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Clinical Research

Comparison of Intra corporeal Knot-tying Suture and Hem-o-lok Clip for Closure of Appendix Stump in Laparoscopic Appendectomy: A Retrospective Study

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ABSTRACT

Objective: The optimal method for closure of the appendix stump in laparoscopic appendectomy is stil controversial. There have been many defined methods for this aim. Here were trospectively compare the closure of appendix stump with intra corporeal knot tying and hem-o-lok clip.
Material and Method: Ninty-two case sunder went to laparoscopic appendectomy in Elazig Medical Park Hospital from January 2013 to June 2014 was retrospectively screened. Age, gender, hospital stay, operation time, whether complicated appendicitis complicated appendicitis, complications and management of complications were noted. Patients were divided into two groups, Group 1 (hem-o-lok clip) and Group 2 (intra corporeal knot tying). Datas were compared between two groups.
Results: Ninty-twopatients (43 male /49 female) were screened. Mean age was 35.1 (15-77) years. Mean operation time was 28.8 minutes (20-50), mean hospital stay was 1.25 (0-5) days. Operation time was significantly shorter in group 1 ($p<0.001$), both in uncomplicated ($p<0.001$) and complicated ($p=0.046$) cases. Although hem-o-lok group had a low hospital stay and postoperative complication rate, the difference between two groups was not statistically significant.
Conclusion: Hem-o-lok clip is a simple and a safe tool for closure of appendiceal stum with low operation time.

Key Words: *Appendix, Laparoscopi, Stump closure.*

ÖZET

Laparoskopik Apendektomide Apendiks Güdüğünün Kapatılması: İntrakorporeal Bağlama ile Hem-o-lok Klip Kullanımının Karşılaştırılması; Retrospektif Çalışma

Amaç: Laparoskopik apendektomide apendiks güdüğünün nasıl kapatılacağı hala tartışmalı bir konudur. Tanımlanmış birçok yöntem vardır. Biz bu çalışmada, intrakorporeal bağlama ile hem-o-lok klip uygulamasını retrospektif olarak karşılaştırdık.
Gereç ve Yöntem: Elazığ Medical Park hastanesinde Ocak-2013 ile Haziran-2014 arasında laparoskopik apendektomi uygulanmış 92 olguyu retrospektif olarak değerlendirdik. Yaş, cinsiyet, hastanede kalış süresi, ameliyat süresi, olgunun komplike olup olmadığı, postoperatif komplikasyonlar ve bu komplikasyonlar için uygulanan tedaviler kaydedildi. Hastalar Grup 1 (hem-o-lok klip) ve Grup 2 (intrakorporeal bağlama) olarak iki gruba ayrıldı ve veriler bu iki grup arasında karşılaştırıldı.
Bulgular: Doksan iki olgu (43 erkek / 49 kadın) değerlendirildi. Yaş ortalaması 35.1 (15-77) ortalama ameliyat süresi 28.8 dakika (20-50), ortalama hastanede yatış süresi 1.25 gün (0-5). Ameliyat süresi birinci grupta tüm olgularda ($p<0.001$) hem komplike olgularda ($p=0.046$) hem de komplike olmayan olgularda ($p<0.001$) anlamlı olarak daha kısa idi. Hem-o-lok kullanılan grupta hastanede yatış süresi ve postoperatif komplikasyon oranı daha kısa olmasına rağmen bu fark istatistiksel olarak anlamlı değildi.
Sonuç: Hem-o-lok klip ile apendiks kökünün kapatılması ameliyat süresini azaltan basit ve güvenilir bir yöntemdir.

Anahtar Kelimeler: *Apendiks, Laparaskopi, Güdük kapama.*

Nowadays, laparoscopic appendectomy (LA) has been widely prefered all around the world in the surgical treatment of acute appendicitis. There are many defined methods to close the stump of appendix during LA, such as endoscopic stappler (1), intracorporeal knot tying (2), polymeric clips (hem-o-lok clips) (3-5), endoloop (5, 6), titanium clips (2, 7). There are many studies in literature that compare these methods especially in terms of operation time and complications. According to our knowledge, there is no study that compares the usage of hem-o-lok clip and intracorporeal knot tying in literature. In this study, we retrospectively compare the results of the usage of hem-o-lok clips and intracorporeal knot tying.

MATERIAL AND METHOD

Ninty-two cases underwent to LA in our hospital from

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January 2013 to June 2014, were screened retrospectively. Ethical commitee permission taken before the study. All of the patients was admitted to our emergency service with the physical and laboratory findings of acute abdomen and all of them underwent to laparoscopic appendectomy except patients with previous surgery and who did not consent to laparoscopic surgery. Written consent was obtained from all patients for laparoscopic appendectomy. All operations were performed by experienced surgeons.

Age, gender, hospital stay, operation time, whether complicated appendicitis or uncomplicated appendicitis, complications (wound infection, mechanical intestinal obstruction and fistula formation) and management of complications were noted prospectively and considered retrospectively. Any complication seen in first postoperative week was accepted as postoperative complication for this study. Patients were divided into two groups according to closure of the stump of appendix: in group 1 it was closed by hem-o-lok clip (Weck Polymer Ligation System ®, medium or large in size) and in group 2 by intracorporeal knot tying. Noted datas were compared between two groups. Additional comparison was performed according to whether the appendicitis was complicated or not. Appendicites was accepted as complicated, if there was one of the following findings; perforation, peritonitis, accompanying abscess formation.

