



A STUDY OF ROLE OF ULTRASONOGRAPHY IN ACUTE RIGHT ILIAC FOSSA PAIN AND AVOIDANCE OF UNNECESSARY REMOVAL OF NORMAL APPENDIX

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ABSTRACT

Background- Acute appendicitis remains one of the most common acute abdominal surgical diseases. Acute appendicitis poses a significant diagnostic challenge in emergency care especially to the surgeon concerned. Delay in early diagnosis will lead to complications with their attendant increased morbidity, while overzealous diagnosis may lead to increased negative appendectomy rate. **Method-** The study is subjected upon 100 patients appearing in Jawaharlal nehru medical College & Hospital, at the out patient department or admitted in the department of Surgery in this hospital with pain in the right lower quadrant of abdomen during the period of Dec'2020- Sept'2022. **Conclusion-** This study was based on the use of ultrasonography to diagnose right iliac fossa pain and hence reduce the rate of negative appendectomies and it appear to be justified as the rate of removal of normal appendix drastically reduced by the increasing use of ultrasonography in diagnosis of right iliac fossa pain. USG supported by clinical and laboratory finding has almost 0% false negative results but account to 6-7% false positive results.

KEYWORDS

Laparoscopic appendectomy, Appendicitis.

INTRODUCTION-

The incidence of acute appendicitis roughly parallels that of lymphoid development with the peak incidence in early childhood currently 84% of all appendectomies are performed for acute pathology. The rate of normal appendectomies averages 16% (i.e., without any pathology). Females comprises of 68% of these patients found to have normal appendix at exploration. Many etiological factors of acute appendicitis are described but for the most part. They are purely contributory. It is agreed that the disease strikes children, adolescent, young adults and aged alike but why a particular individual should develop appendicitis at a particular time remains a mystery.

MATERIAL AND METHODS-

AIMS-

This study aims at:-

- To confirm the cause of right iliac fossa pain prior to exploration.
- Use of Ultrasonography is diagnosis of right iliac fossa pain.
- Avoidance of unnecessary removal of non-pathological appendix.

The aim of this study rotates around the accuracy of preoperative diagnosis of acute appendicitis. Simple appendicitis can progress to perforation, which is associated with a much higher morbidity and mortality and surgeons have therefore been inclined to operate when the diagnosis is probable rather than wait until to certain (Br. J. Surg. 76:7749).

A clinical decision to operate leads to the removal of normal appendix in 15-30% of cases. This proportion may be reduced by observing equivocal cases for a period of time, a practice that seems to be safe for most patients (Br. J. Surg. ii : 551-553). It has been claimed that diagnostic aid can dramatically reduce the number of appendectomies in patient without appendicitis, the number of perforation and time spent in hospital. Graded compression ultrasonography is diagnosis of acute appendicitis has greatly improved the ability to diagnose acute appendicitis. The accuracy offered by sonography should keep negative appendectomy ration to below 10%.

Pre-operative assessment of a patient with right iliac fossa pain requires a combination of clinical, biochemical and radiological parameter to come to a definite conclusion or diagnosis. A wide range of diagnostic aid like laboratory investigation (blood, urine), plain x-ray, graded compression sonography, C.T. Scan and MRI are used to come to a definitive pre-operative diagnosis in a patient with right iliac fossa pain.

Selection of the cases:-

For the present study a series of 50 cases diagnosed to have acute appendicitis or any other pathological conditions of the Rt. Iliac fossa

mimicking acute appendicitis were admitted at random and then subjected to a set pattern of laboratory and radiological investigations.

Ex.-Complete Hemogram

Straight X-ray abdomen

Ultrasonography of abdomen

The study is subjected upon 100 patients appearing in Jawaharlal nehru Medical College & Hospital, at the out patient department or admitted in the department of Surgery in this hospital with pain in the right lower quadrant of abdomen during the period of Dec'2020Sept'2022. Following studies were made in each case after recording the necessary particulars regarding name, age, sex, religion, occupation, address etc. Attempts were made to study the case in detail according to the following schedule.

RESULT AND DISCUSSION-

Age:-

The present study comprises of 100 cases of right iliac fossa pain. The youngest one to 11 years of age while the oldest 60 years of age. Dividing the occurrence the incidence in the different age groups a table has been demonstrated below

Table Showing The Age Distribution In The Present Series

AGE GROUP (in years)	NUMBER OF CASES	PERCENTAGE (%)
01 – 10	0	0
11 – 20	27	27
21 – 30	32	32
31 – 40	23	23
41 – 50	14	14
51 – 60	3	3
TOTAL	100	100

It has been shown that of the 100 cases there were 64 cases diagnosed ultrasonographically to be having appendicitis. The age incidence of appendicitis is shown in the table below:-

Table Showing The Age Distribution In The Present Series Having Appendicitis

AGE GROUP (in years)	NUMBER OF CASES	PERCENTAGE (%)
01 – 10	0	0
11 – 20	24	38
21 – 30	24	38
31 – 40	09	14
41 – 50	06	9
51 – 60	01	2
TOTAL	64	100

McClennan and Watt (1954) in their series of 563 cases of appendicitis found the highest incidence lying in 15-30 years of age.

