

## A Study on the Role of Early Laparoscopic Surgery in Acute Nonspecific Abdominal Pain at Tertiary Care Center

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### Abstract:

**Objectives:** The present study was to evaluate the role of early laparoscopic surgery in acute nonspecific abdominal pain at tertiary care center.

**Methods:** All the preoperative evaluation and preparation, preoperative history, and preoperative clinical examinations and relevant investigations were performed to all patients. Group I (Laparoscopic): patients who had undergone early laparoscopy procedure. Group II (Conservative) — patients who were put under clinical observations, treatment and follow up.

**Results:** Major diagnosis for acute abdomen pain of laparoscopic patients was acute appendicitis (25%), Acute cholecystitis (15%), pelvis inflammatory disease (15%), diverticulitis (15%) and adhesion (10%). Similarly, in conservative group patients major diagnosis for acute abdomen pain of laparoscopic patients was ovarian cyst (30%), undiagnosed (20%), diverticulitis (20%), diverticulitis (20%) and acute appendicitis (15%), acute cholecystitis(15%). 80% patients of laparoscopic group and 90% patients of conservative group were visited for follow up within 2 weeks. Patients who were seen for follow up in one month. Among them, recurrence was seen in 10% patients of laparoscopic group patients.

**Conclusions:** Laparoscopy is a promising, safe minimally invasive diagnostic and therapeutic procedure that is very effective in diagnosing and treating acute abdominal problems. Hence, it is the best choices of treatment procedure for nonspecific acute pain.

**Keywords:** Non-specific Acute Abdominal Pain, Laparoscopic Surgery, Conservative Management.

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### Introduction

Acute nonspecific abdominal pain (NSAP) is defined as acute abdominal pain lasting for 6 h up to 7 days, for which no specific cause determined after history, examination, and beside routine investigations. NSAP is a common problem for general surgeons, as it accounts for 13–40% of admissions in the emergency surgical department [1].

A variety of approaches have been used to evaluate these patients, such as observation, imaging techniques, and early laparoscopy. The watchful waiting option is also considered when the physician can balance the presently anticipated advantages of immediate therapy against the associated risks even if uncertainty exists. However, diagnostic laparoscopy (DL) is advised to prevent treatment postponement and the possible difficulties that may arise as a result [2]. Diagnostic laparoscopy enables a surgeon to directly see

aberrant abdominal contents that may be the source of pain but would not be detected otherwise, and it can exclude other sources of pain [3]. Emergency situations in which laparoscopy is often performed include appendicitis, cholecystitis, and perforated peptic ulcer. Laparoscopy remains a contentious procedure when applied to perforated diverticulitis, small bowel obstruction, or abdominal trauma [4]. The overall diagnostic rate is 99% for acute abdominal pain, 70% for chronic pain syndrome, 95% for focal liver disorders, 95% for abdominal masses, 95% for ascites and 80% for retroperitoneal disease. Diagnostic accuracy of laparoscopy in abdominal trauma is 91%, and laparotomy is found unnecessary in 54% of patients. Incorporation of diagnostic laparoscopy along with biopsy, may improve the management of vague abdominal pain, by making a definite diagnosis, access for immediate treatment, reducing

hospital stay and readmission rates and eventually having cost benefits [5,6]. Objectives of our study was to evaluate the role of early laparoscopic surgery in acute nonspecific abdominal pain at tertiary care center.

### Material & Methods

The present study was conducted in the Department of General Surgery in Government Doon Medical College, Dehradun, Uttarakhand, India during a period from April 2023 to January 2024.

Data was collected by using the random sampling methods with irrespective of age and sex. A total of 40 nonspecific acute abdominal pain patients were categorised into two group. Group I was laparoscopic group and group II was conservative group. Each group had 20 patients.

### Inclusion Criteria:

Patients with NSAP aged above 20 to 60 years of both sexes, hemodynamically stable, have no signs of sepsis or septic shock, accepted coagulation profile, and fit for general anesthesia [American Society of Anaesthesiologist (ASA I–ASA II)]. All these patients who presented to the emergency department with Non-Specific acute Abdominal Pain (NSAP) were enrolled in the present study.

