

## Diagnostic and Therapeutic Value of Diagnostic Laparoscopy in Patient with Chronic Abdominal Pain

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### Abstract

**Introduction:** Chronic abdominal pain is a troublesome dilemma confronting both the medical and surgical care professionals. These patients are submitted to a lot of diagnostic investigations but, regrettably, no precise etiology of their problem could be elucidated. Diagnostic laparoscopy, apart from visualizing the entire abdominal cavity, allows us to take precise biopsies. Laparoscopy also offers a therapeutic solution for many causes of chronic abdominal pain.

**Patient and Methods:** Patient with the inclusion criteria underwent diagnostic laparoscopy for chronic abdominal pain over the last three years from January 2011 to December 2013. The patient's demographic data, duration of abdominal pain, diagnostic studies, intra-operative findings, interventions and follow-up results were recorded.

**Results:** In this study, 80 patients (55 female and 25male) with an average age of  $23 \pm 14.76$  years underwent diagnostic laparoscopy for the evaluation and treatment of chronic abdominal pain. The average duration of pain was  $8 \pm 2.85$  months. Findings included intra-abdominal tuberculosis in 4 patients, internal herniation in 2 patients, significant intra-abdominal adhesions in 18 patients, secondary intussusception in 2 patients, small intestinal stone in 1 patient, intestinal lymphoma in 1 patient, abdominal lymphadenopathy due to lymphoma in 2 patients, cecal diverticulum in 2 patients and subacute appendicitis in 19 patients, jejunal diverticulum in 1 patient, Chron's disease in 2 patients, endometriosis in 3 patients and inflamed Meckle's diverticulum in 1 patient.

**Conclusion:** Diagnostic laparoscopy is a simple, rapid, effective and accurate tool in evaluating patients with chronic abdominal pain, in whom conventional methods of investigations have failed to elicit a certain cause with the advantage that it is an effective therapeutic and accessible tissue sampling tool.

**Keywords:** Abdominal pain; Chronic; Laparoscopy

### Introduction

Surgical and medical care professionals often remain in quandary with the issue of chronic abdominal pain in patients [1]. Commonly, such patients with chronic abdominal pain suffered for long duration and subjected to ample diagnostic investigations suggested by the expert medical practitioners without revealing a specific aetiology [2].

Surprisingly, greater than 40% of chronic abdominal pain patients without proper aetiology are treated as functional condition such as, functional dyspepsia, irritable bowel syndrome and motility disorders [3,4].

Several other organic conditions may be responsible for the chronic abdominal pain in patients which include appendicular causes, intestinal adhesions or some other rare or little known conditions [5]. Failure of multiple investigation efforts to understand the reason of the pain leads to referring the case to the consultation of surgeons with an assumption that surgical intervention may provide insight into the cause of the pain and lead a path to remedy. Considering such situations, appendectomy and laparotomy used to be recommended previously [6].

Laparoscopy is as much a surgical procedure as exploratory laparotomy and, very often, just as informative. Apart from visualizing a large part of the abdominal cavity, a precise targeted biopsy, fine-needle aspiration cytology or fluid analysis can also be done. Laparoscopy offers a distinct advantage over ultrasound or CT scan as it is capable of detecting lesions less than 5 mm in size especially peritoneal metastasis, which cannot be detected by these investigations [7].

In case of diagnostic uncertainty, laparoscopy may help to avoid unnecessary laparotomy, provides accurate diagnosis, helps to plan surgical treatment, improves the outcome in the majority of patients with chronic abdominal pain and allows surgeons to diagnose and treat many abdominal conditions that cannot be properly managed otherwise [8].

### Patient and Methods

From January 2011 to December 2013, 80 patients with the inclusion criteria underwent diagnostic laparoscopy for chronic abdominal pain of undiagnosed etiology. Chronic abdominal pain is abdominal pain which persists for more than 3 months duration either continuously or intermittently. Demographic data of the patients were listed in Table 1.

