



## The Study of Clinico-Pathological Condition of Acute Appendicitis In Srikakulam

Authors

Suraj Kumar Patnaik<sup>1</sup>, S.S.N.Mouluka<sup>2</sup>, N.Ravi Kiran<sup>3</sup>

### ABSTRACT

**Object:** To study clinical and pathological presentation, management and outcome of appendicitis

**Methodology:** During 2 years study period. We studied 100 cases of acute appendicitis admitted in Rajiv Gandhi institute of medical & general Hospital srikakulam. out of them 97 case are appendicitis and 3 were other causes A detailed history and through clinical examination was done the diagnosis of Appendicitis was based upon Alvarado Score, Total W.B.C. count and ultrasonography and Histopathological examination.

**Results:** The study group consisted of 100 patients. Majority (62%) of patients were males and (38%) was Females most, common symptoms were pain in the right iliac fossa 98%, anorexia in 88%, Nausea 87% and Vomiting 83%, Total leucocyte count >10.000 in 50%, of patients, and USG findings of localized adynamic ileus in 88%, and Alvarado Score 7 or > 7 are 90% and Histopathology 89% the overall negative appendicitis of 16.7% in female and 3.8% in Males.

**Conclusion:** Thus from above findings, it can be concluded early diagnosis and appendicectomy is mandatory for better outcome of the patients. The definitive appendicectomy is the line of management.

**Keywords:** Appendicitis; Alvarado Score; Ultrasonography;

### Introduction

It is a well-known adage that abdomen is a temple of surprises and a magic box as well. Since the abdomen accommodates innumerable viscera and other anatomical compliments, diseases of the abdomen constitute a topic full of clinical curiosity. A meticulous examination of abdomen is one of the most rewarding diagnostic procedures available to the doctor, especially the surgeon and plans an ideal treatment. As had been said by Bailey “A correct diagnosis is the hand maiden of successful operation”. Despite the advancements in the fields of diagnosis the surprises never Cease<sup>(1)</sup>. The appendix a cul-de-sac is crudely referred as “worm of the bowel” in ancient

medical books and also called as abdominal tonsil”. Acute appendicitis is the most common acute surgical condition of the abdomen<sup>(2)</sup>. Approximately 7 percent of the population will have appendicitis in there life time<sup>(3)</sup> with the peak incidence occurring between 10 and 30 years<sup>(4)</sup>. Despite technological advances the diagnosis of appendicitis is still based primarily on the patients history and the physical examination, prompt diagnosis and surgical referral may reduce the risk of perforation and prevent complications<sup>(5)</sup>. The mortality rate in non-perforated appendicitis is less than 1 percent, but it may be as high as 5 percent or more in young and elderly patients in whom the diagnosis

may often be delayed thus making perforation more likely<sup>(2)</sup>. Preoperative diagnosis of acute appendicitis is sometimes challenging in young women, children and aged despite all round improvements in medical field and ultrasonography. Diagnostic scores are useful easy methods, which help to reach in decision-making. Delay in diagnosis will lead to complication, which increases morbidity where as overzealous diagnosis may lead to negative appendectomy rate<sup>(6)</sup>.

This study involves to correlate the acute appendicitis between clinically diagnosed and histopathologically examined specimen and the role of ultrasound in early diagnosis of acute appendicitis and to exclude negative appendectomy, in patents admitted in Rajiv Gandhi institute of medical & general Hospital srikakulam during the period Februar 2015 to February 2017.

## Methodology

### Source of Data

For the study, the patients admitted with Acute Appendicitis in Emergency and surgical wards in all the units Rajiv Gandhi institute of medical & general Hospital srikakulam are included without bias on a serial basis. This is a randomised study comprising of 100 patients of suspected acute appendicitis over a period of two years (i.e. from February 2015 to February 2017.). The patients on admission with suspected acute appendicitis are evaluated on the basis of Alvarado Scoring System.

### Inclusion Criteria

All patients who are coming to surgical OPD at Government General Hospital and Basaveshwar Teaching & General Hospital, Gulbarga with Complaints of Acute pain in the right iliac fossa.

### Exclusion Criteria

All patients other than acute Appendicitis are excluded.

A proforma was made for the study of these cases. The cases are subjected to a detailed clinical examination and essential investigations namely

total white cell count and ultrasonography of abdomen.

### USG Criteria of Acute Appendicitis

- Visualisation of appendix, Diameter>6mm, Wall thickness> 3mm, Complex mass (echo poor, asymmetric), Irregular asymmetry, Loss of contour, Free fluid, Local adynamic ileus, Graded tenderness over Mc Burney's point.

