

Role of Laparoscopy in Early Diagnosis and Further Management: In A Cases of Acute Abdominal Pain

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Abstract

Background: Diagnostic laparoscopy is minimally invasive surgery for the diagnosis of intra-abdominal diseases. Patient with acute abdominal pain are challenging for both diagnostic and therapeutic point of view. Diagnostic laparoscopy is now almost unanimously accepted as the preferred approach for treatment of many diseases, Diagnostic laparoscopy not only facilitate to diagnosis of intra-abdominal diseases but also therapeutic interventions possible in the hand of properly trained laparoscopic surgeon, it is possible due to improvement in instrumentation and greater experience with therapeutic procedures.

Material and Methods: This is Prospective observational study, From May 2003 to April 2006, 3 year duration included 50 patients presenting with acute abdominal pain, admitted in surgical wards at Tertiary care Hospital, underwent laparoscopic examination and treatment.

Inclusion criteria: 1 All cases of acute abdominal pain. 2. Patients willing to participate in study. **Exclusion criteria:** 1. Patients in shock. 2. Ongoing Radiation therapy. 3. Pregnant women, women who had recently given birth. 4. Those with severe Coagulation defects. 5. Patients with intra- abdominal Catastrophe who will directly require exploratory laparotomy.

RESULT: In this study out of 50 cases, 29 Cases (58%) were female while 21 cases (42%) were Male hence Male: Female ratio was 1: 1.3. Among 50 cases, age ranges from 10-60 years, maximum reported age group was 21-30 year, seen in 24 cases (48%), and minimum reported age group was 51-60 year, 1 case (2%). Pain was the commonest chief complain observed in 48 cases (96%). Vomiting in 35 cases (70%). fever 27 cases (54%). Distension in 18 cases (36%). Constipation 11 cases (22%), heartburn, Loose motion in few cases. The duration of onset of pain till the hospital admission is varies, admission within 48 hours seen in 25 cases (50%), followed by 2-4 days seen in 14 cases (28%). Out of 50 cases diagnosis were confirmed by Radiological investigation in 20 cases (40%), 17 cases was diagnosed clinically. During diagnostic Laparoscopy, diagnosis confirmed in maximum cases hence therapeutic intervention carried out simultaneously commonest procedure performed it was Appendectomy in 23 cases (46%), and cholecystectomy in 12 cases (24%). Post-operative hospital stay was significantly reduced, 26 patients (52%) were discharged within 2 days. Post-op complications also minimal, like port site infection, fever and vomiting.

CONCLUSION: Diagnostic Laparoscopy and further management of Acute Abdominal pain, is safe and effective procedure with minimally invasive technique which reduced the complication and early outcome of patient from mental and physical trauma. It can be used as routine technique to avoid major exploratory Laparotomy in a critically ill patients.

Key words: Diagnostic Laparoscopy, Acute Abdominal pain, Appendicitis, Cholecystitis.

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I. Introduction

The field of minimally invasive surgery has experienced and explosive growth in the last two decades and witnessed major changes, only in the recent past. **Jacobaeus** is credited as the first physician to perform diagnostic laparoscopic examinations in human¹. However, it was **Kalk and Bruhl** in 1928 who popularized it and are credited as the first to published a large scale series² The laparoscopic surgeries are quite common today than diagnostic laparoscopy, but Diagnostic laparoscopy is now almost unanimously accepted as the preferred approach for treatment of many diseases. Abdominal pain is very common presentation to emergency department. It is vital that the surgeon has an understanding and be familiar with the presentation of common diseases that cause pain.^{3,4} Acute non-specific abdominal pain generally defined as acute abdominal pain of under 7 days duration and for which there is no diagnosis after examination and baseline investigation.⁵ Patient with acute abdominal pain are challenging for both diagnostic and therapeutic point of view. In some cases even a better of Investigation do not reveals the cause of pain, even after numerous diagnostic studies.^{6,7,8,9} It includes blood counts, Renal function test, Liver function test, Serum electrolytes, Serum amylase, Urine

