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RESEARCH ARTICLE

LAPAROSCOPY ROLE IN DIAGNOSIS AND MANAGEMENT OF UNEXPLAINED/NONSPECIFIC ABDOMINAL PAIN.

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Abstract

Background: unexplained/nonspecific abdominal pain makes up a high percentage of surgical admissions to hospitals, both in emergency department, and as elective admissions, with a substantial diagnostic dilemma.

Objective: The aim of this study was to determine if laparoscopy has any significant role in the diagnosis and management of unexplained/nonspecific abdominal pain.

Patients and Methods: All patients who presented to the hospital with abdominal pain with no identifiable etiology and after clinical examination, assessment and investigations were labeled as unexplained/nonspecific abdominal pain, and after that underwent diagnostic laparoscopy to reach a definitive diagnosis were included in the study.

Results: 127 patients were included in the study. Females accounted for 67% (n=85) and males 33% (n=42). The mean age was 28 years (ranged from 18-58 years). Out-patient department was the commonest mode of admission, 99 (78.4%) patients. Patients who presented with unexplained/nonspecific abdominal pain in the lower part of abdomen accounted for 29% (n=37), followed by 25% (n=32) with right lower abdominal pain, and 22% (n=28) with periumbilical pain radiating to right lower abdomen. Diagnosis was established in 85% (n=108) of patients. In 15% (n=19) no pathology was found. The most common diagnosis was pathology of appendix in 33% (n=42) of patients followed by pelvic pathology in 20% (n=25), and abdominal tuberculosis in 16% (n=20) of patients. Most of the patients (42%, n=53) stayed in the hospital for 24 h. There were no major postoperative complications and no readmissions.

Conclusion: Laparoscopy has a definitive role in the diagnostic dilemma associated with unexplained/nonspecific abdominal pain. It has at the same time a role in treatment, decreasing mortality, morbidity, cost, hospital stay, and improving quality of life relative to observation; hence laparoscopy is an effective diagnostic and therapeutic modality in the management of patients with unexplained/nonspecific abdominal pain.

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Introduction:-

Abdominal pain is a common complaint both in general practice and in hospitals, with which patients present to emergency department. ⁽¹⁾Nonspecific abdominal pain (NSAP), is generally defined as acute abdominal pain of under 7 days' duration, and for which there is no diagnosis after examination and baseline investigations, is a common cause of emergency surgical hospitalization. ⁽¹⁾Nearly 25% of patients have nonspecific abdominal pain. ⁽²⁾More than 38% of the patients with chronic abdominal pain have no specific etiological diagnosis made at the end of the diagnostic workup. ^{(3), (4)} Many organic and functional diseases can cause abdominal pain. The most common organic conditions include intestinal adhesions, ^{(5), (6)} biliary causes, ^{(7), (8)} and appendicular causes, ⁽⁹⁾ while functional conditions include irritable bowel disease, ⁽¹⁰⁾ functional dyspepsia, ⁽¹¹⁾ and various motility disorders. Many of patients have ongoing symptoms and cannot be discharged, undergo multiple, often expensive, unneeded investigations and have repeated readmissions. A lot of cases of NSAP are mimicking acute or chronic appendicitis. Most patients with NSAP are referred as possible cases of acute appendicitis, frequently with periumbilical pain and tenderness that radiates to right iliac fossa (RIF). A number of these may erroneously undergo operation for suspected appendicitis, some are put on anti-tuberculosis therapy, while females mostly end up taking anti-androgens. ⁽¹²⁾ One study showed that, NSAP was diagnosed in 30% of 135 patients who are undergoing appendectomy operations. ⁽¹⁾Patients may undergo unnecessary appendectomy operations and may reiterate with symptoms even after surgery. A definite diagnosis is not always achievable, however, with noninvasive imaging modalities including contrast radiology, computed tomography (CT), magnetic resonance imaging (MRI), and ultrasonography. ⁽¹³⁾ In addition, minimally invasive procedures like paracentesis, endoscopy fail to reach a diagnosis as well at times. Laparoscopy is a minimally invasive surgical procedure in which the peritoneal cavity and intrabdominal organs can be visualized in order to detect pathology. It has both a diagnostic as well as a therapeutic potential and it is especially useful in patients with equivocal signs and those who are hemodynamically stable not requiring urgent surgical intervention. It is a safe and effective tool and can establish the etiology and allows for appropriate interventions in such cases. ⁽¹⁴⁾After giving symptomatic treatment to patients, normal diagnostic laparoscopy may allow the surgeon to discharge patients early from hospital. This study was conducted to highlight the role of laparoscopy in unexplained/nonspecific abdominal pain.

