

## Role of diagnostic laparoscopy in acute abdomen

Avinash Gaikwad<sup>1</sup>, Rajeshwara K V<sup>2,\*</sup>, Reshmina Dsouza<sup>3</sup>

<sup>1</sup>Resident, <sup>2,3</sup>Associate Professor, Dept. of General Surgery, Father Muller Medical College, Mangaluru, Karnataka, India

**\*Corresponding Author:**

Email: rajeshwarakv@gmail.com

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### Abstract

**Introduction:** Laparoscopy in surgery is now state of art. The diagnostic laparoscopy has ample advantages over conventional investigations like ultrasound and even laparotomy. Diagnostic laparoscopy allows visualisation of pelvic and Para-colic gutters which can't be seen on laparotomy. Surgical wound is the primary mechanism of peri-operative morbidity. It is natural that surgeon would per sue access to surgical sites through less invasive means. Diagnostic laparoscopy has been proving boon for dubious clinical diagnosis and negative laparotomies can be easily prevented. Hence we did a study to evaluate laparoscopy as a diagnostic tool in cases of acute abdomen where other clinical symptoms and investigations are not conclusive.

**Material and Methods:** Prospective descriptive study was done 50 cases of acute abdominal pain were randomly selected and these patients underwent diagnostic laparoscopy. The study was conducted between Jan 2017 to September 2018.

**Results:** In the current study, equal male to female ratio was found. Majority of the patients were in the age group of 31 to 40 years. Majority of the patients were presented with appendicitis.

Laparoscopy was found to be accurate in 90% of the patients. Appendicitis was diagnosed in 16 out of 16 cases. 10 patients were diagnosed out of 13 patients for hollow viscus perforation. Abdominal trauma and TB abdomen were diagnosed 100%. Bowel obstruction was identified in 9 out of 11 cases. In 58% of the patients, laparotomy was avoided. Blunt trauma cases were managed by laparotomy.

**Conclusion:** It reduces the rate of negative and nontherapeutic laparotomies (with a subsequent decrease in hospitalization, morbidity, and cost after negative laparoscopy).

The earlier diagnosis and intervention with potentially it improves outcomes compared with observation.

**Keywords:** Diagnostic laparoscopy, Laparotomies, Acute abdomen.

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### Introduction

Laparoscopy in surgery is now state of art. The diagnostic laparoscopy has ample advantages over conventional investigations like ultrasound and even laparotomy. Diagnostic laparoscopy allows visualisation of pelvic and Para-colic gutters which can't be seen on laparotomy. Surgical wound is the primary mechanism of Peri-operative morbidity. It is natural that surgeon would per sue access to surgical sites through less invasive means. Diagnostic laparoscopy has been proving boon for dubious clinical diagnosis and negative laparotomies can be easily prevented. Hence we did a study to evaluate laparoscopy as a diagnostic tool in cases of acute abdomen where other clinical symptoms and investigations are not conclusive.

### Material and Methods

Prospective descriptive study was done 50 cases of acute abdominal pain were randomly selected and these patients underwent diagnostic laparoscopy. The study was conducted between Jan 2017 to September 2018.

All the patients were thoroughly worked up in the wards including history taking, clinical examination, radiological investigations like X ray abdomen, USG, CT scan was done whenever felt necessary.

All the routine investigations pre operative investigations were done including CBC, blood urea, serum creatine, HIV and HBsAg. Other investigations

like LFT, serum electrolytes, serum amylase and others were also included whenever necessary.

**Inclusion criteria:** Patients with history of acute abdominal pain, if physical examination and diagnostic tests are unrevealing.

Patients with previous history of abdominal operation are included.

**Exclusion criteria:** Age under 15 years.

Oncological patients.

Pregnant women.

Patients with coagulation defects.

Patients with critical illness.

Medically unfit for surgery.

All surgeries were done under general anesthesia, all patients were catheterised and Ryle tube was put. After pneumoperitoneum with veress needle at the rate of 5-6 L/min so that end point of intra-abdominal pressure should not exceed 20-25 mmHg, 10mm umbilical trocar and two 5mm lateral trocars were put. The laparoscopy was started by a diagnostic inspection of liver, gallbladder, and anterior surface of stomach, large bowel, small bowel, appendix, gynecological organs and peritoneal surfaces. After laparoscopy, 5mm trocars were removed under visual control, the air was released from intra-abdominal space and 10mm trocar was removed. All 5mm wounds were closed in one layer with absorbable sutures and 10mm umbilical wound with non-absorbable suture.

**Methods of collection of data:** The calculated sample size was found to be 50 by applying the formula. The sample size calculation was done using SPSS software 23.1 version.

Formula used  $DEFF \times N_p(1-P)$

$$\left[ \frac{d^2}{z^2} \frac{1}{1-\alpha/2} \right] \times (1-N) + p(1-p)$$

N - Infinite population

P<sup>(1)</sup> -8.6%

Absolute error (d) -8%

Sample size calculated for this study is 52 approx 50.<sup>6</sup>

Ethical clearance will be obtained from the Institutional Ethical Clearance Committee.

After obtaining written informed consent, 50 patients will be included in study that underwent diagnostic laparoscopy in Father Muller's Medical College, Mangalore. The study was conducted between Jan 2017 to September 2018.

