

Diagnostic and Therapeutic Value of Laparoscopy in Patients with Acute and Chronic Abdomen: An Observational Study

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Abstract: ***Background:** Diagnostic laparoscopy is an effective minimally invasive modality for evaluating patients with acute and chronic abdominal conditions when conventional investigations are inconclusive. It also allows simultaneous therapeutic intervention. **Methods:** This single-center observational study, incorporating prospective and retrospective components, was conducted in the Department of General Surgery, Lokmanya Tilak Municipal Medical College and General Hospital, Sion, Mumbai, from January 2020 to December 2021. Fifty adult patients undergoing diagnostic laparoscopy for undetermined abdominal pathology were included. Demographic profile, clinical presentation, radiological findings, intraoperative diagnosis, procedures performed, and complications were analyzed. **Results:** The majority of patients belonged to the 31–40 years age bracket (36%); 52% were male. Abdominal pain was present in all patients. Diagnostic laparoscopy identified appendicitis in 40%, postoperative adhesions in 28%, mesenteric lymphadenopathy in 16%, metastatic disease in 16%, ileocecal thickening in 12%, and other pathologies including pancreatic and colonic malignancies. Therapeutic interventions included mesenteric lymph node biopsy (32%), adhesiolysis (30%), and appendectomy (20%). Conversion to open surgery was required in selected cases (8%). No procedure-related complications were observed. **Conclusion:** Diagnostic laparoscopy appears to be a safe and effective modality for establishing diagnosis and enabling therapeutic intervention in selected patients with acute or chronic abdominal pathology when noninvasive investigations are inconclusive.*

Keywords: Diagnostic laparoscopy, acute abdomen, chronic abdominal pain, minimally invasive surgery, abdominal diagnostics

1. Introduction

Medical science has continuously evolved to improve visualization of internal anatomy. Laparoscopy, developed in the twentieth century, offers a simple, rapid, and safe method to evaluate and diagnose intra-abdominal diseases. The success of laparoscopy in making definite and reliable diagnoses of abdominal disorders over the past two decades has established it within the armamentarium of general surgery to perform this procedure safely.

Diagnostic and therapeutic laparoscopy has important applications in the developing world. Less than 20% of the population in developing regions has ready access to advanced cross-sectional imaging devices like ultrasound, computed tomography (CT) scan, magnetic resonance imaging (MRI), or Doppler. Interestingly, vast areas of the developing world have access to a laparoscope, driven largely by its widespread use in government-sponsored family planning campaigns.

Laparoscopy serves as an important tool in the minimally invasive exploration of selected patients with chronic abdominal disorders whose diagnoses remain uncertain despite comprehensive laboratory and imaging investigations. Chronic abdominal conditions are frequently associated with diminished quality of life and clinical levels of depressive symptoms. Consequently, patients presenting

with chronic abdominal pain are challenging to manage, which can yield unrewarding outcomes for both the patient and the physician. Chronic abdominal pain leads to evident clinical suffering and physical or psychological disability.

When the limits of non-invasive testing are reached, surgical consultation is frequently sought, which historically carried a risk of non-therapeutic exploratory laparotomy. Diagnostic laparoscopy provides an important intermediate option between conservative non-intervention and performing a formal laparotomy. This study aimed to assess the diagnostic yield and therapeutic utility of laparoscopy in undiagnosed acute and chronic abdominal conditions.

2. Materials and Methods

Study Design and Setting

This single-center, observational study was conducted at the Department of General Surgery, Lokmanya Tilak Municipal Medical College (LTMMC) and General Hospital, Sion, Mumbai, from January 2020 to December 2021. The study utilized a convenience sample of 50 adult patients presenting with undiagnosed acute or chronic abdominal pathologies who underwent laparoscopic evaluation. The final sample comprised 20 patients reviewed retrospectively from institutional records and 30 patients enrolled prospectively. Institutional Ethics Committee (IEC) approval was obtained prior to study initiation (Reference No: IEC/LTMMC/2019-

84), and valid written informed consent was acquired from all prospective participants or authorized representatives.

Selection Criteria

Inclusion Criteria: Patients aged ≥ 18 years undergoing diagnostic laparoscopy for undetermined or doubtful clinical or radiological findings.

Exclusion Criteria: Patients presenting with mechanical or paralytic ileus, active pregnancy, uncorrected coagulopathy, severe uncompensated cardiopulmonary disease, active abdominal wall infection, massive ascites, or those unwilling to consent to surgical intervention.

