



ACUTE APPENDICITIS: A CLINICAL DIAGNOSIS OR RADIOLOGICAL DIAGNOSIS

J. Shalini

Resident in surgery. SVS Medical College, Mahabubnagar TS 509002

B. Ananda Rama Rao*

Professor of surgery SVS Medical College, Mahabubnagar TS 509002

*Corresponding Author

ABSTRACT

Acute appendicitis is the most common reason for abdominal surgery in adults and children. Luminal obstruction of the appendix progresses to suppurative inflammation and perforation, which causes generalized peritonitis or an appendix mass/abscess. Classical features include periumbilical pain that migrates to the right iliac fossa, anorexia, fever, and tenderness and guarding in the right iliac fossa. While the clinical diagnosis may be straightforward in patients who present with classic signs and symptoms, atypical presentations may result in diagnostic confusion and delay in treatment. Atypical presentations are particularly common in preschool children. A clinical diagnosis is possible in most cases, after a period of active observation if necessary; inflammatory markers and an ultrasound scan are useful investigations when the diagnosis is uncertain.

KEYWORDS : APPENDICITIS, SUPPURATION, INFLAMMATION, PERFORATION

INTRODUCTION:

Acute appendicitis remains the most common indication for emergency operation. The decision for surgical intervention is still primarily based on precise clinical criteria. Acute appendicitis is a common cause of abdominal pain for which prompt diagnosis is rewarded by a marked decrease in mortality and morbidity. As the consequences of missed diagnosis are dire, the common surgical practice has been to operate on doubtful cases rather than to wait and see till the diagnosis is certain. This resulted in negative appendectomy rate of 20 to 30% and has been considered acceptable¹. This concept is being challenged at present day of quality assurance. The removal of normal appendix is not a benign procedure and negative appendectomy carries a definitive morbidity. Today's aware patient is also concerned about removal of his normal appendix.

In young men, the limited number of alternative diagnosis usually permits a high degree of diagnostic accuracy. It is generally accepted that in men the negative appendectomy rate should be below 20% and rates of 10% -15% are commonly reported^{2,3}. In contrast, young women commonly present with acute gynecological illnesses that closely mimic acute appendicitis. Reported negative appendectomy rates in ovulating women thus remain disturbingly high and range from 34-46%⁴. Major factors contributing to this continued high negative appendectomy rate are non-specificity of clinical findings, lack of readily available techniques allowing direct visualization of appendix and identification of specific diagnostic features of acute appendicitis⁵.

AIM

To assess the accuracy of Alvarado scoring and USG and correlating with histopathological examination in diagnosing acute appendicitis.

OBJECTIVES

To assess the diagnostic accuracy of acute appendicitis through clinical vs. radiological vs. histopathological examination and correlate statistically for significance.

MATERIAL AND METHODS

STUDY DESIGN: This randomised, prospective study was done in the department of General Surgery, SVS Medical College & Hospital, Mahabubnagar; 50 patients selected randomly with right iliac fossa pain will be included in the study.

INCLUSION CRITERIA:

1. Patients of 12-60 years of age irrespective of sex.

2. Patients presenting with right iliac fossa pain.

EXCLUSION CRITERIA:

1. Patients of age less than 12 years and more than 60 years.
2. Patients who are unfit and not willing for surgery.
3. Patients with appendicular mass requiring conservative management.
4. Pregnant women with acute appendicitis.
5. Patients with co-morbid conditions like diabetes, renal failure, cardiac diseases.

METHOD OF COLLECTION OF DATA:

- History of patients with right iliac fossa pain is taken.
- Clinical criteria: ALVARADO SCORE
Mc Burney's tenderness
Rebound tenderness
Rovsing sign
Leukocytosis
- Ultrasound abdomen done with 7.5 HZ linear probe and criteria include:
Diameter of appendix > 7 mm.
Periappendicular fluid collection.
Presence of bowels around appendix.
- Appendix specimen after emergency appendicectomy is sent for histopathological examination
- Results are plotted in the proforma

RESULTS

Table:1 CLASSIFICATION OF CASES WITH APPENDICITIS BASED ON ALVARADO SCORE

| ALVARADO SCORE | FREQUENCY | PERCENT |
|----------------|-----------|---------|
| Less than 4 | 1 | 2 |
| 4 to 6 | 13 | 26 |
| 7 or more | 36 | 72 |
| Total | 50 | 100 |

