International Surgery Journal
Helmy MZ et al. Int Surg J. 2019 Oct;6(10):3507-3512
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20194400

Original Research Article

Laparoscopy in acute abdomen between encouragement and inhibition

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Received: 19 July 2019
Revised: 30 August 2019
Accepted: 03 September 2019

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ABSTRACT

Background: Laparoscopy has been a valuable technique in the treatment of acute abdominal diseases and can be considered either to diagnose or to treat selected cases.
Methods: Here, we randomly select patients with acute abdominal pain in whom the diagnosis was not clear after ultrasonography and plain X-ray, we did diagnostic laparoscopy and according to its findings, we proceeded to surgical intervention. 50 cases with acute abdomen were included in this study in order to clarify the role of laparoscopy in the diagnosis and treatment of acute abdomen.
Results: From the 50 patients, the main complaint was abdominal pain and presented in (100%) of patients, 38 of patients had vomiting, fever in 29 patients and 14 patients had abdominal distension, 7 patients had alteration in bowel habits and burning micturition in 6 patients. In this study, 10 patients had past history of previous surgery. By laparoscopy we could see the pathology in 46 patients and complete the management in all of patients but failed to reach the diagnosis in 2 cases and conversion to laparotomy in other 2 cases. Laparoscopic surgery mean was 47.9±12.4 minutes. Hospital stay mean was (1.851) days. Morbidity was 10%. No mortality was found in our study.
Conclusions: Laparoscopy can be considered safe for diagnosis and effective in the treatment of patients with acute abdomen. It may be useful to avoid the unnecessary laparotomies in a large number of patients presented with acute abdominal pain.

Keywords: Acute abdomen, Laparoscopy, Laparotomy

INTRODUCTION

The commonest complaint requiring emergency surgical admission is acute abdominal pain. Those patients may need lots of investigations but diagnosis can still remain uncertain. All strategies for the management of acute abdomen underline the need for a multidisplinary approach for diagnosis and treatment.[1]

This requires smart and focused use of efficient diagnostic procedures. Diagnostic laparoscopy (DL) may be a solution to solve the diagnostic issue of nonspecific acute abdomen. Furthermore, it permits inspection of the whole abdomen and also intervention, if needed.[2]

Diagnostic laparoscopy was first used in 1901, when Georg Kelling a German surgeon performed a dog peritoneoscopy, "celioscopy". H. C. Jacobaeus, a Swedish internist was the first one to performe the first human diagnostic laparoscopy in 1910.[3]

The value of diagnostic emergency laparoscopy has been begun since the 1950s and 1960s but in acute abdomen the use of diagnostic laparoscopy is relatively recent. It was first done by Philippe Moment in 1990.[4]

Despite new investigative tools, scans, and ultrasonography, the diagnosis of acute abdominal pain can be difficult at some times. So, the commonest

procedure of diagnosis which considered non-invasive is ultrasonography but that is not reliable. History and clinical examination will lead not always to correct diagnosis but the most accurate method is diagnostic laparoscopy even if its compared to laparotomy.[5]

The procedure allows thorough and rapid paracolic gutters and pelvic cavity inspection which considered difficult with the laparotomy. The emergency diagnostic laparoscopy for patients complaining of acute abdominal pain improves the diagnostic accuracy and was accepted widely.[6]

METHODS

This was a prospective study which was conducted at emergency ward at General surgery department; Sohag Faculty of Medicine, Egypt in the period from January 2016 to December 2017.

Ethical committees at Sohag Faculty of Medicine approved this study. Informed consent was signed by all patients after full information of the surgical procedure and possible benefits and side effects.

Inclusion criteria

Patients with signs and symptoms of acute abdominal pain and after ultrasonography, plain X-ray and CBC. The diagnosis was still unclear.

Exclusion criteria

Uncontrolled coagulopathy, Haemodynamically unstable patients, chronic abdominal pain patients, Patients refusing the diagnostic laparoscopy after routine investigations.