analysis, urine culture, Pregnancy test in women of reproductive age, Ultrasonography, Chest X-ray, X-ray abdomen standing (radiological investigation)⁵ Some-time CT Abdomen. To call Non-specific Abdominal Pain “An expensive Mystery” thus, if a diagnosis could be made early there would be a large savings in resources.^{10,11,12} Acute abdominal pain is a common problem dealt with a variety of medical specialists. Even after an extensive work-up in some patients, Pathology not concluded by non-invasive investigation hence further diagnostic and therapeutic procedure carried out. Operative treatment can be provided in many instances and will be performed more frequently. There is no any conclusion of a diagnosis or evidence of peritonitis on clinical examination can also be safely managed by Diagnostic laparoscopy.^{13,14}The early laparoscopy can reduced the incidence of negative laparotomies, serious complication, and pre-operative investigation.¹⁶ Sometime abdominal wall pain is also frequently mistaken for visceral pain, Diagnostic laparoscopy is an important option to explore abdomen.¹⁵In many cases it is medical emergency requiring urgent and specific diagnosis and many times it needs surgical intervention, if not treated can have a catastrophic outcome.

Diagnostic laparoscopy is minimally invasive surgery for the diagnosis of intra-abdominal disease, in the hand of properly trained laparoscopic surgeon. Diagnostic laparoscopy can be performed rapidly, safely with minimal sequelae. The procedure enable the direct inspection of large surface area of intra-abdominal organs.^{17,18}and facilitate to obtain biopsy specimen, fluid/ Pus for culture and cytology.¹⁹ Diagnostic laparoscopy is a valuable technique not only facilitate the diagnosis of intra-abdominal diseases but also therapeutic interventions of acute and chronic abdominal pain,²⁰ it is possible due to improvement in instrumentation and greater experience with therapeutic procedures.

II. Material And Methods

Present study was a prospective observational study carried out from May - 2003 to April - 2006, 3 year duration included 50 patients presented with acute abdominal pain admitted in the surgical wards of tertiary care center.**Inclusion criteria:** 1. all cases of acute abdominal pain. 2. Patients willing to participate in study

Exclusion criteria: 1. Patients in shock. 2. Ongoing Radiation therapy. 3. Pregnant women, women who had recently given birth. 4. Those with severe Coagulation defects. 5. Patients with intra- abdominal Catastrophe who will directly require exploratory laparotomy.

Clinical presentation was studied in detail with respect to their history, clinical examination findings recorded that were considered of significant contribution to the final diagnosis. Major symptoms recorded like the duration of pain, body temperature at the time of admission, heart rate, distention of abdomen, vomiting, constipation, heart burn etc. associated with chronic diseases.All routine blood investigation and radiological study done, after all evaluation written informed consent obtained and patient were posted for Diagnostic laparoscopy with prior consent of therapeutic intervention if it is necessary intra-operatively.

This study was our experience in Diagnostic laparoscopy, to evaluate its indications, contraindication, risks and possible benefits, clinical condition of patient, diagnostic accuracy of the procedure, associated morbidity and follow up observations were analyzed.

Procedure: All Laparoscopic surgeries were carried out under general anesthesia all patient had ryle’s tube insertion and bladder catheterization prior to anesthesia in supine position. Pneumoperitoneum was created using hasson technique. 10 mm umbilical camera port was inserted to explore intra-abdominal organ and then other 2 to 3, 5 mm ports inserted depending on different surgeries and organ involvement. Therapeutic intervention carried out depending on the intraoperative findings and as per indications, after surgery all ports were closed with sterile suture material.

III. Result

1. Gender: In this study 50 cases included out of these, 29 patients(58%) were female while 21 cases, (42%) were male hence, Male:Female ratio was (1: 1.3). It shows that the majority of patients suffering from acute abdominal pain were females in our study. **(Table 1)**

2. Age: In this study age group ranges from 10-60 years, (the mean age 35 year) maximum reported age group was 21-30 years, that was 24 cases (48%), next age group was 31-40 year, included 15 cases (30%), then 41-50 years in 6 cases (12%) reported, then 10-20 years, 4 cases (8%), the least reported age group was 51-60 year that was only 1 case (2%). **(Table 2)**

3. Symptom:In this study pain was the commonest chief complain observed in almost 48 cases (96%). Vomiting was the next positive symptom present in 35 cases (70%). fever is also one of the common symptoms present in 27 cases (54%). Abdominal distension is frequently complained by patient seen in 18 cases (36%). Constipation in 11 cases (22%), heartburn seen in 7 cases (14%), and Loose motion in 6 cases (12%). **(Table 3)**

4. Duration of pain: In this study the duration of pain varies, from onset of pain till the hospital admission according to the severity of pain in abdomen associated with other symptoms, admission within 48 hours seen in

