

ROLE OF DIAGNOSTIC LAPAROSCOPY IN PATIENTS OF CHRONIC ABDOMINAL PAIN

Pramoj Jindal, C. S. Ramachandran, Vijay Arora

Department of General Surgery,
Sir Ganga Ram Hospital, Rajinder Nagar, New Delhi - 110060, India

Abstract: Chronic abdominal pain with no obvious etiology is a challenge to physicians and surgeons. Traditionally diagnostic laparoscopy has been used to evaluate the patients, when all imaging and noninvasive investigations have been exhausted. This study was taken up to determine the efficacy of diagnostic laparoscopy in determining the etiology of abdominal pain. This study was a prospective study wherein all patients underwent a set of noninvasive investigations and then a diagnostic laparoscopy was performed on each of them. Adhesions were the commonest finding seen on diagnostic laparoscopy. Diagnostic laparoscopy was definitive in most of the cases in reaching to a final diagnosis. Pain relief in follow up of patients was also analyzed to know the therapeutic effectiveness of laparoscopic adhesiolysis. In conclusion, diagnostic laparoscopy if done early in case of chronic abdominal pain saves time, money and also agony of the patient.

INTRODUCTION

The management of patients with chronic abdominal pain, where no obvious etiology has been found on repeated investigations, remains a challenge to physicians and surgeons alike. It is not uncommon for patients with chronic abdominal pain to be evaluated by a myriad of physicians and surgeons and often end up with psychiatrists when no cause has been found.

Laparoscopic techniques in the diagnosis and therapy of such patients with chronic abdominal pain are being increasingly used. The role of laparoscopy as a diagnostic modality in relation to other imaging studies continues to be evaluated. Traditionally, laparoscopy has figured very late in the diagnostic algorithm, after all other routine imaging investigations have been done. It may be practical to bypass traditional imaging studies and opt for diagnostic laparoscopy, given its advantages in diagnosis and the availability of a therapeutic option in the same setting. This will help to reduce the economic impact to the patient and will lead us to the diagnosis much earlier, offsetting the cost of an increased number of diagnostic laparoscopies being performed.

This study was designed to determine the efficacy of laparoscopy in determining etiology of pain of unknown origin in patients with a history of recurrent or chronic abdominal pain of longer than 3 months duration.

MATERIALS AND METHODS

This was a prospective study carried out from January 2001 to November 2006 in the Department of General Surgery at Sir Ganga Ram Hospital, New Delhi. The study comprised of 104 patients who underwent diagnostic laparoscopy for chronic abdominal pain.

All patients who attended the surgical outpatients of one of the surgical units, with chronic abdominal pain were entered into the study, provided they fulfilled the following criteria:

- The patients should be aged 12 years and above.
- They should have had chronic abdominal pain of at least 3 months duration.
- Pain due to gallbladder disease, peptic ulcer and renal origin had been excluded clinically and on imaging (where appropriate).

Exclusion criteria: The patients were excluded if they

- Were unfit for general anesthesia.
- Known to have intraabdominal malignancy.

A detailed history was taken from each patient and a full examination was performed. All female patients additionally underwent gynecological examination by a gynecologist. All patients underwent the following investigations.

- Complete hemogram
- Liver function test
- Renal function test
- Blood sugar (random)
- Erythrocyte sedimentation rate (ESR)
- Mantoux test
- X-Ray abdomen
- Chest X-Ray
- Ultrasound scan (whole abdomen)
- Barium meal follow through
- CT scan (whole abdomen)

Any additional investigations like colonoscopy, hysterosalpingography, etc. were also performed on these patients if indicated.

All patients subsequently underwent diagnostic laparoscopy, with tissue biopsy wherever possible or necessary.

Patients underwent an ultrasound examination. Specifically excluded were conditions like cholelithiasis, renal/ureteric calculus disease and deep pathology within the solid organs (liver, spleen and pancreas). Other pathologies which were specifically looked for were ascites, mesenteric lymph nodes, uterine or ovarian pathology and omental caking.

