Research Article

Pinch test: a reliable physical sign for management of acute appendicitis

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Abstract

Introduction: Acute appendicitis is often a surgical emergency. It primarily affects the growing children and needs to be evaluated early. Many patients of acute appendicitis will respond to antibiotics therapy. But a number of such patients will face recurrence and complications thereby pitting their lives in risk. To overcome such accidents acute appendicitis need to be diagnosed early and categorized so as to decide which group will benefit from conservative therapy and who will need emergency operation. The diagnosis of acute appendicitis is based on history and physical examination of the abdomen. Laboratory tests like leukocytosis > 10000/cu.mm and left shift of the Differential leukocyte count are important tests to understand the severity of acute appendicitis. The ALVARADO Score is also widely used for the idea for a better management of acute appendicitis. Pinch test is a single parameter finding to diagnose acute appendicitis. It is a simple examination technique, can be done bedside and more comfortable for the patients. **Methods:** 100 consecutive patients were taken up for the study. Detailed clinical examination was done. Diagnosis was based on primarily physical findings and history. Investigations were undertaken and Pinch test and its results were documented in all the cases. Alvarado scoring was also done. All patients were operated and co-related to the findings with Pinch test recorded. **Result:** Out of 100 cases, 59 were females and 41 were males, which showed slight female preponderance of the diseases. The patients were in the age group of 11 to 30 years with a median age of 21 years. The initial sensitivity and specificity of pinch test was 86.36% and 83.33%. In comparison the modified ALVARADO (MASS) score, it was 90.90% and 33.33% respectively. Pinch Test can be a tool to identify the cases of Appendicitis, which need urgent operative treatment. **Conclusion:** Pinch test can be an additional sign to identify cases of acute appendicitis which will need emergency surgery.

Key words: Appendicitis, Appendicectomy, Pinch test, Alvarado scoring, MASS

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Introduction

For unclear reasons, the appendix often becomes inflamed, get gangrenous, and can burst. This attack of acute appendicitis causes severe pain in the right lower part of the abdomen. This may also be leading to peritonitis, a very serious condition, which can be fatal, with nausea and vomiting. Appendicitis is considered an emergency that requires prompt surgery to remove the appendix. In the U.S of A., one in 15 people will suffer from acute appendicitis. Although it can strike at any age, appendicitis is rare under the age of 2 and most common between ages 10 and 30 with slight female preponderance. Acute appendicitis is diagnosed from the history and the physical signs associated with it. They are-

- Dull pain near the navel or the upper abdomen that becomes sharp as it moves to the lower right abdomen. This is usually the first sign and is also known as shifting of the pain.
- Loss of appetite
- Nausea and/or vomiting soon after abdominal pain begins
- Abdominal swelling
- Fever of 99-102 degrees Fahrenheit
- At times inability to pass stool or flatus.

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As sufficient mortality is associated with complicated acute appendicitis, it needs to be diagnosed quickly and select those patients who will need emergency Appendicectomy. Charles McBurney first put forward the concept related to both the diagnosis and management of appendicitis; it consisted of careful observation, total disuse of the stomach, and early laparotomy [1]. Subsequent advances, led to better understanding in the diagnosis of acute appendicitis. Present day surgeons now lay stress on, particularly the white blood cell count, and abdominal imaging with either ultrasound or computed tomography in addition to the history and physical examination [2]. Despite these advances, tenderness to palpation over McBurney's point remains a key finding on abdominal examination in the diagnosis of appendicitis [3]. At present emergency surgery is considered the ultimate treatment in acute appendicitis. Various methods are suggested for diagnosing acute appendicitis and grade its severity early and those are analyzed by many authors. The idea is to find out which of the patients will benefit with antibiotics therapy and who will need emergency Appendicectomy. ALVARADO scoring is a reliable guide to identify those cases that will need early Appendicectomy and is widely used. A modified ALVARADO score is also available for scoring the severity of the attack of appendicitis. Many authors have suggested other signs, symptoms and laboratory tests to understand which patients of acute appendicitis will improve on antibiotic therapy and who will need surgery. We have studied a sign called “Pinch test” to understand the severity of appendicitis in our patients to plan our treatments accordingly [8]. Although recent works by many researchers now suggest that expectant management of acute appendicitis may avoid a surgery and subsequent elective Appendicectomy rate will go down, however many workers found that increased rate of recurrence after such conservative management [4].
As a result, opinion now differs whether a first line medication therapy is better than such cases [4,5]. It cannot be denied that although Antibiotics therapy as the first line management is successful in many cases, surgery needs to be undertaken for acute appendicitis. Many predictors of severity are suggested to identify the patients, who will need surgery as the first line of therapy. Notable amongst them are total leucocytes count as well as ALVARADO score [6,7]. Raised CRP level is also consistent with the severity of appendicitis, and considered to be a surgical indication marker for acute appendicitis [5].Radiological investigations like ultrasonography and computed tomography scan are being used to decrease the incidences of wrong diagnosis. It is a simple examination technique, can be done bedside and more comfortable for the patients. Other workers also suggested that preoperative WBC, CPR and AMSD all indicated an increased risk of complications. If WBC (/dl) >16,500, CRP >3.1 mg/dl and AMSD >11.4 mm, then complications increases to many times at times as high as six fold rise in complications are also detected in many studies [9,10].

