

ORIGINAL RESEARCH

Correlation between ultrasonographic and surgical findings in patients with acute appendicitis

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ABSTRACT

Background: Acute appendicitis is a common cause of both abdominal pain and surgical crises. Appendicitis patients exhibit a wide range of clinical signs, some of which may be mistaken for symptoms of other illnesses. This study was conducted to assess the correlation between ultrasonographic and surgical findings in patients with acute appendicitis. **Materials & Methods:** 70 patients age 18- 60 years of either gender with acute appendicitis were subjected to ultrasonographic examination. **Results:** Out of 70 patients, males comprise 40 and females 30. The clinical findings were fever seen in 15 patients, nausea/ vomiting in 62, shift in pain in 28, loss of appetite in 51, RLQ tenderness in 65 and rebound tenderness in 47 patients. The position of appendix was pre- ileal in 3, post- ileal in 3, subhepatic in 1, pelvic in 14, retrocecal in 46, and subcecal in 3 patients. The difference was significant ($P < 0.05$). Sonographic diagnosis was positive in 65 cases and negative in 5 cases. The difference was significant ($P < 0.05$). **Conclusion:** In addition to clinical findings, ultrasonography has a defined role and is the best non-invasive approach for treating acute appendicitis.

Key words: Acute appendicitis, Ultrasonography, subcecal

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INTRODUCTION

Surgical and medical professionals still struggle with acute stomach pain. Acute appendicitis is a common cause of both abdominal pain and surgical crises. Appendicitis patients exhibit a wide range of clinical signs, some of which may be mistaken for symptoms of other illnesses.¹ A small number of alternative diagnoses typically allow for a high degree of diagnostic accuracy in young men.² On the other hand, acute gynecological infections, which closely resemble acute appendicitis, are frequently seen in young women. If appendicitis is not treated, it can rupture and result in potentially deadly complications, particularly in youngsters and the elderly. Appendicitis is a surgical emergency.³

Acute appendicitis patients usually present with diffuse abdominal pain or with central abdominal pain that shifts to the right lower quadrant (RLQ).⁴ It is common for children to vomit. Signs of an acute intra-abdominal process can be seen on a clinical examination.⁵ These include cutaneous hyperesthesia, muscle guarding, rebound and localized discomfort, and rectal tenderness. The use of ultrasonography as a diagnostic tool for individuals with acute appendicitis has been the subject of several publications.⁶ A blind-

ended, non-compressible, peristaltic tube with a diameter greater than 6 mm that emerges from the tip of the cecum and has a gut signature is one of the ultrasonographic criteria for acute appendicitis. Regardless of appendiceal diameter, the visualization of an appendix with an appendicolith is likewise considered a positive test. But an ordinary appendix can also be seen on ultrasound.⁷ This study was conducted to assess the correlation between ultrasonographic and surgical findings in patients with acute appendicitis.

MATERIALS & METHODS

The present study consists of 70 patients age 18- 60 years of either gender with acute appendicitis. All were enrolled after obtaining their written consent. Ethical clearance was also obtained.

Data such as name, age, gender etc. was recorded. Parameters such as presenting complaints, their duration, severity, sequence of onset of symptoms, mode of onset, progression, change in pattern at the time of presentation etc. was recorded. Ultrasonographic examination was performed with a handheld 3.5 MHZ sector probe and with a 5 MHZ sector probe scan of the right lateral quadrant using a

graded compression technique. The results were considered significant. statistically analyzed. P value less than 0.05 was

RESULTS

Table I Distribution of patients

Total- 70		
Gender	Male	Female
Number	40	30

Table I shows that out of 70 patients, males comprise 40 and females 30.

Table II Assessment of parameters

Parameters	Variables	Number	P value
Clinical findings	Fever	15	0.05
	Nausea/ vomiting	62	
	Shift in pain	28	
	Loss of appetite	51	
	RLQ tenderness	65	
	Rebound tenderness	47	
Position of appendix	Pre- ileal	3	0.03
	Post- ileal	3	
	Subhepatic	1	
	Pelvic	14	
	Retrocecal	46	
	Subcecal	3	

Table II, graph I shows that clinical findings were fever seen in 15 patients, nausea/ vomiting in 62, shift in pain in 28, loss of appetite in 51, RLQ tenderness in 65 and rebound tenderness in 47 patients. The position of appendix was pre- ileal in 3, post- ileal in 3, subhepatic in 1, pelvic in 14, retrocecal in 46, and subcecal in 3 patients. The difference was significant (P< 0.05).