After a full medical history, general and local physical examination, supplementary studies including hematology, biochemistry and plain radiography of the abdomen, Usually after that, the acute abdomen can be diagnosed as one of the four categories, (i) local peritonitis, such as appendicitis or cholecystitis; (ii) Perforation of a hollow organ such as duodenal ulcer with the presence of pneumoperitoneum; (iii) General peritonitis of uncertain etiology, without perforation or intestinal obstruction, such as intestinal ischemia; and (iv) intestinal obstruction. However, a clear diagnosis, if possible, is important to decide the right abdominal incision or to avoid unnecessary laparotomy. Procedures which are noninvasive, such as ultrasonography or CT, are not always conclusive. The only technique which can visualize the abdominal cavity is then diagnostic laparoscopy and, when the right diagnosis is reached, the surgeon decides the right abdominal approach for the various previous pathologies.

Equipment's including video monitor, light source, insufflator, irrigation device, electro cautery unit were used.

Instruments: Verses needle- used to establish the pneumoperitoneum. The standard length is 10 cm. endoscope, Cannula and Trocars, grasper, dissectors, coagulators, scissors, and adapters.

Procedure

Patients presented with acute abdomen diagnostic laparoscopy are performed as below.

Anesthesia

The anesthesia of choice is general, as it enables us to do therapeutic management after doing diagnosis. Prophylactic antibiotics are generally not indicated in diagnostic laparoscopy but in this study we use a 2 gm third generation cephalosporin antibiotic at induction of anesthesia.

Patient position

The patients position is supine position. The head is tilted up or down by 15 degree depending on the main area of examination. We may use elastic stokes on the legs during the operation to prevent thromboembolism.

The position of the surgeon is on the patients left hand. The main task of the first assistant is to put the video camera, on the patient's left side. We put the the instrument trolley at the left side of the patient to allow the scrub nurse in the assistance of placing the appropriate instruments in the operating ports. We put the television monitors on either side of the end of the operating table at a suitable height; and so the surgeon, anesthetist, and the assistant can see the procedure.

Port location

We insert one optical port at the umbilicus and another 5 mm port at the left iliac fossa. If there is any difficulty in manipulation we use the three-port approach including 5 mm suprapubic, 10 mm umbilical (optical) and 5 mm right hypochondrium.

In most instances a 30 degree telescope is used, by this it is easy to inspect the peritoneal cavity and abdominal organs. The secondary ports are inserted under laparoscopic vision. By finger identification of parietal peritoneum the selected site on the abdominal wall is identified.

After access to the abdomen the first important step is to check for any injury caused by insertion of the trochar, then a second 5mm port is inserted in an appropriate quadrant.

RESULTS

In a prospective clinical study including 50 patients with acute abdominal pain, we did diagnostic laparoscopy in

the period from January 2016 to December 2017. Acute abdominal pain was equally distributed between both sexes (25 males and 25 females), more common in age group from 21 to 30 years (Table 1).

Table 1: Age distribution.

Age (years)	No. of patients
11-20	14
21-30	16
31-40	10
51-60	8
61-70	2
Total	50

Pain was the main presentation in 100% of patients. The next presentation was vomiting in nearly 76% of cases. Fever presented in 29% of cases, nearly 28% patients presented with abdominal distension. Alteration in bowel habits was also present in few cases 14% (Table 2).

Table2: The main presenting symptoms.

Symptoms	No. of cases (%)
Abdominal pain	50 (100)
Vomiting	38 (76)
Fever	29 (58)
Abdominal distension	14 (28)
Alteration in bowel habits	7 (14)
Burning micturition	6 (12)

