Original Article

Role of Laparoscopy in Surgical Emergency

Laparoscopy in Surgical Emergency

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ABSTRACT

Objective: To determine the frequency of diseases and make provisional diagnosis in patients who present with acute abdomen in emergency department.
Study Design: cross sectional study
Place and Duration of Study: This study was conducted at the Department of Surgery, District Headquarters Hospital (DHQ), Rawalpindi from August, 2020 to January, 2021.
Materials and Methods: 160 patients were enrolled in this study with differential diagnosis of pelvic inflammatory diseases, acute pancreatitis, perforated duodenal ulcer, enteric perforation, perforated appendices. Later on patients were subjected to the laparoscopy under general anesthesia & than proceeded for final treatment.
Results: The mean age of patients was 39.64±12.48 years. Male to female ratio was 1.6:1. The mean duration of pain was 4.34±1.08 hours. On laparoscopy, commonest diagnosis was made of appendicitis i.e. 101(63.13%) cases followed by cholecystitis found in 40(25%) cases.
Conclusion: This study concluded that the on laparoscopic findings the most common diagnosis was appendicitis which was found in 63.13% patients followed by cholecystitis in patients with acute abdomen, so in more than 88% percent of cases, diagnosis can be made with 100 % accuracy.
Key Words: Acute abdomen, Appendicitis, Laparoscopy

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INTRODUCTION

The acute abdomen may be caused by an infection, inflammation, vascular occlusion, or obstruction. Usual presentation is with sudden onset of abdominal pain associated with nausea or vomiting. Most patients with an acute abdomen appear ill.[1] approximately between 7 to 10% of emergency department visits are for abdominal pain.[2]

About one-third of abdominal pain patients are diagnosed with non-specific abdominal pain. Another 30% have acute renal colic.[3] The causes of an acute abdomen include appendicitis, perforated peptic ulcer, acute pancreatitis, ruptured sigmoid diverticulum, ovarian torsion, volvulus, ruptured aortic aneurysm, lacerated spleen or liver, and ischemic bowel.[4,5]

Somatic sensory nerves provide sensation to the parietal peritoneum. Somatic pain is sharper and better localized. An example is a pain over McBurney's point when the inflamed appendix is irritating the parietal peritoneum. Because visceral and somatic afferent nerve fibers share spinal cord segments, visceral pain can be felt as referred pain from a somatic distribution. This explains cholecystitis radiating to the right scapula.[1]

Obstetric and gynaecologic causes include ruptured ectopic pregnancy and ovarian torsion. Urologic conditions including ureteral colic and pyelonephritis can also present as acute abdominal pain. Newborns can present with necrotizing enterocolitis. Midgut volvulus present 40% of the time in the first week of life, 50% in the first month and 75% in the first year. Intussusception usually occurs at ages nine to 24 months. The most common cause of an acute paediatric abdomen is appendicitis.[6]

The predictive value of clinical diagnosis reached by laparoscopy is 68% to 92%. On one hand, this method entails risk of complications e.g. peritonitis, haemorrhage, or infertility. On other hand, laparotomy might be unnecessarily performed. Ultrasound, computed tomography scan, and early laparoscopy have all been described as potential methods for improving diagnosis. Laparoscopy is most effective technique for bridging gap between clinical evaluation and major surgical exploration. Advantage in terms of safety, reduced morbidity and mortality, decreased postoperative pain and short hospital stay makes it a valuable diagnostic tool.[7] The most frequent causes were nonspecific abdominal pain (NSAP) (31.46%), and renal colic (31.18%). Biliary colic/cholecystitis and

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diverticulitis were more prevalent in patients aged >65 years.[8]

