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DIAGNOSTIC LAPAROSCOPY;
INDICATIONS AND FINDINGS AT COMBINED MILITARY HOSPITAL RAWALPINDI

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ABSTRACT... azharshabbir@amcolians.net **Objective:** There are various disease conditions that require a definitive diagnosis before embarking on treatment. Common problems like pain abdomen and abdominal trauma are amongst the problems that require an early diagnosis and prompt treatment. Non-invasive investigations like CT scan and MRI may be inconclusive. **Study Design:** This was a descriptive study. **Setting:** Surgical department of Combined Military Hospital Rawalpindi. **Period:** Jan 2002 to Jan 2003 **Material and Methods:** Various indications of diagnostic laparoscopy were assessed with special reference to various modes of presentation. It included fifty patients. Clinical signs, symptoms and investigations were reviewed for these patients and records maintained. Patients were divided in groups according to various modes of presentations. **Results:** Major indications for which it was done included these main groups: pain abdomen, staging and diagnosis of intra abdominal tumors, assessing abdominal trauma and assessment of female infertility. After the procedure the correlation between pre operative diagnoses and post operative findings was studied. **Conclusions:** The diagnostic laparoscopy is a useful investigation that may help in avoiding unnecessary laparotomies but further studies are required to establish its precise role in the management of above mentioned indications.

Key words: Laparoscopy, Diagnostic, Indications.

INTRODUCTION

Many surgeons worldwide have had the challenging experience of facing an unexplainable abdominal pain and uncertain diagnosis or staging of intra abdominal neoplasias. History taking, physical examinations, laboratory tests and sequences of advanced non-invasive imaging studies might provide some help, but are often insufficient for accurate diagnosis. For example, appendicitis is a common cause of right lower abdominal pain, but might be confused[1] with right-sided colonic diverticulitis in elder patients or ovarian disease in women. A number of times, imaging studies can not

provide an accurate diagnosis of the aforementioned abdominal conditions, and they are silent in diagnosing causes of infertility in women as well; thus needle paracentesis[2], peritoneal lavage, or minimal laparotomy have been used to obtain a better understanding of such intra-abdominal conditions. Nevertheless, exploratory laparotomy has inevitably been undertaken for those who have no definite diagnosis even though every modality has been tried. Negative laparotomy, especially for those patients in a critical condition and with a low reserve of organ functions, is generally known to result in poor recovery or even mortality. A more accurate less invasive and good diagnostic method is needed to fulfill such multipurpose demands.

PATIENTS AND METHODS

Data of 50 consecutive patients undergoing diagnostic laparoscopy over the period of one year starting from Jan 2002 till Jan 2003 in the Surgical department of Combined Military Hospital Rawalpindi were audited. Data collection was done directly from the patient. History, clinical examination and investigations were recorded on a performa. All the procedures were video recorded for later review.

Procedure; Same operator (supervisor in surgery) with 03 years experience of laparoscopic surgery performed all the diagnostic laparoscopies. The procedures were done under general anesthesia. Pneumo-peritoneum was created with carbon dioxide. The video-optic port was set infra umbilically with a 10 mm trocar. The choice of location for the second 5 mm port depended upon the clinical suspicion and the initial laparoscopic view. Besides these two routine ports, accessory ports were set if indicated. Tissue biopsies were obtained either by excision, biopsy forceps or the Tru-cut needle under laparoscopic surveillance.

Follow up; All the patients were followed up for 01-month duration and relation between clinical symptoms and diagnoses achieved by the procedure were compared. Records of these patients including history taking, physical examinations, laboratory tests and non-invasive imaging studies (i.e. ultrasonography, contrast radiology, CAT scan, MRI scan, endoscopy. etc.) before and after operation were carefully reviewed and analyzed.

Laparoscopic Findings and Management.

A positive laparoscopic examination was defined if findings of any intra abdominal pathology, such as cholecystitis, appendicitis, displacement of foreign body etc., could be seen and correlated with clinical manifestations, or if tissues were obtained to confirm the nature or staging of the intra peritoneal tumor. Further management was undertaken for patients with definite diagnosis in the same operation. Patients with uncertain diagnosis or with a diagnosis inconsistent with clinical manifestations could be referred for further evaluation and management.

