



Role of Laparoscopy in Evaluation and Management of Acute Abdomen

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ABSTRACT

1. INTRODUCTION

Laparotomy is the usual approach for most conventional presentations of acute abdomen.

Laparoscopy offers the patient various advantages over a conventional laparotomy such as a quicker recovery, smaller scar and as a consequence, early mobilisation and reduced morbidity. Patients can undergo a diagnostic as well as a therapeutic procedure in the same sitting with the option of conversion of the surgery to a laparotomy, in cases where the underlying pathology cannot be managed by laparoscopy 1 .

The aim of this study is to demonstrate the use of laparoscopy as a routine procedure in cases of acute abdomen, where laparotomies have been the norm in most Indian tertiary care centers. We aim to offer patients with an acute abdomen minimal access procedures as an alternative to a large abdominal scar and a lengthy hospital stay.

Hence we designed this work to assess the role of laparoscopy in the evaluation and management of acute abdomen

AIMS

- To study the various clinical presentations of acute abdomen and to evaluate the role of laparoscopy as a diagnostic, therapeutic tool to avoid large midline incisions.

MATERIAL AND METHODS

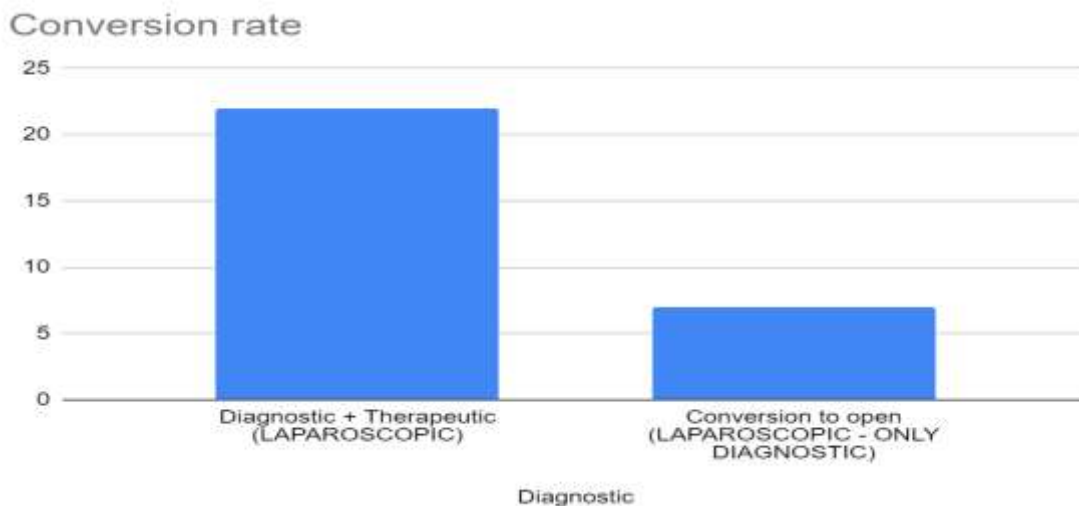
The study was a prospective observational study which was conducted from August 2019 to September 2021 to study the role of laparoscopy in evaluation and management of an acute abdomen in 29 patients admitted to emergency and out patient, transferred from other departments at CSSH.

RESULT

Most common clinical feature was tenderness (82.8%) followed by vomiting (69%) and nausea (44.8%). Abdominal distension was found in 17.2% of the subjects.

Most common clinical diagnosis was Acute Appendicitis as well as Obstruction, each reported as 20.6% of the subjects followed by acute cholecystitis and perforation peritonitis, each reported to be 13.8%.

Conversion to open procedure was required in 24.1% of the subjects for therapeutic purpose.



An overall diagnostic advantage of 8 cases out of 29 cases (27.5%) when compared to clinical

assessment and 5 cases out of 29 cases (17.2%) on radiological assessment was seen in our study.



Hence, our method displayed a clear diagnostic advantage.