Certain lab investigations like complete blood count, U&Es, LFTs, amylase, glucose, arterial blood gases, pregnancy test (in women of childbearing age), and urinalysis are used in the initial assessment. Abdominal X-ray, erect chest X-Ray, intravenous pyelogram, CT scan & ultrasound are done in most of cases depending on presenting complaints. All of the above investigations are non-specific for diagnosis of specific acute abdomen conditions, while studies have proved that laparoscopy was found to be accurate in diagnosing 90% of the patients presenting with acute abdominal pain. Appendicitis was the most common diagnosis (79%) while the second most common finding was cholecystitis according to some studies.[9] One study carried noted that laparoscopy was 56% sensitive, 80% specific & 64% positive predictive value for the prediction of the acute abdominal pain.[10]

The approach to a patient with an acute abdomen should include a thorough history and physical exam. The location of pain is critical as it may signal a localized process. However, in patients with free air, it may present with diffuse abdominal pain. Auscultation may reveal absent bowel sounds and palpation may reveal rebound tenderness and guarding, suggestive of peritonitis. The causes of an acute abdomen had a wide range including appendicitis, perforated peptic ulcer, acute pancreatitis, ruptured sigmoid diverticulum, ovarian torsion, volvulus, ruptured aortic aneurysm, lacerated spleen or liver, and ischemic bowel.[11,12]

The rationale of the study is to determine the role of the laparoscopy in the confirmation of the cause of acute abdomen pain. There are limited number of studies carried out on this topic and have showed the variable results. The results of the study would help to evaluate significance of laparoscopy with respect to diagnosis of patients with acute abdominal pain.

MATERIALS AND METHODS

After obtaining the patient's written consent and permission from the ERB, this cross-sectional study was conducted from 1 August 2020 to 31 January 2021 at DHQ Hospital Rawalpindi Surgery. Paraphrased Text. The study included men and women between the ages of 18 and 60 who presented to the emergency department with acute abdominal pain. The sampling technique was sequential non-probability sampling and data were collected in a form. Pregnancy, coagulopathy, malignancy, trauma, or overt signs of immediate laparotomy such as overt peritonitis, hemorrhagic shock, and evisceration were excluded from the study. Sample size was calculated with 95% confidence using the WHO formula Z(1-a/2) 2 . Quantitative data such as age were presented with mean and standard deviation. Qualitative data such as gender, pain, duration of pain, and laparoscopic assessment were expressed as percentages. Modifications of effects such as age, sex, pain, and pain duration were controlled for by stratification. A post-stratification chi-square test was applied. A P-value < 0.05 was significant. Data were analyzed using SPSS 24.

RESULTS

In this study total 160 patients were enrolled. The mean age of the patients was 39.64±12.48 years with minimum and maximum ages of 18 & 60 years respectively. Out of 160 patients, there were 100(62.50%) were male and 60(37.50%) were females. Male to female ratio of the patients was 1.6:1. According to this study, mean duration of pain was 4.34±1.08 hours with minimum and maximum duration of 3 & 6 hours respectively.

Out of 160 patients, on laparoscopy, diagnosis of appendicitis was noted in 101(63.13%) patients followed by cholecystitis in 40(25%) patients. Gynecological pathology noted in 15(9.38%) patients and perforated duodenal ulcer (PDU) found in 4(2.50%) patients.

Among patients having age ≤ 40 years, appendicitis was found in 49(57.6%) patients whereas among patients having age >40 years, same diagnosis was made in 52(69.3%). Statistically, insignificant difference was found between the laparoscopic findings and age groups. i.e. p-value=0.360 and also explain in table 1.

Table No.1: Comparison of laparoscopic findings between age groups

Age (years)	Laparoscopic Findings				p-value
	Appendicitis	Cholecystitis	Gynecological Pathology	PDU	
≤ 40	49	26	8	2	0.360
	57.6%	30.6%	9.4%	2.4%	
>40	52	14	7	2	
	69.3%	18.7%	9.3%	2.7%	
Total	101	40	15	4	
	63.1%	25.0%	9.4%	2.5%	

In male patients, appendicitis was found in 81(81.0%) patients whereas in female patients, appendicitis was found in 20(33.3%) patients. Statistically significant difference was found between the two genders. i.e. p-value=<0.001 explain in table 2.

