Original Research Article

The role of laparoscopy in chronic abdominal pain

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Abstract

Background-The objective of the study were to study the clinical spectrum of patients of chronic abdominal pain, role of laparoscopy in diagnosis of such patients and to study the impact of diagnostic laparoscopy on the management of chronic abdominal pain. **Methodology**- This study was conducted as a prospective interventional study on all patients of chronic abdominal pain admitted in General Surgery department of tertiary care center on patients with chronic abdominal pain with uncertain diagnosis. Laparoscopy was conducted in all the cases and diagnosis based on laparoscopy findings, histopathological examination or peritoneal fluid cytological findings were noted, treatment and its impact on outcome was studied. **Results**-Tuberculosis was the diagnosis in 45 (62.5%) cases whereas in 22 (30.6%) cases, chronic abdominal pain was secondary to malignancy and in 5 (6.9%) cases couldn't make any diagnosis. Lymph node biopsy, histopathology, ascitic analysis were helpful in making diagnosis and significantly associated with final diagnosis. CA-125 was observed to be significantly associated with malignancy (31.8%) ($p<0.05$). Unnecessary surgical procedure and laparotomy could be avoided in cases with malignancy and in those cases where diagnosis couldn't be made and these cases were referred to higher center for further management. **Conclusion**- Diagnostic laparoscopy is safe and minimally invasive method which not only provide the diagnostic benefit but is helpful in management of patients with chronic abdominal pain. Diagnostic laparoscopy can reduce the requirement of unnecessary laparotomies and its adverse effects. This procedure is effective in definitive diagnosis of patients with chronic abdominal pain. Also it is helpful in obtaining pathological specimen for further analysis. This method is effective in diagnosis of tuberculosis and differentiating tubercular etiology from malignant causes.

Keywords- Diagnostic laparoscopy, chronic abdominal pain, tuberculosis, malignancy, Ca 125.

Introduction

Abdominal pain is one of the most common complaint encountered in surgical practice which usually indicate underlying abdominal pathology[1]. Chronic abdominal pain has been defined as continuous or intermittent pain or discomfort in abdomen, lasting for more than 3 months[2]. Chronic abdominal pain may be due pathology in any system such as gastrointestinal, genitourinary, gynecological etc[2]. The causes may be organic or functional. Most common organic conditions associated with chronic abdominal pain include postoperative internal adhesions, abdominal tuberculosis, appendicular pathology, mesenteric lymphadenopathy, biliary etiology and hernia. Functional causes of chronic abdominal pain include dyspepsia, irritable bowel disease, and motility disorders[3,4]. Chronic abdominal pain remains the fourth leading cause for seeking care in surgery and attribute to 13% of all surgical admissions. Though, in majority of cases, routine investigations such as abdominal X ray, Ultrasonography, CECT abdomen, MRI and endoscopy are helpful in establishing accurate diagnosis, but in approximately 40% cases, despite of extensive testing, the etiology remain unknown[5,6]. In such cases, exploratory laparotomy was the procedure of choice previously, but it was associated with certain complications[7]. Later, with the introduction of laparoscopic surgeries, a revolution in the field of surgery was observed. Laparoscopy can be done for both diagnostic as well as therapeutic purposes.

The advantages of laparoscopic surgery include minimally invasive nature, early return to normal activities, good cosmetic results and lesser complications in terms of patients' morbidity and suffering[8,9]. Diagnostic laparoscopy enables direct visualization of abdomen and its organs; facilitates in taking biopsy specimen (when needed) as well as helps in obtaining the specimen or aspirates for cultures[10]. This procedure can be used to evaluate various intra-abdominal pathologies such as abdominal tuberculosis, liver diseases (discrete masses, portal hypertension), intra-abdominal malignancies, congenital anomalies etc[11].

Diagnostic laparoscopy improves patient outcome by avoiding expensive, time consuming and potentially more complicated surgical procedure. Thus, this procedure also reduce the overall treatment cost. Despite the advancement in medical and surgical techniques, role of diagnostic laparoscopy is still debated in evaluation of chronic abdominal pain by some authors[12]. However, the success of diagnostic laparoscopy largely depend upon skill, training and expertise of surgeon[13,14]. With the above background, this study was conducted at tertiary care center to determine the role of diagnostic laparoscopy in the diagnosis of chronic abdominal pain. The study also aimed to assess its impact on the management of chronic abdominal disorders with the broad aim of improving the outcome of patients of chronic abdominal pain in terms of management and financial burden. The objective of the study were to study the clinical spectrum of patients of chronic abdominal pain, role of laparoscopy in diagnosis of such patients and to study the impact of diagnostic laparoscopy on the management of chronic abdominal pain.

