

Original Research Article

Laparoscopic adhesiolysis in treatment of post appendectomy pain in right iliac fossa- an evaluation

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ABSTRACT

Background: Post-operative complications following appendectomy are relatively not uncommon and pain during this period is sometimes seen. Persistent or reappearance of similar pain causes the loss of patient's confidence on the procedure itself as well as despair for surgeons.

Methods: The study was conducted at our institution to determine the cause of post appendectomy right iliac fossa pain and to evaluate the role of laparoscopic adhesiolysis as a therapeutic tool. 35 patients with post appendectomy right iliac fossa pain were included in the study and outcome of post-operative peri-caecal adhesions (if found) treatment with laparoscopic adhesiolysis was assessed.

Results: 80% of the 35 patients were in the age group of 18-38 years. 37.14% (13 patients) were symptomatic within 1 year of appendectomy. Pain due to post-operative adhesion was found in 20% (7) of the patients. With laparoscopic adhesiolysis, the diagnostic accuracy rate was 78.57% and therapeutic relief in pain was 85.72% of the patients in our study.

Conclusions: Patients presenting recurrent pain in right iliac fossa, after appendectomy should not be overlooked. Patients with recurrent right iliac fossa pain following appendectomy may benefit from laparoscopy, both as a diagnostic tool and with the added advantage of treating the patients simultaneously in the form of laparoscopic adhesiolysis. Adhesiolysis has offered pain free life as long as our follow up is concerned.

Keywords: Adhesiolysis, Laparoscopy, Post appendectomy pain, Right iliac fossa pain

INTRODUCTION

Though appendix is considered vestigial organ, appendectomy is one of the commonest abdominal operation performed during emergency hours for acute appendicitis. It is the common inflammatory pathology in right lower abdomen. Acute appendicitis is essentially a clinical diagnosis, supported by hematological and radiological investigation. If untreated, it can progress to appendicular perforation and peritonitis. Hence treatment of choice is appendectomy. Post-operative complication following appendectomy are relatively not uncommon and reflect the degree of peritonitis that was present at the time of operation, intra operative spillage and inter

current diseases that may predispose to complication. Wound infection is the most common post-operative complication. Late complications include post-operative adhesive intestinal obstruction and right inguinal hernia.

Pain is universally understood as a signal of disease. It is the most common symptom that brings a patient to surgical attention. Patient with right iliac fossa pain after a history of appendectomy is a great challenge. Often it is difficult to pin point the cause. At the time of initial surgery, appendicitis might not be the pathology responsible for pain. A co-morbid pelvic or abdominal organ may also be responsible leading to non-alleviation of pain following appendectomy.

Post appendectomy right iliac fossa pain might be directly attributed to the natural course after a laparotomy for acute appendicitis i.e., post-operative adhesion or might be due to any pathology involving the abdominal, pelvic organ after operation or might be persisting before initial appendectomy.¹⁻³

It may be presumed that a missed diagnosis of appendicitis was made clinically.⁴ Acute appendicitis is one of the most common causes of acute abdomen in young adult and accounts for 1% of all surgical operation.⁵ Often history is inconclusive; physical signs are misleading; laboratory data despite the presence of inflammation or organic pathology are non-contributory. Persistent or reappearance of similar pain causes the loss of patient's confidence on the procedure itself as well as despair for surgeons.

All patients are not relieved off their symptoms following surgery. The large number of patients continues to visit surgical OPD for continuous pain in right iliac fossa even after appendectomy being performed.

At our institution the number of such patients attending surgery outpatient department is not negligible. The objective of the study was to find out the possible causes of right iliac fossa pain in post appendectomy patients and to find out the pericaecal adhesive pathology causing pain in right iliac fossa following appendectomy and their management with laparoscopic adhesiolysis.

METHODS

This study was conducted in Department of General Surgery at College of Medicine and JNM Hospital in Kalyani, Nadia, over a period of 18 months from January 2019 to August 2020. Patients below the age of 10 years and those above 65 years were excluded. Also patients with blood coagulation defects and pregnant women were excluded from the study.

