

## Role of early laparoscopy in management of acute abdominal pain



### Medical Science

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### ABSTRACT

**Background:** Acute abdominal pain is a common cause for presentation to the emergency room and hospital admission. Many of these patients will undergo exploration for suspected appendicitis, but in 20–35% of cases a normal appendix is found. Because of the limited access provided by the gridiron incision, a definitive diagnosis may not be found. Other patients may be treated conservatively and discharged, only to return with recurrent pain or more definitive symptoms of pathology. In patients with acute abdominal pain, early laparoscopy is an accurate means of both making a definitive diagnosis and avoiding a delay in the diagnosis. **Methods:** We performed a retrospective analysis of 300 consecutive patients with acute abdominal pain over a 35-month period. All patients underwent diagnostic laparoscopy within 48 hrs of admission. We evaluated the initial clinical diagnosis, the laparoscopic diagnosis, and the subsequent outcome in this group of patients. Individuals with abdominal trauma were excluded from the study, and all patients were >15 years of age.

**Results:** A definitive diagnosis was made in 80% of patients after diagnostic laparoscopy. Laparoscopy changed the clinical diagnosis in 30% of cases. 70% of patients underwent a laparoscopic operation for management of their condition at the time of diagnosis. In 90 patients (30%) conversion to open surgery either laparotomy or Mcburney's incision was required to manage their condition. Peritonitis was present in 60 patients; 45 of them had appendicitis. 10 patients developed complications related to the diagnostic laparoscopy or the laparoscopic operation, and there was one postoperative death due to a perforated gastric malignancy. Mean operating time was 45 min.

**Conclusion:** Early diagnostic laparoscopy and treatment results in the accurate, prompt, and efficient management of acute abdominal pain. This technique reduces the rate of unnecessary laparotomy and right iliac fossa gridiron incisions and increases the diagnostic accuracy in these patients. This treatment method is feasible where facilities are available to accommodate the workload and there are practitioners with the requisite expertise.

### Introduction

Acute abdominal pain can present a diagnostic dilemma. Clinical examination often fails to yield a diagnosis, particularly when the symptoms and signs are compounded by obesity. This problem is more common in female patients. Blood investigations may be diagnostic for acute pancreatitis, but in most other scenarios, they simply indicate the presence of an inflammatory process. Radiology may suggest a diagnosis, but both radiography and ultrasound have a false-negative rate. The role of diagnostic and therapeutic laparoscopy in the acute abdomen is now well established. As compared to preoperative radiological investigation or a watch-and-wait policy, laparoscopy yields an accurate diagnosis in more patients. It also provides greater visualization of other intra-abdominal organs in patients undergoing gridiron incision for appendectomy<sup>1</sup>. Although laparoscopy is not a substitute for good clinical judgment, early laparoscopy reduces the incidence of negative laparotomy, serious complications, and preoperative investigations.

### Materials and Methods

We conducted a retrospective study of 300 consecutive patients over a 35-month period from July 2012 to May 2015 at AMC accredited hospital. The aim was to document the role of early diagnostic laparoscopy in acute abdominal pain and to determine whether it would facilitate treatment and affect the outcome in these patients or not. Patients with trauma, <15 years old, pregnancy, hemodynamically unstable, densely scarred abdomen from previous surgeries, ultrasound/CT proven diagnosis of acute cholecystitis/pancreatitis were excluded from the study. All other patients with acute abdominal pain were included, irrespective of suspected diagnosis, sex, or the presence of localized or generalized peritonitis. The initial clinical diagnosis, operative details, any change in diagnosis, complica-

tions, and outcome were noted. All patients underwent routine preoperative workup, including investigations for blood count, urea, electrolytes, amylase, blood sugar, and urine. Pregnancy test, chest radiograph, abdominal radiograph and ultrasound performed routinely and CT were performed when clinically indicated. Laparoscopy was performed in all patients within 48 hrs of admission. The procedure was done under general anesthesia in the supine position. Nasogastric and urinary catheters were used selectively. Both open and closed pneumoperitoneum techniques were used. A 10-mm, 0-degree laparoscope placed via an umbilical port was used for the diagnostic part of the laparoscopy. Further ports were inserted according to pathological findings. Therapeutic laparoscopy was performed when indicated. Peritoneal lavage was performed in all cases of peritonitis. Where appendectomy was performed, it was accomplished via an assisted two-port method<sup>2</sup> in most cases.

### Results

Patient age and sex are shown in Table 1. Most of the patients were females (n=190, 63.33%). Mean age was 26 years.