### Exclusion Criteria:

Patients with hemodynamic instability, uncontrolled coagulopathy, multiple previous laparotomies, massive abdominal distension, or patient refusal of a laparoscopic procedure.

### Methods:

All the preoperative evaluation and preparation, preoperative history, and preoperative clinical examinations and relevant investigations were performed to all patients. Group I (Laparoscopic): patients who had undergone early laparoscopy procedure. Group II (Conservative) — patients who were put under clinical observations, treatment and follow up.

### Investigations

- **Laboratory investigations:** Complete peripheral blood count, serum electrolytes, creatinine, liver function tests, and serum amylase levels in patients with right upper quadrant abdominal pain, blood glucose, urinalysis, and urine pregnancy test for all women of childbearing age.

- **Imaging investigations:** Plain abdominal X-ray and abdominal ultrasound: Abdominal computed tomography (CT) and for early laparoscopy group (group I): Preoperative preparation involved one or more of the following, as necessary: (A) Intravenous (IV) fluid resuscitation; (B) Correction of electrolyte or acid–base disturbances; (C) Antibiotics.

### Operative Technique:

Creation of pneumoperitoneum and port placement. Frequently, the access port was positioned in the supraumbilical or infraumbilical area, depending on the technique. Pneumoperitoneum was achieved by the “open method” in all cases. To generate the pneumoperitoneum using the open or Hasson approach, a little skin incision was made, and the rectus fascia was dissected to locate the peritoneum, which was then grasped with Allis clamps and opened with scissors. Confirmation of entry into the peritoneal cavity was accomplished either by digital palpation of the smooth intraabdominal tissues or vision of the omentum or small bowel. After port placement, a detailed examination of the peritoneal cavity was performed. Placement of Additional Ports Additional ports (5- or 10 mm) were placed under direct vision to prevent unintended injuries, to further explore any areas of interest, or to execute a therapeutic technique.

**Perioperative Care:** In diagnosed cases and negative cases, the procedure was done, intraoperative bleeding, conversion to open, bowel injury, postoperative wound infection, port site hernia, shoulder pain, postoperative hospital stay, postoperative complications (deep venous thrombosis, chest infection, and urinary tract infection). **Postoperative Care:** Intravenous fluids, antibiotics, and analgesics were given. Drains were removed once the daily output was less than 50 cc. Patients were instructed to come for follow-up 2 weeks, 1 month after the operation. Stitches were removed 10–14 days postoperatively.

### For the Clinical Observation Group (group II):

Patients who were randomized to this group were those who were hospitalized under active clinical observation. A comprehensive clinical examination was conducted twice daily.

The baseline blood tests were repeated 24 and 48 hours after admission, and supplementary hematologic and/or radiologic investigations were conducted in accordance with the patient’s clinical progression. As soon as a clinical diagnosis could be established, the necessary surgical or medical intervention was initiated. Admission, close observation, IV fluids, antibiotics, analgesics, complete blood picture and other investigations as needed, erect chest and abdomen X-ray, pelviabdominal ultrasound, monitoring of (vital signs–pain–signs of peritonitis), hospital stays, surgery if done, operative time, intraoperative bleeding, bowel injury, postoperative wound infection, urinary tract infection, chest infection, and deep venous thrombosis.

**Statistical Analysis:** Data was analysed with the help of SPSS software. mean± standard deviations were observed. P value was taken less than or equal to 0.05 ( $p \leq 0.05$ ) for significant differences.

Mean age of laparoscopic group patients was  $39 \pm 10.21$  years and conservative group was  $35 \pm 09.56$  years. Among total of 40 patients, males were 45% and females were 55%.

