

Role of Minimally Invasive Surgery (Laparoscopic Surgery) in the Management of Acute Abdomen

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ABSTRACT

Objective: The study's goal is to evaluate the diagnostic and therapeutic efficacy of non-invasive surgery (laparoscopy) in the treatment of acute abdomen.

Methods: This is an observational study, conducted in Peshawar Medical College Group of Hospitals, Peshawar from January, 2020 to July, 2021. Total 60 patients presented with acute abdomen were included in the study. Patients underwent Laparoscopic surgery after initial work-up. The outcome of Laparoscopy was assessed in terms of diagnostic accuracy, conversion rate, inadvertent injury, hospital stay, wound infection and pain score.

Result: Total 60 patients with acute abdomen underwent Laparoscopy during study period. Male to female ratio 1: 1.2 (27:33) while mean age was 36.18 years (12-75). In 93% (56/60) cases per-operative diagnosis was compatible with pre-operative diagnosis. The conversion rate from laparoscopic to open surgery was 1.6%. The average length of hospital stay was 1.45 days (1-4 days). On a visual analogue scale, the mean pre-operative pain level was 6.28. (3-9). On the first post-operative day, the mean post-operative pain score on a visual analogue scale was 1.68. (1-4). Infection at the port site occurred in 3.3% (2/60).

Conclusion: Laparoscopy is a safe and effective method of diagnosing and treating acute abdomen so it can be safely adopted in patients presenting with acute abdomen as Laparoscopy eliminates diagnostic delays and unneeded laparotomy and its complications.

Keywords: Acute Abdomen, Laparoscopy, Minimally Invasive Surgery, Laparotomy

INTRODUCTION

Acute abdomen is common presentation in surgical emergency¹. It is a condition that needs fairly immediate decision to the management². Nearly one fourth of the patients have vague abdominal pain³. Observation, imaging and laparotomy are the different modalities that have been to assess such patients. Rationale for the use of Diagnostic Laparoscopy is these patients are to prevent management delay and to avoid unnecessary laparotomy². The use of early laparoscopy in patients with undifferentiated acute abdomen was not recommended till now, so clinical trials are required to assess the role of early laparoscopy in this clinical situation⁴.

The Laparoscopic technique has recently changed surgical practise. The advantages of a less invasive method for quicker recovery, lower morbidity and mortality are well-established⁵. Despite being widely used in elective surgery, the usage of laparoscopic surgery in emergency situations has been more diverse⁶. Laparoscopy plays an important diagnostic and therapeutic role in patients with acute abdomen⁷.

Using diagnostic laparoscopy, a surgeon may directly see any anomalous abdominal contents that might be the source of discomfort and cannot be identified any other way, as well as rule out other pain-causing factors. On the other side, an unneeded laparotomy causes discomfort, lengthens hospital stays, raises hospital expenses, and is linked to a 5-22% increase in morbidity⁸.

Emergency Laparoscopy can be used for the diagnosis and or management of a wide variety of acute abdomen. Therapeutic procedures using Laparoscopic like appendectomy, peptic ulcer perforation repair, adhesiolysis, lap assisted resection and anastomosis, enteric perforation repair, drainage of free fluid and lavage can be performed⁷. Laparoscopic cholecystectomy in acute cholecystitis is quite safe with low conversion rate, bile duct injuries and hospital stay⁹.

The Diagnostic potential of laparoscopy has changed the management of many surgical diseases presenting with non-specific abdominal pain where conventional modalities of diagnosis are not helpful¹⁰. Acute NSAP is a significant problem and accounts for estimated 13-40% of emergency surgical admission^{11,12}. The study's goal is to evaluate the diagnostic and therapeutic efficacy of minimally invasive surgery (laparoscopy) in

the treatment of acute abdomen. As the conventional approach towards the management of acute abdomen is laparotomy.

MATERIAL AND METHOD

This observational study was conducted in Peshawar medical college Group of Hospitals, Peshawar from January, 2020 to July, 2021 after taking approval from IERB. Patients presented with acute abdomen having symptoms of Pain Abdomen (localized or generalized), nausea, vomiting, anorexia, fever and localized or generalized tenderness were included in the study. Patients were admitted for initial work-up including abdominal radiography, Ultrasound abdomen and pelvis, CT scan, complete blood count, liver function test if needed were done and underwent Laparoscopy with suspicion of Acute Appendicitis, Phlegmonous gall bladder, Gangrenous gall bladder, Perforated gall bladder, perforated duodenal ulcer, ileal perforation, ovarian torsion, and proceeded accordingly. The outcome of Laparoscopy in these conditions was assessed in terms of diagnostic accuracy, conversion rate, inadvertent injury, hospital stay, wound infection and pain score.

