



Prospective Study of Laparoscopy in Patients with Chronic Abdominal Pain

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Abstract

Background: *The intention of this prospective study is to highlight the utility of laparoscopy in patients vexed with chronic abdominal pain as it aides in diagnosis followed by therapeutic intervention in the same sitting.*

Material and Methods: *A prospective study was performed of 100 patients who underwent laparoscopy for chronic abdominal pain (more than or equal to 6 weeks), with average age of presentation being 34.6 years. Standard laparoscopic procedure was followed.*

Results: *A diagnosis could be clinched in 91% of the patients, with laparoscopic adhesiolysis (30%) being the commonest procedure. The average duration of procedure was 62.15minutes and average duration of stay was 4.2 days. Therapeutic efficacy of 80% was attained.*

Conclusion: *Laparoscopy-a minimally invasive, safe and effective modality has showed its utility in cases of chronic abdominal pain where conventional investigation methods have failed us. This invaluable tool has a high diagnostic accuracy and therapeutic efficacy. It allows us to come to a diagnosis with the added advantage of allowing a therapeutic intervention in the same sitting in most cases, thus avoiding further hospitalisation/exploration of the abdomen.*

Keywords: *Laparoscopy, chronic abdominal pain, diagnosis and intervention.*

Introduction

Chronic abdominal pain can be a diagnostic challenge. Patients with chronic abdominal pain are amongst the most difficult to manage. Potentially it can be unrewarding for both the patient and the treating physician as these patients undergo a myriad of tests without identifying the etiology of pain. Surgical consultation often occurs late after other modalities have failed to provide resolution of their symptomatology.¹

The introduction of laparoscopic surgery and recent advances in laparoscopy have been

increasingly recognized as a procedure that offers more information at visual assessment of intra-abdominal condition for diagnosis and prompt intervention. Laparoscopy has a significant diagnostic and therapeutic role in patients with trauma, abdominal cancers, acute and chronic abdominal pain. In case of diagnostic uncertainty, laparoscopy may help to avoid unnecessary laparotomy, provide accurate diagnosis and helps to plan surgical treatment.²

Laparoscopy is the only method of visualizing the pathologic anatomy of abdominal cavity in

clinical practice 7 sometimes even radiological investigations fail to identify them. Laparoscopy allows surgeons to see and treat many abdominal changes that could not be diagnosed otherwise. Hence diagnostic laparoscopy should be considered for patients suffering from acute and chronic abdominal pain, as it is minimally invasive, safe, efficacious and effective diagnostic modality and can be performed rapidly, safely with minimal sequel.³

Material and Methods

A prospective study was conducted on patients with chronic pain in abdomen with failed conservative managements panning from the period of July 2015-October 2019 at our tertiary care centre. A sample size of 100 patients between the age group of 12-60 years was selected with the average age of presentation between 34.60 years. Youngest patient was 16 years old and oldest 57 years old. 52% of the study population was female. Abdominal pain was considered to be chronic if the duration was more than or equal to 6 weeks. In all patients selected for the study, the chronic pain was of unclear aetiology, despite physical, laboratory, and radiographic evaluation.

Inclusion Criteria

1. All cases of pain in abdomen with duration more than or equal to 6 weeks.
2. Age group between 12 to 60 years of age.
3. Irrespective of sex
4. Irrespective of previous abdominal surgery.
5. USG (abdomen pelvis) suggestive of no significant abnormality.

Exclusion Criteria

1. Age below 12 years and above 60 years.
2. Pregnant women.
3. Patient not consenting for procedure.
4. Trauma patients and patients with acute abdominal pain.

Study Design

- Prospective Study Of minimum 100 patients selected as per the above inclusion criteria.
- Thorough history was taken regarding the following: Location, intensity, character, duration of pain, aggravating and relieving factors.
- Detailed clinical examination of all patients was carried out
- Each case was thoroughly investigated:
 - All relevant blood investigations
 - Urine analysis and culture
 - Additional laboratory investigations were chosen on the basis of history and physical examination
- Written informed consent was obtained from patients. The personal details of patients included in the study will not be revealed.
- All patients underwent X-ray abdomen, Chest X-Ray PA
- Pre-operative pulmonary function test was done as when required.
- Pre-operative, intra-operative & post-operative period was monitored including post-operative analgesia requirement & pain assessment by visual analogue score.
- Post-operative follow up at 6 and 12 months included symptomatology, clinical examination of the patient, X ray abdomen and ultrasound (abdomen pelvis) if required.

