



EVALUATION OF RIGHT ILIAC FOSSA PAIN IN SURGERY: A CROSS-SECTIONAL STUDY

Surgery

Zil Desai* Department Of General Surgery, SBKS Medical Institute & Research Centre, Piparia-391760. *Corresponding Author

Rajesh Bharaney Department Of General Surgery, SBKS Medical Institute & Research Centre, Piparia-391760.

ABSTRACT

Background: Right iliac fossa discomfort continues to be the most frequently encountered clinical problem among general surgeons. It accounts for approximately 50% of all instances of acute abdomen. Appendicitis is the most common cause of right iliac fossa pain. The purpose of this study was to analyse, evaluate, and manage individuals who presented with right iliac fossa pain.

Methodology: The present cross-sectional study involved a total of 100 adult patients. To arrive at the ultimate diagnosis, all patients had clinical evaluation and radiological assessment. Following that, a histopathological report was completed on all patients who underwent surgical treatment.

Results: In the current study, 63% of patients were male, and 37% were female. The incidence of right iliac fossa pain was found to be considerably higher in young individuals. Acute appendicitis was shown to be the most often diagnosed cause of right iliac fossa pain (79%). 85% of patients required surgical intervention, with 69 patients being diagnosed with acute appendicitis on histological examination.

Conclusion: Males and females had a higher incidence of acute appendicitis in the younger age groups, although males had a higher total incidence. Acute appendicitis occurred at a rate of 79.00% in patients with right iliac fossa discomfort. A clinical and radiological research was conducted to validate the diagnosis of right iliac fossa discomfort, which resulted in a decrease in the incidence of negative appendectomy.

KEYWORDS

Iliac fossa; Appendicitis; Right iliac fossa pain.

INTRODUCTION

Right iliac fossa is located in the abdomen's right inferior region. Right iliac fossa discomfort is still a common complication for general surgeons and has been observed in more than half of patients presenting with acute abdomen pain. The appendix, caecum, terminal ileum, mesenteric lymph nodes, iliopsoas sheath, ascending colon, right ovary, salpinx/testis, and right ureter are all structures connected with the right iliac fossa. Appendicitis is the most common cause of right iliac fossa pain.

According to some studies, males face an approximately 1/4th greater risk of appendicitis than females. Additionally, the study discovered that appendicitis was more prevalent in young adult males. Globally, the incidence is 0.01%, and roughly a quarter of the population in the United States has undergone appendectomy due to non-specific mesenteric adenitis.

Globally, it was discovered that more than half of people suspected of having the condition did not require surgery. Typhoid fever may appear with intestinal obstruction/perforation, a life-threatening complication that is more likely in patients with poor socioeconomic level [1-2]. In 1/3 of all tuberculosis patients, intestinal Tuberculosis has been identified, with Tuberculosis near the ileocaecal junction being particularly prevalent.

Epididymo-orchitis was more prevalent in men and had a double peak incidence, the first occurring in the second and third decades of life and the second occurring after the sixth decade of life. Because Yersinia infection mimics appendicitis, the illness is dubbed pseudo-appendix. Ulcerative colitis has a prevalence of 225-250 cases per 100,000 people, while Crohn's disease has a prevalence of 195-200 cases per 100,000 people [3]. Between 5% and 10% of the population may develop a urinary tract stone during their lives, with a recurrence rate of approximately 50%.

Diverticulitis is commonly associated with the elderly. However, up to 20% of people with diverticulitis are under the age of 50. In some circumstances, pain associated with an inguinal hernia may manifest in the right iliac fossa due to irritated ilioinguinal and iliohypogastric nerves. Other non-surgical causes of right iliac fossa discomfort include ruptured ectopic pregnancy, ovarian cyst, ovarian tumour, fibroid degeneration, pelvic inflammatory disease, ovarian torsion, and Mittelschmerz [1]. This study will focus exclusively on surgical causes of right iliac fossa pain.

The purpose of this study is to comprehensively identify the many clinical diseases that manifest as the mass in the right iliac fossa. Its

objective is to ascertain the most frequent cause of right iliac fossa mass. Additionally, the study aims to ascertain the various clinicopathological manifestations of their illnesses.

