

Role of Laparoscopy – A Diagnostic Aid, its Indications & Benefits

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Patients with an obscure and unrelievable abdominal condition may be forced to receive open laparotomy for diagnosis. Diagnostic laparoscopy has been suggested as an alternative to diagnostic laparotomy in selected cases. It is a prospective descriptive study in which, thirty one patients' under-going diagnostic laparoscopy using conventional pneumoperitoneal techniques from January 2000 to June 2002 were included in this study. The correlation between preoperative diagnosis, laparoscopic diagnosis and pathologic diagnosis as well as the outcome of laparoscopic diagnosis and treatment have been assessed. Major indications for diagnostic laparoscopy included acute abdominal pain (n=9), chronic abdominal pain (n=13), different intraabdominal tumor (n=7). All patients with acute abdominal conditions, 8 of the 13 patients with chronic abdominal pain and 4 of the 7 patients with abdominal tumors had no reasons for a further exploratory procedure, thus preventing the morbidity or mortality which might occur after unnecessary laparotomy. Diagnostic laparoscopy benefits patients by avoiding unnecessary surgery, avoiding unnecessary delay in diagnosis and treatment and shortening the operative and hospitalized period. However, it provides only an alternative not a substitute for traditional diagnostic procedures and will never lessen the importance of conventional laparotomy.

Key words: Diagnostic laparoscopy, pneumoperitoneum

Many surgeons worldwide have had the challenging experience of facing an unexplainable abdominal pain and uncertain diagnosis or staging of intraperitoneal neoplasm¹. 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. Appendicitis is a common cause of right lower abdominal pain, but might be confused With right-sided colonic diverticulitis in elderly patients or ovarian disease in women^{2, 3}. Since many imaging studies can not provide an accurate diagnosis of the aforementioned abdominal conditions, thus needle paracentesis, 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. However, 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 and even mortality in patients who underwent open laparotomy for diagnostic purposes. A more accurate and minimally invasive method which is associated with minimal morbidity was needed to fulfill such multipurpose demands.

Laparoscopy was not widely applied by general surgeons until the advent of laparoscopic cholecystectomy and other therapeutic uses^{4, 5}. Currently, therapeutic laparoscopy has been generally accepted with the result that there is a new awareness of diagnostic laparoscopy.^{6, 7} The first laparoscopic examinations was performed by Ott, a Russian gynecologist, at the beginning of this century. In 1923, Kelling successfully observed the intraperitoneal organs on a dog with a cystoscope, and described the technique as "coelioscopie".

Materials and methods

From January 2000 to June 2002, thirty one patients underwent diagnostic laparoscopy at South Surgical Unit Mayo Hospital Lahore. The ages of these twenty patients ranged from 13 to 62 years, and a mean age of 29.5 years. Seventeen were males and fourteen were females. Records of these thirty one patients including history taking, physical examinations, laboratory tests and non-invasive imaging studies (i.e. ultrasonography, contrast radiology, CT scan, endoscopy, etc.) before operation were carefully reviewed and analyzed.

Inclusion Criteria.

All patients who had acute or chronic abdominal pain but with out the definite pre-operative diagnosis.

Exclusion Criteria.

Patients with unstable hemodynamic condition, respiratory distress, evidence of peritonitis, pregnancy, severe coagulation defect, markedly distended bowel loops, or any traumatologic emergency were excluded.

Techniques for diagnostic laparoscopy

Under general anesthesia, pneumoperitoneum was created with carbon dioxide. In brief, the video-optic port was set infraumbilically 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 but was usually located over the left or right midclavicular line at about the level of umbilicus. Besides these two routine ports, accessory ports were set if indicated.

Laparoscopic findings and management

A positive laparoscopic examination was defined if findings of any intraabdominal pathology, such as ovarian

cyst, adhesions, appendicitis, could be seen and correlated with clinical manifestations, or if tissues were obtained to confirm the nature or staging of the intraperitoneal tumor. Further management was undertaken for patients with definite diagnosis in the same operation.

Assessment

The patients were assessed by the correlation between preoperative diagnosis, laparoscopic findings and pathologic diagnosis, the outcome of laparoscopic diagnosis and treatment.

Results

In all 31 patients positive diagnosis was reached. Mean hospital stay was 4.7 days. Nine cases presented with pain right iliac fossa. Laparoscopy was helpful in making a diagnosis in all of these cases. The findings of a small ovarian cyst and mesenteric lymphadenitis were also noted.

In all cases of acute appendicitis, 5 female and 2 males, laparoscope assisted appendectomy was done. The postoperative course of all these patients remained normal. Biopsies confirmed the diagnosis of acute appendicitis. In two cases small ovarian cyst was noted in right ovary. In one there was non-specific mesenteric lymphadenitis.

Four patients were presented with pain lower abdomen. All were females. DL was helpful in making diagnosis. Pelvic inflammatory disease was found in three patients and left small ovarian cyst in one patient.

Eight patients, who presented with sub acute intestinal obstruction, were chosen for diagnostic laparoscopy. They were initially managed conservatively. Out of eight, seven were found tuberculous and one case of ventral hernia. Mean hospital stay in the patient was 7 days.

