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DIAGNOSTIC LAPAROSCOPY IN CHRONIC AND RECURRENT ABDOMINAL PAIN MANAGEMENT

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Abstract
Background: Chronic abdominal pain is a common condition encountered by many surgeons in their clinic every day. Despite of availability of different tests in maximum cases the reason behind the pain remains unknown. Diagnostic Laparoscopy is a safe technique that can identify the cause of the pain without using any invasive method. In the present study, the use of diagnostic laparoscopy in the diagnosis and management of chronic and recurrent abdominal pain of unknown origin was investigated.
Material and Methods: All the patients who visited the outpatient department with chronic abdominal pain were included in this study. All the demographic parameters were included and after careful investigation diagnostic laparoscopy were conducted in all these patients. The postoperative outcomes were also recorded in all the patients.
Result: Total of 51 patients was included in this study. Among these patients 23 patients were male and 28 patients were female. Maximum of the patients were in the 31-40 years of age group. The most common pathology for chronic abdominal pain was chronic appendicitis (n=9, 18%) followed by Koch's abdomen and adhesions (n=8, 16%). There were 4 cases of Carcinoma of the gall bladder and 3 cases of metastatic disease with dissemination in the peritoneal cavity and ascitis. 3 cases of liver cirrhosis and 3 cases of endometriosis were also detected. 2 cases of ovarian cysts which were missed by USG were detected correctly by laparoscopy. There were two unusual cases, one of chronic ectopic pregnancy and another of Crohn's disease. All the above findings were confirmed by direct visualizing (86%), or by biopsy (74%) or by fluid analysis. There were no long term complications in our study.
Conclusion: The present study concluded that laparoscopy is a safe and effective method for diagnosis of chronic abdominal pain.
Keywords: Chronic abdominal pain, diagnostic laparoscopy, recurrent abdominal pain

Introduction:

Abdominal pain is one of the common presentations in surgical practices. It is a commonly found complication faced by many of the surgeons in their clinic. Despite of availability of different tests in maximum cases the reason behind the pain remains unknown and results in poor quality of life. Intestinal adhesions are the most common organic condition associated with abdominal pain. In patients with past history of abdominal operations and even in cases of abdominal tuberculosis this is commonly found (1).

The basic diagnosis is mainly made by clinical examination alone or in critical cases, ultrasonography or a computed tomography scan is recommended. However, studies have shown that in approximately 40% of the cases the etiology behind the recurrent abdominal pain remains undiagnosed (2). These undiagnosed abdominal pain cases are often referred to as the unexplained chronic abdominal pain or commonly as UCAP (3). Therefore, it is a great challenge for a physician to detect accurately the correct etiology of the chronic abdominal pain and thus decide the proper treatment regimen.

Laparoscopy recently been used in many studies for visualization of the peritoneal cavity and thus has been proved to be a useful technique in diagnosing the exact cause of the chronic abdominal pain. In addition to the visualization, this technique is also useful in fluid analysis and in targeted biopsy studies (2–5). In a maximum of the patients with chronic and recurrent abdominal pain correctly diagnostic laparoscopy can identify the etiology and can help in improvement of the condition.

Diagnostic Laparoscopy is a safe technique that can identify the cause of the pain without using any invasive method. In the present study, the use of diagnostic laparoscopy in the diagnosis and management of chronic and recurrent abdominal pain of unknown origin was investigated.

Material and Method

This prospective study was conducted in patients with chronic abdominal pain and who were referred to or admitted to the Department of General Surgery, Baba Raghav Das

Medical College Gorakhpur from November 2015 to October 2016.

Inclusion criteria

- Patients with intermittent or continuous abdominal pain of unclear etiology for more than three months were included.
- Patients with abdominal pain in whom the primary investigation was inconclusive

Exclusion criteria

- Patients with known medical causes of abdominal pain
- Patients with a cardiovascular disorder, uncorrectable coagulopathy, abdominal malignancy, and acute abdominal pain were excluded
- Pregnant patients were also excluded

The patient who was included in this study were thoroughly evaluated and an abdominal examination was conducted. Physical examination including pulse rate, blood pressure, temperature, and respiratory rate was checked. Systemic examination of each system such as the cardiovascular system, respiratory system, gastrointestinal and hepato-biliary system, and relevant central nervous system was done.

