

PER-OPERATIVE FINDINGS AND POST-OPERATIVE COMPLICATIONS WITH LAPAROSCOPIC APPENDICECTOMY

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ABSTRACT

Objective: To study the per-operative findings and post-operative complications that arise with laparoscopic appendicectomy.

Material and Methods: This descriptive study was conducted in Surgical "A" and Surgical "C" Unit of PGMI, Lady Reading Hospital from April 2006 to December 2008. Patients with acute appendicitis, short history, age ranges from 15 to 50 years and recurrent appendicitis were included in this study, while patients with appendicular mass, appendicular abscess, pregnancy and with previous abdominal surgery were excluded. All the data was collected by using a proforma. Data was analyzed by descriptive statistics.

Results: Out of 60 patients admitted for Laparoscopic Appendicectomy (LA), 36(60%) were males and 24(40%) were females. Only 6(10%) patients required conversion from laparoscopic to open surgery. Problems and per-operative complications were encountered in 9(15%) patients. These were dense adhesions due to inflammation 4(6.66%), localized perforation 2(3.33%), diffuse peritonitis 2(3.33%) and bleeding during procedure 1(1.66%). Postoperative complications were seen in 5(8.33%) cases, out of which 2(3.33%) patients developed port site infection, 1(1.66%) patient developed postoperative ileus, 1(1.66%) patient developed partial bowel obstruction and 1(1.66%) patient presented with right iliac fossa abscess. There was no mortality. All patients resumed normal activity within 6-7 days of operation and were well satisfied up to median follow-up of 5-6 months.

Conclusion: Majority of the patients were males. Per-operative findings were adhesions, perforation and peritonitis. Post-operative complications were port-site infection, ileus and bowel obstruction. Majority recovered within a week time.

Key Words: Laparoscopic Appendicectomy (LA), Acute Appendicitis, Complications.

INTRODUCTION

Laparoscopic surgery has evolved tremendously over the past two decades. Large number of complex surgical procedures which were performed as open surgery in the past are now being done laparoscopically. Appendicectomy is one of the most common abdominal operations¹, accounting for approximately 50% of emergency operations.

Charles McBurney in 1889 presented a report on early operative intervention in acute appendicitis to the New York surgical society and five years later he formalized the procedure and described McBurney's incision^{2, 3} since then it has been the Gold standard for the treatment of acute appendicitis. First LA was reported almost after a

century in 1983 by a German Gynaecologist Kurt Semm⁴. Today even after a quarter of century laparoscopic appendicectomy has not been able to gain the popularity and acceptance earned by laparoscopic cholecystectomy. Many early randomized trials failed to show any overall benefit for laparoscopy particularly the increased operation time, comparable hospital stay and increased risk of intra-abdominal collection or postoperative ileus with LA outweighed any improvement in wound complication, recovery time or cosmesis. Recent meta-analysis indicates a shift in favour of laparoscopy, probably due to the increase in laparoscopic exposure at all levels of surgical training. There is evidence of reduction in operating time, faster recovery, and lower wound complication rate⁵. This study was conducted to

find out the problems and complications that arose during initial experience with LA.

MATERIAL AND METHODS

This study was carried out on the 60 patients who underwent laparoscopic surgery at Surgical “A” and Surgical “C” Unit of Lady Reading Hospital Peshawar from April 2006 to December 2008. Patients with acute appendicitis, short history, age ranges from 15 to 50 years (Mean=21.23 ± 7.452) and with recurrent appendicitis were included, while patients with appendicular mass, appendicular abscess, pregnancy (it has been suggested that the physiological and anatomical changes of pregnancy make the diagnosis of acute appendicitis more difficult in pregnant patients) ^{6, 7} and those with previous abdominal surgery were excluded from the study.

Complete blood count (CBC) was done in all patients. Ultrasound examination of abdomen was performed in all patients. Other routine laboratory investigations, like renal function tests (serum creatinine and blood urea nitrogen), random blood sugar, chest X-ray and ECG (of patients over 40 years of age) were also done.

The diagnosis of acute appendicitis was made on the basis of detailed history, clinical examination and investigations. An informed consent was taken from all the patients preoperatively, explaining the risk of conversion to open operation. All the patients received a prophylactic 3rd generation cephalosporin intravenously, Injection Ceftriaxone sodium 1 gm before the induction of anesthesia and remained for 24 hours on this and then changed to oral antibiotics.

