

An Assessment of Standard Imaging Protocols Following Stable Pelvic Ring Fractures: Is Surveillance Necessary?

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Purpose: Geriatric patients presenting to the Emergency Department (ED) following a low-energy fall are commonly diagnosed as a lateral compression type 1 (LC1) pelvic ring injury. Given the global increase in the geriatric population, it is important that this type of injury be managed in the most effective way possible, both in terms of quality and cost of medical care. The purpose of this study was to investigate if obtaining injury CT scans and post ambulation radiographs alter the management of this injury pattern.

Methods: An EMR query was performed between 2012 and 2013 at two institutions within one hospital system using ICD-9 codes for pelvic ring injury. 277 pelvic fractures were identified, and 161 of these fractures were of low energy mechanism and classified as LC1 pelvic fractures (OTA type 61-B2) by initial radiographs. Retrospective chart review was performed to collect demographic information (age, gender, mechanism of injury) and determine if a pelvic CT scan and/or a post-ambulation radiograph was obtained for this cohort of patients.

Results: 127 females and 34 males were identified, with an average age of 69.23 ± 20.8 . One hundred and eight patients (67.1%) underwent a pelvic CT scan. Orthopaedic residents were responsible for ordering a CT scan on 18 (15.3%) of patients. ED staff were responsible for a CT scan on 49 (45.4%) of patients and other specialties, including general surgery and internal medicine, were responsible for the CT scan on the remaining (38.0%) patients. Additional fractures about the pelvis requiring surgical repair were discovered on 2 (1.9%) patients, however these patients were both poly-trauma victims. Pelvic hematomas were discovered on 2 (1.9%) patients and 1 patient required CT guided aspiration of pelvic fluid. CT scans were ordered regardless of the energy of the injury ($p = .021$), primarily due to ED protocol for incoming trauma. Sixty-eight (42.2%) patients underwent post-ambulation radiographs. Orthopaedic residents were responsible for ordering the post-ambulation films on 44 (64.7%) of these patients, while ED staff and other specialties were responsible for the orders on the remaining 24 (35.3%) patients. None of these 68 patients experienced changes in their medical care or treatment plan following the post-ambulation films. Patients who were admitted from the Emergency Department were more likely to undergo either a pelvic CT ($p = .001$) or a post-ambulation x-ray ($p < .0005$). The average cost of a pelvic CT and pelvic radiographs (3 views) were \$1500 and \$200, respectively, excluding the costs of radiologist interpretation.

Conclusions: Orthopaedic surgeons should be consulted when possible by the ED prior to additional imaging being ordered to prevent misuse of resources. While pelvic CT scans may continue to have diagnostic value, particularly in geriatric populations where there is a risk of more serious injuries (i.e. visceral injury, etc), post-ambulation radiographs offer no significant contribution to the patient's medical care and create higher costs for both the

patient and the hospital system. Orthopaedic surgeons should be educated on how to manage non-operative pelvic ring injuries without obtaining serial post-ambulation radiographs.