Bruce (1963) noted highest incidence in the age group of 18-20 years i.e. 52% and next highest group lying between 25 and 30 years. Ashley (1967) reported in his series that the incidence was more in the age group of 15-20 years. Roy et al (1960) in a series of 500 cases of appendicitis found the highest incidence in the age group of 21-30 years.

Findings of the present series as regards to the age incidence are quite in agreement with those of the above mentioned workers.

The relative rarity of the disease in both the extreme of life is probably due to the fact that younger and older persons are less susceptible to the obstruction because of relatively obliterated lumen as a result of fibrosis in the later as well as to the atrophied follicles of the appendix.

Sex:

The present series comprises of 31 males and 69 females and show a female predominance.

Out of the 64 cases of appendicitis 26 were males and 38 females showing a male to female ratio of 1:1.5. In males the highest incidence of appendicitis was encountered in the age group 11-20 and in females 21-30 years.

Table Showing The Sex Distribution Of The Cases Diagnosed To Have Appendicitis

AGE GROUP (in years)	NUMBER OF CASES	MALE	FEMALE	RATIO (Male:Female)
01 – 10	0	00	00	1 : 1.5
11 – 20	24	10	14	
21 – 30	24	06	18	
31 – 40	09	04	05	
41 – 50	06	05	01	
51 – 60	01	0	01	
TOTAL	64	26	38	

Willauer and O'Neill (1943) found male to female ratio as being 1 : 1.6, while Shelly (1937) and Paulson (1950) found male to female ratio as being 1 : 2. McClennan and Watt (1954) reported male to female ratio as 1 : 3.2. In the present series the male to female ratio being almost similar to that of the observations made by Willauer and O'Neill (1943).

Occupation:

The apparent increased incidence among the students is perhaps due to the fact that the disease is prevalent in the younger age groups (15-30 years). Similarly in our country girls tend to get married at the age group listed which may explain the relatively high incidence in housewives. No definite specific reason could be established between the occupation and the disease.

Table Showing The Occupation Of The Patients In The Present Series

OCCUPATION	NUMBER OF CASES	PERCENTAGE (%)
Students	30	30.00
Housewives	41	41.00
Teachers	03	03.00
Cultivators	03	03.00
Buisnessman	05	05.00
Unemployed	04	04.00
Other Services	11	11.00
TOTAL	100	100.00

Dietary Habits:

Dietary habits are studied under headings of vegetarians and non-vegetarians. In the present series out of 100 cases, 10 were vegetarian and the remaining 90 were non-vegetarian. In this series non-vegetarians outnumbered the vegetarians.

Table Showing Dietary Habits Of The Patient Of This Series

DIETARY HABITS	NUMBER OF CASES	PERCENTAGE (%)
Vegetarian	10	10.00
Non- Vegetarian	90	90.00
TOTAL	100	100.00

The possible explanation is that patients those used to have diet rich in proteins are more susceptible to appendicitis than to those uses to have diet rich in cellulose. Another contributing explanation is that non-vegetarian people itself represent a major part of the total population in this part of the country. Yet a conclusion can be drawn that a fair number of vegetarian people suffer from this disease.

Symptomatology:

Pain was found to be the presenting symptom in every case in this series. Nausea and vomiting was the next most common symptoms and almost 60% cases presented with either nausea, vomiting or both. 31 cases presented with altered bowel habits either diarrhea or constipation with or without mucus in stool. 15 cases presented with menstrual symptoms either menorrhagia or dysmenorrhoea or both. 6 patients had a predominant complain relating to the urinary system either burning micturition, increased frequency or dysuria.

Site of origin of pain and its relation to posture:

In the present series majority of the cases (79%) complained that pain began in the right iliac fossa. The next common site of occurrence of pain was the central abdomen in association with right iliac fossa (21 cases). It was also observed that out of 100 cases 77 encountered with history of pain on walking and 10 cases had experienced pain in squatting position.

The probable cause of pain are –

1. Exaggerated peristalsis of appendix excited by the accumulation of irritating products of bacterial infection, and
2. Reflux pylorospasm; central abdominal pain occasionally occurs due to reflux pylorospasm.