Materials and methods

The present study was conducted as a prospective interventional study on all patients of chronic abdominal pain admitted in General Surgery department, People's hospital associated with PCMS and RC, Bhopal (M.P.) during the study period of 2 years i.e. from 1st September 2019 to 30th August 2021. All the patients presenting with chronic abdominal pain with uncertain diagnosis after laboratory and non

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invasive investigations and imaging techniques involving USG, CT scan etc., with unknown etiology for ascites or having recurrent subacute intestinal obstruction were included. However, patient having acute bowel obstruction and perforated viscus; contraindications for pneumoperitoneum or general anesthesia; with non-correctable coagulopathies; with abdominal wall infection; with chronic abdominal pain not willing for diagnostic laparoscopy; with irritable bowel syndrome and with gynecological causes of chronic abdominal pain like PID, ovarian mass etc. were excluded from the study.

Consent

Written consent was obtained from the relatives of patients after explaining them the nature and purpose of the study. They were assured that confidentiality would be strictly maintained. The option to withdraw from the study was always open.

Methodology

After obtaining ethical clearance from Institute's ethical Committee, all the patients presenting at the study area during the study period with chronic abdominal pain, fulfilling the inclusion and exclusion criteria were enrolled and written consent was obtained. Data regarding sociodemographic profile and detailed history regarding abdominal pain, its duration, onset, character, site etc. along with associated symptoms if any were noted and documented. All the patients were then subjected to detailed physical and systemic examination. All cases were evaluated preoperatively with ultrasonography scan whole abdomen, erect abdominal X ray skiagram, CT scan, MRI and routine blood investigation and then diagnostic laparoscopy was done if diagnosis was uncertain.

Preoperatively, patients were kept nil orally 10 hours before the procedure. Foley's catheter was used for catheterization and antibiotics were given pre-operatively one hour before surgery.

Operative procedure

Observation chart

- Patient were placed supine on the OT table with 10 to 20 degree head down position.
- All the surgeries were done under general anesthesia
- A site of entry at superior and inferior border of the umbilical ring was chosen andstab incision was made over the site.
- With the dominant hand grasping the shaft of veress needle like a dart it was gently passed into the incision- either at a 45 degree caudal angle to the abdominal wall orperpendicular to abdominal wall in markedly obese patients.
- As the needle entered the peritoneal cavity, a distinct click was heard as the blunt tip portion of veress needle springs forward into the peritoneal cavity.
- Pneumoperitoneum using carbon dioxide was created and intraabdominal pressurewas maintained at 10-12 mmHg.
- A 10 mm laparoscope 0 or 30 degree attached to camera unit was introduced into the peritoneal cavity through umbilical trocar site using a 10/11mm trocar sleeve.
- Depending on the area to be examined, one or two additional 5mm trocars in eachupper quadrant was placed.
- A detailed examination of upper and lower abdomen was done using grasping and Maryland forcep and tissue biopsy was taken by biopsy forcep when needed.
- Abdominal lavage with 500ml of saline to obtain fluid for cytologic investigationwas also done when needed.

Diagnosis based on laparoscopy findings, histopathological examination or peritoneal fluid cytological findings were noted, treatment and its impact on outcome was studied.

Follow up

Patients were followed up periodically to assess the improvement in pain and development of any complications.