Assessment

The patients were assessed by the correlation between preoperative diagnosis, laparoscopic findings and pathologic diagnosis. Various disease conditions that were amenable to diagnosis using laparoscopy are enlisted. A detail analysis of these disease conditions with various clinical features and laparoscopic diagnoses were carried out with the help of charts, tables and statistical analysis using computer software (SPSS-10).

RESULTS

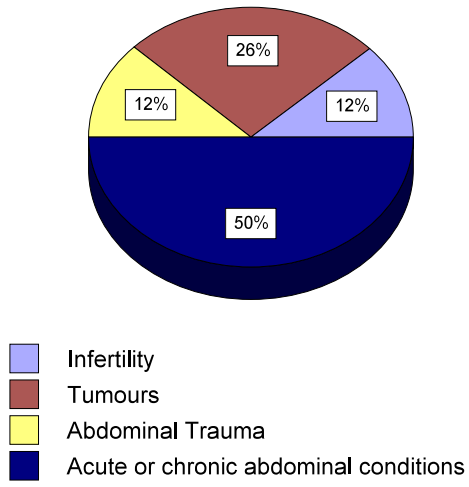
From January 2002 to January 2003, 194 patients underwent elective laparoscopic operations in the department of General Surgery, Combined Military Hospital Rawalpindi. Fifty of them selected for diagnostic purposes were included. All patients were above 09 years of age and were fit for general anesthesia from consultant anesthetist. The patients with unstable hemodynamic conditions, respiratory distress, evidence of peritonitis, pregnancy, coagulation defects and markedly distended bowel loops were excluded from the study.

The ages of these fifty patients ranged from 10 to 77 years, and averaged 45.15 years. Thirty-one were males and nineteen were females. Records of these patients including history taking, physical examinations,

laboratory tests and non-invasive imaging studies (i.e. ultrasonography, contrast radiology, CAT scan and MRI scan, endoscopy. etc.) before operation were carefully reviewed and analyzed.

Major Indications were divided into four main groups (figure-1) which included: determining the cause of inconclusive abdominal conditions / pain (acute or chronic) (n=25), differentiating / assessing intra-abdominal tumors (n=13), assessing abdominal trauma (n=06) and determining the cause of infertility in females (n=06).

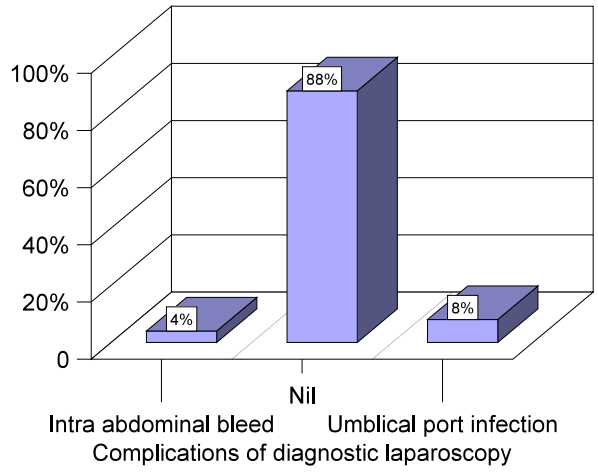
Fig-1. Main groups of indications for diagnostic laparoscopy



Major groups of indications for diagnostic laparoscopy (areas presents percentage of cases)

For those with acute or chronic abdominal conditions / pain, the correlation between clinical diagnosis, laparoscopic diagnosis, pathologic diagnosis and their definitive treatment is shown in table-I. Four of the twenty-five patients with pain abdomen were negatively examined. The diagnosis of two patients with negative laparoscopic findings finally turned out to be uremia and pneumonia, while two patients with negative laparoscopy had pain subsided without any specific treatment and diagnoses remained inconclusive. In terms of laparoscopic findings, one of the fourteen patients with chronic abdominal conditions had no definite pathology while three with acute conditions had negative laparoscopy. All the six patients in group 2 had conservative management (table-II). Four patients in this group had minimal or no findings. One with pelvic fracture had large retro-peritoneal hematoma which was non expanding so was treated conservatively. One had minor liver laceration, which also required no intervention.