Study design: It was a cross sectional study.

Sampling technique: All consecutive patients presenting with right iliac fossa pain post appendectomy presenting to general surgery outpatient department were included in the study

Criteria for inclusions were previous history of appendectomy, symptoms for more than 1 month of operation as non-specific pain arising from operation wound is common during this period.

All the patients were evaluated clinically and investigations performed as per protocol. Routine investigation of the urine was done to rule out urinary tract infection as a cause of pain. X-ray of kidney ureter bladder region with intent to pin point renal, ureteric, or bladder stone, if any. Barium meal x-ray of iliocaecal region was also done in case of suspicion of sub-acute

intestinal obstruction/inflammatory bowel disease/gastrointestinal tuberculosis. Ultrasonogram of the whole abdomen was done routinely to localize any pelvic pathology, if any, such as ovarian cyst, tubo-ovarian mass, hernia, myoma and others.

Patients in whom no specific cause can be accountable for persistent post-appendectomy right iliac fossa pain, was put up for laparoscopic evaluation and laparoscopic adhesiolysis. Laparoscopic procedure is performed in operating room under general anaesthesia. Laparoscopic introduction may be done in two ways are either by Closed technique or Open technique. In closed technique, pneumoperitoneum is made by Veress needle. Through a small infraumbilical skin incision, the umbilical fascia is exposed, the veress needle is introduced. In the open technique, a mini laparotomy is done at or below the level of umbilicus; a Hasson's cannula is introduced-peritoneal nick is tightened around the cannula to prevent gas leakage. Then laparoscope is introduced and pathology dealt. In this study open technique is used.

Technique of laparoscopic adhesiolysis: Prophylactic single dose of 3rd generation cephalosporin was given prior to inducing and intravenous infusion started. Patient was positioned in supine with head tilted and after creation of pneumoperitoneum, one 10 mm umbilical port and two 5 mm ports were created.

Thorough evaluation of abdomen was done and pathology was i.e., pericaecal adhesion was localized with 30 degree scope used because of adequate visualization.

Now adhesion found in relation with caecum was explored and assessed about vascularity of fibrous band. Principles of adhesiolysis that help ensure the safe division these adhesive bands while minimizing the risk of injuries adjacent bowel, solid organ, or major blood vessels, were followed: the adhesion must be streaked and opened up to help visualize the local anatomy; adhesions are usually less vascular at their point of attachment rather than in centre; an adhesive band divided right at its attachment to the abdominal wall; surgeon should minimize the practice of teasing or stripping of adhesive bands. This can result in unexpected bleeding and hematoma formation or may injure adjacent intestinal serosa; adhesions are best divided using scissors; blood vessels should be identified and coagulated prior to division; endoscopic clips, suture, bipolar diathermy or the harmonic scalpel may all be used depending on the surgeon preference.

All the patients were assessed subjectively about their pain relief and scar at 2nd week, 6th week, after 3 months, 6 months and last follow up at the end of 1 year.

Statistical analysis: Data was collected in a predefined structured proforma. Collected data was entered in Microsoft Excel following which data was cleaned

(missing informations were collected in the follow up period). Extreme values were identified and edited. Analysis was done using descriptive statistics. Frequency and percentage was calculated for qualitative variables.

Ethical approval: Institutional ethical committee clearance for the study was obtained.

RESULTS

This study included 35 patients with post appendectomy right iliac fossa pain. Age ranges of these patients were 14 years 50 years.

80% (28) of the patients were in the age group of 18-38 years. 8.57% (3) of the patients belong to the elderly and 11.43% (4 patients) were below 18 years.

37.14% (13 patients) were symptomatic within 1 year of appendectomy. 25.71% (9 patients) were symptomatic in 2nd year of their operation. 11.43% (4 patients) complaint their pain in 3rd year of appendectomy and 14.29% (5 patients) presented with similar pain in right iliac fossa in 4th year of their appendectomy. Only 5.71% (2 patients) attended surgical OPD for their pain in right iliac fossa after 5 years of appendectomy.

