

# Plain X-Ray In Acute Appendicitis

G Rodrigues, L Kannaiyan, M Gopashetty, S Rao, R Shenoy

## Citation

G Rodrigues, L Kannaiyan, M Gopashetty, S Rao, R Shenoy. *Plain X-Ray In Acute Appendicitis*. The Internet Journal of Radiology. 2003 Volume 3 Number 2.

## Abstract

Although the radiological features of acute appendicitis have been well documented, the value of plain abdominal radiograph has not been fully appreciated. This article summarizes the role of radiology in acute appendicitis, especially in atypical cases and extremes of age, where there is often delay in diagnosis.

## INTRODUCTION

Acute appendicitis is one of the commonest surgical emergencies. Although no longer a 'hot topic' in the medical literature and majority of the time the diagnosis is essentially clinical, acute appendicitis still presents a challenge to the treating surgeon. Several modern series indicate that a preoperative clinical diagnosis of acute appendicitis will be incorrect in 15% of cases and that a significant postoperative complication rate can be expected as a result of appendectomy performed for such a mistaken impression.<sup>1</sup> Plain x-ray of abdomen, Ultrasonography (USG) and Computed tomography (CT) scan are used as a combination and of all CT scan has a high diagnostic accuracy. The role of radiography in the diagnosis of acute appendicitis is poorly appreciated.<sup>2</sup> Imaging tools aid the diagnosis in equivocal presentations. Young children, women of childbearing age, elderly and patients receiving antibiotics present atypically.<sup>3</sup>

The value of plain x-ray abdomen is often under appreciated in diagnosing right iliac fossa (RIF) pain. The radiological signs of appendicitis are well documented but few are aware of them.

We present a case of acute appendicitis with interesting radiological features.

## CASE REPORT

A 32-year-old male, known alcoholic presented to the casualty with complaints of pain in the lower abdomen of two days duration with fever and vomiting of one day. To start with the pain was periumbilical but shifted to RIF. Bladder and bowel habits were normal. On examination, the patient was febrile, had mild tenderness of the RIF and at the

Mc Burney's point with no guarding or rigidity.

Investigations revealed a leucocytosis (WBC = 11700/cu mm) and an USG of abdomen revealed no evidence of appendicitis. Twelve hours later patient developed severe vomiting, increased pain in the right iliac fossa with guarding, rigidity and rebound tenderness. A repeat WBC counts was 23000 /cu mm and USG showed localized ileus in the RIF. A plain x-ray abdomen was taken which showed: 1) Localized ileus, 2) Loss of lower 1/3 of right psoas shadow, 3) Greater than 10 mm distance between right flank wall and caecum (air/fluid) and 4) A strip of free air along the right paracolic gutter, delineating the lower border of liver (Figure, arrow).

## Figure 1

Figure: X-ray showing a strip of free air along the right paracolic gutter, delineating the lower border of liver (arrow).



The patient was subjected to an emergency appendectomy. The appendix was found to be retrocecal, gangrenous and

perforated. He had an uneventful recovery and was discharged on the tenth postoperative day.

We have seen similar findings (especially no. 4 as above in the x-ray photograph) in seven of the twenty-three patients admitted with a diagnosis of acute appendicitis and had a perforated appendix at laparotomy.

### DISCUSSION

Acute appendicitis is the most common indication for emergency abdominal surgery. When diagnosed early and treated promptly, the morbidity and mortality from appendicitis is low. However, once perforation occurs, morbidity and mortality rates increase dramatically. The diagnosis of acute appendicitis is usually clinical and straightforward and extensive investigations are unnecessary. Imaging studies are useful when the diagnosis is at doubt. Abdominal radiography is indicated for the evaluation of a patient with suspected appendicitis only when the existence of a surgical problem is in doubt or when appendicitis is one of the many diagnostic probabilities.<sup>2</sup>

In order to shorten the interval between the onset of symptoms and surgical intervention, and, hence to decrease the risk of perforation, various imaging studies including x-ray, USG, CT scan and laparoscopy may be performed in the evaluation of patients with suspected appendicitis. Although a number of reports have discussed adjunctive testing in patients with suspected appendicitis, their diagnostic value remains uncertain.<sup>4</sup>

The original large radiographic series of Steinert,<sup>5</sup> et al first evaluated the usefulness of the plain abdominal film in acute appendicitis and developed three categories: 1) normal 2) possibly abnormal, such as cases with scoliosis, absence of right psoas margin and air in a nondilated appendix and 3) probable appendicitis or suggestive of appendicitis. Demonstration of an appendicolith or right lower quadrant abscess gas justifies the specific diagnosis. Most often several signs will be present in cases with positive abdominal films. A combination of findings more strongly suggests a right lower quadrant inflammatory process than any one alone. Of the 138 positive Bridgeport Hospital cases, 99 (72%) had two or more radiographic signs of appendicitis. Patients with perforation or gangrene are more likely to have a positive radiographic examination (62% in Bridgeport Hospital series).<sup>6</sup> Most authors have found that plain film studies are less frequently positive when the appendix is in the retrocecal position, as in our patient.