A barium meal follow through was performed by administering 200ml of barium sulphate orally and taking x-rays of the abdomen at regular interval till the contrast reaches the

Correspondence : Dr. C. S. Ramachandran

“Anugraha”32, SBI Nagar, Outer Ring Road, Paschim Vihar,
New Delhi – 110063 **Email:** surgicalrama2000@usa.net

ascending colon. Gastroduodenal pathology was looked for. Bowel strictures were identified by a persistent narrowing with proximal dilatation. The ileocaecal region was examined to look for any hold-up or deformity. Transit time till caecum was measured. Fast transit time was defined as less than 40 minutes. All patients underwent CT scan (spiral) of whole abdomen, using the GE light speed machine. The patients were given oral contrast (30 ml diluted to 1600 ml), as well as intravenous contrast (80 ml) and rectal contrast only if indicated. Abdominal cuts were taken at a 6-mm distance.

The patients underwent preanesthetic check-up. All patients subsequently underwent diagnostic laparoscopy after obtaining a written consent. All procedures were performed using standard laparoscopic techniques under general anesthesia. If there was a previous upper midline incision scar or massive intraabdominal adhesions were suspected, a blunt trocar was introduced under vision. Pneumoperitoneum was undertaken by insufflating 3-4 liters CO₂ into the abdominal cavity; the intraabdominal pressure was adjusted to 15 mm Hg. A 10-mm periumbilical incision was chosen for the 0° / 30° camera. Depending upon the intra-abdominal findings the secondary trocars were placed under direct vision.

Careful inspection of the entire abdominal cavity was performed, starting from the pelvis to right iliac fossa, left iliac fossa, right and left paracolic gutters and then to the hepatic and splenic regions. The entire small bowel and mesentery were inspected in retrograde fashion starting from the caecum. After identification of the lesion a decision for necessary therapeutic intervention or taking a suitable biopsy was taken. In cases of intraabdominal adhesions, complete adhesiolysis was performed as close to the abdominal wall as possible with a monopolar electrocautery scissor. Bowel resection, if needed, for small bowel pathology was achieved by extending the midline port incision to 4.0 cm to bring the small bowel loop out. Conversion to open laparotomy was done in a few patients who required a right hemicolectomy. Standard general anesthetic and postoperative care was given in all cases. Postoperative follow up was done till discharge from the hospital.

The patients were reviewed after one week in the outpatient department (OPD), when they were called for the removal of sutures or clips. Relief from the pain was also inquired for and noted. Follow up visits were repeated at 3rd month, 6th month and 1 year intervals after surgery. The few outstation patients were interviewed telephonically. Every patient was asked about the extent of relief of the original pain symptoms, any residual problem and quality of life after surgery.

The data from all these patients was grouped into:

1. Non-invasive investigations (but also included cytology, wherever applicable).
2. Findings of diagnostic laparoscopy.

These were analyzed to evaluate the accuracy rate (false positives, false negatives) of the two modalities with a view to lay down guidelines for the place of diagnostic laparoscopy in patients of chronic abdominal pain.

RESULTS

Patient Characteristics

From January 2001 to November 2006, 104 patients were included in the study. There were 52 women and 52 men with a mean age of 31.5 years (range 14-65 years). The mean duration of abdominal pain was 3.25 years (range 3 months to 20 years). The mean follow up was 4.2 years (6 months to 6 years)

Pain Character

Pain was described as colicky or continuous pain. Out of 104 patients 72 complained of colicky pain whereas 32 patients had continuous abdominal pain. Sixty out of 72 patients (83.33%) having colicky abdominal pain had relief after diagnostic laparoscopy. On the other hand 24 out of 32 patients (75%) having continuous abdominal pain had relief after diagnostic laparoscopy.

Primary Site of Abdominal Pain

The umbilical region was the primary site of pain in the maximum number of patients (68 patients) i.e. 65%, followed by the right iliac fossa (28 patients). None of the patients had the primary site of pain as right & left hypochondrium, right & left flank and left iliac fossa.

Associated Symptoms

Most patients had varied symptoms along with chronic abdominal pain. Symptoms at presentation were vomiting, malena, bleeding per rectum, constipation, etc. The most common symptoms were vomiting, weight loss, anorexia, borborygami and abdominal distension.

History of Tuberculosis

Sixteen patients had a drug history of ATT (antituberculous therapy). Out of these 16 patients, 4 patients had received ATT for cervical lymph node tuberculosis. The rest 12 patients had taken ATT for pulmonary tuberculosis. Four among these 12 patients were a defaulter who had stopped ATT after 2-4 months of initiation. Out of these 16 patients, 12 had a final diagnosis of abdominal tuberculosis. The 4 who didn't had abdominal tuberculosis, had ileal strictures which turned out to be non-specific inflammatory strictures on histopathological examination.