Data was collected from hospital patient's record. A detailed proforma was designed in MS word including patient demography, post-operative diagnosis, conversion, per-operative complications, duration of hospital stay, pain score pre-operative and post-operative, port site infection and analyzed in Statistical Package for Social Sciences (SPSS version 20.0). Descriptive statistics were computed for the above mentioned variables.

All Laparoscopies were performed by expert Laparoscopic surgeon having experience of more than 1000 laparoscopic surgeries.

RESULTS

In our study total 60 patients with acute abdomen underwent Laparoscopic surgery during study period. Male to female ratio 1: 1.2 (27:33) while mean age was 36.18 years (12-75).

In 93% (56/60) cases per-operative diagnosis was compatible with pre-operative diagnosis. All the above cases were managed Laparoscopically except in a case of Meckle's Diverticulum, where small lower mid-line laparotomy incision was made after diagnostic Laparoscopy followed by resection anastomosis, having conversion rate of 1.6% (1/60). The average

hospital stay was 1.45 days (1-4), and 68.3% (41/60) of patients were sent home on the first post-operative day. Laparoscopic surgery was un-eventful; peri-operative complications rate was 0% (0/60), no inadvertent injury occurred during laparoscopic surgery in acute abdomen. Mean pre-operative pain score on visual analog scale was 6.28 (3-9). Post-operative recovery was smooth, mean post-operative pain score on visual analog scale on 1st post-operative day was 1.68 (1-4), only 8.3% (5/60) required intravenous analgesics on 2nd post-operative day.

Table 1: The post-operative diagnosis

Post-operative diagnosis	Frequency	Percent
Acute Appendicitis	29	48.3
Ovarian Torsion	3	5.0
Omental Torsion	1	1.7
Empyema Gall Bladder	11	18.3
Gangrenous Gall Bladder	4	6.7
Perforated Gall Bladder	5	8.3
Mucocele	4	6.7
Perforated Duodenal Ulcer	1	1.7
Meckel's Diverticulum	1	1.7
Liver Abscess	1	1.7
Total	60	100.0

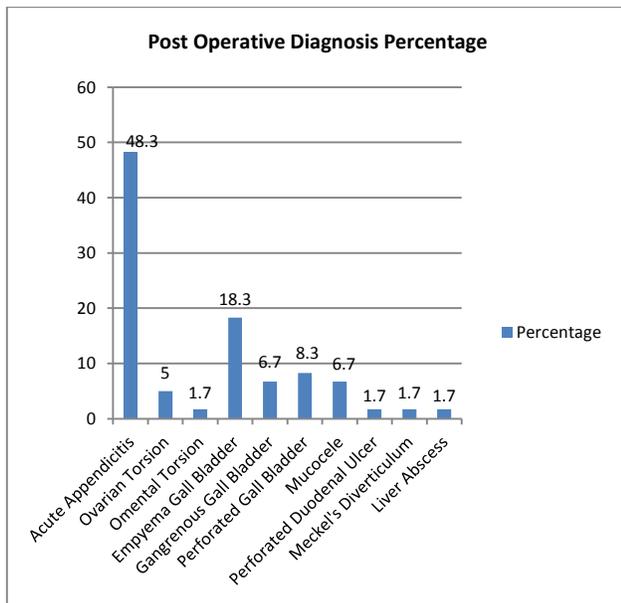


Figure 1:

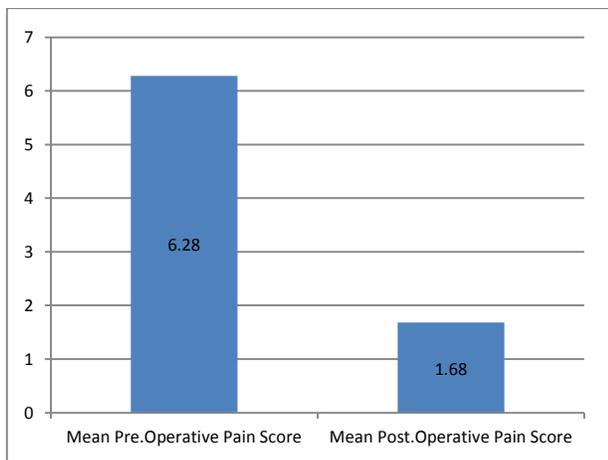


Figure 2: Comparison of Pain Score

On 2 weeks follow-up all the patients were stable. Port site wound infection developed in 3.3% (2/60).