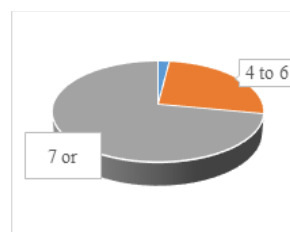
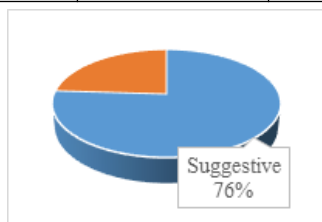
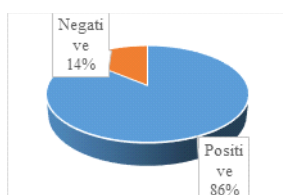


Table:2 PERSONS WITH USG SUGGESTIVE/NOT SUGGESTIVE OF APPENDICITIS

| USG Suggestive | Frequency | Percent |
|----------------|-----------|---------|
| No | 12 | 24 |
| Yes | 38 | 76 |
| Total | 50 | 100 |

**Table:3 PERSONS WITH HPR SUGGESTIVE/ NOT SUGGESTIVE OF APPENDICITIS**

| HPR Suggestive | Frequency | Percent |
|----------------|-----------|---------|
| No | 7 | 14 |
| Yes | 43 | 86 |

**Table:4 COMPARISON OF ALVARADO SCORE 7 OR MORE / ALVARADO SCORE LESS THAN 7 WITH HPR POSITIVE / HPR NEGATIVE**

| ALVARADO SCORE | HPR POSITIVE | HPR NEGATIVE | TOTAL |
|----------------|-------------------|------------------|--------------------------------|
| 7 OR MORE | 36 | 0 | POSITIVE PREDICTIVE VALUE 100% |
| <7 | 7 | 7 | NEGATIVE PREDICTIVE VALUE 50% |
| TOTAL | SENSITIVITY 83.7% | SPECIFICITY 100% | |

Table:5 ALVARADO Scoring vs HPE

| Clinical Scoring (N=50) | HPE | | P-value |
|-------------------------|-----|----|---------|
| 10 | 0 | 5 | 0.001** |
| 5 | 3 | 2 | |
| 6 | 4 | 5 | |
| 7 | 0 | 10 | |
| 8 | 0 | 11 | |
| 9 | 0 | 10 | |

Table:6 USG vs HPE

| USG | HPE | | P-value |
|-------|-----|----|---------|
| | N | Y | 0.084 |
| N | 4 | 8 | |
| Y | 3 | 35 | |
| Total | 7 | 43 | |

p>0.01 is not significant

Table:7 COMPARISON OF USG SUGGESTIVE OR NOT WITH HPR

| USG | HPR POSITIVE | HPR NEGATIVE | TOTAL |
|----------------|-------------------|-------------------|---------------------------------|
| SUGGESTIVE | 35 | 3 | POSITIVE PREDICTIVE VALUE 92.1% |
| NOT SUGGESTIVE | 8 | 4 | NEGATIVE PREDICTIVE VALUE 33.3% |
| TOTAL | SENSITIVITY 81.3% | SPECIFICITY 57.1% | |

DISCUSSION:

Acute appendicitis is one of the most common causes of acute abdominal pain. Accurate diagnosis in a patient with acute abdomen is essential for following reasons:

- In total population, there is at least 6% lifetime chance of suffering from acute appendicitis⁶.
- The overall mortality rate for acute appendicitis is less than 1% but in elderly patient it is higher, ranging 5-15%. 4-7 [advent of antibiotics and early surgical interventions have decreased this from the earlier 26%]
- Appendiceal and other rupture incidents account for 17-40% morbidity, perforation rate being higher in the elderly and the very young^{7,2}.
- Lack of early diagnosis results in perforation and complications such as abdominal abscess, wound infection, infertility and death⁸.