Table No.2: Comparison of laparoscopic findings between male & female

Gender	Laparoscopic Findings				p-value
	Appendicitis	Cholecystitis	Gynecological Pathology	PDU	
Male	81	17	0	2	<0.001
	81.0%	17.0%	0.0%	2.0%	
Female	20	23	15	2	
	33.3%	38.3%	25.0%	3.3%	
Total	101	40	15	4	
	63.1%	25.0%	9.4%	2.5%	

Among patients having VAS score ≤ 7, on laparoscopy the appendicitis was found in 66(71.0%) patients whereas among patients having VAS score >7, on laparoscopy the appendicitis was found in 35(52.2%) patients. Statistically there was significant difference was found between the laparoscopic findings and VAS. i.e. p-value=0.015 explain in table 3.

Table No.3: Comparison of laparoscopic findings between VAS score

VAS	Laparoscopic Findings				p-value
	Appendicitis	Cholecystitis	Gynecological Pathology	PDU	
≤ 7	66	20	5	2	0.015
	71.0%	21.5%	5.4%	2.2%	
>7	35	20	10	2	
	52.2%	29.9%	14.9%	3.0%	
Total	101	40	15	4	
	63.1%	25.0%	9.4%	2.5%	

DISCUSSION

In our study the mean age of the patients was 39.64±12.48 years. Sheikh Azeem & his colleagues showed that the mean age was 30±1.26 years. 52% patients were male while 48% patients were female.[13] Morsy et al[14] demonstrated that the mean age of enrolled patients was 33.51±10.54 years. One more study showed that the overall mean age of presentation was 30.5±12.9 years (males: 27.87±14.7 years, females: 31.76±12.1 years, p>0.05).[15]

The diagnosis of acute appendicitis is predominantly a clinical one. Many patients present with a typical history and examination findings. Abdominal pain is the primary presenting complaint of patients with acute appendicitis. The diagnostic sequence of colicky central abdominal pain followed by vomiting with migration of the pain to the right iliac fossa was first described by Murphy but may only be present in 50% of patients.[16] In our study, diagnosis of appendicitis noted in 101(63.13%) patients followed by cholecystitis in 40(25%) patients, gynaecological pathology noted in 15(9.38%) PDU diagnosis found in 4(2.50%) patients.

Morsy et al[14] presented in their study that Laparoscopy provided higher diagnostic accuracy and improved quality of life in cases of acute abdomen. Based on clinical, laboratory, and radiological data, the author reached conclusion in up to 40% of the cases as acute appendicitis and 28.6% as acute cholecystitis, but we could not reach a diagnosis in approximately one-third of the cases.

Naveen KK and Aggarwal VC[17] documented in their study that the diagnostic laparoscopy has an important role to play in undiagnosed acute abdomen patients both diagnostically as well as therapeutically. The most common intraoperative finding on diagnostic laparoscopy was again turn out to be appendicitis (23%). Out of the 30 patients subjected to diagnostic laparoscopy, 22 patients (73.33%) were diagnosed and managed by laparoscopy only.

One study demonstrated that in cases of chronic abdominal pain, it yielded positive findings in 64% of the cases in patients who had all the initial investigations normal and had no positive findings on colonoscopy. In these patients, 30% had gut adhesions while other common causes found were appendicitis, ovarian cyst & tubal mass. The commonest cause found on diagnostic laparoscopy was again appendicitis i.e. 75.7%.[18]

Anand Thawait et al[9] concluded in their study that the early laparoscopy is valuable in management of acute non-specific abdominal pain. It provides significantly high diagnostic accuracy, permits early patient discharge and minimizes the incidence of unnecessary laparotomy. Studies have proved that laparoscopy was found to be accurate in diagnosing 90% of the patients presenting with acute abdominal pain. Saverio et al.[19] Recommend the laparoscopic approach for diagnostic purposes and also suggested laparoscopic repair of PPU in stable patients with perforation less than 5 mm in size.

In future further studies should be done to evaluate the findings of our study with larger sample size and patients should be taken from multiple centres.