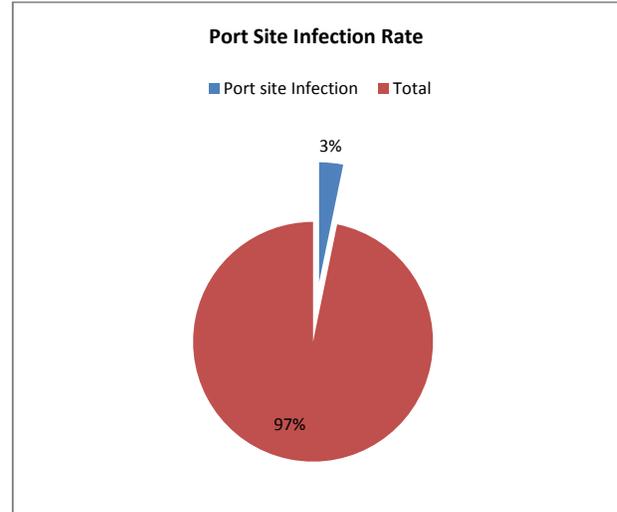


Figure 3:

DISCUSSION

Majority of the per-operative diagnosis at Laparoscopy was compatible with pre-operative clinical diagnosis or suggestive imaging findings except few cases which are worth mentioning.

Case of Omental torsion: patient presented with pain RHC with Tenderness and palpable mass RHC, Ultrasound suggestive of cholelithiasis. Pre-operative diagnosis was Phlegmonous gall bladder, upon Laparoscopy Omentum was found twisted around a single adhesion band. Laparoscopic omentectomy and cholecystectomy were performed.

Case of Meckle's diverticulum: patient presented with pain abdomen and umlicus discharge with umbilical hernia. Upon Laparoscopy Meckle's diverticulum was found incarcerated in umbilical hernia. Small lower midline laparotomy was done followed by resection anastomosis.

Case of ovarian torsion: patient presented with acute abdomen, pain mostly right lower abdomen, with dubious pre-operative diagnosis underwent Laparoscopy and was found to have right ovarian torsion. Right sulphingoophrectomy done laparoscopically.

Case of subhepatic appendix with high lying cecum: patient presented with pain RHC. Per abdomen he was tender in RHC. Ultra-sound abdomen suggested phlegmonous mass RHC with free fluid in right sub.hepatic space and right sub.phrenic space. Upon Laparoscopy pus was found in right sub.hepatic space and right sub.phrenic space with high lying cecum and perforated sub.hepatic appendix, Laparoscopic wash and appendectomy were done.

Case of liver abscess: patient presented with fever and pain abdomen, she had open surgery for Hydatid Liver cyst in the past. Imaging suggested collection in liver cavity most probably abscess. Laparoscopy was done, previous scar on right lobe of liver was opened with diathermy, pus was drained with suction, cavity was washed and omentum was placed in it.

Our abdominal laparoscopy results are comparable to those of other countries' investigations. In their prospective study, Costa G et al. found that the postoperative morbidity rate for emergency abdominal procedures in senior patients was 32.6%, with a statistically significant difference between the open and laparoscopic groups (36.2% against 22.1%, p 0.001)¹¹.

Conversion rate in our study was 1.6% i.e. 1 out of 60 cases owing to lack of facilities for laparoscopic resection & anastomosis in case of Meckel's diverticulum. Morcy M et.al has conversion rate of 7.5% owing to bleeding in their study on Laparoscopy in acute

abdomen⁶. Conversion rate of Laparoscopy was 11 % in a local study by Junaid Zeb et.al adhesion being the most frequent reason for conversion to open surgery¹².

CONCLUSION

In the diagnosis and treatment of an acute abdomen, laparoscopy is secure and reliable. Laparoscopy can be safely adopted in management of acute abdomen as it avoid delay in diagnosis and unnecessary laparotomy and its complications with early post-operative recovery.

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