25 cases (50%) followed by 2-4 days seen in 14 cases (28%), then 4-6 days duration seen in 6 cases (12%), and last observed duration was 6-8 days seen in 5 cases (10%). (Table 4)

5. Diagnosis with clinical and non-invasive tools: All patients underwent basic radiological investigations for diagnosis of acute abdominal pain like Ultrasonography, Chest x-ray, X-ray abdomen standing (Radiological study). On the basis of radiological examination diagnosis confirmed in 20 cases (40%), while out of remaining 30 cases (60%) 17 cases was not diagnosed on radiological examination but fairly comes to the conclusion on the clinical examination, but in 13 cases it was totally inconclusive by non-invasive tools.

6. Different modalities of treatment by Laparoscopy in Acute Abdomen: In this study among all 50 patients who underwent diagnostic laparoscopy, most of cases diagnosed accurately and therapeutic intervention carried out simultaneously, commonest procedure performed, it was Appendectomy in 23 cases (46%), (Fig 4) followed by cholecystectomy in 12 cases (24%). (Fig 1) Drainage of peritoneal free fluid/Abscess, (Fig 3) and lavage in 4 cases (8%), then Adhesiolysis, (Fig 2) Only Diagnostic laparoscopy and biopsy of mesenteric lymph node/peritoneal/ omental biopsy in 3 cases (6%) each. Laparoscopic drainage of liver abscess and laparoscopic closure of Du perforation carried out in 1 case (2%) each. (Table 5)

7. Post-operative Hospital stay: In this study who underwent Diagnostic laparoscopy their post-operative hospital stay was significantly reduced, 26 patients (52%) were discharged within 2 days, followed by 11 patients (22%) discharged in 2-4 days. 8 patients (16%) discharged in 4-6 days, 3 patients (6%) in 6-8 days and only 2 patients (4%) need long stay 8-10 days because of post-operative complications. (Table 6)

8. Complication: In this study the post-operative complications also minimal, like port site infection seen in 3 cases (6%), fever in 5 cases (10%) and vomiting in 2 cases (4%). (Table 7)

IV. Discussion

In this study out of 50 cases 29 patient (58%) were female while 21 cases, (42%) were male hence, Male:Female ratio was (1: 1.3). It shows that the majority of patients suffering from acute abdominal pain were females in our study. Like to our study V. Golash and et al observers that most patients were female 60% than male.²¹ Anand Thawait and et al also mentioned overall higher female preponderance (68%) M:F ratio is (1:2.13).²² Other Studies by Valpen GCV et al observed that is M:F ratio is (1:2.5)²³ Yehia MA et al also observed similar to our study, M:F ratio is (1:2.07)²⁴ Ilce Z et al also had the same observation in their study M:F ratio is (1:2.5)²⁵

In this study age ranges from 10-60 years the (mean age 35 year) commonest reported age group was 21-30 years, 24 cases (48%) reported, next age group was 31-40 year, included 15 cases (30%), then 41-50 years in which 6 cases (12%) reported, then 10-20 years, 4 cases (8%), and the least reported age group was 51-60 year that was only 1 case (2%) reported. Like to our study V. Golash and et al mentioned mean age ranges from 13- 90 years in their study.²¹ Similar study by Anand Thawait and et al observed that the mean age of presentation was 30.5 +_12.9 year. (male- 27. 87+_14.7 year, female 31.76+_12.1 year, p > 0.05)²²

In this study pain was the commonest chief complain observed in 48 cases (96%), Vomiting was the next positive symptom in 35 cases (70%). fever seen in 27 cases (54%). Abdominal distension observed in 18 cases (36%), constipation seen in 11 cases (22%), heartburn in 7 cases (14%). Loose motion in 6 cases (12%). Like to our study Kamlesh Ram et al observed pain was present in all patients (96%), vomiting in (64%) cases, abdominal distension in (32%) cases, fever and constipation also seen in some cases, diarrhea recorded in few cases.²⁰ Similar observation by Anand Thawait and et al that common symptoms apart from pain in the abdomen was nausea (84%), vomiting (80%), fever (72%) but only 8% presented with chills and rigors among them and loss of appetite (88%).²² Again similar study by Yehia MA and et al observed nausea and vomiting in (55%) patient.²⁴ Dislike our study Al Bareaq and et al observed that, loss of appetite in (48%) as second most common symptoms after pain along with vomiting (34%) and fever (11%).²⁶

In this study the duration of onset of pain till the hospital admission is varies according to the severity of pain in abdomen associated with other symptoms, admission within 48 hours seen in 25 cases (50%) followed by 2-4 days duration seen in 14 cases (28%), followed by 4-6 days duration seen in 6 cases (12%), and last observed duration was 6 to 8 days seen in 5 cases (10%).