Graph I Assessment of parameters

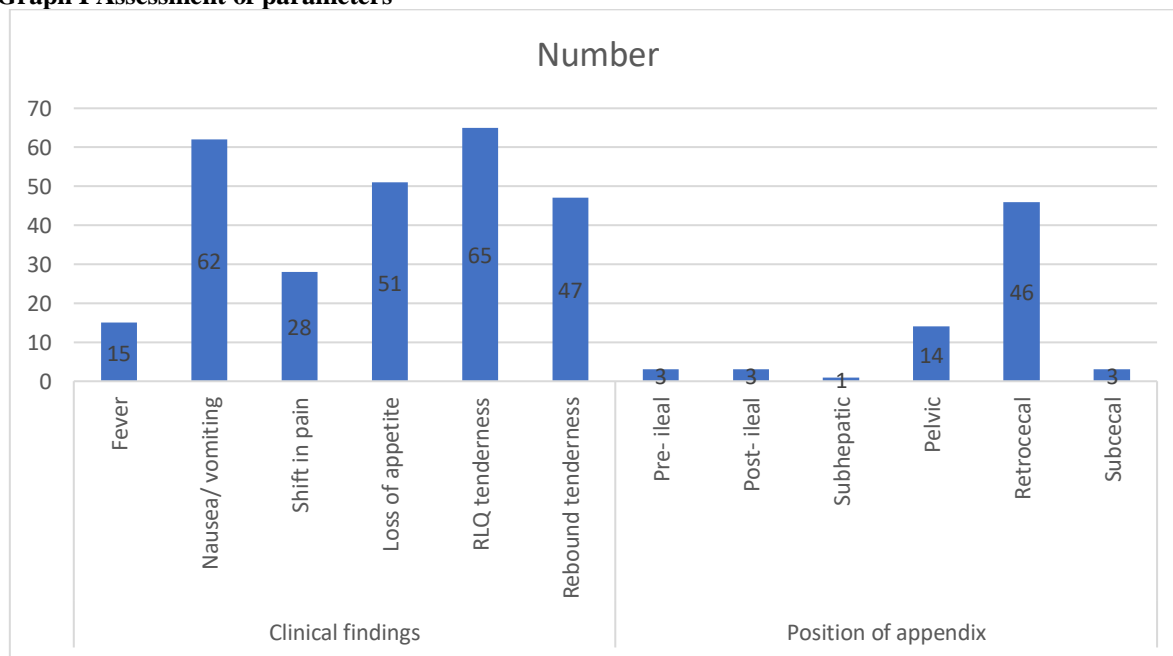


Table III Sonographic diagnosis of patients

Sonographic diagnosis	Number	P value
Positive	65	0.01
Negative	5	

Table III shows that sonographic diagnosis was positive in 65 cases and negative in 5 cases. The difference was significant (P< 0.05).

DISCUSSION

A patient with appendicitis typically presents with a usual series of symptoms, including poorly localized periumbilical pain.^{8,9} Only 50–60% of patients have this conventional presentation, and when unusual patterns of disease are seen, the diagnosis may go unnoticed or be delayed. Atypical symptoms are seen in about one-third of people with acute appendicitis.^{10,11} Acute cholecystitis, renal colic, ovarian and tubal disorders, gastroenteritis, mesenteric lymphadenitis, peptic ulcer, and renal colic are only a few of the many differential diagnoses.^{12,13} This study was conducted to assess the correlation between ultrasonographic and surgical findings in patients with acute appendicitis.

We found that out of 70 patients, males comprise 40 and females 30. Puylaert et al¹⁴ studied the accuracy of abdominal ultrasonography in 111 patients with appendicitis. Among 52 patients later shown in surgery to have appendicitis, ultrasonography was unequivocally positive in 39 (sensitivity, 75 percent). Of 31 patients in whom appendicitis was definitely excluded, none had a positive ultrasound examination (specificity, 100 percent). The sensitivity in those with a perforated appendix (28.5 percent) was much lower than in those with acute non-perforating appendicitis (80.5 percent) or appendiceal mass (89 percent), but the low sensitivity did not influence clinical management, since the need for surgery in patients with a perforated appendix was clinically obvious. Ultrasonography resulted in changes in the proposed management in 29 of the 111 patients (26 percent).

We observed that the clinical findings were fever seen in 15 patients, nausea/ vomiting in 62, shift in pain in 28, loss of appetite in 51, RLQ tenderness in 65 and rebound tenderness in 47 patients. Ali et al¹⁵ correlated the findings of 60 cases of acute appendicitis from ultrasonography with the surgical findings. Of the 60 patients in total, 48 instances had histopathologically confirmed acute appendicitis; of these, 39 (81.25%) were male and 09 (18.75%) were female. In 65% of instances of acute appendicitis with a histological diagnosis, there was an elevated leukocyte count. In our investigation, self-localization proved helpful for ultrasonography diagnosis. About 80% of the cases (48) had ultrasonography results that were indicative of acute appendicitis.

We found that the position of appendix was pre- ileal in 3, post- ileal in 3, subhepatic in 1, pelvic in 14, retrocecal in 46, and subcecal in 3 patients. Sonographic diagnosis was positive in 65 cases and negative in 5 cases. Patra et al¹⁶ assessed the clinical and ultrasonographic diagnostic accuracies in 38 individuals with acute appendicitis. Patients aged 20 to 29 were shown to have an increased incidence of acute appendicitis (37% in prospective studies and 42.9% in retrospective studies, respectively). In both prospective and retrospective trials, the Modified Alvarado score (MAS) demonstrated sensitivity of 47.7% and 59.6%, and specificity of 87.5% and

91.6%, respectively. In both prospective and retrospective investigations, the results of ultrasonography revealed sensitivity of 82.1% and 92.7%, and specificity of 76.4% and 72.7%, respectively.

Kumar et al¹⁷ selected 100 patients, 64 were male patients, of which 49 were diagnosed to have acute appendicitis and 36 were female, of which 25 were diagnosed to have acute appendicitis on USG. 2 males and 2 females were diagnosed to have appendiceal mass on USG. The maximum age was 67 years and the minimum age was 3 years. Maximum number of patients were in the age range of 11 -20 years. Based on the Alvarado value, 73% were likely to have appendicitis. On USG, 74 patients were diagnosed to have acute appendicitis of which 73 were confirmed on histopathology. On histopathological examination of all the removed appendix specimens, 76 were diagnosed as acute appendicitis. The sensitivity of USG in diagnosing acute appendicitis in our study was 96.05%. Specificity was 95.83%. The positive predictive value of the study is 98.64% and the negative predictive value is 88.46%. The most common position of appendix was retro-caecal (78.20%), followed by pelvic (16.66%).

CONCLUSION

In addition to clinical findings, ultrasonography has a defined role and is the best non-invasive approach for treating acute appendicitis.

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