Patient's pain severity was assessed on subjective basis according to visual analogue scale. All of 35 patients reported their pain between 2 and 6 on visual analogue scale. About 34.29% (12) reported their pain as 4 in visual analogue scale. About 28.57% (10) reported their pain severity as 3 in visual analogue scale. About 20% patients said their pain severity as 5 in visual analogue scale and 14.28% (5) as 6 in visual analogue scale. Only 1 patient (2.86%) reported her pain severity as 2 in visual analogue scale. Patients were followed up clinically for pain assessment after 2 weeks, 6 weeks, 3 months and 1 year post operatively. Only 5.71% (2) described their pain increased after feeding.

Out of 35 patients only 8.57% (3) complained of nausea and vomiting and all the 3 patients suffered from urinary tract infection. Occasional diarrhea was present in 11.43% (4). Two patients gave history of passage of mucoid stool and one of them showed ova cyst positive on stool examination. Both responded well with medical treatment.

The urinary complaint in the form of burning in micturition was associated in 25.71% (9). Out of these 9 patients, 7 patients (20%) had demonstrable cause for their complaint, as 4 (11.43%) patients had right ureteric calculus in lower third of right ureter. Two (5.71%) patients had changes of hydronephrosis on right side. In 5 (14.29%) patients, intravenous pyelogram was done and duplication of ureter with reflux was found in 1 (2.86%). Routine urine examination and culture sensitivity of all 35 patients showed features suggestive of urinary tract infection in 6 (17.14%) patients.

Occasional fever was present in 11 (31.43%) patients and was mainly due to infection in the form of UTI, mesenteric lymphadenitis, pelvic inflammatory disease and ilio-caecal Koch's. Out of 28 female patients, 10 (35.72%) patients present with associated gynaecological complaint in the form dysmenorrhoea and leucorrhoea along with right iliac fossa pain.

Regarding previous surgery, 74.29% (26) were underwent emergency appendectomy and 25.72% (9) underwent elective appendectomy.

Regarding type of appendectomy, open procedure in 91.42% (32) and laparoscopic appendectomy were done in 8.58% (3).

Out of 35 patients 26 (74.29%) having Mc Burney's incision and 5 (14.29%) had right lower paramedian incision. About 3 (8.57%) patients had laparoscopic incision for their appendectomy and only 1 (2.86%) patients had infra-umbilical incision. About 6 (17.14%) had ragged scar with small incisional hernia in 2 (5.71%) patients.

Table 1: Distribution of different histopathology in appendicitis.

Histopathology	No. of patients	Percentage
Acute appendicitis	19	54.29
Recurrent appendicitis	4	11.43
Acute on chronic appendicitis	1	2.86
Report was not available	11	31.43

Out of 35 patients, 24 (68.57%) patients were able to show the histological report of previous appendectomy specimen and acute appendicitis was the main finding in 19 patients (54.29%) (Table 1).

Table 2: Showing findings of routine blood investigation.

Investigation findings	No. of patients	Percentage
Leucocytosis	8	22.86
Anaemia	6	17.14
Eosinophilia with anaemia	2	5.71
Normal study	19	54.28

Routine blood investigation was performed in all 35 patients and leukocytosis was the main aberration in 8 patients (22.86%). However 19 patients (54.28%) in the study had normal blood picture (Table 2).

Urine for routine examination and culture/sensitivity performed in all 35 patients and 6 patients (17.14%) had features suggestive of urinary tract infection while the remaining patients (82.86%) were devoid of it.

Table 3: Showing findings of ultrasonography of whole abdomen.

Findings	No. of patients	Percentage
Ureteric stone	4	11.42
Mesenteric lymphadenitis	2	5.71
Ovarian cyst	2	5.71
Tubo-ovarian mass	2	5.71
Gut related mass	1	2.86
Uterine fibroid	1	2.86
Pelvic collection	3	8.57

Ultrasonography of whole abdomen was performed in all 35 patients and it was seen that ureteric stone, pelvic collection, mesenteric lymphadenitis, ovarian cyst and tubo-ovarian mass were top findings (Table 3).

