International Surgery Journal
Shah VS et al. Int Surg J. 2022 Feb;9(2):322-326
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20220071

Original Research Article

A study of incidental appendectomy during diagnostic laparoscopy performed to evaluate the causes of lower abdominal pain

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Received: 28 December 2021
Revised: 07 January 2022
Accepted: 12 January 2022

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ABSTRACT

Background: Diagnostic laparoscopy is a minimally invasive method for the diagnosis of intra-abdominal diseases by direct inspection of intra-abdominal organs whenever there is a diagnostic dilemma even after routine diagnostic workup. Incidental appendectomy is defined as the removal of a clinically normal appendix during non-appendiceal surgery. The study is performed to evaluate the causes of lower abdominal pain during diagnostic laparoscopy and to determine the benefits of incidental appendectomy.
Methods: This study, performed at the department of surgery, B. J. medical college, Ahmedabad from May 2012 to October 2014 is a prospective study. Incidental appendectomy was performed during diagnostic laparoscopy in 30 patients with abdominal pain. Criteria such as symptomatology, aetiology of pain as found on laparoscopy, post-operative pain relief and complications were analysed.
Results: Nearly two third of the patients who presented with intractable lower abdominal pain were females. Mesenteric lymphadenopathy was the commonest per-operative finding affecting half of the patients, followed by adhesions present in about one quarter of the patients. Gynaecological conditions represented about one third of the cases. All, except one patient, had satisfactory pain relief and no complications of incidental appendectomy over a one year follow up.
Conclusions: We conclude that diagnostic laparoscopy is a very good and accurate tool to diagnose the causes of abdominal pain and should be routinely used where radiological investigations are inconclusive. Incidental appendectomy indeed has many advantages when performed in an appropriate age group and proper setting.

Keywords: Incidental appendectomy, Diagnostic laparoscopy, Lower abdominal pain

INTRODUCTION

Laparoscopic surgery, also called minimally invasive surgery (MIS), band aid surgery or key hole surgery, is performed through small incisions (usually 0.5-1.5 cm) as opposed to the larger incisions needed in laparotomy.

Diagnostic laparoscopy is a minimally invasive method for the diagnosis of intra-abdominal diseases by direct inspection of intra-abdominal organs.[1] The main advantage of diagnostic laparoscopy over traditional open laparotomy is reduced morbidity, decreased postoperative pain, and a shortened length of hospital stay. Diagnostic laparoscopy is useful for making a definitive clinical diagnosis whenever there is a diagnostic dilemma even after routine laboratory and radiological workup.

Incidental appendectomy is the removal of a clinically normal appendix during another abdominal operation.[2] This procedure is intended to eliminate the cause of lower abdominal pain, to remove the risk of appendicitis in the future and to simplify any future diagnosis of abdominal pain.

Though diagnostic laparoscopy is now established as a routine tool to diagnose the causes of intractable abdominal pain, there are different school of thoughts on whether incidental appendectomy should be performed or not keeping in mind the pros and cons of the procedure.

The objective of the study is to evaluate the use of laparoscopy as a diagnostic tool in patients with lower abdominal pain where other investigations fail to reach a conclusion, to enumerate the common causes of intractable abdominal pain and to study the usefulness of incidental appendectomy performed during diagnostic laparoscopy.

METHODS

The study was performed at the department of surgery, civil hospital, Asarwa, Ahmedabad, from May 2012 to October 2014. Study protocol of the procedure was formed along with pro forma, patient information sheet and informed consent form. The study was reviewed and approved by the institutional ethics committee.

The study was prospective, observational and longitudinal. Diagnostic laparoscopy was performed in 30 patients with intractable lower abdominal pain. In addition to treating the cause of the pain laparoscopically like adhesiolysis, ovarian cystotomy, etc, an appendectomy was performed in all cases.

The inclusion criteria for the study were-adolescents and adults between 15 and 65 years of age, patients having lower abdominal pain, patients who cannot be stamped as having acute appendicitis by laboratory and radiological investigations and patients who were fit to tolerate general anaesthesia.

The exclusion criteria included-paediatric and geriatric patients, patients with prior appendectomy, patients having acute or subacute appendicitis on ultrasonography, pregnant patients, patients who were positive for HIV, HbsAg and HCV and patients who could not tolerate general anaesthesia.