Operative Technique

After induction of general anaesthesia, patient was placed either flat or in a modified lithotomy position. Patient is catheterized, which avoids bladder injury. Nasogastric intubation is done if stomach is distended. In patients with previous history of surgery pneumoperitoneum is established by Verrees needle at palmers point. Virgin abdomens were accessed through open umbilical Hasson's technique. General inspection of entire abdomen is carried out starting from supracolic compartment examining stomach, liver, spleen in reverse Trendelenburg position. Infracolic compartment examined in Trendelenburg position looking for pathologies in

small bowel, colon, pelvic organs tilting table sideways as required for particular organ. Additional ports are placed as needed.

Evaluation of Outcome

Positive outcome-if patient comes with less or no pain during follow up at 6 and 12 months.

Negative outcome-if patient complaints of persistent or worsening pain during follow up at 6 and 12months.

Results

Table 1: Location of Pain Over Abdomen

LOCATION OF PAIN	PERCENTAGE (%)
Diffuse,All over abdomen	58
Lower abdominal and periumbilical	24
Right lower	10
Central	5
Right lumbar	1
Epigastric	1
Left iliac fossa	1

Table 2: Operative history

History of operation	Number of cases
Present	19
Absent	81
Total	100

Table 2 shows in our study 19 patients had previous history of abdominal operation. 4 patients - history of tubal ligation, 4 patients - history of LSCS, 4patients - open appendicectomy, 3 patients - ventral hernia repair, 2 patients- history exploration of abdomen and 2 patient - abdominal hysterectomy.

The diagnosis at laparoscopy has been summarised in table 3.

Table 3: Diagnosis at laparoscopy

DIAGNOSIS	NUMBER OF CASES (n)
Adhesions	30
Abdominal tuberculosis	21
Chronic appendicitis	16
Mesenteric Lymphadenopathy	9
Endometriosis	8
Ovarian cyst	3
Intussusception	2
Meckel's diverticulum	2
Normal Study	9
TOTAL	100

91% of the patients were found to have an abnormality on laparoscopic examination. Majority of the patients were found to have adhesions, followed closely by abdominal tuberculosis and chronic appendicitis. A small number of patients were encountered to have mesenteric lymphadenopathy, endometriosis, ovarian cyst, intussusception and Meckel's diverticulum. Out of 100 patients who underwent laparoscopy, only 9 patients had normal study.

Table 4: Procedures Performed

PROCEDURES	NUMBER OF CASES
Laparoscopic adhesiolysis	30
Laparoscopic appendectomy	16
Laparoscopic lymph node biopsy	14
Laparoscopic peritoneal biopsy	11
Laparoscopic omental biopsy	5
Laparoscopic biopsy of pelvic lesions	5
Laparoscopic electrocoagulation	3
Laparoscopic aspiration of ovarian cyst	2
Laparoscopic ovarian cystectomy	1
Meckel's diverticulectomy	1
Laparoscopic reduction of intussusception	1
Resection and anastomosis	2
Normal study	9

The commonest finding i.e. adhesions were found in 30 cases (out of which 6 females and 7 males had undergone surgery previously). In these patients, appendix was essentially normal and hence only adhesiolysis was done. Pelvic adhesions, anterior abdominal wall adhesions were the common findings and all cases were managed laparoscopically using harmonic scalpel, cold scissors and monopolar cautery.

The 21 cases of abdominal tuberculosis were managed by laparoscopic peritoneal, lymph node and omental biopsy based on laparoscopic findings of tubercles on peritoneum, multiple mesenteric lymph nodes, omental caking, cocoon abdomen, plastered abdomen whose biopsy& GeneXpert MTB/RIF report came as tuberculosis. These patients were started on anti Kochs treatment.

16 patients found to have thickened appendix underwent laparoscopic appendectomy. Histopathological examination confirmed the diagnosis as chronic appendicitis.

9 patients had non-specific mesenteric lymphadenitis confirmed on histopathology examination after biopsy.

8 patients had features suggestive of Endometriosis.3 underwent electrocoagulative ablation, rest were biopsied and started on hormonal therapy after confirmation on histopathological examination.

Of the 3 cases found to have an ovarian cyst,2 cases underwent ovarian cyst aspiration and 1 patient underwent ovarian cystectomy whose histopathology turned out to be a mucinous ovarian cyst.