CONCLUSION

This study concluded that on laparoscopic findings the most common diagnosis was appendicitis which was found in 63.13% patients followed by cholecystitis in patients presenting with acute abdomen.

Author's Contribution:

Concept & Design of Study:	Hina Murtaza
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Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Patterson JW, Dominique E. Acute Abdomen. In: Stat Pearls [Internet]. Treasure Island (FL): Stat Pearls Publishing; 2022.
2. Camilleri M, Boeckxstaens G. Dietary and pharmacological treatment of abdominal pain in IBS. Gut 2017;66(5):966-74.
3. de Burlet K, Lam A, Larsen P, Dennett E. Acute abdominal pain-changes in the way we assess it over a decade. The New Zealand Med J 2017; 130(1463):39-44.

4. Verki MM, Motamed H. Rectus muscle hematoma as a rare differential diagnosis of acute abdomen; a case report. Emergency 2018;6(1).
5. Kaushal-Deep SM, Anees A, Khan S, Khan MA, Lodhi M. Primary cecal pathologies presenting as acute abdomen and critical appraisal of their current management strategies in emergency settings with review of literature. Int J Critical Illness Injury Science 2018;8(2):90.
6. Li PH, Tee YS, Fu CY, Liao CH, Wang SY, Hsu YP, et al. The role of noncontrast CT in the evaluation of surgical abdomen patients. The Am Surgeon 2018;84(6):1015-21.
7. Cervellin G, Mora R, Ticinesi A, Meschi T, Comelli I, Catena F, et al. Epidemiology and outcomes of acute abdominal pain in a large urban Emergency Department: retrospective analysis of 5,340 cases. Annals Translational Med 2016;4(19).
8. Subramaniam R. Diagnostic laparoscopy in acute abdominal pain. Int Surg J 2019;6(4):1104-7.
9. Thawait A, Dwivedi S, Bhatt M, Bakhshish K, Mittal A. Role of early laparoscopy in diagnosis of acute abdominal pain. Int J Contemporary Med Research 2017;4(7):1568-73.
10. Verki MM, Motamed H. Rectus muscle hematoma as a rare differential diagnosis of acute abdomen; a case report. Emergency 2018;6(1).
11. Kaushal-Deep SM, Anees A, Khan S, Khan MA, Lodhi M. Primary cecal pathologies presenting as acute abdomen and critical appraisal of their current management strategies in emergency settings with review of literature. Int J Critical Illness Injury Science 2018;8(2):90.
12. Humes D, Simpson J. Acute appendicitis. BMJ 2006;333(7567):530-4.
13. Azeem SMI, Ahmad M, Samad A, Shahzad M, uddin Sadiq M. Common intra-abdominal pathologies on diagnostic laparoscopy among patients with non-acute abdominal pain. Pak J Surg 2018;34(1):31-5.
14. Morsy MM, Mostafa TA, Hassan MM. Role of laparoscopy in acute abdomen. The Egypt J Surg 2020;39(3):540.
15. Poulin EC, Schlachta CM, Mamazza J. Early laparoscopy to help diagnose acute non-specific abdominal pain. The Lancet 2000;355(9207): 861-3.
16. Promecene PA, editor. Laparoscopy in gynecologic emergencies. Seminars in Laparoscopic Surgery; Sage Publications Sage CA: Thousand Oaks, CA 2002.
17. Naveen K, Aggarwal V. Evaluation of Laparoscopy in Undiagnosed Acute Abdomen. Clin Surg 2020;5:2698.
18. Agrusa A, Romano G, Di Buono G, Dafnomili A, Gulotta G. Laparoscopic approach in abdominal emergencies: a 5-year experience at a single center. Il Giornale di chirurgia 2012;33(11/12):400-3.
19. Di Saverio S, Bassi M, Smerieri N, Masetti M, Ferrara F, Fabbri C, et al. Diagnosis and treatment of perforated or bleeding peptic ulcers: 2013 WSES position paper. World J Emergency Surg 2014;9(1):45.