Operational Definitions

Diagnostic success was prespecified as the definitive intraoperative visual identification of a clear gross pathology, structural abnormality, or the procurement of a histopathologically sufficient tissue biopsy that explained the patient's clinical symptoms.

Surgical Protocol

Baseline clinical assessments, standard hematological profiles, and non-invasive cross-sectional imaging-consisting of abdominal ultrasonography and contrast-enhanced computed tomography (CECT)- were documented for all patients. Laparoscopy was performed under general anesthesia. Pneumoperitoneum was established using an electronic CO₂ insufflator via a Veress needle or Hasson's open technique to maintain an intra-abdominal pressure of 12 mmHg at a baseline flow rate of 1.2 L/min. A systematic visual exploration of the peritoneal surfaces, liver,

gallbladder, spleen, small and large bowel segments, mesentery, and pelvic anatomy was executed sequentially. Definitive therapeutic procedures or tissue biopsies were immediately undertaken depending on the pathology identified.

Statistical Analysis

Data were tabulated and analyzed descriptively using MS Excel and SPSS version 22.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as means, and categorical variables were expressed as frequencies and percentages.

3. Results

Demographic Profiles

The patient population demonstrated a primary concentration in productive age brackets. The 31–40 years age group constituted the highest proportion (36%), followed by individuals under 30 years (24%). Out of the 50 patients, males represented 52% and females represented 48% of the cohort.

Table 1: Age distribution of the study subjects (N = 50).

Age Group	Patient Percentage (%)
< 30 years	24%
31–40 years	36%
41–50 years	16%
51–60 years	16%
> 60 years	8%

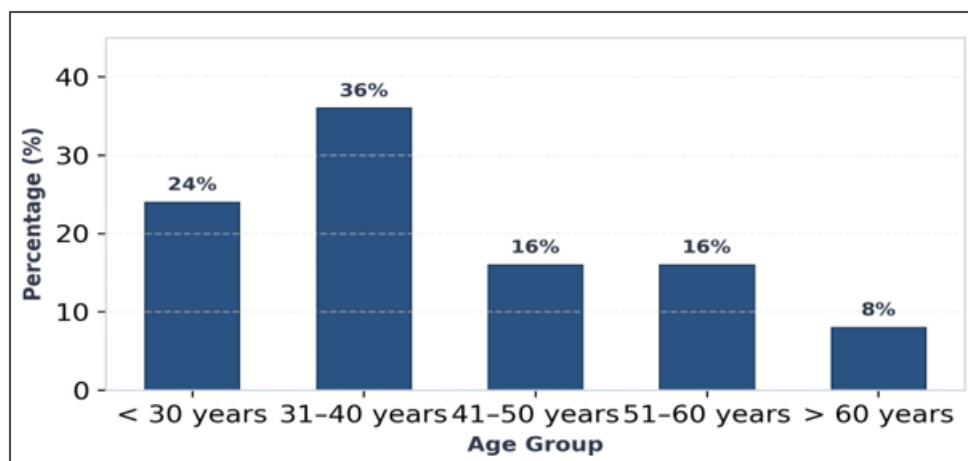


Figure 1: Age Distribution of the Study Subjects (N= 50)

Clinical and Radiological Presentations

Abdominal pain was a universal symptom reported by 100% of the study subjects. Associated clinical presentations included vomiting in 60%, significant weight loss in 24%, constipation in 16%, anorexia in 8%, and fever in 8% of the cases. Non-invasive preoperative CECT of the abdomen and pelvis demonstrated non-specific ileocecal junction thickening in 22% of cases, ascending colon growths in 8%, and dilated bowel loops in 8%. Preoperative CECT was completely normal or inconclusive in 40% of patients.

Intraoperative Diagnoses

Upon laparoscopic visual inspection, a definitive diagnosis was reached across the majority of the study population. Acute or chronic appendicitis was observed in 40% of the cases, followed by postoperative adhesions in 28%. Chronic mesenteric lymphadenopathy and disseminated peritoneal/liver metastatic diseases were each characterized in 16% of patients. Non-specific ileocecal thickening was verified in 12%. Advanced malignant pathologies, including pancreatic carcinoma, ascending colon growths, and inoperable cecal masses, were visualized and mapped.