In each case, a detailed history, clinical examination, investigations and follow up was recorded as per the pro forma. Diagnostic laparoscopy was performed through a 12 mm sub-umbilical incision via a 10 mm 30-degree telescope with the patient in general anaesthesia. Additional 5mm working ports were placed as per the intra operative findings and requirement. Appendectomy was performed via two 5mm working ports- one in the suprapubic region and one in the left iliac fossa. Patients were started on enteral feeds within 24 to 48 hours of surgery. Regular dressings of the stitches were done and stitches were removed on 8 to 10 days. Post-operatively patients were followed up for a period of 1 year and evaluated for any post-operative complications, post-operative pain, incidence of stumpitis and any untoward complication of incidental appendectomy.

The collected data was compiled in Microsoft office excel 2010 format. Data was processed using Epi Info statistical software version 7.2. Frequency and proportions were obtained from the collected data.

RESULTS

The highest percentage of patients (33.33%) was in the age group of 15-25 years while lowest percentage of 3.33% was in the age group of 45-55 years. There were no patients in 55-65 years age group. The 63.33% of the patients were females while 36.67% were males.

All the patients in the study presented with abdominal pain. Anorexia was found to be the 2nd commonest symptom. Nausea, vomiting and fever were other concurrent symptoms. Diarrhoea was found to be the least common (Figure 1).

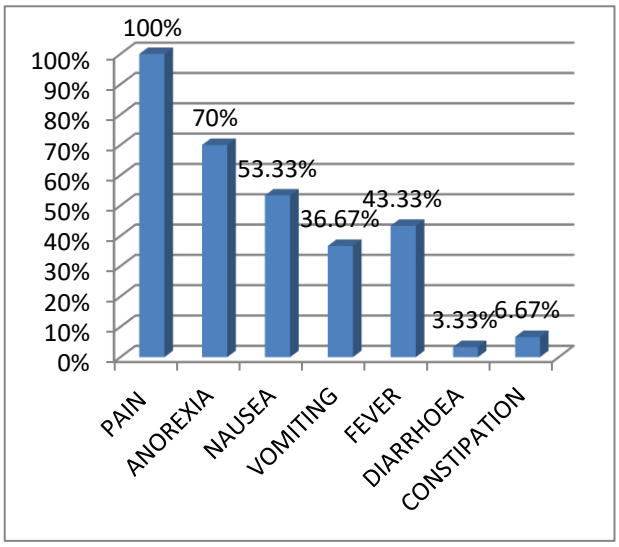

Figure 1: Distribution of cases according to symptoms.

The distribution of patients according to the site of pain is tabulated in Table 1.

Table 1: Distribution of cases according to site of pain.

Site of pain	No. of cases	Percentage (%)
Peri-umbilical region	3	10
Right iliac fossa	16	53.33
Left iliac fossa	1	3.33
Hypogastrium	2	6.67
Lower abdomen diffuse	8	26.67

Mesenteric lymphadenopathy was present in 15 cases. In most of the cases there were multiple small lymph nodes. Biopsy of the lymph nodes was warranted in two cases where the size of the nodes was more than 1.5 cm. In one of the cases, the histopathological examination was

suggestive of acute non-specific lymphadenitis. In the other case, biopsy report was suggestive of tuberculous lymphadenopathy which required AKT post operatively. Adhesions were the next common finding. Most of the adhesions were flimsy and were present between the small bowel loops and the abdominal wall (Figure 2). In one case dense adhesions were present between the bowel loops and LSCS scar site. Out of the 7 patients who had free fluid in POD, only one of the patients had haemorrhagic fluid of about 10 cc. Two other patients had about 200 cc and 100 cc serous fluid in the POD. Remaining four patients had mild serous free fluid (about 10-20 cc) in the pelvis. Out of the 4 patients having ovarian cysts, only one patient had a haemorrhagic cyst in the left ovary (Figure 3). Three other patients had cysts in the right ovary. Other pathologies detected were terminal ileitis and colitis in 3 patients, fibroid in the posterior wall of the uterus in 1 case and a mesenteric cyst in 1 case. In 5 cases, no specific abnormality was detected on diagnostic laparoscopy and hence they were considered as non-specific abdominal pain (NSAP). The findings are tabulated in Table 2.