All patients underwent basic investigation for Diagnosis of acute abdomen like Ultrasonography, Chest X-ray, X-ray abdomen standing (Radiological study). Diagnosis confirmed by radiological study in 20 cases (40%), & remaining 30 cases (60%), 17 cases was diagnosed by clinically but 13 cases were totally inconclusive. Like to our study Reiertsen O and et al studied 81 cases in which, diagnosis was possible by clinically in 42 patients rest are non-conclusive.²⁷

In this study out of 50 patients who underwent laparoscopy, commonest procedure performed it was Appendectomy in 23 cases (46%), followed by cholecystectomy in 12 cases (24%), then drainage of peritoneal free fluid and lavage in 4 cases (8%), then Adhesiolysis, Only Diagnostic laparoscopy and biopsy of mesenteric lymph node/peritoneal/ Omental biopsy in 3 cases (6%) each, then drainage of liver abscess and laparoscopic closure of Du perforation carried out in 1 case (2%) each. Unlike to our study RS Chung and et

al observed that the accuracy of laparoscopic diagnosis is the same as the laparotomy.²⁸ Like to our study **V. Golash and et al** observed that the laparoscopic diagnosis and therapeutic procedures performed which include, Appendectomy in M-432, F-478, PID 24 patients, Adhesiolysis 27 patient, Perforated peptic ulcers seen in 27 patient.²¹ Similar to our study **Erdogan M and et al** stated that the most frequent diagnosis was acute appendicitis 38%. Laparoscopic treatment of the surgical pathology was possible in 36 patients and 7 patients conversion to laparotomy was necessary²⁹. Some study observed that **Taylor EW and et al** out of 19 patients laparoscopic findings include significant appendicitis 11 cases, pelvic inflammatory diseases 5 cases, significant ovarian cyst in 2 cases. Definite treatment was Appendectomy (5 cases) Salphingo-oophorectomy (1 case). Only Diagnostic laparoscopy in (5 cases) and conversion to an open laparotomy in (8 cases).³⁰ Some other studied **Po Chu Lee and et al** studied blunt trauma abdomen of 47 patients from retrospective data categorized group A with laparotomy. Laparoscopy prospective data concluded in group B with 57 patients. In group A (12.8 %) underwent non-therapeutic laparotomy. In contrast, (15.8%) in group B avoided a non- therapeutic laparotomy because no significant intra-abdominal findings. The incidence of laparotomy for patients with significant injuries in group B was lower than in group A (4.2 Vs 100.0 %; P < .001)³¹ Like to our study **Anand Thawait and et al** mentioned different treatment modalities, Appendectomy (32%), Adhesiolysis (20%), oophorectomy for Torsion of ovary (12%), fluid aspiration, biopsy and metrogyl flush for PID (8%), wedge resection and anastomosis for mackles diverticulum (8%), excision of residual GB stump (4%), multiple puncture for ovarian cyst (4%) and enterotomy for phytobezoar (4%).²² Some study shows the role of Diagnostic laparoscopy was controversial **wood and et al** reported a prospective series of patients with undiagnosed abdominal pain a significant pathologic etiology was found in only 30% of this group by laparoscopy.³²

In this study who underwent diagnostic laparoscopy their post-operative hospital stay was significantly reduced, 26 patients (52%) were discharged within 2 days, followed by 11 patients (22%) discharged in 2-4 days, 8 patients (16%) discharged in 4-6 days, 3 patients (6%) in 6-8 days and only 2 patients (4%) need long stay that is 8-10 days. Some studies also observed like **RS Chung and et al** that the 62% of our patients who were managed totally laparoscopically required shorter hospitalization than the cases matched control's treated by open operations,²⁸ Like to our study **Erdogan M and et al** stated that the median post-operative Hospital stay was one day in the Diagnostic laparoscopy group than the control normal laparotomy group.²⁹ Similar study by **Taylor EW and et al** studied 19 cases, among which median post-operative hospital stay was 3 days.³⁰ Some study shows **Po Chu Lee and et al** observed in their study Group B had a shorter hospital stay (11 day Vs 21 days. P < .001). Shorter ICU stay (0, 1) days Vs (0, 9) days (P= .029)³¹ Like to our study **Kamlesh Ram et al** observed that, 52% of cases discharged within 2 days, 12% in 2 to 3 days, 16% in 3-4 days, 8% in 4- 5 days, 4% in 5 to 6 days, and 4% patients discharged takes greater than 6 days.²⁰