This procedure entails documenting the symptoms, signs, and histology of operated specimens in accordance with contemporary trends that are more prevalent in particular illnesses. This can aid the surgeon in differentiating between the numerous origins of mass in the right iliac fossa.

MATERIAL AND METHOD

The present Prospective Cross-Sectional Study enrolled a total of 100 patients aged over 18 years of both sexes. The study included all patients who presented to the outpatient department, were referred to or were admitted to the general surgery department with complaints of right iliac fossa pain. However, unwilling patients, patients with immunocompromised status, and patients with concomitant conditions such as cardiac/respiratory disorders, and organ failure were excluded.

After receiving approval from SVIEC in September 2016, a screening method was conducted on patients who presented to a tertiary care hospital with right iliac fossa pain. Then, 100 patients were enrolled based on the study's selection criteria. The purpose of the study was described to potential study participants, and after obtaining oral agreement from the patient regarding his or her involvement in the study, the patient was informed of the complete study method. After the patient was enrolled in the study, a complete medical history and admission history was recorded and a thorough physical examination. On admission, data on the patient's age, address, and clinical presentation were collected regarding the location of the pain, its duration, its nature, its association with vomiting, nausea, changes in bowel habits, its association with meals, fever, weight loss, rectal bleeding, loss of appetite, hematuria, and other urinary complaints.

Previous occurrences and co-morbidities were mentioned in the history. Family history was elicited for similar problems. Clinical examination of the abdomen was performed to ascertain the precise site of the pain, the presence of palpable lumps, and the presence of any organomegaly. A rectal examination was performed to rule out the presence of any palpable lump. There were reports of standard investigations such as full hemograms, renal function tests, random blood sugar measurements, serum electrolytes, and serology. Ultrasonography of the abdomen and pelvis was collected in addition to the blood investigation report. Each piece of data was entered using a predetermined proforma.

Statistical Analysis

Statistical analysis was performed using SPSS software (SPSS Inc., Chicago, IL, USA) for Windows program (15.0 version). The continuous variables were evaluated by mean (standard deviation) or range value when required. The dichotomous variables were presented in number/frequency and were analyzed using the Chi-square test. With 95% confidence interval, a p-value of < 0.05 or 0.001 was regarded as significant.

RESULTS

We enrolled a total of 100 patients with right iliac fossa discomfort who visited the Department of General Surgery at Dhiraj General Hospital. Males comprised 63.00 %, while females comprised 37.00 % (p=0.5361) [Table-1].

At our facility, we found that 45.00 % had an age between 20 and 25 years, followed by 23.00 % who had an age between 31 and 35 years, 14.00 % who had an age between 26 and 30 years, and 7.00 % who had an age between 36 and 40 years or 41 to 45 years, respectively. As a result of the foregoing, we determined that roughly 85.00 % of patients in our study were younger than 35 years. The patients' mean age was 34.687.56 years [Figure-1].

According to gender distribution, 42.86 % patients and 48.65 % of female patients were between the ages of 20 and 25 years, 28.57 % of male patients and 13.51 % of female patients were between the ages of 31 and 35 years, 14.29 % patients and 13.51 % of female patients were between the ages of 26 and 30 years, and 4.76 % patients and 13.51 % of female patients were between the ages of 26 and 30 years. Tenderness in the right Iliac Fossa is the most prevalent symptom of acute appendicitis, followed by nausea and vomiting. Patients with Mesenteric Lymphadenitis almost universally complained of nausea and vomiting. The most often seen symptom in individuals with right lower ureteric calculi is burning micturition. Fever and Right Iliac Fossa Tenderness were found in patients with Tuberculosis at the I-C junction and Enteric Fever [Table-2].

