Role of Diagnostic Laparoscopy in Chronic Abdominal Pain

Kallakuri Sailaja[1], G. Rajani Devi[2]

[1]Associate Professor, Department of General Surgery, Rangaraya Medical College, Kakinada, Andhra Pradesh, India. [2]Assistant Professor, Department of General Surgery, Rangaraya Medical College, Kakinada, Andhra Pradesh, India.

ABSTRACT

BACKGROUND

Chronic abdominal pain (CAP) is a recurrent condition which may last for 3 days/month in the last 3 months. This study was conducted to evaluate the utility of laparoscopy as an effective diagnostic tool in patients with CAP and also to evaluate the common underlying causes for CAP.

METHODS

This is a prospective longitudinal study, conducted in the department of general surgery, Rangaraya Medical College, Kakinada. Patients with history of abdominal pain for 3 months or more with undiagnosed cause were included in the study. Detailed history of patients was documented before the clinical examination and the findings were recorded. Then laparoscopy was done under general anaesthesia. Visual Analogue Scale (VAS) was used to determine pain pre- and post-scopy.

RESULTS

Among the 50 patients included in the study, age ranged between 19 to 60 years. Male to female ratio was 0.4. Duration of pain ranged between 3 to 12 months. Right lower abdominal quadrant was the most common area where pain was noticed by the patient; majority (40%) of patients reported VAS score of 4; 96% (48) patients had positive outcome 3 months after post-diagnostic laparoscopy.

CONCLUSIONS

The study established that diagnostic laparoscopy is an effective tool for the diagnosis and treatment of patients with CAP.

KEYWORDS

Pain, Range, Study, Patient

Corresponding Author:
Dr. Rajani Devi,
Assistant Professor,
Department of General Surgery,
Rangaraya Medical College, Kakinada,
Andhra Pradesh, India.
E-mail: drrajanikolipey@gmail.com

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BACKGROUND

Chronic Abdominal Pain (CAP) is recurrent abdominal pain for at least 3 days/month in the last 3 months. Continuous abdominal pain, loss of daily function is some of the important symptoms of CAP. It represents around 13% of all surgical admissions internationally.[1] It is a common presenting complaint by various people to the surgeons as well as physicians. Patients with CAP present difficult diagnostic dilemma. By the time of presentation, patients usually underwent various diagnostic techniques including surgery, In spite of these, the pain remains a challenge. More than 40% of CAP cases remain undiagnosed at the end of their diagnostic workup.[2,3] It is a significant reason for referral to a gastroenterologist and the 4th frequent condition in the general population.

CAP is associated with poor quality of life and significant levels of depressive symptoms.[4] Intestinal adhesions was reported to be the most common cause[5,6] followed by biliary causes[7] and appendicular causes.[8] Some extra-abdominal conditions such as corticosteroid insufficiency, diabetic ketoacidosis, porphyria, hypercalcaemia[9] and so on also cause pain abdomen. Here the important issue is differential diagnosis of abdominal wall pain and visceral pain. This is done by careful physical examination as well as by following a battery of investigations. However many patients are still undiagnosed and represent a major diagnostic challenge to the treating specialists.

Laparoscopy is a low risk, minimally invasive surgical procedure used to examine the organs inside the abdomen. Diagnostic laparoscopy may be a key in solving the diagnostic dilemma of CAP. It allows the visual examination of the intra-abdominal organs to detect pathology. The use of this technique in the diagnosis and management of CAP is reported in the literature.[10,11] With these a study was conducted to evaluate the utility of laparoscopy as an effective diagnostic tool in patients with CAP and also to find common underlying causes for CAP.