One patient presented with chronic pain abdomen of uncertain etiology that was present since last 2 years. The routine investigations, liver function tests, abdominal radiographs, abdominal ultrasound and computed tomographic scanning were done but only mild ascities was revealed. In this patient on DL edema and saponification around the pancreas was detected. Diagnosis of pancreatitis was made.

Seven patients presented with history of pain abdomen along with mass and diagnostic laparoscopy was carried out in all these patients. Biopsies were taken in these cases.

Discussion

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

The timely diagnosis of intra-abdominal pathology continues to be an elusive problem^{8,9,10}. Delay in diagnosis and therapeutic decision making are continuing dilemmas in different categories of patients. Laparoscopy is nearly a

century old technique that has experienced a resurgence of interest from surgeons since the development of technology that has broadened its application.

This study, which included patients belonging to a wide range of age groups and coming mainly from poor class of our society, was conducted to evaluate the role of diagnostic laparoscopy in cases where, despite carrying out all the possible investigation, a definite diagnosis could not be made.

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 reserve for those situations, where every non-invasive method has failed to make the diagnosis. Cuesta et al¹¹, have emphasized this in their study that those abdominal condition in which it is difficult to establish an indicative diagnosis before laparotomy and where diagnostic non-invasive procedures do not appear conclusive, diagnostic laparoscopy is the only technique that can visualize the abdomen and can establish accurate diagnosis. Permitting the surgeon to plan accordingly.

In their study Ou CS et al¹², have discussed the role of diagnostic laparoscopy in acute abdomen and their results show a high degree of diagnostic accuracy with the procedure being helpful in 100% of cases. In their study 95% of the patients were managed exclusively by laparoscopy or laparoscopic assisted procedure. Mortality was 0% and morbidity 4%. Comparable results have been obtained in our study with diagnostic accuracy of 100% and similar number of patients being managed exclusively by laparoscopy or laparoscopic assisted procedure in acute abdominal presentation.

Acute pain right lower abdomen, especially in young females, is sometimes a diagnostic dilemma. In our study, in which we evaluated 7 females, the rate of negative appendectomy remained zero. Also in 30% of patients who presented with acute pain in the right lower quadrant of abdomen an unnecessary appendaectomy was avoided and the original pathology was diagnosed and managed. This almost correlates with the results of the study carried out by Moberg et al in 1998¹³. In his study the negative appendectomy rate was very low and 21.4% patients were saved from unnecessary appendectomy.

Similarly Molander et al have shown the importance of laparoscopy in cases presenting with lower abdominal pain in which there is suspicion of pelvic inflammatory disease. In our study the diagnostic accuracy of laparoscopy was 100% comparable to the results obtained by Molander et al of 91%¹⁴. In another study Pediatr et al have obtained a diagnostic accuracy of 67%. Many surgeons and gynaecologists have also advocated the use of laparoscopy for ovarian cysts, benign or malignant.

Diagnostic laparoscopy has also changed the management plans for pancreatic diseases especially pancreatic Carcinoma. Laparoscopy in conjunction with laparoscopic ultrasound combines the proven benefits of

staging laparoscopy with high-resolution intra-operative ultrasounds, thus allowing the surgeon to perform a detailed assessment of the pancreatic disease and considerably augmenting the possibilities of the methods to handle diseases of the pancreas. This procedure has a much better diagnostic accuracy than ultrasonography and computed tomography. Rothlin M has shown in his study that the respectability rates of pancreatic carcinoma can be raised to as 75%-100% by use of diagnostic laparoscopy and laparoscopic ultrasonography. In our setup, the laparoscopic ultrasound is not available but still the diagnostic accuracy of a small number of patients with pancreatic disease, included in our study, was 100%. However the views of Kirk and Cusheiri et al¹⁵, that there are areas within the abdominal cavity that cannot be properly visualized, are right and we also observed that the entry to the lesser sac for visualization of the pancreas was difficult.

Role of laparoscopy in lymphoma, a common disease, has been evaluated for both diagnostic as well as staging purposes. In their study Saeian et al¹⁶ have stated that short of open laparotomy, diagnostic laparoscopy is the most accurate modality for staging of intra-abdominal malignancies like lymphomas, and is particularly well-suited for patients who otherwise would not require surgical palliation. Similarly Mann et al have shown in their study that laparoscopy can safely provide tissue samples of suspected lymphoma for full diagnostic analysis and it should be considered when percutaneous biopsy is not technically possible, when chromosomal or genetic analysis is needed for treatment decisions, or when the results of percutaneous biopsy are inadequate to make therapeutic decisions. In our study, diagnostic laparoscopy helped in diagnosing 100% of the cases that presented with lymphoma and it was also possible to take biopsy in those cases.

Conclusion

On the basis of our experience of the diagnostic laparoscopic procedures performed in all types of emergency and elective, benign and malignant cases we conclude that, diagnostic laparoscopy is a safe, reliable and simple procedure in both acute and chronic abdomen with high of diagnostic accuracy in both elective and emergency patients and it is of great value in diagnosing and assessing malignant abdominal conditions and in planning their further course of management.

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