The gynecological examination was done in all female patients. Routine blood examinations including complete blood count, bleeding profile, urine routine and microscopy, renal function test were conducted. Radiological examinations including X-RAY of chest and abdomen and USG of the whole abdomen were conducted. CT scan or MRI was also done whenever it was necessary.

Operative technique

The operative procedure was completely performed under the general anesthesia. The common site for the insertion was the infra-umbilical midline. The Veress needle was inserted through a stab incision in the infra-umbilical region, with the patient in 5° Trendelenberg position. As the 10mm trocar for the telescope would be inserted at the same spot a 1 cm incision was made from the start. The Veress needle was held like a dart at the shaft (not the hub) between the thumb and the index finger, and cautions were taken so that no deep or sudden penetration can happen.

The left hand elevated the abdominal wall and the Veress needle was advanced through the various layers of the abdominal wall. The needle was introduced almost perpendicular to the abdominal wall with a slight angle towards the pelvis. After the pneumoperitoneum was established successfully the trocar was inserted with the patient maintained in a Trendelenberg position of 15°. The trocar was inserted towards the pelvis at an angle of about 80° to the anterior abdominal wall. The sharp trocar was partially withdrawn into the sheath and the trocar sheath gently advanced 1 cm deeper to ensure that the entire diameter of the tapered trocar was within the peritoneum.

Laparoscopic evaluation of the peritoneal cavity

As soon as the trocar was removed the gas flow was connected to the sheath, the telescope introduced and the entire abdominal cavity carefully examined. Initially, the abdominal cavity was checked for the presence of any iatrogenic injury and then for other pathology.

Methodical inspection of all the quadrants of the abdomen starting from the pelvis was done. Target FNAC and aspiration of the fluid from the peritoneal cavity was done as and when feasible.

The telescope is withdrawn and all the gas from the peritoneal cavity made to leak out through the sheath by disclosing the valve. A sheath was removed, skin stitched with thread, caring and dressing as done and patient shifted to ward.

Postoperative care

After the procedure was over the patient was monitored for at least next 24 hours by charting pulse rate, blood pressure, input-output records, for subcutaneous emphysema, any sign of hemorrhage and for any sign of acute abdomen. A patient was reevaluated for port site metastasis on subsequent follow up after 6 months.

Result and observations

Total of 51 patients was included in this study. Among these patients 23 patients were male and 28 patients were female. Maximum of the patients were in the 31-40 years of age group. The number of females in the younger age group was also significantly higher. 64% of patients had inflammatory pathology, 24% had neoplastic pathology and 2% had miscellaneous pathology. The most common pathology for chronic abdominal pain was chronic appendicitis (n=9, 18%) followed by Koch's abdomen and adhesions (n=8, 16%). There were 4 cases of Carcinoma of the gall bladder and 3 cases of metastatic disease with dissemination in the peritoneal cavity and ascitis. 3 cases of liver cirrhosis and 3 cases of endometriosis were also detected. 2 cases of ovarian cysts which were missed by USG were detected correctly by laparoscopy. There were two unusual cases, one of chronic ectopic pregnancy and another of Crohn's disease. In 5 cases no etiology for the abdominal pain can be detected even after the laparoscopic examination, and in 2 cases diagnosis could not be made even after histopathological examination. All the above findings were confirmed either by direct visualizing (86%), by biopsy (74%) or by fluid analysis.

Out of 22 cases in which ascitis were present, USG was able to diagnose only 16 cases. However diagnostic laparoscopy was able to diagnose ascitis in cases which were missed even by USG. Laparoscopy was successfully used as a therapeutic procedure in 44% of patients.

There were only 2 cases of subcutaneous emphysema showing a low complication rate when compared to exploratory laparotomy. The subcutaneous emphysema was self-limiting. There were no long term complications in our study.