METHODS

It was a prospective longitudinal study, conducted in the department of general surgery, Rangaraya Medical College, Kakinada from June 2016 to August 2018. The study protocol was approved by the Institutional Ethics Committee. Patients with history of abdominal pain for 3 months or more with undiagnosed cause either by clinical examination or diagnostic tests and patients with previous history of abdominal surgeries were included in the study. Individuals aged below 18 years, known malignancy, pregnant women, individuals with coagulation defects, patients with psychiatric disorders and those who did not submit informed consent were excluded from the study. Detailed history of patient was documented before the clinical examination and the findings recorded. The data includes age, gender, duration of pain, patient's abdominal examination. As part of protocol, basic investigations such as Hb%, total leukocyte count, differential counts, ESR, urine microscopy were performed for all patients and stool examination for ova, cyst and occult blood was also conducted. Imaging studies such as ultrasound studies, plain abdominal radiographs, CT Scans were also conducted based on the patient condition. Then the patient was shifted fir laparoscopy, was done under general anaesthesia. Semi-open technique of trocar insertion through the umbilical cicatrix was used for all patients and pneumoperitoneum was created by insufflating CO_2 gradually and building up intra-abdominal pressure slowly up to 12 mm Hg. One 10 mm optical port with trocar and cannula was inserted in supra umbilical midline after making a transverse supra umbilical incision in the skin and subcutaneous tissue. Direction of entry of trocar was always caudal in the midline towards sacral promontory. The scope was introduced into the peritoneal cavity through this port to visualize the abdominal structures. The second port was placed in left Iliac fossa in case of upper or mid abdominal pathology or at right Iliac fossa in case of lower abdominal pathology. Secondary ports were inserted under vision. Abdomen was examined in a systematic and sequential manner. The third port was placed if there is any difficulty in manipulation or any therapeutic intervention is needed, to gain access to that particular site. After the procedure, all the patients were re-evaluated immediately as well as three months later. Either amelioration or absence of pain was considered to be positive outcome and unchanged and worse pain was referred to be negative outcome, on the basis of Visual Analogue Scale.[12]

RESULTS

During the study period, total 50 (100) patients were included in the study. Age was ranged between 19 to 60 years. Age wise, 32% (16) were included in 18-30 years category, 28% (14) were included in 31-40 years category, 24% (12) were included in 41-50 years category and 16% (8) were included in 51-60 years category (Table 1). Gender wise, 28% (14) were male and 72% (36) were female participants and the male female ratio was 0.4.

The duration of pain was ranged between 3 to 12 months. Most patients (56%; 28) patients were presented with 3-4 months history of abdominal pain and just 12% (6) patients complained with pain for 12 months or more. All (100%) the participants underwent ultrasound abdomen, erect X-ray abdomen for 32% (16) and CECT abdomen for 30% (15) members.

Site of abdominal pain wise, right lower abdominal quadrant was the most common (52%; 26) followed by entire lower abdomen (26%; 13), diffuse (10%; 5), pre umbilical (8%; 4) and left lower abdomen (4%; 2) (Table 2). Maximum (40%) number of patients in this study reported VAS score 4 followed by 5 (32%), 6 (24%) and 3 (4%). When post LAP scores were considered, 96% (48) patients had positive outcome 3 months after post-diagnostic laparoscopy with either absence of pain (VAS score 0) or

amelioration of pain (VAS score 1/2) and 4% (2) patients had negative outcome with pain persistence (VAS score 4) (Table 3). A definitive diagnosis was established in 94% of the cases. The most common diagnosis was intra-abdominal Adhesions (44%; 22) followed by appendicitis (24%; 12), abdominal tuberculosis. (12%; 6), right ovarian cyst (4%; 2), mesenteric lymphadenopathy (4%; 2). Right Right necrotic hydrosalpinx, Meckels diverticulum and pelvic inflammatory disease were diagnosed in 1 case (2%) each, respectively (Table 4).

Age	No.	%
18-30	16	32
31-40	14	28
41-50	12	24
51-60	8	16
Total	50	100

Table 1. Agewise Distribution of the Study Participants

Site of Pain	No.	%
Diffuse	5	10
Peri-Umbilical	4	8
Right Lower only	26	52
Left Lower only	2	4
Entire Lower Abdomen	13	26
Total	50	100.0

Table 2. Site of Pain in the Abdomen among the Study Participants

VAS Score	Pre LAP	Post LAP	Total
0	0	30	30
1	0	12	12
2	0	6	6
3	2	0	2
4	20	2	22
5	16	0	16
6	12	0	12

