Role of Diagnostic Laparoscopy in Management of Acute Abdomen of Unknown Aetiology

Thesis

Submitted for Partial Fulfillment of Master Degree in General Surgery

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Reda Harby Marzouk Mithany

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List of Abbreviations

Abb.	Full term
AA	*Acute Appendicitis*
AAP	*Acute Abdominal Pain*
CRP	*C-Reactive Protein*
CT	*Computed Tomography*
ED	*Emergency Department*
E-NOTES	*Embryonic Natural Orifice Transumbilical Surgery*
Hals	*Hand Assisted Laparoscopic Surgery*
HBP	*Hepatobiliary and Pancreatic*
IBD	*Inflammatory Bowel Disease*
IBS	*Irritable Bowel Syndrome*
LC	*Laparoscopic Cholecystectomy*
LESS	*Laparo Endoscopic Single-Site Surgery*
NOM	*Non-Operative Management*
NOTUS	*Natural Orifice Transumbilical Surgery*
OPUS	*One Port Umbilical Surgery*
OS	*Open Surgery*
PID	*Pelvic Inflammatory Disease*
PLS	*Pure Laparoscopic Surgery*
SILS	*Single Incision Laparoscopic Surgery*
SPA	*Single Port Access*
SPICES	*Single Port Incisionless Conventional Equipment-Utilizing Surgery*
SSI	*Surgical-Site Infection*
TvL	*Transvaginal Laparoscopy*

ABSTRACT

Background: Acute abdominal pain (AAP) is a medical emergency, characterized by pain arising from the abdominal area, of non-traumatic origin with a maximum duration of five days. It is the most common surgical emergency, one of the most common reasons for referral to an emergency department (ED) and the most common cause for non-trauma-related hospital admissions.

Aim of the Work: To evaluate the role of laparoscopy in the diagnosis and treatment of unexplained acute abdominal pain and establish it instead of conventional exploratory laparotomy.

Patients and Methods: The current study is a prospective study randomized by closed envelope method which was carried out in Ain Shams University Hospitals. During the period from January 2018 and December 2018.

Results: Maximum numbers of patients were of age 26 to 30 years (9 patients i.e. 30.0%). Least number of patients were from age group of 31-35 years. Female patients of acute abdomen were slightly more than that of male patients, due to increased number of cases of acute cholecystitis in females. Most common cause of acute abdomen in this study was acute appendicitis, while least common causes were pelvic inflammatory disease and mickel's diverticulum equally. Laparoscopy was done in all cases (100%); therapeutic laparoscopy was successful in 22 cases (73.30%) while 8 (26.7%) patients required to be converted to laparotomy. Complications related to laparoscopy in our study were observed in 15 out of 30 cases (50%); with shoulder pain is the most common one.

Conclusion: Diagnostic Laparoscopy is helpful in confirming a diagnosis made on clinical grounds and laboratory evaluation.

Keywords: *Acute abdominal pain - Diagnostic Laparoscopy - Aetiology*

INTRODUCTION

Acute abdominal pain (AAP) is a medical emergency, characterized by pain arising from the abdominal area, of non-traumatic origin with a maximum duration of five days. It is the most common surgical emergency, one of the most common reasons for referral to an emergency department (ED) and the most common cause for non-trauma-related hospital admissions ***(Caporale et al., 2016).***

Despite substantial improvement in the diagnostic approach to AAP, mainly attributable to the extensive use of imaging techniques [especially computed tomography (CT)], many diagnostic pitfalls remain, which can be associated with a substantial number of misdiagnoses and/or avoidable surgery ***(Cervellin et al., 2016).***