Materials and Methods

We conducted a prospective evaluation of 100 patients, who attended Emergency OPD and with acute appendicitis at Gauhati Medical College and Hospital as well as the personal chambers, during the period from 2010 to 2012.

The clinical diagnosis in all cases was acute appendicitis. The diagnosis was based on history of pain in the right lower abdomen, presence of Murphy’s triad, shifting of pain. Physical examination showing signs of tenderness over the Mc Burney’s point, Rebound tenderness, pinch test. Laboratory tests of Blood Routine examinations and ultrasonography of whole abdomen were undertaken in all to understand the severity of acute appendicitis.
To perform the pinch-an-inch test, a fold of abdominal skin over McBurney's point is grasped and elevated away from the peritoneum. The skin is allowed to recoil back briskly against the peritoneum. If the patient has increased pain when the skin fold strikes the peritoneum, the test is positive and peritonitis probably is present.

In this series of 100 cases, all the patients were operated, due to various risk factors, Appendicectomy was performed and the specimen of appendix was sent for histopathological examination. The intraoperative findings and histopathology were correlated to analyze the appropriateness and correctness in the diagnosis of acute appendicitis and also to understand the importance of various severity scoring system, findings available to us.

Various Tables below are produced to ascertain the ALVARADOS classical (1986) and Modified (1994) scores[6,7].

Table I- Classical ALVARADO Score (1986), with 10 points.

Symptoms	Scores
Migratory right iliac foss pain	1
Anorexia	1
Nausea/Vomitting	1
Signs	
Tenderness in the right iliac fossa	2
Rebound tenderness	1
Elevated Temperature	1
Laboratory Findings	
Leukocytosis	2
Shift to left Neutrophils	1
Total Score	10

Table II. The significance of ALVARADO Score

Score	**Significance**
1-4	Unlikely to be acute appendicitis
5-6	Possibly acute appendicitis
7-8	Acute appendicitis present
9-10	Definete acute appendicitis needing surgery

Table III. Modified ALVARADO scoring system (MASS) with 9 points

Item	**Score**
Migratory right iliac fossa pain	1
Anorexia	1
Nausea/ Vomitting	1
Fever >99'5"F (37'%' C)	1
Tenderness in the right iliac fossa	2
Rebound tenderness in the right iliac fossa	1
Leukocytosis	2
Total	9 points

Table IV. Significance of MASS in a study

MASS	**No. of patients**	**Positive for appendicitis**	**Specificity %**
<5	12	2	17.00
5-6	52	30	13.50
7-9	136	126	50.00
Total	**200**	**158** **P value-0.0001**	

Results

Out of 100 cases, 59 were females and 41 were males, which showed slight female preponderance of the diseases. The patients were in the age group of 11 to 30 years with a median age of 21 years.