2 patients had Meckel’s Diverticulum on bowel walk. One had Diverticulitis mimicking as appendicitis and had to undergo laparoscopic resection and anastomosis, one underwent diverticulectomy.

Intussusception was found in 2 patients. One had ileocaecal intussusception and underwent right hemicolectomy and other had ileo-ileal intussusception, only reduction was done. This patient was later subjected to contrast CT of abdomen which showed multiple polyps in ileum and jejunum.

Hence Diagnostic Accuracy was 91%. Only 9 patients had normal findings on laparoscopy.

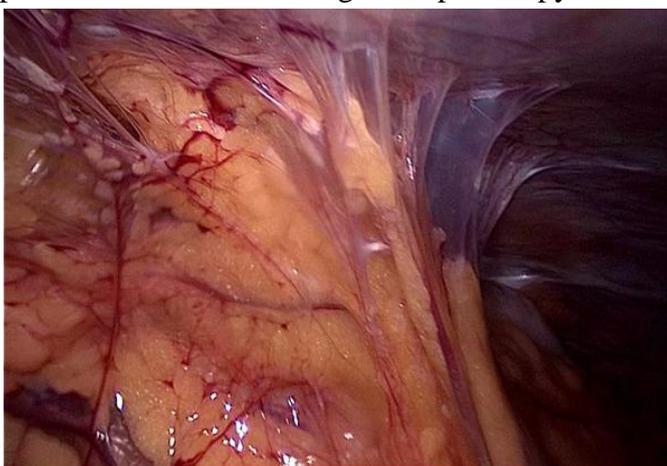


Figure 1: Adhesions to anterior abdominal wall



Figure 2: Adhesions and tubercles in abdominal Koch's



Figure 3: Tubercles on mesentery



Figure 4: Chronic inflamed appendix



Figure 5: Endometrial lesion on pelvic wall

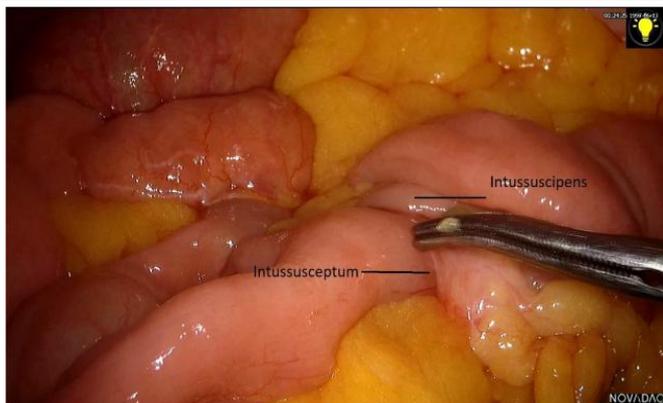


Figure 6: Ileo caecal intussusception



Figure 7 Meckel's diverticulum



Figure 8 Ovarian cyst aspiration

Complications-In most of our cases there was no post-operative complications except in ten patients who developed surgical site infection which was managed conservatively by appropriate antibiotic cover and alternate day wound dressing, (Clavien-Dindo Grade 2). No port site hernias or visceral injuries were encountered. No mortality was encountered in our study group.

Duration of hospital stay: Post-operative hospital stay ranged from 2 to 10 days with a mean duration of stay of 4.2 days.

Duration of procedure: The average length of the operative time was 62.15 minutes. All procedures were done laparoscopically.

Follow up: During the follow up period, all patients were re-evaluated for pain.

The patients were reviewed at 6months and 12months post operatively. Subjective assessment of pain was done during the follow up and positive outcome (less pain or disappearance of pain i.e.80%) was noted and negative outcome (persistence of pain or worsening pain i.e. 20%) was also noted.

Hence on follow up 80 patients had pain relief achieving a Therapeutic Efficacy of 80%.The following tables compare the pre-operative and post-operative Visual Analog Scale (VAS) scores on follow up at 6 and 12 months.

