Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2014; 2(4C):1355-1357 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com **DOI:** 10.36347/sjams.2014.v02i04.041

Review Article

Role of Laparoscopy in Emergency Abdominal Surgery

Dr. Amir Hussain
RKM Hospital, Kolkata, West Bengal, India

***Corresponding author**
Dr. Amir Hussain
Email: dramirhussain@yahoo.com

Abstract: Role of minimal access surgery is uncertain in emergency abdominal surgery. The objective of this review article is to explore the role of laparoscopy in various acute abdominal conditions requiring operative intervention.
Keywords: Laparoscopy, acute abdomen, emergency surgery.

INTRODUCTION

Abdomen may be considered as Pandora's box, and it is especially true in emergency set up. The patients with acute abdomen in emergency situation are often difficult to assess especially critically ill and poly trauma patients. Conventional modalities of investigation like ultrasound (US)/ computerised tomography (CT)/ diagnostic peritoneal lavage (DPL) are associated with false positive and negative results and often they are equivocal. An error in the assessment of abdomen can either lead to a delay in the diagnosis, with disastrous consequence to patients, or unnecessary laparotomy, which is painful and associated with morbidity rate of 5-22% [1, 2].

Laparoscopy as a minimally invasive tool can accurately and quickly confirms the diagnosis and reduces both delay in diagnosis and non- therapeutic laparotomy (NTL) rate. Above all with the improvement in the technology and skills, there is an expanding potential for carrying out therapeutic procedure at the same sitting.

Laparoscopy can be considered in acute abdomen for following reasons.

- Diagnosis
- Diagnosis and treatment
- Treatment
- To determine the best incision just before laparotomy

B. Kirshtein *et al.* [3] carried out diagnostic laparoscopy (DL) in 277 consecutive patients with acute abdominal conditions and obtained a correct diagnosis in 98.6% of cases. In 75% of cases procedure was completed laparoscopically, 12.5% required targeted incision and 12.5% of patients underwent formal laparotomy.

ABDOMINAL PAIN

Sugarbaker *et al.* [4] has shown way back in 1975 that laparoscopy in acute abdominal pain has a diagnostic accuracy of 96% and on the other hand patients who underwent laparotomy with a "Confident pre-operative diagnosis" of acute abdomen were found to have negative laparotomy rate of 22%. Salky BA 5 reported his experience of laparoscopy in acute and chronic abdominal pain with a diagnostic accuracy rate of 98% and 76% respectively. In acute abdominal pain therapeutic laparoscopy was performed in 44% cases. 38% did not require any treatment whereas 17% needed exploratory laparotomy. In a combined analysis of 23 series [6] totalling more than 200,000 procedures, DL was found to be a safe procedure with an acceptably low morbidity and mortality.

ABDOMINAL TRAUMA

In this modern world of urban violence and road traffic accidents, abdominal trauma are often difficult to assess due to factors like intoxication, head injury and poly-trauma. DPL, US and CT scan are associated with false positive result leading to increasing rates of non-therapeutic laparotomy.

Larson [7] documented 20% rate of non- therapeutic laparotomy for blunt abdominal trauma on the basis of positive physical examination and DPL. For stab wound, when using wound exploration to determine fascial penetration as a criterion for performing laparotomy, 50% of patients were subjected to non-therapeutic laparotomy. For gunshot wound, a policy of mandatory laparotomy resulted in a 27% non-therapeutic laparotomy rate (NTL).

Berci *et al.* [8] reported their retrospective experience in 150 DL in blunt abdominal trauma patients in emergency room/intensive care unit using local anaethesia and intravenous sedation. Their management

decision, immediate laparotomy (19%), observation (25%), or early discharge (56%) – based on laparoscopic findings were remarkably accurate. There was only one failure in the observation group. They concluded that DL for trauma patients is highly sensitive, safe and decreases NTL rate.

Townsend *et al*. [9] compared the efficacy of DL in 15 patients with solid organ injuries documented by CT scan. DL identified 6 patients who needed urgent laparotomy (2 with hollow viscus injuries, and 4 with continuing haemorrhage). One patient could not be examined completely laparoscopically and underwent laparotomy, which was negative. The remaining 8 patients were successfully managed conservatively on the basis of laparoscopic findings.

Ivatury *et al*. [10] prospectively performed DL in 100 haemodynamically stable patients with penetrating abdominal injuries and compared them with 407 laparotomies without DL. Authors concluded that DL helped in avoiding unnecessary laparotomies, accurate in detecting solid organ and diaphragmatic injuries. Overall sensitivity and specificity of DL were 87% and 100% respectively; low sensitivity (18%) for hollow viscous and retroperitoneal injuries.