		Number
Age	Min	18 years
	Max	52 years
	Mean ± SD	23 ±14.76 years
Sex	male	25
	female	55
Duration of pain	min	4 months
	max	29 months
	Mean ± SD	8 ± 2.85 months
Site of pain	Upper abdomen	9 patients
	Lower abdomen	53 patients
	Diffuse	18 patients

**Table 1:** Demographic data of the patients.

The inclusion criteria: patients with normal or inconclusive investigation for chronic abdominal pain and in whom no medical cause of pain could be found.

The exclusion criteria: patients with known medical cause of abdominal pain, uncorrectable coagulopathy and patients with severely decompensated cardio-respiratory system.

All patients were subjected to a thorough history of their complaint, general and abdominal examination along with gynecological examination (in women). Routine investigations such as complete blood count, coagulation profile, urine examination, renal function test, X-ray chest and abdomen and abdominal ultrasound were performed in all patients. Upper gastrointestinal (GI) endoscopy was performed in patients with upper abdominal pain only. Computed tomography (CT) abdomen and pelvis scan were done in most of our patients (69 patients).

### Operative technique

The procedure was performed under general anaesthesia. If there was a previous upper midline incision or massive intra-abdominal adhesions were suspected, the Veress needle was passed through the abdominal wall in an area with no scars, most often in the left upper quadrant of the abdomen, a few centimetres below the costal margin.

After establishment of the pneumoperitoneum, a standard three trocar techniques was used (10-mm optic via umbilical trocar and two 5-mm lateral trocars). A fourth 5-mm trocar was inserted as needed during the procedure. The whole abdominal cavity was inspected carefully starting from the liver, gallbladder, anterior surface of the stomach and spleen. With fine smooth graspers, these structures could be touched safely and elevated for further inspection. The small bowel was examined using these atraumatic graspers. It was inspected thoroughly from the ligament of Treitz to the ileocecal valve. The colon including the appendix was inspected in the same manner as the small bowel.

Finally, the gynecological organs and peritoneal surfaces were inspected. If adhesions were seen between the intestinal loops and the abdominal wall or between the abdominal organs, they were dissected

with a scissor in the vast majority of patients. Electrocautery was used mainly for hemostasis and as a dissection technique in few cases. The dissection was made close to the abdominal wall to avoid injury to the bowel loops. Other laparoscopic procedures such as appendectomy, cholecystectomy, hernia repair, and biopsies were performed according to the patient's condition.

### Results

In this study, it was observed that chronic abdominal pain showed higher incidence in second decade, higher incidence in females and most of the patients presented with lower abdominal pain.

In the present study, the most common cause of chronic abdominal pain is recurrent sub-acute appendicitis (chronic appendicitis) followed by intra-peritoneal adhesions either from previous surgery or idiopathic. There were also some patient with suspected small intestinal lesions by CT and confirmed after diagnostic laparoscopy. There were other rare surgical causes of chronic abdominal pain that were diagnosed only after diagnostic laparoscopy (Table 2).

Pathology	Number	%
Abdominal TB	4	5%
Internal herniation	2	2.5%
Significant intra-abdominal adhesions	18	22.5%
Secondary intussusception	2	2.5%
Small intestinal stones	1	1.25%
Intestinal lymphoma	1	1.25%
Abdominal lymphoma due to mesenteric lymph nodes	2	2.5%
Inflamed Cecal diverticulum	2	2.5%
Inflamed jejunal diverticulum	1	1.25%
Inflamed Meckle's diverticulum	1	1.25%
Appendicitis	19	23.75%
Chron's Disease	2	2.5%
Endometriosis	3	3.75%
Total	58	72.5%

**Table 2:** Shows the different causes of chronic abdominal pain diagnosed in the study.

In 22 patients (27.5%), no pathology was detected as a cause of chronic abdominal pain. Twenty patients were presented with lower abdominal pain and for those patients laparoscopic appendectomy was done. The other two patients who presented with upper abdominal pain, nothing was to them. The pain was relieved in 71 (88.75%) patients. For the other 9 patients (11.25%), the pain did not improve (Table 3).