I. INTRODUCTION

Hippocrates' observations of manifestations of acute abdominal conditions have been a masterpiece about life and its meaning. Among the conditions that relate peculiarly to the small intestine is intestinal obstruction, recognized as early as the eighth century BC. At that time, Sushruta recommended that obstruction is treated by incision of the intestine, replacement of organs after moistening them with honey and butter and sewing up of the intestine .

From the surgical point of view acute abdominal pain is the cardinal symptom of acute abdomen. The syndrome of acute abdominal pain generates a large number of hospital visits. Conditions resulting in an acute abdomen can cause serious complications or even death, especially if there is a delay in diagnosis and appropriate therapy, but as pointed out by Cope, —The term acute abdomen should not be equated with the invariable need for operation .

Different strategies to assess these patients have been used, including observation, imaging methods and early laparoscopy . The rationale for the use of diagnostic laparoscopy (DL) in this setting is to prevent treatment delay, with the subsequent potential for poorer patient outcomes, and to avoid unnecessary laparotomy⁷ . Emergency laparoscopy can be used for the diagnosis and/or management of a wide variety of acute abdomen. EL cholecystectomy in the course of acute cholecystitis decreases overall hospital stay and avoids increased complications, conversion to open procedures, and mortality. 4,5

Diagnostic laparoscopy is a key to solve the dilemma of nonspecific acute abdomen. It's a surgical procedure with a thin viewing tube by which the doctors use to view the abdomen by passing through a small cut in the abdominal cavity. Diagnostic laparoscopy was first introduced in 1901 and its value was proved in the 1950s and 1960s. Emergency diagnostic laparoscopy with surgical intervention was proposed in 1990.

Laparoscopy offers the patient various advantages over a conventional laparotomy such as a quicker recovery, smaller scar and as a consequence, early mobilisation and reduced morbidity. Patients can undergo a diagnostic as well as a therapeutic procedure in the same sitting with the option of conversion of the surgery to a laparotomy, in cases where the underlying pathology cannot be managed by laparoscopy 6 .

The aim of this study is to demonstrate the use of laparoscopy as a routine procedure in cases of acute abdomen, where laparotomies have been the norm in most Indian tertiary care centres. We aim to offer patients with an acute abdomen minimal access procedures as an alternative to a large abdominal scar and a lengthy hospital stay.

Hence we designed this work to assess the role of laparoscopy in the evaluation and management of acute abdomen.

AIMS

1. To study the various clinical presentations of acute abdomen.
2. To evaluate the role of Laparoscopy as a diagnostic tool in the acute abdomen.
3. To study the role of Laparoscopy as a therapeutic tool in the acute abdomen.
4. To assess Laparoscopy as a discipline to avoid midline large incisions.

II. MATERIALS AND METHODS

Setting: The prospective study was conducted from August 2019 to September 2021 in the Department of Surgery at Chhatrapati Shivaji Subharti Hospital, a tertiary care speciality hospital attached to Subharti Medical College under Swami Vivekanand Subharti University.

We aimed to evaluate the use of laparoscopy (diagnostic/therapeutic) in management of acute abdomen and associated possibilities of laparoscopy use.

All patients with acute abdomen admitted through surgery outpatient department/ emergency/ transferred from other departments were included in the study and were offered surgical intervention and formed the study group.

Type of study: The study was a prospective observational study.

Duration of study: August 2019 to September 2021.

Sample size: Study included all patients who present with an acute abdomen during the study period.

Inclusion criteria:

All patients presenting with acute abdomen requiring surgical intervention.

All patients of acute abdomen giving consent for minimal access intervention. **Exclusion Criteria:**



1. Pregnant females in the third trimester.
2. Age below 10 years.
3. Uncorrected coagulopathy

Patient not fit for general anaesthesia

Case selection:

The data was collected by a preformed structured interviewer-administered questionnaire that was pretested with modifications made prior to its use in the study. The patients were interviewed for the demographic, socioeconomic status, medical history and previous history of taking any medications and supplements.

Ethical clearance:

The study protocol was approved by the Institutional Review Board for Ethical Clearance of Chhatrapati Shivaji Subharti Hospital/Subharti Medical College/SVS University and was performed in accordance with the Code of Ethics of the World Medical Association according to the Declaration of Helsinki of 1975, as revised in 2000. All patients or their attendants were asked to sign a written consent form prior to commencement of the study.