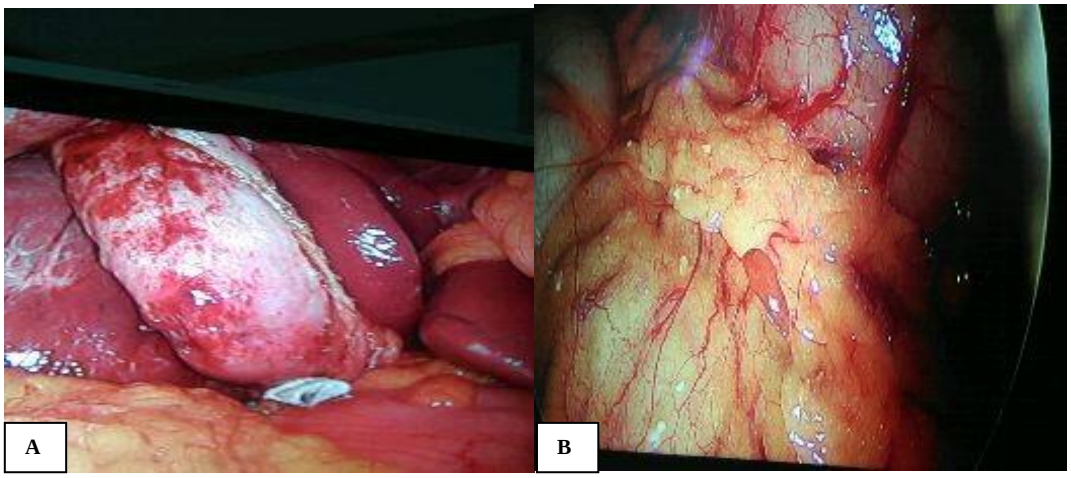

Figure 1: Different laparoscopic views during DL; (A) acute cholecystitis Laparoscopic view and (B) laparoscopic view for acute pancreatitis.

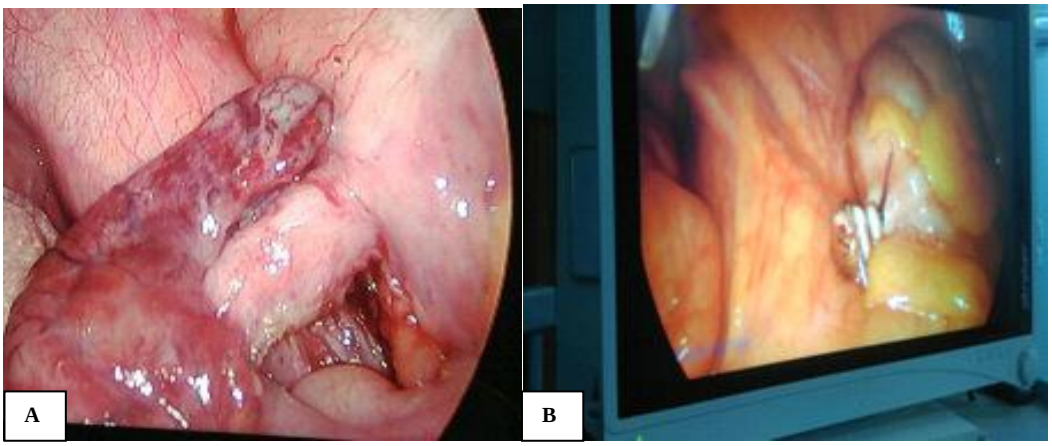

Figure 2 (A and B): Laparoscopic view for appendectomy.

From patients submitted to diagnostic laparoscopy, 17 patients (34%) were found to have non complicated acute appendicitis (Figure 1), 4 patients (8%) with perforated appendix, 2 patients (4%) with peptic ulcer perforation, 1 patient (2%) with small intestinal perforation, 4 patients with acute calcular cholecystitis (8%) (Figure 2), 2 patients with appendicular mass (4%), 6 patients with post-operative adhesions (12%), 2 patients with disturbed ectopic pregnancy (4%), 2 patients with primary peritonitis (4%). Two (4%) patient with acute pancreatitis (Figure 3), one patient with Mackle's diverticulitis, sigmoid diverticulitis and torsion gangrenous right ovary for each condition.

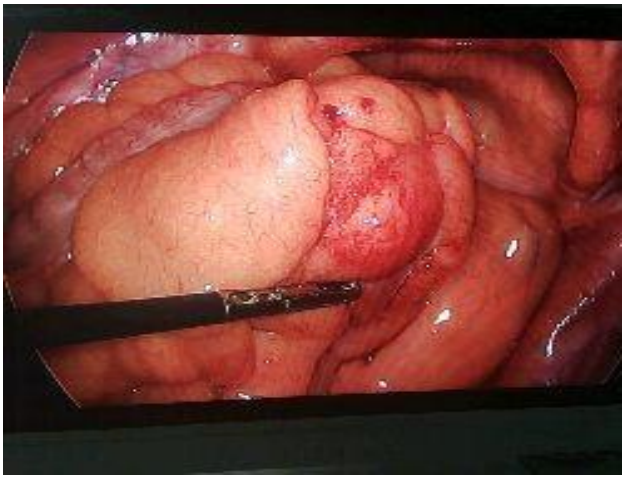

Figure 3: Laparoscopic view showing sigmoid diverticulitis.