Sosa *et al*. [11] reported their prospective experience with DL in 121 consecutive, haemodynamically stable patients with abdominal gun shot wounds. All patients underwent DL, and 68% were spared unnecessary laparotomies on the basis of laparoscopic findings.

Laparoscopy is useful in the management of trauma patients as

- A primary screening modality instead of DPL, U/S, CT scan.
- An adjunct to DPL, U/S scan, CT scan.
- Therapeutic potential to treat an injury such as small bleeding liver tear, diaphragmatic tear.
- Directing the best incision for laparotomy.

LAPAROSCOPY IN INTENSIVE CARE PATIENTS

Critically ill patients are at an increased risk of developing a number of acute abdominal pathologies, such as acalculous/calculous cholecystitis, bowel perforation, intestinal ischaemia, pancreatitis, intestinal obstruction, intra-abdominal haemorrhage. These patients are usually ventilated with multiple organ pathologies, are very difficult to assess , especially after equivocal results of conventional diagnostic modalities. This may lead to either unacceptable delay in diagnosis or results in NTL with increased morbidity and mortality.

Gajic O *et al*. [12] retrospectively studied 77 patients in intensive care unit with suspected abdominal conditions.51 patients underwent surgery and 28 survived (56%).26 (34%) patients did not have surgery and none of these survived. Authors concluded that delay in the surgical evaluation and intervention is critical contributor to mortality rate.

Brandt *et al*. [13] published their experience with DL in 25 intensive care patients. 12 were positive (6 Intestinal ischaemia,4 gangrenous cholecystitis,1 perforated caecum, 1 ruptured spleen). Other 13 were spared laparotomy, 8 of which recovered and 5 died. One died of severe cardiac failure and 4 underwent post mortem examination, that confirm absence of intra-abdominal pathology in 3 and one had small pericolic abscess without bowel perforation.

ACUTE APPENDICITIS

Several retrospective studies have shown a diagnostic accuracy rate of 95%-98%. Cochrane (2002) [14] analysed 45 randomised controlled trials, comparing diagnostic and therapeutic outcomes of patients undergoing open or laparoscopic surgery for suspected appendicitis. Diagnostic outcome favoured laparoscopic approach in both the negative appendectomy rate and the frequency of an un-established diagnosis were reduced, most significantly in women in their reproductive age group. Believe of less adhesion with laparoscopic appendectomy needs studies with longer follow up.

In conclusion in all equivocal cases laparoscopy is better than laparotomy.

The question, should a normal looking appendix be removed during a DL for right iliac fossa pain is controversial. One prospective study from Netherland [15] of 109 patients and a retrospective Irish study [16], suggested that it is safe to leave a normal looking appendix when DL is performed for suspected appendicitis.

PERFORATED PEPTIC ULCER

DL can determine the type of fluid along with the presence of food debri and accurately locate the site of perforation in the majority of cases. Furthermore a therapeutic approach either peritoneal lavage or simple suture closure of the perforation can be performed laparoscopically.

Memon and Brow [17] reported one of the earliest studies, that laparoscopic closure of perforated duodenal ulcer is technically possible if performed within 6 hours.

3 randomised studies [18-20] shown a decrease in analgesia requirement, but no benefit in terms of length of stay, time to resume normal diet, visual analogue score in first 24 hours or early return to activity.

In conclusion laparoscopy provides an accurate diagnosis in patients with perforated peptic ulcer and can be used safely to treat these conditions without

resorting to laparotomy. However, large prospective, randomised trials are required to clarify the exact role of this new modality of treatment.

ACUTE CHOLECYSTITIS

Laparoscopic cholecystectomy for acute cholecystitis on an emergency basis is technically possible, safe and efficient as shown by several studies [21-25]. However, more surgical experience is required as this procedure is associated with higher conversion rates 4-28% and there is increased risk of injury to common bile duct 0-3%. Timing of surgery is important, and should be performed as soon as possible, preferably within 96 hours [22].