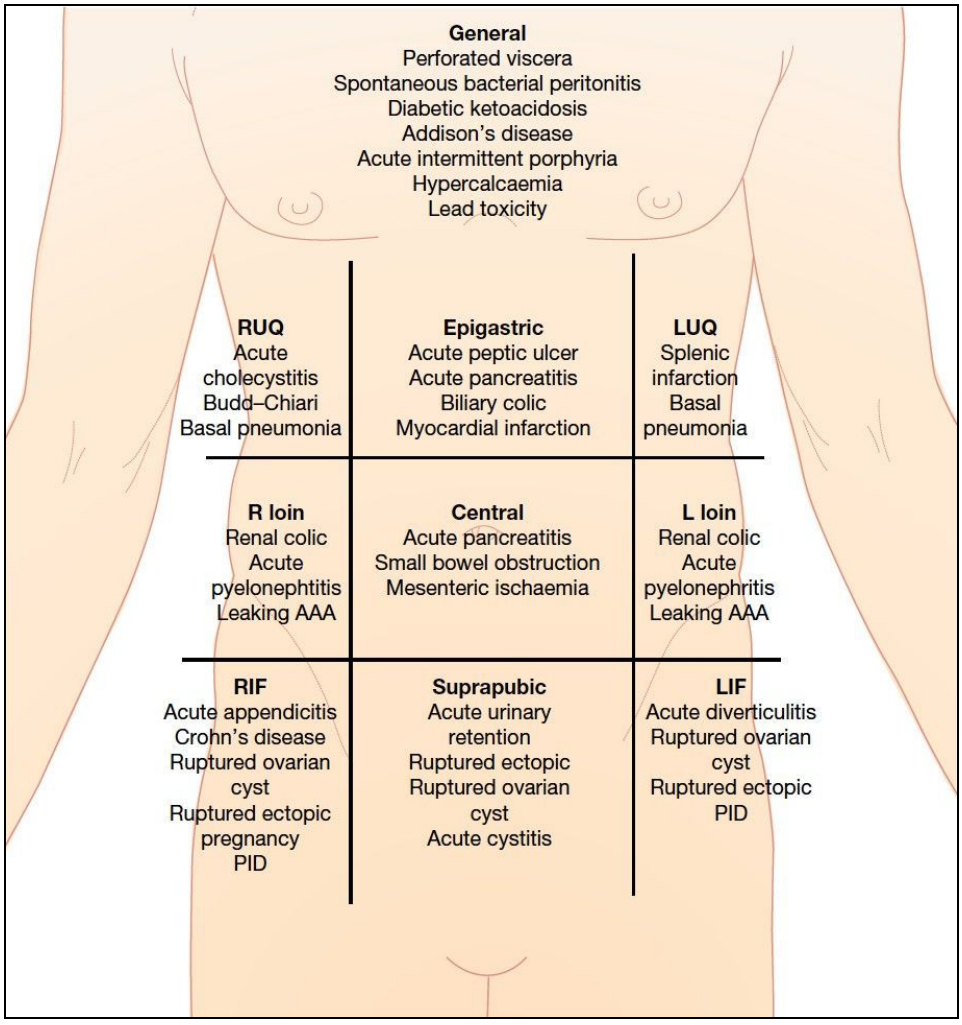

Figure (1): Differential diagnosis of surgical acute abdomen ***(Caporale et al., 2016).***

Table (1): Selected Differential Diagnosis of Abdominal Pain ***(American Academy of Family Physicians, 2019)***

