

Comparison of two Surgical Techniques; Simple Ligation and Ligation with Invagination of Appendicular Stump in Appendicectomy for Acute Appendicitis

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ABSTRACT

Introduction: Appendicitis is an important differential diagnosis in patients with right lower quadrant pain. Acute appendicitis is the common emergency encountered round the globe. It is the cause of an acute surgical abdomen, and it remains one of the most challenging diagnoses in the emergency department. Appendicectomy is the accepted therapy for acute appendicitis.

Objective: To compare the technique of simple ligation and ligation with burial of the stump during appendicectomy for acute appendicitis.

Subjects and Methods: Eighty cases of acute appendicitis were analysed for this study. They were randomly allocated to the two surgical procedures such as simple ligation (Group I) and ligation with invagination (Group II) of appendicular stump in appendicectomy. The clinical variables were statistically evaluated.

Results: The frequency of postoperative ileus was more in group II (22.5%, and 5%) during first 48 and 72 hours respectively as compared to group I, $P < 0.05$. Postoperative wound infection was noticed in 15% patients in group 1 and 22.5% patients in group II ($P > 0.05$).

Conclusion: Simple ligation of stump during appendicectomy is a better and safe procedure as compared to the invagination of stump because there is less incidence of postoperative complications such as postoperative paralytic ileus and wound infection.

Key words: Appendicectomy stump, Simple ligation, Invagination, Complications

INTRODUCTION

Appendicitis is principally the disease of young and middle aged. The condition is most common in individuals that are between 10 and 30 years of age, but can occur in all age groups. The incidence of acute appendicitis is 1.5/1000 in males and 1.9/1000 in females with an overall lifetime risk of 6-20%¹⁻². Appendicitis initially produces crampy periumbilical pain. Pain then becomes more localized to the right iliac fossa, the region of appendix. Anorexia, nausea, vomiting, fever, and leukocytosis are common³.

Acute appendicitis is caused by inflammation of vermiform appendix. The appendix has no known function in the body, but it can become diseased⁴. Acute appendicitis is the common cause of an acute abdomen and as such the associated symptoms and sign have become a paradigm for clinical teaching⁵. It is the most common abdominal surgical emergency with which the general surgeons have been dealing with for the last hundred years⁶.

Pain in the right lower quadrant or lower abdomen creates a diagnostic problem as a

considerable number of conditions such as pelvic inflammatory disease, ruptured graafian follicles, ectopic gestations, salpingitis, right ureteric colic and ovarian torsion come into the differential diagnoses⁷.

Since then appendicitis has been the commonest surgical emergency. The technique of appendicectomy may vary from surgeon to surgeon or from center to center, starting from skin incision to the ligation and invagination of appendicectomy stump, and so on. After ligation or transfixation of the appendix stump some surgeons left the stump as such while others invaginated by means of purse string suture^{8,9}.

The advantages of this study is to compare the outcome of two surgical procedures in terms of postoperative ielus, wound infection and peritonitis/residual abscess as simple ligation nevertheless shortens the operative time and it preserves the intact anatomy of caecal wall.

MATERIAL AND METHODS

The study was conducted in Surgical Unit IV, Services Hospital, Lahore from 1st August 2006 to 31st January 2007. Eighty cases of acute appendicitis were included. Patients who were undergone

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appendicectomy for uncomplicated acute appendicitis were included. All patients were given one preoperative dose of intravenous metronidazole 500mg and three more doses of the same antibiotic in the postoperative period. They were operated under general anaesthesia through McBurney's or Lanz incision. While doing appendicectomy two surgical procedures simple ligation of appendicular stump for group I and ligation with invagination of appendicular stump for group II were adopted. The wounds were closed primarily at the time of exploration in all the patients operation notes were recorded. The cases were observed on 1st and 2nd day for post-operative ileus and were followed on 5th and 14th day for wound infection and peritonitis/residual abscess.

RESULTS

The patients shown in Table 2 were divided into four age groups. In group I (simple ligation), the first age group patients aged 13-20 years (n=20) 50%, in second age group patients aged 21-30 years (n=14) 35%, in the third age group patients aged 31-40 years (n=5) 12.5%, in the fourth age group patients aged 41-50 years (n=1) 2.5%. While in group II (simple ligation with invagination), the first age group patients aged 13-20 years (n=22) 55%, in second age group patients aged 21-30 years (n=13) 32.5%, in the third age group patients aged 31-40 years (n=4) 10%, in the fourth age group patients aged 41-50 years (n=1) 2.5% (Table 1).

Table 1: Distribution of cases by age

Age (years)	Group I (n=40)		Group II (n=40)	
	Frequency	%age	Frequency	%age
13 – 20	20	50.0	22	55.0
21 – 30	14	35.0	13	32.5
31 – 40	5	12.5	4	10.0
41 – 50	1	2.5	1	2.5
Mean±SD	22.92±8.57		20.90±6.23	

Right lower quadrant pain anorexia were important symptoms 100% and 91.25% respectively. Nausea/vomiting were variable in frequency and intensity 27.5% (Table 2).

Tenderness in the right lower quadrant was the single most important finding; 100%. The degree of rebound tenderness, both direct and referred varied considerably.71.25% Elevated temperature was noted in 13 patients (16.25%) (Table 3).