Barium meal follow through x-ray was performed in all 35 patients. It yielded normal in 30 patients while 2 patients (5.71%) had long appendiceal stump; iliocaecal Koch's, caecal growth and ulcerative colitis were found in 1 patient (2.86%) each.

Contrast enhanced CT scan of whole abdomen was performed only in 7 patients out of which 5 had abdominopelvic pathology. Benign ovarian cyst was found in 1 patient. Ovarian neoplasm and mesenteric lymphadenitis were found in 2 patients each.

Table 4: Showing findings laparoscopy procedure.

Laparoscopic findings	Laparoscopic procedure	No. of patients	Percentage
Diffuse and gross pericaecal adhesion	Adhesiolysis	6	17.14
Linear bands causing bowel compression	Adhesiolysis	1	2.86
Adnexal pathology (ovarian cyst)	Cystectomy	1	2.86
Pelvic inflammatory disease	-	2	5.71
Meckel's diverticulum	-	1	2.86
Normal study	-	3	8.57

In absence of significant findings based on various types of investigation, only 14 (40%) patients were put up for laparoscopy with therapeutic intent and revealed the pathology mentioned in Table 4. Total 7 (20%) patients had adhesion in the form of diffuse, pericaecal adhesions and definite linear bands causing bowel compression. But 50% of the laparoscopic patients showed adhesive pathology.

After laboratory, radiological and laparoscopic evaluation distribution of causes of right iliac fossa pain was found as tabulated in Table 5.

Table 5: Showing distribution of different causes of right iliac fossa pain.

Pathology	No. of patients	Percentage
Adhesion	7	20
Ureteric calculus	4	11.43
UTI	2	5.71
Appendix stump	2	5.71
Mesenteric adenitis	2	5.71
Incisional hernia	2	5.71
Ovarian cyst	2	5.71
Tubo ovarian mass	2	5.71
PID	2	5.71
Worm infestation	2	5.71
Llio-caecal Koch's	1	2.86
Meckel's diverticulum	1	2.86
Ulcerative colitis	1	2.86
Caecal growth	1	2.86
Uterine fibrid	1	2.86
Cutaneous nerve entrapment	1	2.86
No pathology (psychological)	2	5.71

About 7 (20%) patients in whom no specific cause can be accountable for persistent post-appendectomy right iliac fossa pain after clinical evaluation and investigation were put up for laparoscopic adhesiolysis. Pain relief obtained post-operatively in follow up period is tabulated in Table 6.

Table 6: Showing pain relief in post-operative follow-up period.

Relief of pain	VAS (preoperative postoperative)	No. of patients	Percentage
Complete	4-1	5	71.43
Significant relief	4-2	1	14.29
No relief of pain	6-6	1	14.28

In view of these result we would like to suggest that this group of patients with unexplained right iliac fossa pain following appendectomy by clinical evaluation and investigation may benefit from laparoscopy, both as diagnostic tool and with the added advantage of treating the patients simultaneously in the form of laparoscopic adhesiolysis. The diagnostic accuracy rate was 78.57% and therapeutic relief in pain was 85.72% of the patients in our study.

Regarding post-operative complications, 2 (5.71%) patient had wound infection and 1 (2.86%) patient had

hypertrophied granulation tissue at scar site which was due to a piece of thread in the subcutaneous tissue.

DISCUSSION

It is noted that about 8.4% of all appendicectomy patients complained similar pain in right iliac fossa.⁶ This study included 35 cases who were operated for appendicitis, continue to visit hospital for continuing similar pain in right iliac fossa for more than one month. Out of 35 cases 28 (80%) patients were female and 7 (20%) were male.