REFERENCES

1. Forde KA, Ganepola GA; Is mandatory exploration for penetrating abdominal trauma extinct? The morbidity and mortality of negative exploration in a large municipal hospital. J Trauma., 1974; 14(9): 764-766.
2. Sosa JL, Baker M, Puente I, Sims D, Sleeman D, Ginzburg E *et al*., Negative laparotomy in abdominal gun shot wound: Potential impact of laparoscopy. J Trauma., 1995; 38(2):194-197.
3. Kirshtein B, Roy-Shapira A, Lantsberg L, Mandel S, Avinoach E, Mizrahi S; The use of laparoscopy in abdominal emergencies: Surg Endosc., 2003; 17(7): 1118-1124.
4. Sugarbaker PH, Bloom BS, Sanders JH, Wilson RE; Preoperative laparoscopy in diagnosis of acute abdominal pain. Lancet, 1975; 305(7904): 442-445.
5. Salky BA, Edye MB; The role of laparoscopy in the diagnosis and treatment of abdominal pain syndromes. Surg Endosc., 1998; 12(7): 911-914.
6. Nord HJ; Complications of laparoscopy. Endoscopy, 1992; 24(8): 693-700.
7. Larson GM; Laparoscopy of abdominal emergencies. Scand J Gasteroenterol., 1995; 208: 62-66.
8. Berci G, Sackier JM, Paz Partlow M; Emergency laparoscopy. Am J Surg., 1991; 161(3): 332-335.
9. Townsend MC, Flancbaum L, Choban PS, Cloutier CT; Diagnostic laparoscopy as an adjunct to selective conservative management of solid organ injuries after blunt abdominal trauma. J Trauma., 1993; 35(4): 647-651.
10. Ivatury RR, Simon RJ, Stahl WM; A critical evaluation of laparoscopy in penetrating abdominal trauma. J Trauma., 1993; 34(6) 822-827.
11. Sosa JL, Arrillaga A, Puente I, Sleeman D, Ginzburg E, Martin L; Laparoscopy in 121 consecutive patients with abdominal gunshot wounds. J Trauma., 1995; 39(3): 501-504.
12. Gajic O, Urrutia LE, Sewani H; Acute Abdomen in Medical ICU. Crit Care Med., 2002; 30(6): 1187-1190.
13. Brandt CP, Priebe PP, Eckhauser ML; Diagnostic laparoscopy in the intensive care patients. Avoiding the non -therapeutic laparotomy. Surg Endosc., 1993; 7(3): 168-172.
14. Sauerland S, Lefering R, Neugebauer EA; Laparoscopic versus open surgery for suspected appendicitis. Cochrane Database Syst Rev., 2010; 10:CD001546.
15. Van den Broek WT, Bijnen AB, de Ruiter P, Gouma DJ; A normal appendix found during diagnostic laparoscopy should be removed. Br J Surg., 2001; 88(2): 251-254.
16. Teh SH, O'Ceallaigh S, Mckeon JG, O'Donohoe MK, Tanner WA, Keane FB; Should an appendix that looks' normal'be removed at diagnostic laparoscopy for acute right iliac fossa pain? Eur J Surg., 2000; 166(5): 388-389.
17. Memon MA, Brow G; Laparoscopic closure of acutely perforated duodenal ulcer- an early experience. Ir Med J., 1993; 86(3): 106-107.
18. Lau WY, Leung KL, Kwong KH, Davey IC, Robertson C, Dawson JJ *et al*.; A randomised study comparing laparoscopic vs open repair of perforated peptic ulcer using suture or sutureless technique. Ann Surg., 1996; 224(2): 131-138.
19. Miserez M, Eypasch E, Spangenberger W, Lefering R, Troidl H; Laparoscopic and conventional closure of perforated peptic ulcer. A comparision. Surg Endosc., 1996; 10: 831-836.
20. So JB, Kum CK, Fernandes ML, Goh P; Comparision between laparoscopic and conventional omental patch repair for perforated duodenal ulcer. Surg Endosc., 1996; 10(11): 1060-1063.
21. Ferrozzi L, Lippolis G, Petitti T, Carnevale D, Masi M; Laparoscopic cholecystectomy for acute cholecystitis: our experience. G Chir., 2004; 25(3): 80-82.
22. Eldar S, Sabo E, Nash E, Abrahamson J, Matter I; laparoscopic cholecystectomy for acute cholecystitis: Prospective trial. World J Surg., 1997; 21(5): 540-545.
23. Asoglu O, Ozmen V, Karanlik H, Igci A, Kecer M, Parlak M *et al*.; Does the complication rate increase in laparoscopic cholecystectomy for acute cholecystitis? J Laparoendosc Adv Surg Tech A., 2004; 14(2): 81-86.
24. Willsher PC, Sanabria JR, Gallinger S, Rossi L, Strasberg S, Litwin DE *et al*.; Early laparoscopic cholecystectomy for acute cholecystitis: a procedure. J Gastrointest Surg., 1999; 3(1): 50-53.
25. Avrutis O, Friedman SJ, Meshoulm J, Haskel L, Adler S; Safety and success of early laparoscopic cholecystectomy for cholecystitis. Surg Laparosc Endosc Percutan Tech., 2000; 10(4): 200-207.