

Original Article

Abuse of Plain Abdominal Radiographs In Abdominal Pain

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ABSTRACT

Objective: The objective of this study was to determine the frequency of unnecessary plain abdominal films and the magnitude of their impact in management plan of abdominal pain.

Methods: This was a prospective cohort study conducted at Isra University Hospital, Hyderabad between 1st February 2006 and 31st July 2006. Eighty three patients undergoing plain abdominal radiography in emergency room during the above mentioned period were included. Preradiograph clinical diagnoses and final diagnoses were compared with special reference to the impact of radiograph on the change in diagnosis and treatment plan. The indications were analyzed on the basis of Royal College of Radiologists (RCR) guidelines.

Results: RCR guidelines were observed in only 30% of the patients whereas 65% abdominal radiographs did not reveal any significant finding. Definite final diagnoses were derived on these abdominal radiographs in only 35% of the patients.

Conclusion: In most of the patients the abdominal radiographs were unnecessary. Adherence to RCR guidelines will decrease the economic burden as well as the unnecessary radiation exposure. (Rawal Med J 2007;32:48-50)

Key words: Plain abdominal film, abdominal pain, Royal College of Radiologists guidelines.

INTRODUCTION

The accurate clinical assessment of acute abdominal pain remains one of the more challenging mysteries of medicine. Patients with acute abdominal pain comprise the largest group of people presenting as general surgical emergency. Following the history and physical examination, plain abdominal films have traditionally been considered one of the first and most useful methods of further investigations. In spite of recent increase in the use of other imaging techniques, plain abdominal films still retain this position as one of the most used initial investigations.¹ However, indiscriminate and over judicious use of plain abdominal films cause wastage of health care resources and unnecessary

radiation exposure. In this era of evidence based medicine and increased financial burden, routine old practices are being challenged. It is not acceptable to order so called 'routine investigations' without any particular objective in mind. The over judicious and unnecessary uses of plain abdominal film make this an abused investigations²⁻⁴ as in most of the cases presenting to emergency room, RCR guidelines are not followed.⁵ The aim of this study was to determine the frequency of unnecessary plain abdominal films and the magnitude of their impact on management of abdominal pain.

PATIENTS AND METHODS

This is a prospective cohort study of all patients coming to emergency room of Isra university hospital with acute abdominal pain over a period of six months from 1st February 2006 to 31st July, 2006. A total of 83 patients underwent abdominal

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X-ray in during this period. A provisional diagnosis was made on the basis of patient's history and clinical examination before ordering the abdominal radiographs. All the radiographs were reported by radiologist and reports were analyzed in context of final diagnosis of the patient. Later, the indications for abdominal radiographs were analyzed on the basis of RCR guidelines. The impact of abdominal radiographs was determined by observing the change in management plan.

RESULTS

The mean age of patients was 52 years with range of 8 to 68 years. Thirty five out of 83 (42%) were females. In most of the cases, the provisional diagnoses were renal/ureteric colic and intestinal obstruction (table 1).

Table 1: Provisional diagnosis before ordering plain abdominal radiograph (n = 83)

Provisional diagnosis	Number(%)
Renal/ ureteric colic	30 (36%)
Intestinal obstruction	24 (29%)
Non Specific abdominal pain (NSAP)	11 (13%)
Chronic obstruction	06 (7%)
Perforation	06 (7%)
Haematuria	02 (2%)
Colitis	02 (2%)
Foreign body	01 (1%)
Large bowel cancer	01 (1%)

RCR guidelines were observed in only 25 (30%) patients. 54 (65%) abdominal radiographs did not reveal any significant findings. 11 radiographs (13%) revealed renal/ureteric stones. In 24 patients with provisional diagnosis of intestinal obstruction, 8 (9.6%) had significant bowel loop dilatation, 3 (3.6%) had loaded colon while 2 (2.4%) had mild bowel loop dilatation. Definite final diagnoses were derived on these abdominal radiographs in 29 (35%) patients (table 2) while no definite diagnosis was made in remaining patients and they were further investigated by other modalities.