### Discussion

Even though Laparoscopy is a superior diagnostic technique which aids in effective diagnosis, it is often underutilized because of the risk associated with the surgical procedure. Recent advances in this

technology and increasing expertise in laparoscopy has established the safety of this procedure with certainty [7].

Pathology	Number	%
No pathology detected	22	27.5%
Resolution of chronic abdominal pain	71	88.75
Diagnostic accuracy	58	72.5%

**Table 3:** Diagnostic accuracy and improvement of pain.

Detail visualization of surface anatomy of intra-abdominal organs and establishment of intra-abdominal pathology became possible with the help of diagnostic laparoscopy for the surgeons. Specific advantage of laparoscopy for both the surgeons and the patients is that it provides specific answers related to pathology and confirms that nothing serious is found intra abdominally [8].

In this study, 58 (72.5%) patients had pathological findings identified at the time of laparoscopy. This percentage is lower when compared with other studies such as Karl miller et al. [9] who reported that laparoscopy provided diagnoses in 89.8% of patients. Also, Raymond et al. [10] reported diagnostic accuracy rate of 89.9% and Vikash Lal et al. [11] in 2014 reported diagnostic accuracy rate of 84%.

In this study, the most common finding was sub-acute appendicitis (chronic appendicitis) in 19 (23.75%) patients, diagnosed intra-operative by adhesions around the appendix, thickened appendix and/or reactionary fluid collection at right iliac fossa and proved by post-operative histopathology of the appendix. The second common cause of chronic abdominal pain was intestinal adhesions either idiopathic or post-operative adhesions in 18 (22.5%) patients.

After reviewing the literature, some studies stated that chronic appendicitis is a very common pathology missed by normal radiological investigations such as ultrasound and sometimes even on CT scan. The advantage of laparoscopy in these patients is that they can be provided therapy in the same setting like the results published by Kolts et al. [12], Baria et al. [13] and Mushaff et al. [7].

Still other studies stated that intestinal and peritoneal tuberculosis were most common findings like Arya and Gaur [14], Krishnan et al. [15] and Rai and Thomas [16] who reported abdominal tuberculosis in 23 (92%) of the 25 patients in whom laparoscopy was performed.

In the 20 patients who presented with lower abdominal pain and no significant pathology was detected during laparoscopy, appendectomy was done. From those 20 (25%) patients, 13 patients had complete resolution of their pain and 7 patients did not improve.

In a study by Fayez et al. [17], patients who underwent appendectomy for chronic lower abdominal pain were reviewed and he recorded that 92% of these patients had abnormal histological findings and 95% of them had resolution of pain.

Raymond et al. [10] reported resolution of pain in 74% of patients with chronic right lower abdominal pain after appendectomy. In the study of Mushraf et al. [7], 80% of patient who underwent appendectomy for chronic abdominal pain had resolution of pain.

This may be attributed to microscopical changes at the appendix that cannot be detected by laparoscopy or may be due to placebo effect of diagnostic laparoscopy.

In the study of Mushraf et al. [7], 6 (17%) patients did not have any pathological findings on laparoscopy. Four of these patients had resolution of pain after procedure which was suggestive of placebo effect.

In this study, 71 (88.75%) patients had pain resolution. Raymond et al. [10] reported that more than 70% of patients had long term pain relief. Paajanen et al. [18] reported that laparoscopy alleviates the symptoms in more than 70% of patients.

In patients where no pathology was detected, this may be due to the limitations of diagnostic laparoscopy which include deep-seated parenchymal organs, non- exploration of the retroperitoneal space, the inner surface of the hollow organs cannot be examined using laparoscopy and laparoscopy does not allow the surgeon to palpate organs.

## Conclusion

Diagnostic laparoscopy is a simple, rapid, effective and accurate tool in evaluating patients with chronic abdominal pain, in whom conventional methods of investigations have failed to elicit a certain cause with the advantage that it is an effective therapeutic and accessible tissue sampling tool.

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