

MODIFIED LAPAROSCOPIC APPENDECTOMY

By

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Background: Appendectomy accounts for 1% of all surgical procedures. Laproscopic appendectomy has incited considerable controversy since its evolution. The purpose of this clinical study is to evaluate the results of some modifications added to the operation of laparoscopic appendectomy.

Patients and Methods: Two groups of patients undergoing appendectomy were studied. In the first group 50 patients were subjected to open appendectomy. While the second group included another 50 patients whom were subjected to modified laparoscopic appendectomy. We compared the patients' operative data, operative findings, postoperative complications, length of hospital stay and recovery variables.

Results: Patients' demographics, history of previous abdominal surgery and operative findings were similar in both groups. There were no intra or postoperative complications in the modified laparoscopic appendectomy group, due to the use of two 5 mm ports, ligation of the appendicular stump with ligatures, copious irrigation of the abdomen with saline and cleaning of the port sites with Povidone Iodine 10%.

Conclusion: We conclude that with the new modifications added in our study, the incidence of postoperative complications were much lower than in other techniques. Also modified laparoscopic appendectomy offers considerable advantages primarily because of its ability for better scope of vision, good exploration, reduction of incidence of wound infection and its cost effectiveness.

INTRODUCTION

Appendicitis was first recognized as a disease entity in the sixteenth century and was called perityphlitis. McBurney,⁽¹⁾ in 1889, described clinical findings of acute appendicitis prior to perforation, with localization of pain to the anatomic point that bears his name. Senn,⁽¹⁾ also in 1889, was the first to report appendectomy for acute appendicitis prior to its rupture. Today, appendectomy accounts for 1% of all surgical procedures. Kurt Semm⁽¹⁾ in Kiel, a German gynecologist performed the first laparoscopic appendectomy in 1980.

The indications for laparoscopic appendectomy adhere to the same surgical principles developed to open procedures. Laparoscopic appendectomy may be advantageous in young females with abdominal pain, when the diagnosis is in doubt, in obese individuals, or in young athletic individuals.⁽¹⁾

Laparoscopic appendectomy has incited considerable controversy since its evolution. However, a number of

clinical trials have supported the belief that laparoscopic appendectomy decreases hospital stay and shortens recovery time when compared with open appendectomy.⁽²⁾

Also laparoscopic appendectomy reduces the incidence of wound infections and is considered⁽³⁾ as safe and effective as open appendectomy.⁽⁴⁾

The complication profile of laparoscopic appendectomy varies depending on the clinicians' interpretation of the presenting symptoms, the clinical findings and the availability of durable equipments and experiences of surgeons. These complications may be in the form of bleeding, wound infection, trocar site hernia, incomplete appendectomy and intra- abdominal abscess.⁽¹⁾

Aim of the Work: The objective of this study is to determine whatever differences there are in clinical or economic outcomes for patients with suspected appendicitis undergoing open versus modified laparoscopic appendectomy. Also to asses the benefits of

the modifications done in laparoscopic appendectomy in reducing operative and postoperative morbidity after appendectomy.

PATIENTS AND METHODS.

One hundred patients were encountered in this study. They were considered candidates for appendectomy according to the standard indications for surgery and based on clinical evaluation, laboratory values as complete blood picture, urine analysis, coagulation profile and diagnostic imaging such as Sonar or CT scan may be indicated in certain clinical situations.⁽¹⁾

Patients were excluded who had palpable right lower quadrant mass (phlegmon or abscess), diffuse peritonitis or septic shock, pregnant, or were younger than 15 years.

Before surgery, all patients received one gram of Ceftriaxone intravenous and 500 mg Metronidazol and were continued postoperatively.

The Technique of Modified Laparoscopic Appendectomy:

The patient was positioned supine on the operating table. General anesthesia was induced; Foley's catheter and Nasogastric tube were inserted. A 10 mm trocar was inserted in the upper edge of the umbilicus and the abdomen was insufflated and the pressure maintained at 12 to 15 mm Hg. Two 5mm trocars were inserted one suprapubically midway between the umbilicus and the symphysis pubis, the second in the right midabdomen between the umbilicus and the right anterior superior iliac spine. After brief exploration of the abdomen, attention was focused on the appendix, which was usually visualized while the patient was in the Trendelenberg's position and tilted to the left side (down). The mesoappendix was divided using diathermy only, without using staplers or clips⁽⁵⁾. The appendix was then amputated after ligation of its base using ligatures vicryl 0 (Polyglactin 910 manufactured by Johnson and Johnson International U.S.A.). whether intra or extra corporeal through one of the ports. The appendiceal base and mesoappendix were

evaluated for hemstasis and before removal of the appendix through one of the 5mm. ports we inject Povidone Iodine 10% through and around the port of removal. The abdomen was copiously irrigated with saline to prevent collection or infection then sucked. The trocars were removed under direct visualization and the wounds were cleaned copiously with Povidone Iodine 10% and then closed.

RESULTS

The study consisted of 50 patients undergoing open appendectomy and another 50 patients undergoing modified laparoscopic appendectomy their sex and age were shown in (Table 1).

There was no conversion of modified laparoscopic appendectomy to open appendectomy. The gross intraoperative findings showed no significant differences when comparing the two groups (Table 2).