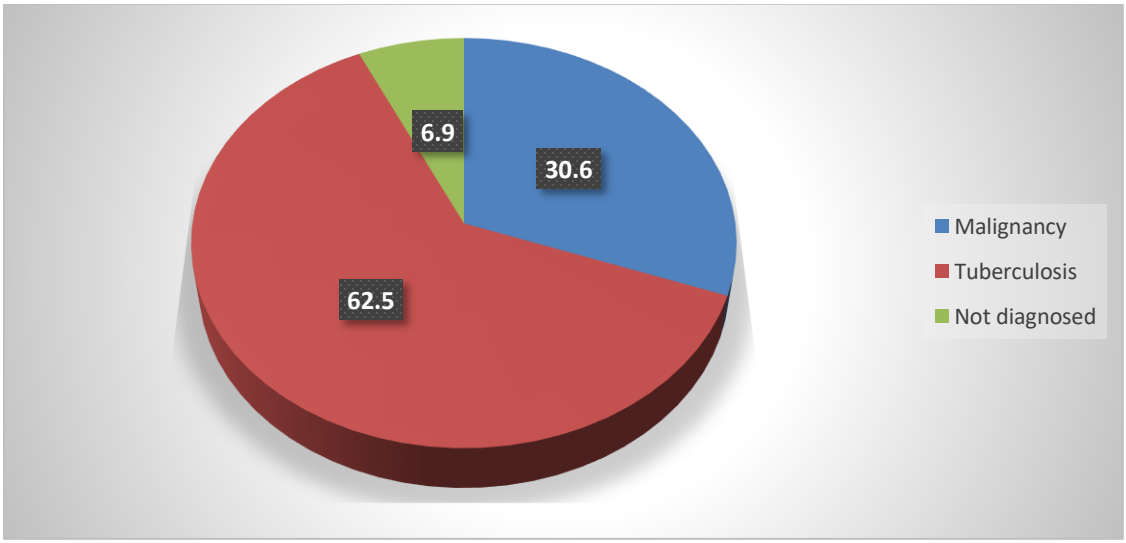

Fig.1: Distribution according to diagnosis

Tuberculosis was the diagnosis in 45 (62.5%) cases whereas in 22 (30.6%) cases, chronic abdominal pain was secondary to malignancy and in 5 (6.9%) cases couldn't make any diagnosis.

Table 1: Association of diagnosis with baseline variables

Baseline variables		Diagnosis			P value
		TB (n=45)	Malignancy(n=22)	Not diagnosed (n=5)	
Age (years)	≤ 20	13 (28.9)	0 (0)	1 (20.0)	0.001
	21 – 30	14 (31.1)	0 (0)	1 (20.0)	
	31 – 40	9 (20.0)	5 (22.7)	0 (0)	
	41 – 50	5 (11.1)	4 (18.2)	2 (40.0)	
	51 – 60	4 (8.9)	3 (13.6)	0 (0)	
	61 – 70	0 (0)	6 (27.3)	0 (0)	
	>70	0 (0)	4 (18.2)	1 (20.0)	
	Mean	29.93±12.82	56.73± 14.02	42.40± 25.16	

Gender	Male	19 (42.2)	12 (54.5)	3 (60.0)	0.535
	Female	26 (57.8)	10 (45.5)	2 (40.0)	
Clinical features	Abdominal pain	24 (53.3)	14 (63.6)	4 (80.0)	0.43
	Anorexia	25 (55.6)	7 (31.8)	2 (40.0)	0.17
	Vomiting	10 (22.2)	6 (27.3)	0 (0)	0.41
	Fever	15 (33.3)	7 (31.8)	1 (20.0)	0.83
	Loss of weight	20 (44.4)	14 (63.6)	3 (60.0)	0.31
	Distendedabdomen	18 (40.0)	15 (68.2)	1 (20.0)	**0.043**
	Lump in abdomen	18 (40.0)	11 (50.0)	1 (20.0)	0.43
	Tenderness	23 (51.1)	7 (31.8)	1 (20.0)	0.18
	Doughy abdomen	16 (35.6)	0 (0)	1 (20.0)	**0.006**
	Free fluid	28 (62.2)	16 (72.7)	4 (80.0)	0.55

Table 2: Association of diagnosis with investigations

Investigations		Diagnosis			P value
		TB (n=45)	Malignancy(n=22)	Not diagnosed (n=5)	
Lymphnode biopsy	Malignant	0 (0)	12 (54.5)	0 (0)	**0.001**
	Tubercular	35 (77.8)	0 (0)	0 (0)	
	Negativefinding	10 (22.2)	10 (45.5)	5 (100.0)	
Histopathological examination of intestine	Malignantcells	0 (0)	15 (68.2)	0 (0)	**0.001**
	Tuberculercells	40 (88.9)	0 (0)	0 (0)	
	Negativefinding	5 (11.1)	7 (31.8)	5 (100.0)	
Omental biopsy	Malignantcells	0 (0)	10 (45.5)	0 (0)	**0.001**
	Tuberculercells	30 (66.7)	0 (0)	0 (0)	
	Negativefinding	15 (33.3)	12 (54.5)	5 (100.0)	
Ascitic routine microscopy	Malignantcells	0 (0)	10 (45.5)	0 (0)	**0.001**
	Tuberculercells	40 (88.9)	0 (0)	0 (0)	
	Negativefinding	5 (11.1)	12 (54.5)	5 (100.0)	
Ascitic cytology	Absent	43 (95.6)	19 (86.4)	5 (100.0)	0.085
	Present	2 (4.4)	3 (13.6)	0 (0)	
Sputum AFB		1 (2.2)	0 (0)	0 (0)	**0.021**
Ascitic AFB		2 (4.4)	0 (0)	0 (0)	0.539
Ascitic CS		0 (0)	0 (0)	0 (0)	NA
Ascitic ADA		10 (22.2)	2 (9.1)	0 (0)	0.234
CA 125		0 (0)	7 (31.8)	0 (0)	**0.001**