Patients with score of 1-4 are not considered likely to have acute appendicitis; those with score of 5-6 probably have, those with score of 7-8 possibly have, those with score of 9-10 are considered to have definitive diagnosis.

### Scoring System

1- 4	-	Appendicitis unlikely
5- 6	-	Appendicitis possible
7- 8	-	Appendicitis probable
9- 10	-	Appendicitis definitive

Patients with score of 7 and > 7 are subjected to surgery. Operative and histopathological diagnoses of appendicitis are confirmed. The cases subjected to emergency surgery are adequately prepared by parenteral fluids, electrolyte supplementation, administration of broad spectrum antibiotics intravenously (usually combination of Ciplox 200 mg 12<sup>th</sup> hourly + Gentamycin 80 mg 12 hourly + Metronidazole 500 mg 8<sup>th</sup> hourly).

Surgery was done under spinal anesthesia. Grid iron incision was employed in all cases. Post operatively patients are kept nil orally, till bowel sounds returned, parenteral fluid, electrolytes, antibiotics and analgesics were continued. Cases are watched for any post operative complications and treated wherever needed. Post operatively sutures are removed on 7-9 days and the patients were discharged after histopathological confirmation

### Results

In this series of 100 cases, all the patients who presented with acute symptoms and diagnosed to have acute appendicitis were included in the study.

**Table – 1: Age and Sex Incidence:**

Age Group (Years)	Sex	
	Male=62	Femalen=38
1 –10	2	1
11 –20	26	16
21 –30	28	18
31 –40	6	3
41 –50	--	--

Acute appendicitis is more common in males than females. Boyd discussing acute appendicitis disease says it is more than twice as common in males as in females and explains it may be due to fact that young males is more subject to strain and trauma and that his diet is usually richer in protein than that of the females. In our series the male to female ratio is 3.1:1.9 In Levis et al series of 1000 cases, the incidence of acute appendicitis was found to occur most commonly in the age group of 20-30 years in both males and females. The male to female ratio was 3:2. In our series, the maximum incidence as found in the age group of 20 to 30 years.

**Table –2: USG Findings**

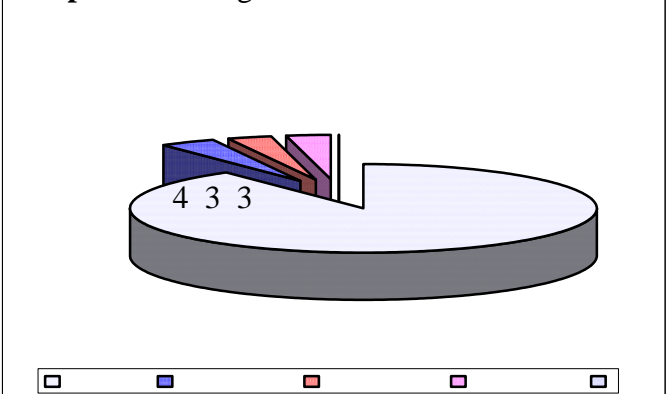
USG Findings	No of Patients n=100	Percentage
Visualization of appendix	33	33.00
Diameter >6mm	6	6.00
Wall Thickness >3mm	22	22.00
Irregular asymmetry	--	--
Loss of contour	--	--
Free fluid	--	--
Local adynamic ileus	88	88.00
Graded tenderness over McBurney’s point	88	88.00
Normally study	12	12.00

In 90 patients, 54 were males and 36 were females with a score of 7 and more than 7. all of them were subjected to surgery with confirmation in 52 out of 54 males – 96.2% and 30 out of 36 females – 83.3%. The negative appendicectomy rate of males is 3.8% and in females 16.7%. Women with normal appendix who underwent operation were having pelvic inflammatory disease in 5 patients, and

ruptured follicular cyst in 1 patient. One of the males with normal appendix had Meckels diverticulities while the other had regional ileitis. 90 patients were given spinal anesthesia and 7 were given general anesthesia.

**Incision:** The incision commonly employed was grid-iron incision and was extended whenever posed with difficulties and better exposure was needed. In one case, the appendix was normal and a Meckel’s diverticulum was present. Appendicectomy with excision of Meckel’s diverticulum was done. The position and condition of the appendix noted intra-operatively.

