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ROLE OF LAPAROSCOPY IN THE DIAGNOSIS AND MANAGEMENT OF NONSPECIFIC ABDOMINAL PAIN

Surgery

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ABSTRACT

Introduction: Acute nonspecific abdominal pain(NSAP) is generally defined as acute abdominal pain of under 7 days duration, and , for which there is no diagnosis after clinical examination and baseline investigations. **Aims and Objectives:** To Study Role of Laparoscopy in the Diagnosis and management of Nonspecific Abdominal pain. **Methodology:** This was prospective study during 2 years period i.e. December 2012 to November 2014. All patients admitted to a tertiary care center surgery ward through outpatients department or casualty during study period were included in the study group. Patients needing exploratory laparotomy for nonspecific acute abdomen i.e. pain of less than 7 days duration where other clinical symptoms and investigations are not conclusive were included into study while. Morbidity included SSI (surgical site infection), persistent post-operative pain and shoulder pain. Patients were followed for 6 months post discharge for recurrence of pain and readmission. **Result:** Out of total 397 patients screened 50 were with Nonspecific acute abdomen pain (NSAP). 38% patients were males while 62% patients were female. The majority of the patients were in the age group of 21-30 and 31-40 i.e. 34%. Based on the findings of diagnostic laparoscopy Group: A- Pathology diagnosed - 33(66.00%), Group :B- No pathology detected-8(16.00); Group C- Insufficient information -9(18.00). In group A patients most common i.e.13 patients had appendicitis (inflamed, perforated or gangrenous).In group B patients no pathology was detected on diagnostic laparoscopy. In groups C patients most common i.e. 9 patients, diagnostic laparoscopy was found to be insufficient to conclude any pathology. Out of 50 patients, diagnostic laparoscopy could help 41 patients. In 33 patients particular pathology was identified. 13 patients had diagnostic laparoscopy followed by therapeutic laparoscopic procedure, including, 9 laparoscopic appendectomies, 2 ovarian cystectomies and in 2 patients adhesive bands were cut relieving the acute symptoms. In group B patients diagnostic laparoscopy was negative the need of urgent surgical measure. unexpected appendicitis found in Group A were 13 (26%); No patients in Group B (0%) and in Group C were 3(6%) patients. No Morbidity found in Category 1 and Category 2 patients ; and in Category 3 - 2/10 and Category 4 were 4/12. Category 1 and 2 patients were discharged over mean duration of around 3 days. Category 3 patients had mean hospital stay of 5 days. Category 4 patients had 10 days of mean hospital stay. Mean hospital stay of laparoscopy only group i.e. category 1 and 2 together is 2.75 days (SD=±0.7). **Conclusion:** Diagnostic laparoscopy effectively establishes a diagnosis, can be therapeutic and causes less morbidity and might change the further course of management to a more limited approach or conservative line of management and help in avoiding unnecessary non-therapeutic laparotomies, a normal laparoscopy may allow the surgeon to discharge patients who are still symptomatic. Confident that there is no requirement of for laparotomy. Incorporation of a laparoscopy may improve the management of emergency admissions and , may also; have cost benefits by rendering hospital stay and re admission rates.

KEYWORDS

Nonspecific abdominal pain(NSAP), Exploratory laparotomy, SSI (surgical site infection).

INTRODUCTION:

Acute nonspecific abdominal pain(NSAP) is generally defined as acute abdominal pain of under 7 days duration, and, for which there is no diagnosis after clinical examination and baseline investigations.[1]