Surgical technique: Patients were operated upon in supine position, which was changed to Trandelenburg and left lateral position when needed. During surgery, after the cleaning of abdominal skin pneumoperitoneum is created by using Veress needle inserted from infraumblical region. Peritoneal space was filled with CO2 at 10mm Hg pressure.10 mm trocar was inserted to abdomen from infraumblical area. Under the guidance of the scope two other 5 mm trocars were inserted from lower abdomen, one of them from suprapubic area and the other from left lower quadrant (Figure). After traction of the appendix from it's tip, mesoappendix was dissected by ligasure (Covidien Vessel Sealing System ®, 5 mm). Only in cases with a large artery, a titanium clip was applied. The base of the appendix was closed either by application of a large hem-o-lok clip or by intracorporeal knot tying with 00 silk according to the surgeon's preference. After dissection of appendix, it was removed through 10 mm trocar. Peritoneal space was washed with isotonic solution.

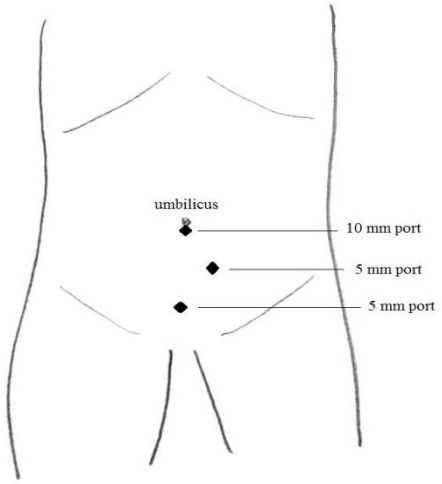

***Figure**. Points for insertion of the trocars.*

Statistical analysis were performed by using SPSS for Windows 20.0 (SPSS Inc., Chicago, IL, USA). Unpaired t test was used to compare the mean values and Fisher's exact test was used to compare independent parameters. P values of <0.05 were accepted as significant.

RESULTS

Of the 92 patients, 43 were male and 49 were female. Mean age was 35.1 (15-77) years. Mean operation time was 28.8 minutes (20-50), mean hospital stay was 1.25 (0-5) days. Detailed comparison of the groups is shown in Table.

***Table**. Comparison of twogroups. p<0.05 accepted as statisticallysignificant (*allpostoperativecomplicationswereseen in caseswithcomplicatedappendicites).*

	Group 1 (Hem-o-lok clip)	Group 2 (Intracorporeal Knot Tying)	P value
Number of Cases	48	44	
Uncomplicated	44 (58%*)	32 (42%*)	
Complicated	4 (25%*)	12 (75%*)	
Age (years)	35.9 ±15.5 (15-77)	34.2 ± 12,1 (16-68)	0.561
Operation Time (min)	25.5 ± 4.2	32.4 ± 6.3	<0.001
Uncomplicated	24.8±2.9	29.4 ± 3.3	<0.001
Complicated	32.5±8.7	40.4 ± 5.4	0.046
HospitalStay (day)	1.1 ± 0.6	1.4 ± 0.9	0.061
Uncomplicated	1.0 ± 0.4	1.0 ± 0.2	1.0
Complicated	2.0 ± 1.4	2.4 ± 1.2	0.586
Complications (number of cases)	1	6	0.051
Woundinfection	1**	4**	0.189
Subileus	0	2**	0.226
Fistula	0	0	

Operation time was significantly longer in knot tying group (p<0.001), especially for uncomplicated cases (p<0.001). Hospital stay was not different in two groups. Although complications were not significantly different, they were seen in more cases in group 2.

Wound infections were treated with wound care and oral antibiotic use. Cases with postoperative subileus have not required any special treatment. Fistula was not seen in both groups. All of the seven postoperative complications were seen in cases with complicated appendicitis.

DISCUSSION

Currently, LA has been successfully performed both in complicated and uncomlicated cases of appendicitis. Recently, it is shown that LA provides less morbidity and short recovery time with lower cost compared to open surgery even in complicated cases (8). In our center, we have performed routine laparoscopic exploration in patients with acute appendicitis for the last four years.

Closure of the stump is an important point in LA due to the potential risk of serious complications such as fistulas, peritonitis and sepsis (9). Therefore, there have been many defined methods with some superiorities to the others. Operation time, hospital stay and postoperative complications are widely used parameters to compare the benefits of these methods (9).

Operation time was significantly longer in intracorporeal knot tying group both in complicated and uncomplicated cases. It is not hard to understand that intracorporeal knot tying requires more time when compared to application of a clip. Similarly, Ates et al. (2) reported a significantly longer operative time in cases of intracorporeal knot tying when compared with titanium clip application. In another study, Colak et al. (4) reported short operative time with the use of hem-o-lok clip when compared the use of endoloop, but the difference was not statistically significant.

Hospital stay is directly associated with postoperative complications, therefore we detected similar results in these two parameters. Hospital stay and postoperative complication rates were better in hem-o-lok clip group, but it was not statistically significant. However, the p value was close to 0.05 (0.061 for hospital stay and 0.051 for postoperative complications). In two prospective studies that compared the hem-o-lok clip with endoloop, there were no difference between the groups in terms of hospital stay and postoperative complications (4, 5). Additionally, Partecke et al. (10) reported that the use of a single hem-o-lok clip is easy to use, safe and cost-effective. They suggested the use of a single clip for the closure of the appendicular stump as the standard procedure in LA. All of the postoperative complications were seen in complicated cases. It can be considered that postoperative complications and hence longer hospital stay were associated with whether the appendicitis was complicated or not, rather than the method for stump closure.

In conclusion, in our opinion, closure of appendix stump with a hem-o-lok clip is a simple and a safe method in LA. Postoperative complications is generally related with presence of perforation, peritonitis or accompanying abscess formation rather than the use of hem-o-lok clip or knot tying.

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