The explanation of increase in pain while walking or squatting is perhaps due to the spasm of psoas and obturator internus muscle because of irritation produced by the inflamed appendix.

SITE OF PAIN AND RELATION TO POSTURE	TOTAL NUMBER OF CASES
Right Iliac Fossa	79
Central Abdominal Pain with Right Iliac Fossa	21
Pain During Walking	76
Pain During Squatting and Sitting	10
No Relation to Posture	14

Referred Pain:

It is observed that pain was found to be mostly referred to the epigastrium than to the back or to the lion.

Nausea and Vomiting:

In the present series nausea was encountered in 57% of the cases while vomiting in 35% of the cases. Smith (1965) in his series of 100 cases found 90 cases with history of anorexia, 85 cases with history of nausea and 80 cases with history of vomiting.

Caron and Wheeler (1966) recorded vomiting in 50% of the cases, nausea in 57% of the cases and anorexia in 64% of the cases. The present series also shows similar incidence in case of nausea with little difference in incidence of vomiting.

Bowel Habits:

In the present series 31 cases presented with altered bowel habits with either constipation or diarrhea with or without mucus in stool.

The constipation leads to frequent faecolith formation which is very common associated factor in appendicitis. Faecoliths or faecolith postulate some forms of appendicular stasis. The inflamed appendix which lies closely adherent to the adjacent ileum and produces a hyperaemic reaction which induces a transient diarrhea.

Urinary Symptoms:

The present series encountered 6 cases which presented with urinary symptoms. 2 of them had history of dysuria while the other 4 had frequency of micturition. All six of them complained of burning sensation in urethra while passing urine.

Roy et al (1969) reported out of 500 cases, that one had oliguria, 4 had dysuria, 5 had frequency of micturition and none had haematuria. Observation in this series shows similarity to of the above series. The incidence of burning micturition is the predominant urinary symptoms in this series.

Presenting Signs:**Tenderness in the Right Iliac Fossa in McBurney's Point:**

In the present series all cases had tenderness in the right iliac fossa in McBurney's point. This sign is the most essential diagnostic criteria in the selection of the cases for the present study.

In the present series from the observation of the values it is found to be 100% of all the cases studied which is well in concert and more than the series studied by Samsi et al and Caron and Wheller.

Laboratory Finding:

65% of the cases in this series presented with Leucocytosis with a predominant increase in the neutrophil percentage. The others had total WBC range within normal limit.

Radiological Finding:

Graded compression sonography has been suggested as an accurate way to establish the diagnosis of appendicitis. The sonographic diagnosis of acute appendicitis was reported to have a sensitivity of 79 to 96% and a specificity of 86 to 98%.

In diseased condition the findings may vary from:

1. Increased diameter > 6mm in anteroposterior direction.
2. Appendicolith if found almost nearly establishes the diagnosis.
3. Thickening of the wall of appendix with interruption of submucosal continuity.
4. Periappendiceal fluid, especially in acute condition.

If the study is found to be inconclusive for supplementing the diagnosis, then we can utilize the increased specificity approx 88% of the ultrasonography to exclude other conditions like right ureteric stone, right tubo-ovarian pathologies and other anterior abdominal wall or retroperitoneal pathologies causing right iliac fossa pain. In the present series we have aimed to ultrasonographically diagnose the cause of right iliac fossa pain in 100 patients. By the help of ultrasonography this study has found 64% cases of Appendicitis, 17% cases of Right Tubo-Ovarian pathology, 13% cases of Colitis and 6% cases of Right Ureteric Stone.

Examination of stool:

Routine examination of stool was done in all the cases of the present series to find out the presence of amoebiasis. Out of the 100 cases of pain in the right iliac fossa 13 cases were diagnosed to have amoebic colitis.

Management:

In the present series out of the 100 patients 85 were managed surgically while 15 were managed conservatively. In the sub-series of the 64 cases of appendicitis all were subjected to surgery.

Incision:

Of the 85 cases that were managed surgically, incision used is given in the chart below:

TYPE OF INCISION	NUMBER OF CASES	PERCENTAGE (%)
McBurney's Incision	55	65
Lanz's Incision	05	6
Right paramedian Incision	15	18
Midline Incision	05	6
Right Inguinal Incision	04	5
Rutherford Morrison Incision	01	1
Total	85	100

Position of Appendix:

Position of the appendix on exploration of the 85 of the 100 cases were found as follows in the present series:

POSITION OF APPENDIX	NUMBER OF CASES	PERCENTAGE (%)
Retrocaecal	37	44
Pelvic	25	29
Subcaecal	09	11
Paracaecal	06	7
Pre-ileal	03	4
Post-ileal	05	6
Left sideal	00	0
Total	85	100

Efficacy of USG:

In the present series 64 cases of USG proven appendicitis had undergone appendectomy. Of these 59 cases were apparent surgically proven to be suffering from appendicitis, where as 5 cases were subjected to unnecessary appendectomy due to a USG proven appendicitis which did not co inside with the intra operative finding of appendix. Hence producing a negative appendectomy rate of 7.8% Oohm et al (1991) in a series performed USG in 525 patients with clinically proven appendicitis. However on surgical exploration the negative appendectomy rate was found to be 7%.

