

Role of CT scan in diagnosis of acute appendicitis

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Received: November 11, 2006 Accepted: February 18, 2007

Abstract

Objective: To evaluate the diagnostic accuracy of the spiral-CT in patients with clinically suspected acute appendicitis.

Material and Methods: A total of 124 patients referred for CT scan with suspected appendicitis between January 2005 and October 2006 were assessed for the appendiceal size and the presence of signs of appendicitis. The findings were correlated with surgical histopathology.

Results: CT scan had a sensitivity of 95 percent and a specificity of 93 percent and an overall accuracy of 92 percent.

Conclusion: The use of spiral CT in patients with equivocal clinical presentation suspected of having acute appendicitis can lead to significant improvement in the preoperative diagnosis. (Rawal Med J 2007;32:39-40)

Key words: Appendicitis, CT scan.

INTRODUCTION

Appendicitis should be considered in any person with undiagnosed abdominal pain. The incidence peaks between the ages 15 and 24. The concept that right lower quadrant pain in women of childbearing age is more complex clinical problem than in men and they historically had higher rates of negative laparotomy.¹ Anderson reported decreased diagnostic accuracy for appendicitis among women, particularly in the third decade of life.² Clinical diagnosis of appendicitis is usually made on the basis of history, physical examination and laboratory studies but a variety of approaches have been used for diagnosis including ultrasound, helical computerized tomography (CT), clinical scoring systems, and neural network.³ However, approximately 20-35% of patients with suspected appendicitis present with diagnostic dilemma mainly in the extremes of life, ovulating females and young children.⁴ Aim of this study was to evaluate the diagnostic accuracy of the spiral-CT in patients with clinically suspected acute appendicitis.

MATERIALS AND METHODS

Appendiceal spiral-CT was performed in 124 patients (51 women and 73 men) with clinically suspected acute appendicitis. Scans were obtained from the L4 level to the symphysis pubis using 5 mm collimation without i.v., oral, or rectal contrast material. Prospective diagnoses based on CT findings were compared with surgical (and histopathological) results and clinical follow-up. The criteria used to diagnose acute appendicitis were: (a) a thickened appendix of more than 7 mm or (b) inflammatory changes in the periappendiceal fat. If the CT findings were negative for acute appendicitis and surgery not performed, the results were correlated with other corroborating diagnostic investigations or clinical follow-up

RESULTS

Eighty-eight of the 96 patients (91.6%) with acute appendicitis were correctly diagnosed by CT, 26 of the 28 patients (93%) without acute appendicitis were correctly diagnosed (table 1).

Table 1. CT scan accuracy rate in patients with suspected acute appendicitis.

Patients suspected to have appendicitis.	Patients referred for surgery	Patients excluded from surgery	Total number
Clinical and CT diagnosis.	96	28	124
CT Scan proved appendicitis.	88	26	114
Accuracy rate.	92%	93%	92% (overall accuracy rate)

CT signs of acute appendicitis included fat stranding (100%), enlarged appendix (>7 mm) (97%), adenopathy (55%), appendicoliths (30%), abscess (7%), and phlegmon (12%) (table 2). Acute appendicitis was identified during surgery in 88 patients (89 per cent). Prospective interpretation of CT images yielded a sensitivity of 92 per cent and a specificity of 93 per cent for the diagnosis of acute appendicitis. There were eight false-negative scans. Of the total there were 88 true positives, 26 true negatives, 8 false negatives and no false positives.

DISCUSSION

The appendix is obstructed by a fecal concretion in 50-80% of all cases .the position of the appendix is retrocecal or retroperitoneal in 30% of the cases and intraperitoneal in 70% of the cases.⁵ Continuous improvements in technology, technique and interpretation achieved over the past 15 years have increased the accuracy of imaging methods substantially. CT scan has gained acceptance as primary imaging techniques

for acute appendicitis by virtue of their ability to image the appendix ,adjacent fat and gut directly.⁶ It is a widely accepted technique because it is rapidly performed and is usually straightforward to interpret by radiologists with varying degrees of experience from residents to more specialized abdominal radiologists.⁷ All these features have led to a steady increase in use of appendiceal CT.^{8,9} The radiation exposure is the main disadvantage of using CT technique.

Table 2. CT scan findings in Patients proved to have acute appendicitis

CT Scan findings in patients proved to have acute appendicitis.	Number of patients found to have acute appendicitis (Total 88 patients).	Percentage of patients (%)
Fat stranding	88 patients	100%
Enlarged appendix>7 mm	85 patients	97%
Adenopathy	48 patients	55%
Appendicolith	26 patients	30%
Abscess	6 patients	7%
Phlegmon	10 patients	11%

In infiltrative phases, the normally readily demonstrable retrocecal fatty tissue is seen on CT scan as a streaky, reticulated area which becomes more demarcated when abscesses are present. While the masking of the surrounding fat is initially less pronounced, the amount of masking can increase as the disease progresses. Protracted processes can cause wall thickening in the pole of the cecum.⁵ Contrast studies are not necessary in reaching a diagnosis nor is there any value in performing an ultrasound examination in acute appendicitis⁴ but it is of value in demonstrating complications or an alternative diagnosis. In conclusion, use of spiral computed tomography in

patients with equivocal clinical presentation suspected of having acute appendicitis led to a significant improvement in the preoperative diagnosis. Developing experience with this technique and understanding the subtleties of interpretation can further improve diagnostic accuracy.

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