Changes in bowel habits are observed in malignancies at the I-C junction, as does weight loss. These are the various signs and symptoms linked with various diseases. Pathological and radiological examinations were performed to confirm the diagnosis. In this study, 7.00% of patients had anaemia, 65.00% had leucocytosis, 55.00% had neutrophilia, and 17.00% had an elevated ESR. USG (Abdomen Pelvis) was performed on all enrolled patients, whilst X-Ray (KUB) was performed on 10% of patients. CT Scan (Abdomen Pelvis) was necessary for 91 % and 02 % of patients (IVP) [Table-3]. Around 4/5ths (79.00 %) of patients were diagnosed with acute appendicitis, whereas the remaining 21.00 % were classified as follows. 10.00 % had Mesenteric Lymphadenitis, 04.00 % had Right Lower Ucentric Calculi, 02.00 % had Tuberculosis at the I-C junction or Other Findings (Ectopic Kidney, Right Undescended Testis), and 01.00 % had Enteric Fever, Malignancy, or Diverticulitis, respectively.

Acute appendicitis was the most common diagnosis in males and females, accounting for 78.00 % in males and 83.00 % in females. Whereas 11.11 % of male patients and 8.11 % of female patients were diagnosed with Mesenteric Lymphadenitis, 4.76 % of male patients and 2.70 % of female patients were diagnosed with Right Lower Ucentric Calculi, 5.41 % of female patients were diagnosed with Tuberculosis at the I-C junction, and 0.00 % of male patients were diagnosed with Enteric Fever and Malignant (p=0.4321). 85.00% of patients required surgical intervention, whereas 15.00% required only conservative treatment [Table-3 & 4; Figure-2].

Appendicitis was diagnosed in 79 patients, 48 of them were male, and 31 of them were female. All had appendicectomy, with 14 patients having a negative histopathological report for appendicitis and 65 patients having a positive histopathological report for appendicitis [Figure-3]. In the present study, 85.00 % of patients required surgical intervention, whereas 15% received conservative treatment. 90.59 % of 85 patients who underwent surgical treatment were diagnosed with Acute Appendicitis, 2.35 % with Right Lower Ureteric Calculi, Tuberculosis at the I-C Junction, and Other Findings (Ectopic Kidney, Right Undescended Testis), and 1.18 % with Malignancy or Diverticulitis, respectively (p<0.0001*).

Out of 15 patients that required conservative treatment, 66.67 % had Mesenteric Lymphadenitis, 13.33 % had Acute Appendicitis or Right Lower Ucentric Calculi, and 6.67 % had an enteric fever.

DISCUSSION

The right iliac fossa is located in the abdomen's right inferior region. Right iliac fossa discomfort is still a common complication for general surgeons and has been observed in more than half of patients presenting with acute abdomen pain. The appendix, caecum, terminal ileum, mesenteric lymph nodes, iliopsoas sheath, ascending colon, right ovary, salpinx/testis, and right ureter are all structures connected with the right iliac fossa. Appendicitis is the most common cause of right iliac fossa pain. Other possibilities for right iliac fossa discomfort include mesenteric lymphadenitis, right lower ureteric calculi, Tuberculosis at the I-C junction, enteric fever, malignancy, right ectopic kidney, and right undescended testis.

This study includes only surgical causes of right iliac fossa discomfort. Tenderness in the right iliac fossa, fever, nausea, and vomiting are signs and symptoms of appendicitis; nausea and vomiting are signs and symptoms of Meckel's diverticulitis; pain in the right lower ureteric calculi is associated with burning micturition, Tuberculosis at the I-C junction, and enteric fever pain is associated with fever, anorexia, and diarrhoea.

In countries such as India, where modern radiological investigations are not financially feasible, general surgeons confront difficulties diagnosing acute appendicitis. As a result, they must rely on clinical factors, although misdiagnosis and negative appendicectomy still occur at a high rate. The surgeon is responsible for determining the most cost-effective management strategy. The decision to operate or not to operate is critical because surgical intervention in acute appendicitis has a risk of morbidity and mortality; a negative appendicectomy carries a morbidity and mortality rate of approximately 10%.