Fig-2. Complications of diagnostic laparoscopy



For those with infertility are shown in table-III. There were positive laparoscopic findings in five out of six patients: the causes were blocked fallopian tubes (n=2), polycystic ovaries (n=2) and adhesions due to pelvic inflammatory disease around the ovary (n=1). In group 4 patients with uncertain or un-staged intra-abdominal tumor, the correlation between diagnosis and their treatment is shown in table 4. One patient with uncertain intra-abdominal tumor was not biopsied due to fear of operator for hemorrhage. Hence its histopathological diagnosis could not be confirmed by laparoscopy after the ultrasound guided FNAC showed it to be metastatic adenocarcinoma. Two patients in this group investigated for mass abdomen were diagnosed on laparoscopy to have no tumour or malignancy (one had cirrhosis liver

and other had retroperitoneal cold abscess). Among the three patients with known intra peritoneal malignancies, two showed no lymph nodes or intra-peritoneal metastasis so radical surgery was planned. However, in another patient with cancer at the pancreatic head, a metastatic lymph node was found at the mesentery; hence, no radical surgery was done.

The mean duration of procedure was 59.24 minutes for all the groups. The mean duration of hospitalization for these four groups was 3 days. Complication was noted in six patients (figure2), which included minor port infection in four patients requiring conservative treatment and intra abdominal bleed in two patients. One patient with intra abdominal bleed died because of concealed nature of haemorrhage while other required no active management. The cause of the bleeding in fatal case later turned out to be bleeding diathesis due to aspirin tablets which patient was taking for his other wise unrevealed sore throat.

Table-I. Correlation between clinical manifestations and laparoscopic diagnoses in patients with abdominal pain.

Age	Sex	Presentation	Pre op diagnosis	Laparascopic diagnosis	Procedure done
10	Female	Chronic abdomen	TB abdomen	post inflammatory mass base of small GUT mesentry	Biopsy lymph nodes
20	Female	acute pain abdomen	Ruptured ovarian cyst	Left ovarian cyst with haemorrhage	Marsupilization and haemostasis
20	Male	Chronic abdomen / wt loss	Malignancy, intra abdominal lymphoma	TB abdomen	Peritoneal and lymph node biopsy
28	Female	Chronic abdomen and fever	Abdominal TB	Negative	Peritoneal biopsy
24	Male	Recurrent sub acute intestinal obstruction	Adhesions (post op)	Adhesions terminal ilium	Adhesionolysis
23	Male	Fever, weight loss	Abdominal lymphadenopathy	inconclusive because of mortality	Biopsy of liver nodule
23	Female	repeated acute pain abdomen	Intra abdomial adhesions	negative	Peritoneal biopsy
28	Female	Chronic abdomen	TB abdomen	Tuberculosis mesenteric lymphnodes	biopsy of lymph node and peritoneum
10	Male	Repeated pain abdomen and vomiting	Meckels diverticulum	Mesenteric lymphadenitis and appendicitis	Laparoscopic assisted appendicectomy cholecystectomy
63	Male	Acute pain abdome after colectomy	Intestinal colic due to ashesions	A calculous cholecystitis	Laparoscopic cholecystectomy
70	Male	Acute pain abdomen	Intestibnal colic	Acute appendicitis	Laparoscopic assisted appendicectomy
15	Male	Acute lower abdominal pain	Acute suppuration pelvis	Negative	Inspection
60	Male	Acute pain right hypochondrium	Acute cholecystitis	Negative	Inspection

67	Male	Chronic pain abdomen	Chronic pancreatitis	Chronic cholecystitis	Laparoscopic cholecystectomy
44	Female	Chronic pain pelvis and abdomen	Chronic appendicitis	Chronic appendicitis	Laparoscopic appendicectomy
51	Female	Chronic pain epigastrium	Chronic liver failure	Chronic cholecystitis	Laparoscopic cholecystectomy
54	Male	Chronic ascites	Chronic liver failure	Liver chirrhosis	Liver chirrosis
26	Male	Chronic pain epigastrium	Chronic cholecystitis	Chronic cholecystitis	Laparoscopic cholecystectomy
31	Male	Chronic pain lower abdomen	Intestinal TB	Chronic appendicitis	Laparoscopic assisted appendicectomy
26	Male	Mesenteric lymphadenopathy	Intra abdominal TB	Reactionary lymphadenopathy	Lymph node biopsy
38	Female	Chronic pain abdomen	Abdominal TB	Caseating tuberculosis lymphnodes	Lymph node biopsy
34	Male	Acute pain abdomen/abdominal distension	Post op adhesions	Fibrotic band near terminal ilium	Adhesionolysis
21	Female	Acute pain abdomen	Acute appendicitis	Ovarian cyst	Laparoscopic marsupilization
45	Male	Chronic pain abdomen	Tuberculous lymphadenitis	Non specific inflammation	Lymphnode biopsy
22	Female	Chronic pain abdomen	Intra abdominal TB	Tuberculous lymphnodes	Lymphnode biopsy