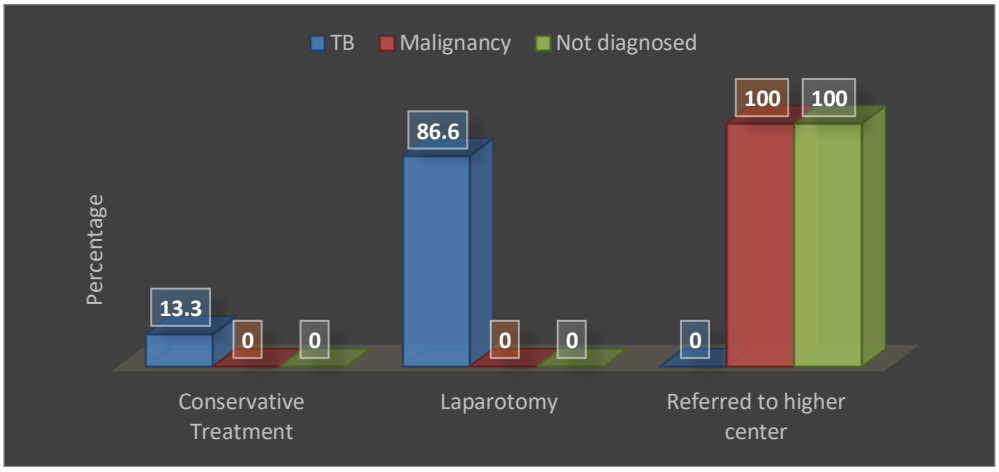

Fig. 2: Management in patients with different Diagnosis

Results

Mean age of patients with chronic abdominal pain was 38.99 ± 18.61 years. About 52.8% cases with chronic abdominal pain were females whereas 47.2% males presented with chronic abdominal pain. Thus, slight female preponderance was observed with male: female ratio of 0.89:1. Mean age of patients with tuberculosis was 29.93± 12.82 years whereas that of cases with malignancy was 56.73± 14.02 years. Majority of cases with chronic abdominal pain with underlying tuberculosis belonged to younger age group and higher proportion of cases with malignancy belonged to elderly age group ($p<0.05$). Abdominal distension was significantly associated with malignancy whereas doughy abdomen was significantly associated with tuberculosis ($p<0.05$)

Lymph node biopsy showed malignant cells in 54.5% cases and tubercular cells in 77.8% cases with malignancy and tuberculosis respectively. Histopathology revealed tubercular cells in 88.9% cases with tuberculosis and malignant cells in 68.2% cases with malignancy and 6.9% cases found with no positive finding oh HP. Omental biopsy revealed malignant cells in 45.5% cases of malignancy and 54.5% cases with malignancy had no malignant cells. Similarly, in cases with tuberculosis, 66.7% cases had tubercular cells and 33.3% cases

have no tubercular cells. The observed association of lymph node biopsy, HP examination, omental biopsy and ascitic routine between tuberculosis and malignancy cases was statistically significant($p<0.05$). Out of various investigations, only CA-125 was observed to be significantly associated with malignancy (31.8%) ($p<0.05$). Thus, only CA-125 was helpful in differentiating tuberculosis from malignancy.Unnecessary surgical procedure and laparotomy could be avoided in cases with malignancy and in those cases where diagnosis couldn't be made and these cases were referred to higher center for further management.

