

Guidance for the appropriate use of Plain Films for Surgical Presentations in the Emergency Department

Background

For many years, the initial imaging modality in the investigation of the acute abdomen has been plain abdominal x-ray (AXR). However, the role of AXR in the decision-making process for patient management is being increasingly questioned. A 2012 review concluded there is no place for plain AXR in the work up of patients with acute abdominal pain as the sensitivity and negative predictive value is too low [1]. In addition to AXR, erect chest x-ray (CXR) is recommended to exclude free air under the diaphragm in suspected perforation. Evidence reports variable sensitivity of plain films to detect pneumoperitoneum, ranging from 50-90% [2-9], and there inability to detect the site of perforation [10]. A number of studies have shown CT has superior sensitivity to detect perforation than plain films [11-13], and has the ability to predict the site of gastrointestinal tract perforation in 86%-94% patients [1, 13, 14].

Findings

A recent study analysed 352 patients who had CT Abdo pelvis in the Emergency Department 256 (72%) underwent plain imaging. 101 (29%) had an AXR and 244 (69%) had an erect CXR. Plain x-rays changed management in 9 patients.

Erect CXR (n=244)

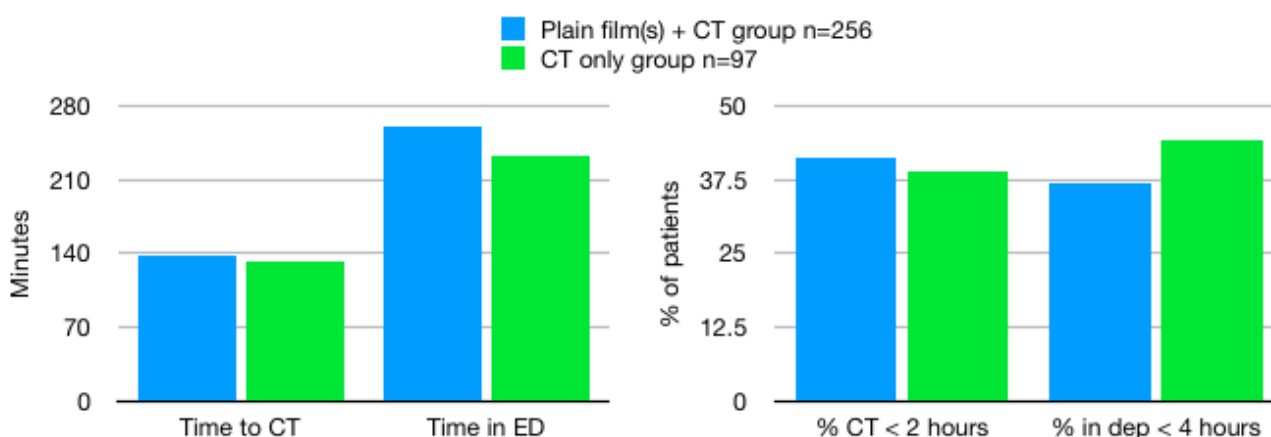
Of those in whom an erect CXR was performed, 12 (4.9%) identified free air. Of these 12, 11 would have had a CT regardless, given their presenting complaint. 174 (71%) scans were negative. 147 of the 244 scans were requested on suspicion of perforation. 11 of these 147 (7.5%) identified free air, 26 (17.7%) identified chest pathology and 114 (78%) were negative. 97 of the 244 scans were requested to look for chest pathology. 35 of these 97 (36%) identified chest pathology. One (1.0%) identified free air and sixty (62%) were negative.

AXR (n=101)

96 of the 101 AXR were requested to look for obstruction. 26 (27%) were positive either for obstruction or dilated loops, 18 of whom would have had a CT scan regardless given the presenting complaint. 54 (56%) scans were negative. 43 of these 54 (80%) negative scans went on to show abdominal pathology on CT.

	sensitivity	specificity	NPV
CT - perforation	86%	98%	99%
Erect CXR - perforation	41%	98%	90%
CT - obstruction	71%	95%	98%
AXR - obstruction	65%	86%	89%

In addition to having unnecessary radiation exposure the patient group who had plain films before CT spent a longer time in the Emergency Department



Recommendations

In order to reduce inappropriate imaging the following recommendations are made
 All erect Chest X-rays and abdominal films are discussed with ED senior before requesting. The guiding principle that one should only request if the findings are negative this would reassure you that there is no surgical pathology.

References

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