Previous Abdominal/Groin Surgery

Forty four (44%) out of 104 patients had a history of previous abdominal/groin surgery for different reasons. Appendectomy was the commonest surgical intervention performed previously.

Aggravating & Relieving Factors

Food was the aggravating factor for pain in 56 patients. One patient specifically described that his abdominal pain was aggravated only after consumption of nonvegetarian food. Out of 56 patients, pain increased immediately after food in 12 patients, but had a delayed onset in 44 patients. The remaining 48 patients had no relationship of abdominal pain with food intake.

Anemia was defined as Hb<10gm% in this study. Out of 104 patients, 32 patients were found to be suffering from anemia. Of these 32 patients, 30 had a final diagnosis reached prior to discharge.

In only 2 cases no diagnosis could be made even after diagnostic laparoscopy.

Contrast Enhanced Computerized Tomographic Scan

CECT scan was the last imaging investigation which used done before diagnostic laparoscopy. Both intravenous and oral contrast was given in every patient. In some patients an additional rectal contrast was also given. CECT scan was normal in 60 patients out of the 104 patients. Forty four patients had positive findings, out of which in 40 patients these findings lead to the final diagnosis. Remaining four patients had findings such as a small splenic cyst, liver hemangioma which did not help in getting to the final diagnosis.

Diagnostic Laparoscopy (Fig.1)

In all patients, diagnostic laparoscopy was performed and a detailed examination of the abdominal viscera along with biopsy of appropriate tissues was performed in a few patients. The mean operation time was 61.5 minutes (range 25-125 minutes). Only 4 patients out of 104 had no positive findings on laparoscopy. (Table 1)

Accuracy of diagnostic laparoscopy

The accuracy of diagnostic laparoscopy is based on the table no.2

- i. Sensitivity (true positive) = 100%
- ii. Specificity (true negative) = 33.33%
- iii. Positive predictive value of diagnostic laparoscopy = 92.00%
- iv. Negative predictive value of diagnostic laparoscopy = 100%
- v. False negatives = 0.00%

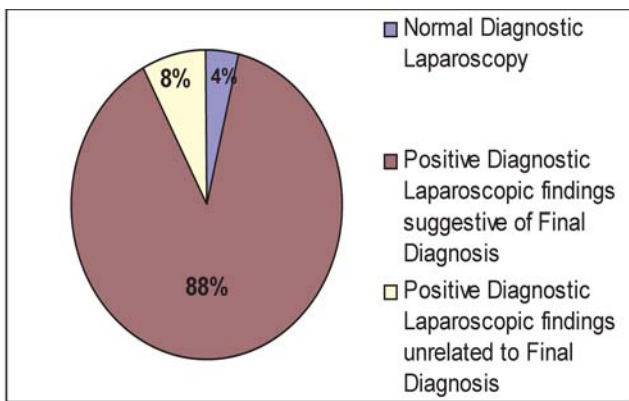


Fig.1: Yield of diagnostic laparoscopy

- vi. False positives = 66.66%

The findings on diagnostic laparoscopy correlated well with the final diagnosis in most of the cases. In twelve cases the final diagnosis could not be made despite all the investigations including diagnostic laparoscopy.

FOLLOW UP

80 patients were followed up for the period ranging from 3 months to one year; showed variable pain relief. (Fig. 2)

Table 1:

Laparoscopic findings	n (number of times seen)	Laparoscopic findings	n (number of times seen)
Adhesions	60	Lymph nodes	50
Fimbrial cyst	20	Tubercles	16
Bowel wall abnormality	16	Appendicular pathology	16
Free fluid	12	Distended bowel	4
Bowel stricture	12	Bands	4
Tubo-ovarian mass	4	Internal hernia (caecum)	1
Endometriosis	4	Inguinal hernia (indirect)	4
No abnormal findings	4		

Table 2: Contingency table for diagnostic laparoscopy

Laparoscopic findings	Diseased	Notdiseased	Total
Positive	92	8	100
Negative	0	4	4
Total	92	12	104