**Table 1: patient age and sex distribution**

Age in years	No of patients	
	Male	Female
15-30	60	100
31-45	20	50
46-60	18	25
61-75	10	10
>75	2	5

<b>Total =300</b>	110	190
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Acute appendicitis was suspected in 80% of patients (n=240) before operation. Other areas of clinically localized or generalized peritonitis were suspected in other 20% of patients (n=60). Diagnostic laparoscopy was performed between 4 and 48 hrs after clinical diagnosis. A laparoscopic diagnosis was established quickly in most cases (Table 2). Therapeutic laparoscopic procedures were performed in 180 patients (60%). These included appendectomy, cholecystectomy, adhesionolysis and a variety of gynecological procedures<sup>3</sup>.

Diagnostic laparoscopy resulted in a change in clinical diagnosis in 90 patients (30%). Only 20% of patients (n=60) were without a diagnosis after diagnostic laparoscopy. Either laparotomy or open appendectomy was performed in 120 patients (40%) after diagnostic laparoscopy. Peritonitis was present in 20% (n=60). The most common cause of peritonitis was a perforated appendix (n=30). Where no pathology could be found, the appendix was removed routinely, regardless of appearance.

**Table 2 : Laparoscopic diagnosis**

Diagnosis	No of patients	
	Male	Female
Normal	22	38
Appendicitis and its complications	35	60
Ruptured corpus luteal cyst		1
Pelvic inflammatory disorder		16
Fibroid uterus		2
Ovarian cyst/tumor		5
Acute cholecystitis	3	6
Adhesions	12	14
Liver abscess	10	3
Terminal ileitis	4	10
Mesenteric lymphadenitis	4	23
Hollow viscus perforation with/without peritonitis	20	12
<b>Total</b>	110	190

The mean operating time was 46 min (range, 30– 90). There were 4 cases of minor trocar site infection, 28 cases of laparotomy wound infection. In two cases, an intraabdominal abscess developed after laparoscopic appendectomy for perforated appendicitis 2 weeks after the operation; both patients were treated successfully by ultrasound-guided percutaneous drainage. There was one death within 30 days of operation. This patients had peritonitis from a perforated gastric malignancy. The mean hospital stay was 4.6 days (range, 2–9).

**Discussion**

Laparoscopy has been recommended as a primary invasive tool in the investigation of acute abdomen<sup>4</sup>. We made a definitive diagnosis in 80% of patients and had low rates of morbidity and mortality. However, if a traditional wait-and-watch policy had been followed or a standard appendectomy had been performed many of these diagnoses could have been missed<sup>1</sup>. Because these excellent results were obtained with only a short hospital stay, there were substantial cost savings for the hospital and benefits that accrued to both the patient and society due to an early return to school or work. Diagnostic laparoscopy for the acute abdomen offers the advantages of enabling a rapid and accurate assessment and providing a high degree of certainty for any subsequent treatment decisions. If surgeons with appropriate training and skills are available, therapeutic laparoscopy can then be used to manage the condition, with the added benefits of reduced pain, less wound morbidity, and a shorter recovery time. The procedure reduces the time needed to make the diagnosis and provide treatment, thereby saving money on imaging studies and decreasing morbidity from progressive disease<sup>5,6</sup>. Our study has confirmed that the most common cause of acute abdomen is appendicitis. This condition is often creates diagnostic difficulties in the early stages of the disease if the appendicitis is retrocecal, walled off, or perforated. Only 50% of patients with acute appendicitis present classically.<sup>7,8</sup> Thus, the diagnosis may be missed or delayed even by experienced practitioners<sup>5</sup>. In addition, a classical presentation may not in fact represent appendicitis; indeed, 20– 25% of such patients are found at operation to have a normal appendix<sup>12</sup>. Eighty percentage of patients with acute appendicitis have no leucocytosis in the first 24 h of pain<sup>9,10</sup>. Finally in 30% of cases, the appendicular tip is hidden from the anterior peritoneum and therefore from the palpating hand<sup>11</sup>. Diagnostic laparoscopy can reduce the uncertainty of diagnosis in this condition. Although ultrasound has been increasingly used in the diagnosis of acute appendicitis, it has not been shown to produce better outcomes than clinical diagnosis alone<sup>12</sup>. It is likely that early intervention will reduce the rate of perforation while the patient is under observation.

Women of child-bearing age present a particular problem in the diagnosis of acute lower abdominal pain. Gynecological conditions may presents with signs and symptoms that are indistinguishable from acute appendicitis<sup>13,14</sup> and traditionally diagnostic laparoscopy has been favored in this group. However, we believe that our study justifies the use of routine diagnostic laparoscopy for both sexes. It is possible that this method of diagnosis may increase the appendectomy rate. In fact in our series, appendectomy was performed on a routine basis if no cause could be found for the pain. We believe that this is acceptable. Pain from an appendicolith, appendicular foreign body, structuring, or chronic recurrent appendicitis may be associated with a normal appearance macroscopically<sup>11</sup>.

There are significant patient benefits in making an early diagnosis and initiating treatment. It is also our impression that the costs are balanced by the shorter hospital stay and the reduction in unnecessary abdominal imaging.

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