Table 3. Pre- and Post-LAP VAS Scores among the Study Participants

Final Diagnosis	No.	%
Adhesions	22	44
Appendicitis	12	24
Abdominal tuberculosis	6	12
Right Ovarian cyst	2	4
Mesenteric lymphadenopathy	2	4
Right necrotic hydrosalpinx	1	2
Meckels diverticulum	1	2
Pelvic inflammatory disease	1	2
No abnormality	3	6
Total	50	100

Table 4. Final Diagnosis of the Study Particiants Using LAP

DISCUSSION

Diagnosis and treatment plans in patients with CAP are usually difficult and frustrating especially when the conventional non-invasive diagnostic tools are not able to identify the underlying pathological cause. It is one of the common surgical symptoms, and among the most challenging problems facing the clinician. Prior to the era of diagnostic laparoscopy, these patients had to undergo a battery of expensive laboratory and imaging investigations, while remaining dissatisfied. The surgical specialists were consulted when the pathology was unclear or tissue diagnosis was required. Diagnostic laparoscopy provides a better option avoiding unnecessary exploratory laparotomy and minimizing the surgical trauma.

Gender wise, in this study, 72% (36) were females and 28% (14) were male participants with female male ratio 2.6 Similar findings were reported by Paajanen H et al. and Rajeev Karvande et al.[13] Both the investigators mentioned female predominance, accounting 83.3% and 58.7%, respectively. The age of the study participants was ranged between 18 to 60 years. Similar age profile was mentioned by Chaphekar et al., [14] here the investigators studied on chronic abdominal pain.

In this study the duration of pain was reported to be 3 to 12 months. The duration of pain was ranged between 5 months to 7 years In a study by Raymond P et al.[15] and 3 to 15 months by El-Labban GM, Hokkam EN.[16] In this study as well as the available two resorts, small sample size is another similarity, which was 50, 30 and 70 participants, respectively. In this research, 62% presented with abdominal pain in the right lower quadrant, 26% had entire lower abdominal pain, 10% with diffuse abdominal pain, 8% had peri-umbilical region pain and 4% had pain in left lower quadrant. A study conducted by Rajeev Karvande et al.[13] also showed that the right lower abdominal quadrant was the most prominent site (68.2%) of pain. Whereas Kinnaresh Ashwin Kumar Baria[17] showed that 50% of the patients complained of pain in the right lower quadrant. The result of this study confirms that majority of the patients complained of pain in the right lower abdomen, similar to the other referenced studies.

Among the study members, 44% in this research were diagnosed with intra-abdominal adhesions, 24% were diagnosed with chronic appendicitis, 12% had omental and peritoneal tubercles suggestive of Koch's, 4% each had right ovarian cyst, mesenteric Lymphadenopathy respectively and 2% patient each had right necrotic hydrosalpinx, mescal's diverticulum, reed fluid in pelvis with congestion of fallopian tubes and uterus respectively. This compares with the previous studies in India, conducted by Kinnaresh Baria et al.,[17] Rajeev Karvande et al.,[13] reported that chronic appendicitis is the most common cause, constituting 40.7% and 56.1% of the study populations respectively. In other study, Salky et al.[20] were able to identify appendicitis in 98% study subjects. Onders RP et al.[21] and Lavonius M et al.[18] mentioned adhesion was the common clinical finding followed by inguinal hernia. Following the diagnosis, 76% patients underwent therapeutic intervention. Laparoscopic management included adhesiolysis (44%), appendicectomy (24%), ovarian cystectomy (4%), right salpingectomy (2%) and Meckel's diverticulectomy (2%). Klingensmith ME et al.[19] reported simultaneous therapeutic intervention in 73% of patients and Kinnaresh Baria et al.[17] reported in 94%, whereas in this research it was 76%.

Diagnostic interventions such as biopsy of tubercles or omentum in 12%, mesenteric lymph nodes in 4% and pelvic fluid aspiration for analysis in 2% members. Patients were treated accordingly post laparoscopically based on the histopathological report. Total 47 out of 50 patients were intervened laparoscopically for arriving at a diagnosis and treatment. 3 patients were found to have no intra-abdominal pathology on laparoscopy and were not intervened. There were no post LAP complications encountered during the procedure and no major complications were diagnosed.