The recorded data included demographics, length of time; it had been presented, location of pain, **Results and Observations**

patient's abdominal examination and diagnostic studies performed. Intraoperative findings and operative interventions undertaken were also identified.

HB%, TC, DC, ESR, Urine microscopy was the basic investigations done for all patients. RBS, BUN, and S.creatinine, chest x-ray, ECG and stool for ova, cyst and occult blood were done when indicated.

Commonly performed imaging studies included plain abdominal radiographs, ultrasounds studies. Barium studies, upper gastrointestinal and lower gastrointestinal endoscopy were done when indicated. The surgical methods employed were as per etiology.

All patients gave informed consent.

Pre op workup was done for all patients, including history taking, clinical examination, routine investigations, basic and conventional radiological explanations like x ray abdomen, ultrasonography, C.T. scan.

### Data Analysis

Data was analyzed using SPSS software version 24.

**Table 1: Indications for Diagnosyic Laparoscopy**

Indications	No. of patients	Percentage
Appendicitis	16	32
Hollow viscus perforation	13	26
Bowel obstruction	11	22
Blunt trauma abdomen	5	10
Tb abdomen	5	10

**Table 2: Diagnostic Accuracy of Laparoscopy**

Indications	No. of patients	No. of patients diagnosed by laparoscopy	Percentage
Appendicitis	16	16	100%
Hollow viscus perforation	13	10	77
Bowel obstruction	11	09	82
Abdominal trauma	5	5	100
Tb abdomen	5	5	100

In the current study, equal male to female ratio was found. Majority of the patients were in the age group of 31 to 40 years. Majority of the patients were presented with appendicitis.

Laparoscopy was found to be accurate in 90% of the patients. Appendicitis was diagnosed in 16 out of 16 cases. 10 patients were diagnosed out of 13 patients for hollow viscus perforation. Abdominal trauma and TB abdomen were diagnosed 100%. Bowel obstruction was identified in 9 out of 11 cases. In 58% of the patients, laparotomy was avoided. Blunt trauma cases were managed by laparotomy.

### Discussion

Laparoscopy is a minimal access surgical procedure that allows visual examination and documentation of intra-abdominal organs in order to detect the pathology with the help of laparoscope. Diagnostic laparoscopy was first introduced in 1901, when the German surgeon Georg Kelling performed a "peritoneoscopy" on a dog, which was called as "celioscopy".<sup>1</sup> It was a Swedish internist Jacobaeus who performed a diagnostic laparoscopy on human in 1910 for evaluation of ascites.<sup>2</sup> The emergency diagnostic laparoscopy with surgical intervention was first proposed by Philippe Moment in 1990.<sup>3</sup> It has employed in recent years for a wide variety of

conditions including patients with acute abdomen and abdominal trauma.

**Saeian K. and Reddy K.R., (1999)** concluded that in addition to avoiding unnecessary laparotomy in this group, diagnostic laparoscopy has proved valuable in the assessment of abdominal trauma, acute abdomen, and ischemic bowel disease.<sup>4</sup>

**Boyd W.P. Jr, Nord H.J. (2000)** concluded that the diagnostic laparoscopy combined with laparoscopic ultrasound is highly accurate in the staging of the intra-abdominal malignancies and it is superior to ultrasonography and computed tomography.<sup>5</sup>

**Majewski W., (2000)** conducted a study in 430 patients to investigate a potential benefits of diagnostic laparoscopy in cases of acute abdomen and found that it yielded a diagnosis in 90% and specificity was 83.3%.<sup>6</sup>

**Karnam US. & Reddy KR., (2002)** concluded that diagnostic laparoscopy guides surgeons in preventing unnecessary laparotomies in setting of acute abdomen, oncologists for accurate staging of malignancies and hepatologists in evaluation of acute and chronic disease as well.<sup>7</sup>

**Rienmann J.F., (2003)** reviewed that the Diagnostic Laparoscopy has been increasingly being used by general and gastro surgeons in cases of acute and chronic abdominal conditions, blunt trauma abdomen & in cases of abdominal malignancies.<sup>8</sup>

The study by Alexander G Nagy, where in appendicitis cases consisted 12 in number, perforation of 9, bowel obstruction of 8, abdominal trauma were 11 in number and tb abdomen of 5, a total of 45 patients.<sup>9</sup>

The present study shows 90% of diagnostic accuracy of laparoscopy in patients with acute abdomen. While, previous study from Alexander G. Nagy shares the same percentage of 90%.<sup>9</sup> Vander Velpen study showed accuracy of 100%.<sup>10</sup>

## Conclusion

It reduces the rate of negative and nontherapeutic laparotomies (with a subsequent decrease in hospitalization, morbidity, and cost after negative laparoscopy).

The earlier diagnosis and intervention with potentially it improves outcomes compared with observation.

Its ability to provide therapeutic intervention is remarkable.

Diagnostic laparoscopy is a safe procedure and useful as a new diagnostic tool for patients with suspected appendicitis. It is a safe procedure that reduces the appendix rate without increasing the total number of operations. It is a useful method for obtaining other, mostly gynecologic, diagnoses. The laparoscopic approach to the perforated appendix has advantages in terms of decreased hospital stay.

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