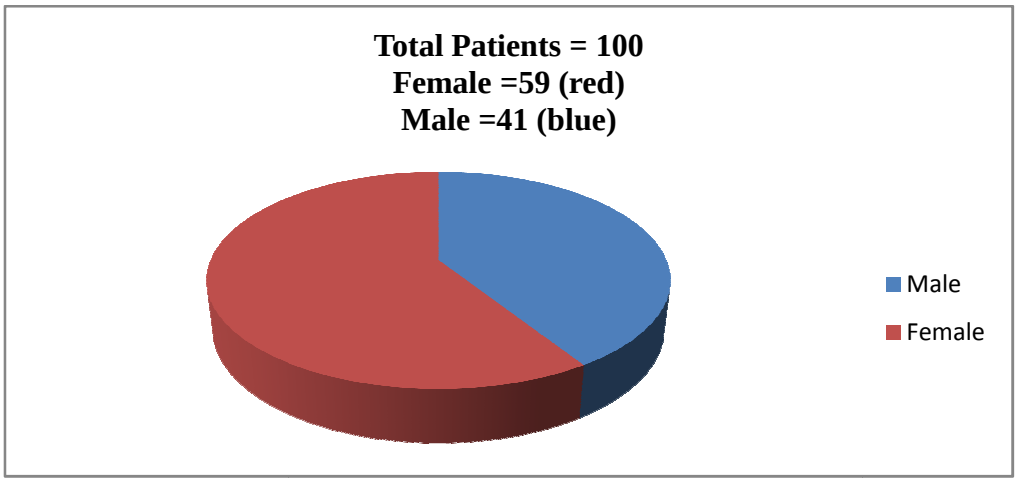

Diagram showing Male: Female ratio in the study

Score/ test	Sensitivity	Specificity
ALVARADO	90.90%	33.33%
Pinch test	86.36%	83.33%.

Table showing the sensitivity and specificity of pinch test was 86.36% and 83.33%. In comparison the modified ALVARADO (MASS) score, it was 90.90% and 33.33% respectively. Rebound tenderness had a sensitivity of 52.27%.

Out of the 80 cases, who were pinch positive, 78 cases with positive pinch test and TLC count >10000/ cu mm were true positive for acute appendicitis showing a positive predictive value of 95%. In all these cases the Appendices were grossly pre or overtly gangrenous. (Pic. I)

Figure 1: Showing one of the cases where Pinch test was positive. Pregangrenous changes are obvious. Conservative therapy is not advisable in such pathology.

Discussion

Charles McBurney published a treatise on appendicitis in 1891, in which he described the exact point on the abdomen at which tenderness was maximal in cases of acute appendicitis--the point now known as "McBurney's point." He also described his approach to both the diagnosis and management of appendicitis, which at the time consisted of careful observation, total disuse of the stomach, and early laparotomy [1].

Since 1891, many advances in the diagnosis of acute appendicitis have been made. Emergency physicians evaluating patients with abdominal pain may rely on laboratory studies, particularly the white blood cell count, and abdominal imaging with either ultrasound or computed tomography in addition to the history and physical examination [2]. Despite these advances, tenderness to palpation over McBurney's point remains a key finding on abdominal examination in the assessment of patients with abdominal pain [3]. A great deal of work suggested later that emergency surgery is the ultimate treatment in acute appendicitis. Recent works by many researchers now suggest that expectant management of acute appendicitis may avoid a surgery and subsequent elective Appendicectomy rate will go down. However many workers found that increased rate of recurrence after such conservative management [4].

Acute appendicitis is probably the most common general surgical emergency besides trauma, many a times emergency surgery has to be carried out to save patients suffering from acute appendicitis. Opinion now differs whether a first line medication therapy is better than such cases [4,5]. It cannot be denied that although Antibiotics therapy as the first line management is successful in many cases, surgery needs to be undertaken for acute appendicitis. Many predictors are suggested to pick up the patients, who will need surgery as the first line of therapy. Notable amongst them are total leucocytes count as well as ALVARADO score [6,7]. Radiological investigations like ultrasonography and computed tomography scan are being used to decrease the incidences of wrong diagnosis. We have studied the cases presenting to us with acute appendicitis and evaluated them with Alvarado scoring as well as pinch test. Pinch test is a single parameter finding to diagnose acute appendicitis with > 80% sensitivity and specificity [8]. It is a simple examination technique, can be done bedside and more comfortable for the patients. We find that if pinch test is positive then patients need operative treatment emergently.

Other workers also suggested that preoperative WBC, CPR and AMSD all indicated an increased risk of complications. If WBC (/dl) >16,500, CRP >3.1 mg/dl and AMSD >11.4 mm, then complications increases to many times at times as high as six fold rise in complications are also detected in many studies [9].

Many researchers also found that only the CRP level is consistent with the severity of appendicitis, and considered to be a surgical indication marker for acute appendicitis [5].

Conclusion

Acute appendicitis needs urgent attention. It is evident that such cases, which were managed initially, successfully faced early recurrence and needed surgery. Some workers found that it is useful in avoiding elective surgery later. However a large group of patients are there who will need emergency surgery. To avoid negative Appendicectomy many tests, findings as well as scores are suggested. Keeping aside the pediatric scoring system, the whole world is unanimous in favor of ALAVRADO scoring system or its modified version, in detecting patients who will need emergency surgery. We also have studied various subjects and found that Pinch test is a reliable guide to take up the patients for emergency surgery. It has been found to be also a reliable physical sign to diagnose acute appendicitis. Pinch test is easily reproducible and is a bed side physical sign. Pinch test when associated with increased total leukocyte count and left shift, becomes a strong indicator for emergency Appendicectomy.

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- The subject and analysis was the idea of the first author.

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