Even if positive, abdominal radiographs add little to the straightforward case of acute appendicitis except expense and radiation exposure. Perhaps 20% of patients with appendicitis present such problems. About half of these patients over 60 years have minimal symptoms, the so-called 'silent appendix'. Since the plain film is positive in less than 50% of such cases, further evaluation by barium enema examination may be indicated.<sup>7</sup>

Ellis<sup>8</sup> recommends plain x-ray films of the abdomen in all cases acute abdomen. Brooks and Killen,<sup>9</sup> have listed these radiological signs for acute appendicitis: 1) Fluid levels localized to the caecum and terminal ileum, indicating inflammation in the right lower quadrant, 2) Localized ileus with gas in the cecum, ascending colon and terminal ileum, 3) Increased soft tissue density of the right lower quadrant, 4) Blurring of the right flank stripe and presence of a radiolucent line between the fat of the peritoneum and transverse abdominis, 5) Fecolith in the right iliac fossa, 6) Gas filled appendix, 7) Intraperitoneal gas, 8) Deformity of the cecal gas shadow occurring due to adjacent inflammatory mass and 9) Blurring of the psoas shadow on the right side.

It is of interest to note that four out of five patients with false-positive radiographs for acute appendicitis have other conditions like ruptured ovarian cyst, leaking carcinoma of cecum or a low lying gall bladder.<sup>6</sup> This emphasizes that radiology reflects all diseases affecting the right lower quadrant, the commonest being acute appendicitis.

Although the routine use of adjunctive imaging studies cannot be advocated at the present time, the judicious use of these tests may prove useful in selected patients such as women of child bearing age, young children, the elderly and patients with systemic disease or who are immunosuppressed, in whom negative appendectomy and perforation rates remain high.

### CORRESPONDENCE TO

Dr. Gabriel Rodrigues, MS., DNB. Assistant Professor of Surgery, 157, KMC Quarters, Madhav Nagar, Manipal – 576 104. Karnataka, INDIA. Tel: +91-820-2572647 Fax: +91-820-2570061 Email: gabyrodrigues@excite.com

### References

1. Kazarian KK, Roedor WJ, Mersheimer WL. Decreasing mortality and increasing morbidity from acute appendicitis. *Am J Surg* 1970; 119: 681-685.
2. Shimkin PM. Radiology of acute appendicitis. *Am J Roentgen* 1978; 130: 1000-1004.
3. Sarfati MR, Hunter GC, Witzke DB, Bebb GG, Smythe SH, Boyan S, Rappaport WD. Impact of adjunctive testing

on the diagnosis and clinical course of patients with acute appendicitis. *Am J Surg* 1993; 166: 660-665.

4. Scher KS, Coil JA. The continuing challenge of perforating appendicitis. *Surg Gynecol Obstet* 1980; 150: 535-538.

5. Steinert R, Hareide I, Christiansen T. Roentgenologic examination of acute appendicitis. *Acta Radiol* 1943; 24: 13-27.

6. Graham AD, Johnson HF. The incidence of radiographic findings in acute appendicitis compared to 200 normal

abdomens. *Milit Med* 1966; 131:272-276.

7. Barnes BA, Behringer GE, Wheelock FC, Wilkens EW. Treatment of appendicitis at the Massachusetts General Hospital. *JAMA* 1962; 180: 122-126.

8. Ellis H, Nathanson LK. Appendix and appendectomy. In: Zinner MJ, Schwartz ST, Ellis H (eds). *Maingot's abdominal operations*, 10th ed, Appleton and Lange, New York 1997: pp 1191-1227.

9. Brooks DW, Killen DA. Roentgenographic findings in acute appendicitis. *Surgery* 1965; 57: 377-384.

**Author Information**

**Gabriel Rodrigues, MS, DNB**

Department Of General Surgery, Kasturba Medical College And Hospital

**Lavanya Kannaiyan, MBBS**

Department Of General Surgery, Kasturba Medical College And Hospital

**Mahesh Gopashetty, MS**

Department Of General Surgery, Kasturba Medical College And Hospital

**Srinivas Rao, MS, FRCS**

Department Of General Surgery, Kasturba Medical College And Hospital

**Rajgopal Shenoy, MS**

Department Of General Surgery, Kasturba Medical College And Hospital