DISCUSSION

A patient with chronic abdominal pain is a challenge for the surgeon. This heterogeneous group of patient has usually been investigated with noninvasive methods without much help. Quite a few studies have reported the usefulness of diagnostic laparoscopy in these patients. These studies suggest that diagnostic laparoscopy is an ideal investigation in patients who have chronic abdominal pain, especially if they have had previous laparotomy or pelvic

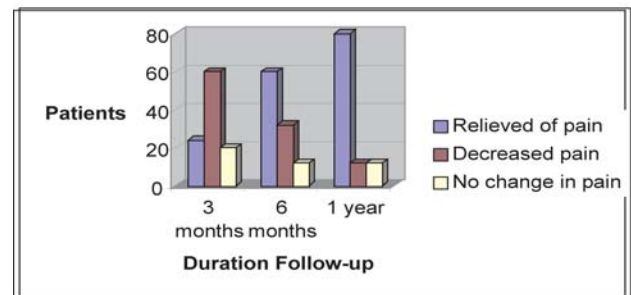


Fig.2: Change in pain on follow-up

inflammatory disease in their history or recurrent attacks of right lower quadrant pain^{2,5}. In a study of patients with chronic abdominal pain by Salky et al.⁶² found that 44% of patients had undergone an abdominal surgery previously. Similarly, in our study 44 (42%) out of 104 patients had a history of previous abdominal/groin surgery for different reasons. Of these 44 patients organic pathology was detected in 40 (90.9%) patients. Of these 40 patients, 28 (70%) patients had adhesions as the cause of their pain. These adhesions were missed by all other investigative modalities and were picked up only on diagnostic laparoscopy.

Adhesions are a substantial cause of hospitalization, mainly because of chronic abdominal pain, infertility and intestinal

obstruction. Kresch et al.³ noticed that adhesion that restricts the movement or distensibility of organs and those that involve the parietal peritoneum or bowel are more likely to cause pain than adhesions involving other sites. Typically the pain caused by adhesions is well localized due to local peritoneal tension, suggesting that the cause of the pain is the traction of the peritoneum, which is very sensitive. However, in our study a simple omental adhesion to the scar site or a flimsy adhesion was the common type of adhesion found. All our patients were relieved completely of their pain after adhesiolysis indicating that simple omental adhesion could also be cause of symptoms. In our study, adhesions were a cause of chronic abdominal pain in 32 patients (30.7%). All these underwent complete adhesiolysis laparoscopically and at a 1-year follow up 24 patients (75%) were completely free from pain, whereas 4 patients (12.5%) had a substantial decrease in pain intensity. Four patients weren't relieved at all and continued to have similar pain in abdomen. Overall laparoscopic adhesiolysis has proved to be beneficial in around 87.5% patients.

Lavonius et al.⁴ found organic disease in 68% of all patients who underwent a diagnostic laparoscopy for chronic abdominal pain. Seventy-eight percent of the patients who underwent a therapeutic procedure reported a positive outcome in terms of relief of their symptoms. In our study we were able to find organic disease in 88.46% (92 out of 104) of patients. Eighty-eight of these 92 patients (95.65%) had a symptomatic relief from pain at a 1-year follow up.

Fayez et al. had reviewed appendectomies for chronic lower abdominal pain. Ninety-five percent were relieved of their symptoms and 92% of the removed appendices revealed abnormalities. At laparoscopy, the appendix appeared abnormal in all cases, and no other pelvic-abdominal abnormality was noted. In our study 12 patients underwent appendectomy, as the appendix appeared abnormal on laparoscopy. All these appendix were also abnormal histologically. All these 12 patients had a relief of their symptoms postoperatively.

Lavonius et al. reported 6 patients who underwent diagnostic laparoscopy with no therapeutic procedure and reported improvement in their pain after the laparoscopy, which suggests a placebo effect of laparoscopy. In our study 4 patients reported improvement in their pain, even though no organic pathology had been found and no therapeutic procedure had been performed except for a mesenteric lymph node biopsy / omental biopsy (which was reported as reactive lymphadenitis). Psychological factors are known to play an important part in the experience of chronic pain, and the importance of "peace of mind" should not be underestimated.