Piper et al have shown that the diagnostic accuracy for appendicitis is low in female patients than in males.⁷ Their study of 1018 cases showed that the diagnosis was correct in 77.7% of the males and 58% of the females with error in diagnosis of 22.3% with male and as high as 42% with females. The overall diagnostic accuracy was low in female patients. The main reason for it, they concluded, that presence of gynaecological disorders as high as 15.5% of cases. In our study, 80% of female patients presented with recurrent symptom as against 20% of male patients suggesting diagnostic accuracy was less in female; with as high as 6 (17.14%) patients with gynaecological problem in form of adnexal pathology pelvic inflammatory disease.

In our study out of the 35 cases, 28 patients (80%) were in age group 18-38 years. In literature, regarding patient particulars 60% of patients were female in the age group of 15-35 years.⁸ Other study, showed about 76% female patients with similar complaint. In our study female patients were 80%.⁹ The preponderance in this age group can be explained by the fact that this is the age group in which patients are subjected to maximum stress and strains of life and hence more prone for psychological trauma. Some findings were given by Ingram et al and they stated that out of 118 young patients who were subjected to appendectomy, only 24% of them got relief of symptoms, thus, either doubting clinical diagnostic accuracy in this age group or association of their pathologies. Piper et al have also shown that diagnostic accuracy falls to 52.7% in the patients in the age group 10-39 years.⁷ They found variety of other conditions in 139 patients which included mesenteric adenitis (63) gynaecological disorders (26) gastroenteritis (24) and urinary tract infection or stone (12). Thus large number of young patients coming with recurrent pain is explainable.

There are many conditions those mimic appendicitis, thus clinical diagnostic error has been reported by various authors varies from 10-42% even with recent advances in radiological diagnosis. Thus approximate incidence of negative appendectomy is 10%. Jinxing et al in 1981 suggested error in diagnosis around 15%.⁹ Per Jess in 1998 reported diagnostic accuracy of around 70%.¹⁰

Out of 35 cases, 26 patients (74.29%) presented in first three years. Out of total 35 patients, 26 (74.29%) were

operated during emergency hours with diagnosis of acute appendicitis, 9 (25.71%) were operated as elective cases with diagnosis of recurrent appendicitis. The continuing symptoms even after removal of inflamed appendix can be explained by Greene et al had showed that incomplete removal of appendix result for failure of the surgeon to locate the true appendicocaecal junction due to abnormally situated ileocaecal fold or an inflammatory process that conceals the proximal portion of appendix.¹¹ This remaining stump may be a seat for subsequent inflammation. In his study, Greene et al showed 3 cases who presented either with stump appendicitis and or with perforation.¹¹ In our study we found 2 (5.71) with clinical diagnosis of stump appendicitis which on radiological study with barium meal follow through examination also suggestive of query stump appendicitis. Patients presented with acute pain in right iliac fossa following appendectomy and responded conservative measures.

Inability to recognize associated pathologies and technique mistake can cause recurrent symptoms. The method of invagination of ligated appendiceal stump with purse sting suture is routinely followed in different center. Goode has raised the possibility of this can't be rule out for continuing pain in right iliac fossa.¹² The surgical removal of chronically inflamed appendix is not surety for abolishing of symptoms. In our study, 9 (25.71%) patients who underwent elective appendectomies come with recurrent pain. Mc Lennan et al studied 413 cases of chronic appendicitis who underwent surgery.¹³ Out of it 83.5% female and 74.2% male patients had relief. Rest 16.5% female and 25.8% male patients had continuing pain. He concluded that existing adhesions, kinks and fibrosis renders surgical procedure inaccurate and tedious. In our study, there were 4 chronic and 1 acute on chronic patients who continued with pain even after appendectomy for chronic appendicitis.

All the 35 patients under study presented with pain in right iliac fossa. This symptom was the major criteria for selection of patients. The urinary complaint in the form of burning in micturition was associated complaint in 9 (25.71%) patients. Out of these 9 patients; 6 patients (17.14%) had demonstrable cause for their complaint, 4 (11.42%) patients had right ureteric calculus in lower 3rd of right ureter. Two patients (5.71%) had changes of hydronephrosis on right side. American urologists have stressed the fact that minor degree of congenital narrowing of a ureter, where it crosses pelvic brim, often exists. It generally causes pain in right iliac fossa. Pain was UTI and stones in 12 out of 139 patients with 8.6% prevalence.