In this study the post-op complication also minimal like port site infection seen in 3 cases (6%), fever seen in 5 cases (10%) and vomiting in 2 cases (4%). Like to our study other also shows the post-operative complication, **T E Udwardia states** that complication occurred after laparoscopic treatment are perforation of ileum seen in 1 patient, respiratory arrest after intravenous diazepam in 1 patient. Wound infection in 1 patient. Surgical emphysema in 12 patient. Pain over 24 hour in 9 patient.³³

V. Conclusion

Diagnostic Laparoscopy and further management of Acute Abdominal pain, is safe and effective procedure with minimally invasive technique. Laparoscopy has an effective Diagnostic accuracy and therapeutic efficacy in the management of patients in those their all basic investigation were inconclusive. It is safe, quick and effective modality for Diagnostic and therapeutic procedure in abdominal pain. Which reduced the complication and early outcome of patient from mental and physical trauma. It can be used as routine technique, to avoid major exploratory Laparotomy in a critically ill patients. Laparoscopic surgery significantly decreased mortality and morbidity, also reduced post-operative complication and length of hospital stay, subsequently reduced overall Hospital cost.

VI. Observation

Table 1: Comparison of sex among patients with pain in abdomen

Sr. number	Sex	No of Patient	Percentage
1	Male	21	42%
2	Female	29	58%

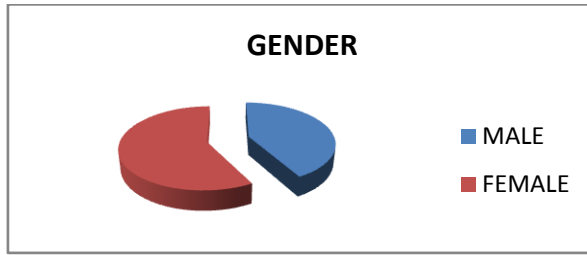


Table 2: Comparison of Age group among patients with pain in abdomen

Sr. No	Age group	No of Patient	%
1	10-20	4	8%
2	21-30	24	48%
3	31-40	15	30%
4	41-50	6	12%
5	51-60	1	2%

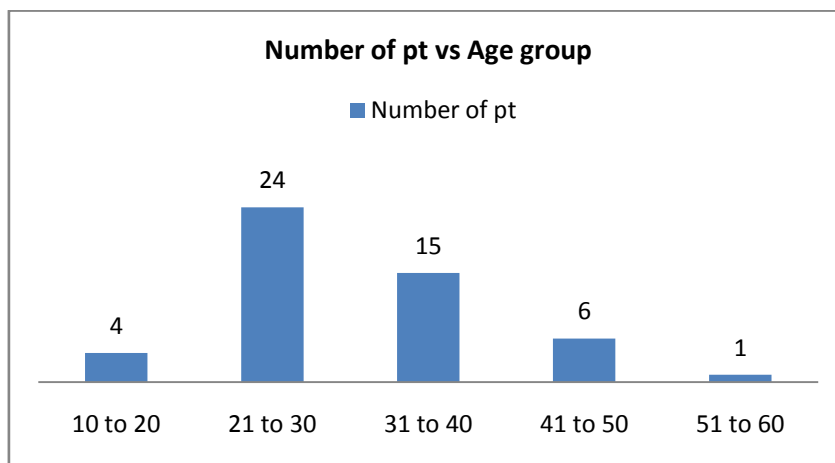


Table 3: Illustration of Symptoms associated with pain in abdomen,

Sr. No	Symptom	No. of Patient	%
1	Pain	48	96%
2	Vomiting/ Nausea	35	70%
3	Loose Motion	6	12%
4	Constipation	11	22%
5	Distension	18	36%
6	Heart Burn	7	14%
7	Fever	27	54%