NSAP is a common cause of emergency surgical hospitalization.[1] one multicenter study in UK found that no less then 43% of patients attending hospital with acute abdominal pain had no diagnosis made on discharge.[2] a study from the oxford reported undiagnosed abdominal pain to be the sixth common cause of hospital admissions in females.[3] most of such patients have persistent symptoms, undergo multiple, often costly investigations, are difficult to discharge and have repeat admissions, a delay in surgical intervention while further investigations are performed, may increase morbidity and prolong hospital stay. Patients managed using the traditional wait and watch approach have mean hospital stay ranges from 4.1 to 6 days[4] and may get an unsatisfactory discharge from hospital with a diagnosis of nonspecific acute abdomen by exclusion.[1] many patients with NSAP are considered as possible cases of acute appendicitis. According to literature, even senior surgeon can achieve clinical diagnostic accuracy rate in appendicitis of around 80%.[6] a number of these patients may erroneously undergo surgery for suspected appendicitis and, indeed, in one study, NSAP was eventually in 33% of 135 patients undergoing appendicectomy.[1]

Although laparoscopy was introduced at the beginning of this century[4], it has, until recently, failed to gain widespread acceptance largely because of the availability of non-invasive imaging techniques.[6] however, a definitive diagnosis is not always possible with non-invasive imaging tests including contrast radiology. Ultrasonography, computed tomography and magnetic resonance imaging.[7] with advances in optics. Laparoscopy allows perfect visual examination of the peritoneal cavity and further makes histological diagnosis of target biopsy under vision possible. It is as much of a surgical procedure as an exploratory laparotomy, often just as informative, and to the trained surgeon affords a better view of the entire peritoneal cavity than the usual exploratory laparotomy. To achieve a high rate of positive diagnosis with laparoscopy, it requires much more than correct technique, it requires a thorough background knowledge of surgery, a sound clinical acumen, knowledge and awareness of abdominal pathology.[8]

Incorporation of laparoscopy may improve the management of emergency admissions and may also have cost benefits by rendering hospital stay and readmission rates.[4,9,10] according to poulin et al the "management of acute NSAP needs to be periodically adjusted to get the best outcomes at the lowest costs and with the least invasive and most appropriate diagnostic tools".[11]

METHODOLOGY:

Prior to the commencement of the study ethical clearance was obtains through ethical clearance committee of the institute. This was prospective study during 2 years period i.e. December 2012 to November 2014. all patients satisfying the inclusion criteria, admitted to a tertiary care center surgery ward through outpatients department or casualty during study period were included in the study group. Patients needing exploratory laparotomy for nonspecific acute abdomen i.e. pain of less than 7 days duration where other clinical symptoms and investigations are not conclusive were included into study while , An active infection of the anterior abdominal wall near the planned entry or accessory trocar site was an absolute contraindication, Hemodynamically unstable patients e.g. systolic BP<90 mm Hg and urine output<15ml/hr, a clear indication for immediate celiotomy such as frank peritonitis, hemorrhagic shock, evisceratin etc., patients with an uncorrectable coagulopathy or uncorrectable hypercapnia, History of multiple previous abdominal

surgeries, Late pregnancy, Immunocompromised patients, Patients effusing the invasive technique (diagnostic laparoscopy) for diagnosis were excluded from the study. Patients admitted with nonspecific abdominal pain needing exploratory laparotomy were considered for diagnostic laparoscopy previous to the planned laparotomy. Patient's attenders were appraised of the study and written, valid and informed consent was taken for diagnostic laparoscopy and conversion to an appropriate procedure, whenever needed. All the necessary clinical details were recorded in a proforma prepared for this study. Initially, all patients were subjected to proper history taking including: age, sex, quadrant of tenderness, previous surgery if any, type of anesthesia, past history of admission with similar abdominal pain and past history of complication were recorded. Then, proper general and local examination was conducted. Hospital stay was determined from the time of admission of the time of discharge. Complication were determined both intraoperatively and postoperatively. Morbidity included SSI (surgical site infection), persistent post-operative pain and shoulder pain. Patients were followed for 6 months post discharge for recurrence of pain and readmission.

RESULT:

During the study period, 397 patients with acute abdomen pain were admitted through casualty or outpatients department in the surgical ward of a tertiary care center. Of 347 patients, 50 patients remained undiagnosed through repeated clinical examinations and baseline investigations and were labeled as Nonspecific acute abdomen pain or NSAP. These 50 patients were our study subjects and underwent diagnostic laparoscopy (under general anesthesia) previous to the planned median laparotomy.