Table 1: Age and sex wise distribution of cases

Age Group	*Male*		*Female*	
10-20	*1*	*2%*	*1*	*2%*
21-30	*5*	*10%*	*9*	*18%*
31-40	*6*	*12%*	*11*	*22%*
41-50	*6*	*12%*	*7*	*14%*
51-60	*2*	*4%*	-	-
>60	*3*	*6%*	_	-

Table 2: Distribution of cases according to pathology

Pathology		*Percentage*
Inflammatory	***32***	***64%***
Neoplastic	***12***	***24%***
Normal	*5*	***10%***
Others	***1***	***2%***
Total	*50*	***100%***

Table 3: Distribution of cases according to incidence of disease

Pathology	*N*	*Percentage*
Chronic appendicitis	*9*	*18%*
Koch's abdomen	*8*	*16%*
Adhesions	*8*	*16%*
Ca GB	*4*	*8%*
Metastatic disease	*3*	*6%*
Cirrhosis	*3*	*6%*
Endometriosis	*3*	*6%*
Ovarian cysts	*2*	*4%*
Genitourinary TB	*2*	*4%*
Salpingitis	*1*	*2%*
Chronic ectopic pregnancy	*1*	*2%*
Crohn's disease	*1*	*2%*
Undiagnosed (normal study)	*5*	*10%*
Total	*50*	*100%*

Table 4: Diagnosis confirmed by various modalities

Modality	*N*	*Percentage*
Direct visualization	*43*	*86%*
Biopsy	37	*74%*
Fluid analysis	*5*	*10%*
Inconclusive	*7*	*14%*

Table 5: Therapeutic procedures done at same time as diagnostic laparoscopy

Diagnosis	*Procedure*	*Number*
Appendicitis	*Appendectomies*	*9*
Adhesions	*Adhesiolysis*	*8*
Endometriosis	*Fulguration*	*3*
Ovarian cysts	*Ovarian cystectomies*	*2*

Table 6: Comparison of detection of ascitis by radiology & laparoscopy

Method* of *Detection of Ascitis	***n***	***Percentage***
Cases diagnosed by USG	*16*	*72.2%*
Cases diagnosed by laparoscopy	*22*	*100%*

Table 7: Complications

Complications	*N*	*Percentage*
Solid organ injury	*0*	*0*
Subcutaneous emphysema	*2*	4
Vascular injury 1 *Hemorrhage*	*0*	*0*
Port site metastasis	*0*	*0*
Gas embolism	*0*	*0*
Infections	*0*	*0*

Discussion

Chronic abdominal pain is a common medical concern faced by all medical specialists. Despite the advancement in the imaging technologies and other clinical examinations, the diagnosis and management of chronic abdominal pain become inconclusive. In addition to providing a detailed visualization of the peritoneal cavity diagnostic laparoscopy also proves to be useful in the histological diagnosis of the intra abdominal pathological conditions.

This prospective study was conducted in the Department of General Surgery in Baba Raghav Das Medical College, Gorakhpur for a period of one year. The total of 51 patients with chronic abdominal pain of unknown etiology was included in this study. The maximum number of patients in this study was in the 31-40 years of age group. Most of the patients in this study were female (n=28) compared with the male (n=23), thus showing a female predominance. In another study, female preponderance was reported by ***Karvande et al (2016)*** (4).

Previous studies have shown that diagnostic laparoscopy can correctly determine the underlying etiology of chronic abdominal pain. ***Prasad et al*** (2017) have reported that diagnostic laparoscopy was able to establish the diagnosis in 92% cases. In this study total, 50 patients were included who had chronic abdominal pain. Among these patients laparoscopy correctly diagnosed the etiology in 42 patients (6). ***Arya and Gaur (2004)*** reported that laparoscopy was

able to diagnose the cause of abdominal pain in 90% of the cases (7).

Salky BA and Edye MB performed a study in 387 consecutive patients who underwent laparoscopy because of abdominal pain. In a chronic abdominal pain group of 265 patients, the etiology was established laparoscopically in 201 cases (76%). A definitive therapeutic laparoscopic procedure was performed in 128 patients (48%) (8). Similar to the above finding in our study a diagnosis was established in 86% cases and definitive therapeutic measures which included appendectomies, adhesiolysis, ovarian cystectomies, and fulguration was done in 44% cases.

In maximum cases, the underlying cause for the chronic abdominal pain was because of appendicitis (18%), Koch's abdomen (16%) and adhesions (16%). We were able to diagnose and stage neoplasms in all cases. A definitive therapeutic laparoscopic procedure was performed in 44% of the cases in the same sitting. In 74% cases, a positive histopathological correlation to support the diagnosis was also present.

Acute over chronic appendicitis is a very common pathology missed by normal radiological investigations like USG, and diagnosis of this pathology is very difficult. Studies have shown that laparoscopy is very sensitive in diagnosing both chronic and acute appendicitis.