Figure 2: Adhesions between bowel and anterior abdominal wall

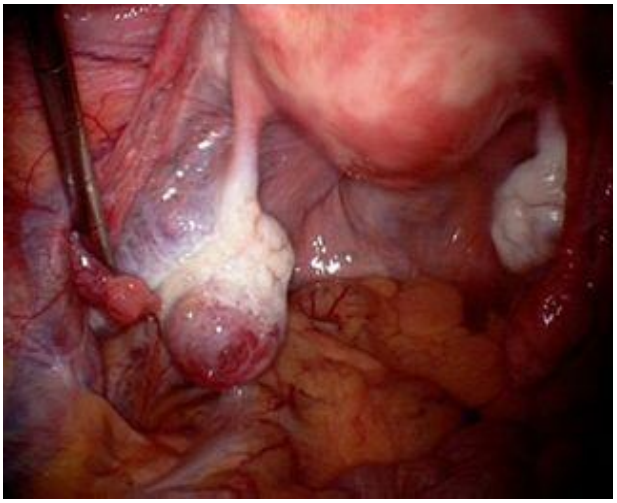

Figure 3: Left ovarian cyst.

Table 2: Distribution of cases according to laparoscopic findings.

Laparoscopy finding	No. of cases	Percentage (%)
Adhesions/ Bands	8	26.67
Free fluid	7	23.33
PID	1	3.33
Ovarian cyst	4	13.33
Mesenteric lymphadenopathy	15	50
Terminal ileitis/ colitis	3	10
Mesenteric cyst	1	3.33
Uterine fibroid	1	3.33

Some of the patients also had multiple pathologies. 4 patients had both mesenteric adenitis and free fluid, while 2 patients had free fluid with ovarian cyst with lymphadenopathy. Adhesions with lymphadenopathy, adhesions with colitis and ovarian cysts with adhesions were other overlapping findings on laparoscopy.

All, except one patient, had satisfactory pain relief over a follow up of one year. The only patient who experienced dull aching pain after about 15 days of the procedure was diagnosed to have terminal ileitis with typhlitis and was treated with antibiotics. One of the patients developed a superficial SSI at one of the port sites and one patient developed postoperative paralytic ileus both of which were treated conservatively. None of the patients presented with stumpitis post-operatively during the one year follow up.

DISCUSSION

The modern surgical practice has been completely revolutionized by the advent of laparoscopic surgery. Most of the surgical procedures which previously warranted a laparotomy can now be completed laparoscopically. This has resulted in a significant decrease in post-operative pain, morbidity and hospital stay.

Previously, a diagnostic laparotomy was the only tool to diagnose the cause of chronic abdominal pain in patients where the routine laboratory and radiological investigations failed to pinpoint a cause. The surgeons would undertake this procedure only if it was thought to be absolutely necessary because of the morbidity and complications associated with the procedure. The cons of the procedure well over weighed the pros. This led to a good number of patients with abdominal pain being left undiagnosed and treated empirically. But laparoscopy has now evolved as a tool to diagnose intractable causes of abdominal pain and is employed routinely. The procedure has the advantage of minimal post-operative pain and almost nil morbidity and complications. Furthermore, some of the conditions diagnosed on laparoscopy can be therapeutically treated in the same setting, thus avoiding an additional surgical procedure later on.

The lifetime risk of acute appendicitis is 6-7%. Incidental appendectomy is defined as the removal of a clinically normal appendix during non-appendiceal surgery.[3] Guidelines have tried to determine candidates for incidental appendectomy, and most reports recommend it in people younger than 35 years. In patients 10 to 30 years of age--the age group associated with a higher incidence of acute appendicitis-who are otherwise healthy, incidental appendectomy is effective in preventing morbidity and death associated with acute appendicitis. In patients 30 to 50 years of age, incidental appendectomy should be left to the discretion of the surgeon. In this age group, the physician should give special consideration to the gender of the patient and the desire for future childbirth. In patients more than 50 years of age, the incidence of acute appendicitis decreases and the risk associated with operation and prolonged anaesthesia is such that an incidental appendectomy is not beneficial. In mentally handicapped patients less than 50 years of age who are physically healthy, incidental appendectomy should be performed. Patients undergoing procedures that may compromise access to the appendix in the future should undergo incidental appendectomy. Incidental appendectomy is contraindicated in patients whose conditions are unstable, patients previously diagnosed with Crohn's disease, patients with an inaccessible appendix, patients undergoing radiation treatment, patients who are pathologically or iatrogenically immunosuppressed and patients with vascular grafts or other foreign material.[4]

In the present study, more than 90% of the patients belonged to the age group of 15-35 years, representing the commonest age group for incidence of acute appendicitis. Of these nearly two third were female patients having a spectrum of gynaecological conditions most of which are difficult to diagnose by laboratory and radiological investigations.

