

## A Prospective Study of Diagnostic Laparoscopy in Chronic Abdominal Pain

Mahadas Anusha<sup>1</sup>, Anchula Srujan Jehna<sup>2</sup>, Cherukuri Indira Gandhi<sup>3</sup>

<sup>1</sup>Assistant Professor, Dept. of General Surgery, Kurnool Medical College, Kurnool, Andhra Pradesh, India

<sup>2</sup>Assistant Professor, Dept. of General Surgery, Kurnool Medical College, Kurnool, Andhra Pradesh, India

<sup>3</sup>Resident, Dept. of General Surgery, Kurnool Medical College, Kurnool, Andhra Pradesh, India

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Corresponding author: Dr. Cherukuri Indira Gandhi

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### Abstract

**Background:** Chronic abdominal pain is a challenging clinical problem, particularly when routine investigations fail to identify a definite cause. Diagnostic laparoscopy provides direct visualization of the abdominal cavity and may identify occult pathologies while allowing simultaneous therapeutic intervention.

**Aim:** To assess the diagnostic and therapeutic efficacy of laparoscopy in the management of chronic abdominal pain.

**Materials and Methods:** A prospective descriptive cross-sectional study was conducted among 30 consecutive patients aged 15–55 years presenting with chronic abdominal pain lasting more than 3 months at the Department of General Surgery, Government General Hospital, Kurnool, during 2022–2024. All patients underwent detailed clinical evaluation and appropriate investigations, followed by diagnostic laparoscopy. Intraoperative findings, therapeutic procedures, postoperative complications, and pain relief were assessed during 3 months of follow-up using the Verbal Rating Scale.

**Results:** The mean age of patients was 33 years, with 17 (56.7%) males and 13 (43.3%) females. The mean duration of abdominal pain was 6 months. The right lower quadrant was the most common site of pain, accounting for 17 (56.6%) patients. Diagnostic laparoscopy identified thickened/inflamed appendix in 14 (46.6%) patients, adhesions in 6 (20%), abdominal tuberculosis in 5 (16.6%), enlarged mesenteric lymph nodes in 1 (3.3%), and neoplasia in 2 (6.6%). No abnormality was detected in 2 (6.6%) patients. Therapeutic procedures were performed in 20 (66%) patients, including laparoscopic appendicectomy and adhesiolysis. Most patients had an uncomplicated postoperative course; wound infection occurred in 2 (7%) patients. Complete or significant pain relief was reported in 36.7% of patients at 1 month and 93.3% at 3 months.

**Conclusion:** Diagnostic laparoscopy is a safe and effective modality for evaluating chronic abdominal pain when conventional investigations fail to establish a definitive diagnosis. It can identify otherwise occult intra-abdominal pathology and permits simultaneous therapeutic intervention, with substantial improvement in pain and clinical outcomes during follow-up.

**Keywords:** Chronic abdominal pain; Diagnostic laparoscopy; Laparoscopic surgery; Pain relief.

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### Introduction

Chronic abdominal pain poses a formidable challenge for medical practitioners and surgeons alike, ranking as the fourth most common chronic pain syndrome among the general population [1]. Beyond its physical toll, this condition exerts a profound psychological burden on affected individuals.

Despite exhaustive diagnostic efforts, arriving at a definitive diagnosis remains a daunting task for surgeons. "Laparoscopy serves as a reliable

diagnostic tool in chronic abdominal pain, offering a direct visualization of intra-abdominal pathologies that often remain undetected through non-invasive methods (Swank et al., 2003)."[2] The emergence of diagnostic laparoscopy has ushered in a new era of understanding and treatment for chronic abdominal pain. By uncovering previously hidden abnormalities, laparoscopy has become an invaluable tool in improving outcomes for the majority of patients grappling with this condition.

This study seeks to underscore the pivotal role of laparoscopy in identifying the underlying causes of chronic abdominal pain and its subsequent impact on treatment strategies and post-operative pain management. Furthermore, it highlights the diagnostic and therapeutic potential of laparoscopy in addressing this debilitating ailment, offering renewed optimism for both patients and medical professionals.

**Aim of the Study:** To assess the diagnostic and therapeutic efficacy of laparoscopy in the management of chronic abdominal pain. To enhance awareness regarding the significance of diagnostic laparoscopy among surgeons emphasizing its role in both diagnosis and treatment of chronic abdominal pain.