**Graph-1 Showing the Alvarado Score**



90  
7 or > 7    Score of 6    Score of 5    Score of 4

**Position of Appendix**

Retocaecal.....	61
Pelvic.....	20
Subcaecal.....	8
Paracaecal.....	5
Preileal and post ileal.....	3

**Table – 3: The condition of The Appendix**

Condition	No. of Patients n=97	Percentage
Normal	11	11.34
Congested	3	3.09
Inflamed	75	77.31
Gangrenous	2	2.06
Perforated	6	6.18

In Semsi et al series of 100 emergency appendicectomy, 21% of the patients had perforated appendix. In Martin Breumen (1970)

series perforated appendix constituted 84% of appendicectomy and gangrenous 9.9%. In 94.84% (92) of patients, classical appendicectomy with burying of the appendicular stump in caecum was done. In 5.16 % (5) cases invagination was not possible because of friable base or caecal congestion and inflammation.

The post operative complication in our series is wound infection with a percentage of 5% or 5 patients. The pathological diagnosis of the specimen of the appendix sent for histopathological study are as follows:

**Table –4 : Histopathology Reports**

Histopathology	No. of Patients n=97	Percentage
Normal	11	11.34
Acute appendicitis	57	58.76
Acute suppurative appendicitis	27	27.83
Acute gangrenous appendicitis	2	2.07

### Discussion

The discussion is based on the observations and analysis of the results in the study of 100 cases with regard to incidence, age, sex, symptoms, signs, investigations operative findings, and histopathological examinations using Alvarado scoring system.

### Clinical Features

**Age incidence:** In the present study the common age group found was 20.30 year (46%) and the median age being 24 years. Gallendo Gallego et al<sup>(7)</sup> found was 20-30 yr (52%)

**Sex Incidence:** It has been established beyond doubt by several authors, that male Sex predominated over female in the incidence of acute appendicitis. Levis et al<sup>(8)</sup> M : F :3: 2 , P. Ronan 'O' connel et al<sup>(9)</sup> M : F :3: 2 , Addis DG, et al<sup>(3)</sup> M : F 1. 3: 1 .In Present Study M: F Ratio : 3. 1: 1.9. Out of 100 Cases, there were 62 Male patients (62%) and 38 Female patients (38%) Symptoms and Signs.

**Pain:** Pain was a complaint in all the cases in this study. The initial location of pain in most cases (59%) presented with pain around umbilicus followed by (41%) in the right lower quadrant and 98% of the patients lately presented with pain in the right iliac fossa, which adds a diagnostic point of acute Appendicitis.

**Table –5 Pain By Various Authors.**

Authors	Pain around Umbilicus	Pain right lower quadrant	Pain in the Right iliac fossa
Gallindo Gallego et al <sup>24</sup>	49%	32%	96.4%
Schwartz SI <sup>4</sup>	50%	50%	100%
Present Study	59%	41%	98%

**Anorexia:** Anorexia was present in 88% of patients in present series. Anorexia nearly always accompanies appendicitis. In present study it is 88% and in previous study Kallan M et al 85% George Mathews, et al<sup>(10)</sup> 92.13%

**Nausea or Vomiting:** Nausea was present in 87% of Cases and vomiting in 83% of cases in present series.

**Table- 6:** Nausea or vomiting as a symptom.

Authors	Nausea	Vomiting
Owen Td, et al <sup>(11)</sup>	84%	78%
George Mathew set al <sup>(10)</sup>	92%	70.9%
Schwartz SI <sup>(4)</sup>	90%	75%
Present Study	87%	83%

**Right Illiac fossa tenderness:** Right iliac fossa tenderness was present in all the cases 100% at the time of presentation, a major contribution for diagnosis of Acute Appendicitis. In the Present Study 100% and in previous study P.K. Bhattacharjee et al<sup>(12)</sup>92%, Gallendo Gallego, et al<sup>(13)</sup>94%

**Rebound Tenderness:** In the present series, in 44% of the cases there was presence of rebound tenderness, and this is noted when there is local peritoneal involvement and it depends upon the time of presentation. In the Present Study 44%

and in previous study P.K. Owen Td et al<sup>(14)</sup> 60%, GallindoGallego,et al<sup>(13)</sup> 56%.

**Fever:** Fever was present in 48 cases (48%) in present series in the major of cases fever was of low grade and continues: the incidence of fever in the Literature and the present series is compared in the following tables. In the Present Study 48 % and in previous study Kallan M et al<sup>(15)</sup> 40%, Gallindo Gallego, et al<sup>(13)</sup> 74%

**Leucocyte count:** W.B.C. count more than 10.000 cells/ cumm was found in 50% of cases and only 2% it was raised above 20,000 Cells/ cumm.