Statistical analysis

The collected data was summarized by using frequency, percentage, mean & S.D. To compare the qualitative outcome measures Chi-square test or Fisher's exact test was used. To compare the quantitative outcome measures Independent t test was used. If data was not following normal distribution, Mann Whitney U test was used. SPSS version 22 software was used to analyse the collected data. p value of <0.05 was considered to be statistically significant.

Discussion

Chronic abdominal pain represents one of the most common cause for admissions and referrals in the surgical department attributing to approximately 13% of all the admissions[7]. In approximately half of the cases, etiology may be determined, however, in few cases underlying pathology could not be determined despite extensive testing[5,6]. Such cases are usually managed with the help of exploratory laparotomy but introduction laparoscopic surgeries revolutionized the field of surgery as these surgeries have good acceptability and lesser complications[8,9]. We conducted this study to determine the role of diagnostic laparoscopy in the diagnosis of chronic abdominal pain and improving the outcome of patients of chronic abdominal pain in terms of management and financial burden.

We identified tubercular etiology as the predominant cause of chronic abdominal (62.5%) followed by malignancy. Similarly Chapekhar et al documented abdominal tuberculosis as the most common cause of chronic abdominal pain in 13 (43.3%) patients[15]. Gupta et al also observed Koch's abdomen as the most common finding during the diagnostic laparoscopy while assessing the patients with chronic abdominal pain[11]. Hussain et al also observed abdominal TB (18%) and mesenteric lymphadenopathy (16%) in patients with chronic abdominal pain on diagnostic laparoscopy[16].

The gold standard test for detection of tuberculosis of peritoneum or abdomen as well as for assessment of malignancy is histopathological examination. Diagnostic laparoscopy was utilized for obtaining the biopsy samples from lymphnode, intestine and omentum. Apart from this, ascitic fluid was obtained and subjected to routine and cytological examination. The diagnostic laparoscopy was also utilized to obtain ascitic fluid which was subjected to routine cytological examination along with AFB assessment.

Lymphnode enlargement can be the feature of both tubercular and malignant etiology. Lymphnode biopsy was helpful in identification of 54.5% malignant and 77.8% tubercular cases whereas histopathological examination of intestine was effective in diagnosis of malignant and tubercular cases in 68.2% and 88.9% cases respectively. Omental biopsy was useful in 45.5% malignant and 66.7% tubercular cases. Diagnostic laparoscopy was on no yield in 6.9% cases with lymph node, HP intestine, omental biopsy and ascitic routine microscopy and cytology show no positivefindings.

Safaror et al concluded that histopathological examination is helpful in establishing the definitive diagnosis of tubercular peritonitis and rule out malignant pathology with the minimal risk of complications and minimally invasive access to the peritoneum[17]. Naniwadekar et al documented yield of diagnostic laparoscopy in 96% cases and diagnostic laparoscopy was utilized as therapeutic procedure in 26% cases whereas in 4% cases, laparotomy was required[10]. Similar to present study, Mishra et al documented that laparoscopy was useful in confirming the clinical diagnosis in 46.875% of cases, whereas it was effective in definitive diagnosis in 34.375% with no established diagnosis. They required the need for laparotomy in only 3% cases[18]. Nar et al concluded that diagnostic laparoscopy is helpful in providing tissue diagnosis and is an effective method for achieving final diagnosis[19].

The impact of diagnostic laparoscopy could be assessed in terms of improvement of outcome and decreased morbidity as unnecessary laparotomy could be avoided. As tuberculosis require urgent attention, anti-tubercular treatment started in all tubercular cases and laparotomy were done in those tubercular cases which were complicated. About 6 of tubercular patients were also found with inflamed appendix and appendectomy was also done at the same sitting, but all the cases of malignancy and those cases with no definitive diagnosis referred to higher center for further management.

Muntean et al[20] in their study could avoid unnecessary laparotomy in 36.4% cases whereas Hemming et al[21] highlighted the role of staging of malignancies using diagnostic laparoscopy which can be helpful in preventing upto 36% laparotomies. Gupta et al documented that diagnostic laparoscopy not only allow the diagnosis but at the same time allow the treating surgeon to treat the pathology and reduce the requirement of unwanted laparotomy as well as its associatedside effects[11].

Conclusion

Diagnostic laparoscopy is safe and minimally invasive method which not only providethe diagnostic benefit but is helpful in management of patients with chronic abdominal pain. Being the minimally invasive surgery, it is cost effective approach as the procedure allow early post-operative mobilization, reduce length of hospital stay and provide better cosmetic results.

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