Materials and Methods:-

This study was conducted out in Department of Surgery, King Khalid University Hospital (KKUH), Riyadh, Saudi Arabia for a period of 3 years, from July 2011 to June 2014. All patients of either sex and age, who were admitted through emergency department or as an elective through outpatient department and presented with acute or chronic nonspecific abdominal pain which was of unclear etiology, in whom medical history, clinical assessment, routine laboratory investigations and radiological evaluations failed to make a definite diagnosis, were included. After acquiring detailed history and clinical examination, relevant blood investigations taken, X-ray abdomen, ultrasound, and CT scan were performed when indicated. Laparoscopy was performed, after completion of all the necessary hematological, biochemical, radiological, and ascetic fluid analysis, endoscopic evaluation, imaging techniques, and Tuberculin sensitivity test, in any chronic abdominal condition in which the etiology was unknown. Depending on the underlying pathology, therapeutic intervention was performed with either open laparotomy or laparoscopic technique. A form was used to keep a record of all the patients' data in terms of medical history, clinical examination, laboratory investigations and laparoscopic findings. The time for hospital stay was defined as time from moment of admission until patient discharge. A single antibiotic for prophylaxis was given preoperatively. Patients informed-consent form approved by our Institution's Ethics Committee was taken before operation. Also, patients were informed about the possibility of conversion of laparoscopic surgery to an open procedure depending on preoperative findings. Pneumoperitoneum was established using veress needle in periumbilical region. After establishment of the pneumoperitoneum, a standard three-trocar technique was used (10-mm optic via periumbilical trocar and two 5-mm lateral trocars), followed by insertion of additional ports where therapeutic intervention was required. The findings and results of laparoscopy were recorded. Biopsy specimens were sent for histopathology to confirm the diagnosis. Outcome measures included diagnosis made, duration of surgery, duration of hospital stay and postoperative complications. Data were analyzed using Statistical Package for the Social Sciences Version 20.0 (SPSS Inc., Chicago, IL, USA) and Microsoft Excel 2010. Categorical data was presented as frequency and percentage, and numerical data as means and standard deviations.

Results:-

The common mode of admission to hospital was through outpatient department ($n = 99$, 78.4%). The common clinical presentations were as follow: nonspecific abdominal pain in the lower part abdomen in 29% ($n=37$) patients, with right lower abdominal pain in 25% ($n=32$) and 22% ($n=28$) with periumbilical pain radiating to right lower abdomen.(detailed in **Table 1**).

Table 1:-Clinical presentations

Site of abdominal pain	Number of patients (N)	Percentage (%)
Pain in lower abdomen (RIF, hypogastrium, LIF)	36	28.4
Pain in RIF	30	24
Pain in periumbilical/central abdomen	28	22
Pain in hypogastrium	9	6.8
Pain in LIF	9	6.8
Pain in right lumbar region	7	5.6
Pain in RIF and hypogastrium	4	3.4
Pain in left lumbar region	3	2.5
Total	127	100

In 43% ($n=55$)of patient's abdominal ultrasound was normal. A common finding that was noted on abdominal and pelvic ultrasound, was distended bowel loops in right iliac fossa. Benign prostatic hypertrophy was reported in three patients. Pelvic ultrasound in 81 of 85 females was normal. In the remaining patients, minimal free fluid in cul-de-sac was reported. All subjects underwent CT scanning, out of which, 52.5% ($n=66$) patients had a change in findings when compared with the findings on ultrasonography.The CT scan was better able to show retroperitoneal/mesenteric lymphadenopathy and dilatation of gut loops. Thirty-four subjects out of 127 cases (27.2%) had altogether new findings, while 92 (72.7%) cases had findings similar to the radiological means. Thirty-six out of these 64 had new findings along with the previous findings. Therefore, 70 out of the 127 subjects had new findings. After diagnostic laparoscopy, tissue diagnosis was achieved in 108 of the 127 subjects (85%).Laparoscopic results showed inflamed appendix, appendicular faecaliths, mesenteric lymphadenitis,enlarged mesenteric lymph nodes, salpingitis, omentum at deep inguinal ring, adhesions in peritoneal cavity and pelvis, fluid in cul-de-sac and ovarian cysts, diverticulitis(as indicated in **Table 2**).

Table 2:-Laparoscopic findings

Laparoscopic findings	Number of patients (N)	Percentage (%)
Inflamed appendix	22	17
Adhesions/bands (postoperative/cong.)	16	12.5
Appendicular faecaliths	12	10.2
Enlarged mesenteric lymph nodes	12	10
Salpingitis with fluid in cul-de-sac	10	7.5
Ovarian cysts	9	6.8
Caesating mesenteric nodes with ileal adhesions	9	6.8
Fibrous/kinked appendix	7	5.6
Strictured terminal ileum with lymph nodes	4	3.4
Omentum/viscus in deep ring	4	3
Meckel's diverticulitis	1	1.1
Fimbrial cyst	1	1.1
Worm in appendix	1	1.1
No pathology found	19	15
Total	127	100

Final diagnosis was made in 108 (85.2%) patients. In 19 patients (14.7%) diagnosis could not be established. All laparoscopic findings were confirmed by histopathology. Inflamed appendix was the most common diagnosis made in 22 (17%) patients with rest of diagnoses detailed in **Table 3**.

