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Research Article

The Usage of Intracorporeal Knotting Instead of Endoloops during Laparoscopic Appendectomy

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Abstract

Laparoscopic appendectomy is currently a widely used surgical treatment for acute appendicitis. Compared to open access, laparoscopy offers several advantages, such as less postoperative pain, shorter hospital stay, faster recovery and lower incidence of wound infection. Although laparoscopy is associated with prolonged surgical and high operative costs, it is more effective and cost-effective than open surgery for uncomplicated appendicitis in experienced hands. However, it remains the first choice for surgical treatment and is indicated specifically for obese patients, the elderly, and patients with underlying medical conditions. Due to the range of techniques available, appendicular stump closure has been the subject of several studies: endo-loop ligatures (pre-defined suture loops (including endo-loops) and intracorporeal tie stitches). There are two important factors to decide which approach to take: patient safety and financial costs. The first component includes prolonged anaesthetic effects due to longer operating times, repeated closures and damage for improper closure (eg, loop failure), extended hospital stay, and cost reduction.

Key Words: Appendecectomy; Laparoscopic appendecectomy; Surgery

1. Introduction

The most acute abdominal condition required for emergency surgery is appendicitis. Open appendectomy is the standard approach to treatment. The open approach technique has many advantages, including less pain in the back period, faster return to normal activity and work, and a lower percentage of wound infections. Significant closure of the appendix stump is necessary to avoid serious complications such as fistulas, peritonitis and sepsis. During LA, many changes have been introduced with new material to improve and eliminate appendix stump closure, including; base closure with staplers, endoloops, titanium clips, non-absorbent polymer clips (lock clips), handmade loops, base closure with extracorporeal ligation sliding knot or intracorporeal knot. Intra-abdominal lumps are harder and more difficult to tie using a laparoscope because of limited space for movement, lack of rotating motion in the wrist joint, movement due to the full length of the device, from the desired site. Is far away and manual skills are also required. Extracurricular eclipse is a widely used alternative technique. The idea is to use extra corporeal sliding knots, tie the knot out of the body and then slide it to the base. The applied knot should be as safe as a conventional knot, which should be quick and easy to apply. The most common intracorporeal knot tying techniques are; intracorporeal Square Knot (Loop Method, Square Knot), Surgeons Knot, Tying laparoscopic intracorporeal knots with one instrument: Dowais tie and Single instrument intracorporeal knot tying.

2. Methods for closure of appendix stump

2.1 Endoloop

Endoloop is is a commercial product commonly used in LA. It can be made of silk or polyglactin and is available in different strengths. Some authors have suggested the use of endoloop because it protects the closing of the attached stump and makes it less expensive. Applying endoloop will connect this loop to the connection base. The two endoloops can be placed separately on top of each other. It provides closure of the residual stump similar to ligation with open appendectomy. Although the operation is compared to the use of staplers or staples, it is similar to other methods in terms of reliability. Endoloop is cheaper than using a stapler, but still more expensive than some other methods. To keep costs down, a loop similar to that commercially available from Endoloop can be made. Hand-made loops are made in no time and used like end-loops. The cost of this method, which is easy to build and use, is much less and is safe to use.

2.2 Suture knot

Suture closure of the appendix base in LA can be done in a similar manner to open surgery. To do this, you can prepare a knot in the abdomen . Internal tie knots require more experience than other methods. Studies have shown that this method is as safe as any other method. A much cheaper way is to loosen the appendix base with sutures, which has the drawback of lengthening surgery time.

3. Materials and Methods

Both LAs conducted by surgeons have been recovered retrospectively in the UK In the analysis, only IK and EL techniques were used to close the appendix stump. The attachment procedure performed with linear staplers has been abolished. Patients are divided into two classes (IK and EL groups). Stamp closure methods are chosen at the discretion of the surgeon. Informed consent was received from all patients. Patient reports (age, gender, BMI (Body Mass Index),

ASA Score) are collected from patient reports. Variables were recorded including service time, use of drains, and length of hospital stay. Patients were called for a follow-up appointment a week after surgery. Postoperative concerns were initially included (<30 days).