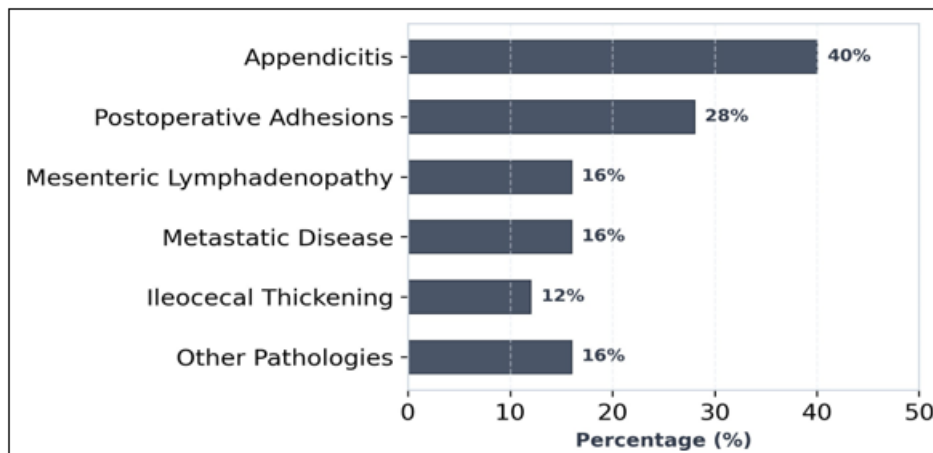


Figure 2: Distribution of Definitive Intraoperative Dia

Surgical Interventions and Complications

Simultaneous therapeutic or diagnostic interventions were carried out during the same procedural sitting. Targeted mesenteric lymph node biopsies were performed in 32% of patients, providing adequate tissue yield for histological confirmation. Laparoscopic adhesiolysis was executed in 30% of the cohort, while definitive appendectomies were performed in 20% of cases.

Selected complex or advanced cases (8%) required conversion to an open laparotomy for major reconstructions, including open resection-anastomosis (4%) and right hemicolectomies (2%). The final perioperative record demonstrated 0% procedure-related or anesthetic complications among all subjects.

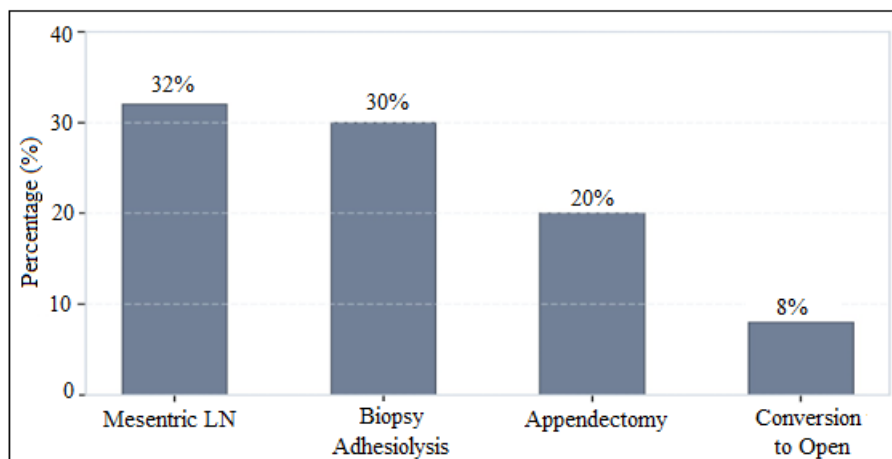


Figure 3: Summary of Surgical and Biptic Interventions Completed

4. Discussion

The definitive management of indeterminate abdominal pain has evolved with the integration of minimal access surgery. This study notes the diagnostic accuracy and clinical utility of laparoscopy when conventional imaging frameworks leave the underlying pathology in doubt. These data align with clinical studies by Salky et al. and Raymond et al., who reported diagnostic yields exceeding 70–75% in chronic abdominal pain syndromes, reducing prolonged diagnostic ambiguity.

In this study, appendiceal pathologies and dense postoperative bands represented the most prominent surgical findings. While Swank et al. previously noted contentions surrounding generalized adhesiolysis, this series observed success in symptom mitigation via highly targeted band relief, mirroring the positive pain resolution tracks documented by Dunker et al. and Shayani et al.

Furthermore, in cases of suspected intra-abdominal malignancy or tuberculous peritonitis where preoperative CECT accuracy ranges moderately, laparoscopy provided rapid tissue procurement and visual mapping. The findings suggest it serves as a valuable diagnostic modality with low procedural morbidity.

5. Conclusion

Diagnostic laparoscopy appears to be a safe and clinically useful approach for selected patients with undiagnosed acute or chronic abdominal conditions, offering both diagnostic clarification and potential therapeutic intervention. It provides effective structural visualization and single-stage therapy, which can help optimize resource utilization in tertiary healthcare institutions. However, given the small sample size of this single-center observational design, larger multicenter studies are needed to confirm generalizability.

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