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Imaging Errors in the Emergency Department: A Case Report

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Case Report

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Abstract: Emergency departments must take care of people presenting physical trauma in a short time, especially where elderly patients are concerned. Otherwise unfortunate errors might be committed for many reasons. One of the main causes of diagnostic errors in the emergency department is the failure to correctly interpret radiographs, and the majority of diagnoses missed on X-ray imaging are fractures. Diagnostic errors potentially have important consequences for patients, clinicians and radiologists. Radiologists play a pivotal role in the diagnostic assessment of multi-traumatic patients, and key elements to reduce errors in the emergency setting are knowledge, experience and the correct application of imaging protocols. With this case report the author describes a typical situation which may happen in an emergency department of a small town with the aim of highlighting the causes of the spectrum of diagnostic errors in radiography in the emergency setting.
Keywords: Errors in Medicine; Emergency Department; Pelvis Fracture; Radiology.

INTRODUCTION

When emergency departments have to take care of people with physical trauma, especially in the case of elderly patients, they might make unfortunate radiological errors for many reasons: inadequate histories, time-critical decisions, concurrent tasks and often inadequate personnel working long hours in busy emergency departments [1,2].

One of the most frequent causes of diagnostic errors in the emergency department is the failure to correctly interpret radiographs, and the majority of diagnoses missed on radiographs are always fractures [3].

Fractures in some complicated anatomical locations are notoriously difficult to detect on plain radiographs that, overall, remain the primary imaging modality used in the Emergency Department (ED) [4].

Missed diagnoses potentially have important consequences for patients, clinicians and radiologists. Radiologists play a pivotal role in the diagnostic assessment of poly-traumatic patients, and key elements to reduce errors in the emergency setting are knowledge, experience and the correct application of imaging protocols [5]. With this case report the author describes a typical situation which happened in an emergency department of a small town with the aim of highlighting the causes of the spectrum of diagnostic errors in radiography in the emergency setting.

CASE REPORT

An elderly 75-year-old female patient, small and thin, diabetic and a smoker, was admitted to the Emergency Department because of an accidental fall to the ground. She presented with limping gait with pain in her left hip. The emergency doctor requested an X-ray of the pelvis to rule out a fracture. However, the radiologist excluded any kind of fracture (Figure 1 see arrow).

Consequently, the patient was discharged with a diagnosis of hip contusion by trauma. Ten days later she attended her GP's office complaining about having severe pain in her left hip and not being able to walk properly. Physical examination revealed severe pelvis pain at passive mobilization of the left leg and serious difficulty in walking. This pain was worsened by moving the hip or attempting to walk. The patient tried to keep her hip or knee bent in a specific position to avoid aggravating the pain. There were slight swelling and bruising in the left hip area. Therefore, a CT of the pelvis was performed showing a clear compound fracture of the left iliac wing (Figure 2,3,4) estending to the acetabular column, which ought to have be suspected with a careful clinical examination, missed by all the doctors involved in. In view of the general situation, the orthopedic surgeon decided to undertake conservative treatment and the patient was discharged.

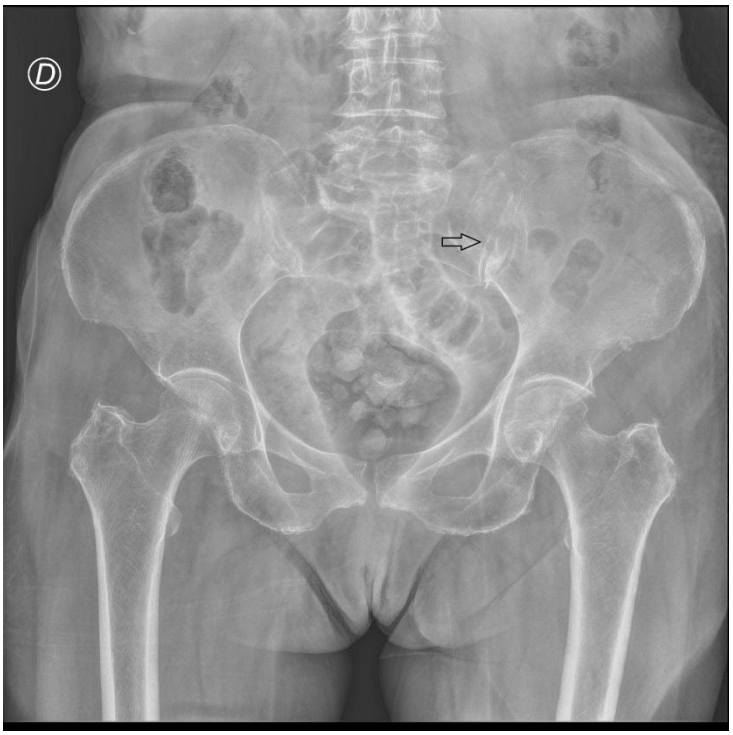

Fig-1: Anteroposterior radiograph of the pelvis shows no clear absence of fracture (upon a first vision by radiologist in Emergency Department)

