



Comparison of extra-corporeal knot-tying suture and metallic endo-clips in laparoscopic appendiceal stump closure in uncomplicated acute appendicitis

M. Nadeem ^{a,*}, S.M. Khan ^{b,c}, S. Ali ^d, M. Shafiq ^e, M.W. Elahi ^b, F. Abdullah ^b, I. Hussain ^b

^a Nishtar Medical College and Hospital, Multan, Pakistan

^b Department of Surgery, Khyber Teaching Hospital, Peshawar, Pakistan

^c Department of Surgery, University of Toledo Medical Center, Toledo, OH

^d Department of Orthopedics, Khyber Teaching Hospital, Peshawar, Pakistan

^e Khyber Teaching Hospital, Peshawar, Pakistan

ARTICLE INFO

Article history:

Received 1 September 2015

Accepted 11 February 2016

Available online 16 March 2016

Keywords:

Laparoscopic appendicectomy

Endoclips

Extracorporeal knot

Complication

Cost

ABSTRACT

Background: An adequate closure of the appendiceal stump is vital to minimize intra-abdominal and surgical site infections. There are various techniques for the closure of base of appendix while performing a laparoscopic appendectomy like endoloops, knotting, clips and staplers.

Objective: To compare the extracorporeal knot-tying suture with metallic endoclips in laparoscopic appendiceal stump closure in terms of complications, operative time, hospital stay and cost.

Methodology: This study was conducted as a single-blinded randomized controlled trial. Patients undergoing laparoscopic appendicectomies in three tertiary care hospitals of Peshawar, i.e. Khyber Teaching Hospital, Lady Reading Hospital and Hayatabad Medical Complex from June 1, 2013 to June 1, 2014 were included in the study and randomized into two groups – extra-corporeal knotting group and the metallic endoclip group. Data on demographics, complications, operative time, hospital stay and cost for the two techniques were collected and analyzed. Statistics analyses were done with IBM SPSS v19 (IBM Corp., Armonk, NY, USA). T-test was used for comparison of continuous data; Chi-square test was used for comparison of categorical data. $P < 0.05$ was considered statistically significant.

Results: A total of 68 patients were enrolled in the study and randomized into two groups: metallic endoclip group $n = 32$ (47.1%), extracorporeal knot group $n = 36$ (52.9%). The two groups didn't significantly differ in age ($P = 0.9$). There were no statistically significant differences between the two groups in terms of complication rates ($P > 0.05$) and hospital stay ($P > 0.05$). The mean operative time for the endoclip group was shorter (mean 42.1 ± 7.4 min) as compared to the extracorporeal knot group (mean 48.3 ± 8.4 min) ($P = 0.002$). The cost of endoclip group was higher (800PKR = 8.10US\$) as compared to the extracorporeal knot group (220PKR = 2.23US\$).

Conclusion: The use of metallic endoclip for appendix stump closure is safe and less time consuming but costs higher. Because of the simplicity of the technique it's a useful alternative to the extracorporeal knotting especially for learners.

© 2016 The Authors. Published by Elsevier Ltd on behalf of Surgical Associates Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Acute appendicitis is the most common cause of intra-abdominal surgical emergency [1] and hence appendectomy is the most common surgical procedure performed in all the departments of surgery globally [2,3]. It is usually the first procedure performed by a resident to learn surgery [4]. Laparoscopic appendectomy was first

described 30 years ago [5]. With the advancing cutting edge technology, it has become an established surgical technique which offers less pain, faster recovery and earlier return to life and work [6–8]. The laparoscopic technique is especially preferred in cases of diagnostic uncertainty, female and obese patients [4,9].

One of the most important steps in appendectomy is the adequate closure of appendiceal base. While performing open appendectomy, the stump after closure would be buried in the cecum with the help of a purse string suture to reduce the chances of intra-abdominal infection. Later, it was proven that stump burial/inversion has no significant impact on outcomes but the technique still is practiced by many surgeons [4]. Similar concerns exist while

* Corresponding author. Nishtar Medical College and Hospital, Multan, Pakistan. Tel.: +92642466121.

E-mail address: drnadeem168@gmail.com (M. Nadeem).

performing laparoscopic appendectomy which initially was proven to have a higher incidence of postoperative intra-abdominal infections than the open technique [10,11]. There are various techniques used to secure the appendix base while performing laparoscopic appendectomy – extra-corporeal knotting, intra-corporeal knotting, endo-loops, endo-staplers, metallic endo-clips and hem-olok clip. These techniques have been compared in many retrospective and prospective studies without reaching a consensus for prioritizing one particular technique over the other [6,12–24], except for a small meta-analysis by Kazemier et al. [25] which has proven an advantage of stapling over loop ligatures in reducing the infections.

Laparoscopic procedures including laparoscopic appendectomy have always remained a subject of debate because of their impact on healthcare expenditure. This along with the added cost of novel base closure techniques have added to the overall cost of procedure. That is one of the reasons that experienced surgeons prefer intra-corporeal or extra-corporeal knotting to secure the base and consider them safer in cases of friable and inflamed bases [26,27]. The novel techniques on the other hand are easier to use, save operative times and have lesser learning curve issues [20,28].

Cristalli et al. [29] for the first time described the use of metallic endoclip in the closure of appendiceal base in 1991. The endoclip is also routinely used in the ligation of cystic duct while performing a laparoscopic appendectomy and is an easier time saving alternative to close the base of appendix [23].