**Objectives of the Study:** Identify Unrevealed Etiologies: To uncover various hidden causes of chronic abdominal pain. Analyze Diagnostic Accuracy: To assess the accuracy of diagnostic laparoscopy in identifying the causes of chronic abdominal pain. Evaluate Efficacy of Laparoscopy: To evaluate the effectiveness of laparoscopy in managing chronic abdominal pain.

#### Materials and Methods

Prospective descriptive cross-sectional study in a total of 30 consecutive patients presented with chronic abdominal pain presented to Department of General Surgery, Government General Hospital, and Kurnool during a period of 2 years between 2022 and 2024.

**Inclusion Criteria:** Age between 15 and 55, both males and females, abdominal pain lasting more than 3 months.

**Exclusion Criteria:** Patients diagnosed as abdominal malignancy, Patients with known psychiatric disorders.

**Methodology:** After obtaining consent from the patients, they underwent thorough interrogation and examination, including per rectal and per vaginal examinations. The following investigations were conducted in all patients: Complete blood count with erythrocyte sedimentation rate (ESR), Blood sugar, blood urea, and serum creatinine levels, liver functions tests, Stool routine, microscopy, and occult blood test, Urine routine and culture, serology for tuberculosis, Plain X-ray of the abdomen, X-ray of the chest, Ultrasound abdomen and pelvis, CT scan of the abdomen and pelvis, Upper gastrointestinal endoscopy, Colonoscopy.

These investigations were done to assist in the diagnosis and management of chronic abdominal pain in the study participants. After undergoing

thorough preoperative evaluation, the intensity of the patient's pain was assessed using the Verbal Rating Scale (VRS). Following this assessment, these patients were scheduled for diagnostic laparoscopy. A comprehensive intraoperative and postoperative management plan for patients undergoing abdominal surgery.

**Intraoperative Assessment:** Careful surveying of the entire abdominal cavity to identify any pathology or abnormal findings. Noting of intraoperative findings, which include adhesions, appendicitis, abdominal tuberculosis, mesenteric lymphadenopathy, or other abnormalities.

**Interventions:** Based on intraoperative findings, various interventions are planned and executed, such as:

**Adhesiolysis:** Surgical removal or lysis of adhesions to free up organs and improve their mobility. Appendectomy: Surgical removal of the appendix in cases of appendicitis. Mesenteric Lymphadenectomy: Surgical removal of lymph nodes in the mesentery, performed for HPE. Biopsy: Collection of tissue samples for pathological examination to diagnose or evaluate disease. Ascitic Fluid Analysis: Sampling and analysis of fluid in the peritoneal cavity to diagnose underlying pathology, such as infection or malignancy.

**Postoperative Follow-up (3 Months):** Patients are followed up for 3 months to assess: Clinical Improvement: Evaluation of overall clinical status and symptoms, including pain relief and resolution of presenting complaints. Degree of Pain Relief: Assessment of pain intensity and reduction in pain scores following surgery.

**Recurrence:** Monitoring for recurrence of symptoms or disease, such as recurrent abdominal pain or reappearance of pathology. Complications: Identification and management of any postoperative complications, such as infection, bleeding, or wound issues.

**Data Collection and Analysis:** Data collected from the study, including intraoperative findings, interventions performed, postoperative outcomes, and follow-up assessments, are processed and analyzed. Statistical analysis done to evaluate the efficacy of interventions, clinical outcomes, and factors associated with recurrence or complications. This approach ensures thorough evaluation, appropriate interventions, and comprehensive follow-up care for patients undergoing abdominal surgery, with the goal of achieving optimal outcomes and patient satisfaction.

#### Results

**Table 1: Age and Sex Distribution**

| Age                 | No of Patients |
|---------------------|----------------|
| 15-25               | 10             |
| 26-35               | 09             |
| 36-45               | 04             |
| 46-55               | 07             |
| total               | 30             |
| Mean age = 33 years |                |
| Female - 13         |                |
| Male - 17           |                |

**Duration of pain:** Mean duration of pain = 6 months. Most of the patients in this study have pain of around 6 months and overall less than 2 years in this study.