INVESTIGATIONS

The patients were worked up thoroughly and subjected to:

- Detailed history and clinical examination.
 - Routine hematological investigation: Hb, TLC, DLC, RBS
 - Viral markers: HCV, HBsAg, HIV 1 & 2 *
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Liver function test: S. Bilirubin, SGOT, SGPT, S. Alkaline phosphatase

- Abdominal X-Ray Erect
- Abdominal USG
- CECT Whole Abdomen (Wherever indicated) 30 Material and Methods
- MRI Whole abdomen (Wherever indicated)
- Other suitable imagery
- ECG
- Pre-anaesthetic check-up
- COVID 19 RT PCR during the COVID era.

PREPARATION Patients were planned for diagnostic laparoscopy and the following protocol was followed:

1. Written and informed consent was taken.

2. Nil by mouth for 6 hours.
3. Part preparation from nipple to mid thigh.
4. Injection Ceftriaxone 1gm IV or suitable antibiotic at the time of induction in the Operation Theatre.
5. Shift to the operation theatre after fulfilling preoperative requirements. OPERATIVE WORKUP:

1. Anaesthesia:

Diagnostic laparoscopy was performed under general anaesthesia with intubation and controlled ventilation or spinal anaesthesia in selected cases.

2. Creation of pneumoperitoneum.

Following cleaning and draping under all aseptic precautions, all patients were put in Trendelenburg's position and pneumoperitoneum was created using Veress needle

3.1 Material and Methods

with closed method or open method without Veress needle. All standard precautions were taken to avoid access injury. Carbon dioxide insufflation was then done using automatic insufflators set initially at 1 litre/minute initially and then insufflations rate were increased so that a pressure of 8 to 12 mmHg was obtained. The pressure was decided according to the condition of the abdomen.

3. Appropriate standard diagnostic laparoscopic ports were inserted with proper modifications as per baseball diamond concept, whenever indicated. Site of first port: Periumbilical or Palmer's point as per the requirement.

4. For subsequent conduct of procedure the choice of energy source or a combination (MEC or BEC or Harmonic) was used as per the choice of the operating surgeon.

3.2 Material and Methods

5. First port findings were recorded and subsequent management of the disease was decided accordingly.

6. Subsequent ports of 10mm and 5mm were created if required.

POST OPERATIVE MANAGEMENT For all patients, antibiotic coverage, analgesia, intravenous iv fluids, and proton pump inhibitors was given for the first 48 hours as per the protocols of the institute as well as decisions of the unit in-charge.



OUTCOME MEASURES:

For each patient, the following parameters were recorded.

INTRAOPERATIVE MEASURES:

- First anatomical details through laparoscopic port.
- Organ involved.
- Operative time.
- Intraoperative blood loss:
 - Minimal: defined as bleeding controlled within a minute, laparoscopically OR one soaked gauze piece
 - Moderate: bleeding controlled between 1 and 3 minutes OR one to three soaked gauze pieces
 - Severe: any bleeding that takes beyond 3 minutes OR requires conversion to open for control OR more than three soaked gauze pieces.

- Conversion to open laparotomy required or not
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Post operative measures:

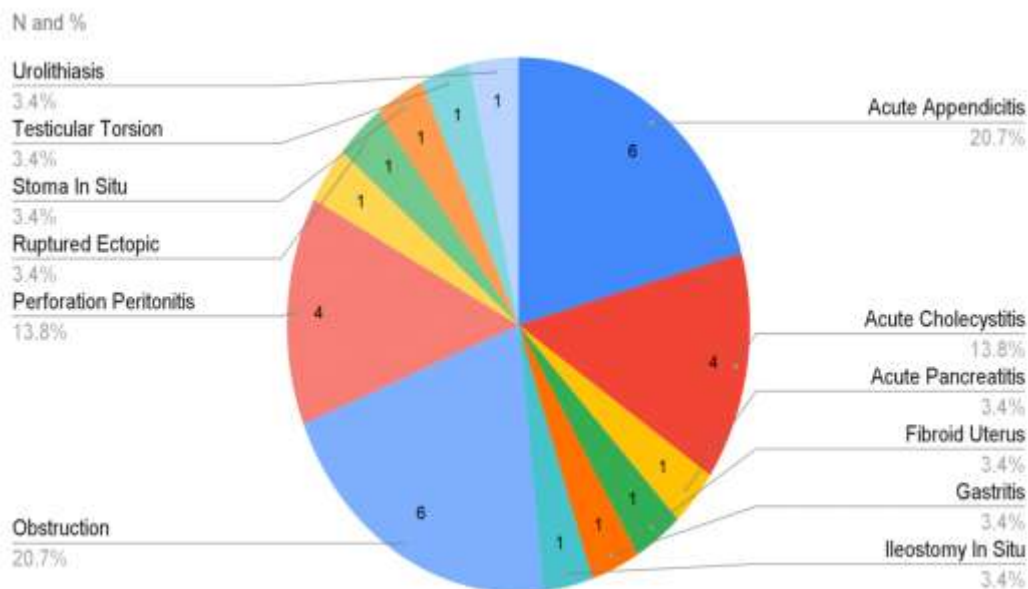
- The severity of pain was recorded as right shoulder tip pain, left shoulder tip pain or generalised abdominal pain at 24 and 48 hours.
- Clinical outcome of the patient
- Complications like tachycardia, localised/generalised abdominal tenderness, shock, fever, tachypnea, abdominal distention
- Post operative bleeding (abdominal drain)
- Other significant postoperative findings to be recorded.

Data Recording:

Data was collected in structured data collection forms. All the findings and observations were coded and entered in Excel master sheet

III. RESULT

Clinical Features



In our study, pain was found in all the subjects. Maximum patients complained of pain in the right upper quadrant region (37.9%). Most common clinical feature was tenderness (82.8%) followed by vomiting (69%) and nausea (44.8%). Abdominal distension was found in 17.2% of the subjects.

In a study by Kesarwani et al, pain in the abdomen was the main complaint in all the 100 patients (100%), followed by vomiting in 78%,

constipation in 29%, abdominal distension in 26% and fever in 17% of the patients. 7

Most of the patients reported within 5 days becoming symptomatic (55.17%) in our study.

Morsy et al 5 revealed that nearly half of the cases had a short duration of up to 2 days (48.6%).

Most common clinical diagnosis was Acute Appendicitis as well as Obstruction; reported in 20.6% of the subjects followed by acute



cholecystitis along with perforation peritonitis (13.8%) in our study.

Ranjeet Ravan Kadam et al 8 in their study revealed similar findings i.e. most common etiology of non-traumatic acute abdomen in their study was acute appendicitis (39.33%) which is similar to that reported by Venkateswarlu MC et al 9 and Ohene-yeboah M et al 10 .

In a study done by Jain et al, the most common cause was perforative peritonitis (39.7%), followed by acute appendicitis (37.7%), and followed by intestinal obstruction (14.2%)¹¹ .

In our study, conversion to open procedure was required in 24.1% of the subjects after laparoscopic diagnosis. This may be because of our learning curve and involvement of multi unit workload and their variable threshold for open conversion. Although in all the cases we were able to make a diagnosis by laparoscopy and only for therapeutic purposes did we need to convert the procedure to an open approach.