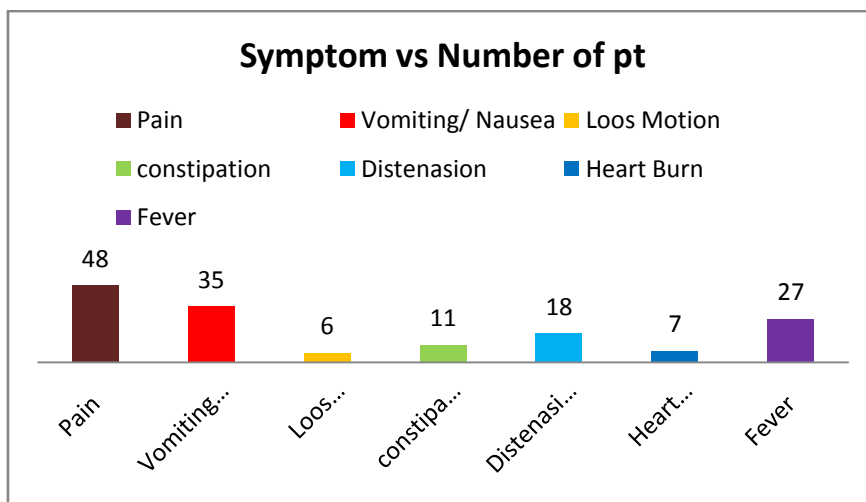


Table 4: Duration of onset of pain till the hospital admission

Sr No	Duration of Pain	Cases	Percentage
1	0 - 48 hours	25	50%
2	2 - 4 days	14	28%
3	4 - 6 days	6	12%
4	6 - 8 days	5	10%

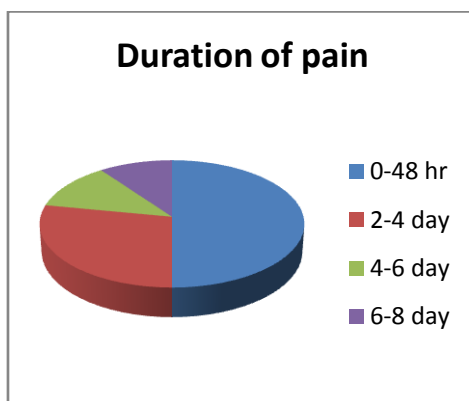


Table 5: Illustration of different treatment modalities by Laparoscopy in Acute Abdomen:

Sr No.	Operation	No. of cases	%
1.	Lap Appendectomy	23	46%
2.	Lap Cholecystectomy	12	24%
3.	Lap Mesenteric Lymph node, peritoneal & Omental Biopsy	3	6%
4.	Lap Closure of Du Perforation	1	2%
5.	Lap Drainage of Liver Abscess	1	2%
6.	Lap only Diagnostic Laparoscopy	3	6%
7.	Lap Therapeutic Adhesiolysis	3	6%
8.	Lap Drainage of free fluid & Lavage	4	8%

Table 6: Post-operative hospital stay among operative patient

Sr No.	Duration of stay (days)	No of cases	Percentage
1.	0 - 2	26	52%
2.	2 - 4	11	22%
3.	4 - 6	8	16%
4.	6 - 8	3	6%
5.	8 - 10	2	4%

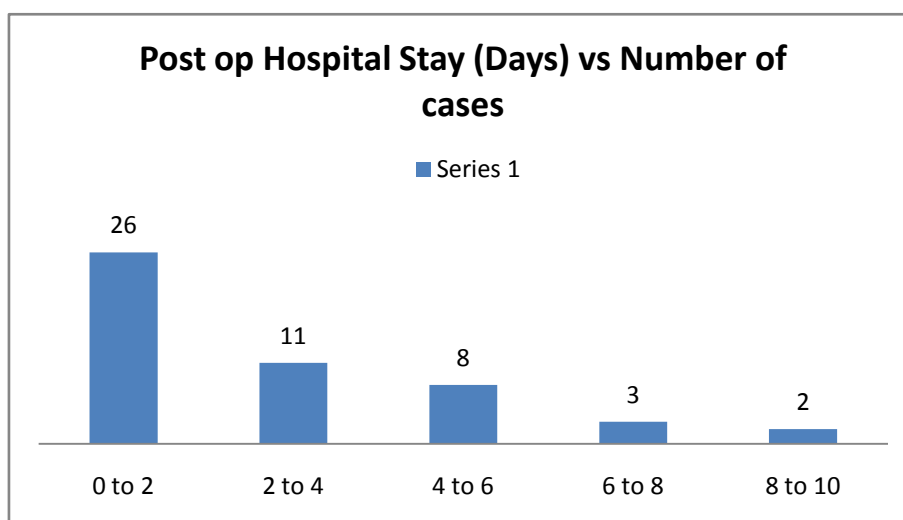


Table: 7 Variouspost operative Complication

Sr no	Complication	No of cases	Percentage
1	Port site infection	3	6%
2	Fever	5	10%
3	Vomiting	2	4%