Male patients constituted a greater proportion of the population in this study than female patients. Male and female percentages in Modi et al.'s[4]. study were 40.00 % and 60.00 %, respectively, whereas male and female percentages in Gaurav et al.'s[5] study were 54.62 % and 45.38 %. In Modi et al.'s[4] study, female patients were found to be 1.5 times more prevalent than male patients. However, in this study, male patients were 1.7 times more prevalent than female patients. The current study discovered that the incidence of acute appendicitis was higher in the younger age groups of both males and females, although the total incidence was higher in males; these findings were also consistent with those of earlier published research studies. Modi et al.[4] concluded in 2015 that the peak incidence occurred in the third decade. However, the current study discovered that the peak incidence occurred in the third decade as well, and similarly, Gurav et al.[5] discovered a greater incidence in the third decade. Tenderness in the right iliac fossa was the most frequently reported symptom in patients with acute appendicitis, followed by nausea and vomiting. Additionally, Modi et al.[4] discovered that right iliac fossa soreness was the most frequently encountered presentation in patients with acute appendicitis.

In the current study, 70.00 % and 59.00 % of patients had Nausea & Vomiting and Fever; whereas, in a study conducted by Gaurav et al.[5], 94.00 % and 70.00 % of patients, respectively, had Nausea & Vomiting and Fever. According to J B Modi et al.'s[4] study, 50.00 % and 40.00 % of patients, respectively, suffered Nausea & Vomiting and Fever. Appendicitis pain begins in the umbilical region as viscera-somatic pain and progresses to the RIF due to the parietal peritoneum's involvement as the inflammatory disease progresses. Vomiting happens in appendicitis when the appendix perforates or becomes extremely inflamed.

In the current study, 10.00 %, 07.00 %, 09.00 %, and 03.00 % of patients, respectively, had nausea, vomiting, fever, and diarrhoea; whereas, Maheshwari et al. discovered that 12.20 %, 08.70 %, 07.00 %, and 28.00 % of patients, respectively, had nausea, vomiting, fever, and diarrhoea. Inflammation of the mesenteric lymph nodes resulting from infection (mostly bacteria), inflammatory bowel disease, pancreatitis, or connective tissue diseases; a membrane that connects the gut to the abdominal wall, resulting in discomfort. Nausea, vomiting, fever, and diarrhoea occur due to pyrogens entering the bloodstream and peritoneal inflammation. Only two patients with right iliac fossa discomfort were identified with Tuberculosis at the I-C junction, and both experienced fever, anorexia, weight loss, and vomiting, while one patient also had right iliac fossa soreness. According to Prakash et al.[6] and Sharma et al.[7], 22.00 % of patients

with intestinal Tuberculosis had diarrhoea, and 33.33 % had a fever.

However, only four patients with right iliac fossa discomfort were identified with Right Lower Ureteric Calculi, and all four patients reported Nausea, Burning Micturation, and three of those patients also had fever and vomiting. There was no such published study in which individuals diagnosed with right lower ureteric calculi experienced pain in the right iliac fossa.

This study aimed to determine the pattern of right iliac fossa discomfort using radiological examination and a validated diagnosis. The present study discovered that approximately 4/5th of patients with right iliac fossa pain were diagnosed with acute appendicitis, implying that the incidence rate of acute appendicitis was 79.00 % in patients with right iliac fossa pain. These findings are consistent with those of Gurav et al.[5], who discovered that the incidence rate of acute appendicitis was 79.00 % in patients with right iliac fossa pain. At the same time, the incidence rate of acute appendicitis was 36.00 % in the Modi et al.[4] study. 15% of patients were managed conservatively, and 85.00% were treated surgically. Modi et al.[4] found that 40.00% of patients were managed conservatively, and 60.00% were treated surgically.

Initially, 21 patients out of 100 were kept conservative; clinically and radiographically, it was determined that the patient did not require surgery at the screening; however, upon follow-up, it was discovered that six patients out of twenty-one had worsened symptoms necessitating planned surgery. Conservative treatment was not chosen in geriatric individuals since any prolonging of the condition can result in problems. Patients were operated on for right iliac fossa discomfort, which was misdiagnosed as acute appendicitis; histological testing revealed that 17.72 % were negative and 82.28 % were positive. Gaurav et al.[5] observed that 26.92 % of histological examinations were negative, and 73.08 % were positive.