In two patients (4%) no pathology could be seen (one diagnosed as familial medetrianian fever and the other diagnosed as typhoid fever post operatively) and open laparotomy wasn't done. conversion occurred in another 2 patients (4%) for whom laparotomy was done, one patient had caecal mass and the anther one had ischemic colitis with perforation at splenic flexure, both were operated. So, in this series, the conversion rate was 4%, (Table 3).

From 50 patients only five developed a post-operative complication, a pelvic collection which was of very minimal amount and resolved without intervention just antibiotics coverage; but 2 patients managed by open surgical procedure developed complications one developed ileus, the other developed wound infection, last one has subcutaneous emphysema resolved gradually post-operative (Table 4).

Table 3: Operative findings.

Diagnosis	No. of cases	Percentage (%)
Perforated appendix	4	8
Acute appendicitis	17	34
Acute calculus cholecystitis	4	8
Appendicular mass	2	4
Perforated duodenal ulcer	2	4
Acute pancreatitis	2	4
Meckles diverticulitis	1	2
Disturbed ectopic pregnancy	2	4
Sigmoid diverticulitis	1	2
Torsion gangernous RT ovar	1	2
Postoperative adhesions	6	12
Small intestinal perforation	1	2
Ruptured liver abscess	1	2
Primary peritonitis	2	4
Caecal mass	1	2
Ischemic colitis	1	2
No pathology	2	4

Table 4: Post-operative complications.

Post-operative complications	No. of patients
Pelvic collection	2
Paralytic ileus	1
Wound infection	1
Subcutaneous emphysema	1
Total	**5**

DISCUSSION

This study, "Diagnostic laparoscopy in the management of acute abdominal pain" was carried out in General Surgery Department; faculty of medicine, Sohag university. On patients admitted with the complaint of acute abdominal pain in the emergency Ward in the period from January 2016 to December 2017.

Here, acute abdominal pain patients were selected randomly, diagnostic laparoscopy (DL) was done and according to its results, we carried out surgical intervention if indicated. The patient's age ranged from 10 yrs. to 70 yrs. Patients less than 10 yrs. and more than 70 yrs. were excluded from this study. Our study included 50 patients; 50% male and 50% female patients.

Out of all patients submitted to diagnostic laparoscopy,17 patients (34%) presented with acute appendicitis, 4 patients (8%) with complicated appendicitis , 2 patients (4%) with peptic perforation,1 patients (2%) with small intestinal perforation, 4 patients with acute calcular cholecystitis (8%), 2 patients with appendicular mass (4%), 6 patients with post-operative adhesions (12%), 2 patients with disturbed ectopic pregnancy(4%) , 2 patients with primary peritonitis (4%). 2 patients with acute pancreatitis , one patient with each of the following

diagnosis; Mackle's diverticulitis, sigmoid diverticulitis and torsion gangrenous right ovary. In two patients (4%) no pathology detected (one diagnosed as familial medetrianian fever later and the other diagnosed as typhoid fever these two cases was not treated with open laparotomy. Conversion occurred in 2 patients one had caecal mass and the other had ischaemic colitis with perforation at splenic flexure so, in this study, the conversion rate was 4%.

Out of all patients submitted to diagnostic laparoscopy, 17 patients (34%) presented with acute appendicitis, 4 patients (8%) with perforated appendix; 2 patients (4%) with appendicular mass. So, we recommend that Patients with symptoms and signs suggestive acute appendicitis (unsure diagnosis) diagnostic laparoscopy should be considered and, if the diagnosis is reached, laparoscopic appendectomy should be done and this come in accordance to recent guidelines that recommend laparoscopic appendectomy as a standard management for acute appendicitis, because there is less pain postoperative, lower risk of surgical wound infections, less hospital stay, return to usual work faster. Also Laparoscopy should be considered in complicated and obese patients. Antibiotic therapy alone has not proven superior to surgery in the management of acute appendicitis because of high rate Of readmission and surgery in the first year.[7,8]

And so peritoneal toilet and aspiration are advised in complicated appendicitis to reduce the rate of abscess formation, a postoperative intra-abdominal abscess is probably due to initial experiences and more recent reviews have not confirmed it.[9]