Table 1: Number of patients with NSAP

Total cases with acute abdomen pain	Nonspecific acute abdomen pain (NSAP)
397 patients	50 Patients (N) 12.6%)

Out of total 397 patients screened 50 were with Nonspecific acute abdomen pain (NSAP)

Table 2: Sex wise distribution of the patients

Total	Males	Females
50	19(38%)	31(62%)

38% patients were males while 62% patients were female.

Table 3: Age wise distribution of patients

Age (in years)	Number of patients	Percentage (%)
1-10	1	2%
11-20	6	12%
21-30	17	34%
31-40	17	34%
41-50	7	14%
51-60	1	2%
61-70	1	2%
Total	50	100%

The majority of the patients were in the age group of 21-30 and 31-40 i.e. 34%

Table 4: Symptomatology

Symptom	Present	Absent	Percentage
Abdominal pain	50	0	100%
Vomiting	42	8	84%
Fever	31	19	62%
Abdominal distention	12	38	24%
Bowel symptoms	9	41	18%
Bladder symptoms	5	45	10%
Gynecological Symptoms	8	42	16%

Table 4-frequency of symptoms in patients with NSAP

Table 5: Groups (Based on the findings of diagnostic laparoscopy)

Group	Findings of diagnostic laparoscopy	Number of patients
A	Pathology diagnosed	33
B	No pathology detected	8
C	Insufficient information	9

Based on the findings of diagnostic laparoscopy Group :A- Pathology diagnosed -33(66.00%)

Group :B- No pathology detected-8(16.00); Group C- Insufficient information -9(18.00).

Table 5a: Diagnostic laparoscopy in group A patients

Diagnosis	Number of patients	Percentage % of total NSAP
Appendicitis	13	26%
Gynecological	6	12%
Adhesive band	2	4%
Koch's abdomen	4	8%
Small/large bowel pathology (other than Koch's and Appendicitis)	6	12%
Gallbladder pathology	2	4%

13 patients had appendicitis (inflamed, perforated or gangrenous). 6 patients had gynecological pathology (1 patients had genitourinary T.B.,1 had twisted ovarian cyst, 2 had simple ovarian cysts, 1 patients had pelvic inflammatory disease and 1 had endometriosis). 2 patients had adhesive bands. 4 patients had features suggestive of koch's abdomen with peritoneal tubercles. 6 patients had small and large bowel pathology other than appendicitis and koch's abdomen (1 had retroperitoneal perforation of the ascending colon, 1 had growth at the descending colon with its retroperitoneal perforation, 2 had omental cysts, 1 had mesenteric cyst and 1 had ileo-ileal intussusceptions). 2 patients had gallbladder pathology (1 had gangrenous cholecystitis and 1 had mucocele of gallbladder).

Table 5b: Diagnostic laparoscopy in group B patients.

Total	Percentage
8	16%

In 3 males and 5 female, no pathology was detected on diagnostic laparoscopy. 3 patients were later diagnosed with gastroenteritis, 1 had duodenal ulcer, and other 4 remained undiagnosed. Undiagnosed case were labeled as “Essentially Nonspecific pain in abdomen”.

Table 5 c. Diagnostic laparoscopy in groups C patients

Group C patients (insufficient information on diagnostic laparoscopy)		
Reason of conversion to laparotomy	males	female
Extensive adhesions	-	3
Excessive fat in omentum and mesentery causing inadequate visualization	1	2
Inexperience in required laparoscopic procedure	1	2

In 9 patients, diagnostic laparoscopy was found to be insufficient to conclude any pathology. It was either due to the extensive interbowel adhesions, excessive fat in mesentery and omentum or due to signs of generalized peritonitis without any obvious pathology. All these patients underwent median laparotomy. 2 patients had gangrenous small bowel segment due to adhesioins, 3 had duodenal perforation, 1 had caecal diverticulum perforation and 3 patients had perforated appendix.