## Results

**Table 1: Age wise distribution.**

Variables	Laparoscopic group (N=20) (Mean ± S.D.)	Conservative group(N=20) (Mean ± S.D.)	p-value
Age	$39 \pm 10.21$	$35 \pm 09.56$	0.208

**Table 2: Gender wise distribution.**

Gender	No. of subjects (N=40)	Percentage
Male	18	45%
Female	22	55%

Major diagnosis for acute abdomen pain of laparoscopic patients was acute appendicitis (25%), Acute cholecystitis (15%), pelvis inflammatory disease (15%), diverticulitis (15%) and adhesion (10%). Similarly, in conservative group patients ,

major diagnosis for acute abdomen pain of laparoscopic patients was ovarian cyst (30%), undiagnosed (20%), diverticulitis (20%), diverticulitis (20%) and acute appendicitis (15%), acute cholecystitis(15%).

**Table 3: Distribution on the final diagnosis.**

Variables	Laparoscopic group(N=20)	Conservative group(N=20)	p-value
Acute appendicitis	5(25%)	3(15%)	0.435
Acute cholecystitis	3(15%)	3 (15%)	1.00
Diverticulitis	3(15%)	4(20%)	0.381
Adhesions	2(10%)	0	0.151
PID	3(15%)	0	0.075
Ovarian cyst	1(5%)	6(30%)	0.039
Undiagnosed	2(10%)	4(20%)	0.381
Perforated peptic ulcer	1(5%)	0	0.317

In the present study, mean and standard deviation of operative time of laparoscopic and conservative group patients was  $36.12 \pm 4.76$  and  $41.43 \pm 11.87$  respectively. Which was not significant differences ( $p=0.071$ ). Intraoperative bleeding was taken in 15% cases of laparoscopic patients. Conversion to open was seen in 15% patients of conservative group patients.

**Table 4: Distribution according to operative data.**

Variables	Laparoscopic group(N=20) Mean ± S.D.	Conservative group(N=20)Mean ± S.D.	p-value
Operative time (minutes)	$36.12 \pm 4.76$	$41.43 \pm 11.87$	0.071
<b>Intraoperative bleeding</b>			
Yes	3(15%)	00	
<b>Conversion to open</b>			
Yes	0	3(15%)	0.075

In the present study, most common post operative complication of laparoscopic group patients was post operative shoulder pain (50%) and bowel injury (35%). Similarly, conservative group patients, post operative complication was only Post operative wound infection (35%).

**Table 5: Showing the post operative complication of both group patient.**

Variables	Laparoscopic group(N=20)	Conservative group(N=20)	p-value
Post operative wound infection	3(15%)	7(35%)	0.149
Bowel injury	7(35%)	0	0.004
Port site hernia	0	0	0
Post operative shoulder pain	10(50%)	0	0.000

In the present study, mean duration (days) of hospital stays of laparoscopic and conservative group patients was  $3.96 \pm 00.78$  and  $5.12 \pm 1.98$  days respectively. Which was significantly differences ( $p=0.019$ ).

**Table 6: Hospital stays of both group patients.**

Variables	Laparoscopic group(N=20) Mean $\pm$ S.D.	Conservative group(N=20) Mean $\pm$ S.D.	p-value
Hospital stays (days)	$3.96 \pm 00.78$	$5.12 \pm 1.98$	0.019

In the present study, 80% patients of laparoscopic group and 90% patients of conservative group were visited for follow up within 2 weeks. Patients who were seen for follow up in one month. Among them, recurrence was seen in 10% patients of laparoscopic group patients.

**Table 7: post operative follow up of both group patients.**

Variables	Laparoscopic group(N=20)	Conservative group(N=20)	p-value
<b>Follow-up 1 (month)</b>			
Recurrence	2(10%)	0	0.151
Readmission	0	0	
<b>Follow-up 2 (Weeks)</b>			
Free	16(80%)	18(90%)	0.381

## Discussions

Acute nonspecific abdominal pain (NSAP), generally defined as acute abdominal pain of less than 7 days duration, for which there is no diagnosis after examination and baseline investigations. It obliges surgeon to decide promptly whether to operate immediately, to treat conservatively, or to observe the patient. It is a significant problem in general surgery and accounts for estimated 13% to 40% of emergency surgical admissions [7,8].