In Gaurav et al.'s[5] investigation, only the Alvarado score was utilised to diagnose and treat appendicitis. However, in the current study, clinical and radiological examinations were performed to confirm the right iliac fossa pain diagnosis. A thorough history and physical examination are critical components of the clinical care of patients with RIF discomfort. Korner et al.[8] discovered that a history of migrating pain and nausea or vomiting were strong predictors of appendicitis.[9] Typically, radiological imaging is employed in patients with an ambiguous clinical diagnosis. Overall, imaging was related to a reduction in the rate of negative appendectomy, which is consistent with the predominance of ultrasound as the first-line imaging modality.

In the current study, 97.47 % of 77 patients with acute appendicitis required surgical therapy, while only 2.53 % required conservative care. All patients with Mesenteric Lymphadenitis required conservative treatment; 50% of patients with Right Lower Ureteric Calculi required surgery, while the remaining 50% required conservative treatment. All Tuberculosis patients at the I-C intersection received surgical treatment.

Modi et al.[4] demonstrated similar findings in their research investigation. In their study, they found that 83.33 % of patients with acute appendicitis required surgical therapy, while only 16.67 % required conservative care. 75.00 % of patients with Mesenteric Lymphadenitis required conservative treatment, whereas 25.00 % required surgery. 33.33 % of Tuberculosis patients at the I-C junction

needed surgery, while the remainder required conservative treatment. The study's single-centred design was one of its limitations. To increase the generalizability of the results, the author suggested a study with a larger sample size.

CONCLUSION

The current study discovered that the incidence of acute appendicitis was higher in the young age group for both males and females but was lower overall for males. The incidence of acute appendicitis was 79.00 % in patients with right iliac fossa pain in the current investigation.

A clinical and radiological research was conducted to validate the diagnosis of right iliac fossa discomfort, which resulted in a decrease in the incidence of negative appendectomy.

TABLES & FIGURES

Table 1: Age distribution according to Gender.

Age Group	Male [n=63]	%	Female [n=37]	%
20-25	27	42.86%	18	48.65%
26-30	9	14.29%	5	13.51%
31-35	18	28.57%	5	13.51%
36-40	3	4.76%	4	10.81%
41-45	4	6.35%	3	8.11%
46-50	2	3.17%	2	5.41%
p-value	X=4.093, p=0.5361			

Table 2: Differential Diagnosis of Right Iliac Fossa Pain.

DIAGNOSIS	N	Right Iliac Fossa Tenderness	%	Non- Tender	%
Acute Appendicitis	79	75	75.00%	4	4.00%
Mesenteric Lymphadenitis	10	4	4.00%	6	6.00%
Right Lower Ureteric Calculi	4	0	0.00%	4	4.00%
Tuberculosis at I-C Junction	2	1	1.00%	1	1.00%
Enteric Fever	1	1	1.00%	0	0.00%
Malignancy	1	0	0.00%	1	1.00%
Diverticulitis	1	1	1.00%	0	0.00%
Other Findings	2	1	1.00%	1	1.00%
P-value	X=48.99 p<0.0001*				

Table 3: Abnormal blood parameter of patients.

	N	%
ABNORMAL BLOOD PARAMETER		
Anemia	7	7.00%
Leukocytosis	65	65.00%
Neutrophilia	55	55.00%
Elevated ESR	17	17.00%
RADIOLOGICAL INVESTIGATION		
X-Ray (KUB)	10	10.00%
USG (Abdomen Pelvis)	100	100.00%
CT Scan (Abdomen Pelvis)	91	91.00%
CT Scan (IVP)	2	2.00%
TREATMENT		
Conservative	15	15.00%
Surgical	85	85.00%