Operative technique

The operator stands to the patient's left and faces a video monitor placed at the patient's right foot. A moderate Trendelenburg tilt of the operating table assists delivery of loops of small bowel away from the pelvis. Three ports technique

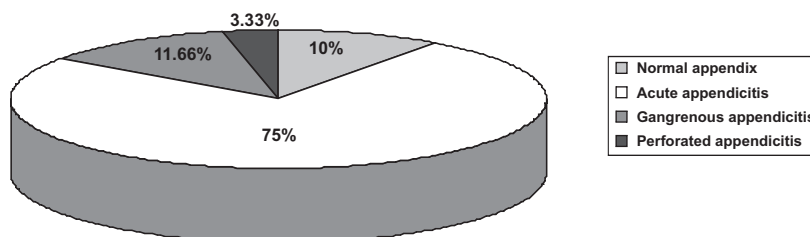
was used after creating the pneumoperitoneum, a 10 mm umbilical port and two 5 mm suprapubic and left lower abdominal quadrant ports. With the camera in 10 mm umbilical port the appendix is recognized by the conventional method by identification of the cecal taeniae and is controlled using a laparoscopic tissue holding forceps. By elevating the appendix, the mesoappendix is displayed. A dissecting forceps is used to create a window in the mesoappendix to allow the appendicular vessels to be coagulated or ligated using a clip applicator. The appendix free of its mesentery, ligated at its base with an absorbable loop ligature or by using extra corporeal knotting and a knot pusher, divided and removed through one of the operating ports. A single absorbable suture is used to close the linea alba at the umbilicus, and the small skin incisions closed with subcuticular sutures.

RESULTS

Among the 60 patients, 36(60%) were males and 24(40%) were females. The age ranged between 15-50 years (Mean=21.23 ± 7.452). Complete blood count was done in all patients. Thirty five(58.33%) patients out of 60 had leucocytosis, while in 25(41.66%) CBC was within normal range. Abdomino-pelvic ultrasonography was performed in all the patients. In 28(46.44%) patients finding were suggestive of appendicitis i.e. an echogenic, elongated, thick walled appendix with periappendicular collection. Other routine laboratory investigations, including renal function tests (serum creatinine and blood urea nitrogen), random blood sugar, ECG (done in patients over 40 years of age) and chest X-ray were found to be normal.

At operation 6(10%) patients were found to have normal appendix, 45(75%) patients had simple appendicitis and 9(15%) had complicated appendicitis i.e. perforated 2(3.33%) patients and gangrenous 7(11.66 %) (Figure 1). Pus around appendix and pelvis was found in 10(16.66%) cases and 3 appendices found to contain faecolith.

Figure 1: Distribution of Types of Appendicitis (n=60)



Per-operative findings and problems were encountered in 9(15%) patients. These were dense adhesions due to inflammation 4(6.66%), localized perforation 2(3.33%), diffuse peritonitis 2(3.33%) and bleeding during procedure occurred in 1(1.66%) patient (Table 1).

Table 1: Per-operative findings and problems

Complications	No. of Patients	% age
Dense Adhesions	4	6.66
Localized perforation	2	3.33
Diffuse Peritonitis	2	3.33
Bleeding	1	1.66

Out of these 9 patients, 6(10%) patients required conversion to open. The reasons for conversion are dense adhesions due to inflammation 2(3.33%), localized perforation 2(3.33%), diffuse peritonitis 1(1.66%) and bleeding during procedure 1(1.66%) patient (Table 2).

Table 2: Reasons for conversion to open appendicectomy

Reasons for Conversion	No. of Patients	% age
Dense Adhesions	2	3.33
Localized Perforation	2	3.33
Diffuse Peritonitis	1	1.66
Bleeding	1	1.66

Postoperative complications were seen in 5(8.33%) cases, out of which 2(3.33%) patients developed port site infection, 1(1.66%) patient developed postoperative ileus, 1(1.66%) patient developed partial bowel obstruction and 1(1.66%) patient presented with right iliac fossa abscess (Table 3).

Table 3: Postoperative complications

Complications	No. of Patients	% age
Port site infection	2	3.33
Post-operative Ileus	1	1.66
Partial Bowel Obstruction	1	1.66
Right illiac fossa abscess	1	1.66

Patients with port-site infection came to the hospital for removal of subcuticular stitches and were found to have infection. So, debridement and dressing of their wound was done and was left open to close by secondary intention and were advised daily betadine dressing and broad

spectrum antibiotics. After a period of 2-3 weeks infection settled with conservative treatment. The other two patients with post-operative ileus and partial bowel obstruction 1 each, was conservatively managed in the ward. One patient after 5 days of appendicectomy presented to the hospital with right iliac fossa abscess, who was admitted and abscess was drained under GA.

There was no mortality in the series. Operative time from skin incision to skin closure ranges from 45 minutes to 110 minutes, with an average of 77.5 minutes. The mean hospital stay in patients with no complications was 1.5 days. All patients resumed normal activity within 6-7 days of operation and were well satisfied up to median follow-up of 3 months, as patients was advised to come after a week to look for wound infection and then after a month and two for port-site hernia.

DISCUSSION

In our study, the per-operative diagnosis was, normal appendix 6(10%) patients, 45(75%) patients had acute appendicitis and 9(15%) had complicated appendicitis i.e. perforated 2(3.33%) patients and gangrenous 7(11.66 %) patients. These findings were somewhat in accordance with the findings of two international studies, i.e. in a study by A. Hussain et al⁸ patients with normal appendix were 20%, acute were 56.18%, gangrenous were 5.3% and patients with perforated appendicitis were 7.77%, while in another series by R. McKinlay et al⁹, the patients presented with normal appendix were 12%, acute were 53%, gangrenous were 12% and patients with perforated appendicitis were 22%.