Removal of normal appendix in the existence of other diseases at exploration is not recommended. But, if there is no other disease is found and the appendix seems to be normal, its recommended to remove it if there is a history of colicky pains and a preoperative examination or radiological finding (US or CT) reveals suspected fecal impaction in the appendix.[10]

The use of staplers regarding closure of stump of the appendix help in reducing the operative time and superficial wound infections, higher costs may influence the choice toward loop closure versus stapling.[11]

Three-port appendectomy is still the laparoscopic gold standard. Various trocar sites and sizes can be used: in young women umbilical and two suprapubic Trocars have been suggested to provide better cosmesis.[12]

Recently, many controversies was present about when and how to operate patients with acute cholecystitis. So for Bittner et al showed that performing laparoscopic cholecystectomy within early two days from the onset of acute attack is associated with the better outcome and the lowest costs, while delayed cholecystectomy is associated with a high risk of postoperative complications and higher costs.[13]

The laparoscopic results in perforated peptic ulcer patients with generalized peritonitis are not different from those of open approach, in addition to much lower complications were observed in minimally invasive technique, septic shock is the main contraindication for a laparoscopic approach. Many series showed that the laparoscopy in perforated peptic ulcer is feasible and safe, with no increased risk of duodenal fistulae or residual abscesses intraperitoneal.[14]

Without DL, we can achieve the diagnosis using clinical findings, physical examination, X-rays and ultrasound of the abdomen and according to obtained data, then we proceeded to further treatment in the form of exploratory laparotomy or we treated the patient conservatively in absence of diagnostic evidence, there was increased morbidity, hospital stay, and treatment costs in patients which were treated conservatively and later on using exploratory laparotomy. By the diagnostic laparoscopy we reached a sure diagnosis and prevented unnecessary exploratory laparotomy in 2 patients. Only two Patients underwent laparotomy one case palpation of the mass was needed to reach a decision for right hemi colectomy in the other case there was colonic perforation with impending fecal peritonitis. So, diagnostic laparoscopy can be considered useful in preventing unnecessary laparotomy. When laparoscopy is not available, we used to perform laparotomy with long, midline exploratory incision, but in case of diagnostic laparoscopy there is no need to perform exploratory laparotomy because the problem will be solved laparoscopically. Even if laparotomy carried out, it will be a tiny incision as the exact pathology is known. In this series we have done only two laparotomies; one for caecal mass and another to ischemic perforation of the colon and so, diagnostic laparoscopy reduces the incision length significantly without affecting the operative procedure. Of 50 patients only five developed a post-operative complication, a pelvic collection which was of very minimal amount and not needed intervention just antibiotics coverage; but 2 patients managed by open surgical procedure developed complications one developed ileus and the other developed wound infection, last one has subcutaneous emphysema resolved gradually post-operative. But no one had major post-operative complications that needed major intervention. Diagnostic laparoscopy reduces post-operative complication rate by reducing operative time, exposure to environment and incision length. Followed up of patients up to three months.

In this study, 50 patients underwent diagnostic laparoscopy. In two patients the correct diagnosis is not reached. One was having a gall stone ileus which is an intraluminal pathology, and so we failed to diagnose the pathology and the other patient was having abdominal pain which was severe with free air under the diaphragm with fever; the definitive diagnosis was not reached and when

laparotomy was done we found a sealed-off perforation on the lesser curvature of the stomach.

CONCLUSION

Using diagnostic laparoscopy in treatment of acute abdominal pain, we reached that it helpful in diagnosis and reduce unnecessary exploratory laparotomy. It also reduces scar size, complications related to open laparotomy, time of operation and hospital stay and so both mortality and morbidity were reduced. DL for management of acute abdomen has been advised as it is easy, less time consuming and cosmetic with lesser complications and lesser mortality and morbidity. By good training, enough experience, enough patience and proper selection of the patients, the result of DL is best and it is the best diagnostic test available at present.

ACKNOWLEDGEMENTS

Special thanks to residents in General Surgery Department Sohag University hospital for their coordination during the study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Helmy MZ, Aldardeer AAK. Laparoscopy in acute abdomen between encouragement and inhibition. Int Surg J 2019;6:3507-12.