FIGURES:

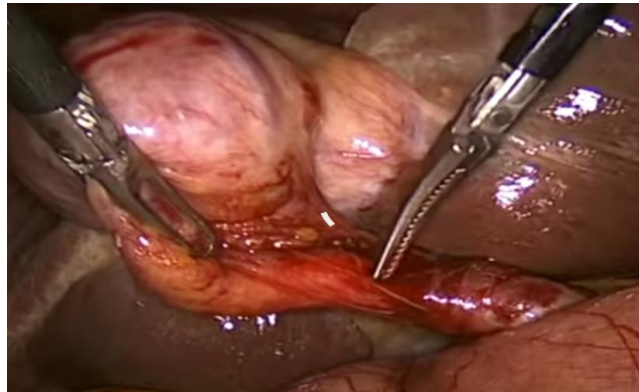


Fig 1. Lap Cholecystectomy



Fig 2. Lap. Adhesiolysis



Fig 3. Lap. Drainage of Intra-Abdominal Abscess

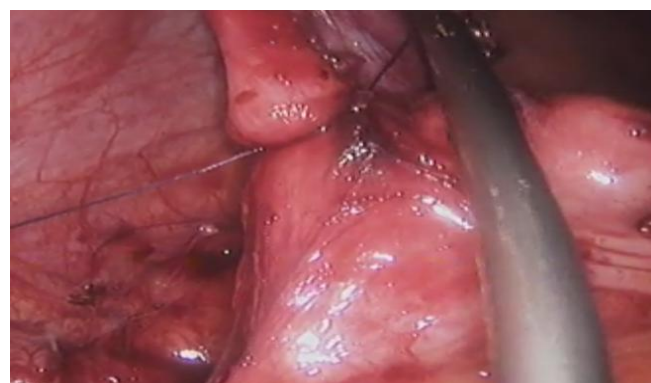


Fig 4. Lap. Appendectomy

Reference

- [1]. Jacobaeus HC: Uber die Moglichkeit, die Zystoskopie being, Untersuchungseroser Hoh lungen, Onzuwenden, Munch, med Wochenschr 57:2090-2092,190
- [2]. Kalk H, Bruhl W.:Leitfaden der "Laparoscopy and Gastroskopie : Stuttgart, Thieme, 1951,pp 1-150
- [3]. Laurel H, Hansson LE, Gunnarsson U, " Diagnostic pitfalls and accuracy of diagnosis in acute abdominal pain" Scand J Gastroenterol 2006;41(10):1126-31
- [4]. Glaser MH, Goldberg E: " acute abdominal pain" med clinic North Am 2006;90:481-503
- [5]. Eric C Poulin, Christopher M Schlachta, Joe Mamazza " early laparoscopy help to diagnose acute non specific abdominal pain" the Lancet, vol 355, issue 9207, P861-863, March 11, 2000.
- [6]. Camilleri M. " management of patients with chronic abdominal pain in clinical practice" NeurogastroenterolMotil 2006;18:499-506
- [7]. Paajanen H, Julkunen K, Waris H," Laparoscopy in chronic abdominal pain: A prospective nonrandomized long-term follow-up study. J Clinton Gastroenterol 2005;39(2):110-4
- [8]. Townsend CO, Sletten CD, Bruce BK, Rome JD, Luedtke CA, Hodgson JE, " Physical and emotional functioning of adult patients with chronic abdominal pain: Comparison with patients with chronic back pain" J Pain 2005;6:5-83
- [9]. McGarrity TJ, Peter's DJ, Thompson C, McGarrity SJ, " Outcome of patients with chronic abdominal pain referred to chronic pain" Clinic. Am J Gastroenterol 2000;95:1812-6
- [10]. Raheja SK, Mc Donald PJ, Taylor " non specific abdominal pain an expensive mystery" JR Soc med 1990;88:10-11
- [11]. Hawthorn IE, " abdominal pain as a cause of acute admissions to hospital" JR collSurgEdinb, 1992; 37:389-393
- [12]. Irvin TT " Abdominal pain: a surgical audit of 1190 emergency admissions" Br J Surg, 1989;76:1121-1125
- [13]. Ronnie AT, Tytherleigh MG, Theodoroupolou K, Farouk R: " A prospective audit of 300 young woman with an acute presentation of right iliac fossa pain" Ann R CollSurgEngl, 2006;88:140-3
- [14]. Goulash V, Willson PD: " Early laparoscopy as a routine procedure in the management of acute abdominal pain: A review of 1,320 patients. SurgEndosc. 2005;19(7):882-9
- [15]. Palanivelu C. " Diagnostic laparoscopy- Indications, tuberculosis and Adhesiolysis In: Art of laparoscopic surgery, textbook and atlas, 1st edition, vol 2, Jaypee publication;2005:152-177
- [16]. You S-Y, Chiu J-H, Loong CC, Wu C-W, Lui WY (1997) " Diagnostic laparoscopy: Indication and benefits" chin med J (Taiwan) 59:158-163