The mean operative time was ranging from 50 to 70 minutes in the modified technique. While in the open technique the time was ranging from 45 to 60 minutes.

There was no intra or postoperative complications in modified laparoscopic appendectomy group. In open appendectomy group, no intraoperative complications

Occurred but there were postoperative complications in only two patients. One patient developed postoperative wound infection due to perforated appendix. The wound was drained and the patient improved.

The other patient developed postoperative small pelvic collection, ultrasound was done and the patient improved on conservative treatment. Other variables of postoperative recovery such as length of hospital stay (one day) and the time from operation to return to work or to normal activities (three days) were less in patients whom under went the modified technique (Table 3).

Table 1 Sex and age of patients.

	<i>Open Appendectomy</i>	<i>Modified Laparoscopic Appendectomy</i>
Male	22	19
Female	28	31
Mean age (years)	25 yrs range (16-51)	25 yrs range (18- 48)

Table 2 Gross pathological findings of the appendices removed in both groups.

	<i>Open Appendectomy</i>	<i>Modified Laparoscopic Appendectomy</i>	<i>Chi-Square test</i>
Normal	6 (12%)	8 (16%)	NS
Inflamed	37 (74%)	36 (72%)	NS
Gangrenous	1 (2%)	2 (4%)	NS
Perforated	6 (12%)	4 (8%)	NS

NS: not significant

Table 3 Postoperative complications, hospital stays and returns to Normal activities.

	<i>Open Appendectomy</i>	<i>Modified Laparoscopic Appendectomy</i>
Wound Infection	1	0
Pelvic collection	1	0
Length of stay in hospital \leq 1 day	10	42
Return to normal activities \leq 3 days	15	45

DISCUSSION

Generally, the diagnosis of appendicitis is not always as readily apparent as its pathology would suggest. In a recent meta- analysis, it was found that the definition and recognition of true appendicitis are both quite variable. When patients with right lower quadrant pain were evaluated, 70% had acute appendicitis, 15% had no demonstrable pathology and 15% had an alternate pathology as a cause of their symptoms.⁽⁶⁾ For more than 100 years, the gold standard treatment of appendicitis has been open appendectomy. However, since the early 1980s, with the era of laparoscopic surgery, there had been mounting support for laparoscopic appendectomy as the treatment of choice. Since that time, there have been numerous publications,⁽⁶⁾⁽⁷⁾⁽⁸⁾ listing different personal preferences. The result of nearly two decades of debate have failed to provide a definitive proof in a clearly defined prospective randomized fashion that which of the laparoscopic⁽⁷⁾ or the traditional open appendectomy is superior.⁽⁸⁾

The argument depends, on different outcomes published by different papers concerning overall hospital and operative cost, length of stay, postoperative pain and complications profiles. Some authors found that laparoscopic appendectomy had greater operative costs, more infectious complications, longer operative times, and no significant decrease in hospital stay or pain.⁽⁸⁾⁽⁹⁾⁽¹⁰⁾

Others found that both laparoscopic and open appendectomy appeared to be roughly equivalent in terms of clinical and economic outcomes.⁽¹¹⁾⁽¹²⁾

Chung and Attwood found that the laparoscopic appendectomy has better outcome than open appendectomy in terms of hospital stay, return to normal activities and complications,⁽¹³⁾⁽¹⁴⁾ which we also found the same in our study.

In our study, we found that modified laparoscopic appendectomy gives a better field of visualization as well as good diagnostic power, due to the placement of the camera in the upper edge of the umbilicus. This helps to identify non-appendicular sources for the presenting symptoms. This is particularly helpful in young women with equivocal examination, obese patients, and patients with signs of peritonitis without any obvious cause.⁽¹⁵⁾⁽¹⁶⁾

In the modified laparoscopic technique, the use of two 5mm trocars lead to decrease in wound infection, trocar site hernia, postoperative pain and better cosmetically.

In this study, after modified laparoscopic appendectomy there was no postoperative complications. This may be due to the modifications we did in all patients including the routine copious irrigation of the peritoneal cavity at the end of surgery, the injection of Povidone Iodine 10% in and around the cannula used for removal of the appendix and then cleaning all the port sites with Povidone Iodine 10% at the end of the operation before closure, as well as the preoperative use of antibiotics which was continued postoperatively. In our technique we ensure that modified laparoscopic appendectomy is economically cost effective more than conventional laparoscopic appendectomy, as we do not use endoloops, staplers or even sterile bags.

CONCLUSION

Laparoscopic appendectomy, unlike other laparoscopic procedures, has not gained universal acceptance among general surgeons. But it has become a valuable tool in the surgeon's armamentarium especially for patients with lower quadrant pain of unknown etiology, females especially in the reproductive age, the elderly and obese.

Laparoscopic appendectomy, unlike other laparoscopic procedures, has not gained universal acceptance among general surgeons. But it has become a valuable tool in the surgeon's armamentarium especially for patients with lower quadrant pain of unknown etiology, females especially in the reproductive age, the elderly and obese.

But what is not up for debate is that laparoscopic appendectomy has been shown to be as safe and effective as open appendectomy, in addition to its advantage as a good diagnostic tool. Modified laparoscopic appendectomy offers considerable advantages primarily because of its ability for better scope of vision, good exploration, reduces the incidence of wound infection and cost effectiveness.

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