**Table 7:** Leucocyte count by various authors.

Authors	Percentage >10,000 Cells./ Cumm.	Percentage > 20,000 Cells/Cumm.
Peiper et al <sup>(16)</sup>	60.00	5.00
GallindoGallego,et al <sup>(13)</sup>	65.00	3.00
Elangovan's <sup>(17)</sup>	80.00	-
Doraiswamy <sup>(18)</sup>	42.00	-
Present Study	50.00	2.00

**Ultrasonography:** In the present series Visualisation of appendix was only seen in 33% of the patients. The reasons is due to non availability of high frequency probe.

In a study by Puylaert BCM et all 88.5% of the patients on ultrasound were reported Visualisation of the appendix in another study by Gallindo Galligoetal<sup>(13)</sup> 82% of the patients reported with Visualisation of appendix. In the present series, graded tenderness over the McBurney's point by transducer was 88% which is the good diagnostic feature of acute appendicitis. According to Puylaert BCM et al graded tenderness over the McBurney's by transducer was 89% in the present series 88% of patients are reported as local dynamic illus in ultrasound. The raise of percentage may be due to other pathologies which also show illus other than appendicitis. In the present series 12% of the patients were

reported as normal study of ultrasound and use has a role excluding the diagnosis of acute appendicitis.

USG specificity and sensitivity in diagnosis of acute appendicitis:

In the present study USG findings showed 88% sensitivity and 88% specificity in diagnosing acute appendicitis.

**Table 8:** Value of USG in the diagnosis of acute appendicitis.

Authors	Specificity	Sensitivity
George Mathews et al <sup>10</sup>	90.90%	88.13%
Puylaert JBCM et al <sup>19</sup>	100%	89%
Gallindo Gallego et al <sup>13</sup>	82%	89%
Jeffrey et al <sup>20</sup>	96.2%	89.9%
Present Study	88%	88%

**Alvarado Score:** In this series 87% are Males and 94.7% were females of score 7 or more than 7.

**Table- 9:** Alvarado Score 7 or > 7 by Authors.

Authors	Percentage	
	Male	Female
Bhattacharjee et al <sup>12</sup>	84.5	80.00
Sudhir Kumar Mohantv et al <sup>21</sup>	75.00	88.23
Present Study	87.00	94.7

**Histopathology:** In the present series 88.65% (86) of the patients are histopathologically confirmed and by other authors it is George Mathews et al<sup>30</sup> 84% , Bhatacharjee et al<sup>(12)</sup> 82% .To prove accuracy of scoring, ultrasound sensitivity and specificity histopathological confirmation is needed.

**Negative Appendicectomy Rate:** The present study shows negative Appendicectomy rate of 16.7% in females and 3.8% in male. In females, negative appendicectomy rate is high. This is probably due to pelvic inflammatory diseases, and ruptured follicular cysts. The conditions are not properly diagnosed on ultrasound and mimic acute appendicitis.

**Table – 10 :** Negative Appendectomy rate by various Authors.

Authors	Percentage	
	Male	Female
Sudhir Kumar Mohanty et al <sup>21</sup>	4.8	6.7
Bhattacharjee et al <sup>12</sup>	6.9	19.1
Korner H et al <sup>21</sup>	9.3	22.2
Present Study	3.8	16.7

### Conclusion

The Alvarado scoring system combined with ultrasound can therefore be used as a cheap and inexpensive way of confirming acute appendicitis thus reducing negative appendectomy rate. History and clinical examination was more diagnostic. Ultrasonography increases the diagnostic accuracy in patients with suspected acuter appendicitis to the tune of 90-95%. Alvarado score with less than 6 leads to more than 25% negative appendectomy rate. If the scoring is above 7, the overall accuracy of diagnosis of acute appendicitis gives up to 90%.

### Summary

A study of 100 cases who presented with pain in right iliac fossa was conducted at Rajiv Gandhi institute of medical & general Hospital srikakulam during the period February 2015 to February 2017. Emergency appendectomy constituted 23.3% of the total abdominal surgeries. Acute appendicitis is more common in males than females and the highest incidence is in 2<sup>nd</sup> & 3<sup>rd</sup> decade of life. The patients presented with symptoms of pain in RIF, vomiting or nausea, anorexia, and sings of RIF tenderness, rebound tenderness, and rise in temperature. The patients were examined clinically thoroughly by using Alvarado scoring system. The patients are subjected to investigations like total count and ultrasonography which are considered in the score.

Ultrasonography has diagnosed 88% of cases as acute appendicitis. 90 of the total cases which has

score 7 and >7 were managed surgically and the remaining 7 patients with score of 6 and 5 were operated and 3 were managed conservatively. 90% of the cases were confirmed intra-operatively and 89% of histopathological examinations confirmed the diagnosis of acute appendicitis. Complications like wound infection was seen only in 5% of the patients.

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