Minor post laparoscopy complications like wound infections were noticed in 4% patients and were managed by change of antibiotics and regular dressings. The duration of hospital stay post-diagnostic laparoscopy varied from 1 to 12 days. Study by El-Labban GM et al.[16] showed similar duration of post-operative hospital stay which ranged between 2 to 9 days.

The score for pain based on the VAS administered to the patients who underwent a review 3 months after the diagnostic laparoscopy varied from 0 to 4. This test was conducted to measure the outcome of the study. 96% of the patients reported either complete absence of pain or amelioration of pain signifying positive outcome with VAS score of 0 / 1 / 2. In 2 (4%) patients, in whom no definitive diagnosis was established post diagnostic laparoscopy, pain still persists with VAS score of 4. In 1 (2%) patient, placebo effect was shown with VAS score of 2, post procedure, even the diagnosis is inconclusive on diagnostic laparoscopy. This study reveals that diagnostic laparoscopy is an important diagnostic tool for arriving at a diagnosis for CAP when other non-interventional diagnostic tools have not yielded diagnosis.

All 50 patients enrolled for this study had undergone imaging diagnostic tools-all 50 patients had undergone USG, 16 had undergone USG + X-Ray and 15 USG + CT. All these had not yielded any relief from the CAP as no definite diagnosis was established. This study reports a 94% diagnostic rate with diagnostic laparoscopy in 50 patients who were enrolled, with non-invasive diagnostic tools not being able to establish the pathology in these patients. Further, this study also revealed that 23 (46%) patients had undergone previous open surgeries and in 22 of them, Intra-Abdominal Adhesions were present, secondary to previous surgeries. Most commonly, patients (13 in number) had undergone Tubectomy followed by LSCS in 6 patients and Hysterectomy in 2 patients. There was past history of laparotomy (for Hollow Viscous Perforation) in 1 patient and history of Open Appendicectomy in 1 patient. Duration between previous surgery and presentation of abdominal pain ranged from 1 year to 20 years.

According to Mueller et al.,[20] laparoscopic adhesiolysis was found to be beneficial in more than 80% of patients presenting with chronic abdominal pain. In this study all 22 patients presenting with intra-abdominal adhesions were found to have positive outcome at the end of three months, that is, 100%. No post procedure complications were reported.

Laparoscopy is an excellent diagnostic tool which is often underutilized due to inherent risks of surgical procedure. With advances in technology and increasing expertise, the safety of laparoscopic procedure is established beyond doubt. It helps in making a diagnosis where other diagnostic modalities fail.

In the present study, the aetiology of the CAP could be established in 94% of cases. In the same sitting, definitive therapeutic procedures were performed in 76% of cases. In this study, Intra-abdominal adhesions were found to be the important cause of CAP that could not be diagnosed by routine imaging studies and Chronic Appendicitis is also common pathology missed by normal radiological investigations such as USG and CT. The benefit of performing laparoscopy in these patients is that, the therapeutic procedure can also be done in the same setting.

The diagnosis of peritoneal or omental tuberculosis is difficult as the size of tubercles is <5 mm, which are not detected on routine ultrasound examination or CT. Laparoscopy provides an accurate specimen for histopathological examination. In this study, there are total 12% cases of abdominal tuberculosis that were confirmed the diagnosis with the help of gross appearance and peritoneal and omental biopsy. Salky and Edye[10] were able to establish the aetiology in 76% out of 387 patient's undergone diagnostic laparoscopy. Therapeutic procedure was done in 128 (48%) patients. In this study, diagnosis was established in 94% of cases while the rate of definitive therapeutic procedure was 76%. Patients diagnosed to have Abdominal Tuberculosis confirmed by HPE were treated by Anti Tubercular Therapy and responded well. The rates of complications reported in the literature are as low as <1%,[3,21] similarly no major complication was reported in this study.

CONCLUSIONS

Diagnostic laparoscopy is an effective tool for the diagnosis and treatment of patients with chronic abdominal pain. Though invasive, in experienced hands it is safe and effective with shorter hospital stay. It avoids unnecessary laparotomies and helps in faster recovery.

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