**Table 2: Site of Pain**

| Site                        | Percentage        |
|-----------------------------|-------------------|
| Right Upper Quadrant        | 04 (13.3%)        |
| <b>Right Lower Quadrant</b> | <b>17 (56.6%)</b> |
| Left Upper Quadrant         | 02 (6.6%)         |
| Left Lower Quadrant         | 02 (6.6%)         |
| Periumbilical               | 05 (16.6%)        |
| Total                       | 30                |

**Table 3: Intraoperative Findings**

| Findings                       | Percentage |
|--------------------------------|------------|
| Thickened Appendix             | 14 (46.6%) |
| Adhesions                      | 06 (20%)   |
| Koch's Abdomen                 | 05 (16.6%) |
| Enlarged Mesenteric Lymphnodes | 01 (3.3%)  |
| Neoplasia                      | 02 (6.6%)  |
| No Abnormality                 | 02 (6.6%)  |
| Total                          | 30         |

Laparoscopic appendicectomy performed in all the patients with appendicular pathology like inflamed thickend appendix all the histopathological reports of appendix specimen showed the chronic inflammation. Post operatively they recovered without any complications and all of them were pain free in the Followup period.

Adhesions was found in 20% (n=6), out of that 4 patients had the history of previous surgery. One patient underwent open cholecystectomy and other 2 had the history of LSCS. Omentum was adherent to the parietal wall in the scar region.

All underwent laparoscopic adhesiolysis, and one of the patients underwent conversion into open technique because of the extensive adhesion which could not be managed laparoscopically. Other 2 patients who didn't underwent surgery previously, had the adhesion of the caecum and appendix to the anterior abdominal wall, laparoscopic adhesiolysis was done in them successfully.

Koch's abdomen was diagnosed in 16% (n=5). Intraoperative findings were multiple tubercles

over the peritoneum, bowel, and omentum in one patient we found flimsy adhesions in interbowel loops and with anterior abdominal wall. Almost all cases have minimal ascitic fluid. Omental and peritoneal biopsy was taken, and ascitic fluid was also sent for biochemical analysis. All were started on antituberculous drugs postoperatively. Malignancy was diagnosed in (n=2) 6% of patient. Both had metastatic colon malignancy on HPE. History of previous abdominal surgeries were found in 4 patients and they had omental adhesions. Mean operating time for diagnostic laparoscopy is 60 minutes.

Management: Therapeutic procedures were done in 66% of patients (n=20) which includes appendicectomy in 70% of patients and adhesiolysis in 30% of patients. One of the patients have enlarged mesenteric lymph nodes at terminal ileum which were sent for biopsy and report shows features of nonspecific lymphadenitis. No abnormality detected in 6% (n=01) of patients that shows negative laparoscopy also present in this study.

**Table 4: Laparoscopic Interventions**

| Laparoscopic Interventions | Patients |
|----------------------------|----------|
| Appendicectomy             | 14 (70%) |
| Adhesiolysis               | 06 (30%) |

**Table 5: Postoperative Complications**

| Post-Operative Complications | Percentage |
|------------------------------|------------|
| None                         | 28 (93%)   |
| Wound Infection              | 02 (07%)   |

**Table 6: Pre-Operative Pain Grading**

| Grading     | Percentage |
|-------------|------------|
| Mild        | 13 (43.3%) |
| Moderate    | 16 (53.3%) |
| Severe      | 01 (3.3%)  |
| Very Severe | 00         |

**Table 7: Post-Operative Pain Relief**

| Duration      | Positive Outcome | Negative Outcome |
|---------------|------------------|------------------|
| After 1 Month | 36.7%            | 63%              |
| After 3 Month | 93.3             | 6.6%             |

All the patients were observed in the post-operative period for pain and amount of analgesics needed to treat. All of them had the follow up in 1st month and 3rd month. Verbal rating scale for pain perception were analysed.

End of 1st Month: 36% of patients experienced complete pain relief. End of 3rd Month: 93% of patients experienced complete pain relief. Remaining 7% of Patients: These patients did not experience any changes in pain grading, potentially due to the nature of their disease. Additionally, patients whose laparoscopic findings were normal also reported feeling symptom-free during follow-up. This improvement might be due to the placebo effect.

### Discussion

Chronic abdominal pain is defined as continuous or intermittent pain in the abdomen lasting more than three months. Diagnosing and treating these patients is often difficult and frustrating. It is one of the most common surgical symptoms and poses a significant challenge for surgeons and physicians. In our study, we evaluated 30 consecutive patients with chronic abdominal pain of no obvious cause and uncertain diagnosis through laparoscopy. Here are the key findings from the evaluation: Diagnostic laparoscopy disclosed normal anatomy

Normal Anatomy: Diagnostic laparoscopy disclosed normal anatomy and no pathological lesions in 7% of the patients. This is notably lower compared to other studies such as Marana and his coworkers, and Gowri and Krolkowski, who found that laparoscopy failed to detect any abnormalities in 20% of the patients. Common site for chronic abdominal pain is right lower quadrant (56%) followed by periumbilical region (16%).