3 (8.57%) patients had associated vomiting. Out of these all 3 had urinary tract disease. Thus, patients of appendicitis may have associated urinary track pathologies which should not be overlooked. Associated urinary tract disease is cause or effect of appendicitis can't be stated firmly but possibility of either can't be

ruled out. The diagnosis of associated lesions and its treatment can lead to abolishing of future agony. 2 (5.71%) patients presented with pain in right iliac fossa with mucoid stool. On stool examination, stool for ova and cyst 1 was found positive and both responded well with medical treatment. Yu et al in their study suggested radiological features to differentiate it from acute appendicitis.⁹

1 patient (2.86%) on barium study found to have inflammatory bowel disease as ulcerative with loss of haustration pattern and treated on medical line of management. The long segmental wall thickening of the terminal ileum, the center of inflammation away from the appendix and circumferential symmetric thickening of the caecum are the major features that differentiate Crohn's disease from appendicitis. Jain et al suggested inflammatory bowel disease manifest as right iliac fossa pain keeping in mind as differential diagnosis.¹⁴

Out of 35 patients studied, 26 (74.29%) had right Mc Burney's incision scar, 5 (14.29%) had right lower paramedian scar and had 1 (2.86%) had infra-umbilical midline scar. 3 (8.57%) underwent laparoscopic appendectomy. About 6 (17.14%) patients had ragged right Mc Burney's scar. Out of these 6 patients 2 (5.71%) had associated small incisional hernia at scar site. Garlock et al found incidence of incisional hernia is 6.4% of cases in study of 624 cases of appendectomies with right Mc Burney's incision.¹⁵ Gue studied 51 cases of indirect inguinal hernia with previous history of appendectomies.¹⁶ Out of these, 41 cases had right inguinal hernia, 7 cases had left inguinal hernia and 3 had bilateral inguinal hernia. The incidence of right to left was being 6:1.

About 3 (8.57%) patients had not found any organic cause for their pain by evaluation. Out of these 3 patients, 1 (2.86%) had neuralgic pain in his scar and local infiltration and block of cutaneous nerve in abdominal wall relieved his pain. Cutaneous nerve entrapment is frequently overlooked cause of post appendectomy pain. Battery of tests does not show any pathology and finally it is considered as possible diagnosis. The patients may be treated by local infiltration and block of cutaneous nerve in abdominal wall. This produces pain relief. We also were successful in 1 (2.86%) cases in our study. Another 2 (5.71%) out of 3 cases without any organic cause were subjected to psychological evaluation and were found to have "psychological pain disorder". Gomez et al, evaluated 96 patients complaining of persistent abdominal pain, only 15 (15.6%) patients had organic disorder.¹⁷ In the remaining 81 (84%) patients, psychological factors were considered primary cause of their pain. But in our study only 2 (5.71%) patients found to have psychological pain in the form of depression and anxiety disorder.

Regarding different modalities of investigations to find out the missing cause of pain, different studies have given

a guide line. Straight x-ray abdomen can show ureteric calculous. In our study, ureteric calculous was found in 4 (11.43%) cases.

USG study had 71-90% accuracy whereas contrast CT has 93-98% accuracy.^{8,18} In our study, only 4 (11.43%) had tubo-ovarian pathology. About 2 patients (5.71%) had mesenteric lymphadenitis diagnose on USG and found to have symptoms due to nonspecific lymphadenitis. Mesenteric adenitis represents a benign infection or inflammation of lymph node within the mesentery that results in abdominal pain, often mimic appendicitis clinically. Piper et al found variety of other conditions in 139 patients which included mesenteric adenitis in 63 (45.32%) cases.⁷ In our study we could manage these two patients with conservative line of management.