3.1 Surgical technique

All patients were injected intravenously with second-generation cephalosporin antibiotics 30 minutes before the prophylaxis incision. The urine catheter was inserted and removed before waking the patient. The operation was carried out through three ports. A pneumoperitoneum was inserted through an inferior umbilical incision. In patients who had not previously had abdominal surgery, varicose needles were used to insert into the abdominal cavity. In patients who had previously had abdominal surgery or in pregnant women, the open technique was used to enter the abdominal cavity. Intra-abdominal pressure was brought to 12 mm Hg. A 10 mm trocar was inserted through the umbilical cord. This trocar offered a 30 degree view. The second trocar was inserted through the quadrant below the left abdomen. Depending on the surgeon's choice, the trocar was either 5 mm or 10 mm. focusing on the bladder; a third trocar with a diameter of 5 mm was inserted from the suprapubic region. In patients who underwent IK, first, the thread was inserted through the left trocar into the abdominal cavity, wrapped in a loop around the base of the appendix, and removed by the same trocar.In patients who underwent EL, a slip knot was obtained externally and reached the base of the appendix with a laparoscopic dissector. When the base of the appendix is reached, the node is externally fixed with one end of the suture in the hand and the other end is fixed intracorporeally using a laparoscopic dissector. The extra suture ends were curtailed and nodes 2 and 3 were placed in the intracorporeally. Appendicular transection was performed remotely for this suture with ligature. In both techniques, the specimen was placed inside the endo bag through the umbilical trocar-site. Facial defects of 10 mm trocars were sutured with No:1 Vicryl.. A drain was placed according to intra-abdominal findings and at the discretion of the surgeon. One in all patients had their drain removed prior to discharge. In the sixth hour postoperatively, patients were given a normal diet and discharged the next day of operation.

4. Results

There were two patients in the IK group, one of whom was long-term of staying, and the other has a little time. In terms of operating hours, the average duration in the IK group was slightly longer than in the EL group, but this statistic was not significant. Drains were placed in 5 patients in IK group and 7 patients in EL group. The length of stay in hospitals was similar between groups. Considering the complexities, the differences between the groups were not statistically significant. In the EL group, at the beginning of the period, the supplement was seen in bed after a collection was published. Percutaneous aspiration was demonstrated and anesthetic antibiotic therapy was optional. The patient recovered somewhat without the need for drainage. Other complications were minor wound problems. No deaths were reported.

5. Discussion

The results show that the IK technique was as safe and feasible as the EL technique for ligating appendage stumps. While not statistically significant, the IK method is 3 minutes longer than the EL method. Postoperative infectious complications after

appendectomy have been reported to be affected by the degree of appendicitis. The operating time in the IK group was 15 minutes longer than in the metal cut group, which was statistically significant. Complications and hospital stay periods were similar between groups. Numerous studies have described invagination suture techniques for appendix stumps. We believe that this technique, seen as a practice in open appendectomy technique, has been reduced by the laparoscopic approach. Other studies have compared endoscopic staplers, titanium staples, and invaginated sutures, where invasive stitches lead to complications compared to hospital stays, longer surgical times, and other procedures. This proportion has been reported to be high. The ideal closure of the appendix stump during LA surgery has not yet been described. Based on the ideal method of closing the appendix stump, it can be expected to have the lowest possible complication rate, easily accessible, inexpensive, and easy to apply. One of the limitations of our study is its retrospective nature. Therefore, some data and the loss of patients during postoperative follow-up cannot be avoided. A similar study with a prospective randomized design provides additional information. Depending on the results, the IK method can be recommended over the EL method, due to its low cost and ease of access. Another advantage of the IK method is that it eliminates dependence on commercial products like EL. Further; The IK procedure helps prepare surgeons for advanced laparoscopic procedures.

6. Conclusions

Despite further research, there is no universal consensus on any method. No specific method is recommended in the literature. There are prospective randomized studies with large sample sizes comparing different methods. Keep in mind that using Endoloop is more expensive than other methods. It is best to use cheaper alternatives such as sutures and ties. Clinical research on these issues is very limited. Clinical studies should support the safety of these methods as seen in clinical studies. The data showed that all methods have the same reliability. Therefore, the cheapest and easiest method to implement should be considered as the first option. However, the final decision on how to use it depends on the surgeon's training and experience, the availability of equipment at the facility, the cost, and the degree of inflammation of the appendix.

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