- [17]. Huckenberg TP, Mentula A, Leppaniemi V. Salonen, " laparoscopic versus open surgery for acute adhesive small bowel obstruction: A propensity score-matched analysis". Scandinavian J. Surg 2017;106(1):28-33
- [18]. Pomp A(1999) " Laparoscopy and acute Appendicitis " can J Surg 42:326-327
- [19]. Karvande Rajeev, Ranjeetkamble, ManojKharade, " A study of role of Diagnostic and therapeutic laparoscopy in chronic and recurrent abdominal pain" IntSurg J. 2016 Aug;3(3):1336-1340
- [20]. McGarrity TJ, Peter's DJ, Thompson C, McGarrity SJ, " Outcome of patients with chronic abdominal pain referred to chronic pain" Clinic. Am J Gastroenterol 2000;95:1812-6
- [21]. V. Goulash, P. D. Willson " Early laparoscopy as a routine procedure in the management of acute abdominal pain" surg. Endosc (2005)19:882-885
- [22]. AnandThawait, SankalpDwivedi, Manisha Bhatt, Karan Bakhshish, Amit Mittal "Role of early Laparoscopy in Diagnosis of Acute Abdominal pain" Int. J. of contemporary medical Research,vol4, issue 7, July 2017:77-83.
- [23]. Velpen GCV, Shimi SM, Cuschieri A, "Diagnostic Yield and Management benefits of Laparoscopy: A prospective audit, Gut, 1994;35:1617-21
- [24]. Yehia MA, Sharkawy MA, Saleh AM, Osman Gm. " Role of Laparoscopy in acute Abdomen" ZUMJ 2013;19:361-8
- [25]. Ilce Z, Yildiz T, Isleyen M, "The role of Laparoscopy in suspicious abdomen pain in children" pak J. med sci, 2013;29:1042-5
- [26]. Bareeq RA, Dayna KB, "Diagnostic Laparoscopy in Acute Abdominal Pain: 5- year retrospective series" Bahrain medical Bulletin 2007;29:1-5
- [27]. Reiertsen O, Rosseland AR, Hoivik B, Solheim K, " Laparoscopy in patients admitted for acute abdominal pain " ActachirurgicaScandinavica (01) Jan 1985,151(6):521-524
- [28]. RS Chung, JJ Diaz, V Chari " Efficacy of routine laparoscopy for the acute abdomen" surgical endoscopy 12(3),219-222, 1998.
- [29]. Erdogan M. Sozuer, Abdulkadir, Mehmet Ulusal, Erdalkayhan and ZekiYilmaz " Laparoscopy for diagnosis and treatment of acute abdominal pain" Journal of laparoendoscopic and advanced technique " 7 July 2004;vol10, no 4.
- [30]. Taylor EW, Kennedy CA, Dunhan RH, Bloch JH " Diagnostic laparoscopy in women with acute abdominal pain" surgical Laparoscopy and endoscopy 1 April 1995;5(2):125-128
- [31]. Po- chu Lee, MD, Chiao Lo, MD.Chien-Ming Wu, MD, et al " laparoscopy decreases the laparotomy rate in dynamically stable patients with blunt abdominal trauma" SAGE Journal Jan 28, 2013.
- [32]. Wood and RAB, Cuschieri" A Laparoscopy for acute abdominal pain. Br J surg. 1997;60:900-2
- [33]. T. E. Udwardia" Diagnostic laparoscopy " SurgEndosc (2004)18:6-10

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