Laparoscopic appendectomy having better results than open as in our study only 3 (8.57%) presented with post appendectomy pain as compared to open appendectomy in 32 (91.43%) cases. Greason suggested that laparoscopic removal of the appendix produces no morbidity and associated with less post-operative comorbidity.¹⁸

In our study, we could find histopathologically majority of patients were correctly diagnosed for pathology. But post appendectomy pain more commonly found in relation to acute appendicitis on histopathology study. Cause may be procedure related in emergency surgery as well as prolonged sepsis in acute condition. In our study, acute appendicitis on histopathology was seen in 19 (54.28%) cases but recurrent appendicitis was found in 4 (11.43%) cases. Sami, in the study of 100 consecutive cases of acute appendicitis with their histopathological findings found no correlation with histopathological diagnosis.¹⁹

Diagnostic is now a days an important aid for evaluation of such cases as it serves the purpose of both diagnostic and the therapeutic value. Extra appendiceal pathology is seen in 5% cases in patients below 50 years and in 20% cases above 50 years.²⁰⁻²² Gross pericaecal adhesions, linear bands, adnexal pathology, long appendiceal stump, small incisional hernia were reported in different studies. About 70% of adhesive pathology and 30% of non-adhesive pathology showed pain. About 68% had pericaecal adhesions.²³ In our study, we found pericaecal adhesion in 6 (17.14%) cases.

Regarding definite therapeutic procedure for giving relief pain, adhesiolysis was important factor. In a study, Lehmann Willenbrock et al suggested that post-operative intestinal adhesions are the most common clinical entity causing recurrent pain after appendectomy or even after any pelvic surgery.²⁴ Post-operative adhesiolysis may relieve the pain in most of the cases. It can be done by laparotomy or laparoscopically. Pain was even relieved after two days of operation. In 75% cases adhesiolysis

was done successfully laparoscopically. 56% had no pain at the end of 18th month. 14 patients (40%) were under went laparoscopic procedure for persistent pain in right iliac fossa without any detectable cause excluded by thorough investigation. Intra-operative findings were adhesions in 7 (20%) cases at the base of the appendix and underwent adhesiolysis by bipolar diathermy and scissor and got relief of symptoms in 6 (85.71%) of the adhesiolysis patients. In view of this result we would like to suggest that this group of patients may benefit from laparoscopic adhesiolysis and therapeutic relief of pain in 85.71% of the patients underwent adhesiolysis.

The limitation of our study is that it includes small study sample with a short follow up period.

CONCLUSION

To conclude, patients presenting recurrent pain in right iliac fossa, after appendectomy should not be overlooked. Many of them may have organic cause for their symptoms. The maximum stress and strain of life in young age and female sex could be associated factor. Urinary tract disease in the form of calculous, hydronephrosis, and or associated infection of urinary tract is major cause for symptoms. Patients of child bearing age group need gynaecological review in female cases. Gynaecological disease in the form of ovarian cyst, tubo-ovarian mass, pelvic inflammatory disease and uterine fibroid are major causes for recurrent right iliac fossa pain after appendectomy. Incisional hernia in scar site following right Mc Burney's incision is not uncommon. Inflammation of remaining stump of appendix is also usually seen technical error during surgery can leads to long stump which can be future cause for morbidity. The patients with recurrent pain in right iliac fossa following appendectomies should be subjected to psychological evaluation if no organic cause is found. Pericaecal adhesion appears to be main factor in cases where investigation do not show other missed pathology. Patients with recurrent right iliac fossa pain following appendectomy may benefit from laparoscopy, both as a diagnostic tool and with the added advantage of treating the patients simultaneously in the form of laparoscopic adhesiolysis. Adhesiolysis has offered pain free life as long as our follow up is concerned.