There is approximately 15-35% negative laparotomy rate with significant chances of morbidity especially in the younger women (up to 45%). This is due to high prevalence of common obstetrical and gynecological disorders notably, the pelvic inflammatory diseases.^{1,2}

Despite technological advances, diagnosis of acute appendicitis is still based primarily on history and clinical examination. Prompt diagnosis and surgical referral may reduce the risk of perforation and prevent complications. Patients with acute appendicitis typically present with central abdominal pain shifting to the right lower quadrant or may present with generalized abdominal pain. Vomiting is common in children. Clinical examination reveals signs of acute intra-abdominal process e.g., local and rebound tenderness, muscle guarding, rigidity, cutaneous hyperesthesia, and tenderness on rectal examination. Since about one third of patients with acute appendicitis present with atypical symptoms,³ differential diagnosis is diverse, such as gastroenteritis, lymphadenitis, ovarian and tubal disorders (in young women), renal colic, peptic ulcer and acute cholecystitis.

Helical CT has reported sensitivities of 90 -100%, specificities of 91-99%, accuracies of 95-100% for the diagnosis of acute appendicitis. These results are comparable with those achieved by experienced investigators who have used thin section conventional and contrast enhanced CT, and are superior to the recently reported clinical accuracy^{1,3}. Laparoscopy has also been shown by some authors to be particularly useful in young women of reproductive age because gynecological conditions may mimic acute appendicitis. The rate of diagnostic error is twice as high in women of reproductive age than in men.^{2,1,14,12}

Even with various diagnostic modalities, negative appendectomy rate of 15-25% has been widely accepted. However, the complication rate of unnecessary operation is upto 13%,⁹ close to that of genuinely inflamed appendix. Removing a normal appendix carries a mortality of 0.65 for every 1000 operations.^{1,2} Prolonged clinical observation in an

attempt to minimize unnecessary operation may mean delayed operation in 28% of cases and a greater risk of perforation.^{2,12} There have been numerous publications on the use of ultrasound as a diagnostic tool. These studies demonstrate sensitivity of 75- 94% and specificity of 87-96%.^{11,12} Several prospective studies have been conducted where the results of ultrasonography were used as an aid to compare accuracy of diagnosing appendicitis through clinical examination (Alvarado scoring) as well as through USG abdomen for an early diagnosis and intervention for better patient management.

CONCLUSION

This study showed that Alvarado scoring has better diagnostic accuracy compared to USG in diagnosing cases of acute appendicitis. USG may be added as an adjunct in making decisions in cases of diagnostic dilemma for better patient care.

REFERENCES

1. Addiss DG, Shaffer N, Fowler BS, Tauxe RV(1990). The epidemiology of appendicitis and appendectomy in the United States. *Am J Epidemiology* 1990;
2. Berry J Jr., Malt RAL(1984) Appendicitis near its centenary. *Ann Surg*1984; 200:567-575.
3. Lewis FR, Holcroft JW, Boey J, Dunphy JE.(1975) Appendicitis: A critical review of diagnosis and treatment in 1000 cases. *Arch Surg*1975.
4. Buchman TG, Zuidema GD.(1984) Reasons for delay of the diagnosis of acute appendicitis, *SurgGynecolObstet* 1984; 158:260-266.
5. Acute appendicitis high Resolution real-time US findings from the Dept. of Radiology and Surgery, University of California, San Francisco, 1986, RSNA Annual Meeting.
6. A sound approach to the diagnosis of acute appendicitis (editorial). *Lancet*. 1987; I: 198-200.
7. Seymour I Schwartz, Harold Ellis. Maingot's abdominal operations. Vol. 1. 1255-1281
8. Walker AR, Segal I.91990) What Causes Appendicitis? *J ClinGastroenterol* 1990; 12: 125-127
9. Gilmore OJA, Brodribb N, Browett JP, et al.(1975) Appendicitis and mimicking conditions: a prospective study. *Lancet*, 1975.
10. Venna A, mehta F S, Vyas KC, et al; (1995) C Reactive protein in acute appendicitis, *Ind. J. Surg* 1995.
- 11' Abu Yousef MM, BleicherJ, Maher JW. (1987) High resolution sonography of acute appendicitis. *AJR*, 1987; 149:53-58.
- 12' Puylaert j, Rutgers P, Lisang R et al.(1987) A prospective study of 1 ultrasonography in diagnosing appendicitis. *N Englmed*. 1987; 317:666-669.
13. Hale DA, Molloy M, Pearl RH, et al; (1997) Appendectomy: a contemporary appraisal. *Ann Surg* 1997:225.
14. Jones PF.(1990) Practicalities in the management of the acute abdomen. *Br J Surg*. 1990; 77:365-367.