Table 3:- Final diagnosis

Final diagnosis	Number of patients (N)	Percentage (%)
Appendicular pathology	42	33
Pelvic pathology	26	20.4
Abdominal tuberculosis	20	16
Mesentericadenitis	6	4.5
Postoperative adhesions	4	3.4
Early inguinal hernia	4	3.4
Congenital bands	3	2.2
Lymphoma	1	1
Meckel's diverticulitis	1	1

The average length of the operative time was 58.7 minutes and the maximum duration was 96minutes. Among the postoperative complications 10 (8%) patients developed wound inflammation/infection, 8 (6.8%) had post-operative fever and chest infection, 6 (4.5%) with post-operative fever alone. Follow-up was done weekly for 1 month, then seen once monthly for 3 months. No major complications were reported and seven patients came back with complaints of recurrent pain who were subjected to further investigations and imaging modalities like CT, MRI, MRCP (magnetic resonance cholangiopancreatography) to reach a definite diagnosis.

Discussion:-

Unexplained/nonspecific abdominal pain still remains a diagnostic dilemma. In many cases, despite all the routine laboratory investigations and imaging modalities, a diagnosis could not be achieved. The challenge posed by patients with NSAP is extensive and noticeable. It accounts for an estimated 15-40% of all emergency-department surgical admissions.⁽¹⁾ The abdominal disease is complicated, and patients usually undergo a lot of costly investigations and even exploratory laparotomy for definite diagnosis. In such conditions, diagnostic laparoscopy is a better choice for the patient. It can directly give a high-field visualization of the abdominal cavity, provide adequate tissue sample for histopathological assessment, and in expert hands is an excellent therapeutic tool with cosmetic acceptable scars. When reviewing the literature, it reveals various outcomes of diagnostic laparoscopy in patients of undiagnosed abdominal pain to support its use in recurrent nonspecific abdominal pain. Some studies clearly support diagnostic laparoscopy role in such challenging situations and have shown a good accuracy in reaching a diagnosis in NSAPs.^{(15), (16)} Some other studies were not as supportive.⁽¹⁷⁾ In our study, the overall success was 88% which supports use of this diagnostic modality. A study done by *Lippert et al.* showed that diagnostic difficulties are more experienced in young females with lower abdominal pain and inconsistent features of appendicitis.⁽¹⁸⁾ It seems to be a better option to evaluate nonspecific lower abdominal pain in this gender class by diagnostic laparoscopy. This is similar to the study carried by *Ou and Rowbotham* in which diagnostic laparoscopy provided a definitive diagnosis in 76 of the 77 cases (99%).⁽¹⁹⁾ In our study, more than half (85 out of 127) of patients were females. This strengthens the observation that nonspecific abdominal pain was common diagnostic problem in this group. Diagnostic laparoscopy provided a definitive diagnosis in 73 (86.4%) out of 85 female patients in our study. In a similar study appendicular pathology was found in 75% cases, whereas in another study it was found in 40% patients.^{(20), (21)} These numbers were higher in our study in which appendicular pathology was found in 33% (n = 42) of patients. In majority of cases in our study, the appendicular pathology was inflamed appendix with pelvic appendix as a common position, along with subserosal and retrocecal appendix. Females with findings of pelvic pathology and pelvic inflammatory disease (PID) were the second most common diagnosis reached with 26 (20.4%), and abdominal tuberculosis was found in 20 (16%) patients in a study which is similar to our results.⁽²²⁾ Five male patients in the present study presented with a complaint of right groin pain that radiated to right iliac fossa. On diagnostic laparoscopy, findings were protrusion of omentum into deep inguinal ring in two patients and small bowel along with omentum in three others. Transabdominal preperitoneal repair was done in all the five patients with no postoperative complications. Our results were in concordance to a study revealing similar results.⁽⁴⁾ Early laparoscopy also has the benefit that a number of therapeutic options were available.⁽²³⁾ In this study, diagnostic laparoscopy has become therapeutic in many cases. Ovarian cysts could be drained and treated with immediate relief of symptoms.⁽²⁴⁾ Purulent fluid collections secondary to pelvic inflammatory disease or diverticulitis could be drained. Early recognition of PID is crucial and enables early treatment that was important if

complications such as infertility were to be minimized. Patients with an inflamed appendix can be dissected safely and effectively laparoscopically. Laparoscopic adhesiolysis was possible. ⁽²⁵⁾In our study, there were some minor postoperative complications noted including wound inflammation/infection and post-operative fever, while the laparoscopy failed to make any diagnosis in 17 patients, which were put on follow-up for further assessment to reach a diagnosis. Seven were females (unmarried) of child bearing age, five were males <12 years of age, whereas the other females had a history of cesarean section with normal imaging studies. All of these patients attended the follow-up clinic for 8 weeks and then were being evaluated with other modalities during follow-up.

Conclusion:-

In conclusion, laparoscopy has an effective diagnostic role in evaluating patients with acute unexplained/nonspecific abdominal pain, in whom conventional methods of investigations have failed to reach a definitive cause. The therapeutic value of laparoscopy is also accepted and appreciated.

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