The frequency of postoperative ileus was more in group (22.5%, and 5%) during first 48 and 72 hours respectively as compared to group I, P<0.05). Postoperative wound infection was noticed in 15% patients in group 1 and 22.5% patients in group II (P>0.05) which is significantly not different in two

procedures. No case of peritonitis/residual abscess was noticed in both groups during the postoperative period and follow-up (Table 4)

Table 2: Presenting symptoms of patients

Symptom	Frequency	%age
Right lower quadrant pain	80	100.0
Anorexia	73	91.25
Nausea/vomiting	22	27.5

Table 3: Signs in patients

Sign	Frequency	%age
Right lower quadrant tenderness	80	100.00
Rebound tenderness	57	71.25
Elevated temperature	13	16.25

Table 4: Comparison of post-operative complications in both groups

Postoperative complication	Group I (n=40) No. of patients (%)	Group II (n=40) No. of patients (%)
Paralytic ileus* 24 – 48 hours	3 (7.5)	9 (22.5)
49 – 72 hours	-	2 (5.0)
Postoperative wound infection**	6 (15)	9 (22.5)
Peritonitis/residual abscess	-	-

*P value: P<0.05, ** value: P>0.05

DISCUSSION

Acute appendicitis is the most common surgical emergency in the developed countries that is common in the second decade of life. Its incidence is increasing in the developing countries and no age is exempted from it, but is most common in persons between twenty and forty years of age¹⁰ as is observed in the present study, in which the majority of the patients were young and belonged to second and third decade of life (Table 1). This is consistent with that reported by Bhopal et al¹¹ and others¹². Its incidence lowers as the age increases.

In the present study, right iliac fossa pain (100%) and anorexia (91.25%) were important presenting symptoms. Nausea and vomiting were variable in frequency and intensity (27.5%) [Table 2]. Tenderness in the right lower quadrant was the single most important finding and was the main diagnostic indicator¹³.

There are many instances of acute appendicitis in which the base of the appendix is indurated and wall of caecum is edematous/friable. The attempts to invaginate the appendicular stump by passing satisfactory purse string suture results in damage to the caecal wall¹⁴. Even assuming however, that the

caecum is not friable and easily delivered into the operative field, there is still the danger of striking a small blood vessel in passing the purse-string suture and causing a spreading haematoma. Haematoma and excessive handling of gut prolong the postoperative ileus¹.

In our study, in which two groups (group I and group II) of patients were compared for postoperative ileus, wound infection and peritonitis/residual abscess by adopting method of simple ligation for group I and ligation with invagination for group II. There was no significant difference in the incidence of wound infection in both groups (15%, and 22.5%) [Table 4]. This was also observed by Dass.¹⁵ Though higher incidence was reported by Jacobs¹⁶ and Sinha¹⁷ among patients in whom invagination of stump was carried out. The frequency of post-operative ileus was more in group II, 22.5% and 5% during first 48 hours and 72 hours respectively as compared to group I (Table 4). No serious postoperative complication was noticed in both the groups in the present study; similar findings were reported by different authors in the international literature^{15,16}.

REFERENCES

1. Chaudhary IA, Samiullah, Mallhi AA, Afridi Z, Bano A. Is it necessary to invaginate the stump after appendicectomy? *Pak J Med Sci* 2005; 21: 35-8.
2. Katkhouda N, Jason RJ, Towfigh S, Gevorgyan A, Essani R. Laparoscopic versus open appendectomy: a prospective randomized double-blind study. *Ann Surg* 2005; 242: 439-45.
3. Paulson EK, Kalady MF, Pappas TN. Clinical practice. Suspected appendicitis. *N Engl J Med* 2003; 348: 236-42.
4. Afzal M, Ali L, Hussain Z, Afzal Z. Negative appendicectomy; its prevalence, an experience. *Prof Med J* 2005; 12: 218-22.
5. l'Connell PR. Vermiform appendix. In: Russell RCG, Williams NS, editors. *Bailey & Love's short practice of surgery*. 24th Ed. London: Arnold Publishers; 2004: 1203-18.
6. Hoffman JR. Aids in the diagnosis of acute appendicitis. *Br J Surg* 1989; 76: 774-9.
7. Ellis H. Iliac fossa (right) swelling. In: Hart FD, editor. *French index of differential diagnosis*. 12th Ed. Bristol: Wright; 1985: 411-3.
8. Simpson J, Scholefield JH. Acute appendicitis. *Surg Int* 2002; 58: 153-7.
9. Al-Khafaji MA. Simple ligation technique of the appendiceal stump in appendicectomy. A personal audit of 120 cases. *MEJEM* 2004; 4: 1.
10. Malik K, Ahmad W, Channa A, Khan A, Waheed I. Epidemiology of acute appendicitis: a study of 354 cases in Jinnah Postgraduate Medical Centre, Karachi. *J Surg PIMS* 1993; 5: 31-3.
11. Bhopal FG, Khan JS, Iqbal M. Surgical audit of acute appendicitis. *J Coll Physicians Surg Pak* 1999; 9: 223-6.
12. Drincovic N. Age distribution and clinical characteristic in acute appendicitis. *Vojnosanit Pregl* 1991; 48: 115-9.
13. Bergeron E, Richer B, Giarib R, Glard A. Appendicitis is a place for clinical judgement. *Am J Surg* 1999; 177: 460-2.
14. Way LW. Appendix. In: Way LW, editor. *Current surgical diagnosis and treatment*. 10th ed. New Jersey: Appleton & Lange; 1994: 610-3.
15. Dass HP, Wilson SJ, Khan S, Parlade S, Uy A. Appendicectomy stump to bury or not to bury. *Trop Doct* 1989; 19: 108-9.
16. Jacobs PP, Koeyers GF, Buryainckx CM. Simple ligation superior to inversion of the appendiceal stump; a prospective randomized study. *Ned Tijdschr Geneesk* 1992; 136: 1020-3.
17. Sinha AP. Appendicectomy: an assessment of the advisability of stump invagination. *Br J Surg* 1977; 64: 499-500.