Table-II.Correlation between clinical manifestations and laparoscopic diagnoses in patients with abdominal trauma

Age	Sex	Presentation	Pre op diagnosis	Laparoscopic findings	Procedure
22	Male	Blunt abdominal trauma	Intra abdominal visceral injury	Free blood no active bleed injury to liver	Drainage of blood / lavage
27	Male	Penetrating wound rt hypochondrium	Peritoneal laceration	Breach liver capsule	Inspection
25	Male	Pelvic trauma and shock	Intra abdominal bleed	Retro peritoneal pelvic hematoma	Inspection
22	Male	Pelvic fracture and shock	Peritoneal haemorrhage	Retro peritoneal hematoma pelvic	Inspection
45	Female	Blunt abdominal trauma	Intra abdominal visceral injury	Splenic tear	Open splenectomy
38	Male	Blunt abdominal trauma	Suspected liver laceration	Normal	Inspection

Table-III. Correlation between clinical diagnoses and laparoscopic diagnoses in patients with infertility with definitive treatment

Age	Sex	Presentation	Pre op diagnosis	Laparoscopic findings	Procedure done
33	Female	Primary imfertility	Primary imfertility	Negative	Chromopertuberation
32	Female	Primary imfertility	Pelvic TB	Adhesions pelvis	Adhesionolysis
24	Female	Primary imfertility	Polycystic ovaries	Normal ovaries, rt fallopian tube stenosis	Chromopertuberation
32	Female	Secondary imfertility	Pelvic inflammatory disease	Adhesions around ovaries and pelvis	Adhesionolysis
24	Female	Primary imfertility	Polycystic ovaries	Polycystic ovaries	Diathermy punctures
34	Female	Primary imfertility	Primary imfertility	Adhesions due to PID	Diagnostic laparoscopy

Table-IV. Correlation between clinical manifestations and laparoscopic diagnoses in patients with undifferentiating or unstaged intra abdominal tumor

Age	Sex	Presentation	Pre op diagnosis	Findings	Procedure
49	Female	Chronic upper pain abdomen	Mass Gall Bladder	Papillary adenocarcinoma Gall bladder	Biopsy
23	Male	Low grade fever, severe epigastric pain	Metastatic adenocarcinoma	Enlarged paraaortic, celiac and porta hepatis lymph nodes	Lymph node biopsy
65	Male	Pain and mass rt hypochondrium	Mass Gall bladder	Mass gall bladder involving colon,metastatic adenocarcinoma	No biopsy
58	Male	Tumour	Hepatic tumour	Liver cirrhosis	Liver biopsy
55	Male	Retro peritoneal tumour	Soft tissue sarcoma	Retroperitoneal abscess	Exploratory laparotomy
35	Male	Hepatic tumour	Hepatoma	Multiple hepatic masses	Liver biopsy
77	Male	Intraabdominal tumour	Growth lower CBD	Cholangiocarcinoma	Biopsy mass
52	Male	Gastric out let obstruction due to growth stomach	Advanced carcinoma stomach	No peritoneal mets	Staging laparoscopy
56	Male	Hrowth head of pancreas	Metrastatic ca head of pancreas	Metastasic adenocarcinoma	Laparoscopic tissue biopsy
65	Male	Mass abdomen	Malignant growth stomach?	Unresectable mass, adenocarcinoma	Tissue biopsy for diagnosis
35	Female	Pelvic pain	Growth in pelvis	Metastastic carcinoid with liver involvement	Biopsy
44	Male	Mesenteric mass	Lymphoma	Non hodgkins lymphoma	Tissue biopsy
55	Male	Growth retroperitoneum	Soft tissue sarcoma	Neurofibroma	Tissue biopsy

DISCUSSION

This study has evaluated the indications for diagnostic laparoscopy in abdominal surgery, and its correlation with clinical manifestations and pathological findings.