Onders et al performed a similar study on 70 patients over a three-year period from 1997 to 2000.[5] In this study, 61 patients were female and 9 were male. The results are comparable to this study where the majority of patients are females.

Barring abdominal pain, which was the indication for performing a diagnostic laparoscopy, other concurrent symptoms were anorexia, nausea, vomiting, fever, diarrhoea and constipation. All these symptoms were nonspecific and did not point to a specific intra-abdominal cause of pain.

Intra operative pathologies found in the presented study were mesenteric lymphadenitis, adhesions, PID, free fluid in pelvis, ovarian cysts, terminal ileitis, mesenteric cyst and uterine fibroid. Onders et al reported adhesions to be the commonest pathology diagnosed on laparoscopy (64.29%).[5] In the present study, mesenteric adenitis was the commonest pathology (50%) followed by adhesions which was the next common (26.27%). Onders et al also reported one case each of endometriosis and gall bladder pathology which were not found in the present study.[5]

In yet another study by Yorden et al adhesions were the most common pathology and endometriosis the least common in the cohort of the 772 patients of their study.[6]

Biswas et al studied 362 patients admitted with abdominal pain in Tralee general hospital, Ireland between January 1997 and December 1999, who then underwent a laparoscopy. The study reported non-specific abdominal pain in 36.18% of cases. Next in the frequency of occurrence were the gynaecological conditions (31.21%) followed by adhesions in 13.25% cases. Adhesions and gynaecological pathologies together make around 40% of cases in both the studies.[7] The results are compared in Table 3.

Table 3: Comparative study with Biswas et al.[7]

Intra op finding	Present study (%)	Biswas et al (%)
NSAP	16.67	36.18
Adhesions	26.67	13.25
Mesenteric adenitis	50	4.97
Bowel pathology	10	5.24
Gynaecological pathologies	16.67	31.21
Metastatic deposits	0	3.03
Others	3.33	1.93

Two- third of the patients were discharged within the first two days of the procedure. Most of the remaining patients were discharged within the next two days. Only one of the patients was discharged on the sixth post op day because of the development of post-operative paralytic ileus which required electrolyte imbalance correction. This proves that diagnostic laparoscopy is a very well tolerated procedure without any significant post procedure pain or morbidity.

There were no major complications of incidental appendectomy identified over a follow up of one year. All the patients had satisfactory pain relief. The only patient who required re admission due to typhlitis was treated with intravenous antibiotics. This probably was an incidental occurrence and not a complication. Port site SSI and paralytic ileus were the only minor complications recorded.

Berker et al and colleagues performed a study during the 10-year period from Jan 1994 to July 2004. They performed elective incidental appendicectomy in 231 patients who underwent laparoscopic treatment for pelvic endometriosis. Concomitant appendiceal pathology was present in 115 patients which made approximately 50%. They concluded that the appendix may be involved and may contribute to chronic pelvic pain in patients with endometriosis.[8]

Limitations

The sample size in the present study is small. Follow up over a longer period is warranted to formulate any guidelines over the usefulness of incidental appendectomy.

CONCLUSION

Diagnostic laparoscopy is indeed a very useful tool to diagnose the cause of intractable abdominal pain. Though it is an invasive procedure, there is no significant pain or morbidity associated with the procedure. One of the added advantages is that the procedure can be converted to a therapeutic one in the same setting if required; but it requires better surgical skills and a longer learning curve as compared to open procedures. Incidental appendectomy seems to be advantageous without any major post-operative complications and can be performed in appropriate age group with proper patient selection.

ACKNOWLEDGEMENTS

Author would like to thank his teachers, Dr. Nina Shah Madam and Dr. Parth Dalal Sir for their kind support, guidance and encouragement.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Shah VS, Parmar AJ, Ninama SM, Patel HA. A study of incidental appendectomy during diagnostic laparoscopy performed to evaluate the causes of lower abdominal pain. Int Surg J 2022;9:322-6.