Diagnostic laparoscopy can also be performed in these cases as a therapeutic procedure as well (9).

Abdominal tuberculosis was another pathology which was common in patients with chronic abdominal pain. Previous studies have shown that in India the prevalence of abdominal tuberculosis is higher. The most common finding of abdominal tuberculosis is abdominal pain and rapid weight loss. In a maximum of the cases, this nonspecific feature of abdominal tuberculosis made this disease hard to detect (10).

In a study by ***Arya et al***, a higher incidence of peritoneal tuberculosis was reported (7). In another study conducted by ***Krishnan et al (2008)*** it was shown that in patients with abdominal tuberculosis without any other complication, diagnostic laparoscopy can prove to be a useful technique that aids to establish a histological diagnosis (11).

In the present study, a total of 8 cases of abdominal tuberculosis were reported where ascitis was detected either clinically or on USG. The diagnosis was confirmed by the gross appearance on laparoscopy and peritoneal biopsies.

Koch's disease is another health problem that is commonly found in India, however, the diagnosis of this problem is difficult. Because of this, in a maximum of the cases these patients are treated empirically. Diagnostic laparoscopy can detect a nodule which is specific for Koch's disease and then a biopsy can be done to confirm the detection. Similar to our study ***Rathod et al*** have reported the presence of Koch's diseases among 11.4% of the patients with chronic abdominal pain (9).

Paajanen H et al performed diagnostic laparoscopy in 79 patients with adhesiolysis in 61 (85%) cases. Intra-abdominal adhesions were found in 61 patients (85%) in the laparoscopy, gynecologic disorders in 4, chronic appendicitis in 1, and no abnormality in 6 patients (2). In our study adhesions were a cause of SAIO in 3 cases and adhesions in previous surgical scar mark were present in 2 cases. In all 8 patients underwent adhesiolysis and were relieved of pain as noticed in subsequent follow-ups.

Diagnostic laparoscopy is helpful in making a visual diagnosis along with the aid of biopsy for cases of unknown ascitis. ***Carlo Vargas et al*** did a retrospective study of 129 patients who underwent diagnostic laparoscopy for unknown ascitis. Diagnosis was made in 82% of cases, 29 patients(40%) had cirrhosis, five patients(7%) had metastatic carcinoma, three patients(4%) had hepatocellular carcinoma and other causes in 36 patients(49%) include tuberculosis, chronic hepatitis, congestive liver disease, mesothelioma, granulomatous liver disease, cholestasis, iron overload, drug hepatotoxicity and peliosis hepatis (12).

In the present study, we had a total of 22 cases of ascitis that was diagnosed preoperatively or during the procedure. These included 8 cases of Koch's abdomen (16%), 4 cases of carcinoma of the gall bladder (8%), 3 cases of metastatic disease (6%), 3 cases of liver cirrhosis (6%), 2 cases of Genitourinary tuberculosis and 2 cases of adhesions with SAID. Laparoscopy in our study was able to diagnose the cause of ascitis in 90.9% of cases. In comparison it is obvious that diagnostic laparoscopy can diagnose the cause of ascitis in more than 80% of cases. Our study was inconclusive in 2 cases of ascitis which appeared to be Koch's abdomen, but the biopsy was not confirmatory for the same. These cases were treated as Koch's abdomen with ATT and both patients responded well. These cases although inconclusive by HPE examination have been discussed under Koch's abdomen as these responded to ATT.

The complication rates in diagnostic laparoscopy were very low compared to other surgeries. In the present study, we had only 2 cases with subcutaneous emphysema which was self-resolving. No long term complication was seen. Most of the studies showed minor complications like wound infection and subcutaneous emphysema. ***Lim et al (2008)*** have reported a complication rate of 1.9% in their study (13). In a study by ***Paajanen H et al,*** organ injury in 1.26% cases, bleeding in 5.06% cases and wound infection in 3.79% cases was reported (2).

Conclusion

The present study concluded that laparoscopy is a safe and effective method for diagnosis of chronic abdominal pain. In patients in whom the other diagnostic methods have been failed to elicit a certain cause laparoscopy can aid in the diagnosis and management of pain in them. In addition, diagnostic laparoscopy can also be used as a useful therapeutic tool.

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