative fever (17 vs. 19) and vomiting (23 vs. 21) were almost equal in both the groups. Wound infection rate was also equal in both groups (3 in Group A vs. 2 in Group B), that too corresponded with the degree of appendicular inflammation. Moreover operating time was less in patients of

Group B (mean 14 minutes) as compared to patients of Group A (mean 16 minutes).

CONCLUSION

With few exceptions, the treatment of choice of acute appendicitis is appendicectomy. There is no added benefit in invaginating the appendiceal stump during appendicectomy. One can save time, and avoid certain potential complications by simple ligature of appendicular stump.

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