PAIN LOCATION	*POSSIBLE DIAGNOSES*
Right upper quadrant	Biliary: cholecystitis, cholelithiasis, cholangitis
	Colonic: colitis, diverticulitis
	Hepatic: abscess, hepatitis, mass
	Pulmonary: pneumonia, embolus
	Renal: nephrolithiasis, pyelonephritis
Epigastric	Biliary: cholecystitis, cholelithiasis, cholangitis
	Cardiac: myocardial infarction, pericarditis
	Gastric: esophagitis, gastritis, peptic ulcer
	Pancreatic: mass, pancreatitis
	Vascular: aortic dissection, mesenteric ischemia
Left upper quadrant	Cardiac: angina, myocardial infarction, pericarditis
	Gastric: esophagitis, gastritis, peptic ulcer
	Pancreatic: mass, pancreatitis
	Renal: nephrolithiasis, pyelonephritis
	Vascular: aortic dissection, mesenteric ischemia
Periumbilical	Colonic: early appendicitis
	Gastric: esophagitis, gastritis, peptic ulcer, small-bowel mass or obstruction
	Vascular: aortic dissection, mesenteric ischemia
Right lower quadrant	Colonic: appendicitis, colitis, diverticulitis, IBD, IBS
	Gynecologic: ectopic pregnancy, fibroids, ovarian mass, torsion, PID
	Renal: nephrolithiasis, pyelonephritis
Suprapubic	Colonic: appendicitis, colitis, diverticulitis, IBD, IBS
	Gynecologic: ectopic pregnancy, fibroids, ovarian mass, torsion, PID
	Renal: cystitis, nephrolithiasis, pyelonephritis
Left lower quadrant	Colonic: colitis, diverticulitis, IBD, IBS
	Gynecologic: ectopic pregnancy, fibroids, ovarian mass, torsion, PID
	Renal: nephrolithiasis, pyelonephritis
Any location	Abdominal wall: herpes zoster, muscle strain, hernia
Other: bowel obstruction, mesenteric ischemia, peritonitis, narcotic withdrawal, sickle cell crisis, porphyria, IBD, heavy metal poisoning	

IBD = inflammatory bowel disease; IBS = irritable bowel syndrome; PID = pelvic inflammatory disease.

Acute appendicitis, diverticulitis, cholecystitis, and bowel obstruction are common causes of acute abdominal pain, but other important, even if less frequent conditions, that may cause acute abdominal pain include perforated viscus or vascular diseases such as aortic dissection and mesenteric ischemia ***(Mazzei et al., 2013).***