Age and Gender of Patients: This study revealed that 17(56%) of the 30 patients were males. Studies conducted by Paaanen H et al [3] and Rajeev Karvande et al [4] showed that the female patients outnumbered the males, accounting for 83.3% and 58.7% of the study population respectively. The age of the patients was between 15 to 55 years with mean age of 33 years. A study conducted by Chaphekar et al on 30 patients with chronic abdominal pain had a mean age of 34 years.

Duration of Pain: In this study the duration of pain was between 3 to 24 Months. In the study by Raymond P et al [5] on 70 patients, the duration of pain ranged from 5 months to 7 years. In another study by El-labban GM, Hokkam EN [6] on 30 patients, the duration of pain ranged from 3 to 15 months.

Site of Pain: 17 patients (56%) presented with abdominal pain in the right lower quadrant, 5 (16%) in peri-umbilical region and 2 (6%) in left lower quadrant. A similar study conducted on 63 patients by Rajeev Karvande et al [4] also showed that the most prominent site of pain was the right lower abdominal quadrant with 43 patients, that is, 68.2%. Studies by Kinnareash Ashwin Kumar Baria [7] 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.

Final Diagnosis after Diagnostic Laparoscopy: 14 cases (46%) were diagnosed with Chronic Appendicitis, 6 cases (20%) were diagnosed with Intra-Abdominal Adhesions, 5(16%) patients had omental and peritoneal tubercles suggestive of koch's, 1 (3%) patients had mesenteric lymphadenopathy, 2(6%) patients diagnosed with

meatastatic coion malignancy. This compares with the previous studies in India, conducted by Kinnaresh Baria [7] and Rajeev Karvande et al, [4] which have shown that the most common diagnosis was Chronic Appendicitis, constituting 40.7% and 56.1% of the study populations respectively. In other study, Salky (8) was able to identify pathology in 69 of 70 patients with appendicitis being the main finding. Inguinal hernias and biliary pathologies were not reported in the present study.

**Therapeutic Intervention:** Following the diagnosis, 20 (66%) out of 30 patients underwent therapeutic intervention. Laparoscopic management included, Appendectomy (70%), Adhesiolysis (30%). 66% of the patients were managed laparoscopically. This finding compares with the findings from the studies of Klingensmith ME et al, [9] who reported simultaneous therapeutic intervention in 73% of patients, and Kinnaresh Baria, [7] who reported in 94%. Post laparoscopy complications: There were no complications encountered during the procedure, and no major complications post operatively. Minor post laparoscopy complications like wound infections were noticed in 2 (7%) patients and were managed by change of antibiotics and regular dressings.

**Post-Operative Hospital Stay:** The duration of hospital stay post-diagnostic laparoscopy varied from 3 to 7 days. Study by El-labban GM et al [10] showed a similar duration of post-operative hospital stay which ranged from 2 to 9 days.

**VRS Score at 3 Months Post Diagnostic Laparoscopy:** The score for pain based on the Verbal Rating Scale 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. 93% of the patients reported either complete absence of pain or amelioration of pain signifying positive outcome with VRS score of 0/1/2. In 2 (6%) patients, in who no definitive diagnosis was established post diagnostic laparoscopy, pain subsided with VRS score of 0 may be due to placebo effect post procedure; even the diagnosis is inconclusive on Diagnostic Laparoscopy. Patients diagnosed to have Abdominal Tuberculosis confirmed by HPE were treated by Anti Tubercular Therapy and responded well.

## Conclusion

The role of diagnostic laparoscopy in chronic abdominal pain is tremendous which increases our

knowledge about various underlying abdominal disorders. Diagnostic laparoscopy can identify abnormal findings and improve the outcome in patients with chronic abdominal pain. However, it should be considered only after a complete diagnostic evaluation has been carried out. It allows the effective surgical treatment of many conditions encountered at the time of diagnostic laparoscopy. It is a safe and effective tool to establish the etiology of chronic abdominal pain and allows for appropriate interventions.

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