Table 6: Categories (based on the intervention done)

Category	characteristic	Number	Percentage
1	Diagnostic laparoscopy only	15	30%
2	Diagnostic laparoscopy followed by therapeutic laparoscopy procedure	13	26%
3	Diagnostic laparoscopy followed by targeted surgical incision	10	20%
4	Diagnostic laparoscopy followed by median laparotomy	12	24%

Patients under study were categorized into 4 categories. Category 1 patients. Who underwent diagnostic laparoscopy and as no pathology was detected, they went home after a period of observation. Category 2 included patients who underwent diagnostic laparoscopy followed by therapeutic laparoscopic procedure. Patients needing smaller incision

and midline laparotomy were categorized as 3 and 4 respectively.

Table 6a. Therapeutic laparoscopy

Diseases	Total	Therapeutic
Appendicitis	13	9
Gynecological	6	2
Adhesive band	2	2
Koch's abdomen	4	-
Small and large bowel pathology other than appendicitis and koch's abdomen	6	-
Gallbladder pathology	2	-

Out of 50 patients, diagnostic laparoscopy could help 41 patients. In 33 patients particular pathology was identified. 13 patients had diagnostic laparoscopy followed by therapeutic laparoscopic procedure, including, 9 laparoscopic appendectomies, 2 ovarian cystectomies and in 2 patients adhesive bands were cut relieving the acute symptoms. In group B patients diagnostic laparoscopy was negative the need of urgent surgical measure.

Table 7: unexpected appendicitis

	Appendicitis	Operated laparoscopically	Operated through small incision	Operated through median laparotomy
Group A	13	9	4	-
Group B	-	-	-	-
Group C	3	-	-	3
Total	16			

unexpected appendicitis found in Group A were 13 (26%); No patients in Group B (0%) and in Group C were 3(6%) patients.

Table 8: Morbidity

Category	Number of patients
Category 1	0
Category 2	0
Category 3	2/10
Category 4	4/12

No Morbidity found in Category 1 and Category 2 patients ; and in Category 3 - 2/10 and Category 4 were 4/12.

10: Postoperative hospital stay

Category	Mean number of days
Category 1	2.47(SD=±0.64)
Category 2	3.07(SD=±0.64)
Category 3	5(SD=±2)
Category 4	10(SD=±2.95)

Category 1 and 2 patients were discharged over mean duration of around 3 days. Category 3 patients had mean hospital stay of 5 days. Category 4 patients had 10 days of mean hospital stay. Mean hospital stay of laparoscopy only group i.e. category 1 and 2 together is 2.75 days (SD=±0.7).

Table 11: Recurrence and Readmission

Group	Recurrence	Readmission
A	-	-
B	2	1
C	-	-

Recurrence and Readmission required for Group B respectively for 2 and 1.

DISCUSSION

NSAP is more common in females.[12,13,14,15] in our study group,31 of the 50 patients were females. M:F ratio of our study group was 1:1.63 maximum incidence of nonspecific acute abdomen was present in third and fourth decade of life. Other studies we reviewed also had third decads as the peak decade at presentation. The youngest patients in our study was 9 years old and the oldest patients being 67 years. The means age of presentation was 31.66 years. Median age was 31 years.

Laparoscopy as a diagnostic tool

In the 1990s, 2RCT compared early laparoscopy to active clinical observation.[58,59] both trials showed that early laparoscopy clearly facilitated the establishment of a diagnosis with subsequent therapy (97% and 81% after early laparoscopy vs. 36% and after clinical observation). Whereas more patients in the control group left the hospital without a clear diagnosis.