Table 5: Pre-operative Visual analogue scores

Percentage of patients (%)	Pre-operative VAS score
92	4-5(moderate pain)
6	6-7(severe pain)
2	1-3(mild pain)

Table 6: Post-operative visual analogue score

Percentage of patients (%)	Post-operative VAS score at 6months	Post operative VAS score at 12 months
74	1-3(mild pain)	0(no pain)
6	4-5(moderate pain)	0(no pain)
18	4-5(moderate pain)	4-5(moderate pain)
2	1-3(mild pain)	1-3(mild pain)

Discussion

Diagnostic laparoscopy makes it possible for the surgeon to directly visualize the contents of the abdominal cavity better than any other investigative modality. The study confirmed that in this difficult patient group, laparoscopy could safely identify abnormal findings and can improve the outcome in a majority of the cases. In this study 100 patients were considered who were admitted in the surgical wards in a Tertiary Care Centre, between July 2015 to October 2019 .In our study 91 patients had pathological findings

identified at the time of laparoscopy. The results of our study compare favourably with similar studies done previously as illustrated below.

Effectiveness of appendicectomy in alleviating pain in patients with chronic abdominal pain

Table 7: Pain relief post appendicectomy

STUDY	SUCCESS RATE
Fayez et al ⁴	95%
Raymond et al ⁵	74%
Present study	96%

Thus, this proves that appendectomy done for patients with chronic right lower abdominal pain with inconclusive diagnosis, does in fact cause resolution of pain, further highlighting the need to include investigation of appendix in the work up of chronic abdominal pain, when no other diagnosis is readily apparent.

Adhesions being the commonest cause is in tandem with various studies as follows-

Table 8: Percentage of patients with adhesions

STUDY	PERCENTAGE OF PATIENTS WITH ADHESION
Lavonius M et al ⁶	63
Klingensmith et al ⁷	56
Raymond P et al ⁵	55
Onders RP et al ⁸	55
Kinnaresh Ashwin Kumar Baria ⁹	14
Present study	27

The therapeutic efficacy of laparoscopic adhesiolysis in our study (77.77%) is comparable to the likes of Dunker S et al¹⁰ (positive outcome in more than 50% cases) and Vafa Shayani et al¹¹ (77.8% cure rate).

Diagnostic accuracy and therapeutic efficacy can be demonstrated by the tables 9 & 10

Table 9: Diagnostic Accuracy

STUDY	NO OF PATIENTS	DIAGNOSTIC ACCURACY
Raymond P et al ⁵	70	85.7%
Karl Miller et al ¹²	59	89.8%
Klingensmith et al ⁷	34	65%
Schrenk P et al ¹³	92	87%
Kinnaresh Ashwin Kumar Baria ⁹	50	90%
Andreollo et al ¹⁴	168	86.3%
Salky BA et al ¹⁵	265	76%
Kumar R et al ¹⁶	150	94%
Gouda M EI Labban and Emad N ¹⁷	30	83.3%
Present study	100	91%

Table 10: Therapeutic Efficacy

STUDY	NO OF PATIENTS	THERAPEUTIC EFFICACY (%)
Klingensmith et al ⁷	34	73
Vafa Shayani et al ¹¹	18	77.8
Miller K et al ¹²	59	89.3
Kinnaresh Ashwin Kumar Baria ⁹	50	94
Chao K et al ¹⁸	41	78
Onders RP et al ⁸	70	70
Paajanen et al ¹⁹	35	>70
Present study	100	80

Thus, our study is congruent with recent literature in terms of diagnostic & therapeutic efficacy. Hence diagnostic laparoscopy is a tool to manage difficult chronic pain abdominal conditions & further determine the course of patient in hospitals

Conclusion

Laparoscopy has an effective diagnostic accuracy and therapeutic efficacy in the management of patients who present to us with chronic abdominal pain, especially in whom conventional methods of investigations have failed to elicit a cause for the pain and in whom conservative management with antibiotics, proton pump inhibitors and antispasmodics/analgesics failed to relieve the symptoms.

Diagnostic laparoscopy has a high diagnostic and therapeutic efficacy. Ability to pinpoint a cause for the abdominal pain or exclude a more major cause for pain not only avoids further investigations but also plays a significant role in alleviating the fears in the minds of the patients. Not only does laparoscopy point to a diagnosis, it has the added advantage that therapeutic intervention can be done at the same sitting in most cases thus avoiding another hospitalization or another exploration of the abdomen.

Laparoscopy prevents unnecessary laparotomy in a significant number of cases.

Diagnostic laparoscopy has a definitive role in the management of patients with chronic pain abdomen and should be an important investigative tool in the armamentarium of all practicing surgeons.

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