In the present study, 40 cases were enrolled according to inclusion criteria. All the patients were categorised into two groups (laparoscopic group and conservative group). Each group had 40 subjects.

The present study demonstrated that there was no significant difference between the laparoscopic and conservative groups regarding age and gender.

This study revealed that acute appendicitis was the commonest diagnosis following laparoscopic surgery 25%, whereas in the conservative group, ovarian cyst was the commonest diagnosis 30%. Morino et al. [7] revealed that diagnosis was achieved in 83.4% of the laparoscopy group and in 45.1% of the clinical observation group. The most common diagnoses in laparoscopy were appendicitis in 16 cases (30.1%), PID in 7 (13.2%), and no diagnosis in 11 (20.7%) while the most common diagnoses in observation were appendicitis in 3 cases (5.8%), PID in 8 (15.6%), and no diagnosis in 28 (54.9%).<sup>14</sup> In one study done by Townsend et al. [9] laparoscopy was capable of achieving a definite diagnosis in 93–100% of patients and could perform a definitive therapy of the underlying condition in 44–73% of patients.

In the present study, operative time was not significantly different among both groups ( $p=0.071$ ).

In agreement with our research, Sharaf et al. [10] reported that a definitive diagnosis was achieved in 99% of the instances. A total of 64% of the cases under investigation were effectively handled using laparoscopy. Conversely, in the present study, the conversion rate to open surgery was 15%, which exceeded the rates documented in prior research. Mehta et al. [11] also demonstrated that the conversion rate was 19%, with challenging procedures or inability to establish a definitive diagnosis serving as the causes for conversion, while Karamanakis et al. [12] revealed that the conversion rate was 2.2%.

Regarding postoperative complications, the present study found that 35% in the conservative group who were subjected to surgery developed wound infection compared to 15% patients in the other group with significant not differences ( $p=0.149$ ). Bowel injury ( $p=0.004$ ) and post operative shoulder pain ( $p=0.000$ ) of both group of patients were significantly differences.

In the present study, length of hospital stay of laparoscopic and conservative group patients was  $3.96 \pm 0.78$  and  $5.12 \pm 1.98$  days.

In concordance with our research, Morino et al. [7] demonstrated that the average length of hospitalization was 3.7 days in laparoscopy and 4.7 days in observation which is significantly high in the observation group. This is consistent with Rubbia et al. [13] who reported that mean hospital stay was 3.36 days, and most cases were discharged on 1–3 postoperative days.

At follow-up postoperatively, the present study results revealed that two patients were missed in

the follow-up within 1 month after admission from the laparoscopic group whereas no missed patients in the conservative group with free of symptoms at this time among both groups.

After 3 months of follow-up, 3 patients of the conservative group were missed during follow-up and 2 patients (10%) returned with abdominal symptoms which were managed conservatively; however, 4 patients (20%) in the laparoscopic group returned with abdominal symptoms which did not require any surgical intervention and referred to gastrointestinal tract (GIT) department for further management.

Morino et al. [7] revealed that 3 months after discharge, 20% of cases in laparoscopy and 52% in observation had recurrent abdominal pain with significant difference between them while after 12 months, 16% in laparoscopy and 25% in observation with no significant difference between them.

It provided that laparoscopy seems to be a promising, safe minimally invasive diagnostic and therapeutic procedure that is very effective in diagnosing and treating acute abdominal problems. Additionally, it may assist surgeons in selecting the most appropriate targeted incision for patients in whom laparoscopic therapy is not feasible for definitive treatment.

### Conclusions

The present study concluded that the laparoscopy is a promising, safe minimally invasive diagnostic and therapeutic procedure that is very effective in diagnosing and treating acute abdominal problems. Hence, it is the best choices of treatment procedure for nonspecific acute pain.

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