As shown by Liu et al¹⁰ in analyzing risk factors for conversion, dense adhesion due to inflammation, localized perforation and diffuse peritonitis are the most common reasons for conversion. Moreover, the surgeon's experience is a clinical predictor for conversion¹⁰. In our series of sixty patients per-operative findings and problems were encountered in 9(15%) patients, these were dense adhesions due to inflammation 4(6.66%), localized perforation 2(3.33%), diffuse peritonitis 2(3.33%) and bleeding during procedure occurred in 1(1.66%) patient, out of these 9 patients, 6(10%) patients required conversion to open appendicectomy (OA) and the reasons for conversion were dense adhesions due to inflammation 2(3.33%), localized perforation 2(3.33%), diffuse peritonitis 1(1.66%) and bleeding during procedure 1(1.66%) patient. We encountered difficulty in dealing with adhesions and bleeding, because of the fact that we lack Harmonic scalpal and Liga-Sure. The total conversion rate of 10% in our study is in

accordance with other published studies^{10, 11}. Although the conversion rate has been reported as high as 22% in some series¹². A lower rate at 1.8% has been recorded also¹³.

Postoperative complications were seen in 5(8.33%) cases, out of which 2(3.33%) patients developed port site infection, 1(1.66%) patient developed postoperative ileus, 1(1.66%) patient developed partial bowel obstruction and 1(1.66%) patient presented with right iliac fossa abscess, while in a study done by R. McKinlay et al⁹, the rate of port-site infection was 11%, post-operative ileus was 6.5%, partial bowel obstruction was 4.3% and the rate of intra-abdominal abscess was 15%.

The low rate of both wound infection and intra-abdominal abscess in our study could be the result of our antibiotic regimen as; antimicrobial prophylaxis perioperatively significantly reduces the risk of postoperative infections¹⁴. Some of the studies of LA are suggestive of a significantly higher intra-abdominal abscess rate and lower wound infection rate when compared with open appendicectomy¹⁵. In contrast, Cueto et al¹⁶ have shown less postoperative intra-abdominal abscesses at 2.8% in comparison to the higher rate for OA. However, So et al¹⁷ in a study of 85 cases of perforated appendicitis that underwent laparoscopic appendicectomy concluded less infectious complications compared to OA. Therefore, the fear of developing deep abscesses following laparoscopic appendicectomy cannot be accepted as a general rule¹⁸.

In our study, the operative time from skin incision to skin closure range from 45 minutes to 110 minutes with mean of 77.5 minutes. Other studies have reported a wide range of operative times, it varies from 31.5 min to 110 min, interestingly; there is no tendency toward a shorter operative time in LA over the last 10 years¹⁹⁻²². The mean hospital stay in patients with no complications was 1.5 days, which is in accordance with published local and international studies^{23, 24}. Gilliam et al have shown LA to be safe and effective even in day care setting for selected patients²⁵.

Minimal access surgery is developing to achieve the optimum results through a small incision and the current era indicates wide application of laparoscopy in general surgery including the emergency setting. Recent advances of Natural Orifice Transluminal Endoscopic Surgery (NOTES) have reported incision-less procedures such as transgastric appendicectomy, which needs time for evolution before it is to be accepted on a practical basis. Laparoscopic management of acute appendicitis on the other

hand is evolving in difficult and challenging types of complicated appendicitis²⁶.

Laparoscopic appendicectomy permitted a more accurate diagnosis and fuller abdominal exploration, with the possibility of detecting and treating concomitant pathologies. There are fewer postoperative complications, less likelihood of adhesions, less postoperative pain, shorter hospital stays and patients returned to work sooner²⁷⁻³⁹.

However, other studies reported longer operating time and higher costs for laparoscopy, or did not find sufficient advantages to prove the superiority of the laparoscopic approach. In 1995, the Consensus Conference of the European Association of Endoscopic Surgery (EAES) affirmed the safety of laparoscopic appendectomy, but warned surgeons of potential dangers and serious complications^{30-32, 36, 40-45}.

Benefits for the patients, especially in terms of a more accurate diagnosis, reduction of wound infection, and earlier return to work, have been shown in controlled trials. Although promising, however, laparoscopic appendectomy is not yet the gold standard for acute appendicitis⁴⁰.

CONCLUSION

In our study, per-operative findings were adhesions, perforation and peritonitis while post-operative complications were port-site infection, ileus and bowel obstruction. Majority recovered within one week time. Based on these, LA procedure should be considered as a first choice, not only because of cosmetic reasons of producing a small scar but also due to increase chances of finding other pathologies (tumours, ovarian cyst, meckel's diverticulum etc.) which may not be easily possible in open appendicectomies using grid iron incision. Additionally early mobilization of the patient and short post operative stay in the hospital may also make it a better choice than routine appendicectomies.

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