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REFERENCES

1. Lewis FR, Holcroft JW, Boey J, Dunphy JE. Appendicitis: a critical review of diagnosis and treatment in 1,000 cases. Arch Surg. 1975;110(5):677-84.
2. Ellis H, Moran BJ, Thompson JN, Parker MC, Wilson MS, Menzies D, et al. Adhesion-related

- hospital readmissions after abdominal and pelvic surgery: a retrospective cohort study. Lancet. 1999;353(9163):1476-80.
3. Rapkin AJ. Adhesion and pelvic pain: a retrospective study. Obstet Gynaecol. 1986;68:13-5.
4. Weibel MA, Majno G. Peritoneal adhesions and their relation to abdominal surgery: a postmortem study. Am J Surg. 1973;126(3):345-53.
5. Borgstein PS, Gordjn RJ, Ejsboals QA. Acute appendicitis a clear cut diagnosis in men, a guessing game in young women. A prospective study on role of laparoscopy. Surg Endosc. 1997;11:923-7.
6. Andersson RE, Hugander AP, Ghazi SH, Ravn H, Offenbartl SK, Nyström PO, et al. Why does the clinical diagnosis fail in suspected appendicitis? Eur J Surg. 2000;166(10):796-802.
7. Piper R, Kager L. Acute appendicitis: a clinical study of 1018 case of emergency appendectomy. Acta Chir Scand. 1982;148:51.
8. Archibong EA, Eskandar M, Sobarde AS Ajao OG. Right lower quadrant pain in female. Is it appendicitis or Gynaecological? Dis Surg. 2002;23(1):30-3.
9. Yu J, Fulcher AS, Turner MA, Halvorsen RA. Helical CT evaluation of acute right lower quadrant pain: part I, common mimics of appendicitis. Am J Roentgenol. 2005;184(4):1136-42.
10. Jess P, Bjerregaard B, Brynitz S, Holst-Christensen J, Kalaja E, Lund-Kristensen J. Acute appendicitis: prospective trial concerning diagnostic accuracy and complications. Am J Surg. 1981;141(2):232-4.
11. Greene JM, Peckler D, Schumer W, Greene EI. Incomplete surgical removal of the appendix; its complications. J Int Coll Surg. 1958;29(2 Pt 1):141-6.
12. Goode JV. Management of appendiceal stump. Ann Surg. 1943;13:956-63.
13. Mc Leanan I, Watt JK. Justification for appendectomy in chronic appendicitis. Br Med J. 1954;2:738.
14. Jain KA, Quam JP, Ablin DS, Gerscovich EO, Shelton DK. Imaging findings in patients with right lower quadrant pain: alternative diagnoses to appendicitis. J Comput Assist Tomogr. 1997;21:693-8.
15. Garlock JH. Appendectomy wound repair and hernia. Ann Surg. 1929;89(2):282.
16. Gue S. Development of right inguinal hernia following appendectomy. Br Med J. 1972;59:352.
17. Gomez AL, Peter KS. Psychological mediated abdominal pain in surgical and medical out patients clinic. Br Med J. 1977;1:1451.
18. Greason KL, Rappold JF, Liberman MA. Incidental laparoscopic appendectomy for acute right lower quadrant abdominal pain. Its time has come. Surg Endosc. 1998;12:223-5.
19. Samsi AB, Adrakar NV, Kamat RS. A study of 100 consecutive cases of acute appendicitis with their histological findings. Indian J Surg. 1969;3:574-9.

20. Whitworth CM, Whitworth PW, Sanfillipo J, Polk HC Jr. Value of diagnostic laparoscopy in young women with possible appendicitis. *Surg Gynecol Obstet.* 1988;167(3):187-90.
21. Greenberg JJ, Esposito JJ. Appendicitis after appendicetomy: a warning. *J laparoendosc Surg.* 1996;6:185.
22. Carter JE. Laparoscopic treatment for chronic pelvic pain: results from three-year follow-up. *J Am Assoc Gynecol Laparosc.* 1994;1(4, Part 2):S6.
23. Hallfeldt KK, Kantelhardt T, Waldner H, Schweiberer L. Laparoscopic adhesiolysis in therapy of chronic abdominal pain. *Zentralblatt fur Chirurgie.* 1995;120(5):387-91.
24. Lehmann Willenbrock E, Mecke H, Riedel H. Sequelae of appendectomy with special reference to intra-abdominal adhesions, chronic abdominal pain. *Gynaecol Obstet Invest.* 1990;29(4):241-5.

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