Negative Laparoscopy:

Group B patients i.e. patients with negative laparoscopy, had sidestepped an unnecessary laparotomy. These patients had no significant finding on diagnostic laparoscopy and were discharged after a short variable period of observation. Laparotomy Is such patients would have proved futile. Beauchamp et al. reported that in 20% to 38% of patient, laparoscopy revealed either no abnormality or discovered a disease requiring no surgery for proper management, thus avoiding the unnecessary burden of non-therapeutic laparotomies.

Laparoscopy as a therapeutic tool:

In a meta-analysis by Dominguez LC et al. results of 5 studied were considered. They found that the final therapeutic utility of the laparoscopy is lower than its diagnostic potential and varied between 10.5-86.9%[24] therapeutic potential was seen in 13 of 33 diagnosed patients of Group A. results from other studies reviewed stay true to the finding of Dominguez LC et al.

20% patients in our study could escape a major surgery i.e. median laparotomy and were operated through a targeted and well placed incision. In other studies also, diagnostic laparoscopy helped adopting the right decision and incision.

Laparoscopy defined targeted, well placed, incision:

20% patients in our study could escapa a major surgery i.e. median laparotomyand were operated through a targeted and well placed incision. In other studies also, diagnostic laparoscopy helped adopting the right decision and incision.

Insufficient laparoscopy:

As all laparoscopic procedures have an associated learning curve. Inexperience in the required therapeutic laparoscopy procedure brought us to the decision of conversion to median laparotomy in some patients. Other needed laparotomy because of improper visualization of the peritoneal cavity. 18% patients had insufficient laparoscopy in our study. Here, diagnostic laparoscopy simply segregated the patients with definite need of laparotomy. Conversion into median laparotomy at appropriate times in such cases helped avoiding major bowel injuries and catastrophic outcomes. In a similar study done by M.A. cuesta et al,[12] 12 patients of 65 patients i.e. 20% patientst had insufficient laparoscopy.

NSAP & Appendicitis:

As mentioned before, most patients with NSAP are referred as possible cases of acute appendicitis, frequently with right iliac fossa pain and tenderness. Even senior surgeons can achieve clinical diagnostic accuracy rates in appendicitis of over 80%[6] A number of these may for erroneously undergo operation suspected appendicitis and, indeed , in e study, nonspecific acute abdomen was eventually diagnosed in 33% of 135 patients undergoing appendicectomy.[1]

In our study confirmed through histopathology reporting, we could achieve 0 percent negative appendectomy rate. All patients operative for appendectomy either through laparoscope, through smaller incision or through median laparotomies, had positive reports on histopathology. 26% of patients presented with nonspecific acute abdomen was eventually diagnosed with some appendicular pathology.

The policy was not to remove the appendix during laparoscopy if no other clears cause of pain was found and the appendix looked externally normal this approach was in contrast to that adopted by previous authors who found external inspection of the appendix at laparoscopy to be an unreliable guide to the presence of appendicitis.[25] Greason et al showed that routine appendectomy during diagnostic laparoscopy does not increase morbidity and does not prolong hospital stay[27]

Negative appendectomy rates:

Using diagnostic laparoscopy, we performed only "rational appendectomies" and had no negative appendectomies.Negative appendectomy rates in patients with nonspecific acute abdomen case. When not adjunct by diagnostic laparoscopy is around 33%.[1] 12.7% webb EM et al[28]). We had no complication in laparoscopy group i.e. Group A and Group B. Patients who underwent laparoscopy as the sole

procedure in our study. Had uncomplicated and uneventful hospital stay of around 3 days. It simply signifies the milder operative stress of the procedure.

CONCLUSION:

Diagnostic laparoscopy effectively establishes a diagnosis, can be therapeutic and causes less morbidity and might change the further course of management to a more limited approach or conservative line of management and help in avoiding unnecessary non-therapeutic laparotomies, a normal laparoscopy may allow the surgeon to discharge patients who are still symptomatic. Confident that there is no requirement of for laparotomy. Incorporation of a laparoscopy may improve the management of emergency admissions and , may also; have cost benefits by rendering hospital stay and re admission rates.

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