

DETECTION AND CHARACTERIZATION OF TRAUMATIC INJURIES FOR FORENSIC EVALUATION BY RADIOGRAPHIC IMAGING

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Background and study aim: Various imaging modalities are increasingly being utilized in forensic medicine. The purpose of the current study was to assess the value of radiographic imaging for forensic evaluation and characterization of traumatic injuries.

Materials and methods: The study included 31 consecutive patients with trauma injuries that were referred for forensic evaluation at the Euromed Diagnostic Center in the period December 2015 – September 2016 (Table 1). From these, 16 subjects presented with chest trauma, 11 subjects with traumas of their extremities, 3 patients with head or spinal traumas, and 1 patient with associated chest and head trauma. All injured regions were evaluated by planar radiography. Special projections were used depending on the type of trauma and its location for optimal visualization of potential injuries with a lowest radiation dose.

Results: Overall, planar radiography revealed distinct traumatic injuries in 24 (77.4%) cases. In subjects presenting with chest trauma (n=16), rib fractures were revealed in 75% cases, xiphoid process injuries in 6.25% cases, and reactive pleurisy in 6.25% cases. In 3 subjects with reported chest traumas no detectable lesions could be revealed on planar chest X-ray. In subjects presenting with traumas of their lower or upper extremities (n=11), various injuries such as bone fractures or tendon ruptures were detected in 63.6% cases, while no distinct injuries could be documented in 36.4% cases (Table 1). Distinct bone fractures were documented in all patients with head, spinal or associated chest and head traumas, even though the small number of subjects presenting with this type of injuries is limiting the interpretation of the obtained results.

Table 1. Percentage of detected lesions by radiographic imaging in trauma subjects presenting for forensic evaluation

	<i>Chest trauma</i>	<i>Trauma of upper or lower extremities</i>	<i>Head, spinal or associated chest and head traumas</i>
Total subjects	16	11	4
Detected injuries	13 (81.25%)	7 (63.6%)	4 (100%)

Conclusion: Radiographic imaging revealed distinct injuries in 77.4% of trauma patients who presented for forensic evaluation, being particularly useful for diagnosing different types of bone fractures. Special projections adjusted to the type of trauma and its location allowed for optimal visualization of potential injuries while maintaining the radiation dose to minimal levels. At the same time, planar radiography proved less informative for evaluating soft tissue injuries, and other imaging modalities may need to be considered for this purpose, the topic being investigated in a separate study in our center.