Fig-2: CT scan (axial section) reveals a compound fracture of the iliac wrist

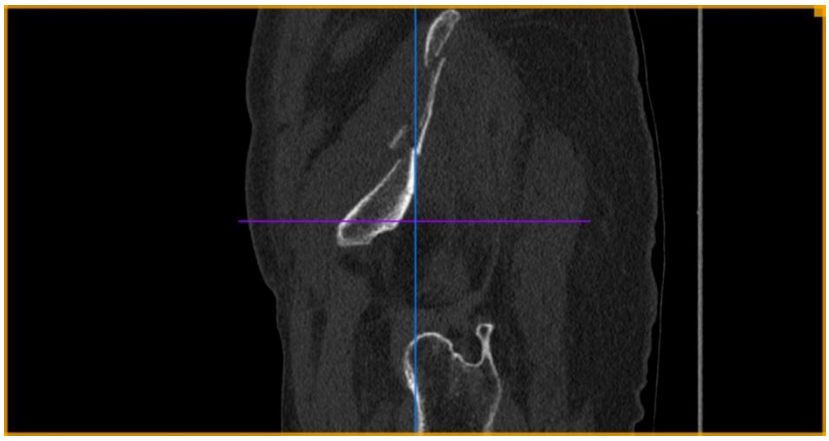

Fig-3: CT scan (axial section) reveals a compound fracture of the iliac wrist.

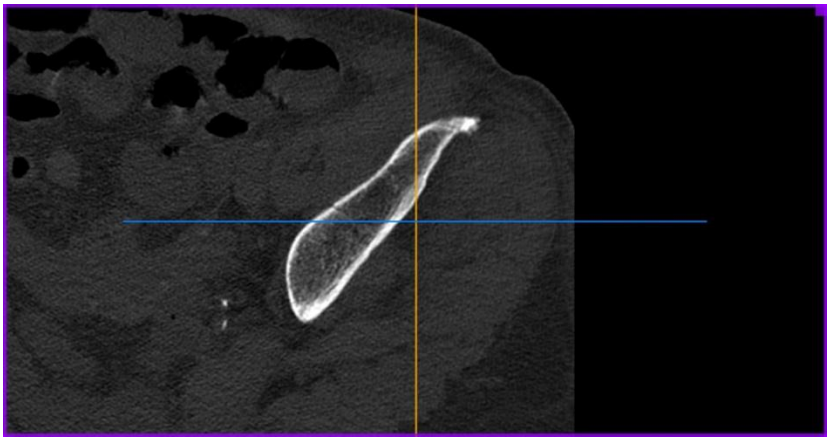

Fig-4: CT scan (axial section) reveals a compound fracture of the iliac wrist estending to the acetabular column

DISCUSSION

Errors and discrepancies in radiology practice are uncomfortably common, with an estimated day-to-day rate of 3-5% of studies reported, and much higher rates reported in many targeted studies [6]. Nonetheless, the meaning of the terms error and discrepancy and the relationship to medical negligence are frequently misunderstood [7]. The emergency room setting presents a scenario suitable for malpractice claims, such as rapid diagnosis and management of patients with whom we have had no prior interaction and who, quite often, may be uncooperative [3]. Misinterpretation of fractures may determine a delayed treatment and poor outcome for patients treated in the ED [8]. It is also one of the most frequent factors leading to medical legal claims [9]. The purpose of this case report is not to outline the incidence of such events or the ways they can be categorized to aid understanding, but rather emphasize how it is possible to apply strategies to minimize error, together with the means of dealing with perceived underperformance when identified. The inevitability of imperfection is understood, but the importance of striving to minimize such imperfection is emphasized. The first thing radiologists should do is to fully understand that when a clinician refers a patient for a radiological investigation it is generally to look for a number of things which should be indicated in the ensuing radiologist's report. Furthermore, there should be an accurate and complete identification of relevant findings, a coherent opinion regarding the underlying cause of any abnormalities and, where appropriate, guidance on what other investigations may be helpful. Secondly, the radiologist should also carry out a physical examination of the patient, even though he/she has already been visited, in order to have a full understanding of the request. Thirdly, the radiologist should obtain details and as much information as possible about the patient's history from the family physician and a clear physical examination from the emergency doctor who have visited firstly the patient. Finally, just in this case because of the complexity of this type of injury, the radiologist should do a CT scan as is common practice for pelvic fractures. Indeed, as radiologists know well, a CT scan will provide a more detailed, cross-sectional image of the pelvis. It follows that the error is to be divided equally between the doctor in the emergency room and the radiologist, neither of whom carried out an appropriate physical examination, possibly because they thought this had already been done by the other. This is the main reason why these errors occur, also because of the stress accumulated by the multitude of accesses to the emergency service and the short time allowed for each visit in cases of minor trauma.

CONCLUSION

Errors will always happen, but some can be avoided by paying attention to the reasoning processes we use and being aware of potential biases and system issues which can lead to mistakes. Also, any appropriate available strategy should be adopted so as to minimize these negative influences. In fact, diagnosis in radiology depends entirely on the visual perception and on the identification of specific characteristics on a radiograph. So, are errors and discrepancies in radiology at the emergency department inevitable or avoidable?

Disclosure

The author declares to have no conflict of interest.

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