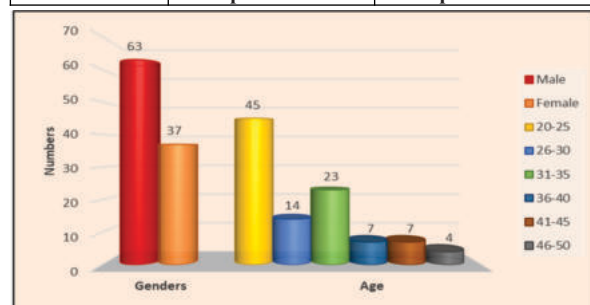
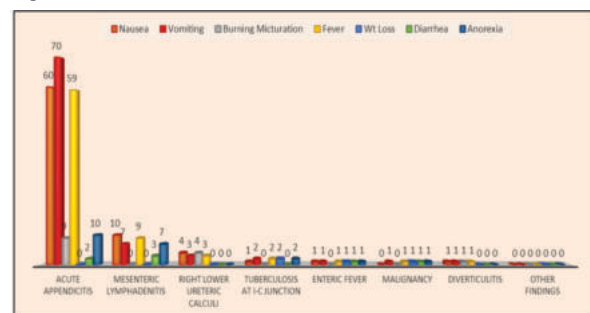
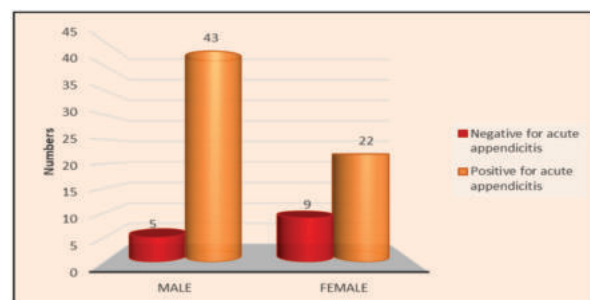
Table 4: Differential Diagnosis of Right Iliac Fossa Pain

DIAGNOSIS	N	Nausea [n=79]	%	Vomiting [n=85]	%	Burning Micturition N=14]	%	Fever [n=76]	%	Wt Loss [n=4]	%	Diarrhea [n=7]	%	Anorexia [n=21]	%
Acute Appendicitis	79	60	60.00%	70	70.00%	9	9.00%	59	59.00%	0	0.00%	2	2.00%	10	10.00%
Mesenteric Lymphadenitis	10	10	10.00%	7	7.00%	0	0.00%	9	9.00%	0	0.00%	3	3.00%	7	07.00%
Right Lower Ureteric Calculi	4	4	4.00%	3	3.00%	4	4.00%	3	3.00%	0	0.00%	0	0.00%	0	0.00%
Tuberculosis at I-C Junction	2	1	1.00%	2	2.00%	0	0.00%	2	2.00%	2	2.00%	0	0.00%	2	02.00%
Enteric Fever	1	1	1.00%	1	1.00%	0	0.00%	1	1.00%	1	1.00%	1	1.00%	1	01.00%

Malignancy	1	0	0.00%	1	1.00%	0	0.00%	1	1.00%	1	1.00%	1	1.00%	1	01.00%
Diverticulitis	1	1	1.00%	1	1.00%	1	1.00%	1	1.00%	0	0.00%	0	0.00%	0	0.00%
Other Findings	2	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%

Table 5: Diagnosis according to Gender and management type.

Diagnosis	Male [n=63]	Female [n=37]	Surgical [n=85]	Conservative [n=15]
Acute Appendicitis	48(76.19%)	31(83.78%)	77(90.59%)	2(13.33%)
Mesenteric Lymphadenitis	7 (11.11%)	3 (8.11%)	0 (0.00%)	10 (66.67%)
Right Lower Ucentric Calculi	3 (4.76%)	1 (2.70%)	2 (2.35%)	2(13.33%)
Tuberculosis at I-C Junction	0 (0.00%)	2 (5.41%)	2(2.35%)	0(0.00%)
Enteric Fever	1 (1.59%)	0 (0.00%)	0 (0.00%)	1(6.67%)
Malignancy	1 (1.59%)	0 (0.00%)	1(1.18%)	0(0.00%)
Diverticulitis	1 (1.59%)	0 (0.00%)	1(1.18%)	0(0.00%)
Other Findings	2 (3.17%)	0 (0.00%)	2(2.35%)	0(0.00%)
P-Value	X=6.969 p=0.4321		X=76.87 p<0.0001*	

**Figure-1:** Graphical representation of age and gender wise distribution of patients.**Figure-2:** Graphical representation of Differential Diagnosis of Right Iliac Fossa Pain.**Figure-3:** Graphical representation of Histopathological Report of patients.**REFERENCES**

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