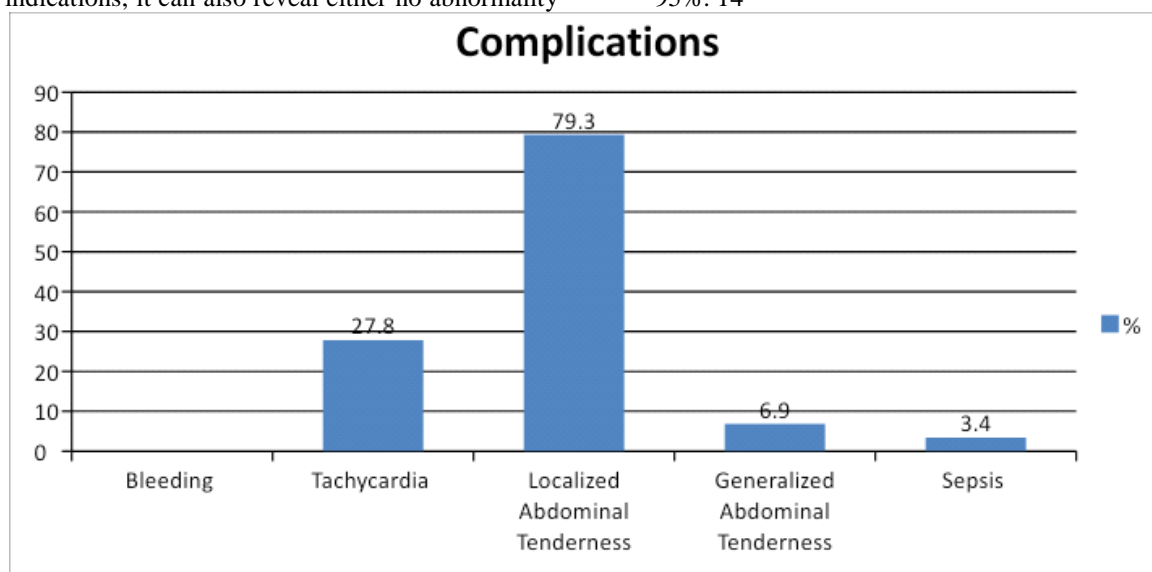
Gonenc et al 12 converted 7% of their laparoscopically diagnosed cases to open surgery in their study.

Laparoscopy is useful for making a definitive clinical diagnosis whenever there is a diagnostic dilemma. In addition to routine surgical indications, it can also reveal either no abnormality

or discover a disease requiring no surgery for proper management, thus avoiding an unnecessary burden of nontherapeutic laparotomies. Laparoscopy has become a routine procedure in the management of acute abdominal disease and can be considered both an excellent therapeutic and additional diagnostic tool in selected cases. We saw our diagnosis matching fully and partially with the clinical diagnosis and intraoperative findings in 44.8% and 27.6% of the subjects respectively. 8 findings (27.6%) during operation were not similar to clinical findings. Radiological diagnosis and intraoperative findings matched fully and partially in 37.9% and 27.6% of the subjects respectively. 5 findings (17.2%) during operation were not similar to radiological diagnosis findings. Fully and partially matched diagnosis between intraoperative findings and pathological diagnosis was found in 65.5% and 3.4% of the subjects respectively. Hence there was a good correlation between the intraoperative findings with pathological diagnosis in our study. Our study also provided an increased diagnostic accuracy as compared to clinico-radiological assessment.

Golash and Willson 13 found that the definitive diagnosis was made in 90% of patients after laparoscopy.

Garbarino and Shimi noticed the elevation of diagnostic accuracy of routine diagnostic laparoscopy in acute appendicitis to more than 95%. 14



IV. CONCLUSION:

Diagnostic laparoscopy followed by appropriate surgery should be the standard approach for acute abdominal emergencies. Acute

appendicitis was found to be the most common cause of acute abdomen and the single most important cause of acute abdominal pain causing great diagnostic difficulties. The preoperative



diagnostic accuracy can be increased by using modern diagnostic tools especially laparoscopy. It reduces rates of misdiagnosis. Thorough exploration of the peritoneal cavity is possible with laparoscopes.

While clinical assessment and radiology is important, laparoscopy proves its diagnostic advantage. Small incision and small scar, minimal complaints like reduced 83 Summary and Conclusion wound infection, minimal postoperative adhesions and prevention of incisional hernia are the added advantages.

Hence the best approach in acute abdomen is to do diagnostic laparoscopy and proceed, rather than going for open laparotomy straightaway, as diagnostic laparoscopy gives all benefits of minimal access surgery including the final appearance of the abdominal wall and provides us the option of offering all the added advantages of this method to the patient.

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