There is a consensus that laparoscopic diagnosis is useful for those with unexplained abdominal pain[3]. Twenty-five patients in this series had abdominal pain. It was acute pain in eleven, and chronic persistent or intermittent in fourteen. Among the eleven patients with acute abdominal pain, who were proved to have negative abdominal conditions, thus avoided unnecessary laparotomy and subsequent morbidity or mortality. Among those with chronic abdominal pain, there existed certain pathology in twelve patients who needed further treatment by surgery (5/12), anti tuberculous treatment (3/12) or conservative treatment (4/12). One patient had no finding in this group while one patient died due to operative complication. In contrast to the relatively high complication rate in patients with negative laparotomy, laparoscopy offered a more reliable and less invasive diagnostic modality for those with uncertain abdominal conditions[4].

No doubt, laparoscopy has been helpful in differentiating suspected intra-abdominal disorders, and assessing operability or resectability of known malignancies. In the past, the diagnostic field of laparoscopy was limited to direct visualization of superficial lesions. With the development of laparoscopic contact ultrasonography and needle biopsy technique[5], diagnosis and localization of intraparenchymal lesions are easier. Results have showed that four suspected intraabdominal tumors were differentiated successfully by laparoscopy, with one huge retroperitoneal abscess undergoing open surgery. Two patients with nodules in cirrhotic livers were diagnosed by laparoscopy, one was benign and another had multiple hepatomas. This procedure should be helpful in the Pakistan since hepatitis B viral infection, chronic liver disease and hepatoma are important epidemiologic problem. Especially for those with multiple liver nodules, diagnostic laparoscopy can provide an easy-to-handle, less invasive way to make a diagnosis and thus avoid an unnecessary negative laparotomy. Of the three patients with known maliganancy, metastasis to lymph nodes, which means intraperitoneal metastasis, was diagnosed by laparoscopy and unnecessary open surgery was also avoided. Imaging examinations can identity most metastatic lesions except small uncertain carcinomatosis or peritoneal cell seeding. In patients with diagnostic difficulty, operability and resectability may be assessed by laparoscopy with the aid of advanced biopsy instrumentations and intraoperative pathologic examinations.

Laparoscopy was performed for diagnosing the cause of infertility in six patients. Five patients were positively diagnosed and then two were managed laparoscopically.

Diagnostic laparoscopy is useful for abdominal conditions where the diagnosis or extent of the disease is unclear or the abdominal findings are equivocal. It can be performed safely in an inpatient or outpatient setting, potentially expediting diagnosis and treatment.

Laparoscopy has definitely reduced the rate of negative non-therapeutic laparotomies in undiagnosed abdominal pain. Some of the common acute abdominal conditions such as acute appendicitis, perforation, gynaecological conditions can be treated effectively by Therapeutic Laparoscopy increase in skills of the surgeons and technological advancement.

Though laparoscope provides an alternative for differential diagnosis of abdominal conditions, it should be emphasized that diagnostic laparoscopy never decreases the importance of traditional diagnostic procedures. However, if used under restricted indications (eg. unexplained abdominal pathologies, assessment of abdominal trauma, differentiating intra-abdominal tumor, assessing known malignancy and evaluating infertility), diagnostic laparoscopy can benefit patients by avoiding unnecessary surgery, avoiding unnecessary delay in diagnosis and treatment and shortening operative and hospitalized periods.

However a few questions need to be answered, such as who should perform emergency laparoscopic

procedures? What should be the selection criteria? Cost implications? Has TL a better outcome? Randomized control trials in future will answer a lot of these questions. It is important that all newer technologies should be evaluated in an unbiased manner, under strict protocol so that objective data can be obtained to devise guidelines for safe and effective use of new devises.

CONCLUSION

Diagnostic laparoscopy is simple, safe, available and diagnostically accurate, but it is not non-invasive, non-traumatic, nor the first choice for diagnosis. It should be reserved for those situations after noninvasive method fail to make a diagnosis.

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