Till date, no study has been done in our country to compare the efficacy of all these techniques of base closure. Our study aims at finding any significant difference in the closure efficiency of extra corporeal knotting (Roeder's knot) and metallic endoclips primarily in terms of infection risk and other complications and secondarily in terms of cost, operative time and hospital stay.

2. Materials and methods

This study was performed from June 1, 2013 to June 1, 2014 as a multicenter randomized controlled trial in three hospitals of Peshawar City, Khyber Teaching Hospital, Lady Reading Hospital and Hayatabad Medical Complex. The study project was approved by Hospital Ethical Committees of all three institutes. Informed consent was taken from all the patients after explaining the risks and alternatives of the two procedures. All patient selected to undergo laparoscopic appendectomy were divided randomly into two groups – extra-corporeal knotting group and the metallic endo-clip group. Because the study was unfunded and conducted by residents and interns themselves with no paramedical staff involvement, it was single blinded. The residents/intern present at the time of procedure would collect the data on data sheets with no blinded investigators who could collect data and at the same time be blinded for the type of procedure done.

A total of 68 patients were included in the study with 36 being in Group A and 32 being in Group B. All patients were diagnosed as having acute appendicitis on the basis of clinical criteria, ultrasound scan and laboratory results (Alvarado score ≥ 8 –10). The patients with perforation of appendix, local and diffuse peritonitis, friable appendix base, evidence of pelvic inflammatory disease, conversion to open procedure and possible other diagnoses were excluded from the study. All patients were operated by certified surgeons in minimal access surgery with more than ten year experience in laparoscopic procedures.

A data sheet was designed and filled for each patient after getting the consent. Besides demographics, it contained variables of two intra-operative – bleeding and organ injury – and five postoperative complications – postoperative ileus, intra-abdominal infection, surgical site infection, readmission and reoperation. The data were collected manually by the residents and interns and checked for errors. All the data collected were fed into the IBM SPSS v19 (IBM

Corp., Armonk, NY, USA) to make a data set. Statistical analysis was done using T-test for comparison of continuous data; Chi-square test was used for comparison of categorical data. $P < 0.05$ was considered as statistically significant.

3. Surgical technique

All the patients were given general anesthesia and the same antibiotics – I/V ceftriaxone (Rocephin[®] by Roche Laboratories) – and the same skin preparation – povidone iodine solution 10%. Three ports were used in all cases with one infra umbilical camera port and two other ports – one port in hypogastrium and one port in right side of abdomen. The abdominal cavity was first inspected and per operative diagnosis of inflamed appendix was confirmed. The base of appendix was cleared out by dissecting away the meso-appendix. For extra-corporeal knotting group, the base of appendix was tied with vicryl 0 (Ethicon Vicryl-[®]Plus[®]) with two knots placed 5 mm away and the appendix was cut between the two knots. The type of knot was a Roeder's knot with a half hitch followed by three full rounds and finally followed by an interlocking half hitch. This was followed by pushing the knot with the help of tight pusher until it snugly tightened around the appendix base. For metallic endo-clip group, three metallic endoclips (Ethicon Ligaclips[®], Titanium Clip Cartridge – medium large or large size) were applied close to the base, with two closer to the base, apposing each other and the third one 5 mm away, and the appendix was amputated between the upper two clips. The appendix was brought out by the hypogastric port and saline irrigation of around 500 ml to 1000 ml was done. All skin incisions were closed using 2/0 prolene suture and mepore dressing was applied.

All patients were prescribed the same antibiotic regimen – oral cefixime (Cefspan[®] by Glaxo Smithkline Pharmaceuticals Ltd.) – for 5 to 7 days and called for follow up on 8th to 12th postoperative day for follow-up and stitch removal. The antibiotics regimens chosen were based on the institutional routine.

4. Results

In this study, there were 68 patients, those were divided into two groups; extra-corporeal knotting group had 36 subjects (52.9%) and metallic endo-clip group had 32 subjects (47.1%). The mean age of patients in extra-corporeal knotting group was 24 ± 7.78 years and in endo-clip group, 23.0 ± 7.30 years. There was no statistically significant age difference ($P = 0.9$) but both groups had significant sex difference ($P = 0.008$) between the two groups (Table 1).

The intraoperative and postoperative complications in both groups were not statistically different. Two patients in the endo-clip group had developed bleeding complication against one patient in the knotting group. This same patient later developed an abscess and was readmitted and re-operated to drain the abscess. The postoperative course was complicated by ileus and wound infection. Notable among others is the superficial surgical site infections, which was similar in the two groups (Table 2).

Table 1
Demographics, cost, operative times and hospital stays.

Variables (Mean \pm SD)	Extra-corporeal knotting group n = 36 (52.9%)	Metallic endo-clip group n = 32 (47.1%)	P value
Age	24 \pm 7.78	23.9 \pm 7.30	0.9
Gender	25/11	12/20	0.008
Cost (PKR ^a)	220	800	-
Operative time (minutes)	48.3 \pm 8.45	42.1 \pm 7.40	0.002
Hospital stay (hours)	21.6 \pm 13.6	29.0 \pm 29.5	0.17

^a 98.75PKR = 1US\$.

Download English Version:

<https://daneshyari.com/en/article/2728510>

Download Persian Version:

<https://daneshyari.com/article/2728510>

[Daneshyari.com](https://daneshyari.com)