G81 Postmortem Computed Tomography (CT) Observations in Pelvic Fracture: An Unrecognized Pattern of Hemorrhage

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After attending this presentation, attendees will be aware of a previously unrecognized hemorrhage pattern in the retro-sacral area associated with pelvic fracture.

This presentation will impact the forensic science community by documenting a previously unrecognized hemorrhage pattern associated with pelvic fracture that may lead to increased morbidity/mortality.

Methods: Postmortem CT angiography was performed in 25 cases of trauma by selective injections of the iliac arteries. Sites of vascular injury were correlated with pelvic fracture location. A previously unrecognized pattern of posterior retro-sacral hemorrhage was identified and documented at autopsy. External examination did not indicate contusion/hemorrhage over the sacral area and dissection was initiated based on CT findings. Based on these findings, a retrospective review of 92 consecutive postmortem CT studies was made and analyzed for the presence of a retro-sacral fluid collection. Presence/absence of a retro-sacral fluid collection was correlated with pelvic fracture and other trauma. Cases without evidence of torso trauma served as controls.

Results: In the 25 angiography cases, the pattern of posterior fluid collection and the pattern of pelvic fracture were documented. Contrast extravasation occurred in the distal branches of the internal iliac arteries with tracking into the retro-sacral soft tissue representing hemorrhage. This hemorrhage was related to fractures of the sacrum and separation of sacroiliac joints. In the 92 cases that underwent retrospective review, 14 were eliminated due to soft tissue trauma in the retro-sacral area. Of the 78 cases, 51 had torso trauma and 27 had no trauma. A posterior fluid collection was documented on CT in 29 (62%) of the trauma cases and 3 (11%) without torso trauma. Of the 51 torso trauma cases, 24 (47%) had pelvic fracture and 18 (75%) of these had a retro-sacral fluid collection. In the 27 torso trauma cases without pelvic fracture, retro-sacral fluid collections were present in 11 (41%) of these cases and were associated with fracture of the lumbar spine. In the 3 cases with retro-sacral fluid collection and no evidence of torso trauma, the fluid accumulation was determined to be associated with edema/dependent position.

Conclusion: Using postmortem angiography, retro-sacral hemorrhage in association with pelvic fracture can be depicted. Even without angiography, retro-sacral fluid collection can be identified on postmortem CT. The appearance of a retro-sacral fluid collection was noted in 75% of the cases with pelvic fracture. Unless dissection of the lower lumbar area of the back is performed during autopsy, this collection of fluid would be overlooked. It is important to recognize this finding in order to understand the morbidity/mortality associated with pelvic fracture. Further study is warranted to clarify the specific mechanism for and type of pelvic fracture leading to this retro-sacral hemorrhage.

Postmortem CT, Pelvic Fracture, Hemorrhage

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