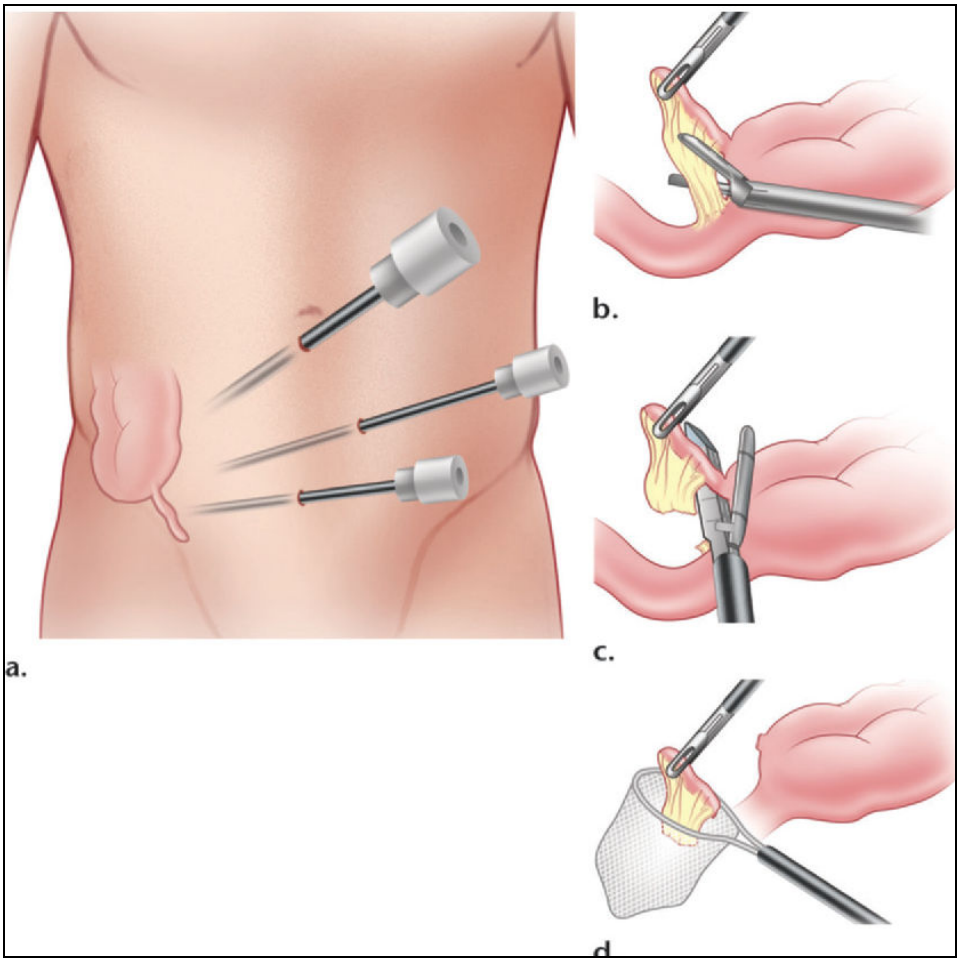

Figure (2): Laparoscopic appendicectomy approach ***(Mazzei et al., 2013).***

Laparoscopies are now widely used to diagnose many different conditions:

Pelvic inflammatory disease (PID) – a bacterial infection of the female upper genital tract, including the womb, fallopian tubes and ovaries.

- Endometriosis – where small pieces of the womb lining (the endometrium) are found outside the womb
- Ectopic pregnancy– a pregnancy that develops outside the womb
- Ovarian cyst–a fluid-filled sac that develops on a woman's ovary
- fibroids – non-cancerous tumours that grow in or around the womb (uterus)
- Female infertility
- Undescended testicles – a common childhood condition where a boy is born without one or both testicles in their scrotum
- Appendicitis – a painful swelling of the appendix (a small pouch connected to the large intestine)
- Unexplained pelvic or abdominal pain
- Laparoscopy can also be used to diagnose certain types of cancers. The laparoscope is used to obtain a sample of suspected cancerous tissue, so it can be sent to a laboratory for testing. This is known as a biopsy.

- Cancers that can be diagnosed using laparoscopy include:
- Liver cancer
- Pancreatic cancer
- Ovarian cancer
- Cancer of the bile duct
- Cancer of the gallbladder

Treating conditions

- Removing an inflamed appendix – in cases of appendicitis where there's a high risk of the appendix bursting
- Removing the gallbladder – often used to treat gallstones
- Removing a section of the intestine – often used to treat digestive conditions, such as Crohn's disease or diverticulitis, that don't respond to medication
- Repairing hernias – such as those found in the groin
- Repairing burst or bleeding stomach ulcers
- Performing weight loss surgery
- Removing some or all of an organ affected by cancer – such as the ovaries, prostate, liver, colon, kidney or bladder

- Treating ectopic pregnancy – it's usually necessary to remove the embryo to prevent damage to the fallopian tubes
- Removing fibroids
- Removing the womb (hysterectomy) – sometimes used to treat pelvic inflammatory disease (PID), endometriosis, heavy periods or painful periods

Minimally invasive surgery continues to transform the field of gynecologic oncology and has now become the standard of care for many early-stage malignancies. The proven benefits of minimally invasive surgery are driving the rapid introduction and dissemination of novel technologies and the increasing ability to perform even the most complex procedures less invasively ***(Stewart and Fader, 2017).***

While laparotomy is the standard of care in hemodynamically unstable patients, stable patients are usually treated by non-operative management (NOM), incorporating adjuncts such as interventional radiology. However, although NOM has shown good results in solid organ injuries, other lesions, namely those involving the hollow viscus, diaphragm, and mesentery, do not qualify for this approach and need surgical exploration. Laparoscopy requires adequate training and experience as well as sufficient staffing and equipment ***(Justin et al., 2017).***