DISCUSSION

A useful investigation is one in which the result will alter the management or add confidence to clinician's diagnosis. Abdominal radiographs are commonly requested indiscriminately for patients with abdominal pain, but the results of many such examinations are negative or non-specific.⁶ Often imaging is ordered prior to the completion of physical examination and laboratory analysis. The reason for this is likely multifactorial, including demands on the acute care physicians to quickly diagnose the cause of symptoms and provide a disposition in a busy emergency department.⁷ Cope commented, "all who have had much experience of the group of cases known generally as acute abdomen will probably agree that in that condition early diagnosis is exceptional".⁸ Thus, careful and appropriate imaging examination for all these patients must be selected expeditiously and with certainty.

Table 2: Findings noted on abdominal radiograph

No significant finding	54 (65%)
Renal/ureteric stones	11 (13%)
Significant bowel loops dilatation	08 (10%)
Mild bowel loop dilatation	02 (2%)
Faecal loaded colon	03 (4%)
Pneumoperitoneum	04(5%)
Foreign body	01(1%)

In 65% of patients, no significant finding was reported by radiologist on plain abdominal film in our study. Other investigations like ultrasound and CT scan are more helpful, more accurate but require expertise, trained operators and specific equipments. In one study of 224 patients, only 10.4% patient's plain radiology was diagnostic.⁹ A study of 175 plain abdominal radiograph found only 13% contributing to final diagnosis.¹⁰ RCR guidelines were only followed in only 30% of patients in our study. As with some other studies, the reason for not adhering to RCR guidelines was that most abdominal radiographs in emergency room were ordered by junior doctors.⁹ It has been observed that when RCR guidelines were adhered

to, positive findings were identified in about 77% of the case whereas when these were not followed; positive findings were seen in only 9% of abdominal x-rays.¹¹ Anyanwu in his study suggested that proper emergency staff education, departmental protocols and increased out of hour's ultrasonography facilities are recommended to reduce the inappropriate use of plain film radiography.⁹

Lack of interpretation skills among junior doctors who order most of these radiographs is also a significant factor for these over judicious requests of abdominal radiographs.⁴ Important management decisions made by junior doctors based on these films should at least be confirmed with senior doctor.¹² In conclusion, our study shows that most of the plain abdominal films are unnecessary orders as "routine work up" and RCR guidelines are not followed in most of these cases.

REFERENCES

1. Field S, Morrison I. The acute abdomen. In: Sutton D. Text Book of Radiology and Imaging. Volume I. 7th Ed. Churchill Livingstone:2003;663-689.
2. Ukrisana P, Yenarken P. Evaluation of necessity of the three abdominal series in the diagnoses of abdominal pain. J Med assoc Thai 2002;85:998-1002.
3. Boleslawski E, Panis Y, Benoit S, Denet C, Mariani P, Valleur P. Plain abdominal radiography as a routine procedure for acute abdominal pain of the right lower quadrant: prospective evaluation. World J Surg 1999;23:262-4.
4. Feyler S, Williamson V, King D. Plain abdominal radiographs in acute medical emergencies: an abused investigation. Postgrad Med J 2002;78:94-6.
5. Royal College of Radiologists. Making the best use of a department of clinical radiology. Guidelines for doctors. 4th Ed. London: Royal College of Radiologists, 1998.
6. Flak B, Rowley VA. Acute abdomen: plain film utilization and analysis. Can Assoc Radiol J. 1993;44:423-8.
7. MacKersie AB, Lane MJ, Gerhardt RT, Claypool HA, Keenan S, Katz DS, et al. Non-traumatic acute abdominal pain: unenhanced helical CT compared with three view acute abdominal series. Radiology 2005;237:144-22.
8. Cope Z. Extract from the preface to the first edition. In: Silen W. Cope's early diagnosis of acute abdomen. 20th ed. New York, NY: oxford, 2000; ix-x.
9. Anyanwu AC, Moalypour SM. Are abdominal radiographs still over utilized in the assessment of acute abdominal pain? A district general hospital audit. J R Coll Edinb 1998;43:267-70.
10. Tasu JP, Takun K, Rocher L, Livartowski J, Nguyen DT, Miguel A, et al. Evaluation of plain abdominal radiography prescriptions in a university hospital centre. Presse Med 2001;30:1097-101.
11. Morris-Stiff G, Stiff RE, Morris-Stiff H. Abdominal radiograph requesting in a setting of acute abdominal pain: temporal trends and appropriateness of requesting. Ann R Coll Surg Engl. 2006;88:270-4.
12. Lim CB, Chen V, Barsam A, Berger J, Harrison RA. Plain abdominal radiographs: can we interpret them? Ann R Coll Surg Engl. 2006;88:23-6.