Abdominal tuberculosis can present either as a tubercular peritonitis or gastrointestinal tuberculosis. In our study 36 cases turned out to be of abdominal tuberculosis (34.6%). Out of these, 8 patients had peritoneal tuberculosis, 8 had ileocaecal tuberculosis and the remaining 20 had tuberculous lymphadenopathy (mainly mesenteric lymph nodes). Similar to the findings of Apaydin et al.¹ tuberculous peritonitis in both the patients were diagnosed only at diagnostic laparoscopy. The only investigation other than diagnostic laparoscopy which was helpful in diagnosing peritoneal tuberculosis was the Mantoux test which was positive in all 8 cases. Similar to as is reported in literature, the diagnosis of

ileocaecal tuberculosis was the easiest. Almost all the investigations including ultrasonography, barium meal follow through and CT scan were positive before the diagnosis was confirmed by diagnostic laparoscopy. Suri et al.⁷ described abdominal lymphadenopathy as the commonest manifestations of tuberculosis on CT. Similarly in our study CT scan diagnosed abdominal tuberculosis in 24 out of 36 cases (66.66%). Out of these 24 cases, abdominal lymphadenopathy was seen in 16 patients. The remaining patients had bowel wall abnormality and omental thickening. Out of the 16 cases with a previous history of tuberculosis (pulmonary/extra-pulmonary), 12 cases were found to have abdominal tuberculosis at diagnostic laparoscopy.

In the era before CT scan and MRI, patients had contrast radiography performed as a part of their diagnostic workup. As per Salky et al.⁶ these preoperative evaluations were not very helpful in delineating pathology. Even with all these preoperative evaluations, a firm diagnosis consistent with the findings at laparoscopy was made in only 4% of the patients. The diagnostic rate of diagnostic laparoscopy is so much higher than that of preoperative studies in this series that it is clear that patients with persistent chronic abdominal pain were better served with laparoscopy, which yielded a firm diagnosis in 76% of cases. Similarly in our study preoperative imaging studies confirmed the diagnosis in only 38.46% (40 out of 104 patients) of cases. Diagnostic laparoscopy yielded a firm diagnosis in 88.46% (92 out of 104 patients) cases.

CONCLUSIONS AND SUMMARY

In summary, we have found that patients with complaints of chronic abdominal pain are likely to benefit from diagnostic laparoscopy if the following criteria are met:

- i. The patient has a prior history of abdominal surgery.
- ii. The patient has a prior history of tuberculosis.
- iii. The patient has a localized abdominal pain.
- iv. Other pathologic causes like gallstones, renal stones have been ruled out.

The present study supports laparoscopic adhesiolysis alone as a satisfying final treatment for chronic abdominal pain caused by adhesions. Laparoscopy is a rapid, accurate, simple, inexpensive and safe modality in the diagnosis of tuberculous peritonitis. Ultrasonography, BMFT and CECT scan have a low yield in patients of chronic abdominal pain. The only area of high yield is in cases of gastrointestinal tuberculosis (lymph nodes, bowel wall abnormality). A decision of using diagnostic laparoscopy early contributes to an early diagnosis and commencement of treatment of chronic abdominal pain.

BIBLIOGRAPHY

- 1) Apaydin B, Paksoy M, Bilir M, Zengin K, Saribeyoglu K, Taskin M. Value of diagnostic laparoscopy in tuberculous peritonitis. *European Journal of Surgery* 1999 Feb;165(2):158-63.
- 2) Klingensmith ME, Soybel DI, Brookes DC : Laparoscopy for chronic abdominal pain. *Surg Endosc.* 1996 Nov;10(11):1085-7.
- 3) Kresch AJ, Seifer DB, Sachs LB, Barrese I. Laparoscopy in 100 women with chronic pelvic pain. *Obstet Gynaecol* 1984;64:672-74.
- 4) Lavonius M, Gullichsen R, Laine S, Ovaska J. Laparoscopy for chronic abdominal pain. *Surgical Laparoscopy & Endoscopy* 1999 Jan;9(1):42-4.
- 5) Sahwi S. Laparoscopic pelvic adhesiolysis using CO2 Laser. *J Am Assoc Gynecol Laparosc* 1994 Aug;1(4, Part 2):S10-1.
- 6) Salky B. Diagnostic laparoscopy. *Surgical Laparoscopy & Endoscopy* 1993 Apr;3(2):132-4.
- 7) Suri S, Gupta S, Suri R. Computed tomography in abdominal tuberculosis. *The British Journal of Radiology* 1999;72:92-98.