RESULT:

Out of the 100 cases in this series 64 were diagnosed to have acute appendicitis. On being subjected to appendectomy there were 59 cases who had a surgically proven inflamed appendix but 5 cases had an apparently normal appendix surgically sacrificed due to a false positive ultrasonography report.

Hence in this series the rate of negative appendectomy was 7.8%. *Similar to the Oohm et al (1991) series showing 7% negative appendectomy rate following ultrasonography.*

Summary-

The present study consists of 100 cases of pain in the Right Iliac Fossa presenting in the department of Surgery in Jawaharlal nehru Medical College and Hospital.

This study was undertaken with a view to ascertain the different common causes of right iliac fossa pain and the role of USG in diagnosing them. An attempt is made to assess the sensitivity of USG in diagnosis appendicitis so as to reduce the rate of negative appendectomy performed for pain in the right iliac fossa. Appendicitis was found to be mainly affecting the age groups between 11-30. It affected females more than males the ration being 1:1.5. All the patient in the study had symptoms of pain right iliac fossas while 15% has menstrual symptoms and 5% urinary symptoms.

All the patients had McBurney's sign positive and presented with tenderness in the right iliac fossa. Leucocytosis was encountered in 65% case while amoebiasis was found on stool examination in 13% cases. Out of the 100 cases ultrasonography diagnosed 64 cases to be having appendicitis. 85 of the 100 cases were subjected to operation through different incision to approach the right iliac fossa. Of the 64 cases diagnosed to be having appendicitis ultrasonographically 5 cases were not having a pathological appendix on surgical exploration. Hence producing a negative appendectomy index of 7.8%.

CONCLUSION-

Acute Appendicitis may be one of the most if not the most common cause of acute right iliac fossa pain. However it's not correct to pinpoint the appendix for any and every pair arising from the right iliac fossa. This is because if the other pathologies causing right iliac fossa pain is collective taken it's almost 35-40% of the number of cases of right iliac fossa pain.

We have also known the immunological role of appendix. Particularly the secretion of IgA. Though the body is not completely dependent on the function of the appendix yet it's not correct to unnecessarily remove a normal appendix. By doing an unnecessary appendectomy for pain in the right iliac fossa the surgeon could invite problem both for himself and the patients. This is because by performing an unnecessary appendectomy in a case of pain in the right iliac fossa; the actual pathological condition causing the pain persists and hence the surgeon fails to actually relieve the patient from his complains completely moreover subjecting a patient to an unnecessary operation invites a wide range of short term and long term complication. The most common cause of intestinal obstruction is post-operative adhesions. As appendicitis is the most common surgical intra abdominal pathology. It's necessary to come to a definite diagnosis before subjecting a patient to operation with the increasing use of USG. It's now becoming more easy to support our clinical and laboratory diagnosis and hence come to a definite diagnosis prior to subjecting the case to operation. USG is also very capable in diagnosing renal, ureteric, tubo-ovarian, intestinal mesenteric, anterior abdominal or retroperitoneal pathologies in the right iliac fossa that could be the culprit for causing pain.

CONCLUSION

95 This study was based on the use of ultrasonography to diagnose right

iliac fossa pain and hence reduce the rate of negative appendectomies and it appear to the justified as the rate of removal of normal appendix drastically reduced by the increasing use of ultrasonography in diagnosis of right iliac fossa pain. USG supported by clinical and laboratory finding has almost 0% false negative results but account to 6-7% false positive results.

However to observed that the negative appendectomy came down considerable with use of graded compression sonography. USG has been assented in recent studies and particularly in a large review in Ooms et al. 1991.

USG with graded compression was performed in 525 patients with clinical signs of acute appendicitis. As experience improved the negative appendectomy dropped to 7% and delay beyond 6 hours after admission occurring only 2% of case with surgically proven appendicitis Ooms. *HWA; Kovmans RKJ Hokane you P.J. et al – 1991. Ultrasonography in the diagnosis of Acute Appendicitis. Br. J. Surgery Vol.-78, page 315-318.* The results of this series is similar to that of Ooms et al in 1991.

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